CISCO SYSTEMS

Cisco WAN Switching Command Reference

Release 9.3.30
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About This Guide

This command reference defines the Cisco Wide Area Network switch user commands for System Software Release 9.3.0. Network designers and operators use these commands to set up, configure, monitor, manage, and troubleshoot a network consisting of Cisco BPX and IGX switches. This command reference is intended to provide detailed command information to support the configuration procedures and technical overviews provided in the *BPX Installation and Configuration Guide* and the *IGX Installation and Configuration Guide*.

The commands are listed alphabetically. In some cases, the same command is presented in two separate definition sections, one for the BPX series switches and the other for the IGX series switches.

Chapter Two groups the commands according to function with tables of commands related by technology, such as Frame Relay or functions, such as configuring Virtual Switch Interfaces (VSI). The commands in the function-oriented tables are linked to their command definition sections.

This section specifies the conventions used throughout this command reference and provides references to related Cisco documentation and other sources of information.

Each command definition section begins with the full command name and a functional description, followed by syntax, parameters, any display fields, command attributes, related commands, and actual examples with screen samples.

Related Documentation

The following Cisco publications contain additional information related to the operation of this product and associated equipment in a Cisco WAN switching network.

Cisco WAN Manager Release 10.5 Documentation

The product documentation for the Cisco WAN Manager (CWM) network management system for Release 10.5 is listed in Table 1.

Table 1 Cisco WAN Manager Release 10.5 Documentation

Title	Description
Cisco WAN Manager Installation Guide for Solaris, Release 10.5 DOC-7812948=	Provides procedures for installing Release 10 of the CWM network management system and Release 5.3 of CiscoView.
Cisco WAN Manager User's Guide, Release 10.5 DOC-7812945=	Describes how to use the CWM Release 10 software which consists of user applications and tools for network management, connection management, network configuration, statistics collection, and security management.
Cisco WAN Manager SNMP Service Agent, Release 10.5 DOC-7812947=	Provides information about the CWM Simple Network Management Protocol Service Agent, an optional adjunct to CWM used for managing Cisco WAN switches using SNMP.
Cisco WAN Manager Database Interface Guide, Release 10.5 DOC-7812944=	Provides information about accessing the CWM Informix OnLine database that is used to store information about the network elements.

Table 2 WAN CiscoView Release 10 Documentation

Title	Description
WAN CiscoView Release 3 for the MGX 8850 Edge Switch, Release 1 DOC-7811242=	Provides instructions for using this network management software application that allows you to perform minor configuration and troubleshooting tasks.
WAN CiscoView Release 3 for the MGX 8250 Edge Concentrator, Release 1 DOC-7811241=	Provides instructions for using this network management software application that allows you to perform minor configuration and troubleshooting tasks.
WAN CiscoView Release 3 for the MGX 8230 Multiservice Gateway, Release 1 DOC-7810926=	Provides instructions for using this network management software application that allows you to perform minor configuration and troubleshooting tasks.

Cisco MGX 8850 Release 2.1 Documentation

The product documentation for the installation and operation of the MGX 8850 Release 2.1 switch is listed in Table 3.

Table 3 Cisco MGX 8850 Switch Release 2.1 Documentation

Title	Description
Cisco MGX 8850 Routing Switch Hardware Installation Guide, Release 2.1 DOC-7812561=	Describes how to install the MGX 8850 routing switch. It explains what the switch does, and covers site preparation, grounding, safety, card installation, and cabling.
Cisco MGX 8850 Switch Command Reference, Release 2.1 DOC-7812563=	Describes how to use the commands that are available in the CLI[1]of the MGX 8850 switches.
Cisco MGX 8850 Switch Software Configuration Guide, Release 2.1 DOC-7812551=	Describes how to configure the MGX 8850 switches to operate as ATM edge and core switches. This guide also provides some operation and maintenance procedures.
Cisco MGX 8850 SNMP Reference, Release 2.1 DOC-7812562=	Provides information on all supported MIB[2]objects, support restrictions, traps, and alarms for the AXSM, PXM45, and RPM. PNNI is also supported.
Cisco MGX and SES PNNI Network Planning Guide DOC-7813543=	Provides guidelines for planning a PNNI network that uses the MGX 8850 switches and the BPX 8600 switches. When connected to a PNNI network, each BPX 8600 series switch requires a Service Expansion Shelf (SES) for PNNI route processing.
Cisco MGX Route Processor Module Installation and Configuration Guide, Release 2.1 DOC-7812510=	Describes how to install and configure the MGX Route Processor Module (RPM-PR) in the MGX 8850 Release 2.1 switch. Also provides site preparation, troubleshooting, maintenance, cable and connector specifications, and basic IOS configuration information.

1. CLI = command line interface
2. MIB = Management Information Base

SES PNNI Release 1.1 Documentation

The product documentation that contains information for the understanding, the installation, and the operation of the Service Expansion Shelf (SES) PNNI Controller is listed in Table 4.

Table 4 SES PNNI Controller Release 1.1 Documentation

Title	Description
Cisco SES PNNI Controller Software Configuration Guide, Release 1.1 DOC-7813539=	Describes how to configure, operate, and maintain the SES PNNI Controller.

Table 4 SES PNNI Controller Release 1.1 Documentation (continued)

Title	Description
Cisco SES PNNI Controller Software Command Reference, Release 1.1 DOC-7813541=	Provides a description of the commands used to configure and operate the SES PNNI Controller.
Cisco MGX and SES PNNI Network Planning Guide DOC-7813543=	Provides guidelines for planning a PNNI network that uses the MGX 8850 switches and the BPX 8600 switches. When connected to a PNNI network, each BPX 8600 series switch requires a SES for PNNI route processing.

Cisco WAN Switching Software, Release 9.3 Documentation

The product documentation for the installation and operation of the Cisco WAN Switching Software Release 9.3 is listed in Table 5.

Table 5 Cisco WAN Switching Release 9.3 Documentation

Title	Description
Cisco BPX 8600 Series Installation and Configuration, Release 9.3.30 DOC-7812907=	Provides a general description and technical details of the BPX broadband switch.
Cisco WAN Switching Command Reference, Release 9.3.30 DOC-7812906=	Provides detailed information on the general command line interface commands.
Cisco IGX 8400 Series Installation Guide, Release 9.3.30 OL-1165-01 (online only)	Provides hardware installation and basic configuration information for IGX 8400 Series switches running Switch Software Release 9.3.30 or earlier.
Cisco IGX 8400 Series Provisioning Guide, Release 9.3.30 OL-1166-01 (online only)	Provides information for configuration and provisioning of selected services for the IGX 8400 Series switches running Switch Software Release 9.3.30 or earlier.
Cisco IGX 8400 Series Regulatory Compliance and Safety Information DOC-7813227=	Provides regulatory compliance, product warnings, and safety recommendations for the IGX 8400 Series switch.

MGX 8850 Multiservice Switch, Release 1.1.40 Documentation

The product documentation that contains information for the installation and operation of the MGX 8850 Multiservice Switch is listed in Table 6.

Table 6 MGX 8850 Multiservice Gateway Documentation

Title	Description
Cisco MGX 8850 Multiservice Switch Installation and Configuration, Release 1.1.3 DOC-7811223=	Provides installation instructions for the MGX 8850 multiservice switch.
Cisco MGX 8800 Series Switch Command Reference, Release 1.1.3. DOC-7811210=	Provides detailed information on the general command line for the MGX 8850 switch.
Cisco MGX 8800 Series Switch System Error Messages, Release 1.1.3 DOC-7811240=	Provides error message descriptions and recovery procedures.
Cisco MGX 8850 Multiservice Switch Overview, Release 1.1.3 OL-1154-01 (online only)	Provides a technical description of the system components and functionary of the MGX 8850 multiservice switch from a technical perspective.
Cisco MGX Route Processor Module Installation and Configuration Guide, Release 1.1 DOC-7812278=	Describes how to install and configure the MGX Route Processor Module (RPM/B and RPM-PR) in the MGX 8850, MGX 8250, and MGX 8230 Release 1 switch. Also provides site preparation, troubleshooting, maintenance, cable and connector specifications, and basic IOS configuration information.
1.1.40 Version Software Release Notes Cisco WAN MGX 8850, MGX 8230, and MGX 8250 Switches DOC-7813594=	Provides new feature, upgrade, and compatibility information, as well as known and resolved anomalies.

MGX 8250 Edge Concentrator, Release 1.1.40 Documentation

The documentation that contains information for the installation and operation of the MGX 8250 Edge Concentrator is listed in Table 7.

Table 7 MGX 8250 Multiservice Gateway Documentation

Title	Description
Cisco MGX 8250 Edge Concentrator Installation and Configuration, Release 1.1.3 DOC-7811217=	Provides installation instructions for the MGX 8250 Edge Concentrator.
Cisco MGX 8250 Multiservice Gateway Command Reference, Release 1.1.3 DOC-7811212=	Provides detailed information on the general command line interface commands.
Cisco MGX 8250 Multiservice Gateway Error Messages, Release 1.1.3 DOC-7811216=	Provides error message descriptions and recovery procedures.
Cisco MGX 8250 Edge Concentrator Overview, Release 1.1.3 DOC-7811576=	Describes the system components and functionality of the MGX 8250 edge concentrator from a technical perspective.

Table 7 MGX 8250 Multiservice Gateway Documentation (continued)

Title	Description
Cisco MGX Route Processor Module Installation and Configuration Guide, Release 1.1 DOC-7812278=	Describes how to install and configure the MGX Route Processor Module (RPM/B and RPM-PR) in the MGX 8850, MGX 8250, and MGX 8230 Release 1 switch. Also provides site preparation, troubleshooting, maintenance, cable and connector specifications, and basic IOS configuration information.
1.1.40 Version Software Release Notes Cisco WAN MGX 8850, MGX 8230, and MGX 8250 Switches DOC-7813594=	Provides new feature, upgrade, and compatibility information, as well as known and resolved anomalies.

MGX 8230 Multiservice Gateway, Release 1.1.40 Documentation

The documentation that contains information for the installation and operation of the MGX 8230 Edge Concentrator is listed in Table 8.

Table 8 MGX 8230 Multiservice Gateway Documentation

Title	Description
Cisco MGX 8230 Edge Concentrator Installation and Configuration, Release 1.1.3 DOC-7811215=	Provides installation instructions for the MGX 8230 Edge Concentrator.
Cisco MGX 8230 Multiservice Gateway Command Reference, Release 1.1.3 DOC-7811211=	Provides detailed information on the general command line interface commands.
Cisco MGX 8230 Multiservice Gateway Error Messages, Release 1.1.3 DOC-78112113=	Provides error message descriptions and recovery procedures.
Cisco MGX 8230 Edge Concentrator Overview, Release 1.1.3 DOC-7812899=	Provides a technical description of the system components and functionary of the MGX 8250 edge concentrator from a technical perspective.
Cisco MGX Route Processor Module Installation and Configuration Guide, Release 1.1 DOC-7812278=	Describes how to install and configure the MGX Route Processor Module (RPM/B and RPM-PR) in the MGX 8850, MGX 8250, and MGX 8230 Release 1 switch. Also provides site preparation, troubleshooting, maintenance, cable and connector specifications, and basic IOS configuration information.
1.1.40 Version Software Release Notes Cisco WAN MGX 8850, MGX 8230, and MGX 8250 Switches DOC-7813594=	Provides new feature, upgrade, and compatibility information, as well as known and resolved anomalies.

About Cisco WAN Switch Product Names

The Cisco WAN Switch products were previously offered under different names:

- Any switch in the BPX switch family is referred to as BPX® 8650 broadband switch. (Previously: Cisco BPX® 8620 broadband switch)
- The Cisco BPX® 8620 broadband switch was formerly called the BPX Service Node switch.
- The Cisco BPX® 8650 broadband switch may be used as a Label Switch Controller (LSC). A LSC was formerly called a Tag Switch Controller.
- The Cisco MGX™ 8220 edge concentrator was formerly called the AXIS shelf.
- Any switch in the IGX switch series (IGX 8, IGX 16, IGX 32 wide-area switches) is called the Cisco IGX™ 8400 series multiband switch.
  - The Cisco IGX™ 8410 multiband switch was formerly called the IGX 8 switch
  - The Cisco IGX™ 8430 multiband switch the IGX 16 switch.
- The Cisco WAN Manager® (CWM) was formerly called Cisco StrataView Plus®.

Conventions

This command reference follows these conventions:

Command definitions:

- Commands and keywords are in **boldface**.
- Required command arguments are inside angle brackets (< >).
- Optional command arguments are in square brackets ([ ]).
- Alternative keywords are separated by vertical bars (|).

Command examples:

- Terminal sessions and information the system displays are in `screen` font.
- Information you enter is in **boldface**.
- Nonprinting characters, such as passwords, are in angle brackets (< >).
- Default responses to system prompts are in square brackets ([ ]).

Note Means you should *take note*. Notes contain important suggestions or references to materials not contained in the current body of text.

Caution Means *be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

Obtaining Documentation

The following sections explain how to obtain documentation from Cisco Systems.

World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following URL:

http://www.cisco.com

Translated documentation is available at the following URL:

http://www.cisco.com/public/countries_languages.shtml

Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:

  http://www.cisco.com/cgi-bin/order/order_root.pl

- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:

  http://www.cisco.com/go/subscription

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

Documentation Feedback

If you are reading Cisco product documentation on Cisco.com, you can submit technical comments electronically. Click **Leave Feedback** at the bottom of the Cisco Documentation home page. After you complete the form, print it out and fax it to Cisco at 408 527-0730.

You can e-mail your comments to bug-doc@cisco.com.

To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

Cisco Systems
Attn.: Document Resource Connection
170 West Tasman Drive
San Jose, CA 95134-9883

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools. For Cisco.com registered users, additional troubleshooting tools are available from the TAC website.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information and resources at anytime, from anywhere in the world. This highly integrated Internet application is a powerful, easy-to-use tool for doing business with Cisco.

Cisco.com provides a broad range of features and services to help customers and partners streamline business processes and improve productivity. Through Cisco.com, you can find information about Cisco and our networking solutions, services, and programs. In addition, you can resolve technical issues with online technical support, download and test software packages, and order Cisco learning materials and merchandise. Valuable online skill assessment, training, and certification programs are also available.

Customers and partners can self-register on Cisco.com to obtain additional personalized information and services. Registered users can order products, check on the status of an order, access technical support, and view benefits specific to their relationships with Cisco.

To access Cisco.com, go to the following website:

http://www.cisco.com

Technical Assistance Center

The Cisco TAC website is available to all customers who need technical assistance with a Cisco product or technology that is under warranty or covered by a maintenance contract.

Contacting TAC by Using the Cisco TAC Website

If you have a priority level 3 (P3) or priority level 4 (P4) problem, contact TAC by going to the TAC website:

http://www.cisco.com/tac

P3 and P4 level problems are defined as follows:

- P3—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- P4—You need information or assistance on Cisco product capabilities, product installation, or basic product configuration.

In each of the above cases, use the Cisco TAC website to quickly find answers to your questions.

To register for Cisco.com, go to the following website:

http://www.cisco.com/register/

If you cannot resolve your technical issue by using the TAC online resources, Cisco.com registered users can open a case online by using the TAC Case Open tool at the following website:

http://www.cisco.com/tac/caseopen

Contacting TAC by Telephone

If you have a priority level 1(P1) or priority level 2 (P2) problem, contact TAC by telephone and immediately open a case. To obtain a directory of toll-free numbers for your country, go to the following website:

http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml

P1 and P2 level problems are defined as follows:

- P1—Your production network is down, causing a critical impact to business operations if service is not restored quickly. No workaround is available.
- P2—Your production network is severely degraded, affecting significant aspects of your business operations. No workaround is available.

Command Line Fundamentals

A workstation, terminal, or personal computer can function as a control terminal for an IGX or BPX node through an EIA/TIA-232 link or over an Ethernet TCP/IP LAN. All command input takes place at the terminal, and all displays appear on the terminal screen. Through displays that show status, alarm, or statistics, the terminal constantly provides a view of an individual node, a trunk, a connection, or the entire network.

The control terminal gives you the ability to control the network from any routing node. A remote access command is available for controlling the network from a node other than the node physically connected to the terminal. This command is the Virtual Terminal (**vt**) command. The **vt** command creates a communication channel for the operator to a remote node. After you access a node by using **vt**, you can begin executing commands at the accessed node. Most commands and tasks that you can execute at the local node are also executable at a remote node.

The WAN Manager Network Management Station provides network management capabilities for multinode networks. WAN Manager also collects and displays statistics. For access, WAN Manager operates in LAN mode or telnet mode. (As of Release 8.0, you can no longer access a node through the serial port.) Refer to the *Cisco WAN Manager Operations Manual* for more information.

The User Command Screen Layout

After the node receives power and correctly starts up, the terminal screen appears as shown below. If the screen is blank or does not display the initial screen, check all connections to the node, and make sure the terminal and node are receiving power. If the connections are correct, press the Delete key a few times or cycle the terminal power.

```
sw180          TN    No User         IGX 8420  9.3.g0    Oct. 20 2000 06:09 GMT









Enter User ID:
```

The user command screen is divided into three areas:

- The top line of the screen (status line) displays the node name, current user name, software revision level, date, time and time zone. If the date and time have not been configured on the node, the screen states this.
- The middle part of the screen shows the information returned by the executed commands. This could be, for example, configuration or statistical information.
- The bottom area of the screen displays prompts for the next command or the current command parameters. As the system receives the parameters you enter, it duplicates them above the command entry line to serve as a record of the entries. The bottom area also shows the command last entered.

All command screens eventually time out. This includes dynamically updated screens such as the display for the **dspbob** command. Furthermore, if sufficient time passes, you are logged out.

Entering a Command

This section describes how to enter a command for those who are unfamiliar with Cisco WAN switch equipment. It also describes the online help for the commands.

Each user command can have one or more access privilege levels (see Access Privileges, page 1-6). Entering a particular command is possible for a user at the same or higher privilege of the command. Each command definition in this manual shows the privilege or range of privileges for the command. Most commands are not case-sensitive.

When the **Next Command** prompt is at the bottom of the screen, the system is ready for a new command. Some commands, such as those for simply displaying information, do not require parameters. Display commands often have no required parameters but have one or more optional parameters for changing the scope of displayed information. Commands that require parameters usually prompt for each parameter.

To abort a command for any reason, press the Delete key. If you make a mistake or need to edit the command line, see To Edit a Typed Command, page 1-5.

The general syntax is **command** <*parameter*(*s*)> [*optional parameter*(*s*)]. When a command definition displays actual parameters, the required parameters appear within the arrow heads (< >). If the list of command parameters is too long, the command definition's "Syntax" field just shows "parameters," which means the parameters are available only in the parameters table for the definition. For information on the format of system resource numbering, see The Numbering of Trunks, Lines, and Channels, page 1-10.

Those unfamiliar with the system can use the online help feature to view the seven categories of commands and get syntax information on a command (see About Command Categories, page 1-3).

To enter a command from the menu:

Step 1 At the **Next Command** prompt, either press the Escape key or enter the word **help** or a question mark. A list of command categories appears as in the example below.

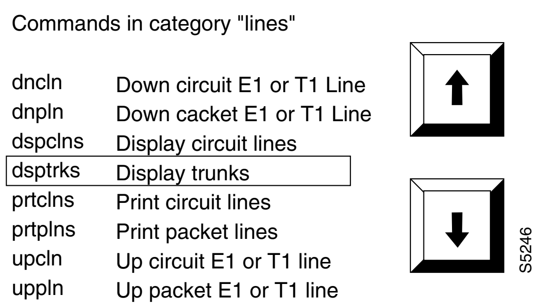
```
gamma           TRM    YourID:1        IGX 8420    9.3.20    Aug. 15 2000 13:47 CST

All commands fall into one (or more) of the following categories:

Control Terminal
Configuration
Lines
Network
Connections
Cards
```

```
Alarms and Failures




This Command: ?

Use cursor keys to select category and then hit <RETURN> key:
```

Step 2 Use the up/down arrow keys to select a command category, then press **Return**. A list of all the commands in that category appears. (The next example is from the “line” category of commands.)

Step 3 Use the cursor key to select the command you want to enter (**dsptrks** for example), then press **Return**. The selected command appears on the screen, and the system prompts you for any additional parameters needed to complete the command.

Figure 1-1 Entering a Command



A faster way to enter a command, using fewer keystrokes, is to enter the command on the command line, then press the Return key. The system prompts you for any additional parameters required to complete the command.

The fastest way to enter a command, using the fewest keystrokes, requires that you know the command along with the necessary parameters. Enter the command name and all of the required parameters in the correct format, then press the Return key.

About Command Categories

The command category menu is displayed when you press the Escape or **?** or **Help** key. The commands are organized into seven categories. (These categories are not the categories used to organize this manual.) Table 1-1 lists and describes the command categories.

Table 1-1 Command Categories

Category	Command functions
Control Terminal	Configure your password, serial port and printer functions, use the help facility, establish virtual terminal connections, and create and edit jobs.
Configuration network and line timing	Configure voice and data channels. Display network configuration.
Lines	Activate and deactivate lines. Display line status.
Network	Add and delete trunks, configure a node name. Display and print network status.
Connections	Add, delete, and display circuit (voice and data) and FastPacket data channel connections. Configure network routing and connection characteristics (Frame Relay and ATM). Perform connection.
Cards	Activate, deactivate, and reset printed circuit cards. Display power supply status.
Alarms and Failures	Display, print, and clear alarms, errors, and network history. Configure alarm thresholds.

Aborting a Command

To abort any command, press **Delete**

On terminals without a **Delete** key, you might need to press **Shift-Backspace** or other keys to perform the **Delete** function.

The **Next Command:** prompt appears at the bottom of the screen indicating that you can enter another command. The command you aborted appears in low intensity letters on the screen after the **Last Command:** prompt.

Command Shortcuts

When you enter a command, it is displayed next to the **Last Command:** prompt at the bottom of the screen. To copy the command to the new command line, press the **Ctrl** and **A** keys simultaneously.

To execute the previous command:

- Edit the command line and then press the Return key,

  OR:

- Enter an exclamation mark (**!**) followed by the first letter or letters of a previous command and press the Return key.

For example, to repeat the **dspcons** command:

Last Command: **dspcons**

Next Command: **!dsp**

Press the **Return** key. You can use the **Display Command History** (**.**) command to display the 12 most recently executed commands:

Step 1 Type **.** (a period) and press **Return**. A numbered list of commands displays. In the following example, the most recently executed command is number 1.

```
12:
11:
10:
 9:
 8:
 7:prtscrn
 6:addcon 12.1 alpha 12.1 v
 5:delcon 12.1
 4:cnfport a 1200 n 8 1 x x n
 3:cnftime 17 19 34
 2:redscrn
 1:help
```

Step 2 Type the number of the command you want to re-execute, then press the Return key. The command is displayed after the **Next Command:** prompt. Press the Return key to execute the command, or edit the command line and then press the Return key. Whenever you end a terminal session by signing off (with the **bye** command), the command list is cleared.

To Edit a Typed Command

Before you press **Return**, you can use control keys to edit a typed command. Table 1-2 lists the control key to edit information on the command line. Not all terminals have the same key characters. If the exact key is not available, determine which alternate key performs the function.

Table 1-2 Keys for Editing the Command Line

Function	Keys	Cursor Movement
Move the cursor	Ctrl-B	Moves the cursor left one word.
	Ctrl-F	Moves the cursor right one word.
	Ctrl-L	Moves the cursor right one character.
	Ctrl-G	Moves the cursor left one character.
	Arrows	Moves the cursor in the direction of the arrow.
Delete	Ctrl-W	Deletes a character.
	CHAR DEL	Deletes a character.
	Ctrl-H	Moves the cursor left one character and deletes that character.
	Ctrl-D	Deletes all characters from the cursor position to the end of the line.
	Ctrl-X	Deletes a line.
	BACKSPACE	Moves the cursor left one character and deletes that character.

Table 1-2 Keys for Editing the Command Line (continued)

Function	Keys	Cursor Movement
Insert	Ctrl-I	Toggles insert mode.
	TAB	Toggles insert mode.
	CHAR INSERT	Toggles insert mode.
	Ctrl-^	Inserts line.
Miscellaneous	*	Leaves the data in this field as it is displayed and goes to the next field.
	DELETE	Aborts command.
	Ctrl-M	Carriage return.
	RETURN	Carriage return.
	Ctrl-S	Stops the data flow from the node to the terminal screen.
	Ctrl-Q	Restarts the flow of data from the IGX.
	Ctrl-A	Copies the last command line.
	! (..)	(The exclamation mark followed by the first characters or character of a command, brings that command back to the command line.)

Access Privileges

Access to the commands is password protected. To access the commands, type your **user ID** and **user password** at the log-in prompts. Each user is assigned a privilege level by the System Manager that determines which commands you can use.

The six user privilege levels follow this basic convention:

Level 0 is the SuperUser access level permitting use of SuperUser commands. See SuperUser Commands, page 2-33. SuperUser commands are identified in the Attributes table of the command definition.

Level 1 has access to all the commands.

Level 6 has access to the fewest commands.

A given privilege level has access to all levels below it. For example, level 3 has access to levels 3 through 6. The privilege level for each command is part of the command summary.

Help

The system software provides a help function for commands. The **help** command gives you access to a general help menu or to information on a specific command.

To access the Command Category menu, enter either **help** or **?**.

Either of these commands displays the Command Category menu listing all commands and command syntax. You are prompted to make a selection. Use the arrow keys to move the cursor to the correct category, then press the **Return** key.

The Command Category Menu:

- Control terminal
- Configuration
- Lines
- Network
- Connections
- Cards
- Alarms and failures

For information on a specific command, enter **help** or **?** followed by a command name. For example, enter the following for information on adding a trunk:

help addtrk

Press Return to display the information.

Enter **help** or **?** followed by a character string to display all those commands containing the character string. For example, for a list of all commands that contain the string "fr," enter the following:

? fr

You can then select a particular command from this list for help information.

The Online Help feature of WAN Manager provides more detailed command information. Hypertext links allow you to navigate through command category lists, alphabetical indexes, and the command descriptions. Refer to the *Cisco WAN Manager Operations* manual for more information.

About Command Names

Most of the command names use the convention of a descriptive verb and noun. For example, the **addcon** command adds a connection, the **delcon** command deletes a connection, and the **dspcon** command displays information about a connection. Table 1-3 lists the command-related abbreviations.

Table 1-3 Command-Related Abbreviations

Format	Mnemonic	Descriptor
Verbs	add	Add
	bye	Bye
	clr	Clear
	cnf	Configure
	cpy	Copy
	del	Delete
	dn	Down
	dsp	Display
	edit	Edit
	grp	Group
	help	Help
	prt	Print

Table 1-3 Command-Related Abbreviations (continued)

Format	Mnemonic	Descriptor
Verbs (continued)	red	Redraw
	reset	Reset
	run	Run
	stop	Stop
	switch	Switch
	tst	Test
Nouns	adv	Adaptive voice
	ait	AIT
	alm(s)	Alarms
	bob	Breakout box
	bus(es)	Bus(es)
	cd(s)	Card(s)
	ch	Channel
	clk	Clock
	cln(s)	Circuit line(s)
	cls	Class
	cnf	Configuration
	con(s)	Connection(s)
	congrp	Connection group
	cond	Conditioning
	cos	Class of service (COS)
	d	Data
	date	Date
	dfm	DFM
	dial	Dial
	dl	Dial type
	eia	EIA
	errs	Errors
	extlp	External loop
	fp	FastPAD
	fr	Frame Relay
	ftc	FTC
	func	Function
	gn	Gain insertion
	grp(s)	Group(s)
	ict	Interface control template

Table 1-3 Command-Related Abbreviations (continued)

Format	Mnemonic	Descriptor
Nouns (continued)	ip	IP
	job(s)	Job(s)
	lcn	Logical connection
	ln(s)	Line(s)
	load	Load
	loclp	Local loop
	log	Log
	mc	Multicast
	msg	Message
	name	Name
	nw	Network
	ospace	Open space
	parm(s)	Parameter(s)
	port	Port
	pref	Preference
	prt	Printer
	pwr	Power
	rcv	Receiver
	red	Redundant
	rmtlp	Remote loop
	rts	Routes
	scr	Screen
	seg	Segment
	sig	Signal
	slot	Slot
	snmp	SNMP
	src(s)	Source(s)
	st	Status
	stats	Statistics
	stby	Standby
	sys	System
	term	Terminal
	tmzn	Time zone
	tp	Type
	trig	Trigger
	trk(s)	Trunk(s)

Table 1-3 Command-Related Abbreviations (continued)

Format	Mnemonic	Descriptor
Nouns (continued)	user	User
	utl	Utilization
	xmt	Transmit
	yred	Y-cable redundancy

The Numbering of Trunks, Lines, and Channels

The information contained in this manual allows you to set up, configure, and maintain traffic on trunks and lines. Table 1-4 lists the format conventions for the names of trunks, lines, and channels.

Table 1-4 Formats of System Resource Names

Trunk, line, or channel	Description
CDP/CVM Circuit Line and NTC/NTM Trunk	The number assigned to a CDP or CVM line (CLN) or an NTC or NTM trunk (TRK) is the slot number of the BC-T1 or BC-E1 back card in the physical slot where the CLN or TRK is connected to the IGX node. In the case of redundant pairs, it is the slot associated with the primary back card.
AIT Trunk	The number assigned to the backslot of the BC-T3 or BC-E3 back card.
BPX Trunk Numbers	The number assigned to a BPX trunk (TRK) is the backslot number and port (1 - 3) of the BNI (**slot.port; example, 2.1**) card to which the T3 trunk cable is attached.
Voice Channel Numbers	A voice channel is specified by “SLOT.CH”. Sets of voice channels are specified by “SLOT.CH-CH”. The notation “SLOT” refers to the back slot number of a circuit line and “CH” refers to a channel (1-24 for T1 or 1-31 for E1). For example, “12.1” indicates channel 1 on circuit line 12, and “12.1-9” indicates channels 1-9 on circuit line 12.
Data Channel Numbers	Data channels are specified by “SLOT.PORT”, where “SLOT” refers to the slot number of a data card, and “PORT” refers to a port on that data card. For example, “9.3” specifies port 3 on the data card in slot 9. The notation “9.1-4” refers to ports 1-4 on that card. The range of port numbers is from 1 to 4 for SDI and DDS data cards. An appended “a”, for example; 11.1-5a, indicates the channels are configured to use the super-rate alternating channel feature.

Table 1-4 Formats of System Resource Names (continued)

Trunk, line, or channel	Description
Frame Relay channel numbers (local addressing)	In the local addressing convention, Frame Relay channels are specified by "SLOT.PORT.DLCI", where "SLOT" refers to the slot number of an FRP, "PORT" refers to a port on the FRP card, and "DLCI" is the local data link connection identifier. The range of port numbers is from 1 to 4. For example, the following **addcon** command at node alpha: **addcon 6.1.101 beta 4.1.102 2** The command adds a connection between alpha and beta. The user device at alpha refers to this connection using the local DLCI of 101. The user device at beta refers to this connection using the local DLCI of 102. The DLCIs have local significance only. With local addressing, the same DLCI can be used again, but not for more than one destination from the same port. For example, the following adds another connection from alpha port 6.1: **addcon 6.1.100 gamma 6.2.102 2** In this case, a DLCI of 100 is used at alpha. A DLCI of 102 can be used at gamma as well as at beta, because the DLCIs have only local significance.
Frame Relay channel numbers (Global Addressing)	In the global addressing, the format for Frame Relay channel specification is "SLOT.PORT.DLCI." However, each FRP or FRM port (and associated user device) is identified by a unique DLCI. No two ports in the network can have the same DLCI. For example, alpha port 6.1, gamma port 6.2, and beta port 4.1 could be assigned unique DLCIs of 79, 80, and 81 when adding connections, as in the following example: **addcon 6.1.80 gamma 6.2.79 2 (at alpha)** **addcon 6.1.81 beta 4.1.79 1 (at alpha)** **addcon 4.1.80 gamma 6.2.81 5 (at beta)** The user device at alpha refers to the connection between alpha and gamma, using the DLCI of 80 assigned to gamma. The user device at gamma refers to this connection using the DLCI of 79 assigned to alpha. The user device at alpha refers to the connection between alpha and beta using the DLCI of 81 assigned to beta. The user device at beta refers to this connection using the DLCI of 79 assigned to alpha. The user device at beta refers to the connection between beta and gamma using the DLCI of 80 assigned to gamma. The user device at gamma refers to this connection using the DLCI of 81 assigned to beta. For information on adding Frame Relay connections through a FastPAD, refer to the command descriptions in the online version of the 8.2 *FastPAD User's Guide*.

User Interface Commands

The user interface commands:

- Provide help on how to use the commands
- Display the twelve most recent commands entered into the system
- Connect to another node
- Sign on and off
- Clear, print, or redraw the screen

These commands are all simple to use and have no command parameters except the virtual terminal command (**vt**), in which you must specify the node name, and the help commands, in which you must enter a command character string.

See the section Basic User Interface Commands in Chapter 2 for a list of these commands linked to their full command definitions.

Signing On

Signing on to the system is a two-step process requiring you to enter both a User ID and a password. The system administrator can provide a User ID and password for the network. Only the system administrator can assign and change User IDs. Once a password is assigned, you can change your own password. For security reasons, users should periodically change their passwords.

Note: User ID and passwords are case-sensitive.

When the following prompt appears at the bottom of the initial screen, the system is ready for you to log in:

Enter User ID:

Entering a User ID and password gives access at a particular level of user privilege. (Each command has one or more levels of associated user privilege.) User IDs can have up to twelve (12) characters. At the prompt, enter the User ID. The system responds with the following prompt:

Enter Password:

When you initially sign on, enter the password. (The password does not appear on the screen.) Upon receiving the correct User ID and password, the log-in is recorded by the event log, and the screen displays the following prompt:

Next Command:

The system is ready to receive commands.

Logging Out

To log out, enter **bye**. When the terminal connection is local, this returns you to the initial screen.

To log out completely from a remote (virtual terminal) session, enter **bye** twice.

Clearing and Redrawing the Screen

To clear the screen, use the Clear Terminal Screen (**clrscrn**). The **clrscrn** command clears any information displayed in the top portion of the screen. This information could consist of status displays on lines and connections or Help text.

To clear and redraw the screen, use the Redraw Terminal Screen (**redscrn**) command. The **redscrn** command redraws the screen and updates the status lines. To make sure the status lines have been updated, enter the **redscrn** command. For example, to redraw a screen's display with the latest statistics before printing the screen, enter **redscrn**.

Printing Screens

Use the Print Terminal Screen (**prtscrn**) command prints the current screen display. Verify that the node printer is correctly configured before attempting to print a screen. Upon entering the **prtscrn** command, the screen display goes to either a local or remote printer. To print all the information in a screen, enter **prtscrn**.

Accessing Physically Remote Nodes

The Make Virtual Terminal Connection (**vt**) command establishes a virtual terminal connection to a remote node. Once the connection is established, entering and executing commands takes place as if the terminal were the local terminal on the remote node. The **vt** command lets network configuration take place from a central site. The only command that cannot run remotely is the **vt** command itself.

The privilege of user commands available through a **v**t connection is the same as that of the user who logged into a node with **vt**. To establish a virtual terminal connection with a remote node, enter **vt** and the name of the node name. For example, to **vt** to node "alpha," enter:

vt alpha

The words Virtual Terminal appear on the screen at the lower left corner to indicate that a virtual terminal connection exists. The remote node name appears at the upper left corner of the screen. To terminate the virtual terminal connection and return to your local terminal connection, enter the **bye** command.

The **bye** command has two separate functions:

- If the terminal connection is local, **bye** logs you off the system.
- If the connection is remote (a **vt** connection), the **bye** command breaks the remote connection and returns the terminal to a local connection.

To log out of the system during a remote (vt) session, enter the **bye** command twice. Note that after a default period of four minutes of inactivity, the vt session automatically ends, and the connection reverts back to being local. The timeout is configurable.

If the multiple **vt** feature has been purchased, multiple users can log into a node with the **vt** command. Cisco personnel must activate this feature.

CHAPTER 2

Functional Organization

This chapter provides an overview of the features introduced in Release 9.3.30 for the BPX and IGX. The chapter also groups related commands according to general functional usage. These functional groupings are listed below.

- Basic User Interface
- Setting Up Nodes
- Setting Up Lines
- Setting Up Trunks
- Voice Connections
- Universal Router Module
- Data Connections
- Frame Relay Connections
- ATM Connections
- Universal Router Module
- Synchronizing Network Clocks
- Managing Jobs
- Managing the Network
- Statistics
- Troubleshooting
- Error Information
- VSI Commands
- VSI Commands
- SuperUser Commands
- Command Aliases

The Type column of the command tables shows whether the command is for the BPX or IGX switches, and whether it is a SuperUser (SU) command.

New with Release 9.3.30

With Release 9.3.30, the BPX and IGX switch software supports several new features. On overview of each feature is presented in the following sections.

URM BC-2FE Back Card on the IGX

Release 9.3.30 provides support for the new BC-2FE back card for the IGX Universal Router Module (URM). The BC-2FE back card provides two Fast Ethernet (FE) ports that support 100 Mbps Ethernet. The URM front card and BC-2FE back card combination supports IOS-routing functions only. The URM front card and BC-2FE2V back card combination introduced in Release 9.3.20 continues to support both IOS-based voice and routing functions.

There are a couple precautions regarding the use of the BC-2FE back card.

- The BC-2FE back card is not swappable.
- The BC-2FE back card should be inserted first into the chassis, then the URM front card. (This sequence also applies to the BC2FE2V back card. Insert the back card, then the URM front card.)

For more information about BC-2FE card, refer to the *Cisco IGX 8400 Series Provisioning Guide*.

The CLI commands modified to support the new URM BC-2FE back card are listed below.

dspcd (display card)	In addition to other card information, now displays detailed information about the new URM BC-2FE back card.
dspcds (display cards)	In addition to other card information, now displays the new URM BC-2FE back card.

URM VSI Support on the IGX

Release 9.3.30 introduces support for the Virtual Switch Interface (VSI) feature on the IGX URM. The VSI feature and usage on the URM is the same as for VSI on the UXM interface card, except that the URM does not support trunks, or IMA lines and trunks. An NPM with 4M BRAM and 64M RAM is required to support this feature. Existing CLI commands are used to configure VSI on the URM embedded UXM ATM port. These commands configure the VSI controller, VSI slave, VSI partition, service class template (SCT), and VSI Qbin statistics. For a complete list of these VSI commands, see the "VSI Commands" section on page 2-30. The IOS CLI VSI xtag commands are used to configure the URM embedded router.

URM Remote Router Configuration Feature on the IGX

The Release 9.3.30 Remote Router Configuration feature allows you to start up the URM embedded IOS router with an IOS configuration file that is downloaded from a TFTP server and stored in the URM Admin flash. This feature eliminates the need to have console access to the embedded router to perform initial configuration. Once the IOS configuration file is stored in the URM, it can be used repeatedly upon router reset or restart. The IOS configuration file can have a configuration to enable access to the router from standard TCP-based applications, such as telnet, FTP, and TFTP.

The new and modified CLI commands used to support the URM Remote Router Configuration feature are listed below. For detailed information on the URM Remote Router Configuration feature, see **cnfrtr (configure router configuration parameters), page 3-405**.

burnrtrcnf (burn router configuration file)	Burns the IOS configuration file from the NPM RAM buffer to the Admin flash of the URM card. This is a new CLI command.
clrrtrcnf (clear router configuration file)	Clears the NPM RAM buffer used to store the IOS configuration file downloaded from the TFTP server. This is a new CLI command.
cnfrtr (configure router configuration parameters)	Configures the router parameters on a specified router slot. A new parameter value is added to specify the URM Admin flash as the source of the IOS configuration file.
cnfrtrcnfmastip (configure router configuration download initiator TFTP server IP)	Configures the IP address of the authorized TFTP server from which the IOS configuration file is to be transferred. This is a new CLI command.
dspcd (display card)	Now also displays the Remote Router Configuration feature supported by the URM front card.
dspcnf (display configuration save/restore status)	This command is modified to display that the NPM RAM buffer is occupied with an IOS configuration file.
dsprtr (display router)	Displays the router parameter configuration on a specified router slot. The display includes the new parameter value specifying the URM Admin flash as the source of the IOS configuration file.
dsprtrcnfdnld (display status of router configuration file)	Displays the progress of the transfer of the IOS configuration file from the TFTP server to the NPM RAM buffer and the copy (burn) of the configuration file to the URM Admin flash. The display is updated dynamically. This is a new CLI command.
dsprtrslot (display router slot)	Displays operational information and alarm status for the router on a specified router slot. The display now includes information on the IOS configuration file stored in the URM Admin flash.

TFTP Configuration Save and Restore Feature on the BPX and IGX

In releases prior to 9.3.30, the configuration save and restore facility used a proprietary protocol for communication between the nodes and CWM only. With the Release 9.3.30 TFTP Configuration Save and Restore facility, the standard TFTP protocol can be used to backup configuration files to a network server other than CWM. The network server can be any machine that is connected to a LAN attached to the network, has a TFTP server and disk, and is used to store configuration files. Configuration files that are saved using the TFTP method can be restored using the proprietary method, and vice versa, as long as the files are stored in the correct directory with the correct file names assumed by the proprietary protocol.

The TFTP Configuration Save and Restore facility includes a TFTP Start file interface for initiating a configuration save and restore request. The TFTP Start file naming convention is:

dnld.savecnf	for the Save operation
dnld.loadcnf	for the Restore operation.

Upon receipt of the TFTP Start file, the node drives the save and restore process in the same manner as it does with a CLI or SNMP request.

The default number of simultaneous sessions is 4, but the feature allows for up to 15 simultaneous TFTP Save/Restore operations. Use the default, then slowly increase the number of sessions to guard against any traffic congestion problems in your network(s).

The new and modified CLI commands used to support the TFTP Configuration Save and Restore facility are listed below. For detailed information on the feature, see the **savecnf** command description on page 4-446.

Note The TFTP Configuration Save and Restore facility also includes an SNMP interface for initiating configuration save and restore requests and reporting errors and status. This new interface allows the use of other network management platforms running SNMP managers for driving network management functionality in the WAN.

cnffwswinit (configure FW/SW download initiator IP address)	Specifies the IP address of the machine used to initiate a firmware or software download. This command now allows you to specify the IP address of the network server used to initiate the configuration save and restore operation using the TFTP Start file or SNMP interface.
cnfsysparm (configure system parameters)	Configures system-wide parameters. A new parameter is added to indicate the total number of nodes that can perform TFTP configuration data transfers simultaneously.

cnfnodeparm (configure node parameter)	Configures node-level parameters. A new parameter, IP Relay Gateway Node Number, is added to specify the number of the node that is to serve as the IP Relay Gateway to the TFTP target network server. The target network server must be reachable through the LAN from the configured IP Relay Gateway. The gateway can be the same on all nodes if a single target network server is used for all TFTP configuration backups. Multiple gateways and multiple target network servers can be used to decrease bottlenecks and the time required to back up the entire network.
savecnf (save configuration)	Takes a snapshot of the existing node configuration, saves it in RAM buffer files, then uploads the files to a network server, where they are stored on disk. Parameters are now expanded to allow configuration of the IP address of a network server other than CWM and specify TFTP for data transfer.
loadcnf (load configuration)	Downloads node configuration files from a network server to the node, where they are stored in the RAM buffer. Parameters are now expanded to allow configuration of the IP address of a network server other than CWM and specify TFTP for data transfer.
dspcnf (display configuration save/restore status)	Displays the save and restore status on each node in the network. The format of some node status messages are modified to support this feature. Specifically, the message substring “SV+ at <nodename>” is replaced with substring “IP address”.

Trunk Incremental CDV Feature on BPX and IGX

The trunk cell delay variance (CDV) is particularly important for voice and non-time-stamped (NTS) connections, for which voice quality and bit datastream transparency must be maintained. The delay for a physical trunk is easily estimated as a function of the transmit queue size and transmit rate. However, the delay for a virtual trunk connected to a public ATM network is not easily estimated by the BPX/IGX network. Consequently, the CDV for virtual trunks is frequently over estimated, resulting in excessive latency for the connections.

The Release 9.3.30 Trunk Incremental CDV feature reduces the transmission latency introduced at the egress port of a voice or NTS connection, when the connection traverses over one or more trunks. With this feature, the BPX/IGX system estimates the CDV (estimated CDV) for voice and NTS virtual trunk connections as if they were physical trunk connections. The feature also allows you to configure an incremental CDV on both physical and virtual trunks.

When configured, the incremental CDV is added to the estimated CDV to derive the effective CDV. The effective CDV is used during connection routing to assure that the CDV tolerance specified for the connection is not exceeded. The effective CDV is also used to derive the jitter buffer size at the egress ports.

The CLI commands modified to support the Incremental CDV on Virtual Trunk feature are listed below. For additional information on this feature, see the **cnftrk** command description on 3-444.

cnftrk (configure trunk)	Configures trunk parameters. A new parameter is added to specify the incremental CDV value for a trunk.
dsptrkcnf (display trunk configuration)	Displays the incremental CDV value configured for a trunk.

Virtual Circuit (VC) Merge

VC merge improves the scalability of MPLS networks and allows multiple incoming VCs to be merged into a single outgoing VC, which is called merged VC. VC Merge is responsible for processing any incoming VSI messages from the MPLS controller and identifies the merging request. In the BPX 8600 series switch, VC Merge is implemented as part of the output buffering for ATM interfaces. The VC Merge feature requires the enhanced BXM (BXM-E) cards. Tag switching is supported.

Only frame-based connections are implemented.The key to VC Merge is to switch cells from the merging Label Virtual Circuit (LVC) to the merged LVC that points to the destination, while preserving AAL5 framing. Several AAL5 frames can arrive on different VCs and are merged onto a single VC without interleaving the frames.

If VC Merge is not supported on the card, N/A is displayed from the command **cndcdparm**.

cnfcdparm (configure card parameters)	Configures card parameters. The new index value 2 specifies VC merge. Enter either “E” to enable or “D” to disable the VC Merge feature.
cnfrsrc (configure resource)	Configures card resources. If the VC Merge feature is enabled under the command **cnfcdparm**, the feature is enabled by filling at least 1023 VSI channels on any interface on the card.
dspcd (display card)	Displays card information. VC merge support is indicated under VSI attributes supported with a “V.”

CRC-4 Protection Feature on the IGX

ITU-T Recommendation G.704 provides for the optional use of a 4-bit CRC to protect the E1 framing structure. The Release 9.3.30 CRC-4 Protection feature allows you to enable/disable the CRC check on multiframed UXM E1 trunks and lines.

The CLI commands modified to support the CRC-4 Protection feature are listed below.

cnftrk (configure trunk)	Configures trunk parameters. The command now allows you to enable/disable the CRC check on all multiframed E1 trunks.
dsptrkcnf (display trunk configuration)	Displays the current state of the CRC check on a multiframed E1 trunk.

cnfln (configure line)	Configures line parameters. The command now allows you to enable/disable the CRC check on all multiframed E1 lines.
dsplncnf (display line configuration)	Displays the current state of the CRC check on a multiframed E1 line.

AIS OAM Recognition Feature on BPX and IGX

With the Release 9.3.30 AIS OAM Recognition feature, virtual trunks recognize receipt of end-to-end F4 OAM AIS alarms from the ATM service provider. Prior to Release 9.3.30,virtual trunks recognized ILMI traps/responses as a source of Virtual trunk path failure.

The AIS OAM Recognition feature is provided on BPX BXM and IGX UXM cards only. Virtual trunks in a VP-tunnelling configuration (IGX) are not supported.

The absence or presence of ILMI support from the ATM service provider does not affect the functionality of detecting F4 OAM AIS. Similarly, absence or presence of AIS indication from the ATM cloud does not affect the functionality of ILMI.

The Virtual Trunk Path Fail states have been expanded to distinguish between failures due to ILMI and AIS. The trunk states now include:

- Clear state
- Virtual Trunk Path Fail state due to ILMI trap
- Virtual Trunk Path Fail state due to AIS
- Virtual Trunk Path Fail state due to both ILMI and AIS

This feature provides a new entry point into the Virtual Trunk Path Failure alarm. Consequently, more connection rerouting may occur. You can use the **cnftrk** Trunk Deroute Delay timer to avoid excessive rerouting during brief outages.

The CLI commands modified to support the AIS OAM Recognition feature are listed below.

cnftrk (configure trunk)	Configures trunk parameters. A new parameter, F4 AIS Detection, is added to enable the AIS OAM Recognition feature.
dsptrkcnf (display trunk configuration)	Displays the parameter configuration for a trunk. The display now includes the new F4 AIS Detection parameter
dspcd (display card)	Displays support for the AIS OAM Recognition feature on the BXM (“F4F5” field) and UXM (“F4 AIS Recognition” field) cards.
dsptrks (display trunks)	Displays all trunks on a node. The Virtual Trunk Path Fail state alarms are expanded to distinguish between failures due to ILMI and AIS.

Virtual Trunk Clock Source Synchronization Feature on BPX and IGX

With the increased use of virtual trunks in Wide Area Networks, it is required that the clock source be derived from the ATM service provider for network synchronization. The Virtual Trunk Clock Source Synchronization feature associates the network clock source with the physical interface, rather than the virtual interface. This enables the use of all configurable virtual interfaces available on a physical trunk port as clock sources. When a virtual trunk fails, the clock source is not switched to another physical interface or internal clock source if there is another active, clock configurable virtual interface on the physical interface. This means that if at least one virtual trunk interface is up without any failure, the physical interface remains a sustainable clock source. This feature has no effect on regular, non-virtual trunks.

When a virtual trunk port is configured for clock source, the first virtual trunk interface on the trunk port is internally marked as the clock source. If the first virtual trunk interface on the trunk port fails, or becomes unusable as the clock source, the node searches for the next active virtual trunk interface that is usable as a clock source and marks that interface as the clock source. This virtual trunk search mechanism allows the clock source of the node to be associated with the physical trunk port rather than the physical interface. The clock selection mechanism within the same trunk port is transparent to the other nodes in the network, including the highest numbered node.

The CLI commands modified to support the F4 AIS Detection feature are listed below.

cnfclksrc (configure network clock source)	Configures a network-wide clock source. The prompts and error messages now support the Virtual Trunk Clock Source Synchronization feature.
dsplog (display event log)	Displays the event log for a node. The clock switch event log for local and remote node is modified for clock switches between physical interfaces. The virtual interface number is no longer included in the trunk address.

800 Part Number Support for Back Card Feature on BPX and IGX

This Release 9.3.30 feature enables display of the 800-level part number (also referred to as the Top Assembly Number, or TAN) for selected back cards. The 800 part number provides information about the back card that can assist with trouble shooting. Only the following back cards provide 800 part number support:

- BXM on the BPX
- URM, UXM, UFM, and UVM on the IGX

The 800 Part Number Support feature is not provided on controller back cards. Additionally, this feature does not provide the capability of writing the back card 800 part number.

The CLI commands modified to support the 800 Part Number Support for Back Card feature are listed below.

dspcd (display card)	Displays the 800 part number for supported back cards.

Virtual Port ILMI Enhancement on the BPX

The Virtual Port ILMI enhancement enables selection of the ILMI link management protocol on a BXM physical interface configured with virtual ports. Prior to Release 9.3.30, the ILMI protocol applied only to physical ports. LMI continues to be supported on BXM physical ports only.

Although ILMI can be enabled on the virtual ports, there is only one ILMI session per physical interface; meaning, an ILMI session only runs between the BXM physical interface and the ATM device to which it is directly connected. Similar to the existing ILMI implementation on the physical ports, the ILMI session on the BXM interface with virtual ports does not process incoming connection status traps.

ILMI configuration performed on one virtual port applies to all virtual ports on the same physical interface. When the protocol is enabled on a virtual port, ILMI processing is done only on the BXM card. You cannot configure the protocol to run on the controller card (BCC) with virtual ports.

The ILMI Neighbor Discovery feature on the BXM interfaces with virtual ports is only supported at the BPX switch level. There is currently no Cisco Wan Manager support for this feature. The cnfport CLI has been modified to allow users to configure ILMI on a virtual port.

The following parameters were applicable to physical ports only, they are now also applicable to virtual ports.

- Protocol (the only valid protocol for virtual ports is ILMI).
- VPI for ILMI connection
- VCI for ILMI connection
- ILMI Address Registration Enable
- ILMI Polling Enable
- ILMI Trap Enable
- ILMI T491 Polling Interval
- ILMI N491 Error Threshold
- ILMI N492 Event Threshold
- Protocol by the Card
- Advertise Interface Information (in previous releases, this parameter was known as Neighbor Discovery)

Concurrent Routing on the BPX and IGX

The Release 9.3.30 Concurrent Routing feature allows multiple route requests to be concurrently active on a node. This feature shortens network settling time (the time required for all connections in the network to reroute) by allowing multiple route requests to be accepted and serviced without blocking.

The maximum total number of concurrent routes is eight, and the maximum number of master routes is two. The second instance of the master route has to be path orthogonal to the first master route (i.e. with non-overlapping path). If the master node fails to find the second eligible route after a number of tries, it gives up the second route attempt—the second route is path blocked.

Concurrent routing also supports CPU throttling, a mechanism used to temporarily reduce routing concurrency when CPU utilization exceeds a defined threshold. The threshold is set by the **cnfrrcpu** command.

CLI commands modified to support the Concurrent Routing feature are listed below.

cnfcmparm (configure connection management parameters)	Configures connection management parameters for a node. A new parameter, Route Concurrency Level, is added to specify the number of concurrent routes available on the node.
dsprrst (display reroute statistics)	Displays reroute statistics. New statistics show the CPU throttling/resumption details for master, via, and slave routes. A new optional parameter now displays nodal settling time measurements.
cnfrrcpu (configure CPU-based reroute throttling level parameters)	Configures CPU-based reroute throttling level for master, via and slave nodes.

60K Channel Support for VSI on the BPX

The Release 9.3.30 60K channel support for VSI feature provides the capability to support up to 60K channels for VSI connections on trunk side, port side, or a combination of trunks and ports. The enhanced BXM-E card models DX and EX support up to 60K channels per card slot. In contrast, pre-release 9.3.30 switch software specifies that the total number of channels used by AutoRoute and VSI connections cannot exceed 32K. The maximum supported AutoRoute channels remains at 32K.

To upgrade a BXM-E card slot with 32K channel configuration, you can execute the new **upgdvsilcn** command. If you have a BXM card slot, and want to configure that slot to use the 60K channels feature, you have to follow the procedure for “Hitless Upgrade of BXM to BXM-E” documented in Release 9.3.00, then execute the new **upgdvsilcn** command.

Channel statistics level 0 or 1 is required for feature operation. If you execute **upgdvsilcn** with channel statistics levels 2 or 3, you receive the following error message: “Logical card does not support 60K LCN for VSI.” Use the **cnfcdparm** command to specify the channel statistics level.

The new and modified CLI commands used to support the 60 channel support for VSI feature are listed below.

dspcd (display card)	Displays card detail. The command now displays the total channel number the physical BXM-E card can support.
dspcmi (service level command, not documented in this reference manual.)	Display the Total LCN for the Physical and Logical card.
dsplog (display event log)	Displays the event log for a node. Events are added to log configuration of 60K VSI LCN.
dsplogcd (service level command, not documented in this reference manual.)	Display the Maximum channel number used for the Autoroute Connection and VSI Connection. They are max_ar_lcn and max_vsi_lcn respectively.
upgdvsilcn (expand VSI LCN to 60K for BXM-E)	Configures the BXM-E card slot to support 60K VSI LCN. This is a new CLI command.

F4 to F5 Mapping Feature on the BPX

The F4 to F5 Mapping feature allows end-to-end OAM cell flow on a multi-segment PVC to enhance end-to-end connection management. The feature allows the path level OAM (F4 AIS) cells arriving at the VCC/VPC interface to be mapped to channel level OAM (F5 AIS) cells for all the VCC segments at the interface with the same VPI value. The VPC is provisioned by the ATM service provider. The VCCs are terminated at the BXM line port, which is the VPC/VCC interface. When the F4 to F5 Mapping feature is enabled on a BXM port, the BXM is programmed to detect F4 AIS for all the VPIs for which VCCs exist on that port. Consequently, F4 to F5 mapping is configured on a logical port basis. Mapping is not configured for VPIs on a logical port.

The modified CLI commands used to support the F4 to F5 Mapping feature are listed below.

addcon (add an ATM connection)	Adds connections. This command now displays error messages to support this feature.
cnfport (configure ATM port)	Configures port parameters. A new parameter, F4 to F5 Mapping, is added to enable/disable this feature. In addition, the number of F4-F5 channels on the port is displayed.
dspport (display port)	Displays port configuration. The command now displays the state of the F4 to F5 Mapping feature. In addition, the number of F4-F5 channels on the port is displayed.
dspcd (display card)	Displays support for the feature on the BXM card (“F4F5” field).
dspchuse (display channel usage)	Displays the channel distribution in a specified slot. This command now shows the number of channels used for F4-F5 mapping.

Automatic Routing Management to PNNI Migration

Release 9.3.30 supports the first phase of the Automatic Routing Management (AR) to Private Network-to-Network Interface (PNNI) migration. This release enables the introduction of PNNI networking software and MGX 8800 series routing switches into existing networks comprising BPX 8600 series routing switches running AR networking software.

The BPX 8600 supports both an Extended Permanent Virtual Connection (XPVC) and an Extended Permanent Virtual Path (XPVP) that spans over an AR-PNNI, or AR-PNNI-AR, hybrid network. This document concentrates on Extended Permanent Virtual Connections (XPVCs). Each XPVC can contain up to five segments that support various combination pairs of FR, ATM, and RPM endpoints. Each XPVC may contain feeder nodes such as MGX 8220, MGX 8230, MGX 8250, and Release 1 MGX 8850.

The UNI or NNI interface on each XPVC segment is enhanced and called Enhanced User-to-Network Interface (EUNI) or Enhanced Network-to-Network Interface (ENNI). The EUNI/ENNI allows segment OAM loopback cells to start from an edge of the hybrid AR-PNNI network and traverse through the multiple XPVC segments. When a fault is identified, CLI commands described in this document can be used at each EUNI/ENNI point to loopback OAM cells. Cisco recommends you use the Cisco WAN Manager (CWM) application to set up multi-segment OAM loopback. This OAM segmentation capability supports fault isolation in the AR-PNNI network.

With Release 9.3.30, the BXM card supports an Extended Local Management Interface (XLMI) protocol. The XLMI protocol, in conjunction with the LMI Neighbor Discovery feature, enables the exchange of connection status and topology information between the BPX and MGX switches in the AR-PNNI hybrid network.XLMI supports D bit, meaning that if a segment is automatically deleted, an AIS is sent to the Customer Premises Equipment (CPE). Abit operational status is not exchanged.

The Cisco WAN Manager (CWM) is required with Release 9.3.30. The CWM combines the XPVC segments into a single connection for simplified management. CWM must be used to add, modify, or delete a multi-segment XPVC (using the SNMP Service Agent proxy along with provided CWM-XPVC-CLI scripting capability). CWM must also be used to display the XPVC connection details. The CWM initiates test delay procedures and monitors the connection endpoints at the edge of the AR-PNNI network. CWM receives connection information from each network segment and reports the XPVC connection status.

The Release 9.3.30 AR-PNNI networking feature is compatible with the following network components:

- BPX software release 9.3.30 and above
- BXM firmware version MFH and above
- MGX release 2.1.60 and above
- AXSM with MGX2 release
- CWM release 10.5 and above

The following PVC endpoints are eligible on the AR network edge:

- BXM/ASI port
- BXM/BNI feeder to AXIS/MGX 8850 Release 1 with AUSM, FRSM, RPM, and PXM1 as endpoints

All connections supported on BPX software Release 9.3 with the above endpoints are supported in the AR-PNNI hybrid network. All feeders supported on BPX software Release 9.3 are supported in the AR-PNNI hybrid network.

The following network components are not supported:

- BXM/BNI feeder to AXIS/MGX 8850 Release 1 with VISM and CESM as endpoints
- BPX-SES in the PNNI network

With Release 9.3.30, the LMI Neighbor Discovery feature is only supported on BXM physical ports over the AR-PNNI link. LMI Neighbor Discovery is allowed only when the XLMI protocol runs on the BXM card. The XLMI protocol only runs on the BXM card and is only supported over the AR-PNNI link.

A maximum of 12 ports can be configured with the XLMI protocol per BXM card. The maximum number of ports that can have XLMI enabled on the BPX is 144 (12 BXM cards/BPX times 12 physical ports/BXM card).

The following features are not supported in Release 9.3.30:

- IP relay is not supported over the AR-PNNI link.
- VSI partition is not supported on EUNI/ENNI port types.
- BPX virtual ports cannot be configured as EUNI/ENNI port types.

The modified CLI commands used to support the AR-PNNI migration feature are listed below.

addyred (add Y-cable redundancy)	Performs XLMI Neighbor Discovery feature mismatch verification on a Y-cabled redundant BXM pair.
cnflan (configure LAN)	Sends the LAN IP address to the BXM when the XLMI protocol is enabled and the Management IP address is the LAN IP address.
cnfnodeparm (configure node parameter)	Configures the XLMI Management IP address as LAN IP address or Network IP address.
cnfnwip (configure network IP address)	Sends the Network IP address to the BXM when the XLMI protocol is enabled and the Management IP address is the Network IP address.
cnfoamseg (configure connection OAM segment status)	Configures the segment status of an XPVC segment in a hybrid AR-PNNI network. This is a new CLI command.
cnfport (configure ATM port)	Configures the BXM port type as EUNI/ENNI and enables both the XLMI protocol and LMI Neighbor Discovery feature. The command also performs LMI Neighbor Discovery feature mismatch verification on replacement BXM cards.
dspcd (display card)	Displays the BXM card’s capability to support the XLMI protocol and LMI Neighbor Discovery feature.
dspcon (display connection)	Displays the local AR node connection details for an XPVC segment.
dspcons (display connections)	With the -abit parameter, displays the connection status of an XPVC segment at the AR-PNNI interfaces. “Abit” is not exchanged through XLMI between a BPX switch and an MGX Release 2 switch. The Abit display interpretation on MGX Release 2 and the BPX gateway node is changed. The abit display on the gateway BPX and the MGX Release 2 nodes means connection is missing on the neighbor network.

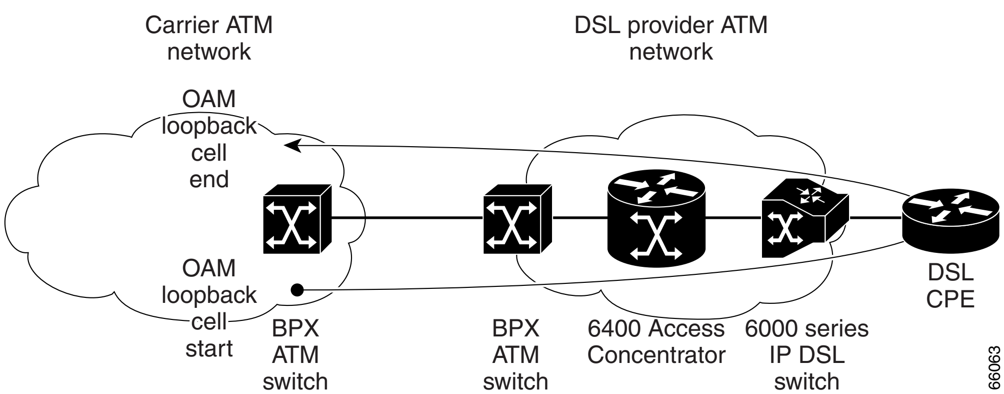
dspnebdisc (display neighbor discovery)	Displays the neighbor AXSM's topology information when the XLMI protocol and LMI Neighbor Discovery feature are enabled. The command also displays the protocol running on the BXM port, for example, ILMI or XLMI.
dspoamseg (display connection OAM segment status)	Displays the segment status of an XPVC segment in a hybrid AR-PNNI network. This is a new CLI command.
dspport (display port)	Displays the status and configuration of a BXM port terminating an XPVC segment.
tstcon (test connections)	Tests a multi-segment XPVC in the AR-PNNI hybrid network.
tstconseg (test connection segment)	Tests a multi-segment XPVC in the AR-PNNI hybrid network.
tstdelay (test connection round-trip delay)	Tests a multi-segment XPVC in the AR-PNNI hybrid network. The **tstdelay** command provides data continuity as well as delay measurement between the 2 edges of our network.

Network to Endpoint Connectivity Verification and Round Trip Delay Measurement

The network to endpoint loopback connectivity verification feature tests the data path for a connection from a BPX switch by generating and detecting end-to-end OAM loopback cells. You can verify the connectivity from the network to a PVC endpoint or a PVP endpoint, depending upon the type of connection on which the test is issued from the BPX switch. Unlike the command **tstdelay**, which tests connectivity "inside" the network, the new command **tstpingoam** tests connectivity going "out" of the network.

The **tstpingoam** command is useful for troubleshooting in a multi-provider network, as shown in Figure 2-1.

Figure 2-1 Multi-Provider Network



When an end user experiences connectivity or delay problems with a connection to an ATM network, there are multiple places where connectivity problems can occur. It is difficult to determine where the problem is located, and therefore, who has the responsibility to fix the problem. By giving each service provider the ability to establish connectivity with the CPE and measure delay, they can quickly narrow down which network has the problem, then work within that network to fix the problem.

The new or modified CLI commands used to support the network to endpoint loopback connectivity verification feature are listed below.

tstpingoam (network to endpoint loopback test)	Performs a network to endpoint loopback test of the data path for a connection from a BPX switch by generating and detecting end-to-end OAM loopback cells.
cnfcdparm (configure card parameters)	Provides for selection of O.151 OAM cell format (a non-standard format still used by some service providers) instead of the standard I.610 OAM cell format. Refer to this command if you need to change the OAM cell format used in the test.
tstconseg (test connection segment)	Used to test segment connectivity "outside" the network. The round trip delay measurement is added to this command display.
tstdelay (test connection round-trip delay)	Used to test connectivity "inside" the network. The round trip delay measurement is added to this command display.

Basic User Interface

The user interface commands:

- Provide help on how to use the commands
- Display the twelve most recent commands entered into the system
- Connect to another node
- Sign on and off
- Clear, print, or redraw the screen

These commands are all simple to use and have no command parameters except the virtual terminal command (**vt**), in which you must specify the node name, and the help commands, in which you must enter a command character string.

Command	Description	Type	Page
.	Display command history	BPX, IGX	3-1
bye	End user session	BPX, IGX	3-90
clrscrn	Clear screen	BPX, IGX	3-112
help or **?**	Help	BPX, IGX	4-406
prtscrn	Print screen	BPX, IGX	4-429
redscrn	Redraw screen	BPX, IGX	4-434
vt	Make a virtual terminal connection	BPX, IGX	4-490

Setting Up Nodes

This group of commands are used to set up an IGX or BPX node. (You must set up each node before you build the network.) This group also contains commands to:

- Configure a node name and time zone.
- Add and remove a network node.
- Add and remove an interface shelf in a tiered network.
- View a node's configuration.
- Specify Y-cable redundancy for cards in the node.
- Start a window session to an external device or specify an interface to an attached terminal.
- Sending A-bit Notification on ILMI/LMI Using Configurable Timer

Command	Description	Type	Page
addalmslot	Add an alarm slot	BPX, IGX	3-3
addshelf	Add a trunk between an IGX or BPX core switch shelf and an interface shelf	BPX, IGX, MGX, SES	3-70
addyred	Add Y-cable redundancy	BPX, IGX	3-83
cnfasm	Configure ASM card	BPX, IGX	3-126

Command	Description	Type	Page
cnfdate	Configure date	BPX, IGX	3-198
cnffunc	Configure system function	BPX, IGX	3-228
cnfname	Configure node name	BPX, IGX	3-278
cnfprt	Configure printing functions	BPX, IGX	3-360
cnfterm	Configure terminal port	BPX, IGX	3-434
cnftime	Configure time	BPX, IGX	3-439
cnftmzn	Configure time zone	BPX, IGX	3-442
delalmslot	Delete alarm slot	IGX	4-3
delshelf	Delete a trunk between a IGX/BPX core switch shelf and interface shelf	BPX, IGX	4-19
delyred	Delete Y-cable redundancy	BPX, IGX	4-25
dspasm	Display ASM card configuration	BPX	4-47
dspcd	Display card	BPX, IGX	4-69
dspcdred	Display Y-cable redundancy (displays card redundancy for SONET Automatic Protection Switching). Alias for **dspyred**	BPX, IGX	4-77
dspcds	Display cards	BPX, IGX	4-78
dspctrlrs	Display all PNNI VSI controllers on a BPX node	BPX, IGX	4-153
dsplancnf	Display LAN configuration	BPX, IGX	4-179
dsplmistats	Display LMI Statistics	BPX, IGX/AF	4-185
dspnds	Display nodes	BPX, IGX	4-216
dspnode	Display summary information about interface shelves	BPX, IGX/AF	4-219
dspprtcnf	Display print configuration	BPX, IGX	4-273
dsppwr	Display power	BPX, IGX	4-275
dsptermcnf	Display terminal configuration	BPX, IGX	4-351
dsptermfunc	Display terminal port configuration	BPX, IGX	4-352
dspyred	Display Y-cable redundancy	BPX, IGX	4-402
prtyred	Print Y-cable redundancy	BPX, IGX	4-433
upcd	Up card	BPX, IGX	4-474
window	Window to external device	BPX, IGX	4-492

Setting Up Lines

A circuit line is the physical line that carries data, voice, Frame Relay, or ATM traffic between an IGX or BPX node and customer premises equipment (CPE). Each piece of customer premises equipment is attached to a node through a circuit line. After a *card* has been "upped" with the **upcd** command, a *circuit line* on that card can be "upped" and configured.

Line commands are the same as circuit line commands. However, the **cnfcln** command is no longer used; use **cnfln** instead. The switch software prompts for the parameters appropriate for the card type it detects.

Command	Description	Type	Page
cnfcassw	Configure CAS switching	IGX	3-141
cnfln	Configure line (alias for **cnfcln**)	BPX, IGX	3-242
cnfphylnstats	Configure physical line statistics	BPX, IGX, SU	3-306
cnfport	Configure a port	BPX, IGX	3-330
cnfrsrc	Configure resources	BPX, IGX	3-376
dnln	Down line (alias for **dncln**)	BPX, IGX	4-32
dsplncnf	Display line configuration (alias for **dspclncnf**)	BPX, IGX	4-191
dsplns	Display lines (alias for **dspclns**)	BPX, IGX	4-197
dspphylnstatcnf	Display physical line statistics configuration	BPX, IGX, SU	4-238
dspphylnstathist	Displays the physical line statistics history	BPX, IGX, SU	4-242
dspport	Displays information about a specific port.	BPX, IGX	4-244
dsptsmap	Display time slot map	BPX, IGX	4-390
prtlns	Print circuit lines (alias for **prtclns**)	BPX, IGX	4-425
upln	Up line (alias for **upcln**)	BPX, IGX	4-482

Setting Up Trunks

After you have configured the *nodes*, you must activate the *trunks*. Trunks are intra-node communication links in a network. A trunk can connect any combination of IGX or BPX nodes.

Before executing the commands in this section, you must have finished setting up the nodes. Also, the front and back cards that support the proposed line type and communication technology must reside in the slot intended for the trunk.

You cannot use a virtual trunk as an interface shelf (feeder) trunk; similarly, you cannot configure an interface shelf trunk to act as a virtual trunk, nor can you terminate interface shelf (feeder) connections on a virtual trunk.

Command	Description	Type	Page
addapsln	Add SONET APS line redundancy to a BXM OC-3 or OC-12 card	BPX	3-4
addtrk	Add trunk	BPX, IGX	3-79
addtrkred	Add trunk redundancy	BPX, IGX	3-81
cnfapsln	Configure APS parameters on a working line of redundant pair	BPX	3-123
cnfrsrc	Configure resources	BPX, IGX	3-376
cnftrk	Configure trunk	BPX, IGX	3-444
cnftrkalm	Configure trunk alarm	BPX, IGX	3-460
cnftrkict	Configure trunk interface control template	IGX	3-464
cpytrkict	Copy trunk interface control template	IGX	3-506
delapsln	Delete SONET APS line from a BXM OC-3 or OC-12 card	BPX	4-4
deltrk	Delete trunk	BPX, IGX	4-21

Command	Description	Type	Page
deltrkred	Delete trunk redundancy	IGX	4-23
dntrk	Down trunk	BPX, IGX	4-35
dspapsln	Display currently configured APS lines and their status	BPX	4-45
dspcntrstats	Display counter statistics for a given statistics object	BPX, IGX	4-124
dspnw	Display network	BPX, IGX	4-221
dspphyslns	Display lines in an IMA trunk	IGX	4-235
dspphyslnstathist	Display statistics gathered for lines in an IMA trunk	IGX	4-242
dsptrkbob	Display trunk breakout box	IGX	4-353
dsptrkcnf	Display trunk configuration	BPX, IGX	4-354
dsptrkict	Display trunk interface control template	IGX	4-364
dsptrkred	Display trunk redundancy	BPX, IGX	4-366
dsptrks	Display trunks	BPX, IGX	4-367
dsptrkstats	Display trunk statistics	BPX, IGX	4-376
prtapsln	Print the APS line redundancy switching interface	BPX	4-414
prtnw	Print network	BPX, IGX	4-427
prttrkict	Print trunk interface control template	IGX	4-431
prttrks	Print trunks	BPX, IGX	4-432
switchapsln	Control the APS line redundancy switching interface	BPX	4-453
uptrk	Up trunk	BPX, IGX	4-485

Voice Connections

The voice commands apply to setting up, configuring, and statistical reporting for voice connections (including FAX). You use these commands to add a voice connection, configure card redundancy, and optimize the use of voice activity detection (VAD).

Voice connections exist as ports on circuit lines supported by a Channelized Voice Module (CVM) or Universal Voice Module (UVM) in an IGX node. The back card for the CDP or CVM is either a BC-T1, BC-E1, or BC-J1. For the UVM, the back card is either a BC-UVI-2T1EC, a BC-UVI-2J1EC, or BC-UVI-2E1EC.

Command	Description	Type	Page
addcon	Add channel voice connection	IGX	3-96
cnfchadv	Configure channel adaptive voice	IGX	3-151
cnfchdl	Configure channel dial type	IGX	3-153
cnfchec	Configure channel echo canceller	IGX	3-155
cnfchfax	Configure fax modem detection for channels (UVM)	IGX	3-158
cnfchgn	Configure channel gain insertion	IGX	3-159
cnfcond	Configure conditioning template	IGX	3-192

Command	Description	Type	Page
cnfdch	Configure data connection to have idle code suppression enabled/disabled	IGX	3-200
cnflnpass	Configure line pass	IGX	3-260
cnfrcvsig	Configure receive signaling	IGX	3-370
cnfvchtp	Configure voice channel interface type	IGX	3-495
cnfxmtsig	Configure transmit signaling	IGX	3-501
delcon	Delete connection	BPX, IGX	4-5
dspchcnf	Display channel configuration	IGX	4-84
dspchdlcnf	Display channel dial type configuration	IGX	4-87
dspchec	Display channel echo canceller	IGX	4-89
dspcon	Display connection	IGX	4-127
dspcond	Display conditioning template	IGX	4-142
dspcons	Display connections	BPX, IGX	4-143
dspconst	Display connection state	IGX	4-151
dspsigqual	Display signal qualifiers	IGX	4-298
dspsvcst	Display voice SVC statistics	IGX	4-347
prtchcnf	Print channel configuration	IGX	4-416
prtchdlcnf	Print channel dial type configuration	IGX	4-417
prtcons	Print connections	IGX	4-419

Data Connections

These commands apply to setting up, configuring, and statistical reporting on data connections:

- Setting up a circuit line and a data connection
- Configuring data channel redundancy
- Using interface control templates
- Enabling DFM and data channel utilization
- Enabling Embedded EIA operation
- Configuring idle code suppression on a per-connection basis

Command	Description	Type	Page
addcon	Add a data channel connection	IGX	3-6
cnfchdfm	Configure Data Frame Multiplexing (DFM)	IGX	3-152
cnfcheia	Configure EIA	IGX	3-157
cnfcldir	Configure control lead direction	IGX	3-171
cnfdch	Configure data connection to have ICS (Idle Code Suppression)	IGX	3-200
cnfdchtp	Configure data channel interface type	IGX	3-205

Command	Description	Type	Page
cnfdclk	Configure data clock	IGX	3-207
cnfict	Configure interface control template	IGX	3-232
cpyict	Copy interface control template	IGX	3-504
delcon	Delete connection	BPX, IGX	4-6
dspchcnf	Display channel configuration	IGX	4-84
dspcons	Display connections	BPX, IGX	4-143
dspict	Display interface control template	IGX	4-175
prtchcnf	Print channel configuration	IGX	4-417
prtcons	Print connections	IGX	4-419
prtict	Print interface control template	IGX	4-421

Frame Relay Connections

The Frame Relay commands let you add, configure, delete, and specify statistical reporting for Frame Relay connections:

- Set up a Frame Relay connection
- Use Frame Relay classes
- Use interface control templates
- Configure channel utilization
- Set channel priorities
- Display statistics

In an IGX node, the Frame Relay commands operate on an FRM or UFM card set. For the Frame Relay commands that operate on an FRSM in an MGX 8220 shelf, refer to the *Cisco MGX 8220 Command Reference*.

Command	Name	Type	Page
addcon	Add Frame Relay connection	BPX, IGX	3-21
addport	Add Frame Relay port T1/E1. (The command **addfrport** is an older alias.)	IGX	3-61
clrchstats	Clear Frame Relay channel statistics	IGX	3-94
clrfrcportstats	Clear FRC/FRM Port Concentrator link statistics	BPX, IGX	3-99
cnfchpri	Configure Frame Relay channel priority	IGX	3-160
cnffrcls	Configure Frame Relay class	IGX	3-219
cnffrcon	Configure Frame Relay connection	IGX	3-222
cnffrcport	Configure Frame Relay port on a Port Concentrator Shelf	IGX	3-224
cnfict	Configure interface control template	IGX	3-236
cnfmode	Configure mode	IGX	3-273
cpyict	Copy interface control template	IGX	3-504

Command	Name	Type	Page
delcon	Delete connection	BPX, IGX	4-7
delfrport	Delete Frame Relay port using T1 or E1 Lines	IGX	4-11
dnfrport	Down Frame Relay port. An alias for **dnport**.	BPX, IGX	4-32
dspchcnf	Display channel configuration	IGX	4-86
dspchstats	Display channel statistics	BPX, IGX	4-95
dspcon	Display connection	IGX	4-131
dspcons	Display connections	BPX, IGX	4-143
dspfrcls	Display Frame Relay class	IGX	4-163
dspfrport	Display Frame Relay port. An alias for **dspport**	BPX, IGX	4-166
dspict	Display interface control template	IGX	4-175
dspmode	Display mode	IGX	4-213
dspmodes	Display modes	BPX, IGX	4-215
dsppcs	Display Port Concentrator Shelf	IGX	4-229
dspportids	Display port IDs	BPX, IGX	4-248
dspportstats	Display port statistics	BPX, IGX	4-259
prtchcnf	Print channel configuration	IGX	4-416
prtcons	Print connections	IGX	4-421
prtict	Print interface control template	IGX	4-422
upfrport	Up Frame Relay port. An alias for **upport**	BPX, IGX	4-477

ATM Connections

These commands let you activate and configure ATM connections, as well as statistical reporting for these connections, at an ATM UNI in a BPX or IGX node. You can add ATM connections to an ASI or BXM in a BPX node, and to a UXM or URM in an IGX node. For details on ATM commands and other support on an MGX 8220 shelf, refer to the MGX 8220 documentation. For details on ATM commands on an MGX 8550 shelf, refer to the MGX 8550 documentation.

Command	Description	Type	Page
addcon	Add ATM connection	BPX, IGX	3-30
addport	Add ATM or Frame Relay port	BPX, IGX	3-61
clrchstats	Clear channel statistics	BPX, IGX	3-94
cnfatmcls	Configure ATM class template	BPX, IGX	3-128
cnfcls	Configure class template	BPX, IGX	3-179
cnfcon	Configure connection	BPX, IGX	3-222
cnfport	Configure ATM or Frame Relay port. (Use instead of older **cnffrport** alias.)	BPX, IGX	3-226
cnfportq	Configure port queue parameters	BPX, IGX	3-350

Command	Description	Type	Page
cnfrtr	Configure Universal Router Module embedded router	IGX	3-405
delcon	Delete connection	BPX, IGX	4-7
delport	Delete ATM port	BPX, IGX	4-17
dnport	Down port	BPX, IGX	4-33
dspatmcls	Display ATM connection class	BPX, IGX	4-48
dspchstats	Display all embedded statistics for a channel	BPX, IGX	4-95
dspcls	Display connection class	BPX, IGX	4-118
dspcntrstats	Display counter status statistics	BPX, IGX	4-124
dspcon	Display ATM connections	BPX, IGX	4-133
dspconcnf	Display connection configuration	BPX	4-140
dspcons	Display connections	BPX, IGX	4-143
dsplmistats	Display Annex G LMI statistics	BPX, IGX/AF	4-185
dspnebdisc	Display Neighbor Discovery	BPX, IGX	4-217
dspport	Display port	BPX, IGX	4-244
dspportq	Display ARM port Qbin information	BPX, IGX	4-249
dspports	Display all ports that exist on the node	BPX, IGX	4-252
dspportstats	Display Frame Relay port statistics	BPX, IGX	4-259
dspqbinstats	Display Qbin summary statistics	BPX, IGX	4-282
dsprtcache	Display cost-based route cache	BPX, IGX	4-298
dsprtr	Display Universal Router Module embedded router configuration	IGX	4-299
dsprtrslot	Display operational information for a specified Universal Router Module embedded router	IGX	4-302
dsprtrslots	Display summary of operational information for all Universal Router Module embedded routers	IGX	4-305
rstrtr	Reset Universal Router Module embedded router	IGX	4-439
upport	Up port	BPX, IGX	4-483

Universal Router Module

The Universal Router Module (URM) was introduced with Release 9.3.20 on the IGX 8400. The URM is functionally equivalent to a UXM card with one ATM port and an IOS router.

Management of the URM is different from other IGX cards. The IGX CLI is used to manage the embedded UXM and internal ATM port. The IOS CLI and IOS management applications are used to manage the embedded router. The IGX CLI, however, does provide features that facilitate configuration, serviceability, and monitoring of the URM embedded router. These commands are described in the following table.

The URM supports the Virtual Switch Interface (VSI) feature. The VSI feature and usage on the URM is the same as for VSI on the UXM interface card, except that the URM does not support trunks, or IMA lines and trunks. Existing CLI commands are used to configure VSI on the URMs embedded UXM ATM port. See "VSI Commands" section on page 2-30 for the list of IGX VSI commands.

Command	Description	Type	Page
burnrtrcnf	Copies, or burns, the IOS configuration file from the NPM RAM buffer to the Admin flash of the URM card.	IGX	3-89
clrrtrcnf	Clears the NPM RAM buffer used to store the IOS configuration file downloaded from the TFTP server.	IGX	3-111
cnfrtr	Configures certain router parameters on a specific router slot. Parameters include IOS configuration file source and serial port function.	IGX	3-405
cnfrtrcnfmastip	Configures the IP address of the authorized TFTP server from which the IOS configuration file is to be transferred.	IGX	3-409
cnfrtrparm	SuperUser. Configures certain router parameters on a specific router slot. Parameters include common action, router reset, and write to bootflash.	IGX	3-410
dspalms	Displays major and minor alarms throughout the network and specific alarms at the local node.	IGX	4-41
dspcnf	Displays the nodes reserved for the IOS configuration file stored in the NPM RAM buffer. The save and restore facility is not allowed on these reserved nodes.	IGX	4-122
dsprtr	Reports the router configuration on a specific router slot.	IGX	4-299
dsprtrcnfdnld	Displays the progress of the transfer of the IOS configuration file from the TFTP server to the NPM RAM buffer and the copy (burn) of the configuration file to the URM Admin flash.	IGX	4-300
dsprtrslot	Reports router operational information on a specific router slot. Operational information includes: card type, VIC type, IOS software image name, router operational state, and router alarm status. Command also displays information on the IOS configuration file stored in the URM Admin flash	IGX	4-302
dsprtrslots	Reports router operational information for all router slots in the IGX. Operational information includes: card type, VIC type, and router alarm status.	IGX	4-305
rstrtr	Resets the router on a specified router slot.	IGX	4-439

Optimizing Traffic Routing and Bandwidth

To achieve peak network performance, the routing of traffic and the use of available bandwidth is configurable. The information used in configuring traffic routing and bandwidth is gathered from historical network trends. These commands are used to complete those tasks required to optimize the network: specifying channel utilization, specifying the class of service (including the use of the priority bumping feature), and managing bandwidth.

Command	Description	Type	Page
cnfbmpparm	Configure priority bumping	BPX, IGX	3-130
cnfchutl	Configure channel utilization	IGX	3-168
cnfcmb	Configure combined timeout parameters	IGX	3-181
cnfcon	Configure a connection	BPX, IGX	3-190
cnfcos	Configure class of service	IGX	3-194
cnfpref	Configure preferred route for connections	BPX, IGX	3-358
cnfrtcost	Configure cost based routing	BPX, IGX	3-403
dncon	Down connections	IGX	4-30
dspbmpparm	Display priority bumping parameters	BPX, IGX	4-50
dspload	Display connection loading	BPX, IGX	4-50
dspospace	Display open space for routes	BPX, IGX	4-228
dsprts	Display connection routing	BPX, IGX	4-299
dsptrkutl	Display trunk utilization	BPX, IGX	4-385
prtrts	Print connection routes	BPX, IGX	4-428
upcon	Up connections	IGX	4-475

Synchronizing Network Clocks

These commands are used to synchronize a network.

The designation of the clock source depends on the stratum (or stability) of the clock source. Each node in the network synchronizes to the nearest (fewest number of hops) primary clock source. If no primary source is available, the nearest secondary clock source is used, and so on. If no other source is available, the network synchronizes to the internal oscillator of one of the nodes in the network.

Command	Description	Type	Page
clrclkalm	Clears an alarm associated with a clock source. The cause of an alarm usually clock source that fails or is outside of the frequency limits. You must clear a clock alarm before the corresponding clock source is usable.	BPX, IGX	3-96
cnfclksrc	Configure network clock source. Specifies a primary, secondary, or tertiary clock source in a network	BPX, IGX	3-173
dspclksrcs	Displays all the currently defined network clock sources.	BPX, IGX	4-113
dspcurclk	Displays the clock source that the network is currently using.	BPX, IGX	4-155

Managing Jobs

A *job* is a user-specified string of commands. A job can automatically execute on a prearranged schedule or upon an event trigger. Use these commands to:

- Create a job
- Run a job
- Stop a job
- Display one or more jobs
- Edit a job
- Delete a job
- Create a job trigger

The system assigns a number to a new job. This *job number* identifies the job and is a required parameter for most job control commands. When you create a new job, the current privilege level is automatically saved as the privilege level of the job. Only commands that are available at your privilege level can be in your job specification. For example, a user whose highest privilege level is 3 cannot include the **addtrk** command in a job because **addtrk** requires a level 1 privilege. This privilege requirement also applies to other job functions, such as running, editing, or stopping a job.

Not all Cisco WAN Switching commands can execute as a part of a job. For this reason, the Attributes section of each command description in this manual states whether the command can function in a job.

Command	Description	Type	Page
addjob	Add a job	BPX, IGX	3-45
addjobtrig	Add a job trigger	BPX, IGX	3-48
deljob	Delete a job	BPX, IGX	4-13
deljobtrig	Delete job trigger	BPX, IGX	4-155
dspjob	Display a job	BPX, IGX	4-177
dspjobs	Display jobs	BPX, IGX	4-178
editjob	Edit a job	BPX, IGX	4-403
prtjob	Print a job	BPX, IGX	4-422
prtjobs	Print jobs	BPX, IGX	4-423
runjob	Run a job	BPX, IGX	4-444
stopjob	Stop a job	BPX, IGX	4-450

Managing the Network

These commands are used for network administration. They are also used to manage system user access, passwords, and tasks.

Command	Description	Type	Page
adduser	Add user(s)	BPX, IGX	3-82
cnffwswinit	Configure Cisco WAN Manager node IP address for the firmware and software initiator	BPX, IGX	3-231
cnfpwd	Configure password	BPX, IGX	3-362
cnfsnmp	Configure SNMP parameters	BPX, IGX	3-416
cnfstatmast	Configure statistics master SV+ address	BPX, IGX	3-417
cnfsysparm	Configure system parameters	BPX, IGX	3-428
deluser	Delete user	BPX, IGX	4-24
dsplanip	Display LAN IP address of all nodes in network	IGX	4-181
dspnwip	Display network IP interface	BPX, IGX	4-225
dsppwd	Display password	BPX, IGX	4-274
dspsnmp	Display SNMP parameters	BPX, IGX	4-337
dspsnmpstats	Display SNMP statistics	BPX, IGX	4-338
dspstatfiles	Display TFTP statistics file information	BPX, IGX	4-339
dspsv3	Display WAN manager Layer 3 link control blocks	BPX, IGX	4-342
dsptsmap	Display SNMP parameters	BPX, IGX	4-390
dspusers	Display users	BPX, IGX	4-391
dspusertask	Display user task	BPX, IGX	4-392
dspusertasks	Display all user tasks	BPX, IGX	4-394

Statistics

Command	Full Name	Type	Page
clrchstats	Clear channel statistics	IGX	3-94
cnflnstats	Configure line statistics collection	BPX, IGX, **SU**	3-265
cnfphyslnstats	Configure physical line statistics collection (OC-3)	IGX, **SU**	3-306
cnfportstats	Configure port statistics collection	BPX, IGX, **SU**	3-353
cnfrobparm	Configure robust alarms parameters	BPX, IGX, **SU**	3-372
cnfrtrparm	Configure universal router module (URM) embedded router parameters	IGX, URM, **SU**	3-410
cnfslotstats	Configure slot statistics collection	BPX, **SU**	3-414
cnfstatparms	Configure statistics parameters	BPX, IGX, **SU**	3-418
cnftrkstats	Configure trunk statistics collection	BPX, IGX, **SU**	3-477
dspchstatcnf	Display statistics enabled for a channel	IGX, **SU**	4-91
dspchstathist	Display statistics data for a channel	IGX, **SU**	4-93

Command	Full Name	Type	Page
dspclnstatcnf	Display statistics enabled for a circuit line (Note older alias: **dsplnstatcnf)**	BPX, IGX, **SU**	4-116
dspclnstathist	Display statistics history for a circuit line	BPX, IGX, **SU**	4-117
dspcntrstats	Display counter status statistics	BPX, IGX	4-124
dsplnstathist	Display statistics data for a line	BPX, IGX, **SU**	4-200
dspphyslnstatcnf	Display statistics enabled for a physical line on a UXM. The alias **dsplnstatcnf** is used for IGX only.	BPX, IGX, **SU**	4-238
dspphyslnstathist	Display statistics history for a physical line on a UXM	IGX, **SU**	4-242
dspportstatcnf	Display statistics enabled for an FR port	IGX, **SU**	4-253
dspportstathist	Display statistics history for an FR port	IGX, **SU**	4-254
dspportstats	Display ATM port statistics	BPX, IGX	4-268
dsprobst	Display robust statistics	BPX, IGX, **SU**	4-288
dsprrst	Display reroute statistics	BPX, IGX, **SU**	4-289
dspslotstatcnf	Display statistics enabled for a slot	BPX, IGX, **SU**	4-334
dspslotstathist	Display statistics history for a slot	BPX, IGX, **SU**	4-336
dspstatmem	Display statistics memory use	BPX, IGX, **SU**	4-341
dsptrkcons	Display trunk connection counts	BPX, IGX, **SU**	4-359
dsptrkmcons	Display trunk connection counts by master node	BPX, IGX, **SU**	4-365
dsptrkstatcnf	Display statistics enabled for a trunk	BPX, IGX, **SU**	4-371
dsptrkstathist	Display statistics history for a trunk	BPX, IGX, **SU**	4-373
rststats	Reset statistics collection time	BPX, IGX, **SU**	4-441
tststats	Test statistics	BPX, IGX, **SU**	4-473

Troubleshooting

Command	Full Name	Type	Page
addalmslot	Add alarm slot	BPX, IGX	3-3
addextlp	Add external loopback	IGX	3-44
addloclp	Add local loopback to connections on a port	BPX, IGX	3-54
addlocrmtlp	Add local-remote loopback in a tiered network	BPX, IGX	3-59
addrmtlp	Add remote loopback to connections	BPX, IGX	3-65
clrchstats	Clear channel statistics	BPX, IGX	3-95
clrclkalm	Clear clock alarm	BPX, IGX	3-96
clreventq	Clear the events queues from the fail handler	IGX	3-98
clrlnalm	Clear circuit line alarm	IGX	3-100
clrlnerrs	Clear circuit line errors	IGX	3-102
clrlog	Clear log	IGX	3-103

Command	Full Name	Type	Page
clrmsgalm	Clear message alarm	BPX, IGX	3-104
clrphyslnalm	Clear physical line alarms	IGX	3-105
clrphyslnerrs	Clear physical line errors	IGX	3-108
clrportstats	Clear port statistics	IGX	3-109
clrslotalms	Clear slot alarms	BPX	3-113
clrsloterrs	Clear slot errors	BPX, IGX	3-114
clrtrkalm	Clear trunk alarm	BPX, IGX	3-115
clrtrkerrs	Clear trunk errors	BPX, IGX	3-119
clrtrkstats	Clear trunk statistics	BPX, IGX	3-120
cnfbus	Configure active bus	IGX	3-137
cnfleadmon	Monitor LDM/HDM data port control leads	IGX	3-240
cnflnalm	Configure line alarm	IGX	3-258
cnfslotalm	Configure slot alarm parameters	BPX	3-330
cnftrkalm	Configure trunk alarm	BPX, IGX	3-463
dellp	Delete loopbacks from a connection or port	BPX, IGX	4-15
dncd	Down card	BPX, IGX	4-28
dspalms	Display alarms	BPX, IGX	4-41
dspbob	Display Breakout Box	BPX, IGX	4-55
dspbusbw	Display cell bus allocated bandwidth	IGX/UXM	4-59
dspbuses	Display bus status	BPX, IGX	4-64
dspclnerrs	Display circuit line errors	IGX	4-114
dspeventq	Display the event queue names and the data in each.	BPX, IGX	4-160
dspfrcbob	Display FRC-2/FRM-2 breakout box	IGX	4-161
dsplnalmcnf	Display line alarm configuration	IGX	4-189
dsplnerrs	Display line errors	IGX	4-195
dsplog	Display event log	BPX, IGX	4-205
dsppwr	Display power supply status	BPX, IGX	4-275
dspslotalms	Display slot alarms	BPX	4-331
dspsloterrs	Display slot errors	BPX	4-332
dspslotstatcnf	Display slot statistics configuration	BPX	4-335
dspsv3	Display Cisco WAN Manager L3 (layer 3) Link Control Blocks	BPX, IGX	4-342
dsptrkerrs	Display individual or all trunk errors	BPX, IGX	4-360
prtclnerrs	Print circuit line errors	IGX	4-418
prtlnerrs	Print line errors	BPX, IGX	4-424
prtlog	Print log	BPX, IGX	4-426
prttrkerrs	Print trunk errors	BPX, IGX	4-430
resetcd	Reset card	BPX, IGX	4-435

Command	Full Name	Type	Page
resetpc	Reset Port Concentrator	BPX, IGX	4-437
switchcc	Switch controller card	BPX, IGX	4-455
tstcon	Test connection	BPX, IGX	4-462
tstconseg	Test connection segment	BPX, IGX	4-465
tstdelay	Test Frame Relay connection delay	BPX, IGX	4-467
tstpcs	Test Port Concentrator Shelf	IGX	4-470
tstport	Test port	IGX	4-471

Error Information

Command	Description	Type	Page
dspcds	Displays front and back cards in the node, with type, revision, and status	BPX, IGX	4-78
dspcons	Displays a summary of connections.	BPX, IGX	4-143
dsplns	Displays status and configuration of circuit lines.	BPX, IGX	4-197
dsplog	Displays events affecting the node.	BPX, IGX	4-205
dspnds	Displays name, type, and alarm status of nodes within the local network.	BPX, IGX	4-216
dspnw	Displays the network topology in tabular form, including alarm status of each node in the network.	BPX, IGX	4-221
dsppwr	Displays power supply status and internal temperature.	BPX, IGX	4-275
dsprtrslot	Displays operational information and alarm status for a specified URM embedded router.	IGX	4-302
dsprtrslots	Displays operational information and alarm status for all URM embedded routers in a node.	IGX	4-305
dsptrks	Displays basic information for all trunks.	BPX, IGX	4-367

VSI Commands

Virtual Switch Interface (VSI) is a common control interface for Cisco switches such as the MGX 8850, the BPX 8650 and the IGX 8400. It provides a resource management scheme that allocates the switch resources needed for setting up connections, such as system bandwidth and channel space, to a number of external connection-management entities (controllers) which manage calls or connections with PNNI or MPLS or other protocols.

The switch resources are partitioned between Automatic Routing Management and the MPLS or PNNI Controllers.

While BPX supports both SES PNNI and MPLS controllers, IGX supports only MPLS controllers.

VSI on the BPX and IGX provides these facilities:

- multiple VSI partitions

- Service Class templates
- virtual trunk support for VSI
- Cisco WAN Manager support for VSI

VSI is supported on:

- UXM and URM cards on the IGX
- BXM cards on the BPX

For more overview information and specific information on how to configure a BPX 8650 switch, refer to the *Cisco BPX Series Installation and Configuration Guide*. For information about configuring a router for MPLS operation, refer to the *MPLS Software Configuration Guide*. For information on the IGX 8400 switch, see the *IGX Installation and Configuration Guide*.

Summary of IGX VSI Commands

Mnemonic	Description	Page
addctrlr	Attach a VSI controller to the IGX node.	3-39
addyred	Enables card redundancy for IGX cards.	3-83
compactrsrc	Compact the Automatic Routing Management CBAs on a particular slot.	3-503
cnfctrlr	Reconfigure the VPI and start_VCI of the control channels for an MPLS Controller.	3-196
cnfqbin	Configure Qbin parameters on a selected port, physical or virtual trunk.	3-363
cnfrsrc	Configure resources, for example, for Automatic Routing Management PVCs and MPLS (Multiprotocol Label Switching) Controller (LSC).	3-383
cnfvsiif	Assign a different Service Class Template to an interface.	3-498
delctrlr	Delete an MPLS controller from an IGX node.	4-8
dspcbause	Query the specified slot and display information about the CBA block usage.	4-67
dspchuse	Display a summary of channel usage in a given slot.	4-111
dspctrlrs	Display the MPLS controllers attached to an IGX node.	4-153
dspqbin	Display Qbin parameters on the specified port, physical or virtual trunk.	4-277
dspqbinstats	Display Qbin summary statistics	4-282
dspqbint	Display the default Qbin parameters for a VSI Qbin in a Qbin template.	4-284
dsprsrc	Display the resource partitioning for a port or trunk.	4-295
dspsct	Display a list of nine Service Class Templates and the Class of Service.	4-309
dspvsiif	Display Service Class Template assigned to an interface.	4-396

Mnemonic	Description	Page
dspvsipartinfo	Display VSI resource information for a partition.	4-399
dspyred	Display information for Y-cable pairings	4-403

Summary of BPX VSI Commands

Mnemonic	Description	Page
addctrlr	Attach a PNNI VSI controller to a BPX node through an AAL5 interface shelf. For controllers that require Annex G capabilities in the controller interface.	3-41
addshelf	Add a trunk between the hub node and interface shelf, VSI-MPLS controller or an SES PNNI controller.	3-70
addyred	Enables card redundancy for BPX cards.	3-83
cnfqbin	Configure Qbin parameters on a selected port, physical or virtual trunk.	3-363
cnfrsrc	Configure resources, for example, for Automatic Routing Management PVCs and MPLS controller (LSC).	3-390
cnfvsiif	Configure VSI or a different template to an interface.	3-498
cnfvsipart	Configure VSI partition characteristics for VSI.	3-500
delctrlr	Delete a controller, such as a PNNI ESP (Extended Services Processor) 4.0 controller, from a BPX node.	4-9
delshelf	Delete a trunk between a hub node and access shelf.	4-19
dspchuse	Display a summary of channel distribution in a given slot.	4-111
dspctrlrs	Display the VSI controllers attached to a BPX node.	4-153
dspqbin	Display Qbin parameters.	4-277
dspqbinstats	Display Qbin summary statistics.	4-282
dspqbint	Display Qbin template.	4-284
dsprsrc	Display the resource partitioning for a port or trunk.	4-295
dspsct	Display Service Class Templates and the Class of Service.	4-309
dspvsiif	Display VSI.	4-396
dspvsipartcnf	Display information about VSI ILMI functionality.	4-398
dspvsipartinfo	Display VSI resource information for a partition.	4-399
dspyred	Display information for Y-cable pairings	4-402
upgdvsilcn	Expand VSI LCN to 60K for BXM-E	4-480

SuperUser Commands

The Cisco WAN switch software SuperUser commands require user privilege level 0 (zero). SuperUser commands (privilege level 0) require a different login and password than commands with privilege levels 1–6. Because the privilege level for all SuperUser commands is 0, the privilege level does not appear in the command definition.

Once you log into a node as SuperUser (user privilege level 0), you will have access to all the SuperUser commands throughout the entire session until you log off that node.

Caution These commands are intended to be restricted to Cisco personnel and other qualified users, such as system administrators. Do not distribute this information to casual users because improper use of SuperUser commands could lead to system malfunction or complete failure.

To access these commands, type in **SuperUser** at the login prompt. Enter the SuperUser password and the password prompt. To exit a command at any point, press the Delete key.

The definitions of potentially dangerous SuperUser commands contain an advisory for you to call the Cisco Technical Assistance Center (TAC) before you proceed. The number in the United States is 800-553-2447. For international access, use 1-408-526-4000.

This section briefly describes the statistics command line interface (CLI) definitions that are provided for various statistics commands (for example, **cnfchstats**, **cnflnstats**, **cnfportstats**, and so on.) Each statistics command displays field names on the CLI.

The descriptions provided in the various statistics description tables may vary from the actual definitions of the field name as it appears on the switch software command line interface statistics screens.

Only BXM card statistics descriptions are provided; however, note that many of the UXM card statistics are similar or identical to those used for the BXM card. This means that in many cases, the description may also apply to the UXM card.

The statistics descriptions provided in the various tables may not always map directly to the CLI field names, but in many cases, they provide a description of the statistic that is sent from the card firmware to the switch software CLI (through CommBus messages from the firmware to switch software).

Note The BXM CommBus interface is similar in many places to the CommBus interface for previously-released cards (ASI and BNI cards). Note that there are small differences in the CommBus definition for other cards. In some cases the object ID for the BXM card statistic differs from its ASI or BNI counterpart.

Several tables contain CommBus messages, along with descriptions of how each message is used by the switch software. Note that in many cases, the CommBus message description provides a description of the statistics field name on the CLI screen display, on **dspchstats**, **dspchstathist**, and so on.

Explanation of table columns:

- **ID**—Indicates the object ID number.
- **Object Name**—Provides a description of the object.
- **Range/Values**—Indicates the legal values that the object can take.
- **Default**—Indicates the default value used by the firmware if this object is not sent. Special defaults:
  - R—Indicates that there is no default and the object must be supplied each time.
  - RI—Indicates that the object is required only at initial setup time.

- NA—Not Applicable; Indicates that the object is “get-only” so a default value does not apply in this case.
- NC—No Change.
- LR—Line Rate (E3, DS3, OC-3, OC-12).

- **Description**—Indicates the use of the object.

Functional Description of Channel Statistics

This operation provides a way for the software to collect channel statistics. The number of channel statistics that can be collected is limited and configurable by software. Note that all of these statistics are not available on the Monarch firmware at one time. For the statistics that are not configured, a value of zero will be returned during the “get” operation.

In the description column of the screen display, the numbers in brackets indicate how many stats-per-connection need to be configured on the card for the specific statistic to be available over the CommBus interface. [ALL] indicates the statistic is available regardless of the number of configured stats-per-connection. If the number inside the [ ]s is preceded by “A:”, that means that the statistic is available when primary statistics are requested for the connection. If the number inside the [ ]s is preceded by “B:”, that means the statistic is available when secondary statistics are requested for the connection.

Command	Description	Type	Page
burnfwrev	Burn firmware image into a specific card’s memory.	BPX, IGX, SU	3-87
clrcderrs	Clear detailed card errors log	BPX, IGX, SU	3-92
clrcnf	Clear configuration memory of the current node	BPX, IGX, SU	3-97
cnfabrparm	Configure parameters for ABR queue on all ports of UXM card	IGX, SU	3-122
cnfbusbw	Configure UXM card bus bandwidth parameters	IGX, SU	3-139
cnfcdparm	Configure channel statistics level on BXM or UXM cards	BPX, IGX, SU	3-143
cnfcdpparm	Configure CVM card parameters	BPX, IGX, SU	3-148
cnfcftst	Configure communications fail test pattern	BPX, IGX, SU	3-150
cnfchstats	Configure channel statistics collection	BPX, IGX, SU	3-162
cnfchts	Configure channel timestamp, a pre-aging parameter	BPX, IGX, SU	3-166
cnfcmparm	Configure connection management parameters	BPX, IGX, SU	3-183
cnfdiagparm	Configure diagnostic test parameters	BPX, IGX, SU	3-211
cnfdlparm	Configure software and firmware download parameters. Primarily a debug command.	BPX, IGX, SU	3-213
cnfecparm	Configure CDP or CVM echo canceller parameters for a specified voice circuit line.	IGX, SU	3-217
cnffstparm	Configure Frame Relay Optimized Bandwidth Management node parameters	BPX, IGX, SU	3-226
cnflan	Configure Ethernet LAN between node and Cisco WAN Manager terminal.	BPX, IGX, SU	3-238
cnflnparm	Configure ATM line parameters	IGX UXM, SU	3-259
cnflnsigparm	Configure line signaling parameters for voice cards	IGX, SU	3-262

Command	Description	Type	Page
cnflnstats	Configure line statistics collection. Primarily a debug tool.	BPX, IGX, SU	3-265
cnfmxbutil	Configure Muxbus utilization	IGX, SU	3-276
cnfnodeparm	Configure miscellaneous node parameters	BPX, IGX, SU	3-279
cnfnwip	Configure network IP address and subnet mask for the node	BPX, IGX, SU	3-303
cnfphyslnstats	Configure physical line statistics collection on UXM	IGX UXM, SU	3-306
cnfportstats	Configure FR port statistics collection. Primarily a debug command.	IGX, SU	3-353
cnfrobparm	Configure Robust Alarms parameters (a protocol for node-to-network management systems)	BPX, IGX, SU	3-372
cnfrtrparm	Configure Universal Router Module (URM) embedded router parameters	IGX URM, SU	3-410
cnfslotstats	Configure slot statistics collection for troubleshooting	BPX, SU	3-414
cnfstatparms	Configure port statistics parameters	BPX, IGX, SU	3-418
cnftcpparm	Configure TCP parameters. Specifies the number of times the BCC checks the IP addresses for attention requests.	BPX, IGX, SU	3-433
cnftermfunc	Configure terminal port parameters	BPX, IGX, SU	3-436
cnftlparm	Configure trunk-based loading parameters	BPX, IGX, SU	3-440
cnftrkparm	Configure trunk parameters to optimize traffic mixes	BPX, IGX, SU	3-466
cnftrkstats	Configure collection of Qbin statistics on specified trunk	BPX, IGX, SU	3-477
cnftstparm	Configure card self-test parameters	BPX, IGX, SU	3-485
cnfuiparm	Configure control terminal user interface parameters	BPX, IGX, SU	3-488
cnfuvmchparm	Configure UVM channel parameters	IGX, SU	3-490
cnfvchparm	Configure CVM or CVM voice channel parameters	IGX, SU	3-492
dchst	Display CDP or CVM channel status	IGX, SU	4-1
diagbus	Diagnose failed MuxBus or cell bus	IGX, SU	4-27
drtop	Display Route Op Table. Displays network statistics for connection rerouting resulting from failed trunks.	BPX, IGX, SU	4-38
dspabortlog	Display abort log	BPX, IGX, SU	4-39
dspasich	Display ASI channel routing entry	BPX, SU	4-46
dspbuses	Display available MuxBux or cell bus bandwidth	BPX, IGX, SU	4-62
dspcderrs	Display card failure information from diagnostics at local node	BPX, IGX, SU	4-76
dspcftst	Display communications fail test pattern	BPX, IGX, SU	4-81
dspchan	Display voice channel configuration	IGX, SU	4-82
dspchstatcnf	Display statistics enabled for a channel to help debug statistics	IGX, SU	4-91
dspchstathist	Display history of statistics enabled for a channel	IGX, SU	4-93
dspclnstatcnf	Display statistics enabled for a circuit line by **cnflnstats**	IGX, SU	4-116
dspclnstathist	Display statistics history for a circuit line	BPX, IGX, SU	4-117
dspcnf	Display configuration save and restore status	BPX, IGX, SU	4-122
dspdnld	Display status of a download to a node	BPX, IGX, SU	4-156

Command	Description	Type	Page
dspdutl	Display percentage of data channel utilization	IGX, SU	4-157
dspecparm	Display CDP echo canceller parameters	IGX, SU	4-158
dspfwrev	Display status of card firmware revision image loaded in controller card's RAM	BPX, IGX, SU	4-166
dsplnstathist	Display statistics data for a line	BPX, IGX, SU	4-200
dspphyslnstatcnf	Display statistics enabled for a physical line on a UXM by cnfphyslnstats	IGX, SU	4-238
dspphyslnstathist	Display statistics history for a physical line on a UXM	IGX, SU	4-242
dspportstatcnf	Display statistics enabled for an FR port	IGX, SU	4-253
dspportstathist	Display statistics history for an FR port	IGX, SU	4-254
dsprevs	Display system configuration and status of primary and secondary revisions running all nodes	BPX, IGX, SU	4-286
dsprobst	Display statistics associated with Robust Alarms	BPX, IGX, SU	4-288
dsprrst	Display statistics on reroutes resulting from failed trunks	BPX, IGX, SU	4-289
dspsig	Display current signaling rate from specified voice channel	IGX, SU	4-326
dspslot	Display system information associated with a slot	BPX, IGX, SU	4-328
dspslotstatcnf	Display statistics enabled for a BXM card	BPX, IGX, SU	4-334
dspslotstathist	Display statistics history for a BXM card	BPX, IGX, SU	4-336
dspstatmem	Display memory usage for statistics collection	BPX, IGX, SU	4-341
dspswlog	Display software errors log	BPX, IGX, SU	4-348
dsptcpparm	Display TCP bandwidth throttle parameter	BPX, IGX, SU	4-350
dsptrkcons	Display number of connections routed over specific trunk	BPX, IGX, SU	4-359
dsptrkmcons	Display number of connections routed over specific trunk (BNI) by master node	BPX, IGX, SU	4-365
dsptrkstatcnf	Display statistics enabled for a physical or virtual trunk	BPX, IGX, SU	4-371
dsptrkstathist	Display statistics history for a physical or virtual trunk	BPX, IGX, SU	4-373
dsputl	Display utilization for voice and data connections	IGX, SU	4-395
getfwrev	Get firmware revision image	BPX, IGX, SU	4-405
killuser	Log out a user	BPX, IGX, SU	4-409
loadcnf	Load configuration image from WAN Manager	BPX, IGX, SU	4-410
loadrev	Load secondary software revision from WAN Manager	BPX, IGX, SU	4-412
prtcderrs	Print card error information	BPX, IGX, SU	4-415
rrtcon	Manually reroute connection	BPX, IGX, SU	4-438
rststats	Reset statistics collection time for the **tststats** command	BPX, IGX, SU	4-441
runcnf	Restores network configuration image to one or all nodes	BPX, IGX, SU	4-442
runrev	Run a specific revision of system software at a node	BPX, IGX, SU	4-445
savecnf	Save system configuration image on WAN Manager workstation disk	IGX, SU	4-446
tststats	Display a summary of test statistics resulting from use of **tstcon**	BPX, IGX, SU	4-473

Command	Description	Type	Page
upgdlogcd	For BXM to BXM-E card, manually upgrade the logical card database	BPX, SU	4-477
upgdvsilcn	Expand VSI LCN to 60K for BXM-E	BPX, SU	4-480

Command Aliases

These commands are functionally identical. The first command name is an alias; see the command definition for the second, preferred name:

- **addcdred**—same functionality as **addyred**
- **addfrport**—same functionality as **addport**
- **cnfclnstats**—same functionality as **cnflnstats**
- **cnffrport**—same functionality as **cnfport**
- **delcdred**—same functionality as **delyred**
- **delfrport**—same functionality as **delport**
- **dnfrport**—same functionality as **dnport**
- **dspcdred**—same functionality was **dspyred**
- **dspfrport**—same functionality as **dspport**
- **dsplnstatcnf**—same functionality as **dspphyslnstatcnf**
- **dsplnstats**—same functionality as **dspphyslnstats**
- **prtcdred**—same functionality as **prtyred**
- **switchcdred**—same functionality as **switchyred**
- **upfrport**—same functionality as **upport**

Alphabetical List of Commands addad through cpytrkict

. (a period) (display command history)

Displays the twelve (12) most recently used commands. To reuse one of these commands, enter the associated number. The command appears on the command entry line, where you can edit or re-execute a command.

To edit the command line: backspace through the command's arguments and type in a new value or backspace without typing a new value to restart the command at the cursor position.

Syntax

. (A period)

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Example

Display the command history.

. (A period)

```
sw180          TN    Cisco          IGX 8420  9.3.g0    Oct. 20 2000 09:26 GMT

Command history

12: addyred 4
11: dspcds
10: dspcd 6
 9: dspcd 9
 8: addyred 6 9
 7: dsptrks
 6: addshelf 5.1
 5: upcd
 4: upcd 6
 3: dspcds
 2: dncd 9
 1: upcd 9


Last Command: upcd 9


Next Command:
```

addalmslot (add alarm card set)

Enables the MAJOR and MINOR alarm indicators on an Alarm Relay Card (ARC) or Alarm Relay Module (ARM) front card. It also configures the slot to provide external alarms from the Alarm Relay Interface (ARI) back card.

Use this command at each node equipped to provide external alarm indications to the customer alarm reporting system. The slot specified for the ARC or ARM may be any shelf slot, but is usually the slot farthest to the right.

Upon executing the command, the system places the alarm card set in the active state and displays the current alarm status.

Syntax

addalmslot <slot number>

Parameter

Parameter	Description
<slot number>	Specifies the slot number of the alarm card set.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	Yes	BPX, IGX			Yes	

Related Commands

delalmslot, **dspalms**

Example

Enable alarm reporting from slot 16 in a node. (The system then displays alarm status.)

addalmslot 16

```
beta           TRM   YourID:1        IGX 8430    9.3      Apr. 13 2000 14:27 MST

Alarm summary   (Configured alarm slots: 16)
Connections Failed:       None
Groups Failed:            None
PLN Alarms:               1 Major
CLN Alarms:               None
Cards Failed:             1
Missing Cards:            None
Remote Node Alarms:       1 Major
Remote Domain Alarms:     None

Last Command: addalmslot 16

Next Command:
```

addapsln/delapsln (add/delete SONET APS line)

Add a SONET APS (Automatic Protection Switching) line. The **addapsln** and **delapsln** command lets you add SONET APS (Automatic Protection Switching) for BXM OC-3 or OC-12 lines.

SONET APS is a standard that describes the switching of SONET lines from the active line to a standby line to provide hardware line redundancy. The SONET APS feature applies only to BXM OC-3 and OC-12 cards in this release.

When adding a new APS line pair, you must specify the desired APS protocol. The **delapsln** command deletes APS for the lines.

When the **addapsln** command executes, the switch software:

- Verifies that the slot.port arguments support APS
- Verifies that the appropriate back card is installed
- Verifies that the protection port is not already active
- If card redundancy is already configured for the two-slot case (APS 1+1), verifies that the primary card is the same type as the working line card.

Before the **addapsln** command has been executed, there is no working or protection line. The **addapsln** command defines which line is the working line and which line is the protection line. (For APS 1+1 Annex B, the active line is called the "primary section," and the standby line is called the "secondary section," which provides protection for the primary section.)

Feature Mismatching to Verify APS (Automatic Protection Switching) Support

The **addapsln** command, in addition to other configuration commands, performs mismatch verification on the BXM and UXM cards. For example, the **addapsln** command verifies whether the cards both have APS support configured. Refer to the *BPX 8600 Series Installation and Configuration Manual*.

Whenever you activate a feature by configuring it with CLI commands, switch software performs a verification to ensure that the hardware and firmware support the feature. For example, if you are attempting to add APS on a specific line (by using **addapsln**), and the BXM card does not support this feature, a warning message is displayed and the addition is not completed.

The Feature Mismatching capability does not mismatch cards unless the actual feature has been enabled on the card. This allows for a graceful card migration from an older release.

Syntax

addapsln <slot.port1> < slot.port2> <protocol>

You must enter the slot.port pair and the protocol option. If you do not enter the protocol option, a menu lists the options.

Parameters

Parameter	Description
slot.port1	The desired working line number
slot.port2	The desired protection line number
protocol	1: 1+1 2: 1:1 3: 1+1 Annex B 4: 1+1, ignore K1K2 bytes

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX			Yes	

Related Commands

delapsln, cnfapsln, dspapsln, dsplog, dspalms

Example

Add an APS redundant pair, with Working line on slot 11, port 1; Protection line on slot 12, port 1; with “1” specifying APS 1+1 protocol.

addapsln 11.1 12.1 1

```
sw119          TRM   StrataCom       BPX 8620  9.3.10    Date/Time Not Set

Work/Protect Actv Active Line      Standby Line     Current APS     Last User
(Work1/Work2)Line Alarm Status     Alarm Status     Alarm Status    Switch Req
11.1 12.1    NONE Deactivated      APS Deactivated  APS Deactivated Clear




Last Command: addapsln 11.1 12.1 1
```

addcon (add a data channel connection)

Establishes data channel connections between nodes in a network.

After you add a connection by using the **addcon** command, the node automatically routes the connection. The node where you execute **addcon** is the "owner" of the added connections. The concept of ownership is important because you must enter information about automatic rerouting and preferred routing at the node that owns the connection. See the **cnfpref** and **cnfcos** commands for more information on automatic rerouting. Before the node adds the connection, the proposed connection appears on the screen with a prompt for you to confirm the addition.

When applied to data connections, the **addcon** command adds a synchronous data connection to the network. You can add synchronous data connections to any node slot equipped with either an LDM or HDM in an IGX node. Before you add a connection, determine the desired data rate. To find the data rates that individual cards support, refer to the card descriptions in the *Cisco IGX 8400 Series Reference* manual.

When connecting sets of data channels, you do not have to specify the full channel set for the local end of the connection. You have to designate only the first channel in the range. For example, to add connects 27.1-4 at local node alpha to channels 9.1-4 at beta, you can enter:

```
addcon 27.1-4 beta 9.1
```

If Y-cable redundancy has been specified, you can add data connections at only primary card slots (not at the secondary card slots). See the **addyred** definition for more information. Standard Data Rates Table 3-1 through Table 3-9 follow, listing data rates. The following notations appear with some data rates:

- * Must be used with 8/8 or 8/8I coding.
- /n Specifies a partially filled packet type: the /n allows partial packets to be sent and so avoid the delay incurred by waiting to build a full packet.
- f Entered after the data rate, an *f* specifies fast EIA (interleaved EIA) for the connection.
- t Indicates "transparent" (CDP or CVM subrate DS0A): if you include the t-option, the IGX node does not check for supervisory or control information.

Table 3-1 Data Connection Load Table with Normal EIA and No DFM

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
1.2	43	28	38	32
1.8	65	28	57	32
2.4	35	70	30	80
3.2	46	70	40	80
3.6	52	70	45	80
4.8	35	140	30	160
6.4	46	140	40	160

Table 3-1 Data Connection Load Table with Normal EIA and No DFM (continued)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
7.2	52	140	45	160
8	58	140	50	160
9.6	69	140	60	160
12	86	140	75	160
12.8	92	140	80	160
14.4	103	140	90	160
16	115	140	100	160
16.8	120	140	105	160
19.2	138	140	120	160
24	172	140	150	160
28.8	206	140	180	160
32	229	140	200	160
38.4	275	140	240	160
48	343	140	300	160
56	381	147	334	160
57.6	392	147	360	160
54	436	147	381	168
72	490	147	429	168
76.8	523	147	458	168
84	572	147	500	168
96	654	147	572	168
112	762	147	667	168
115.2	784	147	686	168
128	871	147	762	168
144	980	147	858	168
168	1143	147	1000	168
192	1307	147	1143	168
224	1524	147	1334	168
230.4	1568	147	1372	168
256	1742	147	1524	168
288	1960	147	1715	168
336	2286	147	2000	168
384	2613	147	2286	168
448	3048	147	2667	168
512	3483	147	3048	168

Table 3-1 Data Connection Load Table with Normal EIA and No DFM (continued)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
672	4572	147	4000	168
768	5225	147	4572	168
772	5252	147	4596	168
896	6096	147	5334	168
1024	6966	147	6096	168
1152	7837	147	6858	168
1344			8000	168

Unshaded connections generate time-stamped data packets. Shaded connections generate non-time-stamped data packets.

Table 3-2 Data Connection Load Table with Interleaved EIA

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
1.2f	35	35	30	40
1.8f	52	35	45	40
2.4f	35	70	30	80
3.2f	46	70	40	80
3.6f	52	70	45	80
4.8f	69	70	60	80
6.4f	92	70	80	80
7.2f	103	70	90	80
8f	115	70	100	80
9.6f	138	70	120	80
12f	172	70	150	80
12.8f	183	70	160	80
14.4f	206	70	180	80
16f	229	70	200	80
16.8f	240	70	210	80
19.2f	275	70	240	80
24f	343	70	300	80
28.8f	412	70	360	80
32f	458	70	400	80
38.4f	549	70	480	80
48f	686	70	600	80
56f	800	70	700	80

Table 3-2 Data Connection Load Table with Interleaved EIA (continued)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
57.6f	823	70	720	80
54f	915	70	800	80
72f	1029	70	900	80
76.8f	1098	70	960	80
84f	1200	70	1050	80
96f	1372	70	1200	80
112f	1600	70	1400	80
115.2f	1646	70	1440	80
128f	1829	70	1600	80
144f	2058	70	1800	80
168f	2400	70	2100	80
192f	2743	70	2400	80
224f	3200	70	2800	80
230.4f	3292	70	2880	80
256f	3658	70	3200	80
288f	4115	70	3600	80
336f	4800	70	4200	80
384f	5486	70	4800	80
448f	6400	70	5600	80
512f	7315	70	6400	80
1.2f	35	35	30	40
1.8f	52	35	45	40
2.4f	35	70	30	80
3.2f	46	70	40	80
3.6f	52	70	45	80
4.8f	69	70	60	80
6.4f	92	70	80	80

DFM is not available on interleaved EIA connections.

Table 3-3 Data Connection Load Table with Partially Filled Packets and No DFM

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
2.4/4	86	28	75	32
3.2/4	115	28	100	32

Table 3-3 Data Connection Load Table with Partially Filled Packets and No DFM (continued)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
3.6/4	129	28	113	32
4.8/10	69	70	60	80
4.8/4	172	28	150	32
6.4/10	92	70	80	80
6.4/4	229	28	200	32
7.2/10	103	70	90	80
7.2/4	258	28	225	32
8/10	115	70	100	80
9.6/10	138	70	120	80
12/10	172	70	150	80
12.8/10	183	70	160	80
14.4/10	206	70	180	80

All of the above connections generate time-stamped data packets.

Table 3-4 Data Connection Load Table with Normal EIA and DFM

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
1.2	58	21	24	3
1.8	86	21	24	3
2.4	39	63	72	9
3.2	51	63	72	9
3.6	58	63	72	9
4.8	37	133	152	19
6.4	49	133	152	19
7.2	55	133	152	19
8	61	133	152	19
9.6	73	133	152	19
12	91	133	152	19
12.8	97	133	152	19
14.4	109	133	152	19
16	121	133	152	19
16.8	127	133	152	19
19.2	145	133	152	19
24	181	133	152	19

Table 3-4 Data Connection Load Table with Normal EIA and DFM (continued)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
28.8	217	133	152	19
32	241	133	152	19
38.4	289	133	152	19
48	361	133	152	19
56	422	133	152	19
57.6	434	133	152	19
64	482	133	152	19
72	542	133	152	19
76.8	578	133	152	19
84	632	133	152	19
96	722	133	152	19
112	843	133	152	19
115.2	867	133	152	19
128	963	133	152	19

Table 3-5 Data Connection Load Table with Partially Filled Packets and DFM

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
2.4/4	115	21	100	24
3.2/4	153	21	134	24
3.6/4	172	21	150	24
4.8/10	77	63	67	72
4.8/4	229	21	200	24
6.4/10	102	63	89	72
6.4/4	305	21	267	24
7.2/10	115	63	100	72
7.2/4	343	21	300	24
8/10	127	63	112	72
9.6/10	153	63	134	72
12/10	191	63	167	72
12.8/10	204	63	178	72
14.4/10	229	63	200	72

Table 3-6 Data Connection Load Table with Partially Filled Packets and Interleaved EIA

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
1.2f/2	86	14	75	16
1.8f/2	129	14	113	16
2.4f/5	69	35	60	40
2.4f/2	172	14	150	16
3.2f/5	92	35	80	40
3.2f/2	229	14	200	16
3.6f/5	103	35	90	40
3.6f/2	258	14	225	16
4.8f/5	138	35	120	40
6.4f/5	183	35	160	40
7.2f/5	206	35	180	40

All of the above connections generate time-stamped data packets. DFM is not available on interleaved EIA connections.

Table 3-7 Sub-Rate Data Connection Load Table (HDM to HDM)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
2.4t			35	80
4.8t			35	160
9.6t			70	160
56t			381	168
t			381	168

All sub-rate data connections use 8/8 coding. Unshaded connections generate time-stamped data packets. Shaded connections generate non-time-stamped data packets. DFM is not available on sub-rate connections. Interleaved EIA is not available on sub-rate connections.

Table 3-8 Sub-Rate Data Connection Load Table (HDM to HDM)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
2.4/4t			88	32
4.8/10t			70	80
4.8/4t			175	32

Table 3-8 Sub-Rate Data Connection Load Table (HDM to HDM) (continued)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
9.6/10t			140	80
All sub-rate data connections use 8/8 coding. All of the above connections generate time-stamped data packets. DFM is not available on sub-rate connections. Interleaved EIA is not available on sub-rate connections.				

Table 3-9 Super-Rate Data Connection Load Table (LDM to HDM)

Bit Rate (Kbps)	7/8 Coding		8/8 Coding	
	Pkt/Sec	Bits/Pkt	Pkt/Sec	Bits/Pkt
1x56	381	147	334	168
2x56	762	147	667	168
3x56	1143	147	1000	168
4x56	1524	147	1334	168
5x56	1905	147	1667	168
6x56	2286	147	2000	168
7x56	2667	147	2334	168
8x56	3048	147	2667	168
1x64	436	147	381	168
2x64	871	147	871	168
3x64	1307	147	1307	168
4x64	1742	147	1143	168
5x64	2177	147	1524	168
6x64	2613	147	1905	168
7x64	3048	147	2286	168
8x64	2483	147	2667	168
All of the connections generate non-time-stamped data packets. DFM is not available on interleaved EIA connections.				

In fast EIA signaling mode, an interleaved byte of EIA signaling information is associated with every byte of data in a packet. This format is appropriate for applications where EIA lead transitions must closely synchronize with user data. Fast EIA can apply to data rates up to 512 Kbps.

When FastPackets are built using the 7/8 coding format, each octet in the FastPacket payload consists of seven user data bits followed by a 1. This “bit-stuffing” allows these FastPackets to be safely carried on trunks that enforce ones density requirements by ensuring that each octet contain at least one 1 (such as IGX trunks configured for ZCS or AMI encoding). The user data may have any format and may contain any pattern, including all 0s. The single 1 inserted in the final bit position of each octet ensures that no more than seven consecutive 0s occur in a FastPacket. The 7/8 coding format is the safest mode to use when the data protocol is unknown and certain trunks in the network use ZCS or AMI.

When FastPackets are built using the 8/8 coding format, each octet in the FastPacket payload consists of eight user data bits. The 8/8 coding format is more efficient than the 7/8 format. However, the ones density requirement on trunks must be met by one of the following:

- Ensuring that the end-user equipment data protocol can never send more than seven consecutive 0s.
- Ensuring that the connection can never be carried on a trunk which uses ZCS ones density enforcement.

The vast majority of trunks today use intelligent ones density enforcement schemes, such as B8ZS, HDB3, B3ZS, or CMI. All such trunks can safely carry 8/8 data connections with no risk of data corruption. Data connections can be configured to NOT use ZCS trunks by specifying the optional "*Z" routing restriction.

When FastPackets are built using the 8/8I coding format, each octet in the FastPacket payload consists of eight inverted user data bits, i.e., each 0 is changed to a 1 and each 1 is changed to a 0. The bits are re-inverted at the far end of the connection. For such connections, the ones' density requirement on trunks must be met by one of the following:

- Ensuring that the end-user equipment data protocol can never send more than seven consecutive 1s.
- Ensuring that connection can never be carried on a trunk that uses ZCS ones density enforcement.

As with the 8/8 coding format, 8/8I connections can be safely carried on the vast majority of trunks today. However, the 8/8I format is primarily intended to provide the efficiency of 8/8 coding for any data which is HDLC or SDLC-based. HDLC/SDLC can never send more than six consecutive 1s, which, when inverted, automatically meets the ones density requirements of every possible trunk format.

If the data protocol requires an acknowledgment and is delay-sensitive, avoid routing the connection over a satellite line (*s for avoid). If 8/8 or 8/8I coding is the selected format, avoid trunks with zero code suppression (*z for avoid) because the zero code suppression could corrupt the last bit in the byte.

Syntax

addcon <local channel> <remote node> <remote channel> <type> <coding> [avoid]

Parameters

Parameter	Description
<local channel>	Specifies the local channel or set of channels in the format slot.port [–port]. (The brackets indicate you can specify a range of channels.)
<remote node>	Specifies the name of the node at the other end of the connection. For a DACS-type connection (where a channel on a node connects to a channel on the same node), use the local node name for *remote node*.
<remote channel>	Specifies the remote channel or set of channels in the format slot.port [–port]. (The brackets indicate you can specify a range of channels.)
<type>	Specifies the data connection bit rate, EIA control lead mode, and in some cases, the number of data bytes in a data packet. Refer to the Standard Data Connection rates for allowable bit rates.

Parameter	Description
<coding>	Specifies the data coding format for data transmissions. Valid formats: • 7/87 = bits of user data plus a 1 inserted in the final bit position of each data byte in a data packet. This is the default coding. • 7/8e = used with LDP or LDM application. • 8/88 = bits of user data for each data byte in a data packet. • 8/8I8 = bits of user data for each data byte in a packet. The data is inverted
[avoid]	Optionally specifies the type of trunk for the connection to avoid. The default is no avoidance. The choices are: • s – avoid satellite trunks. • t – avoid terrestrial trunks. • z — avoid trunks using zero code suppression techniques that modify any bit position to prevent long strings of 0s.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

delcon, dncon, dspcon, dspcons, upcon

Example

Add a low speed data connection of 56 Kbps at 6.1. The connections are highlighted on the screen. A prompt appears asking you to confirm these connections. Respond "**y**" for yes to add the connection. The connections screen then appears showing that data channel 11.1 on node pubsigx2 is connected to channel 6.1 on node pubsigx1. The 56 under the type category indicates that the data rate for the channel is 56 Kbps.

addcon 6.1 pubsigx2 11.1 56

```
pubsigx1       TN    SuperUser       IGX 8420    9.3    Apr. 13 2000   06:23 PDT

 From           Remote      Remote
 6.1            NodeName    Channel         State  Type       Compress  Code CoS
 6.1            pubsigx2    11.1            Ok     56                   7/8  0

Last Command: addcon 6.1 pubsigx2 11.1 56

Next Command:
```

Example

For a CDP super-rate connection, add a 256 Kbps (4x64) connection from an SDP at node alpha to the CDP at node beta. Data rates come from the Standard Data Rate Connections in the preceding pages.

addcon 5.1 beta 6.1-4 4x64

The elements on the command line consist of:

addcon *slot.port remote nodename slot.start channel at far-end channel rate*

Example

For CDP to CDP or CVM to CVM, add a 256 Kbps (4x64) data connection from a CDP (or CVM) at node alpha to the CDP (or CVM) at node beta. The syntax for this example requires that the start and end channel are entered for both ends of the connection and that the *data rate* is specified to be the same at both ends.

addcon 5.4-7 beta 6.1-4 4x64

The channel *numbers* can be different on each end if they are contiguous.

addcon	slot.start channel	-end channel	remote nodename
	slot.start channel	-end channel	rate

addcon (add channel voice connections)

Establishes the channel connections between nodes in the network. You can add voice connections to any slot that has a CDP, UVM, or CVM. Before you add a connection, determine its compression type.

If you plan for a port on a UVM to carry more than 16 channels with LDCELP or the G.729 version of CACELP, you must have a second, connected UVM and configure the resultant pair of UVMs for passthrough operation. If you attempt to add more than 16 LDCELP or G.729 channels, the system reports any excess connections as being failed connections after **addcon** execution finishes. Furthermore, if you execute **dspcon**, the status display for the excess connections shows "ConnRJ" (connection rejected). Refer to the **cnflnpass** description in this chapter and the UVM description in the *Cisco IGX Reference* for a description of passthrough.

After you have established passthrough for a pair of UVM card sets, the system does not allow duplication of channel numbers when you add connections. For example, if you add 7.1.1-16, the node does not allow you to add 8.1.1-8 if you have linked the UVMs by using **cnflnpass**. Instead, you would add 8.1.17-24.

A UVM with Model B or higher firmware supports CAS switching. Before you can add connections in a network with CAS switching, you must configure the UVM for this feature by using the **cnfcassw** command. Note that, for CAS switching, you use **addcon** to add the signaling channels at the near and far end in the format *slot.port*.24 on a T1 line and *slot.port.*16 on an E1 line. Also, the connection *type* for these signaling channels is "t." If you specify D-channel compression, the connection type is "td." See the description of **cnfcassw** in the "Setting Up Lines" chapter or, for a more detailed description, the manual titled *Cisco VNS (Voice Network Switching) Installation and Operation*.

When adding a range of channels, you do not have to specify the full channel set at the near-end. You may specify only the first channel in the set. For example, to connect channels 13.1-10 at alpha to channels 12.5-14 at beta, you could enter "**addcon** 13.1-10 beta 12.5." In this example, channel 13.1 is connected to channel 12.5, and channel 13.2 is connected to channel 12.6, and so on.

Connections are added with a default *class of service* (CoS). The value of CoS is the number of seconds that the node waits before it reroutes the connection after a failure. The CoS applies to various types of connections other than voice.

Table 3-10 and Table 3-11 describe what you enter for the *type* parameter for each rate and compression variable.

Table 3-10 Types of CDP and CVM Operation

Rate	VAD	No VAD	Comment
64 Kbps	v	p	None.
32 Kbps	c32	a32	None.
32 Kbps for FAX	c32d	a32d	Specifies 32 Kbps specially optimized for FAX; c32d incorporates Voice Activity Detection (VAD).
24 Kbps ADPCM	c24	a24	None.
16 Kbps no ZCS	c16z	a16z	For non-ZCS only.
16 Kbps	c16	a16	ZCS is permissible; c16 and a16 use non-standard compression algorithms.

Table 3-11 Types of UVM Operation

Rate	VAD	No VAD	Comment
64 Kbps	v	p, t	Pass-through does not accept t-type connections.
32 Kbps	c32	a32	None.
24 Kbps ADPCM	c24	a24	None.
16 Kbps no ZCS	l16V	l16	For non-ZCS only.
8 Kbps	g729r8v g729ar8v	g7298 g729ar8	The UVM supports two forms of CACELP. Both versions can support VAD (or no VAD). The "a" indicates G.729A. The other version is G.729.

Table 3-12 Types of UVM Connections

Connection	Description
p	A p-connection carries 64 Kbps PCM voice and supports A-law or micro-law encoding and conversion, gain adjustment, and signaling.
t	A t-connection carries 64 Kbps clear channel data traffic.
td	A td-connection carries compressed, 16 Kbps signaling between an IGX node and VNS unit.
v	A v-connection is the same as "p" (above) but with VAD.
a32 a24	Specifies ADPCM only. You can specify 32 Kbps or 24 Kbps.
c32 c24	Specifies both ADPCM and VAD. You can specify 32 Kbps or 24 Kbps.
l16	LDCELP compression of voice to 16 Kbps.
l16v	LDCELP compression of voice to 16 Kbps with VAD.
g729r8	CACELP voice compression at 8 Kbps according to G.729. This type also supports automatic FAX and modem upgrade.
g729r8v	CACELP voice compression at 8 Kbps with VAD according to G.729.
g729ar8	CACELP voice compression at 8 Kbps according to G.729A.
g729ar8v	CACELP voice compression at 8 Kbps with VAD according to G.729A.

The difference between a PCM (p) connection and a transparent (t) or transparent D-compression (td) connection is that the D4 frame signaling bits are identified and processed as signaling information with PCM connections. PCM connections permit gain adjustment to be applied to the connection. Transparent connections treat all bits, including signaling bits, as data bits and disables any gain adjustment conversion that you may have specified.

The *number* in the type field indicates the ADPCM rates in Kbps. The "z" suffix indicates that 00 code level is used. Type a16 or c16 uses only 01, 10, and 11 binary codes to avoid long strings of zeros. Type a16z and c16z connections use the 00 code and are automatically configured to avoid ZCS lines (*Z).

Syntax

addcon <local channel> <remote node> <remote channel> <type> [avoid]

Parameters

Parameter	Description
local channel	Specifies the local channel or set of channels to add. Right-angle brackets indicate a range of channels. Channel specification on a UVM has one more parameter than the specification on a CDP or CVM: For a CDP or CVM, the format for channel specification is *slot.chan*[–*chan*]. For a UVM, the format for channel specification is *slot.line.chan*[–*chan*]. Refer to the *Cisco IGX Reference* for a description of the UVM's lines. Note that, if you are using CAS switching with Model B firmware, *line* must be 1.
remote node	Specifies the name of the node at the other end of the connection. For a DAX connection (where channels on a node are connected to channels on the same node), use the local node name.
remote channel	Specifies the remote channel or set of channels to connect. Brackets indicate that a range of channels can be specified. Channel specification on a UVM has one more parameter than the specification on a CDP or CVM. For a CDP or CVM, the format for channel specification is *slot.chan*[–*chan*]. For UVM, the format for channel specification is *slot.line.chan*[–*chan*].
type	Specifies the voice connection type. Refer to Table 3-9 or Table 3-10 for voice connection types and compression. For connections to an access device such as the Cisco 3810, *type* can be one of the following: 24 Kbps or 32 Kbps ADPCM, LDCELP, or CACELP.
avoid	Specifies the type of trunk for the connection to avoid. Optional Default: no avoidance. The choices are: • s – avoid satellite trunks. • t – avoid terrestrial trunks. • z — avoid trunks using zero code suppression techniques that modify any bit position to prevent long strings of zeros.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

delcon, dncon, dspcon, dspcons, cnfcos

Example

Add a v- type voice connection. This command connects channel 7.2 on node alpha to channel 8.2 on node beta. A prompt asks you to confirm the proposed connections.

Connection type is “v,” class of service (CoS) is “2,” compression is VAD, and ownership is local. For an explanation of CoS, see the **cnfcos** description. Because you are entering the **addcon** command at node alpha, the node alpha is the owner of the connection.

addcon 7.2 beta 8.2 v

```
alpha          TRM   YourID:1        IGX 16    9.3    Apr. 13 2000 09:37 PST

 Local      Remote      Remote                                 Route
 Channel    NodeName    Channel    State  Type    Compression Avoid CoS
 7.2        beta        8.2        Ok     v       VAD         L     2






Last Command: addcon 7.2 beta 8.2 v


Next Command:
```

addcon (add a Frame Relay connection)

After you add a connection, the system automatically routes the connection. The node on which you execute **addcon** is the *owner* of the connection. The concept of ownership is important because you must specify automatic rerouting and preferred routing information at the node that owns the connection. See the **cnfpref** and **cnfcos** descriptions for information on automatic rerouting. Before it actually adds the connection, the system displays the parameters you have specified and prompts you to confirm them.

Note For cards with Y-cable redundancy specified, you can add connections to only primary cards.

Each Frame Relay connection (and associated user device) has a local identification in the form of a unique DLCI. The total range for DLCIs is 1–1023. Typically, DLCIs 16–1007 are available for local and remote channels. According to ANSI standards, DLCIs 1–15 and 1008–1022 are reserved. DLCI 1023 is reserved for LMI signaling.

Only a UFM could come close to using all DLCIs. The maximum number of connections on a UFM is 1000. The maximum number of Frame Relay connections on an FRC or FRM is 252.

If a user device can automatically determine the network configuration by using the LMI, you do not need to specify the DLCIs in the network to the device. If a device cannot interrogate the network to determine the DLCIs in the network, you must specify the network DLCIs to the user device.

As the following sections describe, you can generally differentiate Frame Relay connections as *normal*, *bundled*, *grouped*, and *frame forwarding*. In particular, a Frame Relay connection can also terminate at a Frame Relay endpoint or an ATM endpoint if the endpoints have firmware to support this arrangement. A connection that terminates at Frame Relay and ATM endpoints uses service interworking (SIW).

Service Interworking

Frame Relay connections that terminate at ATM endpoints require service interworking (SIW) support. At the Frame Relay end, service interworking is one of the optional parameters. The line cards on which you can add service interworking connections are:

- the UFM on an IGX node
- ASI on a BPX node
- FRSM in an MGX 8220 shelf.

The Frame Relay endpoint has an identifier in the format *slot.port.DLCI*.

For SIW connections, the ATM endpoint identifier has the format *slot.port.vpi.VCI*.

Note You cannot group or bundle SIW connections with non-SIW connections.

Adding connections to a virtual port for a BXM card does not require the virtual port number. The slot, port, and VPI map to the supporting virtual port. In addition, Vc QDepth is configurable for all connection types.

Bundled Connections

A *normal* connection is a single PVC. A Frame Relay PVC can terminate at either a Frame Relay endpoint or an ATM endpoint.

Connection bundling creates a full mesh of connections between two groups of Frame Relay ports by executing **addcon** command only once. When you add a bundle between two groups of ports, you create a connection between each port of one group of ports and each port of the other group of ports. Each group of Frame Relay ports can include up to four ports. Consequently, the maximum number of connections in a bundle is 16 (resulting from a full mesh of connections between two groups of four ports each).

Note that a Port Concentrator Shelf does not support bundling.

Characteristics of connection bundling are:

- The number of ports used at each end of the bundle does not have to be the same.
- All of the ports used in a group must be on the same card.
- Only the FRP Model D and the FRM Model D support connection bundles. The UFM does not support connection bundling.
- All of the ports used for a bundle must be contiguous. For example, a bundle on a card may not consist of only ports 1, 3, and 4.
- The syntax for specifying a group of ports for a connection bundle is *slot.port[xport]*.

When you create a connection bundle with **addcon**, you do not explicitly specify the required DLCI at each endpoint of each connection. Instead, the DLCIs are automatically assigned using global addressing with the Port IDs, which have been previously assigned to the ports. Consequently, you must first assign a Port ID (other than 0) to every port to which you plan to assign a connection bundle. Use **cnfport** to assign a Port ID or **dspport** to see an existing Port ID.

For example, the command

addcon 6.1x3 alpha 7.2x3 1

defines a single connection bundle between a local group of 3 ports (ports 1, 2, and 3 on card 6) and a remote group of 2 ports (ports 2 and 3 on card 7). The resulting connection bundle consists of these six connections:

local node slot 6.port 1 to node alpha slot 7.port 2

local node slot 6.port 1 to node alpha slot 7.port 3

local node slot 6.port 2 to node alpha slot 7.port 2

local node slot 6.port 2 to node alpha slot 7.port 3

local node slot 6.port 3 to node alpha slot 7.port 2

local node slot 6.port 3 to node alpha slot 7.port 3

Each connection in the bundle is assigned the parameters of the same Frame Relay class (class 1, in the example above). Notice that no DLCIs were specified for the six connections. The DLCIs are automatically assigned using the Port IDs of the ports.

As an example, assume that the following Port IDs had been previously assigned for the five ports.

port 6.1Port ID = 22

port 6.1Port ID = 534

port 6.3Port ID = 487

port 7.2Port ID = 92

port 7.3Port ID = 796

As a result of the **addcon** command, the six connections that you create are automatically assigned DLCIs using global addressing as follows.

6.1.*92* – 7.2.*22*

6.1.*796* – 7.3.*22*

6.2.*92* – 7.2.*534*

6.2.*796* – 7.3.*534*

6.3.*92* – 7.2.*487*

6.3.*796* – 7.3.*487*

The **dspcons** display shows the entire bundle as a single item. Therefore, you cannot see the automatically assigned DLCIs on the **dspcons** screen. (The automatically assigned DLCIs in the preceding list appear in italics.) To see the DLCIs, use **dspcon**, as in the following example:

dspcon 6.1x3 alpha 7.2x3

The preceding shows one screen for the whole bundle then an additional screen for each connection in the bundle. The assigned DLCIs appear in these individual connection display screens.

Note If you request help for **addcon** at the command line prompt, the Help line shows *type* as a parameter. However, when you are *using* **addcon** for a Frame Relay connection, the *type* shown in the help display is actually the *Frame Relay class* shown on the preceding syntax line As stated, you can optionally override any or all of the bandwidth parameters and ForeSight-enable in the Frame Relay class by typing the parameters that appear as *frp_bw* and *avoid* in the Help display.

Note also that you do not enter the *coding* parameter shown on the Help line.

Frame Forwarding Connections

A non-Frame Relay data connection (such as HDLC or SDLC) that is routed through Frame Relay cards can bypass a router or take advantage of DFM at higher data rates. The format *slot.port*.* identifies a frame forwarding connection. For example:

addcon 11.2.* alpha 12.3.* 2

The “*” indicates to the node that a DLCI is meaningless.

Maximum Connections Per Port with Signaling Protocols

For any Frame Relay card set that has a maximum frame length of 4510 bytes, the use and type of signaling protocol you may have (optionally) specified with the **cnfport** command results in a limit on the possible number of connections per physical or logical port. The maximum number of connections per port for each protocol is:

- For Annex A: 899
- For Annex D: 899
- For StrataLMI: 562

The **addcon** command does not prevent you from adding more than the maximum number connections on a port. If the number of connections is exceeded, the particular LMI does not work on the port, the full status messages that result are discarded, and LMI timeouts occur on the port. A port failure results and subsequently leads to A-bit failures in segments of the connection path.

Syntax

addcon <local_channel> <remote_node> <remote_channel> [con_type] <frame_relay_class | [individual parameters]> [route_avoid]

Parameters

Parameter	Description
local channel	Specifies the local channel to connect in the format: *slot.port.DLCI* | *x port* | .* Range for FRP *port:* 1–24 Range for FRM *port:* 1–31 Range for UFM-C *port:* 1–250 (For connections on a UFM-C, *line* is not necessary because of the port-to-line mapping through **addport**). Range for UFM-U (V.35 or X.21) *port:* 1–12 Range for UFM-U (HSSI) *port:* 1–4 Range for *DLCI*: 16–1007
remote node	Specifies the name of the remote node at the other end of the connection.

Parameter	Description
remote channel	Specifies the connection at the far end. For Frame Relay termination points, use: *slot.port.DLCI* | *x port* | .* If the far end is an ATM termination (as in interworking), use: *slot.port.vpi.vci* Range *vpi*: 0–255 *Range vci*: 1–4095 One exception to these ranges is an interface shelf (which uses Annex G signaling) in a tiered network: • For an MGX 8220 shelf, VPI range: 1–1015 VCI range: 1–65535 • For an MGX 8850 shelf, when adding a connection with a UNI interface to a BPX routing node, VPI range: 1–4095 VCI range: 1–65535 For an MGX 8850 shelf, when adding a connection with an NNI interface to a BPX routing node, VPI range: 1–4095 VCI range: 1–65535 • For an IGX/AF shelf, Range (VPI and VCI): 1–255 You do not need to specify the virtual port (if one has been activated for this channel) on a BXM card. The slot, port, and VPI will automatically map to the correct virtual port.
Frame Relay class	Specifies a Frame Relay class. Entering a Frame Relay class is a shortcut for specifying bandwidth parameters. You must enter a Frame Relay class, but then you can modify any of the bandwidth parameters specified by the class. To do so, do not press Return after you type the class number but continue typing either a value for the parameter or a * to keep the current value. The system does not display the parameters, but the description of the frp_bw parameters in the “Optional Parameters” table that follows shows the order and ranges of the parameters you can specify.
con_type	Optionally specifies the type of ATM-to-Frame Relay service interworking. (If the connection is Frame Relay-to-Frame Relay, the network selects any necessary interworking.) The possible *con_type* entries are *atft* and *atfx*. To specify service interworking in transparent mode, type **atft**. To specify service interworking in translation mode, type **atfx**. In translation mode, a standard set of encapsulation protocols are translated. If system software does not recognize an encapsulation protocol for an atfx connection, it generates one of two Frame Relay endpoint statistics: rcvFramesDscdUnknownProtocol or xmtFramesDscdUnknownProtocol.

Parameter	Description
frp_bw	Optionally specifies individual bandwidth parameters. The parameter name “frp_bw” is the label for the bandwidth parameters described here. The slash (/) between the repeated parameter name shows that you can specify a value for each direction. (FST is the exception.) Two parameters can be either the (default) Cisco versions or the Frame Relay Forum standard parameters. To switch between Cisco and Frame Relay Forum, use the **cnfsysparm** command. Note that all parameters you select with **cnfsysparm** are network-wide and not confined to the current connection addition. The switchable parameters are: • Cisco Parameters Standard Parameters • PIR (peak information rate)Be (excess burst) • VC_Q (VC queue depth)Bc (committed burst) When you are using the Cisco parameter set, the names and order of specification are: MIR/MIR, CIR/CIR, VC_Q/VC_Q, PIR/PIR, Cmax/Cmax ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl When you are using the parameters with the two Frame Relay Forum versions, the names and order of specification are: MIR/MIR, CIR/CIR, Bc/Bc, Be/Be, Cmax/Cmax, ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl For the definition of each parameter and important information on setting CIR=0, refer to the appropriate installation and configuration guide.
avoid	Optionally specifies the type of trunk or route to avoid for the connection. The default is no avoidance. To specify an *avoid* value, type it after the Frame Relay class or—if you override the Frame Relay class—after the frp_bw values. Be sure to include the asterisk (*). The *avoid* parameters are: *s = Avoid satellite trunks. *t = Avoid terrestrial trunks. *z = Avoid trunks using zero-code suppression techniques that modify any bit position to prevent long strings of zeros.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX, (BPX service internetworking)			Yes	

Related Commands

delcon, dncon, dspcon, dspcons, upcon

Example (local addressing)

Execute these commands at node Alpha to configure the network shown in Figure 3-1.

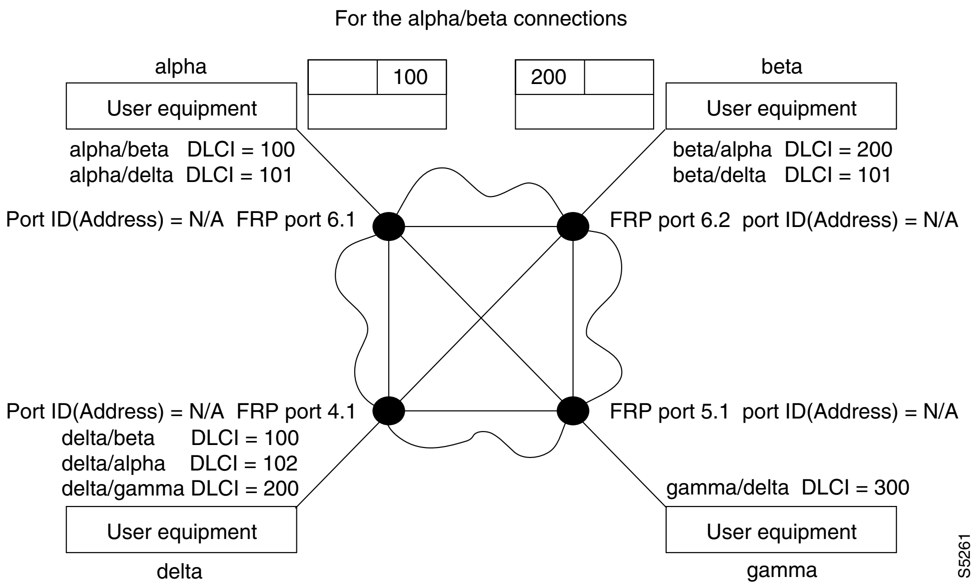
addcon 6.1.100 beta 6.2.200 3

addcon 6.1 101 delta 4.1.102 2

addcon 4.1.100 beta 6.2.101 4

addcon 4.1.200 gamma 5.1.300 1

Figure 3-1 Local Addressing Example



Example

Add a connection between the user-device at alpha port 9.1 and the user-device at gamma port 8.1. The user-device at alpha refers to the connection using local DLCI 200. The user-device at gamma refers to this connection using local DLCI 300. The DLCIs have only local significance, so a DLCI must apply to only one connection.

addcon 9.1.200 gamma 8.1.300 1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:12 PST

Local      Remote     Remote                                       Route
Channel    NodeName   Channel    State   Type  Compression   Code   Avoid    CoS   O
 5.1       beta       25.1       Ok      256                 7/8             0     L
 9.1.100   gamma      8.1.200    Ok      fr                  0                     L
 9.1.200   gamma      8.1.300    Ok      fr                  0                     L
 9.2.400   beta       19.2.302   Ok      fr                  0                     L
 14.1      gamma      15.1       Ok      v                   0                     L




Last Command: addcon 9.1.200 gamma 8.1.300 1

Next Command:
```

Example

Add another connection at local port 9.1. A DLCI of 100 is used at the local node. A DLCI of 300 can be used at both beta gamma because the DLCIs have only local significance.

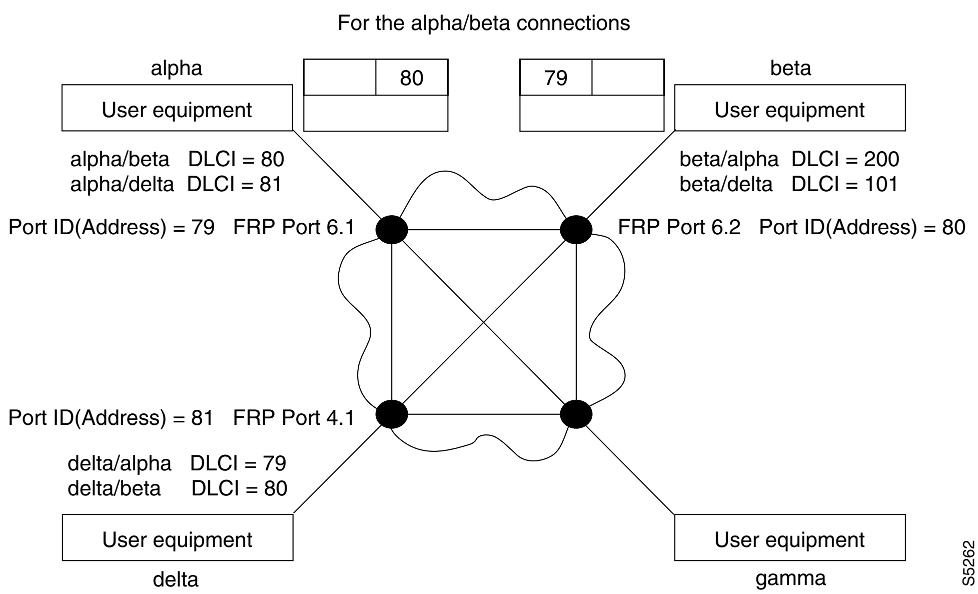
addcon 9.1.100 beta 6.2.300 2

Example (global addressing)

The network to configure in this example is shown in Figure 3-2.

addcon 6.1.80 beta 9.2.79 2
addcon 6.1.81 gamma 4.1.79 1
addcon 4.1.80 beta 6.2.81 5

Figure 3-2 Global Addressing Example



Example (bundle connections)

Add a bundle of connections between Frame Relay ports 8.1-3 on node gamma and 19.2-4 on node alpha. For this bundle, the network routes traffic between gamma port 8.2 and alpha port 19.2.

addcon 8.1x3 alpha 19.2x4 1

```
pubsigx3       VT    SuperUser       IGX 8410     9.3 Apr. 13 2000  19:41 GMT

 Local          Remote      Remote
 Channel        NodeName    Channel         State  Type      Compress  Code CoS
     8.1x3      alpha      19.2x4     Ok     fr


This Command: addcon 8.1x3 alpha 19.2x4 1


Add these connections (y/n)?
```

Example (frame forwarding)

Add a frame forwarding connection between the local node's port 8.2 and 19.2 on node alpha.

addcon 8.2.* alpha 19.2.* 1

```
Locals       Remote      Remote                                        Route
Channel      NodeName    Channel    State    Type   Compression  Code   Avoid  CoS   O
6.1          beta        25.2        Ok      256                 7/8            0     R
8.1.200      alpha       9.1.100     Ok      fr                                 0     R
8.2.300      beta        19.1.101    Ok      fr                                 0     R
15.1         alpha       14.1        Ok      v                                  0     R




This Command: addcon 8.2.* alpha 19.2.* 1


Add these connections (y/n)?
```

Example (modifying bandwidth)

Parameters specified by Frame Relay class 7 for this connection are modified by substituting 30 for Cmax in both directions, enabling ForeSight, and reducing percent utilization from 100 percent to 80 percent.

addcon 8.3.101 beta 19.3.201 7 * * * * 30/30 * * Y 80/80

```
gamma          TRM   YourID:1        IGX 8410    9.3   Apr. 13 2000 12:10 CST

 Local      Remote      Remote                                      Route
 Channel    NodeName    Channel    State  Type   Compression  Code Avoid CoS O
 6.1        beta        25.2        Ok     256                 7/8          0  R
 8.1.200    alpha       9.1.100     Ok     fr                               0  R
 8.2.300    beta        19.1.101    Ok     fr                               0  R
 15.1       alpha       14.1        Ok     v                                0  R



Last Command: dspcons


Next Command: addcon 8.3.101 beta 19.3.201 7 * * * * 30/30 * * Y 80/80
```

addcon (add an ATM connection)

Establishes an ATM connection between the current node another node in the network. ATM connections are added to UNI or NNI ports on ASI or BXM interface cards in a BPX node and UXM or URM interface cards in an IGX node. Before a connection is added, you are prompted to confirm the connection addition. After **addcon** executes, the system software automatically routes the connection.

The **addcon** command for ATM adds any one of the following types of ATM connections:

- Constant Bit Rate (CBR)
- Variable Bit Rate (VBR)—rt-VBR and nrt-VBR
- Frame Relay-to-ATM interworking connection (ATFR)
- Frame Relay-to-ATM interworking with ForeSight (ATFST) connection
- Available Bit Rate according to ATM Forum standards (ABRSTD)
- Available Bit Rate with ForeSight (ABRFST)
- Frame Relay-to-ATM transparent Service Interworking (ATFT)
- Frame Relay-to-ATM transparent Service Interworking with Foresight (ATFTFST)
- Frame Relay-to-ATM translational Service Interworking (ATFX)
- Frame Relay-to-ATM translational Service Interworking with Foresight (ATFXFST)
- Unspecified Bit Rate (UBR)

Frame Relay-to-ATM Interworking enables Frame Relay traffic to be connected across high-speed ATM trunks using ATM standard Network and Service Interworking. Two types of Frame Relay-to-ATM interworking are supported, Network Interworking and Service Interworking.

You can add connections to a virtual port on a BXM card. When adding a connection to a virtual port, the virtual port number is not required. The slot, port, and VPI will map to the supporting virtual port. In addition, Vc QDepth is configurable for all connection types.

The node on which **addcon** executes is the "owner" of the connection. Automatic rerouting and preferred routing information is entered on the node that owns the connection. See the **cnfpref** and **cnfcos** descriptions for details on automatic rerouting.

If **addcon** is attempted on a port with F4-F5 mapping enabled, and there are no channels left for F4-F5 mapping, the following message is displayed: "No channel left for F4-F5 mapping on this portgroup." If channel unavailability occurs at the remote end, the following message is displayed: "No channel left for F4-F5 mapping on this portgroup at the remote end."

For detailed descriptions of the connection types, traffic classes, policing, and ATM-related topics, refer to the *Cisco BPX 8600 Series Installation and Configuration* guide or the ATM Forum specifications.

Syntax

addcon <local_channel> <remote_node> <remote_channel> [connection_class] [individual parameters]

Parameters

The **addcon** parameter prompts depend on the connection type. The following two tables define the parameters and list the defaults and ranges for each parameter.

The notation (0), (1), or (0+1) appears for some parameters. This refers to the state of the Cell Loss Priority (CLP) bit. The usage of the CLP bit is in the traffic policing schemes: (0+1) means cells with CLP=0 or 1; (0) means cells with CLP=0; (1) means cells with CLP=1. The CLP bit is used in different contexts. For example, CDVT (0+1) refers to Cell Delay Variation Tolerance (CDVT) for cells with CLP=0 or 1.

Parameter	Description
local channel	Specifies the local slot, port, virtual path identifier (VPI), and virtual connection identifier (VCI) for the connection. The format is *slot.port.vpi.vci.* You do not need to specify the virtual port (if one has been activated for this channel). The slot, port, and VPI will automatically map to the correct virtual port. The VPI range for a UNI connection is 1–255. The VPI range for an NNI connection is 1–4095. When adding an MGX 8850 interface shelf with a UNI interface to a BPX routing node, the VPI range is 1–255. The VCI range is 1–65535. When adding an MGX 8850 interface shelf with an NNI interface to a BPX routing node, the VPI range is 1–255. The VCI range is 1–65535. When adding an SES (Service Expansion Shelf) to an IGX 8400 routing node, for VCC addressing, the VPI range is 1–255. The VCI range is 1–65535. For VPC addressing, when adding an SES interface shelf to an IGX 8400 routing hub with a UNI interface, the VPI range is 1–255. The VCI range is 1–65535. For VPC addressing, when adding an SES shelf to an IGX 8400 routing with an NNI interface, the VPI range is 1–4095. The VCI range is 1–65535. Note that when adding an SES to an IGX 8400 routing node, the VPI/VCI configured on the IGX 8400 routing hub should match the VPI/VCI configured on the SES interface shelf endpoint address. When adding a VP tunnelling DAX connection to an IGX UXM card, either end of the connection can be the VPI or VCI side. This connection type can be any of the ATM connection types supported by UXM virtual trunks, for example, ABR, CBR, UBR, and VBR. The VCI range is 1–65535. The VCI can be an asterisk (*) to indicate the connection is a *virtual path connection* (so the VCI has no meaning within the network). **Note** The VCI cannot be less than 33, if F4-F5 mapping is enabled on the port.
remote node name	Specifies the name of the node at the other (or remote) end of the connection.

Parameter	Description
remote channel	Specifies the remote node's slot, port, VPI, and VCI for this connection. The format is *slot.port.vpi.vci*. The VPI and VCI ranges are: The VPI range for a UNI connection is 1–255. The VPI range for an NNI connection is 1–4095. The range for a VCI is 1–65535. The VCI can be an asterisk (*) to indicate the connection is a *virtual path* (the VCI does not provide a distinction within the network). **Note** The VCI cannot be less than 33, if F4-F5 mapping is enabled on the port. You do not need to specify the virtual port (if one has been activated for this channel). The slot, port, and VPI will automatically map to the correct virtual port.
connection class/ traffic type	Specifies one of the following traffic types—VBR (rt-VBR or nrt-VBR), UBR, CBR, ATFST, ATFR, ABRSTD, ABRFST, ATFT, ATFX, ATFTFST, or ATFXFST; or connection classes—for example, for rt-VBR, connection class 3 for a new node running Release 9.2.20. The subsequent displayed parameters depend on the connection type you choose. To see the parameters associated with each connection type, refer to the appropriate flow diagrams in the *Cisco BPX 8600 Series Installation and Configuration* guide. Instead of entering a class of service, you can choose a class *number*. The class number represents a preconfigured *template* for a connection type. The class serves as an alternative to specifying each parameter for a connection type. For example, class 4 for nrt-VBR, and class 3 for rt-VBR. To specify a connection class, enter a digit in the range 1–10. To see the parameter values for a class, use the **dspcls/dspatmcls** commands. To customize any class template, use the **cnfcls/cnfatmcls** commands. **Note** For a new node running 9.2.20 or later, the rt-VBR connection class number is 3. An upgraded node will retain existing connection classes and will not have the rt-VBR connection class 3. However, you can configure the connection classes to whatever service and parameters you want by using the **cnfcls/cnfatmcls** commands. **Note** For VP tunnelling DAX connections, a VP tunnelling connection type is represented by CBRVP, ABRSTVP, ABRFSTVP, and so on. The letters VP are appended to the connection class or connection type, to indicate that it is a VP tunnelling connection. This connection type must be the same as the VCC connection type provisioned within the public ATM cloud.
PCR	Peak Cell Rate: the cell rate that the source cannot exceed.
%Util	Specifies the percentage of bandwidth utilization.
MCR	Minimum Cell Rate: the committed, minimum cell rate for a connection in a network.
CDVT	Cell Delay Variation Tolerance: controls policing tolerance for cells which are early or late relative to the PCR.

Parameter	Description
FBTC (AAL5 Frame-based Traffic Control)	Enables the possibility of discarding the whole frame, not just one non-compliant cell. This is used to set the Early Packet Discard bit at every node along a connection. With the ASI, FBTC means packet discard on both policing and queueing. With the BXM, FBTC means packet discard on queueing only.
VSVD	Virtual Source Virtual Destination.
Flow Control External Segments	Enables Cisco WAN switches to perform flow control on external segments (on the CPE, for example) in addition to the Cisco WAN Switching segments.
SCR	Sustainable Cell Rate: the long-term limit on the rate that a connection can sustain.
MBS	Maximum Burst Size: the maximum number of cells that can burst at the PCR and still be compliant. MBS is used to determine the Burst Tolerance (BT), which controls the time period over which the SCR is policed.
Policing	Selects the type of policing to be applied to this connection. Possible values are 1-5. See Table 3-15 for details about each of the five policing modes.
VC QDepth	The depth of the queue VC QDepth. As of Release 9.3, VC QDepth can be configured for all connections, not just ABR connections.
CLP Hi	Cell Loss Priority Hi threshold (% of VC QDepth). When the high threshold is exceeded, the node discards cells with CLP=1 until the number of cells in the queue drops below the level specified by CLP Lo/EPD. As of Release 9.3, CLP Hi can now be configured for all connections, not just ABR connections.
CLP Lo/EPD	Cell Loss Priority Low threshold (% of VC QDepth)/Early Packet Discard. When the number of cells in the queue drops below the level specified by CLP Lo/EPD, the node stops discarding cells with CLP=1. If the card is a BXM and AAL5 FBTC=yes, the percent of VC QMax equals the value of EPD. Frame-based Traffic Control (FBTC) is FGCRA for AAL5. For an ASI card, the percent of VC QMax is CLP Lo regardless of the FBTC setting. As of Release 9.3, CLP Lo/EPD can now be configured for all connections, not just ABR connections.
EFCI	Explicit Forward Congestion Indication threshold (% of VC QDepth).
ICR	Initial Cell Rate: the rate at which a source initially transmits after an idle period.
IBS	Initial Burst Size: the maximum burst size a source can initially transmit after an idle period. IBS applies only to BXM cards.
ADTF	The Allowed-Cell-Rate Decrease Factor. Time permitted between sending RM cells before the rate is decreased to ICR. (In previous software releases, ADTF was ICR TO—Initial Cell Rate Time Out.)
Trm	An upper bound on the time between forward RM-cells for an active source: an RM cell must be sent at least every *Trm* milliseconds. (In previous software releases, Trm was Min. Adjust.)
RIF	Rate Increase Factor: controls the amount by which the cell transmission rate may increase upon receipt of an RM cell. (In previous software releases, RIF was Rate Up.)

Parameter	Description
RDF	Rate Decrease Factor: controls the amount decrease in cell transmission rate when an RM cell arrives. (In previous software releases, RDF was Rate Down.)
Nrm	Nrm. Maximum number of cells a source may send for each forward RM cell: an RM cell must be sent for every *Nrm*–1 data cells.
FRTT	Fixed Round Trip Time: the sum of the fixed and propagation delays from the source to a destination and back.
TBE	Transient Buffer Exposure The negotiated number of cells that the network would like to limit the source to sending during start-up periods, before the first RM-cell returns.

Table 3-13 addcon—Parameter Defaults and Ranges

Parameter with Default Settings	UXM and BXM T1/E1, T3/E3, OC-3, and OC-12 RANGE	ASI Range
PCR(0+1)[50/50]	50–max. T1/E1 cells/sec 50–max. T3/E3 cells/sec 50–max. OC-3 cells/sec 50–max. OC-12 cells/sec	T3: MCR–96000 E3: MCR–80000 OC-3 (STM1): 0–353200 Limited to MCR–5333 cells/sec for ATFR connections.
%Util [100/100] for UBR [1/1]	0–100%	1–100%
MCR [50/50]	cells/sec 6–max. of T3/E3/OC-3/OC-12	T3: 0–96000 cells/sec E3: 0–80000 cells/sec
AAL5 Frame-Based Traffic Control: for rt/nrt-VBR [disable] for ABR/UBR [enable] for Path connection [disable]	enable/disable With the BXM card, FBTC means packet discard on queueing only.	enable/disable With the ASI card, FBTC means packet discard on both policing and queueing.
CDVT(0+1): for CBR [10000/10000], others [250000/250000]	0–5,000,000 microsecs.	T3/E3 1–250,000 usecs. OC-3/STM1: 0–10000 *u*secs.
ForeSight [disable]	0 = disable 1 = enable	0 = disable 1 = enable
VSVD [disable]	enable/disable	enable/disable
Flow Control External Segment [disable]	enable/disable	enable/disable
Default Extended Parameters [enable]	enable/disable	enable/disable
CLP Setting [enable]	enable/disable	enable/disable

Table 3-13 addcon—Parameter Defaults and Ranges (continued)

Parameter with Default Settings	UXM and BXM T1/E1, T3/E3, OC-3, and OC-12 RANGE	ASI Range
SCR [50/50]	c50–max. T1/E1 cells/sec 50–max. T3/E3 cells/sec 50–max. OC-3 cells/sec 50–max. OC-12 cells/sec	T3: MCR–96000:T3 E3: MCR–80000: E3 OC-3/STM1: 0–353200 Limited to MCR–5333 cells/sec for ATFR connections.
MBS [1000/1000]	1-5,000,000 cells	T3/E3: 1–24000 cells OC-3 (STM1): 10–1000 cells
Policing [3] For CBR: [4]	1 = VBR.1 2 = VBR.2 3 = VBR.3 4 = PCR policing only 5 = off	1 = VBR.1 2 = VBR.2 3 = VBR.3 4 = PCR policing only 5 = off
ICR: max [MCR, PCR/10]	MCR - PCR cells/sec	MCR - PCR cells/sec
ADTF [1000]	62–8000 msecs.	1000–255000 msecs.
Trm [100]	ABRSTD: 1–100 msecs. ABRFST: 3–255 msecs.	20–250 msecs.
VC QDepth [16000/16000] For ATFR/ATFST [1366/1366]	0–61440 cells	Applies to T3/E3 only ABR: 1–64000 cells ATFR: 1–1366 cells
CLP Hi [80/80]	1–100%	1–100%
CLP Lo/EPD [35/35]	1–100%	1–100%
EFCI [30/30] For ATFR/ATFST [100/100]	1–100%	1–100%
RIF: For ForeSight: = max [PCR/128, 10] For ABRSTD [128]	If ForeSight, then in absolute (0–PCR) If ABR, then 2^n (1–32768)	If ForeSight, then in absolute (0–PCR) If ABR, then 2^n (1–32768)
RDF: For ForeSight [93] For ABRSTD [16]	IF ForeSight, then % (0%–100%) If ABR, then 2^n (1–32768)	If ForeSight, then % (0%–100%) If ABR, then 2^n (1–32768)
Nrm[32]–BXM only	2–256 cells	not applicable
FRTT[0]–BXM only	0–16700 msec	not applicable
TBE[1,048,320]–BXM only	0–1,048,320 cells different maximum range from TM spec. but limited by firmware for CRM (4095 only) where CRM=TBE/Nrm	not applicable

Table 3-13 addcon—Parameter Defaults and Ranges (continued)

Parameter with Default Settings	UXM and BXM T1/E1, T3/E3, OC-3, and OC-12 RANGE	ASI Range
IBS [0/0]	0–24000 cells	T3/E3 ABR: 0–24000 cells ATFR: 1–107 cells OC-3: 0–999 cells
Trunk Cell Routing Restriction (y/n) [y]	yes or no For rt-VBR connections, this prompt will not display.	yes or no For rt-VBR connections, this prompt will not display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

delcon, dspcons

Example

Add a standard ABR connection with VSVD and no Default Extended Parameters (which then require user input for SCR, MBS, and so on).

addcon 9.1.100.100 pubsbpx2 9.1.102.102

```
pubsbpx1       TN    SuperUser       BPX 15    9.3 Apr. 13 2000 05:22 GMT

 From            Remote      Remote                             Route
 9.1.100.100     NodeName    Channel          State  Type        Avoid CoS O
 9.1.100.100     pubsbpx2 9.1.102.102     Ok     abrstd
 9.1.102.102     pubsbpx2 9.1.100.100     Ok     abrstd


This Command: addcon 9.1.100.100 pubsbpx2 9.1.102.102 abr * * * * e e * d * * 1
* * * * * * * * *


Add these connections (y/n)?
```

Example

Add a virtual path connection (VPC) to virtual circuit connection (VCC) between ports 1 and 2. (This is called a VP tunnelling connection.)

addcon 5.2.10.* pubsigx1p 5.1.1.100 CBR ...

```
pubsigx1       TN    SuperUser     IGX 8400    9.3   Apr. 13 2000 05:22 GMT

 From          Remote        Remote                              Route
               NodeName      Channel       State   Type          Avoid CoS O
 5.2.10.*      pubsigx2      5.1.1.100     Ok      abrstvp
 5.1.1.100     pubsigx2      5.2.10.*    s  Ok      abrstvp
This Command: addcon 5.2.10.* pubsigx1p 5.1.1.100 CBR ...

Add these connections (y/n)?
```

PCR Values and Traffic Policing

The following three tables provide additional information on PCR values and traffic policing. Table 3-14 defines the minimum PCR values with policing for each card type. Table 3-15 provides traffic policing definitions for each connection type.

Table 3-14 Minimum PCR Values with Policing Enabled

Card Name	Card Types	Minimum PCR Values with Policing
IGX-UXM	T1/E1	6 cps
IGX-UXM	T3/E3	12 cps
IGX-UXM	OC-3/STM-1	50 cps
BPX-BXM	T3/E3	12 cps
BPX-BXM	OC-3/STM-1	50 cps
BPX-BXM	OC-12/STM-4	50 cps

Note The policing accuracy is always within one percent. The maximum PCR policing values are the same as the line rate.

Table 3-15 Traffic Policing Definitions

Connection Type	ATM Forum TM spec. 4.0 conformance definition	PCR Flow (1st leaky bucket)	CLP tagging (for PCR flow)	SCR Flow (2nd leaky bucket)	CLP tagging (for SCR flow)
CBR	CBR.1 when policing set to 4 (PCR policing only)	CLP(0+1)	no	off	n/a
CBR	when policing set to 5 (off)	off	n/a	off	n/a

Note 1: - For UBR.2, SCR = 0

Note 2:

CLP = Cell Lost Priority

CLP(0) means cells that have CLP = 0

CLP(1) means cells that have CLP = 1

CLP(0+1) means both types of cells: CLP = 0 & CLP = 1

CLP(0) has higher priority than CLP(1)

CLP tagging means to change CLP = 0 to CLP = 1, where CLP= 1 cells have lower priority

Table 3-15 Traffic Policing Definitions (continued)

Connection Type	ATM Forum TM spec. 4.0 conformance definition	PCR Flow (1st leaky bucket)	CLP tagging (for PCR flow)	SCR Flow (2nd leaky bucket)	CLP tagging (for SCR flow)
UBR	UBR.1 when CLP setting = no	CLP(0+1)	no	off	n/a
UBR	UBR.2 when CLP setting = yes	CLP(0+1)	no	CLP(0)	yes
rt/nrt-VBR, ABR, ATFR, ATFST, ATFT, ATFTFST, ATFX, ATFXFST	VBR.1 when policing set to 1	CLP(0+1)	no	CLP(0+1)	no
rt/nrt-VBR, ABR, ATFR, ATFST, ATFT, ATFTFST, ATFX, ATFXFST	VBR.2 when policing set to 2	CLP(0+1)	no	CLP(0)	no
rt/nrt-VBR, ABR, ATFR, ATFST, ATFT, ATFTFST, ATFX, ATFXFST	VBR.3 when policing set to 3	CLP(0+1)	no	CLP(0)	yes
rt/nrt-VBR, ABR, ATFR, ATFST, ATFT, ATFTFST, ATFX, ATFXFST	when policing set to 4	CLP(0+1)	no	off	n/a
rt/nrt-VBR, ABR, ATFR, ATFST, ATFT, ATFTFST, ATFX, ATFXFST	when policing set to 5 (off)	off	n/a	off	n/a

Note 1: - For UBR.2, SCR = 0

Note 2:

CLP = Cell Lost Priority

CLP(0) means cells that have CLP = 0

CLP(1) means cells that have CLP = 1

CLP(0+1) means both types of cells: CLP = 0 & CLP = 1

CLP(0) has higher priority than CLP(1)

CLP tagging means to change CLP = 0 to CLP = 1, where CLP= 1 cells have lower priority

addctrlr (add a VSI controller to an IGX node)

Add VSI controller to a UXM line interface. Use the **addctrlr** command to add an VSI controller to UXM line interface on an IGX node. You can connect a VSI controller to an IGX node by physically connecting a cable from the controller to the UXM line interface.

You cannot connect a VSI controller to these interfaces:

- trunk
- virtual trunk
- feeder trunk
- IMA ports

The maximum number of controllers that can be added to an IGX is three, although the valid controller ID range is 1 to 16.

Syntax

addctrlr < slot.port> <controller id> <partition id> <control_vpi> <start_vci>

Parameters

Parameter	Description
<slot.port>	Slot and port numbers corresponding to the line or port to which a controller is attached.
<controller id>	Controller ID corresponding to the MPLS controller. Range: 1–16
<partition id>	Partition ID of the VSI partition controlled by the MPLS controller. Range: 1–3
<control_vpi>	VPI of the VSI control channels used for communication between the VSI master residing on the MPLS controller and VSI slaves residing on the UXM cards. For a 16-slot IGX there are a total of 14 such channels. For a 32-slot IGX there are a total of 30 such channels. For a line interface with NNI header type: Range: 0–4095 For a line interface with UNI header type Range: 0–255 Default value: 0
<start_vci>	Starting VCI of the VSI control channels. This VCI value is assigned to the first VSI control channel (between the VSI master and the VSI slave residing on the UXM card in slot 3). The last VSI control channel corresponding to communication with the VSI slave on slot 16 or 32 (depending on the number of slots in the particular IGX model) will use the VCI value of (<start_vci> + *number of slots on the IGX* - 2). Range for 16-slot IGX: 40–65521 Range for 32-slot IGX: 40–65505 Default value: 40

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX	Yes	Yes	Yes	Yes

Related Commands

delctrlr, dspctrlrs

Example

Add controller to port 1 on slot 12, partition ID of 2 and controller ID of 3.

addctrlr 12.1 3 2 0 40

```
arnold         TN    Cisco           IGX 8430  9.3.10    Aug. 16 2000 17:04 PST

                   VSI Controller Information

CtrlrId   PartId     ControlVC           Intfc    Type     CtrlrIP
                   VPI    VCIRange
   3         2       0      40-70          12.1     MPLS     0.0.0.0



Last Command: addctrlr 12.1 3 2 0 40

Controller added successfully!
Next Command:
```

addctrlr (add VSI capabilities to an AAL5 feeder interface (BPX))

Adds VSI capabilities to a trunk interface to which a feeder of type AAL5 is attached. Use the **addctrlr** command to connect a Private Network-to-Network Interface (PNNI) controller. PNNI controller software resides on the Service Expansion Shelf (SES) hardware.

To add a PNNI controller to a BPX node:

Step 1 Run the command **addshelf** with shelf type set to X to add an AAL5 feeder. This ensures that Annex G protocol runs between the BPX and the SES.

Step 2 Run the **addctrlr** command to set up the VSI control channels from the PNNI SES controller to the VSI slave processes running on the BXM cards to ensure full VSI functionality for the PNNI controller. Execute the **addctrlr** command on an existing AAL5 interface shelf.

Note that you can add a PNNI controller to a trunk interface only if the interface already has an active VSI partition corresponding to the partition that is controlled by the PNNI controller. For example, if a PNNI controller controlling partition 1 were added to a trunk interface 12.1. Then it would be necessary that a VSI partition corresponding to partition 1 be active on the interface 12.1. Otherwise the **addctrlr** command would fail.

When adding VSI controller capabilities to an AAL5 interface shelf (or feeder), the switch software prompts you for the specifics of the VSI controller:

- controller ID of the PNNI controller
- partition ID of the VSI partitions controlled by the PNNI controller
- VPI used for the VSI control channels set up by the PNNI controller
- start_VCI value for the VSI control channels set up by the PNNI controller

The PNNI controller controls VSI partitions on those BXM cards that support VSI capability. Hence a separate VSI control channel must be set up from the PNNI control to each BXM card that supports VSI.

Example: You specify a VPI value of 0 and start_VCI value of 40 for the VSI control channels. Then the control channel corresponding to any BXM card on slot 1 would use VPI, start_VCI values <0, 40>. The VSI control channels to other slots would use the VPI, start_VCI values of <0, 40+slot-1>, where "slot" corresponds to the slot number of the BXM card.

Caution For feeder trunk interfaces, the **addctrlr** command will fail if the Automatic Routing Management connections terminating on the feeder interface use the same VPI start_VCI as those specified for the VSI control channels. You must delete the connections before proceeding if connections with VPI and start_VCI in the range exist in the range you specified.

The addition of a controller to a node will fail if there are not enough channels available to set up the control VCs in one or more of the BXM slaves.

Syntax

addctrlr < slot.port> <controller id> <partition id> <control_vpi> <start_vci>

Parameters

Parameter	Description
<slot.port>	Slot and port numbers corresponding to the feeder trunk.
<controller id>	Controller ID corresponding to the PNNI controller, values 1–32.
<partition id>	Partition ID of the VSI partition controlled by the PNNI controller.
<control_vpi>	Starting VPI of the VSI control channels used for communication between the VSI master residing on the SES and VSI slaves residing on the BXM cards. There can be a total of 12 such channels, one for each slave residing on each BXM card. For a trunk interface with NNI header type: Range: 0–4095 For a trunk interface with UNI header type: Range: 0–255 Default: 0 **Note** For a PNNI controller, do not modify control_vpi and start_vci.
<start_vci>	Starting VCI of the VSI control channels. This VCI value is assigned to the first VSI control channel (between the VSI master and the VSI slave residing on the BXM card in slot 1). The last VSI control channel corresponding to communication with the VSI slave on slot 14 will use the VCI value of (<start_vci>+14-1). Range: 33–65521 Default: 40 **Note** For a PNNI controller, do not modify control_vpi and start_vci.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX	Yes	Yes	Yes	Yes

Related Commands

addshelf, delctrlr, dspctrlrs

Example

Add controller to port 4 on slot 10, partition ID of 2, and controller ID of 3.

addctrlr 10.4 3 2 0 40

```
night           TN   StrataCom     BPX 8600   9.3.10 Aug. 1 2000 14:31 GMT


                  BPX 8620 VSI controller information

Ctrl Id    Part Id Control_VC     Trunk   Ctrlr Type     Intfc
                  VPI  VCIRange
   1       1       0     40-54     10.3    VSI            VSI
   2       2       0     40-54     11.1    VSI            VSI


Warning partition already in use do you want to add redundant controller

Last Command: addctrlr 10.4 3 2 0 40


Next Command:
```

Example

Adds a controller, such a PNNI controller, to a BPX interface shelf.

addctrlr 10.3 3 1 0 40

```
night           TN   StrataCom     BPX 8600   9.3.10 Aug. 1 2000 14:31 GMT


                  BPX 8620 VSI controller information

Ctrl Id    Part Id Control_VC     Trunk   Ctrlr Type     Intfc
                  VPI  VCIRange
   1       1       0     40-54     10.3    VSI            VSI
   2       2       0     40-54     11.1    VSI            VSI


Warning partition already in use do you want to add redundant controller

Last Command: addctrlr 10.3 3 1 0 40


Next Command:
```

addextlp (add external loop)

Places an external device in loopback mode. The **addextlp** command applies to existing connections on an SDP, HDM, LDP, or LDM. A near loopback causes the NEAR EIA template to be applied. A far loopback causes the FAR EIA template to be applied to the data port. The loopback remains in place until removed by the **dellp** command.

The **dspcons** command shows which connections are in loopback mode. Specifying an "n" after the channel indicates a near loopback, and an "f" indicates a far loopback. Because **addextlp** takes the specified connections out of service, use it only when a service disruption is tolerable.

Syntax

addextlp <channel> < n | f >

Parameters

Parameter	Description
channel	Specifies the channel to loopback in the format *slot.port*.
n | f	Specifies whether the loopback is near or far. An "n" specifies near; an "f" specifies far. For a non-DDS port, the near or far modem is placed in loopback, if it supports this function. For a DDS port, the external DDS device is placed in CSU loopback. Local channels must be configured as OCU in order to place them in external loopback.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dellp, dspcons

Example

Place the device connected to channel 5.1 in near loopback.

addextlp 5.1 n

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 12:53 PST

 Local      Remote      Remote                                            Route
 Channel    NodeName    Channel    State  Type    Compression  Code Avoid CoS O
 N5.1       beta        25.1       Ok     256                  7/8          0  L
 9.1.100    gamma       8.1.200    Ok     fr                                0  L
 9.2.400    beta        19.2.302   Ok     fr                                0  L
 14.1       gamma       15.1       Ok     v                                 0  L

Last Command: addextlp 5.1 n
Next Command:
```

addjob (add a job)

Creates a job or command script. When you create a new job by using **addjob**, your privilege level becomes the privilege level of the job itself. When adding commands to the job, you cannot add a command that requires a privilege higher than your privilege level. Furthermore, you must have a privilege level at least as high as the job to run the job (with **runjob**, for example).

The system does not check the validity of the command with respect to the current state of the network or for relationships to other commands in the job. To ensure that it works as expected, try running the job with **runjob**.

Syntax

addjob [description] [execution time, execution interval] <commands>

Parameters

Parameter	Description
command	Specifies the syntax for a command to include in the job. The number of commands that can be included in a job is limited only by available memory. Not all commands can be included in a job. A job cannot contain commands that are above your privilege level. For example, if you have privilege level 3, your job cannot include the **addtrk** command because this command requires privilege level 1.
failure reaction	Specifies the desired reaction to the failure of a command in the job. Each command in the job must have a failure reaction. The failure reaction is specified in the following format <c | a | rc | ra> <*number of repetitions*>. In this format: **c** specifies that the job continues running. **a** specifies that the job must abort. **rc** specifies that the command should retry for the specified number of times and continue running the job even if the command fails during the retries. **ra** specifies that the command should retry for the specified number of times and abort the job if the command always fails during the retries.
job description	A user-specified description of the job. This description can be up to 16 characters, including spaces.

Parameter	Description
execution time	Specifies the date and time to run the job. Without an execution time, the job can begin running only by the **runjob** command. Execution time is specified in the following format. (The *seconds* parameter is optional.) year (four digits) month (two digits) day hour (0–23) minute [seconds]
execution interval	Specifies an interval between job repetitions. The three possible execution intervals are: **d** (days) **h** (hours) **m** (minutes) The interval range is 1 minute to 45 days. If you do not specify an execution interval, the job runs once at execution time. If you specify an execution interval (**d**, **h**, or **m**), you must also specify the number of units in the interval.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

deljob, dspjob, dspjobs, editjob, prtjob, runjob, stopjob

Example

The system response is a series of prompts requesting details of the job. The system requests a job description (or name), an execution time for the job, a unit for the interval at which the job is to run (hours, for example), the number of units in the interval, the commands to execute, and what to do with the result.

addjob

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 14:15 PST

                                  Job 1   test
Last Execution Results: None                     Status: Idle
Next Execution Time: 08/17/97 20:20:30           Interval: 1 days

 1: prtlog
   - Failure Reaction: Repeat 2 Times and Abort        Exec. Results: None

Last Command: addjob

Next Command:
```

In this example, a new job is being created. The job number is "1." The job description (or name) is "test." The job is scheduled to run on August 17, at 2:20:30 PM and every day thereafter at the same time. The command in the job is **prtlog**. If this command fails when the job runs, it tries twice again and aborts if unsuccessful.

The "Enter Cmd" prompt at the bottom of the screen indicates you can enter the next command for the job. To exit **addjob**, press Return without entering a command.

addjobtrig (add job trigger)

Configures a job to run if a failure or repair occurs on a trunk (narrowband or broadband), a line (voice, data, Frame Relay, ATM, narrowband, broadband), or a T3 (DS3). You can also use **addjobtrig** to allocate or release bandwidth from other connections. This bandwidth decision depends on whether the EIA lead status is “up” or “down.” For example, a job can be triggered to run if the RTS lead of an HDM/LDM port changes state. If the FRM you are using is an FRM-T1 or E1, it qualifies as a line and can be used as a job trigger.

A line failure is any alarm condition that takes the trunk or line out of service. Such a condition is always a major alarm. However, not all major alarms cause the trunk or line to be considered failed. Those that are considered failed are the ones that appear on the **dsptrks** or **dsplns** screens with a color associated with it, such as “Major—Local All Ones” or “Major—Remove Packet Out of Frame (Yel)”. Specifically excluded are all the statistical alarms, some of which may be major.

A line repair is the opposite of a line failure. A repair of a line occurs when the alarms on the line are removed.

The lead type on HDM/LDM is based on the configuration from **cnfleadmon**. The display shows: “Front Card Supports Lead State Trap”.

Syntax

addjobtrig <job_number> <line_type> <line_specifier> <fail/repair>

Parameters

Parameter	Description
job number	Specifies the number of the job to trigger.
line type	Specifies the type of line. A “p” indicates any type of trunk (TRK). A “c” indicates any type of circuit line. (A “d” indicates a DS3 line. Do not specify the “d” option; this represents an obsolete card—the MT3.)
line specifier	Specifies the slot number for trunks and lines. Use the standard nomenclature to designate trunks and lines. For example, depending on the card type (single-line or multi-line), specify either <*slot.port*>, or just <*slot*>.
fail/repair	Specifies whether the trigger occurs on the failure or repair of a line. If the card is an SDP, LDP, HDM, or LDM, the fail and repair triggers occur only on the transitions of RTS (regardless of whether the port is DCE or DTE). If you select fail, the trigger is the transition of RTS from on to off. If you select repair, the trigger is the transition of RTS from off to on. To enable triggering on leads other than RTS, use the **cnfict** command.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	No	BPX, IGX			Yes	

Related Commands

addjob, dspjob, dspjobs

Examples

addjobtrig	1 p 14 f	trigger job 1 when TRK 14 fails
addjobtrig	3 c 15 r	trigger job 3 when CLN 15 repairs
addjobtrig	2 p 14 r	trigger job 2 when TRK 14 repairs
addjobtrig	3 d 27 E f	trigger job 3 when DS3 27 E (East) fails

Example

Trigger job 1 whenever a repair of line 14 occurs.

addjobtrig 1 c 14 r

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 14:22 PST

Job   Description       Next Execution      Status     Interval    Access Group
1     test              08/17/97 11:00:00   Idle       1 days      Group 1
      Trigger 1 -  CLN 14         REPAIR




Last Command: addjobtrig 1 c 14 r


Next Command:
```

addlnloclp (add local loopback to line)

Establishes a local-remote loopback on a trunk or port card in a BPX. Applicable cards are the ASI, BNI, BME, and BXM.

While a line loop is present, software suspends the card self-test and the line diagnostic test that normally run when a line goes into alarm. Suspending these tests prevents background test loops from interfering with the user-specified loop.

Line loops are set for a line on the local node, so you cannot specify a remote node, and no network messaging is supported for setting a line loop of any type on a remote node.

Line loop status is displayed on the **dsplns** screen for an ASI, BME, or a BXM in port mode and the **dsptrks** screen for a BNI, BME, or a BXM in trunk mode. Line loop status is not displayed for connections (**dspcons**) affected by a line loop. Instead, a warning is printed if the line has connection traffic travelling on it, and an event is logged when a line loop is set or cleared. A line loop on a trunk generates Comm Fail, causing connections to fail and be rerouted.

For both of the **dsplns** and **dsptrks** screens, the "[" character appears before the back card type in the "Type" column to indicate that the line local loopback is active.

The line loop state is not saved in BRAM or on a rebuild but is preserved on a switchover. After a rebuild, a line's loop state is cleared.

Exercise caution when you set up loops on a BNI, BME, or BXM trunk because looping an added BNI/BXM/BME trunk causes Comm Failure and connection rerouting. BNI/BXM/BME **addlnlocrmtlp** is not supported because of a lack of useful purpose, and Cisco recommends that you use **addlnloclp** only when the trunk is upped but not added. On the other hand, the system does not prevent you from looping an added BNI/BXM/BME trunk port.

Syntax

addlnloclp <slot.port>

Parameters

Parameter	Description
slot.port	Specifies the port.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX			Yes	

Related Commands

dellnlp, dsptrks, dsplns, addlnlocrmtlp

Example

The **dsplns** display appears with the connection highlighted and a prompt for confirmation.

addlnloclp 11.8

```
sw53           VT    Cisco           BPX 8620  9.3.m0    Dec. 14 2000 12:33 GMT

Line      Type     Current Line Alarm Status
11.1      OC3      Clear - OK
11.8     ]OC3      Clear - OK







Last Command: addlnloclp 11.8
```

addlnlocrmtlp (add local-remote loopback to BPX line)

Establishes a local-remote loopback on a trunk or port card in a BPX. Applicable cards are the ASI, BNI, and BXM/BME.

While a line loop is present, software suspends the card self-test and the line diagnostic test that normally run when a line goes into alarm. Suspending these tests prevents background test loops from interfering with the user-specified loop.

Line loops are set for a line on the local node, so you cannot specify a remote node, and no network messaging is supported for setting a line loop of any type on a remote node.

Line loop status is displayed on the **dsplns** screen for an ASI or a BXM/BME in port mode and the **dsptrks** screen for a BNI or a BXM/BME in trunk mode. Line loop status is not displayed for connections (**dspcons**) affected by a line loop. Instead, a warning is printed if the line has connection traffic travelling on it, and an event is logged when a line loop is set or cleared. A line loop on a trunk generates Comm Fail, causing connections to fail and be rerouted.

For both of the **dsplns** and **dsptrks** screens, the "[" character appears before the back card type in the "Type" column to indicate that the line local-remote loopback is active.

The line loop state is not saved in BRAM or on a rebuild but is preserved on a switchover. After a rebuild, a line's loop state is cleared.

Exercise caution when you set up loops on a BNI or BXM/BME trunk because looping an added BNI/BXM/BME trunk causes Comm Failure and connection rerouting. BNI/BXM/BME **addlnlocrmtlp** is not supported because of a lack of useful purpose, and Cisco recommends that you use **addlnloclp** only when the trunk is upped but not added. On the other hand, the system does not prevent you from looping an added BNI/BXM/BME trunk port.

In this release, you can use the **addloclp** and **addlocrmtlp** commands to enable a two-segment connection at the hub node port endpoint in a network of IGX hubs and MGX 8800 interface shelves. The **addloclp** and **addlocrmtlp** commands are blocked at the interface shelf trunk endpoint. The **addrmtlp** command is not supported at either endpoint of the connection. You can use the **dellp** command to remove the local (or local remote) loopbacks that have been added; however, you cannot use the **dellp** command at the trunk endpoint of the connection—it will be blocked. Loops of any kind are not supported for the middle segment of a three-segment connection.

Syntax

addlnlocrmtlp <slot.port>

Parameters

Parameter	Description
slot.port	The port on the local node.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX			Yes	

Related Commands

dsptrks, dsplns, dellnlp, addlnloclp

Example

The **dsptrks** screen appears with the loopback highlighted by the "[" character.

addlnlocrmtlp 10.1

```
pubsbpx1       TN    SuperUser       BPX 8620    9.3 Apr. 13 2000 01:27 GMT

TRK     Type   Current Line Alarm Status               Other End
 1.1    T3     Clear - OK                              pubsaxi1(AXIS)
 1.3    T3     Clear - OK                              pubsipx1/8
 4.1    OC-3    Clear - OK                              -
10.1   [OC-3    Clear - OK                              -




Last Command: addlnlocrmtlp 10.1


Next Command:
```

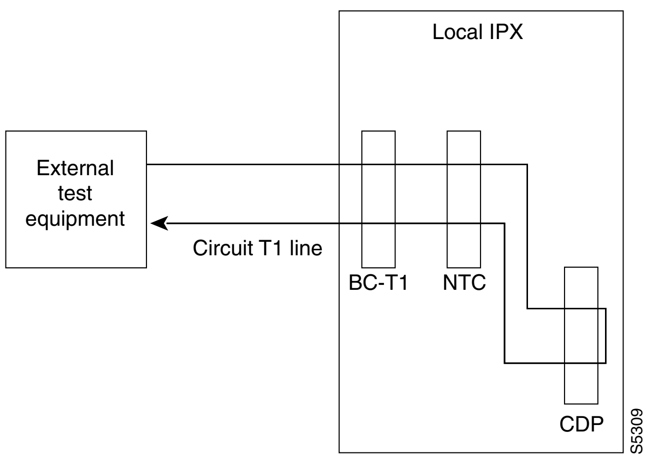
addloclp (add local loopback to connections on a port)

Places these types of channels in local loopback mode:

- Voice
- Data
- Frame Relay port
- Frame Relay connection
- ATM connection
- Access device port

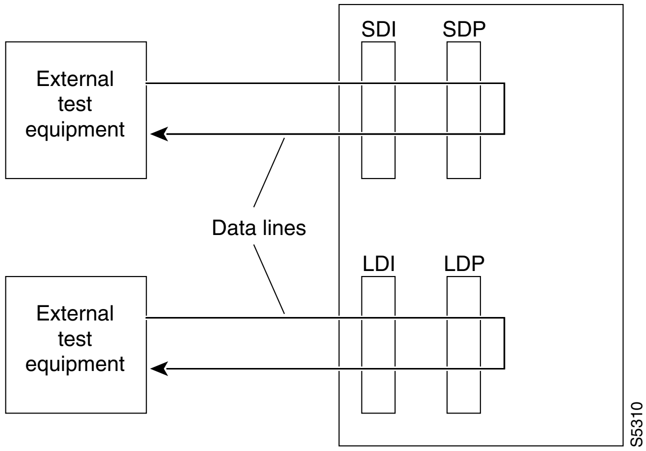
For voice connections, **addloclp** creates a signal path from a channel or group of channels on an incoming line then back out to the line. External test equipment can test the integrity of the path at the T1 DS0 level. Figure 3-3 shows a local loopback on a voice channel.

Figure 3-3 Local Loopback on a Voice Channel



For data connections, **addloclp** creates a signal path from the incoming data port or set of ports back to these same port(s) through the local CDP/CVM, SDP/HDM, or LDP/LDM. External test equipment can then test the integrity of the path. Figure 3-4 illustrates a local loopback on a data connection.

Figure 3-4 Local Loopback on a Data Connection



A local loopback can simultaneously exist at both ends of a connection. However, a local loopback and a remote loopback cannot co-exist on a connection. (See the **addrmtlp** description for more information.)

Before executing a loopback, the IGX node performs signal and code conditioning to remove the connection from service. The loopback remains in place until removed by the **dellp** command. Only existing connections can be looped back.

Use the **dspcons** command to see which connections are looped back. A flashing right parenthesis ")" or left parenthesis "("is used in the connections display to indicate a loopback. The direction and location of the parenthesis depends on whether the loopback is local or remote and which end of the connection was used to establish the loopback.

A local loopback initiated from the local end of the connection looks like this in the connections display:

Local Channel	Remote Node	Remote Channel
12.1	alpha	15.1

A local loopback initiated from the remote end of the connection looks like this:

Local Channel	Remote Node	Remote Channel
12.1	alpha	15.1

In Frame Relay connection loopback mode (DLCI included in command), all packets from the far-end of the connection are dropped. The far-end system software is informed of the loopback. In port loopback mode (port specified without a DLCI), all packets for this port are dropped and each opposite end is informed of the loopback mode.

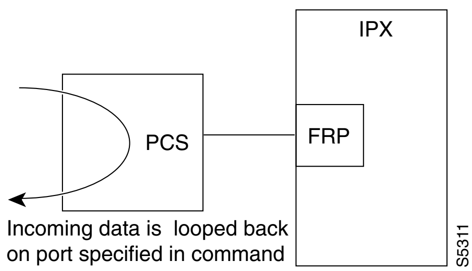
Use the format *slot.port* in port mode to loop just the port. The data is looped directly in the FRI back card, so no data reaches the muxbus or cellbus. Use the format *slot.port.DLCI* in connection (channel) mode to loop a specific channel. Note that this can affect up to 252 connections (channels) in port loopback mode.

Because the **addloclp** command causes the connection(s) to be removed from service, you should use loopbacks only when a service disruption can be tolerated. You establish remote loopbacks with the **addrmtlp** command. You remove local and remote loopbacks with the **dellp** command. You can also initiate loopbacks for data channels by pressing a button on the front of the associated data card.

Frame Relay Local Loops with Port Concentrator

When a Frame Relay port or connection is located on a Port Concentrator instead of directly on an FRP or FRM card, the data test path is different. When just the <*port*> parameter is used, incoming data is looped back out on the Port Concentrator port, as shown in Figure 3-5.

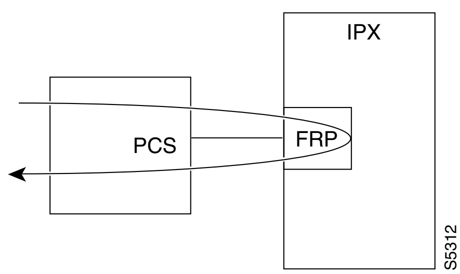
Figure 3-5 Local Loop on Port Concentrator



This loop disrupts all Frame Relay connections on the port that is under test.

When you specify a connection with <*port.dlci*> parameters, the connection is looped back at the FRM-2 or FRP-2 interface with the IGX card bus, as shown in Figure 3-6.

Figure 3-6 Local Loop on FRM-2 or FRP-2



As shown, this test verifies the operation of all components from the Port Concentrator to the IGX interface with the FRP-2 or FRM-2 card.

This tests interrupts *only* the specified connection on the Port Concentrator port.

In this release, the **addloclp** and **addlocrmtlp** commands support the two-segment connection at the hub node port endpoint in a network of IGX hubs and SES interface shelves. The **addloclp** and **addlocrmtlp** commands are blocked at the interface shelf trunk endpoint. The **addrmtlp** command is not supported at either endpoint of the connection. You can use the **dellp** command to remove the local (or local remote) loopbacks that have been added; however, you cannot use the **dellp** command at the trunk endpoint of the connection—it will be blocked. Loops of any kind are not supported for the middle segment of a three-segment connection.

Syntax

addloclp *channel*

Parameters (Voice)

Parameter	Description
slot	Specifies the slot number of the card containing the port to loop at the local node.
channel (s)	Specifies the channel or set of channels to loop at the local node.
port	Where applicable for the connection type, specifies the port.

Parameters (Data)

Parameter	Description
slot	Specifies the slot number of the card containing the port to loop at the local node.
port	Specifies the local port to loop at the local node.

Parameters (Frame Relay Connection)

Parameter	Description
slot	Specifies the slot number of the FRP card containing the port to loop at the local node.
port	Specifies the local port to loop at the local node.
DLCI	Specifies the Data Link Connection Identifier (DLCI) number of the channel to loop at the local node.

Parameters (ATM Connection)

Parameter	Description
slot	Specifies the slot number of the ATM card containing the port to loop at the local node.
port	Specifies the local port to loop at the local node.
VPI/VCI	VPI range: 0–7 VCI range: 1–255 An asterisk (*) indicates a virtual path.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

addrmtlp, dellp, dspcons, dspfrport

Example

The connections screen appears with connection 14.1 highlighted. The system prompts you to confirm the loopback. To confirm it, enter y.

addloclp 14.1

```
Next Command:
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:03 PST

 Local      Remote      Remote                                     Route
 Channel    NodeName    Channel    State  Type    Compression  Code Avoid CoS O
 5.1        beta       )25.1       Ok     256                  7/8          0  L
 9.1.100    gamma       8.1.200    Ok     fr                                0  L
 9.1.200    gamma       8.1.300    Ok     fr                                0  L
 9.2.400    beta        19.2.302   Ok     fr(Grp)                           0  L
 14.1      )gamma       15.1       Ok     v                                 0  L




Last Command: addloclp 14.1


Next Command:
```

addlocrmtlp (add local-remote loopback in a tiered network)

Adds support of a local-remote loopback for testing multisegment connections in a tiered network. The effect is to instruct the remote node to set up a remote loopback.

You must execute the **addlocrmtlp** command before using **tstcon** and **tstdelay** for multisegment connections. For interface shelves, you can execute **addlocrmtlp** on either the interface shelf (after you telnet to it).

After testing is complete, remove the local-remote loop by executing **dellp**. A parenthesis on the screen shows the loop's endpoint.

The **addloclp** and **addlocrmtlp** commands support a two-segment connection at the hub node port endpoint in a network of IGX hubs and SES interface shelves. The **addloclp** and **addlocrmtlp** commands are blocked at the interface shelf trunk endpoint. The **addrmtlp** command is not supported at either endpoint of the connection.

You can use the **dellp** command to remove the local (or local remote) loopbacks that have been added; however, you cannot use the **dellp** command at the trunk endpoint of the connection—it will be blocked. Loops of any kind are not supported for the middle segment of a three-segment connection.

Syntax

addlocrmtlp <channel(s)>

Parameters

Parameter	Description
channels(s)	The connection endpoint on the local node.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

tstcon, tstdelay, dellp, dspcons, dspfrport

Example

The connections screen appears with the connection highlighted and prompts you to confirm.

addlocrmtlp 5.1.3.100

```
pubsbpx1       TN    SuperUser       BPX       9.3    Apr. 13 2000 14:41 PDT

 Local          Remote      Remote
 Channel        NodeName    Channel         State  Type      Compress  Code CoS
 5.1.3.100 (       pubsbpx3    7.1.2.49         Ok   aftr                      0



This Command: addlocrmtlp 5.1.3.100


Loopback these connections (y/n)?
```

addport (add ATM or Frame Relay port)

This command is required to add ports to the IGX and BPX. Use **addport** to:

- add an ATM port to the BPX (for example, ASI, BXM, physical, or virtual port).
- add the internal ATM port to the embedded UXM in the Universal Router Module (URM) (introduced in Release 9.3.20 on the IGX 8400).
- add a Frame Relay port to the IGX on a channelized FRP, FRM, or UFM card set. Only T1 or E1 lines carry channelized Frame Relay traffic, so the **addport** command does not apply to a Port Concentrator Shelf or front cards with a V.35, X.21, or HSSI interface.
  - Only T1 or E1 lines carry channelized Frame Relay traffic, so the **addport** command does not apply to a Port Concentrator Shelf or front cards with a V.35, X.21, or HSSI interface.
  - The **addport** command adds a logical Frame Relay port by using the slot number of the FRM and the DS0/timeslots that make up the logical port. On a UFM, the logical ports span the whole range of physical lines: you associate the logical ports to the lines as needed, then include the DS0s as the last field of the argument.

Note If you attempt to add a Frame Relay port on the UFM card set and the error message "Total number of ports and polling rate are not compatible, check cnfsysparm" is displayed, change the polling interval using the **cnfsysparm** command, option 25. Before changing the polling interval, run the command **dspstatsinfo** to see if the number of ports is less than 300, less than 500, or greater than 500. To make the ports and polling interval compatible, change the polling interval as follows: to 5 minutes if the number of ports is less than 300, to 10 minutes if the number of ports is less than 500, and to 15 minutes if the number of ports is less than 500.

The **addport** command is required before the ports can be activated (**upport**). The optional <vport> identifier indicates a virtual port. Only BXM cards support virtual ports.

For BPX only, since Release 9.3.0, **upln** no longer automatically configures a port. You must use the **addport** command to add the port before you can use the **addcon** command. You can verify that the line has been activated by using the **dsplns** command.

Syntax

addport <slot.port>[.<vport>]

For FRP or FRM card sets:
addfrport <slot.port> [DS0 channel] [56 | 64]

For UFM-C card sets:
addfrport <slot.port> <line.DS0_channel>

Parameters

Parameter	Description
slot.port[.vport]	Specifies the slot number of the card, the physical port, and the optional virtual port (BXM card only). Range (vport identifier): 1–31
slot.port (FRP or FRM series) slot.port line.DS0 channel (for UFM-C series)	Specifies the FRI T1 or E1 line number and the logical port number. For a UFM-U, specifies the physical slot and port. For an example of a T1 or E1: 8.12 is physical slot 8 and timeslot (or *channel*) 12. For the UFM card sets, this parameter specifies the slot and logical port, the physical line (the connector), and one or more contiguous DS0s. Range (logical ports): 1–250 Range (UFM-4C lines): 1–4 Range (UFM-8C lines): 1–8 Note the space between the port and line.
– chan	Optionally specifies that multiple DS0/timeslots should form one logical port. A "–" separates the starting and ending DS0s/timeslots). Timeslots must be contiguous. For example: **addfrport** 8.1–5. The system uses the lowest DS0/timeslot number as the logical port number and shows this in related displays.
rate	Optionally specifies the rate of a single, logical port. By default, a single logical port (or channel) is 64 Kbps. A single DS0 (timeslot) may be 56 Kbps or 64 Kbps. Default: 64 Kbps

Error/Warning Messages

Messages	Reason for Message
Slot is out of range	Line number not correct for T1/E1. You cannot add slots 0–31, that is, you cannot have a port at E1 speed. The maximum you can get is 31 slots (1984) using CCS (Common Channel signaling) because slot 0 is used for FAS, and so on.
Line must first be upped	Line is down.
Invalid channel range	Channel is out of the range 1–24 or 1–31 (16 is a reserved channel for E1).
Channel is busy	Channel is already assigned to a logical port.
You cannot use signaling channel 16" (E1)	CAS channel 16 included in logical port (E1). CCS permits the use of channel 16 but not in all countries.
Invalid rate	Entered rate is not 56 Kbps or 64 Kbps.
This rate is available for single channel only	Entered rate is 56 Kbps, but multiple channels specified.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

delport, upport, dnport, dspports, dspport, cnfport

Example

Add port 3 to the BXM card in slot 11.

addport 11.3

```
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 19 2000 12:43 GMT

Port configuration for ATM 11

From        VPI Min/Max     Bandwidth    Interface   State      Protocol  Type
11.3           0 /  255    353208 (cps)  LM-BXM      INACTIVE   NONE      UNI



Last Command: addport 11.3

256 PVCs allocated. Use 'cnfrsrc' to configure PVCs
```

Example

Add the internal ATM port 11.1 on the Universal Router Module (URM) in an IGX node. The interface type is “INTERNAL”. The default configuration is UNI with no protocol and is the same as the default configuration for a UXM port.

addport 11.1

```
sw190          TRM   Cisco           IGX 8420  9.3.e9    Oct. 6 2000  05:28 GMT

Port configuration for ATM 11

Port   Chan         Speed      Interface       State       Protocol    Type
1      1        353208 (cps)  INTERNAL        INACTIVE    NONE        UNI



Last Command:addport 11.1

256 LCNs allocated. Use 'cnfrsrc' to configure LCNs
Next Command:
```

Example

Add a single Frame Relay port that occupies DS0s (timeslots) in the range 9–15. For a T1 line, this channel rate is 7 x 64 Kbps = 448 Kbps, as the screen example shows. The card is an FRP.

addport 21.9 –15

```
gamma          TRM   YourID:1        IGX 8410    9.3    Apr. 13 2000 17:28 CST

Port configuration for FRP 21

From   Chan   Speed    Interface   State
1      9-15    448      FRI           T1    INACTIVE



Last Command: addport 21.9-15


Next Command:
```

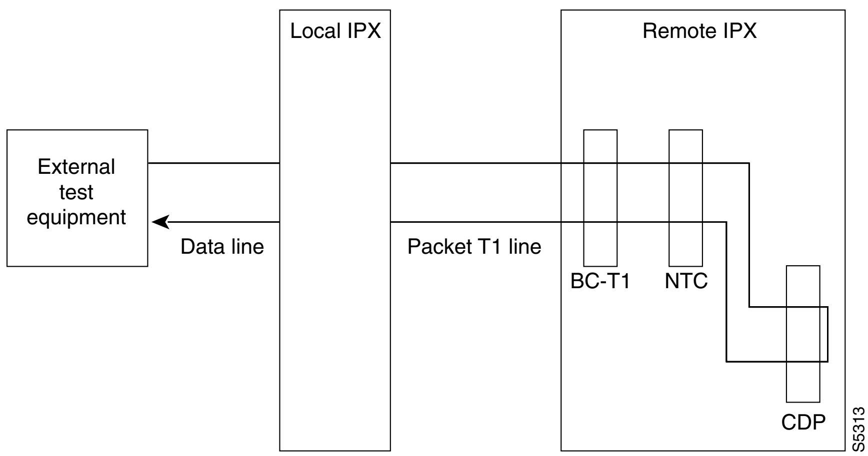
addrmtlp (add remote loopback to connections)

The **addrmtlp** command places these types of channels in remote loopback mode:

- Voice
- Data
- Frame Relay port
- Frame Relay connection
- ATM connection

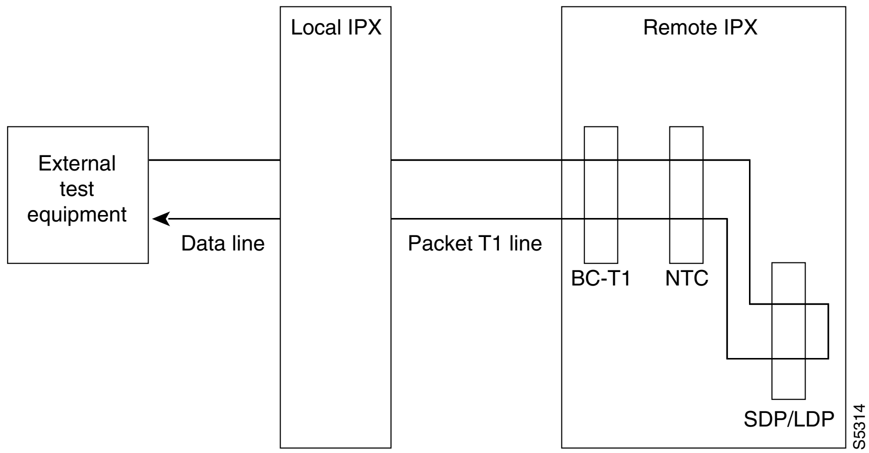
For voice connections, **addrmtlp** loops the information stream from the designated channel or group of channels on an incoming circuit line across the network and loops it back to the circuit line by way of the remote CDP or CVM. External test equipment can then test the integrity of the path at the T1 DS0 level. Figure 3-7 illustrates a remote loopback on a voice channel.

Figure 3-7 Remote Loopback on a Voice Channel



For data connections, **addrmtlp** transfers the information stream from the designated channels through the network and loops it back to the data port(s) through a remote SDP, HDM, LDM, or LDP. External test equipment can then test the integrity of the path. Figure 3-8 illustrates a data connection remote loopback.

Figure 3-8 Remote Loopback on a Data Connection



Prior to executing the loopback, the IGX node applies signaling template bit patterns to the A, B, C, and D signaling bits at the remote end to remove the connection from service. The loopback remains in place until removed by the **dellp** command. Only existing connections (those that have been entered with the **add-on** command) can be looped back. You cannot establish a remote loopback on a connection that is already looped back, either locally or remotely. (See the **addloclp** command for more information on local loopbacks.)

Use the **dspcons** command to see which connections are looped back. A flashing left parenthesis "("or right parenthesis ")" is used in the connections display to indicate a loopback. The direction and location of the parenthesis depends on whether the loopback is local or remote and which end of the connection was used to establish the loopback. A remote loopback initiated from the local end of the connection looks like this:

Local Channel	Remote Channel	Remote Node
3.2	alpha	12.1

A remote loopback initiated from the remote end of the connection looks like this:

Local Channel	Remote Node	Remote Channel
3.2	alpha	12.1

For remote loopback of Frame Relay connections, note that in remote loopback mode, if the transmit minimum bandwidth exceeds the receive minimum bandwidth, then loopback data may be dropped. For this reason, the connection speeds will be checked and the user will receive the following message if there is a problem:

```
Warning—Receiver's BW < Originator's BW-Data may be dropped
```

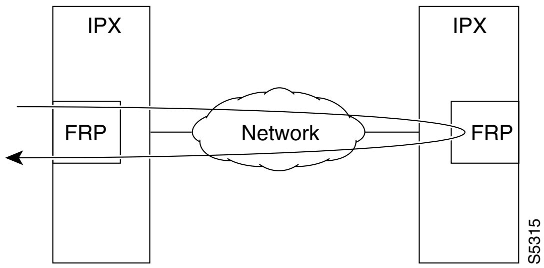
Because the **addrmtlp** command causes the connection to be removed from service, loopbacks should be used only when a service disruption can be tolerated. Local loopbacks are established with the **addloclp** command. Both local and remote loopbacks are removed by the **dellp** command. Loopbacks for data channels can also be initiated by pressing a push-button on the front of the associated data card.

Remote Loopbacks and the Port Concentrator Shelf

For Frame Relay remote loops, DLCI MUST be specified; entering only port number only generates an error message.

Unlike local loopbacks, remote loopbacks are not supported for Frame Relay *ports*; connections must be specified. Data incoming on the Frame Relay port is looped at the remote end FRM-2 or FRP-2 card, as shown in Figure 3-9.

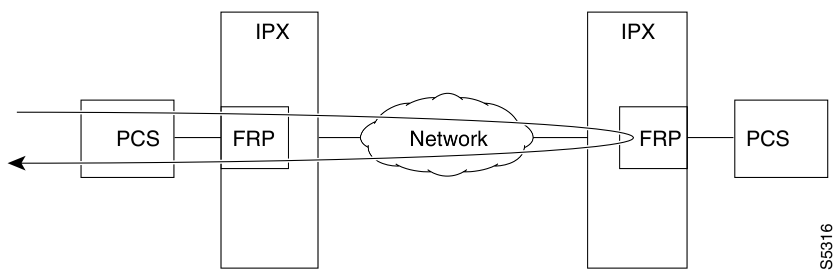
Figure 3-9 Frame Relay Remote Loops



As shown, this test verifies the operation of IGX network components up to the interface with the remote-end FRM-2 or FRP-2. This test interrupts data traffic for *only* the connection specified by DLCI.

If a port concentrator is attached to the FRM-2 or FRP-2, the only difference in the loop is that the port specified to loop data is on the Port Concentrator, as shown in Figure 3-10.

Figure 3-10 Frame Relay Remote Loops with Port Concentrator



The **addloclp** and **addlocrmtlp** commands support the two-segment connection at the hub node port endpoint in a network of IGX hubs and SES interface shelves. The **addloclp** and **addlocrmtlp** commands are blocked at the interface shelf trunk endpoint. The **addrmtlp** command is not supported at either endpoint of the connection. You can use the **dellp** command to remove the local (or local remote) loopbacks that have been added; however, you cannot use the **dellp** command at the trunk endpoint of the connection—it will be blocked. Loops of any kind are not supported for the middle segment of a three-segment connection.

Syntax

addrmtlp (see parameter tables)

Parameters (Voice)

Parameter	Description
slot	Specifies the slot number of the card containing the port to loop at the local node.
channel (s)	Specifies the channel or set of channels to loop at the local node.
port	Where applicable for the connection type, specifies the port.

Parameters (Data)

Parameter	Description
slot	Specifies the slot number of the card containing the port to loop at the local node.
port	Specifies the local port to loop at the local node.

Parameters (Frame Relay)

Parameter	Description
slot	Specifies the slot number of the FRP card containing the port to loop at the local node.
port	Specifies the local port to loop at the local node.
DLCI	Specifies the Data Link Connection Identifier (DLCI) number of the channel to loop at the local node.

Parameters (ATM)

Parameter	Description
slot	Specifies the slot number of the card containing the port to loop at the local node.
channel (s)	Specifies the channel or set of channels to loop at the local node.
port	Where applicable for the connection type, specifies the port.
vpi.vci	Specifies VPI/VCI.

Related Commands

addloclp, dellp, dspcons

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

addloclp, dellp, dspcons

Example

The connections screen appears with connection 5.1 highlighted. The system prompts to confirm the loopback. To confirm it, enter y. A flashing parenthesis ")" appears in the "Remote Channel" column of the connection to indicate that the connection is looped back.

addrmtlp 5.1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 12:57 PST

 Local      Remote      Remote                                      Route
 Channel    NodeName    Channel    State  Type    Compression  Code Avoid CoS O
 5.1        beta       )25.1       Ok     256                  7/8          0  L
 9.1.100    gamma       8.1.200    Ok     fr                                0  L
 9.2.400    beta        19.2.302   Ok     fr                                0  L
 14.1       gamma       15.1       Ok     v                                 0  L



Last Command: addrmtlp 5.1


Next Command:
```

addshelf (add interface shelf or controller to a routing node or hub)

In a tiered network, adds an ATM link between:

- an IGX or BPX core switch shelf and an interface shelf; or
- a BXM card on a BPX node and a Label Switch Controller (LSC) such as a series 7200 or 7500 router; or
- a BXM card on a BPX node.

An MPLS controller is considered an interface shelf from the BPX's perspective.

The interface shelf can be one of these:

- An MGX 8220 shelf connected to a BPX node
- An MGX 8850 shelf connected to a BPX node
- An MPLS (Multiprotocol Label Switching) controller connected to a BPX node
- A Private Network to Network Interface (PNNI) Controller connected to a BPX node
- An IGX node connected to an IGX routing node that serves as a hub for the IGX/AF
- An SES (Service Expansion Shelf) connected to an IGX node

The signaling protocol that applies to the trunk on an interface shelf is Annex G. (Annex G is a bidirectional protocol defined in Recommendation Q.2931, used to monitor the status of connections across an UNI interface. The Annex G protocol is used in this release to pass connection status information between an IGX/BPX core switch shelf and an attached feeder.)

For example, the MGX 8850 interface shelf, or feeder, communicates over a UXM/UXM-E interface with the routing hub over Annex G LMI using AAL5 format.

Note Because tiered network capability is a paid option, personnel in the Cisco Technical Assistance Center (TAC) must Telnet to the unit and configure it as an interface shelf before you can execute **addshelf**.

Each IGX/AF, MGX 8220, MGX 8850, or SES shelf has one trunk that connects to the BPX or IGX node serving as an access hub. A BPX routing hub can support up to 16 T3 trunks to the interface shelves, which can be IGX/AF, MGX 8220, or MGX 8850 interface shelves. An IGX hub can support up to four trunks to the interface shelves, which can be IGX/AF or SES (Service Expansion Shelf) shelves.

Before it can carry traffic, you must "up" the trunk on an interface shelf (using **uptrk** on both the interface shelf and the IGX/BPX core switch shelf) and "add" it to the network (using **addshelf**). Also, a trunk must be free of major alarms before you can add it with the **addshelf** command.

Use the commands **addshelf** and **addctrlr** to add an MPLS or PNNI controller to the BPX. Use the command **addshelf** with option "v" to add a VSI shelf. This is used mainly for MPLS controllers. Use the command **addctrlr** to add a controller to a shelf that has LMI capabilities.

You can use an IGX as a feeder node to connect via a UXM IMA trunk to an IGX or BPX router node using IMATM. Use **addshelf** with the "I" option at the IGX node to add the feeder trunk connecting it to an IGX feeder node.

Syntax

Interface shelf:

addshelf <slot.port> <shelf-type> [vpi] [vci]
addshelf <slot>.<primary link> <shelf type>

Label switch controller:

addshelf <slot.port> <device-type> <control partition> <control ID>

VSI controller:

addshelf <trunk slot.port> v <ctrlr id> <part id> <control vpi> <control vci start> <redundant ctrlr warning>

Note If you manage a tiered network through the command line interface, you can manage only Frame Relay interworking connections (ATFR) across the network. Three-segment connections for carrying serial data or voice between IGX/AFs is allowed, but you must manage them through Cisco WAN Manager.

Parameters

Parameter	Description
slot.port (trunk)	slot.port Specifies the BXM slot and port number of the trunk. (You can configure the port for either trunk (network) or port (service) mode.
shelf-type	I, A, P, V, X On a BPX node, shelf type specifies the type of interface shelf when you execute **addshelf**. The choices are I for IGX/AF, A for the MGX 8220, a type of adjunct processor shelf), V for VSI, or X for the MGX 8800. In the case of BNI, only two options are available: I for IGX/AF A for the MGX 8220. On an IGX node, shelf type specifies the type of interface shelf you can add. The choices are: I for IGX/AF X for AAL5 for an SES (Service Expansion Shelf).
device-type	vsi, for “virtual switch interface”, specifies a virtual interface to an ATM-LSR (Label Switch Router) controller such as a Cisco 7200 or 7500 series router. Note that the “v” option is not applicable when configuring Automatic Routing Management PVCs. You need to enter only the “v” or “vsi” option when configuring VSI options.
vpi vci	vpi,vci are optional when adding an interface shelf (feeder). (Specifies the vpi and vci (Annex G vpi and vci used). For the MGX 8220 only, Range vpi: 1–1015 Range vci: 1–65535

Parameter	Description
control VPI control VCI start	The (VPI.VCI) of the 15 control VCs is (control_VPI.control_VCI_start) to (control_VPI.control_VCI_start+14).The control VC used for slot n (1<= n<=15) is (control_VPI.control_VCI_start + n -1). Choose <control_VPI> such that: • If <control_VPI> = 0, <control_VCI_start> can be set to a value > 40. • If any VSI partition exists on the interface, then control_VPI <start_VPI or control_VPI> end_VPI for all partitions on that interface. An error message is displayed if the control VPI falls into the VPI range belonging to a VSI partition. • No Automatic Routing Management connection exists on (VPI.start_VCI to VPI.start_VCI+14). If any Automatic Routing Management connection exists on these VPI/VCI values, you are not allowed to use these VPI/VCI values. • This VPI is “reserved” for control VCs.
control partition	Specifies the control partition. You can typically leave this field blank when you add an MPLS Controller to a BPX or MGX 8800 node.
control ID	Control IDs must be in the range of 1 to 32, and you must set these identically on the VSI-MPLS Controller and in the **addshelf** command. A control ID of “1” is the default used by the MPLS Controller.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	Yes	Yes	BPX switch with IGX interface shelves IGX switch with IGX shelves BPX switch with MGX 8220 interface shelf BPX with MGX 8850 interface shelf BPX switch for MPLS controller IGX switch for the Service Expansion Shelf (SES)	Yes	Yes	Yes	Yes

Related Commands

delshelf, **dspnode**, **dsptrks**

Release History

Previous to Release 9.2, WAN switching software supported the ability to configure the MGX 8220 as an interface shelf to the BPX. Release 9.1 introduced the ability for the MGX 8850 to serve as an interface shelf to a BPX routing hub. Release 9.2 introduced the ability for an SES (Service Expansion Shelf) to serve as an interface shelf to an IGX 8400 routing hub.

Release 9.2.20 supports:

- You can attach SES feeders to the routing network through an IGX 8400 routing hub using UXM/UXM-E and PXM trunks using UNI and NNI format. A routing hub can support up to four feeders.
- The LMI/Annex G signaling channel is used to communicate with the SES feeder through the SAR (Segmentation Assembly and Reassembly).
- UXM Feeder support provides voice, Frame Relay, and ATM data connections from feeder node to feeder node for a 2- or 3-segment network.

Signaling Channel Used by MGX 8850 and SES Interface Shelves Connecting to Routing Hubs

The SES interface shelf with a UXM/UXM-E interface communicates with the routing hub over an Annex G LMI interface by using AAL5 format.

Annex G is a bidirectional protocol used to monitor the status of connections across a UNI interface. This includes the real-time notification of the addition or deletion of connection segments and the ability to pass the availability (active state) or unavailability (inactive state) of the connections crossing this interface.

An SES feeder uses the Annex G protocol to pass connection status information between itself and an IGX 8400 routing hub. Similarly, an MGX 8850 feeder uses the Annex G signaling channel to pass connection status information between itself and a BPX routing hub.

The SES interface shelf communicates with an IGX routing hub through ATM cells. Thus, IP data destined for an IGX 8400 is encapsulated in an AAL5 ATM cell format.

addshelf Error Messages

Some of the possible error messages for the **addshelf** command:

- An MGX 8850 Interface Shelf already exists on this Hub
- Trunk is already added to the Network
- Trunk is in alarm
- An Interface Shelf already exists on this trunk
- Interface Shelf VPI out of range
- Interface Shelf VCI out of range
- No memory available for Interface Shelf allocation
- Communication failure during Shelf modification
- Shelf has been added
- Shelf has been deleted
- Communication breakdown
- Interface Shelf allocation failure

- Interface Shelf already has a network connection
- Interface Shelf name is not unique
- Interface Shelf IP address is not unique
- Interface Shelf modification failure

Example (Interface Shelf)

Add an MGX 8220 at trunk 11.1. After you add the shelf, the screen displays a confirmation message and the name of the shelf. Add the MGX 8220 (may be referred to on screen as AXIS):

addshelf 11.1 a

The sample display shows a partially executed command prompting you for the interface shelf type:

```
nmsbpx23       TN    SuperUser       BPX 8620    9.3.10    Apr. 4 2000   13:28 PST

                        BPX Interface Shelf Information

Trunk    Name      Type      Alarm
 1.3     AXIS240   AXIS      OK
 11.2    A242      AXIS      OK





This Command: addshelf 11.1 a

Enter Interface Shelf Type:  I (IGX/AF), A (AXIS), P (APS), V (VSI), X (AAL5)

Next Command:
```

Example (MGX 8850 AAL5 Interface Shelf)

Add an MGX 8850 at trunk 4.8. After you add the MGX 8800 shelf, the screen displays a confirmation message and the name of the shelf.

To add the MGX 8850 (may be referred to on screen as AAL5), use this command:

addshelf 4.8 x

The system response shows that an MGX 8850 was added on trunk 4.8 as an AAL5 (ATM Adaptive Layer 5) type of interface shelf. (Adding an MGX 8850 interface shelf is similar to adding an MPLS controller interface shelf.)

```
pswbpx3       TN    SuperUser       BPX 8600    9.3.10    June 6 2000   13:28 PST


                  BPX 8620 Interface Shelf Information

Trunk    Name      Type    Part Id Ctrl Id    Control_VC     Alarm
                                              VPI  VCIRange
4.8      SIMFDR0   AAL/5    -       -         -     -        OK


This Command: addshelf 4.8 x

Enter Interface Shelf Type:  I (IGX/AF), A (AXIS), P (APS), V (VSI), X (AAL5)

Next Command:
```

Example (SES to an IGX)

Add an SES interface shelf to an IGX 8400 (using a UXM or UXM-E interface). After you add the SES interface shelf, the screen displays a confirmation message and the name of the shelf. Add the SES (may be referred to on-screen as AAL5) as follows:

addshelf 6.1 X

Enter Interface Shelf Type: **X** (AAL5)

Note You can add an SES (Service Expansion Shelf) feeder only to an IGX routing node.

```
sw288       TN    SuperUser       IGX 8420    9.3   Apr. 13 2000 15:38 PST

TRK      Type     Type          Alarm
9.1      ases1    AAL5         MIN



This Command: addshelf 4.1

Enter Interface Shelf Type:  I (IGX), A (AXIS), P (APS), V (VSI), X (AAL5)

                        IGX Interface Shelf Information

Trunk    Name       Type        Alarm
 9.1     ses_fdr    AAL5       MIN





This Command: addshelf 4.1 x

Enter Interface Shelf Type:  A (AXIS), P (APS), V (VSI), X (AAL5)

Shelf has been added
Next Command:
```

The sample display shows that an SES was added on trunk 9.1 as an AAL5 type of interface shelf. (AAL5 is the ATM Adaptive Layer 5 protocol, which is an ATM standard interface that is used by the routing node or routing hub to communicate with the SES shelves.) Adding an IGX interface shelf is similar to adding an MPLS (Multiprotocol Label Switching) controller as an interface shelf.

The **addshelf** command will prompt for “Interface Shelf Type.” Because the MGX 8220, MGX 8850, and the SES (Service Expansion Shelf) use the same Annex G LMI signaling protocol to communicate with an IGX routing hub, they all use the same interface shelf type of AAL5 (designated by the **addshelf** “X” option).

Adding a VSI Controller

The maximum number of controllers that can be attached to a given node is limited by the maximum number of feeders (16) that can be attached to a BPX hub. Therefore, the total number of feeders and controllers cannot exceed 16.

You add a VSI controller, such as an MPLS controller, to a switch by using the **addshelf** command with the *vsi* option. The *vsi* option of the **addshelf** command identifies VSI controllers and distinguishes them from interface shelves (feeders).

The VSI controllers are allocated a partition of the switch resources. VSI controllers manage their partition through the VSI interface. The controllers run the VSI master. The VSI master entity interacts with the VSI slave running on the BXMs through the VSI interface, to set up VSI connections using the resources in the partition assigned to the controller.

Two controllers that are intended to be used in a redundant configuration must specify the same partition when added to the node through the **addshelf** command.

When a controller is added to the node, switch software sets up the infrastructure so that the controllers can communicate with the slaves in the node. The VSI entities decide how and when to use these communication channels.

The controllers also require a communication channel between them. This channel could be in-band or out-of-band. When a controller is added to the switch, switch software sends controller information to the slaves. This information is advertised to all the controllers in the partition. The controllers may decide to use this information to set up an intermaster channel. Alternatively the controllers may use an out-of-band channel to communicate.

To add a controller to the node, use the **addshelf** command. You add a redundant controller in the normal way, except that it specifies a partition that may be already in use by another controller. The **addshelf** command allows for up to three controllers to manage the same partition.

One of the parameters that must be specified with the **addshelf** command when a VSI controller is added to the switch is the controller ID. This is a number between 1 and 32 that uniquely identifies the controller. Two different controllers must always have different controller IDs.

The management of resources on the VSI slaves requires that each slave in the node has a communication control VC to each of the controllers attached to the node. When a controller is added to the BCC via the **addshelf** command, the BCC sets up the set of master-slave connections between the new controller port and each of the active slaves in the switch. You specify the master-slave connections by using the <Control VPI> and <Control Start VCI> parameters. The default for these parameters is 0/0.

Note If you manage a tiered network through the command line interface, you can manage only Frame Relay interworking connections (ATFR) across the network. Three-segment connections for carrying serial data or voice between IGX/AFs is allowed, but you must manage them through WAN Manager.

Feature Mismatching to Verify VSI Support

The **cnfrsrc** and **addshelf** commands, in addition to other configuration commands, perform mismatch verification on the BXM and UXM cards. For example, the **cnfrsrc** and **addshelf** commands verify whether the cards both have VSI 2.0 support configured.

The Feature Mismatching capability does not check mismatched cards unless the actual feature has been enabled on the card. This allows for a graceful card migration from an older release.

Example (Redundant VSI Controller)

Add a redundant (more than one) VSI controller (as an interface shelf to a BPX node), on slot 11 on port 1, with a control partition of 1 and control ID of 2.

addshelf 11.1 vsi 1 2

```
night          TN    StrataCom       BPX 8600   9.3 Apr. 13 2000 14:31 GMT


                        BPX Interface Shelf Information

Trunk     Name       Type      Part Id   Ctrl Id   Alarm
1.1       sww222     IGX/AF    -         -         UNRCH
10.3      VSI        VSI       1         1         OK




Warning partition already in use do you want to add redundant controller?

Last Command: addshelf 11.1 vsi 1 2
```

Adding an MPLS Controller

For MPLS to carry traffic, you must first up the link to an MPLS controller (by using **uptrk**) at the BPX node. You can then add the link to the network (by using **addshelf**).

The link must be free of major alarms before you can add it with the **addshelf** command.

Note Once you up a port on the BXM in either trunk or port mode by using either the **uptrk** or **upport** commands, respectively, you can up only those ports in the same mode.

Example (MPLS Controller)

Add trunk 4.1 as a VSI-MPLS controller interface shelf with control ID set to 1, partition ID set to 1, control VC VPI set to 0, and control VC VCI start at 40.
addshelf 4.1 vsi 1 1 0 40

```
nmsbpx23       TN    SuperUser       BPX 15    9.3.10    Aug. 1 2000 13:28 PST


                  BPX 8620 Interface Shelf Information

Trunk    Name      Type    Part Id Ctrl Id    Control_VC     Alarm
                                              VPI  VCIRange
4.8      SIMFDR0   AAL/5    -       -         -     -        OK
4.1      VSI       VSI      1       1         0     40-54    OK

This Command: addshelf 4.1 v 1 1 0 40

Next Command:
```

addtrk (add a trunk between nodes)

You must add a trunk to the network before it can carry traffic. You need only to execute **addtrk** at one of the nodes terminating the trunk. Before you add a trunk to the network, you must have activated (or "upped") the trunk at both ends by using **uptrk**.

A trunk must be free of major alarms before you can add it. If you use **addtrk** to join two networks that were previously separate, the local node verifies that all node names and node numbers in both networks are unique before it adds the trunk.

You cannot add a trunk while any of these conditions are true:

- Another node is attempting to change the network topology by adding or deleting a trunk.
- Another node is notifying all nodes that it has been renamed.
- Another node is currently adding or deleting a connection in the network with the **addcon** or **delcon** command.
- An unreachable node exists in the network.
- Connections are rerouting.
- The node names or the node numbers across the two networks are not unique. Use the command and optional parameter **dspnds +n** to see the node numbers.

Warning **When using the addtrk command, exercise caution when adding a new node to a network or one network to another network. With these particular operations, the user IDs and passwords may be replaced by those in the other network. Consult Customer Service before performing these operations.**

Adding a Virtual Trunk

You can add a trunk as a physical trunk or a virtual trunk. A virtual trunk is a way to connect Cisco nodes through a public ATM cloud. You can define virtual trunks on BNI, BXM and UXM cards.

(Note that even though nodes running Release 9.2 can interoperate with 9.1 or 8.5 nodes, if you are running a network with mixed releases, you cannot add UXM and BXM virtual trunks because the networking messages are incompatible due to the virtual trunk number and different cell format on virtual trunks. BNI cards use STI cell format, and BXM and UXM cards use NNI cell format.)

To designate a trunk as a virtual trunk, you use a virtual trunk number, which is used to differentiate the virtual trunks within a physical port. (Refer to the *BPX 8600 Series Reference* for more information on virtual trunking.)

For the BXM card, you can define a maximum of 32 virtual trunks within one port. Valid virtual trunk numbers are 1–31 per port. The number of virtual trunks available is limited by the number of virtual interfaces (VIs) available on the card. Each logical trunk (physical or virtual) consumes on VI.

For the UXM card, you can define a maximum of 16 virtual trunks within one port. Valid virtual trunk numbers are 1–15.

The **addtrk** command will be blocked for virtual trunks configured for VSI.

Syntax

addtrk <slot.port>[.vtrk]

Parameters

Parameter	Description
slot.port	Specifies the slot and port number of the trunk to add.
vtrk	Optionally specifies the virtual trunk number. Virtual trunking is supported on a BNI or BXM card on a BPX node, or a UXM card on an IGX node. The maximum number of virtual trunks per physical port: BNI card: 32 T3 or E3 line: 32 OC-3/STM1 line: 11 The maximum number of virtual trunks per port: BXM card: 32 UXM card:16

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX			Yes	

Related Commands

deltrk, dsptrks, uptrk

Example

Add trunk 5.4 to node sw180.

addtrk 5.4

```
NOTE: update example to show: "Add trunk 5.4 to node sw180."

sw180          TN    Cisco           IGX 8420  9.3.r3    Dec. 19 2000 14:10 GMT

TRK         Type   Current Line Alarm Status              Other End
 5.4        OC3    Clear - OK                             -
 8          T1/24  Clear - OK                             sw108/14





Last Command: addtrk 5.4
```

addtrkred (add trunk redundancy)

Configures trunk redundancy on an ATM trunk. The **addtrkred** command specifies a backup trunk to the primary trunk. Applicable line types are T3 and E3. The redundancy scheme requires two sets of ATM trunk cards and two standard T3 or E3 cables (not Y-cables). Note the following characteristics of trunk redundancy:

- Applicable card sets are the AIT connected to a BNI card set on a BPX node.
- Execute **addtrkred** on an IGX but not on the BPX side.
- Primary and backup card sets must be in adjacent slots.
- After a primary trunk failure clears, the traffic automatically returns to the primary card set.
- Trunk redundancy is not compatible with virtual trunking.

Syntax

addtrkred <primary trunk> <secondary trunk>

Parameters

Parameter	Description
primary trunk	Specifies the slot number of the primary trunk card set.
secondary trunk	Specifies the slot number of the secondary trunk card set as backup.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	Yes	BPX, IGX			Yes	

Related Commands

deltrkred, dsptrkred

Example

Add bandwidth redundancy for the primary ATM trunk in slot 4 with backup from the ATM trunk in slot 5.

addtrkred 4 5

```
beta           TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000   15:15 MST

ATM Line Backup ATM Line
   4           5


Last Command: addtrkred 4 5

Next Command:
```

adduser (add a user)

Adds a user to the network. The first time the new user ID is used for logon, a prompt asks the user to change from the default password to a new password which they enter using the **cnfpwd** command. Users with privilege levels 1 through 5 may add users with lower privilege levels. Because privilege level 6 has no user levels below it, level 6 cannot add any users.

Syntax

adduser <user_id> <privilege_level>

Parameters

Parameter	Description
<user_id>	Specifies the name of the user to add.
<privilege_level>	Specifies the privilege level to grant to the added user. Range: 1–6, where 1 is the highest level and 6 is the lowest.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	Yes	BPX, IGX			Yes	

Related Commands

cnfpwd, **deluser**, **dspusers**

Example

Add a user sarah with privilege level 5.

adduser sarah 5

```
alpha          TRM   YourID:1        IGX 8410    9.3    Apr. 13 2000 13:48 PST

YourID       1
Sarah        5




Last Command: adduser Sarah 5


Next Command:
```

addyred (add Y-cable redundancy)

Enables card redundancy for cards on the BPX and IGX. The **addyred** command also enables SONET Automatic Protection Switching (APS) across two BXM OC-3 or OC-12 cards. Use the **addyred** command to specify the slots of the primary and secondary cards that form the redundant pair. Redundancy applies to the entire card, and not specific trunks or lines. (The **addyred** command performs the same function as the **addcdred** alias command.)

Redundant card sets must have these characteristics:

- The primary and secondary card sets must be identical.
- Secondary card sets must not currently be active.
- Neither the primary nor secondary card set may already be part of a redundant set.
- When configuring APS 1+1, the primary and secondary card sets must be in adjacent slots. (Note that this restriction applies only to the BPX chassis for APS 1+1 redundancy.) See the "APS 1+1 Environment (Redundant Back Cards with Front Card Redundancy)" section on page 3-86 for additional information on APS 1+1.

In both single and multiport card sets, if the secondary card set becomes active, the primary card set serves as its backup (assuming the primary card set is complete and not failed). You cannot use the **addyred** command if the primary and secondary slots are empty. If one or both of the card slots is empty, the **addyred** command will fail.

You must use the **addyred** command to configure a VSI slave redundant card. When a standby slave card is first started (either by inserting the card into the slot, or issuing the **addyred** command from the CLI console), the active slave forwards all VSI messages received from the master VSI controller card to the standby slave VSI controller card.

If cards reside in the primary and secondary slots, the system checks for card compatibility. Two types of incompatibility can occur: back card and jumper or cable inconsistencies. On SDI, FRI, and FTI cards, jumpers determine whether a port is configured as DCE or DTE. On LDI cards, either a DCE or DTE adapter cable connects to the LDI port. If incompatibilities exist, the message "Y-Cable Conflict" appears on the screen. Specific conflicts are listed in reverse video in the **dspyred** display. See the **dspyred** description for more information. For descriptions of the jumper positions and cabling, see the *Cisco IGX 8400 Series Installation and Configuration* manual.

The **addyred** commands (**addyred, delyred, dspyred, prtyred, switchyred**) perform feature mismatch checking on both the primary and secondary cards. For information on feature mismatch checking, refer to the *BPX 8600 Series Installation and Configuration Guide*. Also see the "Feature Mismatching" section on page 3-85 for detailed information.

With the second phase of the Automatic Routing Management to PNNI migration introduced in Release 9.3.30, the BXM interface card supports the Extended LMI (XLMI) protocol. This protocol enables the exchange of neighbor discovery information between the BXM and AXSM over the AR-PNNI link. You cannot activate XLMI/ENNI when there are existing connections. Also in this release, ILMI Neighbor Discovery feature is also available for virtual ports on the BXM card.

With Release 9.3.30, **addyred** is NOT allowed in the following instances:

- When the secondary BXM card does not support LMI Neighbor Discovery and the primary BXM card supports LMI Neighbor Discovery and at least one port is running the XLMI protocol.
- If one card in the Y-redundant BXM pair is replaced, mismatch is declared when the original card pair supports LMI Neighbor Discovery and at least one port is configured for LMI Neighbor Discovery.
- If O.151 OAM is enabled on the primary card (using **cnfcdparm**) and the secondary card does not support the feature.

Note In the hybrid AR-PNNI network, both the active and standby BXM cards receive messages for connections that are added or deleted. Both cards maintain identical connection database views. However, there is no XLMI redundancy, and only the active BXM card exchanges connection status information with the adjacent AXSM. At switchover, the new active BXM card initiates an exchange with the adjacent AXSM to synchronize the AXSM's connection database.

Syntax

addyred <primary slot> <secondary slot>

Parameters

Parameter	Description
<primary slot>	Specifies the slot number of the primary card set.
<secondary slot>	Specifies the slot number of the secondary card set.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

delyred, **dspyred**, **prtyred**, **switchyred**

Example (BPX)

Add Y-cable redundancy to the BPX BXM card sets in slots 2 and 12.

addyred 2 3

```
sw118          TN    Cisco          BPX 8620  9.3.c0    May  9 2001  1330 GMT

     Slot Other Front   Back
Slot Type Slot  Card    Card
2    Pri  3     BXM     LM-BXM
3    Sec  2     BXM     LM-BXM

This Command addyred 2 3
```

Example (IGX)

Add Y-cable redundancy to the IGX UXM/T3 card sets in slots 12 and 13.

addyred 12 13

```
arnold         TN    Cisco          IGX 8430  9.3.1p    Aug. 16 2000 17:27 PST

     Slot Other Front  Back   Channel Configuration
Slot Type Slot  Card   Card     1    2    3    4    5    6    7    8
12   Pri  13    UXM    T3       --   --   --   --   --   --   --   --
13   Sec  12    UXM    T3       --   --   --   --   --   --   --   --




Last Command: addyred 12 13


Next Command:
```

Feature Mismatching

During **addyred's** mismatch checking, the following verifications are performed:

- A verification is performed to ensure that both the primary and secondary cards support features that are activated. For example, if the APS feature is configured on the primary card, and this feature is not available on the secondary card, you are blocked from using the **addyred** command. As another example, to ensure that cards with the Idle Code Suppression feature enabled on them are compatible, **addyred** blocks cards that have different idle code suppression capability.
- If the feature is not enabled, and the secondary card does not support similar feature sets, the (internal) logical database is updated to reflect this difference.
- Following a **delyred** command execution, the logical card's database is updated to reflect the primary card's capabilities.

With Release 9.3.10, **addyred** is NOT allowed if the BPX Neighbor Discovery Enable/Disable flag is set to ENABLED on any port on the primary card and the secondary card does not have the BPX Neighbor Discovery capability. An error message is displayed in this situation. The **addyred** is allowed if the BPX Neighbor Discovery Enable/Disable flag is NOT set to ENABLED on any port on the primary card. If the secondary card does not have the BPX Neighbor Discovery capability, the following events occur:

1. Mismatch is not declared.
2. Neighbor's information (Neighbor's IfName and Neighbor's IP Address) is deleted from all ports on the primary card.
3. BPX Neighbor Discovery Enable/Disable flags on all ports on the primary card are set to DISABLED (if previously set to ENABLED).
4. The logical card table(s) are updated to indicate that the BPX Neighbor Discovery feature is no longer supported.
5. CWM is notified via the Robust Port Update message.

Events **1** through **5** also occur in the following situations:

- A stand-alone BXM card with Neighbor Discovery capability and BPX Neighbor Discovery Enable/Disable flag set to either ENABLED or DISABLED on any port on the card is replaced with one that does not support the feature.
- One of the cards in a Y-redundant card pair (both cards with Neighbor Discovery capability and BPX Neighbor Discovery Enable/Disable flag set to either ENABLED or DISABLED on any port on the logical card) is replaced with one that does not support the feature.

Starting with Release 9.3.30, the BXM-E models DX and EX card slots can be configured to support 60K LCNs for VSI connections. For Y-cabled or APS 1+1 redundancy, the system checks the total physical channel number supported by each card in the pair. When **addyred** is executed, the **lower** value of the two cards becomes the attribute value for the logical card. If the logical card is configured to support 60K VSI LCN, mismatch is declared when a replacement card's attribute value of total physical channel number supported is not 60K-64.

APS 1+1 Environment (Redundant Back Cards with Front Card Redundancy)

The same numbered ports on adjacent BXM cards are used. A hardware, firmware, and software upgrade is required. (Firmware that supports APS 1+1 setup, and switch software Release 9.2 is required.)

The APS 1+1 feature requires two BXM front cards, an APS redundant frame assembly, and two redundant type BXM back cards. The two redundant BXM back cards are plugged into the APS redundant frame assembly. (Refer to the SONET APS Configuration chapter in the *Cisco BPX 8600 Series Installation and Configuration* guide for more information on APS hardware configuration.) The types of redundant back card and backplane sets required are:

Note Using only one front card and two back cards is not a valid configuration when adding APS capability, and APS alarm capability is reduced when the standby card is not available. You must configure card redundancy before you can configure APS redundancy.

Note When SONET Automatic Protection Switching (APS) is configured, you will not be able to use the **addyred** or **delyred** commands on a card configured for APS 1:1 architecture. That is, you will not be able to execute the **addyred** command, then configure the APS 1:1 architecture. Similarly, you will not be able to configure APS 1:1, then execute the **addyred** command. You will be blocked from executing these commands at the command line interface. Refer to the *Cisco BPX 8600 Series Installation and Configuration* manual for more information on configuring SONET APS 1+1 card and line redundancy for BXM OC-3 and OC-12 cards.

burnfwrev (burn firmware image into cards)

Burns a firmware image into the memory of a specific card. Before you use **burnfwrev**, the firmware image must already reside in the controller card's memory. (Use **getfwrev** to load the image to the controller.)

A few seconds after you enter **burnfwrev**, the system displays a screen similar to the one in Figure 3-10, then the Burn Address column starts to indicate the addresses that are being "burned." When **burnfwrev** finishes, the status changes to "Complete."

After all cards at a node have been updated with **burnfwrev**, enter the following to clear the firmware image from the controller card's buffer area:

getfwrev 0.0 *node_name*

Use the **dspfwrev** command to display the firmware image status on the controller card at any time after **burnfwrev** has finished.

At the SuperUser level (0), you can use **burnfwrev** only to change the *revision level* of a card's firmware. If the firmware revision would result in a new *model number* for the card, only a user with a higher privilege level can burn the firmware image. In this case, you would have to call the TAC to execute the command.

Syntax

burnfwrev <image name> <slot number>

Parameters

Parameter	Description
<image name>	Specifies the name of the firmware image to burn. You should typically enter image names in all capital letters; also, image names are case-sensitive.
<slot number>	Specifies the shelf slot where the card to burn is located. Specifying slot 0 will burn all cards of the appropriate type at the local node.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspfwrev, **getfwrev**

Example

Burn Firmware Revision into Card

burnfwrev

```
gamma            TRM       SuperUser        Rev: 9.3 Apr. 13 2000  14:28 PDT

Firmware        Size        Status
F.D.A           256 K       Burning into slot 19 (6 lives)

File            Address     Length      CRC           Burn Address
0               800000      10          E986E939
1               800800      410         22996DDA
2               801000      2D40        B212147F
3               805E60      480         85CB29EA
4               80A630      70          57A938AE
5               80A6B0      20          4B9E8DDC
6               810000      10000       338E45F6
7               820000      4400        95990113
8               835000      1810        875771B2
9               8368A0      15D0        4C597B97


This Command: burnfwrev

Continue?
```

burnrtrcnf (burn router configuration file)

Burns the IOS configuration file for the Universal Router Module (URM) embedded router from the NPM RAM buffer to the Admin flash of the URM card.

For information about the URM Remote Router Configuration feature introduced in Release 9.3.30, refer to URM Remote Router Configuration Feature on the IGX, page 2-3.

Syntax

burnrtrcnf <slot_number> <configuration_file_name>

Parameters

Parameter	Description
slot number	Slot number of the URM card to which the IOS configuration file is to be burned.
configuration file name	Name of the IOS configuration file that is to be copied to the URM Admin flash. The IOS configuration file name can be a maximum of 32 characters. The maximum file size is 256K bytes. The file must be an ASCII text file. Compressed files cannot be interpreted by the IOS router.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
Super Group	Yes	Yes	IGX	Yes	Yes	Yes	No

Related Commands

clrrtrcnf, cnfrtr, cnfrtrcnfmastip, dspcnf, dsprtr, dsprtrcnfdnld, dsprtrslot

Example

Copy the IOS configurative file named 1234.c to the URM Admin flash.

burnrtrcnf

```
sw175          TN    Cisco          IGX 8420   9.3.30 Mar. 9 2000   05:31 GMT

Router Config filename         Status
1234.c                         Complete

Router Config fileSize         Bytes Dnld
256050



Last Command: burnrtrcnf 1234.c
```

bye (end user session)

Ends a local or remote terminal connection. The local connection ends, and the initial sign-on prompt appears on the screen. With a local terminal connection, the **bye** command logs out the user. If a local terminal is inactive for a (default) period of 20 minutes, the connection is automatically broken. This is the equivalent of entering the **bye** command. With a remote terminal connection (**vt**), the **bye** command returns the terminal to the local node. After a (default) period of four minutes of inactivity, a remote terminal connection is automatically returned to a local connection. This is equivalent to entering the **bye** command.

Syntax

bye

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

vt

Example

bye

```
-----------------------------------SCREEN 1-------------------------------------
sw180          TN    Cisco           IGX 8420  9.3.g0    Oct. 20 2000 06:24 GMT

clrclnerrs         - Clear Circuit Line Errors
Can be included in Jobs.
Usage: clrclnerrs [<line_number>]




Last Command: help


Next Command: bye

-----------------------------------SCREEN 2-------------------------------------
sw180          TN    No User         IGX 8420  9.3.g0    Oct. 20 2000 06:26 GMT






Enter User ID:
```

chklm (check node loading model)

Verify target node load models by issuing the **chklm** and **dsplm** commands. These commands compare sections of the current node's database with all other nodes in the network. These commands are useful before a software upgrade since ideally, the network should be alarm free at the time of the software upgrade. If this is not possible, at least the reason for all major alarms should be identified and noted, and then suitable reconfiguration should be made in order to remove the alarm.

Issue the **chklm** command on every node in the network sequentially. When complete, return to the first node and run the **dsplm** command.

Syntax

chklm

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
Super group	Yes	No	BPX, IGX	No	Yes	Yes	No

Related Commands

dsplm

Example

The command only returns a command prompt. See **dsplm** command for sample output.

clrcderrs (clear detailed card errors)

The **clrcderrs** command clears the history of card failures (errors) associated with the specified slot.

When you enter this command the system responds with Slot Number or *. After you enter the command, the system asks you to confirm that it is OK to clear this data.

Syntax

clrcderrs <slot number | *>

Parameters

Parameter	Description
<slot number | *>	Specifies the slot number to clear. A "*" can be entered to clear all cards.
<start_vci>	Starting VCI of the VSI control channels. This VCI value is assigned to the first VSI control channel (between the VSI master and the VSI slave residing on the UXM card in slot 3). The last VSI control channel corresponding to communication with the VSI slave on slot 16 or 32 (depending on the number of slots in the particular IGX model) will use the VCI value of (<start_vci> + *number of slots on the IGX* - 2). Range 16-slot IGX: 40–65521 Range 32-slot IGX: 40–65505 Default: 40

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspcderrs, **prtcderrs**

Example

```
pubsigx1       TN    SuperUser       IGX 32    9.3       Apr. 13 2000  18:48 GMT

FRM in Slot 3  : 172240 Rev ESJ     Failures Cleared: Date/Time Not Set
----------------------------------- Records Cleared:  Date/Time Not Set
Self Test          Threshold Counter: 0          Threshold Limit: 300
Total Pass: 495          Total Fail: 0              Total Abort: 2
First Pass: Date/Time Not Set          Last Pass: Apr. 13 2000 19:36:48 GMT
First Fail:                            Last Fail:

Background Test    Threshold Counter: 0          Threshold Limit: 300
Total Pass: 29849        Total Fail: 0              Total Abort: 0
First Pass: Date/Time Not Set          Last Pass: Apr. 13 2000  18:46:34 GMT
First Fail:                            Last Fail:

Hardware Error     Total Events: 0     Threshold Counter: 0
First Event:                           Last Event:


This Command: clrcderrs 3

OK to clear (y/n)?
```

After replying “y” (yes) to the confirmation prompt, the screen appears:

```
pubsigx1       TN    SuperUser       IGX 32    9.3       Apr. 13 2000  18:55 GMT

FRM in Slot 3  : 172240 Rev ESJ     Failures Cleared: Date/Time Not Set
----------------------------------- Records Cleared:  Apr. 13 2000  18:55:02 GMT
Self Test          Threshold Counter: 0          Threshold Limit: 300
Total Pass: 0            Total Fail: 0              Total Abort: 0
First Pass:                            Last Pass:
First Fail:                            Last Fail:

Background Test    Threshold Counter: 0          Threshold Limit: 300
Total Pass: 0            Total Fail: 0              Total Abort: 0
First Pass:                            Last Pass:
First Fail:                            Last Fail:

Hardware Error     Total Events: 0     Threshold Counter: 0
First Event:                           Last Event:

Last Command: clrcderrs 3
```

clrchstats (clear channel statistics)

Clears the gathered statistics for either a specific channel or all channels, including Frame Relay channels. When you enter a specific channel number, the current channel statistics display appears, asking if you want to clear the display. If you enter “*” (all channels) for the channel specification, the display prompts you to confirm whether you want to clear all channel statistics. This is sometimes referred to as a summary statistics command.

The Multilevel Channel Statistics lets you configure and display additional levels of statistics beyond level 1 statistics (for example, levels 2 and 3), as supported by the Multilevel Channels Statistics feature. You use the **cnfcdparm** command to configure the channels statistics level on the BXM or UXM cards.

For example, if you configure slot 5 to support level 3 channel statistics, all connections on that particular card are set to provide level 3 statistics. Switch software collects, displays, and propagates to Cisco WAN Manager the various statistics types. The channel statistic type vary in number and type based on the level of support provided by the BXM and UXM cards. You use the **dspchstats** and **clrchstats** to display and clear the statistics.

Syntax

clrchstats <channel | *>

Parameters

Parameter	Description
channel	Specifies the channel whose statistics are cleared. Frame Relay format: *slot.port.DLCI*.
*	Specifies all channel statistics.

Attributes

Privilege	Jobs	Log	Node	Lock
1–5	Yes	Yes	IGX, BPX	Yes

Related Commands

dspchstats

Example

Clear channel statistics for 3.1.1 (BPX).

clrchstats 3.1.1

Example

Clear channel statistics for 3.1.1.

clrchstats 3.1.1

```
sw83           TN    SuperUser       IGX 8420    9.3      Apr. 13 2000 19:24 PST

Channel Statistics: 3.1.1         Cleared: Aug. 17 1997 08:10
MIR: 3.8 kbps           Collection Time: 6 day(s) 10:04:58      Corrupted: NO
                     Frames   Avg Size Avg    Util          Packets     Avg
                              (bytes)  (fps)  (%)                       (pps)
From Port:          1516586        198      2   35
To Network:         1516215        198      2   35        16678365        30
Discarded:              371        198      0    0
From Network:       1518665        197      2   35        16705146        30
To Port:            1518629        198      2   35
Discarded:               36        120      0    0             238         0
                   ECN Stats:  Avg Rx VC Q:            0    ForeSight RTD    40
Min-Pk bytes rcvd:      52470  FECN Frames:            0    FECN Ratio (%)    0
Minutes Congested:          0  BECN Frames:           16    BECN Ratio (%)    0
Frames rcvd in excess of CIR:       0  Bytes rcvd in excess of CIR:         0
Frames xmtd in excess of CIR:       0  Bytes xmtd in excess of CIR:         0

This Command: clrchstats 3.1.1


OK to clear (y/n)?
```

Example

Clear the statistics of channel 9.2.400.

clrchstats 9.2.400

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 13:24 PST

Channel Statistics for 9.2.400    Cleared: Apr. 13 2000 13:23
MIR: 9.6 kbps           Collection Time: 0 day(s) 00:02:42      Corrupted: NO
                     Frames   Avg Size Avg    Util          Packets     Avg
                              (bytes)  (fps)  (%)                       (pps)
From Port:                0          0      0    0
To Network:               0          0      0    0               0         0
Discarded:                0          0      0    0
From Network:             0          0      0    0               0         0
To Port:                  0          0      0    0
Discarded:                0          0      0    0               0         0

                   ECN Stats:  Avg Rx VC Q:            0    ForeSight RTD    --
Min-Pk bytes rcvd:          0  FECN Frames:            0    FECN Ratio (%)    0
Minutes Congested:          0  BECN Frames:            0    BECN Ratio (%)    0


This Command: clrchstats 9.2.400


OK to clear (y/n)?
```

clrclkalm (clear alarm clock)

Clears the alarm status of a clock source, either circuit line or trunk, after a problem is cleared. Before the node can use the original clock source, you must clear the alarm with **clrclkalm**. The system displays no messages after execution.

The clock test runs continuously in a node, comparing the frequency of the node's clock source to a reference on the BCC/CC/control card. If a clock source is found to be outside preset frequency limits, it is declared defective and another clock source is selected. In order for the node to return to the original clock source, the alarm must be cleared by using the **clrclkalm** command. The alarm may be either a “Bad Clock Source” or “Bad Clock Path” alarm.

Syntax

clrclkalm <line type> <line number>

Parameters

Parameter	Description
<line type>	Specifies the type of line: “L” indicates a line. “T” indicates a trunk.
<line number>	Specifies the number of the line or trunk.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	Yes	BPX, IGX			Yes	

Related Commands

cnfclksrc, dspclksrcs, dspclns, dspcurclk, dsptrks

clrcnf (clear configuration memory)

Clears the configuration memory at the current node and resets the node.

The **clrcnf** command erases most network configuration data. This configuration data includes connections, trunks, circuit lines, and so on, for the local node. You might need to use the **clrcnf** command when you upgrade the network with a new software release or when you move a node. A warning and a confirmation prompt appear before the command executes.

This command should be used only on a node that has not yet been placed in service or when the network configuration has been previously saved so it can be quickly reloaded. The configuration can be saved in one of several ways:

- On a Cisco WAN Manager terminal using the **savecnf** command. The node is then reloaded using the **loadcnf** command.
- On a standby controller card. Before entering the **clrcnf** command, remove the standby controller from its slot. The configuration data will be maintained in BRAM even though the power has been removed from the card.

Caution Use **clrcnf** with extreme caution. Typically, you should use **clrcnf** only if the Cisco TAC has instructed you to do so. This command can make the node unreachable to the network.

Syntax

clrcnf

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			Yes	

Related Commands

loadcnf, **runcnf**, **savecnf**

clreventq (clear event queues from the fail handler)

Clears high-water marks for fail handler event queues.

Syntax

clreventq

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

dspeventq

Example

Clear the fail handler event queue.

clreventq

```
sw151          TN    SuperUser       IGX 16    9.3       Apr. 13 2000 19:18 GMT

  QUEUE                  LENGTH            THROTTLING
NUM NAMES          MAX   HIGH CURRENT       POINT
 1  Fail_Xid             26      1          7000
 2  Fail_ Q              25      0
 3  Mt_Sv_Q[0]      300     9      0           270
 4  sv_mt_bufq            9      0




This Command: clreventq


OK to clear HIGH counts(y/n)?
```

clrfrcportstats (clear FRC/FRM port statistics)

Clears port statistics for FRM-2 or FRP-2 physical ports connected to a Port Concentrator Shelf. To see the statistics that you clear with **clrfrcportstats**, execute **dspfrcportstats**. The controller card collects statistics from the FRM-2 or FRP-2 once per minute. Because **clrfrcportstats** clears statistics on the controller card, it might not clear statistics generated within the last minute.

Syntax

clrfrcportstats <slot.port | *>

Parameters

Parameter	Description
<slot.port	*>	Slot and port of the physical port. The range for *port* is 1–4. An asterisk (*) specifies all FRC-2/FRM-2 physical ports.

Related Commands

dspfrcportstats

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	BPX, IGX			Yes	

clrlnalm (clear circuit line alarm)

Clears the alarms associated with a circuit line. Since the statistical alarms associated with a circuit line have associated integration times, they can keep a major or minor alarm active for some time after the cause has been rectified. This command allows these alarms to be cleared, allowing any new alarms to be quickly identified. The **clrlnalm** command can clear only alarms caused by the collection of statistical data. Alarms caused by a network failure cannot be cleared. For example, an alarm caused by a collection of bipolar errors can be cleared, but an alarm caused by a card failure cannot. (Same as alias **clrclnalm**.)

Syntax

<line_number> <fail_type>

Parameters

Parameter	Description
<line_number>	Specifies the number of the line.
<fail_type>	Specifies the type of alarm to clear.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	Yes	IGX			Yes	

Related Commands

dsplns, dsplnerrs

Example

Clear the minor alarm caused by frame slips on circuit line 14.

clrlnalm 14 2

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 13:10 PST

                             Line Alarm Configuration

                       Minor                               Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  1) Bpv        10E-7  10 min       3 min         10E-3   10 sec      10 sec
  2) Fs          .01%  10 min       3 min           .1%   10 sec      10 sec
  3) Oof       .0001%  10 min       3 min          .01%   10 sec      10 sec
  4) Vpd           2%   5 min       3 min            5%   60 sec      10 sec
  5) Tsdp        .01%   5 min       3 min           .1%   60 sec      10 sec
  6) Ntsdp       .01%   5 min       3 min           .1%   60 sec      10 sec
  7) Pkterr      .01%  10 min       3 min           .1%  125 sec      10 sec
  8) Los       .0001%  10 min       3 min          .01%   10 sec      10 sec



This Command: clrlnalm 14 2


Continue?
```

clrlnerrs (clear line errors)

Clears the errors associated with a circuit line. Since the statistical alarms associated with a circuit line have associated integration times, they can keep a major or minor alarm active for some time after the cause has been rectified. This command allows these alarms to be cleared, allowing any new alarms to be quickly identified.

The **clrlnerrs** command can clear only those alarms that the collection of statistical data has caused. You cannot clear alarms caused by a network failure cannot be cleared by **clrlnerrs**.

Syntax

clrlnerrs [<line_number>]

Parameters

Parameter	Description
<line_number>	Specifies the number of the line.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	IGX			Yes	

Related Commands

dsplnerrs, prtlnerrs

Example

Clear line error counts. In response to the prompt, enter "y" to reset all line error counts to "0."

clrlnerrs

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 13:12 PST

Total Errors

From  Code    Frame   Out of  Loss of Frame   CRC     Out of
CLN   Errors  Slips   Frames  Signal  BitErrs Errors  MFrames AIS-16
14          0       0       0       -       0       -       -       -

Last Command: clrlnerrs


Next Command:
```

clrlog (clear event log)

Clears the event log. When the log is cleared, one entry remains, “Info Log Cleared”. Before the event log is cleared, a prompts asks you to confirm. See the **dsplog** command for more information on the event log.

Syntax

clrlog

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	IGX			Yes	

Related Commands

dsplog

Example

Clear the event log. When the log is cleared, one entry remains, “Info Log Cleared.” Enter “**y**” to confirm.

clrlog

```
sw151          TN    SuperUser       IGX 16    9.3       Apr. 13 2000 19:19 GMT

Most recent log entries (most recent at top)
Class  Description                                                Date     Time
Info   User SuperUser logged out (Local)                          09/12/96 18:18:57
Major  LN 5.6 Loss of Sig (RED)                                   09/12/96 18:12:22
Info   User SuperUser logged out (Local)                          09/12/96 18:11:17
Info   Clock switch to oscillator of SCC                          09/12/96 18:10:46
Clear  LN 5.6 OK                                                  09/12/96 18:05:11
Minor  LN 5.6 Out of Multi-Frames                                 09/12/96 18:03:27
Info   Clock switch to LINE 5.6                                   09/12/96 18:03:12
Clear  LN 5.6 OK                                                  09/12/96 18:02:42
Info   Clock switch to oscillator of SCC                          09/12/96 17:59:24
Major  LN 5.6 Loss of Sig (RED)                                   09/12/96 17:59:24
Info   Clock switch to LINE 5.6                                   09/12/96 17:59:20
Clear  LN 5.6 OK                                                  09/12/96 17:59:20
Major  LN 5.6 Loss of Sig (RED)                                   09/12/96 17:58:51

This Command: clrlog


OK to clear (y/n)?
```

clrmsgalm (clear message alarm)

Clears the minor alarm due to an alarm message received at an alarm collection port.

Syntax

clrmsgalm

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	Yes	BPX, IGX			Yes	

Related Commands

dspalms, dsplog

clrphyslnalm (clear physical line alarm)

Clears the specified statistical alarm associated with a physical line on a UXM card. The physical line statistical alarms include LOS, LOF, AIS, YEL, LOP, Path AIS, and Path YEL. You can display these alarms by using the **dspphysln** command. These alarms are shown as the physical line status, at the top of the display, when you run the **dspphysln** command.

Alarms caused by a network failure cannot be cleared. For example, an alarm caused by a collection of bipolar errors can be cleared, but an alarm caused by a card failure cannot.

Syntax

clrphyslnalm <line_number> <fail_type>

Parameters

Parameter	Description
<line_number>	Specifies the number of the physical line.The format is either *slot* (for a single-trunk card) or *slot.port*.
<fail_type>	Specifies the type of alarm to clear. If not specified, the system prompts with `Enter Type:`.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	Yes	IGX			Yes	

Related Commands

dspphyslns, dspphyslnerrs

Example

Clear an alarm on physical line 10.1.

clrphyslnalm 10.1

```
sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  18:10 GMT

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  1) Bpv        10E-7  10 min       3 min         10E-3   30 sec      10 sec
  2) Fs          .01%  10 min       3 min           .1%   30 sec      10 sec
  3) Oof       .0001%  10 min       3 min          .01%   30 sec      10 sec
  4) Los       .0001%  10 min       3 min          .01%   30 sec      10 sec
  5) Fer         .01%  10 min       3 min           .1%  200 sec      10 sec
  6) CRC         .01%  10 min       3 min           .1%  200 sec      10 sec
  7) Oom        .001%  10 min       3 min           .1%   30 sec      10 sec
  8) Ais16     .0001%  10 min       3 min          .01%   30 sec      10 sec


This Command: clrphyslnalm 10.1


Continue?


sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  18:11 GMT

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  9) Pkoof       .01%  10 min       3 min           .1%  200 sec      10 sec
  10) Pkterr     .01%  10 min       3 min           .1%  125 sec      10 sec
  11) Badclk      .1%  10 min       3 min            1%   50 sec      10 sec
  12) Vpd          2%   5 min       3 min            5%   60 sec      10 sec
  13) Tsdp       .01%   5 min       3 min           .1%   60 sec      10 sec
  14) Ntsdp      .01%   5 min       3 min           .1%   60 sec      10 sec
  15) Pccpd     .001%   5 min       3 min           .1%   60 sec      10 sec
  16) Bdapd     .001%   5 min       3 min           .1%   60 sec      10 sec


This Command: clrphyslnalm 10.1


Continue?

sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  18:11 GMT

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  17) Bdbpd     .001%   5 min       3 min           .1%   60 sec      10 sec
  18) Lcv       10E-5  10 min       3 min         10E-3   30 sec      10 sec
  19) Pcvl      10E-7  10 min       3 min         10E-3   30 sec      10 sec
  20) Pcvp      10E-7  10 min       3 min         10E-3   30 sec      10 sec
  21) Bcv       10E-7  10 min       3 min         10E-3   30 sec      10 sec
  22) Rxvpd        1%   5 min       3 min            4%   60 sec      10 sec
  23) Rxtspd     .01%   5 min       3 min           .1%   60 sec      10 sec
  24) Rxbdapd   .001%   5 min       3 min           .1%   60 sec      10 sec

This Command: clrphyslnalm 10.1

Continue?
```

```
sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  18:11 GMT

                             Line Alarm Configuration

                       Minor                                 Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  25) Rxbdbpd   .001%   5 min       3 min           .1%   60 sec      10 sec
  26) Rxntspd    .01%   5 min       3 min           .1%   60 sec      10 sec
  27) Rxhppd    .001%   5 min       3 min           .1%   60 sec      10 sec
  28) Atmhec      .1%  10 min       3 min            1%  120 sec      10 sec
  29) FSyncErr   .01%  10 min       3 min           .1%  200 sec      10 sec
  30) Rxspdm     .01%   4 min       2 min         .001%   30 sec       5 sec
  31) CGWpktds   .01%   5 min       3 min            1%   60 sec      10 sec
  32) CGWcelld   .01%   5 min       3 min            1%   60 sec      10 sec

This Command: clrphyslnalm 10.1

Continue?
 sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  18:12 GMT

                             Line Alarm Configuration

                       Minor                                 Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  33) Txntscds  .001%   5 min       3 min           .1%   60 sec      10 sec
  34) Txhpcdsc  .001%   5 min       3 min           .1%   60 sec      10 sec
  35) Txvcdscd    .1%   5 min       3 min        .0001%   60 sec      10 sec
  36) Txtscdsc   .01%   5 min       3 min           .1%   60 sec      10 sec
  37) Txbdacds  .001%   5 min       3 min           .1%   60 sec      10 sec
  38) Txbdbcds  .001%   5 min       3 min           .1%   60 sec      10 sec
  39) Txcbrcds  .001%   5 min       3 min           .1%   60 sec      10 sec
  40) Txabrcds  .001%   5 min       3 min           .1%   60 sec      10 sec


This Command: clrphyslnalm 10.1


Continue?

 sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  18:12 GMT

                             Line Alarm Configuration

                       Minor                                 Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  41) Txvbrcds  .001%   5 min       3 min           .1%   60 sec      10 sec
  42) TxGwFPds   .01%   5 min       3 min            1%   60 sec      10 sec
  43) RxGwCLds   .01%   5 min       3 min            1%   60 sec      10 sec

This Command: clrphyslnalm 10.1

Enter Type:
```

clrphyslnerrs (clear UXM physical line errors)

Clears the errors associated with a UXM physical line. Since the statistical alarms associated with a circuit line have associated integration times, they can keep a major or minor alarm active for some time after the cause has been rectified. This command allows these alarms to be cleared, allowing any new alarms to be quickly identified. The **clrphyslnerrs** command can clear only those alarms that the collection of statistical data has caused. Alarms caused by a network failure cannot be cleared by **clrphyslnerrs**.

Syntax

clrphyslnerrs [<line_number>]

Parameters

Parameter	Description
[<line_number>]	Specifies the physical line.The format is either *slot* (for a single-trunk card) or *slot.port*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	IGX			Yes	

Related Commands

dspphyslnerrs, prtphyslnerrs

Example

Clear UXM physical line error counts from line on port 3 of slot 11. In response to the prompt, enter “**y**” to reset all circuit line error counts to “0.”

clrphyslnerrs 11.3

```
sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  18:10 GMT

                              Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  1) Bpv        10E-7  10 min       3 min         10E-3   30 sec      10 sec
  2) Fs          .01%  10 min       3 min           .1%   30 sec      10 sec
  3) Oof       .0001%  10 min       3 min          .01%   30 sec      10 sec
  4) Los       .0001%  10 min       3 min          .01%   30 sec      10 sec
  5) Fer         .01%  10 min       3 min           .1%  200 sec      10 sec
  6) CRC         .01%  10 min       3 min           .1%  200 sec      10 sec
  7) Oom        .001%  10 min       3 min           .1%   30 sec      10 sec
  8) Ais16     .0001%  10 min       3 min          .01%   30 sec      10 sec
This Command: clrphyslnalm 10.1
```

clrportstats (clear port statistics)

Clears the statistics for any port card. This includes the data byte count in the transmit and receive directions and error counts associated with the port. Statistical accumulation then resumes for that port.

The **clrportstats** command clears statistics for a virtual port if a virtual port is specified.

Syntax

clrportstats <slot>.<port | *>[.<vport>]

Parameters

Parameter	Description
slot.port	Specifies the slot and port number of the trunk to add.
<port	*>	Specifies the port or asterisk for all ports.
[.<vport>]	Specifies the virtual port

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	IGX			Yes	

Related Commands

dspportstats

Example

Clear the port statistics for port 1 on an FRP card in slot 9. Type “**y**” to confirm.

clrportstats 9.1

```
alpha          TRM   YourID:1        IGX 8420    9.3   Apr. 13 2000 10:57 PST

Port Statistics for 9.1         Cleared: Apr. 13 2000 15:32
Port Speed: 256 kbps    Collection Time: 11 day(s) 19:22:09     Corrupted: YES

                      Bytes      Average (kbps)     Util (%)         Frames
From Port:                0            0               0                  0
To Port:                  0            0               0                  0
Frame Errors               LMI Receive Protocol Stats   Misc Statistics
Invalid CRC            0   Status Enq Rcvd         0   Avg Tx Port Q        0
Invalid Alignment      0   Status Xmit             0   FECN Frames          0
Invalid Frm Length     0   Asynch Xmit             0        Ratio (%)       0
Invalid Frm Format     0   Seq # Mismatches        0   BECN Frames          0
Unknown DLCIs          0   Timeouts                0        Ratio (%)       0
Last Unknown DLCI      0   Invalid Req             0   Rsrc Overflow        0
                           Sig Protocol:  None         DE Frms Dropd        0

This Command: clrportstats 9.1
OK to clear port statistics (y/n)?
```

Example

Clear the port statistics for port 11.1 for the BXM card. Type "**y**" to confirm.

clrportstats 11.1

```
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 13 2000 10:24 GMT

Port Statistics for 11.1        Cleared: Dec. 13 2000 10:00
Port Speed: 353208 cps  Collection Time: 0 day(s) 00:21:59      Corrupted: NO

              Cells           CLP         (EFCI)
Rx Port:          0             0           --
Tx Port:        248             0           --


Unkn Addr (UA):       248  Rx OAM Cells  :         0  Rx Clp 0 Cells:        0
Rx Clp 0 Dscd :         0  Rx Clp 1 Dscd :         0  Tx Clp 0 Cells:      248
Tx OAM Cells  :       248  Rx RM Count   :         0  Tx RM Count   :        0
Lst Unk VpiVci:    0.0

UA sums across ports in port group.


This Command: clrportstats 11.1


OK to clear port statistics (y/n)?
```

clrrtrcnf (clear router configuration file)

Clears the IOS configuration file stored in the NPM RAM buffer. This buffer must be cleared before a new save/restore configuration file, a new firmware image, or a new IOS configuration file can be stored in the NPM RAM buffer. This is because the NPM RAM buffer can be used only by one application at a time.

The **clrrtrcnf** command supports the URM Remote Router Configuration feature introduced in Release 9.3.30. This feature allows you to start up or restart the URM embedded IOS router with an IOS configuration file that is downloaded from a TFTP server. For additional information on the URM and Remote Router Configuration feature see the **cnfrtr** command description.

Syntax

clrrtrcnf

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	IGX	Yes	Yes	Yes	NO

Related Commands

burnrtrcnf, cnfrtr, cnfrtrcnfmastip, dspcnf, dsprtr, dsprtrcnfdnld, dsprtrslot

Example

Clear the IOS configuration file from the NPM RAM buffer. The **clrrtrcnf** command prompts you to confirm the clear procedure before it executes.

clrrtrcnf

```
sw175          TN    Cisco           IGX 8420  9.3.q6    Mar. 9 2000  05:33 GMT










This Command: clrrtrcnf


Router configuration file will be deleted from NPM, Continue (y/n)?
```

clrscrn (clear terminal screen)

Clears the terminal screen.

Syntax

clrscrn

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

redscrn, prtscrn

clrslotalms (clear slot alarms)

Clears the alarm messages associated with the alarms displayed for the Display Slot Alarms command. Alarm messages are cleared for the specified slot only. These counters should be cleared before beginning any monitoring session. This command prompts the user with an "OK to Clear?" message before actually clearing the counters.

Use **dspslotalms** to observe the slot alarms. Refer to the **dspslotalms** command for a description of the counters cleared by the **clrslotalms** command.

Syntax

clrslotalms <slot>

Parameters

Parameter	Description
<slot>	Specifies the number of the shelf slot in the BPX node.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	BPX			Yes	

Related Commands

dspslotalms

Example

Clear alarm on slot 3.

clrslotalms 3

clrsloterrs (clear slot errors)

Clears the counters for the error counts displayed for the Display Slot Errors command. Counters are cleared for the specified slot only. These counters should be cleared before beginning any monitoring session. This command prompts the user with an “OK to Clear?” message before actually clearing the counters.

Use **dspsloterrs** to observe the **slot errors**. Refer to the **dspsloterrs** command for a description of the counters cleared by the **clrsloterrs** command.

Syntax

clrsloterrs <slot number | *>

Parameters

Parameter	Description
<slot number | *>	Specifies the shelf slot in the node or an asterisk for all shelf slots.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspsloterrs

Example

Clear the slot errors in slot 3.

clrsloterrs 3

clrtrkalm (clear trunk alarm)

Clears statistical alarms associated with either a physical or virtual trunk. Note that if a virtual trunk is specified for a command that configures information related to the physical port, then the physical port information is configured for all virtual trunks. This means that using **clrtrkalm** clears parameters on a logical trunk basis, but any changes automatically affect all trunks on the port when you change a physical option. Any changes you make to a virtual trunk on a port affect all virtual trunks on that port.

Since the statistical alarms associated with a trunk have associated integration times, they can keep a major or minor alarm active for some time after the cause has been rectified. The **clrtrkalm** allows these alarms to be cleared, allowing any new alarms to be quickly identified.

The **clrtrkalm** command can clear only alarms caused by the collection of statistical data. Alarms caused by a network failure cannot be cleared. For example, an alarm caused by a collection of bipolar errors can be cleared, but an alarm caused by a card failure cannot.

Note A virtual trunk also has trunk port alarms that are shared with all the other virtual trunks on that port. You clear and set these alarms together for all the virtual trunks sharing the same port.

Alarms for the BXM and UXM card types are cleared and displayed differently.

Syntax

clrtrkalm <trunk number> <failure type>

Parameters

Parameter	Description
<trunk number>	Specifies the trunk. Note that for virtual trunks, no virtual trunk parameter is required—just *slot.port*. The format is either *slot* (for a single-trunk card) or *slot.port*.
<failure type>	Specifies the type of alarm to clear.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	Yes	BPX, IGX			Yes	

Related Commands

dsptrks, dsptrkerrs

Example

Display trunk alarm configuration.

clrtrkalm 4.2

```
------------------------------------SCREEN 1-----------------------------------
sw108          VT    Cisco          IGX 8420  9.3.p8    Dec. 13 2000 10:38 GMT

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  1) Bpv        10E-7  10 min       3 min         10E-3   30 sec      10 sec
  2) Fs          .01%  10 min       3 min           .1%   30 sec      10 sec
  3) Oof       .0001%  10 min       3 min          .01%   30 sec      10 sec
  4) Los       .0001%  10 min       3 min          .01%   30 sec      10 sec
  5) Fer         .01%  10 min       3 min           .1%  200 sec      10 sec
  6) CRC         .01%  10 min       3 min           .1%  200 sec      10 sec
  7) Oom        .001%  10 min       3 min           .1%   30 sec      10 sec
  8) Ais16     .0001%  10 min       3 min          .01%   30 sec      10 sec


This Command: clrtrkalm 4.2


Continue?  y

------------------------------------SCREEN 2-----------------------------------
sw108          VT    Cisco          IGX 8420  9.3.p8    Dec. 13 2000 10:34 GMT

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  9) Pkoof       .01%  10 min       3 min           .1%  200 sec      10 sec
  10) Pkterr     .01%  10 min       3 min           .1%  125 sec      10 sec
  11) Badclk      .1%  10 min       3 min            1%   50 sec      10 sec
  12) Vpd          2%   5 min       3 min            5%   60 sec      10 sec
  13) Tsdp       .01%   5 min       3 min           .1%   60 sec      10 sec
  14) Ntsdp      .01%   5 min       3 min           .1%   60 sec      10 sec
  15) Pccpd     .001%   5 min       3 min           .1%   60 sec      10 sec
  16) Bdapd     .001%   5 min       3 min           .1%   60 sec      10 sec


This Command: clrtrkalm 4.2


Continue?  y

------------------------------------SCREEN 3-----------------------------------
sw108          VT    Cisco          IGX 8420  9.3.p8    Dec. 13 2000 10:34 GMT

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  17) Bdbpd     .001%   5 min       3 min           .1%   60 sec      10 sec
  18) Lcv       10E-5  10 min       3 min         10E-3   30 sec      10 sec
  19) Pcvl      10E-7  10 min       3 min         10E-3   30 sec      10 sec
  20) Pcvp      10E-7  10 min       3 min         10E-3   30 sec      10 sec
```

```
  21) Bcv       10E-7  10 min       3 min         10E-3   30 sec      10 sec
  22) Rxvpd        1%   5 min       3 min            4%   60 sec      10 sec
  23) Rxtspd     .01%   5 min       3 min           .1%   60 sec      10 sec
  24) Rxbdapd   .001%   5 min       3 min           .1%   60 sec      10 sec


This Command: clrtrkalm 4.2


Continue?   y

------------------------------------SCREEN 4-----------------------------------
sw108          VT    Cisco          IGX 8420  9.3.p8    Dec. 13 2000 10:34 GMT

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  25) Rxbdbpd   .001%   5 min       3 min           .1%   60 sec      10 sec
  26) Rxntspd    .01%   5 min       3 min           .1%   60 sec      10 sec
  27) Rxhppd    .001%   5 min       3 min           .1%   60 sec      10 sec
  28) Atmhec      .1%  10 min       3 min            1%  120 sec      10 sec
  29) FSyncErr   .01%  10 min       3 min           .1%  200 sec      10 sec
  30) Rxspdm     .01%   4 min       2 min         .001%   30 sec       5 sec
  31) CGWpktds   .01%   5 min       3 min            1%   60 sec      10 sec
  32) CGWcelld   .01%   5 min       3 min            1%   60 sec      10 sec


This Command: clrtrkalm 4.2


Continue?  y

------------------------------------SCREEN 5-----------------------------------
sw108          VT    Cisco          IGX 8420  9.3.p8    Dec. 13 2000 10:35 GMT

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  33) Txntscds  .001%   5 min       3 min           .1%   60 sec      10 sec
  34) Txhpcdsc  .001%   5 min       3 min           .1%   60 sec      10 sec
  35) Txvcdscd    .1%   5 min       3 min        .0001%   60 sec      10 sec
  36) Txtscdsc   .01%   5 min       3 min           .1%   60 sec      10 sec
  37) Txbdacds  .001%   5 min       3 min           .1%   60 sec      10 sec
  38) Txbdbcds  .001%   5 min       3 min           .1%   60 sec      10 sec
  39) Txcbrcds  .001%   5 min       3 min           .1%   60 sec      10 sec
  40) Txabrcds  .001%   5 min       3 min           .1%   60 sec      10 sec


This Command: clrtrkalm 4.2


Continue?  y

------------------------------------SCREEN 6-----------------------------------
sw108          VT    Cisco          IGX 8420  9.3.p8    Dec. 13 2000 10:35 GMT

                             Line Alarm Configuration

                       Minor                                Major
```

```
  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  41) Txvbrcds  .001%   5 min       3 min           .1%   60 sec      10 sec
  42) TxGwFPds   .01%   5 min       3 min            1%   60 sec      10 sec
  43) RxGwCLds   .01%   5 min       3 min            1%   60 sec      10 sec
  44) CGWfrmab   .01%   5 min       3 min            1%   60 sec      10 sec


This Command: clrtrkalm 4.2


Enter Type:
```

Example

Clear alarms on trunk 4.2

```
------------------------------------SCREEN 1-----------------------------------
sw108          VT    Cisco           IGX 8420  9.3.p8    Dec. 13 2000 11:09 GMT


Last Command: clrtrkalm 4.2 4

------------------------------------SCREEN 2-----------------------------------
sw108          VT    Cisco           IGX 8420  9.3.p8    Dec. 13 2000 11:05 GMT

TRK         Type   Current Line Alarm Status              Other End
 4.2        OC3    Clear - OK                             sw180/5.1
 4.4        OC3    Clear - OK                             sw53/11.2
14          T1/24  Clear - OK                             sw180/8


Last Command: dsptrks
```

clrtrkerrs (clear trunk errors)

Clears the statistical error counters at the node for the specified physical or virtual trunk. You should do this before you begin any monitoring session and periodically thereafter to determine exactly when a trunk problem begins. Use **dsptrkerrs** to observe errors without clearing counters.

Syntax

clrtrkerrs <trunk_number | *>

Parameters

Parameter	Description
<trunk_number	*>	Specifies the trunk counter to clear or asterisk for all trunks.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	BPX, IGX			Yes	

Related Commands

dsptrkerrs, prttrkerrs

Example

Clear all trunk errors.

clrtkerrs *

```
pubsbpx1       TN    SuperUser       BPX 8620    9.3       Apr. 13 2000 19:37 PST

Total Errors

      Code    Rx Cell Out of  Loss of Frame   HCS     Tx Cell Cell    Cell
TRK   Errors  Dropped Frames  Signal  BitErrs Errors  Dropped Errors  Oofs
 1.1        0       0       0       0       -       0       0       -       -
 1.2        0       0       0       0       -       0       0       -       -




This Command: clrtrkerrs *


Clears errors on all trunks. Continue (y/n)?
```

clrtrkstats (clear trunk statistics)

Clears the node counters used for the Display Trunk Statistics. Counters are cleared for a physical or virtual trunk. You should clear these counters before beginning any monitoring session. This is similar to the **clrtrkerrs** command for errors. This command prompts you with an "OK to Clear?" message before actually clearing the counters.

Use **dsptrkstats** to observe the trunk statistics. See the **dsptrkstats** command for a description of the counters cleared by the **clrtrkstats** command.

Syntax

clrtrkstats <*trunk number*>

Parameters

Parameter	Description
trunk number	Specifies the trunk. Note that, for virtual trunks, no virtual trunk parameter is required—just slot.port. The format is either slot (for a single-trunk card) or slot.port.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	BPX, IGX			Yes	

Related Commands

dsptrkstats

Example

Clear the statistics on trunk 4.4.

clrtrkstats

```
sw108          VT    Cisco          IGX 8420  9.3.p8    Dec. 13 2000 11:17 GMT

Trunk  4.4           Clear - OK
Collection Time: 0 day(s) 00:00:00                  Clrd:  12/11/00 16:18:00
Type                                      Count
QBIN: NTS Cells Tx to line                      0
QBIN: Tx NTS Cells Received                     0
QBIN: Tx NTS Cells Discarded                    0
QBIN: Hi-Pri Cells Tx to line                   0
QBIN: Tx Hi-Pri Cells Received                  0
QBIN: Tx Hi-Pri Cells Discarded                 0
QBIN: Voice Cells Tx to line                    0
QBIN: Tx Voice Cells Received                   0
QBIN: Tx Voice Cells Discarded                  0
QBIN: TimeStamped Cells Tx to ln                0
QBIN: Tx TS Cells Received                      0
QBIN: Tx TS Cells Discarded                     0

This Command: clrtrkstats 4.4


OK to clear (y/n)?
```

cnfabrparm (configure assigned bit rate queue parameters)

Configures parameters for the Assigned Bit Rate (ABR) queue on all ports on the selected UXM.

You can toggle the Egress/Ingress Congestion Information control and/or the ABR RM cell Explicit Rate stamping parameters on and off. All ports on the UXM in the selected slot are dynamically reconfigured according to the new parameters.

Syntax

cnfabrparm <slot> <CI_control> <ER_control>

Parameters

Parameter	Description
<slot>	Specifies the slot number of the UXM card.
<CI_control>	Enables or disables Egress/Ingress Congestion Information control.
<ER_control>	Enables or disables ABR RM cell Explicit Rate stamping.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			Yes	

Related Commands

cnfportq, **dspportq**, **cnfport**, **dspport**

Example

Configure assigned bit rate queue parameters for slot 5.

cnfabrparm 5

```
sw205          TN    SuperUser       IGX 8420    9.3    Apr. 13 2000 04:50 GMT

ABR Configuration for UXM in slot 5

CI Control         : N
Egress ER Stamping : N


This Command: cnfabrparm 5
```

cnfapsln (configure APS line parameters)

Configure SONET APS Line Redundancy according to industry standards. The IGX platform supports ATM trunk redundancy; the BPX supports SONET APS line redundancy. APS line redundancy provides a standards-based solution to line redundancy.

Note For the Annex A protocol, you cannot set both the Bidirectional and Nonrevertive options—they are invalid combinations. For the Annex B protocol option, the default is Bidirectional and Nonrevertive.

Syntax

cnfapsln <*slot.port*> <*SFBER*> < *SDBER*> <*Revertive_mode*> <*WTR*> <*Direction*>

Parameters

Parameter	Description	Range/Options
slot.port	Slot and port of the line you want to configure.	–
SFBER (Signal Fail Bit Error Rate)	Signal Fail Bit Error Rate threshold at which point an APS switch occurs.	Default: 3 Range: 3–12
SDBER (Signal Detect Bit Error Rate)	Signal Detect Bit Error Rate for line degradation.	Default 5 Range: 5–12
Revertive mode	Revert to Working line after Wait to Restore interval expires. You must enter the number 0 or 1. This applies only to automatic switches. Revertive switching does not take place as a result of user-initiated switching. For Annex A, the default is non-revertive. For Annex B, the default is non-revertive. For Annex B, you are not allowed to change to unidirectional or revertive mode.	Default: 1 Range: 0–1 0 = revertive 1 = non-revertive
WTR (Wait to Restore)	Wait to restore interval. After a switch from a Working to a Protection line, this is the interval in minutes to wait before attempting to switch back to the Working line. This is not applicable if the Revertive Mode option is set to N (non-revertive).	Default: 5 Range: 1–12 minutes
Direction	Direction of switching. Unidirectional is switching in only one direction. With Bidirectional, after one side switches, then the other side also switches. For Annex A, the default is unidirectional. For Annex B, default is bidirectional. For Annex B, you are not allowed to change to unidirectional or revertive mode.	Default: 0 (unidirectional) Range: 0–1, where 0 is unidirectional and 1 is bidirectional.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	Yes	BPX			Yes	

Related Commands

addapsln, delapsln, cnfapsln, dspapsln, dsplog, dspalms, switchapsln

Example

Configures APS line parameters.

cnfapsln 1.1

```
alexa       TRM    genre         BPX 8620           9.3         Apr. 13 2000
16:15 PDT

APS Configuration parameters for Working, Protection lines 1.1, 1.2

APS Protocol:                                          1+1

Signal Fail BER threshold (10 to the -n):              3
Signal Detect BER threshold (10 to the -n):            5
Revertive Switching:                                   Yes
Wait to Restore Timer:                                 5 minutes
Uni/Bi Directional Switching:                          Unidirectional

Command: cnfapsln 1.1
```

Example

Configures APS line parameters.

cnfapsln 1.1

```
colossus       TN    StrataCom       BPX 8600    9.3    Apr. 13 2000  16:08 PDT

APS Configuration parameters for Working, Protection lines 1.1, 1.2

APS Protocol:                                 1+1

Signal Fail BER threshold (10 to the -n):     3
Signal Detect BER threshold (10 to the -n):   5
Revertive Switching:                          Yes
Wait to Restore Timer:                        5 minutes
Uni/Bi Directional Switching:                 Unidirectional

Command: cnfapsln 1.1
```

Example

Configures APS line parameters for APS 1:1 line redundancy

cnfapsln 6.3

```
colossus       TN    StrataCom       BPX 8600    9.3    Apr. 13 2000  16:08 PDT

APS Configuration parameters for Working, Protection lines 6.3, 6.4

APS Protocol:                                 1+1

Channels Halved for APS operation:            Yes
APS Standard for Card:                        GR-253

Signal Fail BER Threshold (10 to the -n):     3
Signal Detect BER Threshold (10 to the -n):   5
Uni/Bi Directional Switching:                 Bidirectional
Revertive Switching:                          Yes
Wait to Restore Timer:                        5 minute(s)


Command: cnfapsln 6.3
```

cnfasm (configure ASM card)

Sets configurable parameters associated with the BPX Alarm and Status Monitor card in slot 15. Because this card always resides in slot 15, entering the slot number is unnecessary. Robust alarms are generated for these alarm conditions:

- Power supply, temperature, fan, and DC-voltage level alarms. (Some of these conditions already generate Robust Alarms on the IGX.)
- Connection AIS alarm
- Bus failure
- External clock source failure
- Multiple invalid login attempts on a user port (potential security threat)
- Excessive CPU and memory usage on switch processor card

These alarm conditions above appear in the maintenance log or in the node command line interface commands (**dspasm**), and are not also reported as SNMP trap to the customer NMS. (Such traps are generated by the Cisco WAN Manager RTM proxy upon receiving Robust Alarms from a switch.)

In Release 9.2 and above, robust alarms are generated by the BPX when power and temperature alarm conditions are detected by the ASM card. The ASM card monitors and reports events involving:

- Power supplies
- Cabinet temperature
- Cooling fan speed
- DC-voltage level

You configure and control the reporting of these events by using the **cnfasm** command, where you can enable or disable each alarm. For power supply failure/removal events, you can also specify the alarm class (that is, Major vs. Minor).

A robust alarm is generated by these events:

- The IGX platform when a DC-voltage out-of-range condition occurs.
- All switch platforms (IGX, BPX) when:
  - An Alarm Indicator Signal (AIS) condition is detected on a PVC. The alarm now has an NNI Status field that previously appeared in the Connection NNI Alarm message.
  - A bus failure or failure cleared event occurs. (In releases previous to Release 9.2, such events are reported through maintenance log messages.)
  - An external clock source failure or failure cleared event occurs.
  - The number of successive invalid login attempts on a user port exceeds the current threshold setting on the switch. You set the threshold by using the **cnfsysparm** command.)
  - The processor card CPU utilization of the IDLE process falls below a fixed threshold. The purpose of the alarm is to indicate the possible degradation of service caused by processor load reaching an abnormally high level.

Syntax

cnfasm

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspasm

Example

Configure parameters for the ASM card

cnfasm

```
D1.jea         TRM   SuperUser       BPX 8600    9.3     Apr. 13 2000 12:25 GMT

[1] Cabinet temp threshold:       50 C  [4] Polling interval (msec):    10000
[2] Power A deviation:             6 V  [5] Fan threshold (RPM):         2000
[3] Power B deviation:             6 V


                    ALM                                       ALM
[6]  ACO button      -                  [14] BPX card slot   -
[7]  History button  -                  [15] PSU A failure   Y
[8]  Cabinet temp    Y                  [16] PSU A removed   Y
[9]  Power A volt    Y                  [17] PSU B failure   Y
[10] Power B volt    Y                  [18] PSU B removed   Y
[11] Fan 1 RPM       Y
[12] Fan 2 RPM       Y
[13] Fan 3 RPM       Y


This Command: cnfasm


Which parameter do you wish to change:
```

cnfatmcls (configure class template)

Use **cnfatmcls** to modify the ten Cisco-supplied class templates for ATM connection configuration. (The **addcon** command can take a class as an input.)

When you enter the number of the class to configure, the display shows the current value of each parameter in the class. For each item in the class, a prompt appears for changing or keeping the current value.

You can use **cnfatmcls** and **cnfcls** to configure the rt-VBR ATM connection class. You can use **dspatmcls** and **dspcls** to display the connection parameters for the rt-VBR and nrt-VBR connection classes.

The rt-VBR connections are configured per class 3 service parameters, and nrt-VBR connections are configured per class 2 service parameters. You can change these class parameters by using the **cnfcls/cnfatmcls** commands, or you can enter the parameters individually for each connection by specifying yes to the extended parameters prompt of the **addcon** command.

Note For a new node running software Release 9.2.20 or later, the rt-VBR connection class number is 3. An upgraded node will retain existing connection classes. Therefore, it won’t have the rt-VBR connection class 3. However, you can configure the connection classes to desired service and parameters by using the **cnfcls/cnfatmcls** commands. For nrt-VBR connections in a new node, running Release 9.2.20, a number of connection classes are preconfigured, including 2, 4, 5, and 6.

Syntax

cnfatmcls <class number> [*optional parameters*]

Parameters

Parameter	Description
class	Specifies the class to configure. Range: 1–10
optional parameters	Individual parameters are specific to the type of connection (rt-VBR, nrt-VBR, CBR, UBR, ATFST, ATFR, ABRSTD, ABRFST, ATFT, ATFX, ATFTFST, ATFXFST). Each is prompted one at a time. Refer to the **dspcls** command to see the parameters in each of the classes.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

addcon, cnfatmcls, dspatmcls, cnfcls, dspcls

Example

Configure ATM connection class 10. The command line interface (CLI) displays the current settings and requests the class type (see System Response 1). After you enter a class type, the CLI prompts you to specify each parameter for the selected class type (ABRSTD as System Response 2 shows).

cnfatmcls 10

```
sw60           TN    SuperUser       BPX 8620    9.3 Date/Time Not Set

                        ATM Connection Classes
Class: 10                                                        Type: CBR
   PCR(0+1)     % Util       CDVT(0+1)         Policing
 4000/4000     100/100      10000/10000            4

       Description: "Default CBR 4000"

This Command: cnfatmcls 10

Enter class type (rt-VBR, nrt-VBR, UBR, CBR, ATFST, ATFR, ABRSTD, ABRFST, ATFT, ATFX,
ATFTFST, ATFXFST):


sw60           TN    SuperUser       BPX 8620    9.3 Date/Time Not Set

                        ATM Connection Classes
Class: 10                                                        Type: ABRSTD
   PCR(0+1)     % Util      MCR            CDVT(0+1)         AAL5 FBTC
 4000/4000     100/100  4000/4000         10000/10000            n

       Description: "Default CBR 4000"

This Command: cnfatmcls 10 abrstd * * * * *

Do you want this change (y/n)?
```

Example

Configure ATM connection class 3 for rt-VBR class type connection parameters. The command line interface (CLI) displays the current settings and requests the class type.

cnfatmcls 3

```
sw60           TN    SuperUser       BPX 8620    9.3 Date/Time Not Set

                        ATM Connection Classes
Class: 3                                                        Type: rt-VBR
   PCR(0+1)     % Util       CDVT(0+1)        AAL5 FBTC       SCR
 2000/2000     100/100      10000/10000          n           2000/2000

  MBS       Policing
1000/1000        3

       Description: "Default rt-VBR 2000"


This Command: cnfatmcls 3


Enter class type (rt-VBR, nrt-VBR, UBR, CBR, ATFST, ATFR, ABRSTD, ABRFST, ATFT, ATFX,
ATFTFST, ATFXFST):
```

cnfbmpparm (configure priority bumping)

Configures priority bumping parameters.

Priority bumping requires a number of configuration parameters saved in the BRAM and sent to the Standby Processor card. The parameters consist of a feature activation flag, a bundle size, and a set of seven CoS bands (0-7), implicitly defining eight CoS bands. Unlike Automatic Routing Management capabilities, which include a number of different operational flavors, priority bumping is strictly a CoS-based (or, more accurately, band-based) algorithm. Each band is defined by the low-end CoS value within the band. Band 0 (implicitly defined) is the most important one, whereas Band 7 is the least important. Each connection within a band is equally important, despite the fact that it might be tagged with a different CoS. Note that Band 0 is not bumpable.

A minimum of two bands are required to be defined for the priority bumping feature to work. A network with only one band is equivalent to having the priority bumping feature disabled.

The entire network must be upgraded to 9.3.0 in order for the priority bumping feature to be operational.

Use these steps to set up priority bumping:

Step 1 For a BPX switch, a license must be purchased for each BPX node on the network using the **cnfswfunc 6 e command** (see the first Example). The Cisco System Engineer enters the password to purchase priority bumping license. The license is granted immediately with the correct password.

Step 2 Before you enable priority bumping, ensure that a minimum of two bands exist by using the **dspbmpparm** command.

Caution If less than two bands exist, the BCC aborts.

The following sample output shows that two bands do not exist:

```
XXX      TN    Cisco           BPX 8620   9.3.0     Feb. 22 2006 12:12 GMT

   Priority Bumping Enabled                [  NO]
   Priority Bumping Bundle                 [    0]
   Priority Bumping Bands:
   Band 0 (non-bumpable)                   [ 0-15]




   Priority Bumping Active on this node    [   NO]
   Number of bumpable Bands                [    0]

Last Command: dspbmpparm
```

If a minimum of two bands do not exist, use the **cnfbmpparm** command to create the bands. The following sample output shows the default values for the bumping bands:

```
XXX        TN    Cisco           BPX 8620  9.3.0    Feb. 22 2006 12:10 GMT

1  Priority Bumping Enabled               [  NO]
2  Priority Bumping Bundle                [  50] (D)
3  Priority Bumping Bands:
   Band 1                                 [   2] (D)
   Band 2                                 [   4] (D)
   Band 3                                 [   6] (D)
   Band 4                                 [   8] (D)
   Band 5                                 [  10] (D)
   Band 6                                 [  12] (D)
   Band 7                                 [  14] (D)


Last Command: cnfbmpparm 3 2 4 6 8 10 12 14
```

Step 3 From either an IGX switch or a BPX switch, enable priority bumping from any node on the network using the **cnfbmpparm** command.

Parameter changes made at one node are propagated to the rest of the network, then updated both to the BRAM and Standby Processor card.

The default configuration when priority bumping is enabled is shown below:

Band	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
CoS	0/1	2/3	4/5	6/7	8/9	10/11	12/13	14/15

Step 4 To test priority bumping (optional) you can create an environment to “stress” bandwidth resources and see how the feature works. For example:

1. Delete a trunk.
2. Physically remove a cable to a connection.
3. Add connections to create limited bandwidth resources on a trunk.

You then can use the **dspcons** command to view connection routing.

Step 5 To display the CoS-based loads, use the **dspload** command. Information about the CoS-based loads within each band helps you determine where to add connections in a priority bumping environment. The loads are displayed for a trunk. The total capacity is shown at the bottom of the display, and the load for each Band is displayed at the top. Any connection that is added to a band could bump and utilize bandwidth resources for the band that follows it; for example, adding a connection to Band 5 can bump connections in Band 6 and Band 7, allowing connections in Band 5 to utilize the bandwidth from those bands.

Limitations

- Priority bumping does not support a situation when VPC CONIDs (or any resources other than bandwidth and LCN) are in short supply.
- Priority bumping can only be activated when all nodes are upgraded to Release 9.3.0 switch software, or higher.

- In a 9.3 network, there can be some nodes (BPX only) that do not purchase the priority bumping feature. Consequently, they are not capable of participating in the priority bumping operations. These nodes are not chosen during route selection unless the trunks leading to or from the nodes have sufficient network resources.
- The maximum number of low priority connections that can be bumped in each attempt to route a high priority connection is 1023.
- The maximum number of connections that can be bundled in a routing attempt is 50.

Syntax

cnfbmpparm [1 [<enable>|<disable>]]
[2 <bundle>]
[3 <b1> <b2> [<b3> [<b4> [<b5> [<b6> [<b7>]]]]]]

Parameters

Parameter	Values	Description
Priority Bumping Enabled	ON or OFF Default OFF	This flag specifies whether the priority bumping feature is activated on the node.
Priority Bumping Bundle	Range: 1–50 Default 10	The number of connections that can be selected in a priority bumping routing request.
Bumping Band 1	Range: 1–50 Default 2	The lowest value in the second most important CoS band. Connections with a CoS value below *Bumping Band 1* are implicitly grouped as the most important band, Band 0. Connections in Band 0 can bump those in other bands, but cannot be bumped. Connections in Band 1 can bump those in bands 2–7, and can only be bumped by those in Band 0.
Bumping Band 2	Range: 1–15 Default 4	The lowest value in the third most important CoS band. Connections in this band can bump those in bands 3–7, and can be bumped by those in bands 0–1. *Bumping Band 2* cannot be less than *Bumping Band 1*. If they are equal, the band definition ends.
Bumping Band 3	Range: 1–15 Default 6	The lowest value in the fourth most important CoS band. Connections in this band can bump those in bands 4-7, and can be bumped by those in bands 0–2. *Bumping Band 3* cannot be less than *Bumping Band 2*. If they are equal, the band definition ends.
Bumping Band 4	Range: 1–15 Default 8	The lowest value in the fifth most important CoS band. Connections in this band can bump those in bands 5–7, and can be bumped by those in bands 0–3. *Bumping Band 4* cannot be less than *Bumping Band 3*. If they are equal, the band definition ends.

Parameter	Values	Description
Bumping Band 5	Range: 1–15 Default 10	The lowest value in the sixth most important CoS band. Connections in this band can bump those in bands 6–7, and can be bumped by those in bands 0–4. *Bumping Band 5* cannot be less than *Bumping Band 4*. If they are equal, the band definition ends.
Bumping Band 6	Range: 1–15 Default 12	The lowest value in the seventh most important CoS band. Connections in this band can only bump those in Band 7, and can be bumped by those in bands 0–5. *Bumping Band 6* cannot be less than *Bumping Band 5*. If they are equal, the band definition ends.
Bumping Band 7	Range: 1–15 Default 14	The lowest value in the least important CoS band. Connections in this band cannot bump, but can be bumped by those in bands 0–6. *Bumping Band 7* cannot be less than *Bumping Band 6*.

Attributes

Privilege	Jobs	Log	Node	Card Type and Memory Requirement	Lock
1–2	No	No	IGX or BPX	NPM-32 NPM-64 BCC-64.	Yes

Related Commands

dspbmpparm, dspbmpstats

Example

Purchase priority bumping on a BPX using the **cnfswfunc** command, option 6

cnfswfunc 6 e

```
---------------------------------------------

bpx1           TN    StrataCom       BPX 8620  9.3.0K    Jan. 26 2000 14:16 PST

Index Status    Function

1      Enabled   Configuration Save/Restore
2      Enabled   ForeSight
3      Enabled   Multiple VTs (6 sessions enabled)
4      Enabled   Virtual Trunks
5      Enabled   ABR standard with VSVD
6      Enabled   Priority Bumping

Last Command: cnfswfunc 6 e
```

Example

CoS-based loads.

```
igxaf1         TN    StrataCom       IGX 8420  9.3 the.0F    Jan. 10 2000 15:33 PST

Configured Trunk Loading:  TRK  igxaf1 16.4--10.1 bpx2
 Band:  CoS            Xmt-c    Rcv-c
 B1  : 1- 1              191      191  Conid In Use+Avail 256
 B2  : 2- 2              288      288
 B3  : 3- 3             1036     1036 VPC conids: 0/256
 B4  : 4- 4              216      216
 B5  : 5- 5              216      216  Trunk type is Terrestrial
 B6  : 6-13              900      900  Trunk supports cell routing
 B7  :14-15              300      300  Trunk does not use ZCS
 Total In Use           3147     3147  Trunk end supports all gateway types
 Reserved                400      400  Gateway conns:   28/200
 Available                75       75  Traffic: V TS NTS FR FST CBR NRT-VBR ABR
 Total Capacity         3622     3622           RT-VBR
Lcn/GwLcn bmap, oe: 7F/5F,7F/00
```

Example

Default Setup, Eight CoS Bands.

The default configuration is priority bumping disabled. However, when the feature is simply enabled (without changing the other banding parameters), the network would operate with eight CoS bands.

Band	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
CoS	0/1	2/3	4/5	6/7	8/9	10/11	12/13	14/15

Example

Refined Granularity of CoS Banding.

A sample *PB_Band* configuration of 1, 2, 3, 4, 5, 11 and 13 provides a better granularity of CoS banding at the more important end of the spectrum.

Band	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
CoS	0	1	2	3	4	5-10	11/12	13-15

Another sample *PB_Band* configuration of 3, 5, 8, 12, 13, 14 and 15 provides a better granularity of CoS banding at the less important end of the spectrum.

Band	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**
CoS	0-2	3/4	5-7	8-11	12	13	14	15

Example

Reduced CoS Banding, Better Operational Performance.

A sample *PB_Band* configuration of 1, 2, 8, 9, 9, 9 and 9 provides a reduced CoS banding, thus allowing better routing performance (with fewer iterations through the bands).

Band	0	1	2	3	4
CoS	0	1	2-7	8	9-15

This screen illustrates how the bands are configured, then displayed.

```
------------------------------------SCREEN 1-----------------------------------
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 13 2000 10:03 GMT

1  Priority Bumping Enabled                 [ YES]
2  Priority Bumping Bundle                  [  50] (D)
3  Priority Bumping Bands:
   Band 1                                   [   1] (D)
   Band 2                                   [   2] (D)
   Band 3                                   [   8] (D)
   Band 4                                   [   9] (D)
   Band 5                                   [   9] (D)
   Band 6                                   [   9] (D)
   Band 7                                   [   9] (D)


Last Command: cnfbmpparm 3 1 2 8 9 9

------------------------------------SCREEN 2-----------------------------------
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 13 2000 10:00 GMT

   Priority Bumping Enabled                 [  YES]
   Priority Bumping Bundle                  [   50]
   Priority Bumping Bands:
   Band 0 (non-bumpable)                    [ 0- 0]
   Band 1                                   [ 1- 1]
   Band 2                                   [ 2- 7]
   Band 3                                   [ 8- 8]
   Band 4                                   [ 9-15]


   Priority Bumping Active on this node     [   NO]
   Number of bumpable Bands                 [    0]


Last Command: dspbmpparm
```

Example

Minimum CoS Banding.

Another sample *PB_Band* configuration of 1, 1, 1, 1, 1, 1 and 1 provides a minimum CoS banding of only two bands).

Band	0	1
CoS	0	1-15

cnfbpnv (set backplane type to new)

Use the command **cnfbpnv** to configure the backplane, if the backplane is so enabled. This operation is necessary in some instances to program the NOVRAM.

Issue the **dspbpnv** command to see the NOVRAM setting. For some operations, it is necessary to verify the NOVRAM in order to ensure feature compatibility. For example, in order for the BPX 8600 to operate at 19.2 Gbps with the BCC-4V, it must have the NOVRAM Word #2 set to 0001 (which indicates that the backplane version is new). If it instead has the NOVRAM Word#2 set to 0000 (indicating that the backplane version is old) the switch cannot run with a 19.2 Gbps peak throughput. If you visually verify that the backplane is a 19.2 Gbps backplane (see note below), but the backplane NOVRAM Word #2 has not been set to 0001, then issue the **cnfbpnv** command to program the NOVRAM.

Step 1 Enter **cnfbpnv**, and the response is:

Are you sure this is a new backplane (y/n)

Enter **y**

Step 2 Use the command **dspbpnv** to confirm the change. It should display:

Word #2 =0001

Note The 19.2 backplane can be visually identified by the small white card slot fuses at the bottom rear of the backplane. These fuses are approximately 1/4 inch high and1/8 inch wide. The 9.6 Gbps backplane does not have these fuses. If the BPX switch is a late model, then a 19.2 Gbps backplane is installed.

Syntax

cnfbpnv

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
Super User	No	No	BPX	No	OK	Yes	No

Related Commands

dspbpnv

cnfbus (configure active bus)

Use the **dspbuses** command to display the current bus configuration when configuring the buses with the **cnfbus** command. It should only be necessary to use this command when a problem is suspected with the currently active System Bus. As a safeguard against bus failure, each node is equipped with redundant System Buses, Bus A and Bus B. Either bus can be configured as the active bus and the remaining bus is reserved as standby.

Syntax

cnfbus <a | b | t | l>

Parameters

Parameter	Description
a	Select Bus A as the active bus.
b	Select Bus B as the active bus.
t	Toggles between buses. It changes the standby bus to the active bus and the active bus to the standby bus.
l	Toggles between buses and lanes. It changes the standby bus to the active bus and the standby lane to the active lane and the active bus to the standby bus and the active lane to the standby lane.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	Yes	Yes	IGX			Yes	

Related Commands

dspbuses

Example

Configure the system bus to toggle.

cnfbus t

```
pubsigx1       TN    SuperUser       IGX 32    9.3       Apr. 13 2000 19:42 GMT

                                Bus Info

Bus Bandwidth usage in Fastpackets/second   (Snapshot)

    Allocated = 20000      ( 2%)

    Available = 1148000    (98%)


-----------
Bus A: Standby - OK
Bus B: Active - OK


Last Command: cnfbus t


Next Command:
```

cnfbusbw (configure UXM card bus bandwidth)

Configures the amount of bandwidth allocated on the bus for a specified UXM card. The default amount of bus bandwidth allocated depends on the connection type you are adding; 77 Mbps (1/2 OC-3 rate) of bus bandwidth is allocated to an OC-3 port card when the first line is upped. For the T3/E3 line, 44/34 Mbps (T3/E3 rate) is allocated as default bus bandwidth. For a T1/E1 line, the amount of bandwidth allocated will be enough for all T1/E1 lines supported on the card.

After the default bus bandwidth is allocated, the system will not allocate any more bus bandwidth to the card when you activate more lines, so you must manually allocate the bus bandwidth to the card using the **cnfbusbw** command. All ports on the UXM in the selected slot are dynamically reconfigured according to the new parameters.

Syntax

cnfbusbw <slot> <bw>

Parameters

Parameter	Description
<slot>	Specifies the slot number of the UXM.
<bw>	Specifies the amount of bandwidth to be allocated in UBUs, which the system converts to either FastPackets per second or cells per second. The maximum rate you can set is 288,000 cells per second, which is 235 UBUs. Each UBU is the equivalent of 4000 cells per second.

Display Fields

Display	Description
Minimum Required Bandwidth	Minimum bandwidth in FastPackets per second and cells per second required for all connections currently configured on this card. This is calculated by UXM firmware as connections are added.
Maximum Port Bandwidth	Total bandwidth of all active trunks/ports on this card in FastPackets per second, cells per second and UBUs.
Average Bandwidth and Peak Used Bandwidth	Statistics counters maintained by UXM firmware. These statistic counters display FastPackets per second, cells per second, and UBUs. Use this information when calculating the amount of bus bandwidth to be allocated. These counters are cleared when the UXM card is reset.

Display	Description
Last Updated time	Shows the time when the counters were last updated. This will be the current time if you answered yes to the `Get updated bandwidth info from card (Y/N)?` prompt or entered the command with the u parameter.
Allocated Bandwidth	The bandwidth allocated for this card using the **cnfbusbw** command. Allocated bandwidth is specified in UBU units and converted to either FastPackets per second or cells per second by the system.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	IGX			Yes	

Related Commands

dspbusbw (a standard user command)

Example

Configure the bandwidth on the UXM card in slot 3 of the IGX.

cnfbusbw 3

```
sw108          VT    Cisco          IGX 8420  9.3.p8    Dec. 13 2000 11:47 GMT

Bus Bandwidth Usage for UXM card in slot 3   Last Updated on 12/13/00 11:45:46

                          FPkts/sec   Cells/sec    UBUs
Minimum Reqd Bandwidth:           0       19549       5
Average Used Bandwidth:           0           0       0
Peak    Used Bandwidth:           0           2       1
Maximum Port Bandwidth:           -     1059624     265

Allocated    Bandwidth:                               1
           (Cell Only):           -        4000
           (Cell+Fpkt):        2000        3000
           (Fpkts / 2 + Cells)   <=        4000


Reserved     Bandwidth:           -        4000       1

Last Command: cnfbusbw 3
```

cnfcassw (configure CAS switching)

Configures a UVM to convert channel associated signaling (CAS) and dual-tone multi-frequency (DTMF) tones to common channel signaling (CCS) call control messages. This conversion is necessary for voice networks in which a Voice Network Switch (VNS) uses SVCs to route calls from a CAS-based PBX through a WAN. Model B or later firmware on the UVM is necessary.

Before you can execute **cnfcassw**:

- The line to which you apply **cnfcassw** must be up.
- If any connections exist on the line, you cannot change the **cnfcassw** parameters. However, you can execute the command to see the current parameters in the **cnfcassw** display.
- You cannot configure a line for both CAS-switching and pass-through.
- With CAS-switching on a UVM that has Y-cable redundancy, the call state of each connection is lost in the event of a switch-over.

Syntax

cnfcassw <line> <mode> <CCS type> <CAS type> <conn type> <country code> <interdigit timeout> <tone level> <DTMF duration> <idle pattern> <*parameters 6–18*>

Note For the initial implementation of CAS switching, you should specify only port 1 for the *line* parameter (where *line* has the format *slot.port*) and select "PBX-end" for *mode*.

Parameters

Parameter	Description	Default
line	Specifies the line in the format *slot.port*. The line must be up before you can execute *cnfcassw*.	
mode	Possible entries are "p" for PBX-end, "s" for server-end, or "o" for off. The applications are as follows: • PBX-end applies to a UVM connected to a PBX. Specify PBX-end mode if you plan to add the signaling channel (using **addcon**) at the UVM connected to the PBX (rather than the CVM or UVM connected to the VNS). • Server-end applies to a UVM connected to the VNS. Specify Server if you plan to add the signaling channel (using **addcon**) at the UVM connected to the VNS (rather than the PBX). • Off means the UVM is not in CAS-switching mode.	off
CCS type	Range: 1–4. A 1 selects Q.SIG.	1
CAS type	Range: 1–32. A 1 specifies AB signaling for 2-wire E&M line.	1
conn type	Specifies the type of voice connection. Range: a32 and a24.	a32
country code	Range: 0–0xFF. For example, 0 is the U.S. country code.	0

Parameter	Description	Default
interdigit timeout	Range: 0–0xFF, where each hexadecimal value you enter is a multiplier of 50 millisecond increments.	05, which results in 250 ms.
tone level	Specifies the dB level of the DTMF below 0 dBm. Range: 0–0xFF	00 for 0 dB
DTMF duration	Specifies the DTMF on/off duration. Range: 0–0xFF, and the value you enter is multiplied by 5 millisecond increments.	0C, which results in 60 ms on then 60 ms off.
idle pattern	Specifies the data pattern for the data channel. Range: 0–0xFF	7F for T1, 54 for E1 line
parms 6–19	Parameters 6-18 are reserved for future use.	00

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	Yes	IGX			Yes	

Related Commands

dspln, dsplncnf

Example

Configure port 1 of the UVM in slot 5 to support CAS switching.

cnfcassw 5.1

```
sw175          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000 06:11 PST

Line 5.1 CAS Switching Parameters
=> CASSW mode    [OFF]                      Parm 11       [00] (H)
   CCS Type      [ 1] (D)                   Parm 12       [00] (H)
   CAS Type      [ 1] (D)                   Parm 13       [00] (H)
   Conn Type     [a32   ]                   Parm 14       [00] (H)
   Country code  [00] (H)                   Parm 15       [00] (H)
   Interdigit TO [05] (H)                   Parm 16       [00] (H)
   Tone level    [00] (H)                   Parm 17       [00] (H)
   DTMF duration [0C] (H)                   Parm 18       [00] (H)
   Idle pattern  [54] (H)
   Parm 6        [00] (H)
   Parm 7        [00] (H)
   Parm 8        [00] (H)
   Parm 9        [00] (H)
   Parm 10       [00] (H)

This Command: cnfcassw 5.1

Enter mode: Pbx/Server/Off (o):
```

cnfcdparm (configure card parameters)

Configures card level functionality, including the level of channel statistics, the selection of VC merge, and support for O.151 OAM cell format, a non-standard format still used by some service providers instead of the standard I.610 OAM cell format.

This command supports the multilevel channel statistics feature, which lets you configure and display additional levels of statistics on a BXM or UXM card.

Configuration of the channel statistic level is a slot-based parameter. For example, if slot 5 is configured to support level 3 channel statistics, all connections on the card in slot 5 will be set to level 3 statistics.

The multilevel channel statistics feature is supported on the BPX and IGX platforms, for BXM and UXM cards. (Refer to release notes for card firmware release requirements.) The multilevel channel statistics feature requires switch software to collect, display, and propagate to Cisco WAN Manager the various statistics types. The channel statistic types vary in number and type based upon the level of support provided by the BXM and UXM cards. For additional information see the "Multilevel Channel Statistics Support" section on page 3-146.

Apart from the **cnfcdparm** command that you use to configure the channel statistic level on the BXM/UXM cards, you use the following commands to configure and display BXM and UXM card statistics:

- Summary Statistics Commands: **dspchstats**, **clrchstats**
- Interval Statistics Commands: **dspchstathist**, **dspchstatcnf**, **cnfchanstats** (statistics information collected by these commands is sent to Cisco WAN Manager)

Syntax

cnfcdparm <slot> <index> <value>

Parameters

Parameter	Description
<slot>	Specifies the slot.
<index> and <value>	Index values are 1, 2, or 3; 1 = Channel Statistics. If 1 is entered for <index>, the values are one of the statistics levels: 0, 1, 2, 3. For a description of all four channel statistics levels, see the *BPX 8600 Installation and Configuration Manual, Release 9.3.30*, Chapter 5 BXM Card Sets: T3/E3, 155, and 622.

Parameter	Description
<index> and <value>	Index values are 1, 2, or 3; 2 = VC Merge. If 2 is entered for <index>, the values are: E = Enable VC Merge feature D = Disable VC Merge feature Enable or disable Virtual Circuit (VC) merge. VC merge improves the scalability of MPLS networks and allows multiple incoming VCs to be merged into a single outgoing VC, which is called merged VC. VC Merge is responsible for processing any incoming VSI messages from the MPLS controller and identifies the merging request. In the BPX 8600 series switch, VC Merge is implemented as part of the output buffering for ATM interfaces. The VC Merge feature requires the enhanced BXM (BXM-E) cards. Tag switching is supported. Only frame-based connections are implemented.The key to VC Merge is to switch cells from the merging Label Virtual Circuit (LVC) to the merged LVC that points to the destination, while preserving AAL5 framing. Several AAL5 frames can arrive on different VCs and are merged onto a single VC without interleaving the frames. If VC Merge is not supported on the card, N/A is displayed. Errors encountered after executing this parameter may generate the following error messages: • Could not send request to card. The request to enable or disable VC Merge cannot be sent to the BXM-E card. • Card rejected cmd.The BXM-E card rejects the request to enable or disable VC Merge. • No response from card. The BXM-E card did not respond to the request to enable or disable VC Merge.
<index> and <value>	Index values are 1, 2, or 3; 3 = O.151 OAM cell format If 3 is entered for <index>, the values are: E = Enable O.151 OAM cell format D = Disable O.151 OAM cell format Support for O.151 OAM is on a per card basis. If O.151 OAM is enabled on the card: • The card is then able to support both I.610 and O.151 formats at the same time. • You can then use the command **tstconseg** with O.151 OAM cells or I.610 cells running on all connections provisioned on that card. **Note** The user cannot execute the command **addyred** if O.151 OAM is enabled on the primary card and the secondary card does not support the feature.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX	No	OK	Yes	No

Related Commands

cnfchstats, **dspchstats, tstpingoam, tstconseg**

Example (BPX)

Configure channel statistics level 1 on slot 11 in the BPX.

cnfcdparm 1 3 E

```
sw252          TN    Cisco           BPX 8620  9.3.30    Aug. 21 2001 18:21 PST

                            Card Parameters

1  Channel Statistics Level .........................................     1
2  VC Merge State           .........................................     N/A
3  O.151 OAM Format         .........................................     E

Last Command: cnfcdparm 1 3 E

O.151 OAM cell format enabled on this card.
Next Command:
```

Example (BPX)

Enable VC Merge on slot 5.

```
m2             TN    Cisco           BPX 8620  9.3.a0    May  7 2001  21:37 GMT

                            Card Parameters

1  Channel Statistics Level .........................................     1
2  VC Merge State            .........................................     E


Last Command: cnfcdparm 5 2 e


VC Merge enabled on this card.
```

Example (BPX)

```
Error message when VC Merge is selected by not supported (note N/A beside VC Merge State).
cnfcdparm 2 E
hugh           TN    Cisco           BPX 8620  9.3.3o    May  21 2001 09:39 PST

                            Card Parameters

1  Channel Statistics Level .........................................     1
2  VC Merge State            .........................................    N/A


VC Merge not supported by card
This Command: cnfcdparm 2 E
```

Multilevel Channel Statistics Support

The number of statistics available are based upon the statistics level programmed on the BXM or UXM card. Table 3-16 lists the channel statistics available on the BXM and UXM cards. The four different levels supported are shown, along with the statistics field description as it appears on the related statistics screens (**dspchstats**, **cnfcdparm**, **clrchstats**, **dspchstathist**, **dspchstatcnf**, **cnfchanstats**).

Table 3-16 Channel Statistics Available on BXM

Level 0	Level 1	Level 2	Level 3
No Stats	RX Cells from port	All level 1	All Level 2
	RX EOFs from port	TX EFCI 1 to Port	RX EFCI 1 from Port
	RX cells to NW	RX CLP0 to NW	RX EFCI 0 from Port
	RX CPL1 from port	RX CLP1 to NW	TX EFCI 0 from NW
	RX cells Non-cmplt	TX EFCI 0 to Port	TX EFCI 1 from NW
	RX CLP0 Non-cmplt	RX EFCI 0 to NW	
	RX CLP1 Non-cmpl	RX EFCI 1 to NW	OAM from Port
	Ingress VC Q depth	TX EOFs to Port	RM Cells from Port
	TX cells from NW		RM From NW
	TX CLP1 to Port	RX EOF CNG DSC	OAM From NW
	TX Cells to Port		RM Cells to Port
	RX CLP0 Cng Dscd		Rx EFCI 0 Cng Dsc

Table 3-16 Channel Statistics Available on BXM

Level 0	Level 1	Level 2	Level 3
	RX CLP1 Cng Dscd		Rx EFCI 1 Cng Dsc
	RX CLP0 from Port		Rx OAM Cng Dsc
	TX CLP0 Cells to Port		Rx RM Cng Dsc
	TX CLP0 from NW		Rx FRM to NW
	TX CLP1 from NW		Rx BRM/Fst to NW
	Ingress VSVD ACR		Tx EFCI 0 Cng Dsc
	Egress VSVD ACR		Tx EFCI 1 Cng Dsc
	Egress VC Q Depth		Tx RM Cng Dsc
			Tx OAM Cng Dsc
	*TX CLP 0 Dscd		
	*TX CLP 1 Dscd		
	*TX CLP0+1 Dscd		
	*RX CLP0+1 from prt		
	*OAM State		
	* indicates summary stats only		

However, the **cnfcdparm** command will not allow you to change the statistics level if the card is active. The switch software detects the current channel statistics level available on the UXM or BXM card. Also, switch software performs these card mismatch verification:

- When a card is inserted, if the channel statistic level decreases from the entry in the logical card database, the card will mismatch.
- When a card is inserted, if the channel statistic level increases from the entry in the logical card database, the card will not mismatch. The logical card database will NOT be updated with the increased channel statistic level value, and you will have available only the number of statistics described on the primary card.
- During the Y-cable mismatch verification, if the secondary card has a smaller channel statistic level, then the primary card (logical card) and the secondary card will mismatch. During the Y-cable mismatch verification, if the channel statistic level is larger on the secondary card, the card will not mismatch. The Y-cable will continue to operate based on the number of statistics available on the primary/logical card.

cnfcdpparm (configure CVM card parameters)

Configures CVM parameters for Modem Detection (MDM), certain reserved debug parameters, and In Frame and Out of Frame (I Frm and O Frm) thresholds for DS0A-type T1 applications. (See the **cnfln** description for information on assigning % Fast Modem on a per-channel basis.) All CVMs in the node are dynamically reconfigured according to the new parameters. When you enter the command, the system prompts for a parameter number.

Syntax

cnfcdpparm <parameter number> <new value>

Parameters

Parameter	Description
<parameter number>	Specifies the number of the parameter to change. (See Table 3-17.)
<new value>	Specifies the new value for the parameter.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			Yes	

Related Commands

cnfchts, **dchst**, **cnfecparm**

Caution You should consult the Cisco TAC before changing any of these parameter.

Table 3-17 cnfcdpparm—Parameters and Descriptions

No.	Parameter	Description	Default[1]
1	MDM Low Power Threshold	Power level for Modem Detect high-range threshold.	3160 (H)
2	MDM Stationary Coefficient	Indicates how rapidly the power level is changing to not be detected as modem.	14 (H)
3	MDM ZCR High Freq Threshold	Defines upper frequency value for 2100 Hz tone used in V.25 modem detection.	5A (H)
4	MDM ZCR Low Freq Threshold	Defines lower frequency value for 2100 Hz tone used in V.25 modem detection.	56 (H)
5	MDM Detect Failure Count	Defines number of failures above which fast modem is not declared.	4 (H)
6	MDM Detect Window Min.	Number of 5.25-milliseconds windows used in modem tests.	39 (H)

Table 3-17 cnfcdpparm—Parameters and Descriptions (continued)

No.	Parameter	Description	Default[1]
7	MDM Detect Silence Max.	Amount of time a channel stays in a modem-detected state. The parameter equals the value you enter times 84 milliseconds. Default=1008 milliseconds.	C (H)
8	MDM Pkt Header	Changes packet type from voice to non-time-stamped for modems.	6 (D)
9	Null Timing Pkt Header	Gives a higher priority to the specified number of voice packets to decrease delay for spurts of talking.	4 (D)
10	Debug Parameter A	A reserved engineering debug parameter. This parameter does not actually go to the card.	0 (H)
11	Debug Parameter B	A reserved engineering debug parameter. This parameter does not actually go to the card.	0 (H)
12	I Frm 2.4 Threshold(msecs)	Specifies In Frame threshold for DS0 2.4 Kbps overhead data channel.	500 (D)
13	O Frm 2.4 Threshold (msecs)	Specifies Out of Frame threshold for DS0 2.4 Kbps overhead data channel.	500 (D)
14	I Frm 4.8 Threshold (msecs)	Same as 19 for DS0 4.8 Kbps channel.	500 (D)
15	O Frm 4.8 Threshold(msecs)	Same as 20 for DS0 4.8 Kbps channel.	500 (D)
16	I Frm 9.6 Threshold(msecs)	Same as 19 for DS0 9.6 Kbps channel.	500 (D)
17	O Frm 9.6 Threshold (msecs)	Same as 20 for DS0 9.6 Kbps channel.	500 (D)

1. Enter value in either decimal (D) or hexadecimal (H).

Example

cnfcdpparm

```
pubsigx1       TN    SuperUser       IGX 32    9.3 Apr. 13 2000 18:06 PDT

1   MDM Low  Pwr Thrsh      [3160] (H)  15  0 Frm 4.8 Thrsh (msecs) [ 500] (D)
2   MDM Stationary Coef.    [  14] (H)  16  I Frm 9.6 Thrsh (msecs) [ 500] (D)
3   MDM ZCR High Frq Thrsh  [  5A] (H)  17  O Frm 9.6 Thrsh (msecs) [ 500] (D)
4   MDM ZCR Low  Frq Thrsh  [  56] (H)
5   MDM Detect Failure Cnt  [   4] (H)
6   MDM Detect Window Min.  [  39] (H)
7   MDM Detect Silence Max. [  24] (H)
8   MDM Pkt Header          [   6] (D)
9   Null Timing Pkt Header  [   4] (D)
10  Debug Parm A            [   0] (H)
11  Debug Parm B            [   0] (H)
12  I Frm 2.4 Thrsh (msecs) [ 500] (D)
13  O Frm 2.4 Thrsh (msecs) [ 500] (D)
14  I Frm 4.8 Thrsh (msecs) [ 500] (D)

This Command: cnfcdpparm


Which parameter do you wish to change:
```

cnfcftst (configure communication fail test pattern)

The communication fail test pattern is used to periodically test for failure of nodes to communicate with each other. This test pattern is also used to recover from communication fail conditions.

A communication fail is defined as a loss of controller communication over one or more trunks to a particular node. A communication fail differs from a communication break condition in that the node may be reachable over other paths. The communication fail test is used to test the failed trunk for proper controller traffic.

Use **cnfcftst** to configure the communication fail test pattern byte by byte. It defaults to a pattern of 4 bytes of 1s followed by 4 bytes of 0s. Varying the length of the test pattern makes the communications test more or less rigorous. Changing the characters determines the pattern sensitivity for strings of less than 14 bytes.

The **dspcftst** command displays the current communication test pattern. The parameters used for declaring and clearing communication fails are set by the **cnfnodeparm** command.

Syntax

cnfcftst

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

dspcftst

Example

Configure Communication Fail Test Pattern.

cnfcftst

```
pubsigx1       TN    SuperUser       IGX 32    9.3       Apr. 13 2000 21:17 GMT

Comm Fail Test Pattern

==> Byte  0: FF     Byte 12: 00     Byte 24: FF     Byte 36: 00     Byte 48: FF
    Byte  1: FF     Byte 13: 00     Byte 25: FF     Byte 37: 00     Byte 49: FF
    Byte  2: FF     Byte 14: 00     Byte 26: FF     Byte 38: 00     Byte 50: FF
    Byte  3: FF     Byte 15: 00     Byte 27: FF     Byte 39: 00     Byte 51: FF
    Byte  4: 00     Byte 16: FF     Byte 28: 00     Byte 40: FF     Byte 52: 00
    Byte  5: 00     Byte 17: FF     Byte 29: 00     Byte 41: FF     Byte 53: 00
    Byte  6: 00     Byte 18: FF     Byte 30: 00     Byte 42: FF     Byte 54: 00
    Byte  7: 00     Byte 19: FF     Byte 31: 00     Byte 43: FF     Byte 55: 00
    Byte  8: FF     Byte 20: 00     Byte 32: FF     Byte 44: 00     Byte 56: FF
    Byte  9: FF     Byte 21: 00     Byte 33: FF     Byte 45: 00     Byte 57: FF
    Byte 10: FF     Byte 22: 00     Byte 34: FF     Byte 46: 00     Byte 58: FF
    Byte 11: FF     Byte 23: 00     Byte 35: FF     Byte 47: 00     Byte 59: FF

This Command: cnfcftst
Enter Byte 0:
```

cnfchadv (configure channel adaptive voice)

Enables the adaptive voice (ADV) feature for individual channels. ADV must also be enabled at each node that terminates the connection. The channel-specific **cnfchadv** has no effect at nodes that do not support ADV enabled.

If the ADV feature is enabled for a channel with a “c” or “v” connections, VAD is automatically disabled on that channel when trunk bandwidth is available and enabled when trunk bandwidth is needed. If the Adaptive Voice feature is not enabled for a channel with a “c” or “v” connections, VAD is always turned on for that channel. In order for a voice (“c” or “v”) connection to use ADV, both ends must have ADV enabled by the **cnfchadv** command.

Syntax

cnfchadv <channel> <e | d>

Parameters

Parameter	Description
<channel>	Specifies the channel or range of channels over which you specify Adaptive Voice.
e	Enables ADV (default)s
d	Disables ADV

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dspchcnf

Example

Enable Adaptive Voice for channel 13.1.

cnfchadv 13.1

```
sw150          TN    Cisco          IGX 8420  9.3.2T    Dec. 20 2000 00:36 PST

           %   Adaptive          Gain (dB)  Dial   Interface       OnHk    Cond
Channels  Util Voice      Fax    In  Out    Type   Type          A  B  C  D Crit
13.1-24    60  Enabled    -       0    0   Inband  Unconfig      ?  ?  -  -  a



Last Command: cnfchadv 13.1
```

cnfchdfm (configure channel DFM)

Enables or disables Data Frame Multiplexing (DFM) for individual channels and sets the DFM parameters for the channels. The default state when the DFM feature is activated on a card is enabled. Because DFM is a purchased option, the Cisco Technical Assistance Center (TAC) must activate on the applicable nodes before you use the **cnfchdfm** command.

The DFM feature must be both *installed* and *enabled*. The DFM feature must be installed through software control at each node terminating the connection. If DFM is not installed for a pertinent node in the network, the **cnfchdfm** command has no effect at that node. Furthermore, you must use **cnfchdfm** at both ends of the connection to enable DFM.

Syntax

cnfchdfm <channel(s)> <7 | 8 | 16> [e | d]

Parameters

Parameter	Description
channel	Specifies the channel or range of channels.
7 | 8 | 16	Specifies the pattern length in bits for the DFM algorithm. Default: 8 bits
e | d	Optionally enables or disables DFM. Note that DFM works at rates no higher than 128 Kbps. Default: e

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dspchcnf

Example

Set the DFM pattern length to 8 bits for data channel 5.1.

cnfchdfm 5.1 8

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000  16:21 PST

     Maximum EIA      %      DFM Pattern          DFM
Channels     Update Rate      Util      Length          Status
5.1     15     100     8                                Enabled
5.2-4    2     100     8                                Enabled

Last Command: cnfchdfm 5.1 8
Next Command:
```

cnfchdl (configure dial type for channels)

Configures the dial type for a channel or set of channels. The dial type may be inband, pulse, or user-configured. The user-configured option allows non-default timing values to be used. The parameters associated with the **cnfchdl** command are timing constants used to ensure that signaling pulses are not distorted in time by transmission through the network.

- Dial type determines the signaling message timing for a connection. Dial type is ignored for DS0 data connections.
- When you add an inband or pulse dial type to a channel, the channel configuration screen appears, showing the designated dial types for each channel.
- When you add a user-configured dial type, a more detailed screen appears, showing the dial type as well as the signaling delay, minimum wink, interdigit times, and playout delay.

If you select inband, the node assumes that the A and B bits are not used for loop-disconnect dialing. Therefore, any change in signaling bit status goes in a packet to the far end of the connection.

If you select pulse, the transmitting node waits (normally 72 ms) after an A or B bit transition for another transition to arrive. If a transition arrives, the new transition goes into the same signaling packet that is sent to the far end of the connection. This step increases the delay of the signaling transition across the network but decreases the amount of trunk bandwidth used for signaling.

If the default timings are not correct for the network, you must configure the options. The dialing type should be set correctly. If a connection-designated pulse is used for inband signaling, a greater than necessary delay across the network results. If a connection-designated inband is used for pulse signaling, the relative timing of signaling transitions may be lost and so distort the pulses.

Syntax

cnfchdl <channel(s)> <dial_type> [<sig_delay> <min_wink> <int_dig_time>
<playout delay>]

Parameter

Parameter	Description
channel	Specifies the channel or range of channels over which to configure dial type.
dial type	Specifies the dial type to assign. The three possible dial types are: i = inband p = pulse u = user-configured Inband is the default dial type. If you designate "**u**" for a user-configured dial type, you are prompted, as applicable, from among the following: sig delay, min wink, interdigit time, and playout delay.
signaling delay	Specifies the signaling delay for the user-configured dial type. Range: 12–96 ms. Your entry is rounded to the closest multiple of 1.5 ms.
minimum wink	Specifies the minimum wink to assign to the user-configured dial type. Range: 3–765 ms. Your entry is rounded down to the nearest multiple of 3 ms. This parameter does not apply to CDP, UVM, or CVM channels.

Parameter	Description
interdigit time	Specifies the interdigit time for the user-configured dial type. Range: 3–765 ms. Your entry is rounded down to the nearest multiple of 3 ms. This parameter does not apply to CDP, UVM, or CVM channels.
playout delay	Specifies the signaling delay assign to the user-configured dial type. Range: 12–96 ms. Your entry is rounded to the closest multiple of 1.5 ms.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dspchcnf, dspchdlcnf

Example

Configure the dial type of channel 14.1 to pulse.

cnfchdl 14.1 p

```
alpha          TRM   YourID:1        IGX 8420    9.3   Apr. 13 2000 09:46 PST

           %    Adaptive  Gain (dB)   Dial                        OnHk      Cond
Channels  Util  Voice      In  Out     Type   Interface Type    A  B  C  D  Crit.
14.1       40   Enabled     0    -    Pulse   Unconfig          ?  ?  -  -    a
14.2-24    40   Enabled     0    -    Inband  Unconfig          ?  ?  -  -    a




Last Command: cnfchdl 14.1 p


Next Command:
```

cnfchec (configure channel echo canceller)

Configures the echo canceller and other channel parameters associated with a voice channel. (You cannot configure CAS and data channels using **cnfchec**.) The CDP/CVM and UVM have slightly different parameters. Unavailable parameters appear on the screen as a dashed line, so no prompts for these unavailable options appear.

Syntax

For CDP/CVM:
cnfchec <chan> <ec> <erl> <td> <convergence> <nlp>

For UVM:
cnfchec <chan> <ec> <td> <nlp> <bkgd_filter>

Parameters

Parameter	Description
channel	Specifies the channel or range of channels. For a CDP or CVM, "channel" has the format *slot.channel(s)*. For a UVM, "channel" has the format *slot.line.channels(s)*.
echo canceller	Enable or disable the echo canceller. An "e" enables. A "d" disables.
echo return loss	Sets the echo return loss as high/low). An "h" specifies high. An "l" specifies low.
tone disabler	Enables or disables the tone disabler. An "e" enables. A "d" disables.
convergence	Enables or disables convergence. An "e" enables. A "d" disables. Except for test purposes, the normal state for convergence is enabled.
nonlinear processing	Enables or disables nonlinear processing. An "e" enables. A "d" disables.
bkgd_filter	Enables or disables the background filter.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	No	IGX			Yes	

Related Commands

dspchec

Example

Enable and configure the Echo Canceller in channel 7.1 with high echo loss tone disabled, convergence enabled, and non-linear processing enabled. In this example, the card is either a CDP or CVM because the channel is specified with *slot.channel* rather than *slot.line.channel*.

cnfchec 7.1 e h e e e

```
pubsigx1       TN    cisco      IGX 8420  9.3   Apr. 13 2000 06:06 PDT

          Echo     Echo Return    Tone      Conver-  Non-Linear Voice
Channels  Cancel   Loss (.1 dBs)  Disabler gence    Processing Tmplt
7.1       Enabled  High  60       Enabled   Enabled  Enabled    USA
7.2-31    Disabled High  60       Enabled   Enabled  Enabled    USA




Last Command: cnfchec 7.1 e h e e e


Next Command:
```

Example

Enable the echo canceller in channel 10.1.1. In this example, the card is a UVM because the channel is specified with *slot.line.channel*. Note the available parameters differ slightly from a CDP/CVM.

cnfchec 10.1.1

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 12:21 PST

           Echo     Echo Return  Tone     Conver-  Non-Linear Voice Bkgrnd
Channels   Cancel   Loss(.1 dBs) Disabler gence    Processing Tmplt Filter
10.1.1-24  Disabled       -      Enabled      -    Enabled     -    Enabled
10.2.1-24  Disabled       -      Enabled      -    Enabled     -    Enabled





This Command: cnfchec 10.1.1


Enable or Disable Echo Cancel (e/d)? [d]:
```

cnfcheia (configure EIA update rate for channels)

Sets the sampling rate for the updating EIA control leads. You can set this rate from 0 (no sampling) to packet-generation rate for the EIA leads associated with the channel.

At 20 updates/second, the control leads are polled for changes every 50 msec. Therefore, changes occurring more rapidly than that might not be detected. If there is no change in EIA lead status, no packet is sent. A minimum of one update per second is sent if the maximum update rate chosen is from 1 to 20.

If the connection is configured in such a way that an implied isochronous clock is detected, the update rate is always 20 per second in the same direction as that of the clock signal. For 1.544 Mbps data connections, this defaults to 0. This does not affect EIA sampling rates of fast EIA or embedded EIA leads.

Syntax

cnfcheia <channel> <update_rate>

Parameters

Parameter	Description
<channel>	Specifies the channel or range of channels over which to configure the EIA update rate.
<update_rate>	Specifies the maximum EIA update rate in updates per second.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dspchcnf

Example 1

Set the EIA update rate to 15 sec. for data channel 5.1.

cnfcheia 5.1 15

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 16:20 PST

             Maximum EIA      %     DFM Pattern     DFM
Channels      Update Rate     Util     Length     Status
5.1                    15     100     8          Enabled


Last Command: cnfcheia 5.1 15


Next Command:
```

cnfchfax (configure FAX modem detection for channels)

Configures a channel on a UVM for either *FAX detection* or *FAX relay*. If you enable FAX detection, the UVM suspends voice compression when it detects a FAX or modem tone on the channel. For the duration of the FAX, transmission takes place at 64 Kbps.

FAX relay is a mechanism for compression the FAX transmission rate across a network to 9.6 Kbps.

To view the current configuration, use the **dspchcnf** command.

Syntax

cnfchfax <slot.line> <channel> <e | d>

Parameters

Parameter	Description
<slot.line>	Specifies the line of the UVM.
<channel>	Specifies the DS0 or range of DS0s.
<e | d>	Enable or disable FAX detection.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Command

dspchcnf

Example

Configure channels 1-24 on line 1 of the UVM in slot 7 to have FAX modem detection.

cnfchfax 7.1.1

```
sw109          VT    Cisco      IGX 8420    9.3   Apr. 13 2000 19:10 PST

           %   Adaptive          Gain (dB)  Dial   Interface       OnHk    Cond
Channels  Util Voice      Fax    In  Out    Type   Type          A  B  C  D Crit
7.1.1-24   40  Enabled  Disabled  0    0    Inband  2W E&M        0  X  -  -  a
7.2.1-24   40  Enabled  Disabled  0    0    Inband  Unconfig      ?  ?  -  -  a



Last Command: cnfchfax 7.1.1


Next Command:
```

cnfchgn (configure gain insertion for channels)

Configures the amount of gain inserted by the IGX node for a given circuit line channel or range of channels. Gain can be configured between +6 dB and -8 dB. The input gain is inserted at the receive side of a voice card and is therefore applied before the signal is packetized by the card. The output gain is inserted at the transmit side of a voice card and is applied after the signal has been depacketized by the card. Gain is meaningless for channels that carry data.

Syntax

cnfchgn <channel(s)> <input_gain> <output_gain>

Parameters

Parameter	Description
channel	Specifies the channel or range of channels.
input_gain	Specifies the gain, in decibels, to assign to the channel. Range: –8 dB–+6 dB.
output_gain	Specifies the gain, in decibels, to assign to the channel. Range: –8 dB –+6 dB.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dspchcnf

Example

Configure input gain of –4 dB and an output gain of +2 dB for channel 1 of circuit line 1.

cnfchgn 14.1 -4 2

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 09:52 PST

           %    Adaptive  Gain (dB)   Dial                          OnHk      Cond
Channels  Util  Voice     In  Out      Type   Interface Type    A  B  C  D  Crit.
14.1       40   Enabled   -4    -2 User    Unconfig ?  ?  -  -    a
14.2-24    40   Enabled    0    -2 Inband  Unconfig ?  ?  -  -    a



Last Command: cnfchgn 14.1 -4 2


Next Command:
```

cnfchpri (configure Frame Relay channel priority)

Sets the channel priority for a Frame Relay connection. The Channel Priority feature permits some Frame Relay connections to receive a higher priority within a port queue than other Frame Relay traffic on a per-connection basis. The default priority is low. You can configure Frame Relay LMI ports to communicate the priority to a router. You must change the priority on both ends of a connection.

Note Note that data of high-priority (hi-pri) connections is sent to the CPE (customer premises equipment) ahead of data from low priority (low-pri) connections. Note that this parameter has nothing to do with how the connection is routed through the network, but affects only how data is sent to the CPE.

Syntax

cnfchpri <slot.port.DLCI.> <h | l>

Parameters

Parameter	Description
<slot.port.DLCI.>	Specifies the channel or range of channels. The format is *slot.port.DLCI*.
<h | l>	The priority: h = high; l = low.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dspchcnf

Example

Configure a high priority for Frame Relay connection 9.1.100.

cnfchpri 9.1.100 h

```
alpha          TRM   YourID:1        IGX 8410    9.3    Apr. 13 2000 16:00 PST

Conn:  9.1.100    gamma       8.1.200     fr
   MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR    FST
 9.6/9.6   9.6/9.6      5/5       256/256    10/10  65535/65535  9.6/9.6   n
% Util: 100/100
Owner: LOCAL  Restriction: NONE  CoS: 0                     Status: OK
Group: NONE  Priority: H  TestRTD: 0 msec

Path:     alpha   14--13beta    15--15gamma
Pref:     Not Configured


alpha 9.1.100                                  gamma 8.1.200
FRP:   OK                                      FRP:   OK
FRI:   OK                                      FRI:   OK


Last Command: cnfchpri 9.1.100 h


Next Command:
```

cnfchstats (configure channel statistics collection)

Enables statistics collection for various channel parameters. The **cnfchstats** command is sometimes referred to as an "interval statistics" command—the statistics information collected is propagated to Cisco WAN Manager.

To configure the channel statistics level on the BXM and UXM card, use the **cnfcdparm** command. This command lets you configure a specific card slot to support additional levels of statistics (levels 2 and 3) that were supported in releases previous to Release 9.2 (level 1). See the **cnfcdparm** command for more information.

This debug command enables statistics collecting for channel parameters. Table 3-18 lists the statistics by type. Not all statistic types are available for all connections. Only valid statistics are displayed for you to select; inapplicable statistics appear in gray. If you are unsure of the size parameter to specify, select four bytes per sample.

The **dspchstatcnf** command displays the channel statistics configuration. Statistics are collected by and displayed on the Cisco WAN Manager workstation. Cisco WAN Manager allows statistics collection to be customized. You can disable a Cisco WAN Manager-enabled channel statistic by specifying the optional node name of the workstation as the last parameter on the command line.

Syntax

cnfchstats <channel> <stat> <interval> <e | d> [<samples> <size> <peaks>] [nodename]

Parameters

Parameter	Description
<channel>	Specifies the channel (connection) to configure.
<stat>	Specifies the type of statistic to enable/disable. (See Table 3-18.)
<interval>	Specifies the time interval of each sample (1–255 minutes).
<eld>	Enables/disables a statistic. E to enable; D to disable a statistic.
[samples]	Specifies the number of sample to collect (1–255).
[size]	Specifies the number of bytes per data sample (1, 2 or 4).
[peaks]	Enables/disables the collection of one-minute peaks. Y to enable; N to disable.
[nodename]	Specifies the name of the node to which the Cisco WAN Manager terminal connects.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspchstatcnf, **cnfdparm**, **dspchstathist**, **cnfchanstats**

Example

cnfchstats 9.2.1.100

```
 sw199          TN    SuperUser       IGX 8420    9.3    Apr. 13 2000 09:28 PDT

Channel Statistic Types

46) Cells Received from Port           60) Average Tx Vcq Depth in Cells
47) EOF Cells Received from Port       61) Bkwd Severely Errored Cell Blocks
48) Cells Transmitted to Network       62) Bkwd Lost Cell Count
49) Cells Received from Network        63) Bkwd Misinserted Cell Count
50) Cells Received with CLP=1          64) Bkwd Bipolar Violation Count
51) Non-Compliant Cells Received       65) Fwd Severely Errored Cell Blocks
52) Average Rx VCq Depth in Cells      66) Fwd Lost Cell Count
53) Cells Transmitted with EFCI=1      67) Fwd Misinserted Cell Count
54) Cells Transmitted to Port          68) Fwd Bipolar Violation Count
56) Cells Received with CLP=0          69) Good Pdu's Received by the Sar
57) Cells Transmitted with EFCI=0      70) Good Pdu's Transmitted by the Sar
58) Ingress Vsvd Allowed Cell Rate     71) Rx pdu's discarded by the Sar
59) Egress Vsvd Allowed Cell Rate      72) Tx pdu's discarded by the Sar



sw199          TN    SuperUser       IGX 8420    9.3    Apr. 13 2000 09:28 PDT

Channel Statistic Types

73) Invalid CRC32 pdu rx by the sar
74) Invalid Length pdu rx by the sar
75) Shrt-Lgth Fail detected by the sar
76) Lng-Lgth Fail detected by the sar




This Command: cnfchstats 9.2.1.100


Statistic Type:
```

Table 3-18 Channel Statistics

Statistic Number	Statistic Type
1	Frames Received
2	Receive Frames Discarded
3	Frames Transmitted
4	Transmit Frames Discarded
5	Packets Received
6	Receive Packets Discarded
7	Packets Transmitted
8	Projected Packets Transmitted
9	Supervisory Packets Transmitted
10	Bytes Received

Table 3-18 Channel Statistics (continued)

Statistic Number	Statistic Type
11	Receive Bytes Discarded
12	Bytes Transmitted
13	Transmit Bytes Discarded
14	Seconds V.25 Modem On
15	Seconds DSI Enabled
16	Seconds Off-Hook
17	Seconds In Service
18	Frames Transmitted with FECN
19	Frames Transmitted with BECN
20	Supervisory Packets Received
21	Minutes Congested
22	DE Frames Received
23	DE Frames Transmitted
24	DE Frames Dropped
25	DE Bytes Received
26	Frames Received in Excess of CIR
27	Bytes Received in Excess of CIR
28	Frames Transmitted in Excess of CIR
29	Bytes Transmitted in Excess of CIR
32	Rx Frames Discarded—Deroute/Down
33	Rx Bytes Discarded—Deroute/Down
34	Rx Frames Discarded—VC Queue Overflow
35	Rx Bytes Discarded—VC Queue Overflow
36	Tx Frames Discarded—Queue Overflow
37	Tx Bytes Discarded—Queue Overflow
38	Tx Frames Discarded—Ingress CRC
39	Tx Bytes Discarded—Ingress CRC
40	Tx Frames Discarded—Trunk Discard
41	Tx Bytes Discarded—Trunk Discard
42	TX Frames During Ingress LMI Fail
43	TX Bytes During Ingress LMI Fail
44	Unkn Prot Frms Dscd at Ingress
45	Unkn Prot Frms Dscd at Egress
46	Cells Received from Port
47	EOF Cells Received from Por
48	Cells Transmitted to Network

Table 3-18 Channel Statistics (continued)

Statistic Number	Statistic Type
49	Cells Received from Network
50	Cells Received with CLP=1
51	Non-Compliant Cells Received
52	Average Rx VCq Depth in Cells
53	Cells Transmitted with EFCI=1
54	Cells Transmitted to Port
56	Cells Received with CLP=0
57	Cells Transmitted with EFCI=0
58	Ingress Vsvd Allowed Cell Rate
59	Egress Vsvd Allowed Cell Rate
60	Average Tx Vcq Depth in Cells
61	Bkwd Severely Errored Cell Blocks
62	Bkwd Lost Cell Count
63	Bkwd Misinserted Cell Count
64	Bkwd Bipolar Violation Count
65	Fwd Severely Errored Cell Blocks
66	Fwd Lost Cell Count
67	Fwd Misinserted Cell Count
68	Fwd Bipolar Violation Count
69	Good pdus Received by the SAR
70	Good pdus Transmitted by the SAR
71	Rx pdus discarded by the SAR
72	Tx pdus discarded by the SAR
73	Invalid CRC32 pdu rx by the SAR
74	Invalid Length pdu rx by the SAR
75	Invalid Length pdu rx by the SAR
76	Lng-Lgth Fail detected by the SAR

cnfchts (configure channel timestamp)

Configures a pre-aging parameter for data channels. Applicable cards are the SDP, LPD, LDM, and HDM. Applicable traffic is time-stamped data.

This command configures the pre-age parameter for data channels. The pre-age parameter specifies the initial age of a time-stamped packet. With a non-zero pre-age, the packet has less time to wait at the destination before it reaches the Max Time-Stamped Packet Age and is taken out of the ingress queue. (Data channels with the greater pre-age value are processed sooner.) However, if the pre-age value is too high because of queuing delays in the network, packets could be discarded because they appear too old at the destination.

The value you enter for pre-age should be a multiple of 250 microseconds (otherwise, the system rounds the value down to the nearest multiple of 250 microseconds). The default value is 0. Acceptable values are in the range 0 to the Max Time Stamped Packet Age (set by the **cnfsysparm** command). After you change a time-stamp, the connection should be rerouted or restarted for the new value to take effect.

Note You can see the value for pre-age in the screen display for the **dspchcnf** command. If **dspchcnf** is entered at a user-privilege level below SuperUser level, the pre-age parameter does not appear in the **dspchcnf** output.

Syntax

cnfchts <channel> <pre-age>

Parameters

Parameter	Description
<channel>	Specifies the data channel.
<pre-age>	Specifies a value in 250-microsecond increments to go in the age field in the header of a time-stamped packet.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	IGX			Yes	

Related Commands

cnfcdpparm

Example

cnfchts 3.1 1000

```
pubsipx1       TN    SuperUser       IGX 8420    9.3    Apr. 13 2000 03:50 GMT

            Maximum EIA     %      DFM Pattern     DFM        PreAge
Channels    Update Rate    Util      Length       Status      (usec)
3.1               2        100         8          Enabled       1000
3.2-4             2        100         8          Enabled          0


Last Command: cnfchts 3.1 1000


Next Command:
```

cnfchutl (configure channel utilization)

Informs the system software of the expected utilization rate of connections with traffic-dependent compression algorithms (voice connections with VAD, data connections with DFM, Frame Relay connections). The software load model then takes the user-specified rate of the connection and modifies it by using the percent of utilization you specify with **cnfchutl**. The resulting rate is used in calculations for loading trunks. The load model uses these figures instead of calculated estimates from real traffic patterns.

For the full benefits of the compression algorithms to be used, the default utilizations should be modified after traffic studies have been performed. Traffic studies of Frame Relay connections should be used to determine optimum utilization settings. When calculating loads in a network, the load allocated to a connection is:

channel utilization x full load for the connection type

For example, with a channel utilization of 50percent and a full load of 480 packets per second, the load allocated to a connection is:

0.50 x 480 pps = 240 pps

For voice connections with VAD turned off, the bandwidth allocated is always the maximum bandwidth for the connection type. In other words, the utilization, although configurable, is ignored for a voice channel without VAD and a data channel without DFM.

If you use **cnfchutl** to increase the utilization of a connection, the system verifies that the additional bandwidth is available on the connection's current route. If the bandwidth is not available, the system attempts to reroute the connection. If no other route is found, the connection is failed.

If you use **cnfchutl** to decrease the utilization of a connection, the system makes the bandwidth available to other connections that require a route. The screen displayed by the **cnfchutl** command depends upon whether a data channel, voice channel, or Frame Relay channel is specified.

Syntax

cnfchutl <channel> <%_util>

Parameters

Parameter	Description
channel	Specifies the channel for configuring utilization. The channel can be in voice, data, Frame Relay. The format for *channel* depends on the technology: • Voice connection: *slot.channel* • Data connection: *slot.port* • Frame Relay connection: *slot.port.DLCI* • Access device connection: *slot.port.device_ID*
percent utilization	Specifies the percentage of utilization of the channel. Range: 0–100 Default value (data or Frame Relay): 100% Default value (voice): 40%

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dspchcnf

Example

Set utilization on data channel 5.1 at 40%.

cnfchutl 5.1 40

```
salpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:45 PST

            Maximum EIA     %      DFM Pattern     DFM
Channels    Update Rate    Util      Length       Status
5.1             15          40         8         Enabled
5.2-4            2         100         8         Enabled



Last Command: cnfchutl 5.1 40


Next Command:
```

Example

Set utilization on voice channel 14.1 at 55%.

cnfchutl 14.1 55

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:10 PST

           %    Adaptive  Gain (dB)   Dial                           OnHk      Cond
Channels  Util  Voice      In  Out     Type   Interface Type    A  B  C  D  Crit.
14.1       55   Enabled   -4    -     User    Unconfig          ?  ?  -  -    a
14.2-24    40   Enabled    0    -     Inband  Unconfig          ?  ?  -  -    a



Last Command: cnfchutl 14.1 55


Next Command:
```

Example

Set utilization on Frame Relay channel 8.1.100 at 60%.

cnfchutl 8.1.100 60

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:45 PST

Frame Relay Channel Configuration Port: 8.1

FromMinimumPeakAvgFrameCmaxVC QECN Q% Util
8.1.1009.6*7010655356553560
8.1.3019.6*70106553565535100


Last Command: cnfchutl 8.1.100 60


Next Command:
```

cnfcldir (configure control lead direction)

Sets the control lead direction for pins 11 and 23 on the EIA/TIA-232 data channels of an SDP or HDM card set. This allows the control leads to carry “backward” channels. Pins 11 and 23 on an EIA/TIA-232 interface are bidirectional. The signals on these pins can have various names, such as SI, SF, CH, CI, and QM. To display control lead information about pins 11 and 23, use the **dspbob** command. Use the **cnfict** command to configure the behavior of all output leads.

Syntax

cnfcldir <channel> <lead> <direction>

Parameters

Parameter	Description
<channel>	Specifies the EIA/TIA-232 data channel whose control lead direction to configure.
<lead>	Specifies the pin number of the control lead. Range: 11 and 23
<direction>	Specifies the direction of the control lead signal. Valid control lead directions are: Input = The control lead acts as an input to the IGX node (default). Output = The control lead acts as an output from the IGX node.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnfict, dspbob, dspict

Example

Configure lead number 11 of channel 3.1 to be an input. The screen example shows the display after the system has accepted the input as valid.

cnfcldir 3.1 11 input

```
pubsigx1       TN    SuperUser       IGX 8420    9.3      Apr. 13 2000 00:30 GMT

Port:           3.1
Interface:      V35   DCE
Clocking:       Normal

      Inputs from User Equipment              Outputs to User Equipment
 Lead  Pin          Lead  Pin           Lead  Pin          Lead  Pin
 RTS   C                                CTS   D
 DTR   H                                DSR   E
 TxD   P/S                              DCD   F
 TT    U/W                              RI    J
                                        TM    K
                                        RxD   R/T
                                        RxC   V/X
                                        TxC   Y/a


Last Command: cnfcldir 3.1 11 input


Next Command:
```

cnfclksrc (configure network clock source)

Specifies a network-wide clock source. The clocking scheme ensures that all nodes in the network automatically synchronize to the nearest, most stable clock available. After you specify a clock source, the location and type of the network clock source goes out to all nodes in the network. This synchronization remains in effect despite line failures, power outages, controller card switchovers, line repairs, and the joining of subnetworks and all other network topology changes. Each node in the network maintains a list of the available clock sources for the network.

A clock *source* can be:

- a line (L)
- a trunk (T)
- an external source (E)

The clock *type* can be:

- primary (P)
- secondary (S)
- tertiary (T)

To remove a clock source, enter its type as "r" at the end of the **cnfclksrc** command line.

Designation of the clock type depends on the stratum (or stability) of the clock source. In a large network, for example, you could designate all stratum 2 clocks as "primary," all stratum 3 clocks as "secondary," and all stratum 4 clocks as "tertiary." The network regards all primary clocks as equal in the network clocking hierarchy, regards all secondary clocks as equal, and regards all tertiary clocks as equal. Each node synchronizes to the highest stratum clock source that is available. If multiple, equal clock sources are available, the node synchronizes to the source that is physically the closest. If none of the sources is available, the network synchronizes to the internal oscillator of one of the nodes in the network.

When you are planning clock sources, consider these points:

- The **dspclksrcs** command displays all clock sources in a network. The **dspcurclk** command displays the clock source that a specific node is currently using and the path between the source and the local node.
- To avoid unnecessary clock disruptions, configure all primary clock sources for the network first.
- A line must be *upped* and not in an alarm before you can configure it as a network clock source.
- Before you define a trunk as a clock source, use **cnftrk** to specify that the trunk does not pass synchronization.

Syntax

cnfclksrc <line type> <line number> <source type> [freq]

Parameters

Parameter	Description
line type	Specifies whether the clock source is a trunk (T), line (L), or external (E).
line number	For a line (L) clock source, this specifies the back slot location of the source. For a trunk (T) clock source, this specifies the slot.port. For external clock sources (E), this specifies either front card slot 1 or 2, as long as either slot has a card. This external source designation applies to IGX and BPX nodes.
source type	Specifies where the clock fits in the hierarchy: P = primary; S = secondary; and T = tertiary. To remove the clock source configuration for the current type and line, enter an “r.”
freq	Specifies the frequency of the clock source. An entry is necessary only if the *line type* is an external line. The supported frequencies are 1.544 MHz and 2.048 MHz. Enter a “1” for 1.544 MHz or a “2” for 2.048 MHz.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX			Yes	

Related Commands

dspclksrcs, dspcurclk

Example

Configure trunk 10.1 as a primary clock. The network clock sources screen shows that trunk 10.1 has been configured as a primary clock source for the network.

cnfclksrc T 10.1 P

```
sw152          TN    Cisco           IGX 8420  9.3.b1    Mar. 16 2001 15:03 GMT

                            Network Clock Sources

Primary
sw245    Line  10.2       sw213    Trunk   9.5      sw213    Trunk  14.2
sw152    Line  10.4       sw152    Trunk  10.1

Secondary
sw152    Trunk  16.3

Tertiary
None




Last Command: cnfclksrc T 10.1 P
```

cnfclnparm (configure circuit line parameter)

Configures the alarm integration time for circuit lines originating on a UVM, CDP, or CVM and for T1/E1 Frame Relay circuits originating on an FRP, FRM, or UFM.

This command configures the circuit line alarm integration times for RED and YELLOW circuit line alarms. These integration times are specified in milliseconds and should be set to correspond to the local carrier's alarm integration times. Carrier integration times are typically 800 to 1500 ms. for RED Alarm and 1500 to 3000 ms. for YELLOW Alarm. The allowable range for these parameters are 60 to 3,932,100 ms.

Syntax

cnfclnparm <line>

Parameters

Parameter	Description
<line>	Specifies the circuit line to configure.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	No	Yes	IGX			Yes	

Related Commands

cnfclnsigparm, **dchst**

Example

cnfclnparm 11

```
gamma         TRM       SuperUser        Rev: 9.3  Apr. 13 2000  14:27 PDT

CLN 11 Parameters
 1  Red Alarm - In/Out  [  1000 /    2000] (Dec)
 2  Yel Alarm - In/Out  [  1000 /    2000] (Dec)




This Command: cnfclnparm 11


Which parameter do you wish to change:
```

cnfclnsigparm (configure circuit line signaling parameters)

Configures signaling parameters for a UVM or CVM.

The CVM & UVM Heartbeat parameter (option 1) is the rate, in seconds, at which the card sends a signaling (ABCD bits) state update to the other end of the connection, even when there is no change in the state of the signaling bits. This is done because signaling packets are time-stamped data packets, and there is a small chance that a signaling packet might be discarded somewhere in the network. This mechanism is a recovery mechanism to ensure that on-hook and off-hook notifications are not lost.

Increasing this interval will probably have no impact as long as none of the normal signaling time-stamped data packets are discarded in the network.

Syntax

cnfclnsigparm <parameter number> <parameter value>

Parameters

Parameter	Description
<parameter number>	Specifies the parameter number of the signaling parameter to change.
<parameter value>	Specifies the new value to enter.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	No	Yes	IGX			Yes	

Related Commands

cnfclnparm, **dspsig**

Example

cnfclnsigparm

```
sw219          TRM   SuperUser       IGX 8420  9.3    Apr. 13 2000 08:12 GMT

1  CVM & UVM Heartbeat                     [   2] (sec)
2  CVM & UVM Sig. Polling Rate             [  10] (sec)
3  CVM & UVM Default Inband Sig Delay      [  96] (msec)
4  CVM & UVM Default Inband Playout Delay  [ 200] (msec)
5  CVM & UVM Default Pulse Sig Delay       [  96] (msec)
6  CVM & UVM Default Pulse Playout Delay   [ 200] (msec)
7  CVM & Number of Packet Slices           [   1]
8  CVM & UVM Packet Rate                   [ 200] (pkt/sec)
9  CVM & UVM Condition E1 CCS Lines?       [  NO]
10 CVM & UVM Default Inband Min. Wink      [ 140] (msec)
11 CVM & UVM Default Pulse Min. Wink       [ 140] (msec)
12 CVM & UVM Condition T1 Lines?           [ YES] (yes/no)


Last Command: cnfclnsigparm


Which parameter do you wish to change:
```

Table 3-19 Display Fields

No.	Parameter	Description	Range
1	Heartbeat	The current state of the signaling is periodically transmitted to the far end even if no signaling transitions are detected. This interval is determined by the value of "heartbeat." The CVM & UVM Heartbeat parameter (option 1) is the rate, in seconds, at which the card sends a signaling (ABCD bits) state update to the other end of the connection, even when there is no change in the state of the signaling bits. This is done because signaling packets are time-stamped data packets, and there is a small chance that a signaling packet might be discarded somewhere in the network. This recovery mechanism ensures that on-hook and off-hook notifications are not lost. Increasing this interval will probably have no impact as long as none of the normal signaling time-stamped data packets are being discarded in the network.	2–30 sec.
2	Signal Polling Rate	How often the control card polls the UVM/CVM for the status of the signaling. This parameter is used to update displays and statistics.	2–60 sec.
3	Default Inband Signal Delay	The transmit buffer timer value set after a valid signaling transition for in-band signaling arrives. After timeout, a signaling packet is sent.	30–96 msec.
4	Default Inband Playout Delay	The receive buffer timer that "ages" an incoming, time-stamped packet. When the age of the packet reaches the time-stamp value, it moves on to depacketization and then to the user equipment. This parameter is used to even out the delay between signaling packets and voice packets.	0–200 msec.
5	Default Pulse Signal Delay	Same as number 3 but applied to pulse signaling.	30–96 msec.
6	Default Pulse Playout Delay	Same as number 4 but applied to pulse signaling.	100–200 msec.
8	Packet Rate	Reserves trunk bandwidth for carrying UVM/CVM signaling.	0–1000 packets/sec.

Table 3-19 Display Fields (continued)

No.	Parameter	Description	Range
9	Condition CCS Lines	If you specify “yes” for this parameter, the card applies signaling conditioning during an alarm to all channels on E1 CCS circuit lines to notify marked for Common Channel Signaling to notify PBX of a line failure.	YES or NO
10	Inband Min. Wink	Same as 6 for in-band signaling.	120–300 msec.
11	Pulse Min. Wink	For UVM/CVM connections only, this parameter controls both wink and inter-digit intervals for signaling that arrives over the NPM signaling channel from a far end UVM/CVM.	120–300 msec.
12	Condition T1 Lines?	If you specify “yes” for this parameter, the card applies signaling conditioning during an alarm to all channels on T1 circuit lines to notify PBX of a line failure.	YES or NO

cnfcls (configure class template)

Modify the ten Cisco-supplied class templates for connection configuration. (The **addcon** command can take a class as an input.)

When you enter the number of the class to configure, the display shows the current value of each parameter in the class. For each item in the class, a prompt appears for changing or keeping the current value.

You can use **cnfatmcls** and **cnfcls** to configure the rt-VBR ATM connection class. You can use **dspatmcls** and **dspcls** to display the connection parameters for the rt-VBR and nrt-VBR connection classes.

The rt-VBR connections are configured per class 3 service parameters, and nrt-VBR connections are configured per class 2 service parameters. You can change these class parameters by using the **cnfcls** or **cnfatmcls** commands, or the parameters can be entered individually for each connection by specifying yes to the extended parameters prompt of the **addcon** command.

Note For a new node running software Release 9.2.20 or later, the rt-VBR connection class number is 3. An upgraded node will retain existing connection classes. Therefore, it cannot have the rt-VBR connection class 3. However, you can configure the connection classes to desired service and parameters by using the **cnfcls/cnfatmcls** commands. For nrt-VBR connections in a new node, a number of connection classes are pre-configured, including 2, 4, 5, and 6.

Syntax

cnfcls <class number> [*optional parameters*]

Parameters

Parameter	Description
class number	Specifies the class to configure. Range: 1–10
optional parameters	Individual parameters are specific to the type of connection (CBR, rt-VBR, nrt-VBR, ABR, ATFR). Each is prompted one at a time. Refer to the **dspcls** command to see the parameters in each of the classes.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

addcon, dspcls, cnfatmcls, dspatmcls

Example

Configure connection class 10. The command line interface (CLI) displays the current settings and requests the class type. After you enter a class type, the CLI prompts you to specify each parameter for the selected class type (ABRSTD in the second screen display).

cnfcls 10

```
sw60           TN    SuperUser       BPX 8620    9.3 Date/Time Not Set

                        ATM Connection Classes
Class: 10                                                        Type: CBR
   PCR(0+1)     % Util       CDVT(0+1)         Policing
 4000/4000     100/100      10000/10000            4

       Description: "Default CBR 4000"

This Command: cnfcls 10

Enter class type (VBR, CBR, UBR, ABRSTD, ABRFST, ATFR):

_______________________________________________________

sw60           TN    SuperUser       BPX 8620    9.3 Date/Time Not Set

                        ATM Connection Classes
Class: 10                                                        Type: ABRSTD
   PCR(0+1)     % Util      MCR           CDVT(0+1)         AAL5 FBTC
 4000/4000     100/100  4000/4000         10000/10000            n

       Description: "Default CBR 4000"

This Command: cnfcls 10 abrstd * * * * *

Do you want this change (y/n)?
```

This screen is an example of a **cnfcls/cnfatmcls** command and response:

```
pubsbpx1       TN    silves:1        BPX 8620  9.3    Apr. 13 2000 10:42 PDT

                        ATM Connection Classes
Class:  2                                                        Type: nrt-VBR
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
 1000/1000     100/100      10000/10000          n       1000/1000

     MBS         Policing
 1000/1000          3

       Description: "Default nrt-VBR 1000 "

This Command: cnfcls atm 2

Enter class type (rt-VBR, nrt-VBR, CBR, UBR, ABRSTD, ABRFST, ATFR, ATFST, ATFT,
ATFTFST, ATFX, ATFXFST):
```

cnfcmb (configure combined timeout parameters)

Configures the time the node waits for a second packet to become available for placing in an ATM cell. Use the **cnfcmb** command to control the time that the node waits for individual traffic types.

Syntax

cnfcmb <parameter> <value>

Parameters

Parameter	Description
<parameter>	Specifies the number of the parameter to change.
<value>	Specifies the value of the parameter to change. When you enter a value for a parameter, switch software multiplies the value by 125 microseconds to derive the timeout.

Parameter Values

Parameter	Description	Default
1	Timeout for Voice (multiplied by 125 microseconds)	2
2	Timeout for Time-Stamped Traffic (multiplied by 125 microseconds)	2
3	Timeout for High Priority Traffic (multiplied by 125 microseconds)	0
4	Timeout for Non-Time-Stamped Traffic (multiplied by 125 microseconds)	2
5	Timeout for Bursty Data 1 Traffic (multiplied by 125 microseconds)	255
6	Timeout for Bursty Data 2 Traffic (multiplied by 125 microseconds)	255

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
service	Yes	No	IGX			Yes	

Related Commands

dspchcnf

Example

Change the timeout for voice packets from the default of 2 * 125 microseconds to 1 * 125 microseconds.

cnfcmb 1 1

```
pubsigx1       TN    SuperUser       IGX 32    9.3    Apr. 13 2000 23:38 PDT

                     System-Wide Combine Timeout Parameters

1 Packet Combining Timeout for Voice (125 usec *).....................     2
2 Packet Combining Timeout for Time Stamped Traffic (125 usec *).......     2
3 Packet Combining Timeout for High Priority Traffic (125 usec *)......     0
4 Packet Combining Timeout for Non Time Stamped Traffic (125 usec *)...     2
5 Packet Combining Timeout for Bursty Data 1 Traffic (125 usec *)......   255
6 Packet Combining Timeout for Bursty Data 2 Traffic (125 usec *)......   255



This Command: cnfcmb


Which parameter do you wish to change: 1 1
```

cnfcmparm (configure connection management parameters)

Configure various connection management parameters for the node. This command configures parameters (see Table 3-20 for parameter values) that affect Adaptive Voice, Rerouting, and Courtesy Up/Down. These parameters are used only at the local node.

The **cnfcmparm** command is used to enable cost-based route selection and the use of delay as the trunk cost. By default, delay is enabled. This worst-case delay for each connection type is calculated from the configured voice and non-time-stamped trunk queue depths.

For delay sensitive connections on the IGX (voice and non-time-stamped), the worst-case trunk delay can be used as the per-trunk cost.

For delay sensitive connections on the BPX (ATM CBR), end-to-end delay is not used as a routing constraint in Automatic Routing Management.

Syntax

cnfcmparm <parameter> <value>

Parameters

Parameter	Description
<parameter>	Specifies the number of the parameter to change. See Display Fields below.
<value>	Specifies the new parameter value to enter.

Table 3-20 Parameter Values

No.	Parameter	Description	Range	Default
8	Maximum Routing Bundle	For rerouting, the maximum number of connections allowed in a routing request. For derouting, the maximum number of connections chosen using the CoS-based criterion. The value of this parameter should be set to less than that of parameter 21. A larger value provides a faster rerouting/derouting time. A smaller value provides better load balancing.	1–250	90
9	Reroute Timer	The number of seconds since the last reroute to wait before attempting another reroute of the same connection. After a connection has been successfully routed, it does not get rerouted again (especially for a connection that has previously experienced a failure at its preferred route) until this amount of time has elapsed. The time delay permits the preferred route to stabilize its operational status before a working connection with a preferred route is returned to the preferred route. A zero timer means the request is re-attempted immediately.	0–900 seconds	0 seconds
10	Timer Reset on Line Fail	This boolean specifies that the reroute timer in parameter 9 can be ignored if the current route actually fails (instead of attempting a rerouting of working connections on non-preferred routes).	y=yes n=no	y

Table 3-20 Parameter Values (continued)

No.	Parameter	Description	Range	Default
11	Max Down/Up Per Pass	The maximum number of connections allowed to be upped or downed per pass. A larger value provides a faster completion of state update notifications, at the expense of potentially flooding the network. A smaller value provides better control of network traffic, but at the expense of prolonged state update notifications.	0–255	50
12	Down/Up Timer	The amount of time to wait before the next pass of upping/downing connections. A larger value provides slower-paced state update notifications, thus allowing time for the node to process other requests. A smaller value provides faster-paced state update notifications.	1000–65535 msecs	30000 msecs
13	Maximum Route Errors per Cycle	The maximum number of failed rerouting attempts allowed for a connection. Once this threshold has been reached, the connection is removed from the reroute group (see parameters 25, 26, and 27) and placed in a block waiting for the next cycle. (See also parameters 14 and 15.) A larger value provides a more resilient rerouting attempt. A smaller value allows a faster declaration of rerouting failure.	0–65535 failures	BPX: 50 IGX: 200
14	Maximum Time Between Routing Cycles	All connections that have waited for this amount of time are allowed to be returned into the reroute group. The expiration of this timer starts off another cycle of rerouting attempts. (See also parameters 13 and 15.) A larger value provides more time for the network topology to settle before re-attempting a connection reroute. A smaller value allows more frequent reroute attempts.	1–8 minutes	5 minutes
15	Maximum Routing Error Cycles	The maximum number of cycles of rerouting attempts. Once this threshold has been reached, the connection is declared failed. You must use the **rrtcon** command to reroute the failed connection. (See also parameters 13 and 14.) Alternatively, the failed connection is rerouted when the BCC becomes active (for example, due to card reset or **switchcc**). A larger value provides a more resilient rerouting attempt. A smaller value allows a faster declaration of rerouting failure.	0–255 cycles	BPX: 10 IGX: 1
16	Routing pause timer	The amount of time to wait before the next rerouting attempt. Do not wait when set to 0. A larger value provides a slower-paced rerouting attempt, taking advantage of possible network topology updates. A smaller value allows for a faster-paced rerouting attempt that does not depend on the changing network topology.	0–65535 msecs	0

Table 3-20 Parameter Values (continued)

No.	Parameter	Description	Range	Default
17	Max. messages sent per update	The maximum number of CMUPDATE messages that may be sent into the network without acknowledgment. This parameter permits the transmitting node to throttle the networking traffic to prevent jamming. A larger value allows the broadcasting to complete faster, at the risk of jamming the network. A smaller value slows down the broadcasting without flooding the network, but at the expense of more broadcasting iterations.	0–223 decimal	10
18	Send SVC urgent msgs	IGX only. This parameter enables an IGX node to inform each via node to remove an SVC connection during deletion. When disabled, the via nodes are not immediately informed through an update message. This causes the trunk loading occupied by a deleted SVC to remain unavailable until the update message is received by the via node.	y=yes n=no	BPX: n IGX: y
19	Max SVC Retry	IGX only. The maximum number of failed routing attempts before the SVC connection is declared failed. If the routing attempt fails due to a reason other than being “blocked,” the connection is immediately declared failed. A blocked attempt means that the routing state machine on the via/slave node is already processing a route request, or is locked by some other state machines. A larger value provides a more resilient SVC rerouting attempt. A smaller value allows a faster declaration of rerouting failure.	0–30 decimal	0
20	Wait for TBL updates	After routing all connections based on CoS, wait roughly this amount of time before the routing of other connections in need of rerouting (for example, those failed connections due to lack of critical internal resources). This delay allows the topology to settle after the CoS-based rerouting phase. This wait period should typically be one or two seconds longer than the time specified by the Fast Interval parameter (default 5 seconds) of the **cnftlparm** command.	0–65000 decimal	70 (x100 msecs)
21	Max derouting bundle	The maximum number of connections chosen based on load, that can be derouted concurrently. The value of this parameter should be set to greater than that of parameter 8. The actual number of connections concurrently derouted can reach the sum of this parameter and of parameter 8. A larger value provides a faster rerouting/derouting time. A smaller value provides better load balancing.	0–16000 decimal	500
22	Enable cost-based routing	This boolean specifies whether the cost-based routing algorithm should be used in preference to the hop-based routing algorithm. Yes means enable cost-based routing. Cost-based routing allows the network operation to better tune the network utilization based on the least cost. Hop-based routing is a simpler algorithm that selects a path strictly based on the least number of hops.	y=yes n=no	n

Table 3-20 Parameter Values (continued)

No.	Parameter	Description	Range	Default
23	Enable route cache usage	This boolean specifies whether the most recent successfully used routes are to be placed in cache in order to avoid performing route selection. Yes enables route cache usage. The cache route can be either a cost-based route or a hop-based route.	y=yes n=no	n
24	Use delay for routing	This boolean specifies whether queuing delay is considered in the cost-based routing algorithm. Yes means use delay for routing. The parameter only applies to voice and non-timestamped connection types.	y=yes n=no	n
25	# of reroute groups used	Specifies the number of reroute groups allowed for the node. Each reroute group is categorized based on the load requirement for each connection. The node reroutes connections with the highest load units first and proceeds with successively decreasing load unit ranges. A larger value provides more groups at the cost of more iterations stepping through the reroute groups during rerouting. A smaller value provides a faster completion of the iterations.	1–200 groups	50
26	Starting size of RR groups	The first reroute group is defined to consist of connections with load units at or below this parameter value. During rerouting, connections from this reroute group are considered last. Connections with load units above this value but at or below the sum of this value and that of the next parameter (increment between RR groups) are placed in the second reroute group. A larger value provides a bigger range of bandwidth for the first reroute groups. A smaller value provides a more refined range of bandwidth included in the first reroute group.	0–96000 cell load units (CLUs)	0 CLUs
27	Increment between RR groups	Each of the remaining reroute groups is defined to consist of connections with load units higher than the previous reroute group, but at or below the sum of the previous reroute group threshold and this parameter value. The last reroute group can accommodate any load units above the second-last reroute group threshold. (See parameter 26 for a definition of the first reroute group.) A larger value provides a bigger range of bandwidth for each of a smaller number of reroute groups. A smaller value provides a smaller range of bandwidth for each of a larger number of reroute groups.	1–96000 cell load units (CLUs)	100 CLUs

Table 3-20 Parameter Values (continued)

No.	Parameter	Description	Range	Default
28	CM updates app timeout	Configures a second timeout for CM updates. This avoids CM-update overloads after rebuilds in large networks with fully loaded nodes. The timeout value is specified in 10-second increments. This parameter is relevant to the following CM updates: • Exist • Non-exist • Pref route • BW • State Switch software sends all of the above updates in the form of a bitmap of LCON indexes. When an update is sent, switch software marks a timeout of 150 seconds. It also marks a "pending bitmap" that contains all the LCON indexes for update messages that have been sent. If the node does not receive a response for any of the updates within the 150 second timeout, the updates are sent again. However, if the node receives a networking acknowledgment for the CM update message, or a response for some of the LCONs (also a bitmap), a second timeout of *10 seconds (the value configured for this parameter) is marked. Also, the bits for which a timeout has been received are cleared in the pending bitmap. If this second timeout expires, all the updates are sent again to the remote node, including the updates for which responses have been received.	1 to 15 (10 to 150 seconds)	5 (50 seconds)
29	Route concurrency level	Specifies the number of concurrent routes available on the BPX or IGX node. A value of 1 disables concurrent routing, and the node uses sequential routing. The values 2 through 8 indicate the total number of concurrent routes available on the node. When the value is changed, all reroute statistics are retained. The Concurrent Routing feature can be enabled only if the entire network is running Release 9.3.30 or above.		

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

dsprrst, **cnftlparm**

Example

The example shows the two screens required to display all **cnfcmparm** parameters.

```
------------------------------------SCREEN 1-----------------------------------
sws5           TN    Cisco           IGX 8420  9.3.a4    Mar. 15 2001 06:05 PST

1  Normalization Interval    [    2] (D)
2  Max Number To Normalize   [    5] (D)
3  Normalization Logging     [   No]
4  Settling Interval         [    4] (D)
5  Minimum Open Space        [ 1000] (D)
6  Normalization Priority    [ Load]
7  Load Sample Period        [    4] (D)
8  Maximum Routing Bundle    [   90] (D)
9  Reroute Timer             [    3] (secs)
10 Reset Timer on Line Fail  [  Yes]
11 Max Down/Up Per Pass      [   50] (D)
12 Down/Up Timer             [30000] (msecs)
13 Max Route Errs per cycle  [  200] (D)
14 Time between Rrt cycles   [    5] (mins)
15 Max. Rrt Err cycles       [    1] (D)

This Command: cnfcmparm


Continue?
------------------------------------SCREEN 2-----------------------------------
sws5           TN    Cisco           IGX 8420  9.3.a4    Mar. 15 2001 06:06 PST

16 Routing pause timer       [    0] (msecs)
17 Max msgs sent per update  [   10] (D)
18 Send SVC urgent msg       [  Yes]
19 Max SVC Retry             [    0] (D)
20 Wait for TBL Updates      [   70] (100 msecs)
21 Max Derouting Bndl (0=all)[  500] (D)
22 Enable Cost-Based Routing [   No]
23 Enable Route Cache Usage  [   No]
24 Use Delay for Routing     [   No]
25 # of reroute groups used  [   50] (D)
26 Starting size of RR grps  [    0] (CLU)
27 Increment between RR grps [  100] (CLU)
28 CM updates app timeout    [    5] (10 secs)
29 Route concurrency level   [    1] (D)


This Command: cnfcmparm


Enter parameter index:
```

cnfcon (configure connection)

If the connection type includes ForeSight (ABR enabled), the results of the last test round-trip delay command (**tstdelay**) appear. Note that this is not the current RTD but the result of the last test that ran. Connection priority—high or low—is displayed for standard Frame Relay connections and ForeSight connections. Several checks are done on the parameters that specify bandwidth to assist users in efficient use of network bandwidth.

These messages describe the performance evaluation:

- Error: Min cannot exceed peak
- Warning: Min exceeds this port's speed.
- Warning: Sum of mins exceeds port's speed.
- Warning: Peak exceeds this port's speed.

Warning messages are informational only, so the related operation continues. If an error message appears, the operation does not continue.

Syntax

cnfcon <slot.port [dlci | vpi.vci]> [bandwidth parameters]

Parameters

Parameter	Description
<slot.port [dlci | vpi.vci]>	Specifies the connection to configure. This command configures one connection at a time.
[bandwidth parameters]	Optional. Refer to the **addcon** command for descriptions and connection types.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX	Yes	Yes	Yes	Yes

Related Commands

addcon, dspcon

Example

Configure ASI connection 11.1.1.15.

cnfcon 11.1.1.15

```
bpx01          TN    Cisco           BPX 8620  9.3.2V    Jan. 19 2001 07:53 PST

Conn:  11.1.1.15         bpx02       11.2.21.15        nrt-vbr   Status:OK
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
   50/50       100/100     250000/250000         n          50/50

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

Trunk Cell Routing Restrict: Y



Last Command: cnfcon 11.1.1.15
```

cnfcond (configure conditioning template)

Creates a conditioning template that specifies the bit patterns to be transmitted for each of the T1 and E1 timeslots and their A, B, C, and D signaling bits while the channel is in the failed state. Its purpose is to prevent the signaling bits from returning to the idle (on-hook) bit pattern during a channel failure and to force a known bit pattern (usually busy). If a connection fails and the template has been specified as the conditioning template for the failed connection, the data parameter in the template is transmitted in the channels timeslot, and the A, B, C, and D bits are processed according to the specified parameters.

A two-character sequence in the ID parameter field identifies the template. The Data Pattern field displays the pattern transmitted in the channels timeslot. The Signaling Pattern field displays the pattern transmitted in the channel's A, B, C, and D signaling bit positions. Each of the A, B, C, and D signaling bits are specified independently and may be held high or low or toggled to the on-hook condition for a short time then off-hook (the name of this latter action is a *wink*). You can control the timing of the bit-toggling by specifying the duration of winks in increments of 50 ms.

A typical failure response is for the node to:

1. Transmit idle characters in the channel's timeslot
2. Signal off-hook for a period of 2 seconds
3. Return permanently to the on-hook condition

Syntax

cnfcond <id> <data> <A bit> <B bit> <C bit> <D bit>

Parameters

Parameter	Description
id	Specifies the identifier of conditioning template. The identifier may be any two character combination of lowercase letters (a–z) and numeric digits (0–9).
data	Specifies an eight-bit binary string to use instead of the voice in the event the channel fails.
A bit B bit C bit D bit	Specifies the signaling sequence to be transmitted for these bits in the event of a channel failure. You can independently set each of these parameters. Each element in the sequence is expressed as a 1 or 0 (to indicate the logic state of the line) followed by a number in parenthesis to indicate the duration that the state remains on the channel. The duration number is expressed in 50 ms intervals. If you do not enter a duration value, the state remains the same indefinitely. For example, if <B> is set to 1(40); upon a channel failure, the B bit remains in the 1 state for 2 seconds (40 x 50 ms=2 seconds). For another example, <C> set to 0 would cause the C bit to be held permanently at 0 during a failed channel condition because no duration value is present. Note that you can specify a sequence of states by entering several states separated by slash symbols. The maximum number of states in a sequence is 5. For example, you could set <A> to 1(40)/0(20)/1 to vary the duration of the 0 and 1 states.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnfvchtp, dspchcnf, dspcond

Example

Configure the conditioning template.

cnfcond lm 01010100 0(40)/1 1 1 1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 09:59 PST

Conditioning criterion lm:

  Data Pattern
  01010100 - E1/T1



  Signaling Pattern
  A            0(40)/1
  B            1
  C            1
  D            1




Last Command: cnfcond lm 01010100 0(40)/1 1 1 1


Next Command:
```

cnfcos (configure CoS)

Determines the priority for rerouting a connection. You determine the priority by specifying a delay before the network reroutes one or more failed connections. The CoS applies to:

- A single connection
- A range of connections
- A connection group

When connections have failed (typically due to a trunk failure), the network reroutes them according to priorities that are set primarily by the class of service (CoS). The value of CoS is the number of seconds the network waits before it begins to reroute the connection, so the CoS determines the rerouting order for connections owned by a node. The range of possible CoS values is 0–15.

The number of connections in a network has an effect on the increment between CoS values you should use. For larger numbers of connections, you should allow more time to reroute the connections in a class. To facilitate the greater time required to reroute larger numbers of connections, use a larger increment between CoS values. In a larger network, for example, you could specify CoS values that are 3 seconds apart (such as 0, 3, 6, 9, 12, and so on, for example). For a network with less traffic, assign CoS values in increments of 1 or 2. This strategy ensures that all connections of a given CoS reroute before the connections with the next CoS start to reroute.

Syntax

cnfcos <group | channel> <cos>

Parameters

Parameter	Description
<group | channel>	Specifies the voice, data, Frame Relay, or FastPAD voice/data channel(s), where *channel* is one of the following: • Voice connections: *slot.channel* • Serial data connections: *slot.port* • Frame Relay connections: *slot.port.DLCI*
<cos>	Specifies the class of service number to assign to the channel, range of channels, or connection group. Range: 0–15 seconds The rerouting priority is inversely proportional to the CoS (a low CoS values means a high routing priority).

Related Commands

dspcons

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Example

Set the CoS for channel 5.1 to 0.

cnfcos 5.1 0

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:12 PST

 Local      Remote      Remote                                      Route
 Channel    NodeName    Channel    State  Type    Compression  Code Avoid CoS O
 5.1        beta        25.1       Ok     256                  7/8          0  L
 9.1.100    gamma       8.1.200    Ok     fr                                0  L
 9.2.400    beta        19.2.302   Ok     fr                                0  L
 14.1       gamma       15.1       Ok     v                                 0  L





Last Command: cnfcos 5.1 0


Next Command:
```

cnfctrlr (configure controller with new VPI and start_VCI for control channels)

Reassign the VPI and start_VCI for the control channels between the VSI controller and the UXM slaves. The required input parameters are:

- a controller ID
- a new VPI
- a new start_VCI

The command will delete all existing control channels to release the old VPI and start_VCI and then reprogram the control channels with the new VPI and start_VCI.

During the process of channel deprogramming and reprogramming, communication between the controller and slaves will be disrupted.

Syntax

cnfctrlr <controller_id> <VPI> <start_VCI>

Parameters

Parameter	Description
<controller_id>	The controller identifier (1–16)
<VPI>	The VPI for control channel UNI ports: 0–255 NNI ports: 0–4095
<start_VCI>	The starting VCI for the control channel 16-slot IGX: 40–65521 32-slot IGX: 40–65505

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	No	IGX	No	Yes	Yes	No

Example

Configure controller 3 with a new VPI (5) and a new start_VCI (100).

cnfctrlr 3 5 100

Description

```
arnold         TN    Cisco           IGX 8430  9.3.1p    Aug. 16 2000 17:16 PST

                   VSI Controller Information

CtrlrId   PartId     ControlVC            Intfc     Type     CtrlrIP
                    VPI    VCIRange
   3         2       0      100-70          12.1     MPLS     0.0.0.0



Last Command: cnfctrlr 3 5 40

Controller VPI.VCI reconfigured successfully!
Next Command:
```

cnfdate (configure date and time)

Sets the date and time for the entire network. The node broadcasts the specified date and time to every node in the network. The time displayed at each node is consistent with the time zone where the node resides. (See the **cnftmzn** description.) For the first-time configuration of the date and time in a network, **cnfdate** requires all the parameters except for *second*. The default for *second* is 0. If a date and time already exist in the network, the defaults are the existing values at the moment you enter the **cnfdate** command. Note that changes to date and time alter the time-stamps on WAN Manager statistics.

Syntax

cnfdate <year> <month> <day> <hour> <minute> [second]

Parameters

Parameter	Description
year	Specifies the year.
month	Specifies the month. Range: 1–12
day	Specifies the day. Range (depending on the month): 1–31
hour	Specifies the hours. Range: 0–23 For example, enter 6 AM as 6 and 6 PM as 18.
minute	Specifies the minute of the hour. Range: 0–59; Default: 0
second	Specifies the seconds. Range: 0–59; Default: 0

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX			Yes	

Related Commands

cnftime, **cnftmzn**

Example

Set the time to 1:54:11 PM, December 16, 1997. The system prompts:
"Warning: Changing time of day affects StrataView statistics time-stamps.

Continue?"
Enter "**y**" to continue or "**n**" to abort." Upon a "y" response, the system further prompts with: "Hit RETURN to change clock, DEL to abort."

cnfdate 1997 12 16 13 54 11

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 13:54 PST

YourID       1
Sarah        5



Last Command: cnfdate 1997 12 16 13 54 11

Warning: Changing time of day affects StrataView statistics timestamps
Continue?
```

cnfdch (configure voice connection for idle code suppression)

Configure a super-rate data connection that has idle code suppression (ICS) enabled or disabled, before adding a connection. The ICS information in the **cnfdch** screen is identical to that of **dspchcnf**.

The idle code suppression feature provides a way to stop FastPacket generation on an Nx64 super-rate PVC connection when the connected PBX has terminated a video call and there are no video calls in progress. It enables the UVM and CVM to detect the on-hook condition of video conferencing calls. No video traffic will be generated when a video call has terminated. Traffic on the data network is therefore reduced.

During the on-hook phase, FastPacket generation ceases, resulting in more trunk bandwidth becoming available. All connections that use ForeSight can use this unused bandwidth, resulting in higher information rate.

Because there are multiple channels involved in an Nx64 data connection, the idle code suppression configuration of the first channel in the Nx64 channel will be used for the entire connection bandwidth.

Configuration must be done for each endpoint of a connection. When the state of an ICS connection changes, no network message is sent to the other end. You can choose to configure the other end if ICS is supported on the other end also. To maximize the benefit of the idle code suppression feature, you should enable ICS on both endpoints of the connection.

If some of the specified channels do not yet have any connection attached, those channels will be initialized to a data type channel.

To interwork with HDM/LDM/SDP/LDP cards, idle code suppression on UVM/CVM/CDP channel will be turned off for any super-rate connection that also terminates on HDM/LDM/SDP/LDP.

All super-rate data connections will have their ICS state set to “disabled” state unless they have been specifically configured with the **cnfdch** command to be enabled, or through Cisco WAN Manager (or another SNMP manager application).

Use the **cnfdchl** command to configure a channel before you add a connection. The configuration remains the same when connections are removed and added again. This configuration will be removed when the associated line is deactivated.

The **cnfdch** command is available for level 2 users and above; that is, you must have at least privilege level 2 or above to use this command.

The **cnfdch** command is blocked if one or more specified channels is carrying a voice connection (including t-type).

The **cnfdch** command prompts you to enable or disable idle code suppression:

```
Enable or Disable Idle Code Suppression (e/d)?[d]:
```

Syntax

cnfdch <channel><ch_ics_state>

Parameters

Parameter	Description
channel	*slot.line.channel* for UVM or *line.channel* for CVM/CDP. A channel range is allowed.
ch_ics_state	Channel idle code suppression state: d for disabled; e for enabled.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
2–6	Yes	No	IGX			No	

Related Commands

dspchcnf, dspcons

How Idle Code Suppression Works

When a video call terminates, the PBX generates the appropriate line idle code (for example, 0x7f for mu-law). Per ITU H.221 video coding scheme, no byte will be repeated on one DS0 for more than 80 times. In the case of BONDING protocol, the maximum is 256 (32 msec). The firmware can distinguish a video call and an idle channel carrying idle code. Idle code suppression is not programmable. Any byte that repeats for more than 32 msec in all DS0s in a super-rate connection will be suppressed.

Switch software determines idle code suppression capability on a card based on firmware model and revision number (for example, it considers that the CVM card supports idle code suppression starting with model B revision E firmware).

The idle code suppression feature for the UVM and CVM cards on the IGX detects the idle (on-hook) state of a video call, which uses an Nx64K data connection, and suppresses packet transmission during this idle condition. The UVM or CVM at the far end plays out the idle code during this time. You disable or enable and display the status of idle code suppression on a per-connection basis through the switch software CLI **cnfdch** and **dspchcnf** commands.

The UVM and CVM card firmware identifies an on-hook or idle condition by detecting repetition of idle codes. These codes can be present in the regular video traffic also (that is, in H.221 or BONDING frames). The code must repeat a certain number of times before it can be concluded that the call is on-hook. It is not necessary to look for specific idle codes. Any byte-code repeating beyond the threshold (about 32 ms) indicates idle channels. The firmware monitors byte repetition on each Nx64 connection for which this feature is enabled. On detecting repetition beyond the specified threshold, FastPacket generation for such a connection would cease. This results in the remote side of the connection to under-run. In this condition, it would transmit the previously transmitted byte on each DS0 for the connection. The UVM/CVM continues to monitor DS0s for the connection to detect a change in data received. Any change would indicate an off-hook condition, after which FastPacket transmission would resume.

The idle code suppression feature consists of IGX switch software Release 9.2, and requires UVM model E firmware and CVM/CDP model B revision E firmware. The new UVM/CVM/CDP firmware ensures that idle code suppression can interoperate with UVM/CVM/CDP cards that do not have idle code suppression capability. Such a configuration means that FastPacket generation stops in one direction while the other end continues to generate FastPackets. This behaves exactly the same as enabling idle code suppression on one side but not on the other side.

All back card types supported by UVM/CVM/CDP support idle code suppression.

Interface with Cisco WAN Manager and Other Network Management Systems

The SNMP agent interface on the IGX provides the following operations: Get/Set of MIB information of the desired state of idle code suppression (enabled/disabled).

If a request fails, a General Error is returned to Cisco WAN Manager. An error string is logged in the switch software error table. Cisco WAN Manager can then optionally obtain the error string from switch software. Examples of error messages are "Card in slot does not support Idle Code Suppression" and "E1 CAS and Voice Channels - Not Configured".

Inserting/Removing Cards (Idle Code Suppression Mismatch)

Given an active non-Y-redundant UVM/CVM/CDP card without ICS support, upgrades to a card with ICS are allowed. However, you cannot downgrade a card with ICS capability to a card that does not support ICS (see Table 3-21).

Given a pair of cards in a Y-redundancy configuration, whether any of them is active or not, they must have the same ICS capability (see Table 3-22).

Table 3-21 Active Line That is Not in Y-Redundant Pair

ICS Support		
Old Card	**New Card**	**Comment**
NO	NO	OK—same card
NO	YES	OK
YES	NO	mismatch
YES	YES	OK—same card

Table 3-22 Card is Configured for Y-Redundancy

ICS Support		
Old Card	**New Card**	**Comment**
NO	NO	OK
NO	YES	OK but ICS is not available until both cards support ICS
YES	NO	Mismatch if both cards support ICS before
YES	YES	OK

Y-Redundancy

To ensure that cards with the same ICS capability be allowed to be a Y-redundancy pair, **addyred** blocks cards that have different idle code suppression capability (see Table 3-23).

Table 3-23 Addyred Blocked Cards

ICS Support		
Primary Card	Secondary Card	Comment
NO	NO	OK
NO	YES	**addyred** blocked
YES	NO	**addyred** blocked
YES	YES	OK

Upgrading and Downgrading the Idle Code Suppression Feature

Given an active non-Y-redundant UVM/CVM/CDP card (see Table 3-24) without idle code suppression support, an upgrade to a card with ICS support is allowed. Downgrading a card with ICS capability to a card without ICS capability is not allowed.

Upgrading the ICS feature to a Y-redundancy pair (see Table 3-25) that does not support the ICS feature is not allowed. The Y-redundancy pair must be deleted first to upgrade the feature. After both cards complete the ICS upgrade, the cards can be added as a Y-redundancy pair.

Table 3-24 Active Line that is Not in Y-Redundant Pair

ICS Support		
Old Card	New Card	Comment
NO	NO	OK—same card
NO	YES	mismatch
YES	NO	mismatch
YES	YES	OK—same card

Table 3-25 Card is Configured for Y-Redundancy

ICS Support		
Old Card	New Card	Comment
NO	NO	OK
NO	YES	OK but ICS is not available until both cards support ICS
YES	NO	Mismatch if both cards support ICS before
YES	YES	OK

Limitations with Idle Code Suppression

T-type connections are not supported. On a VNS controlled network, t-type SVCs are used for video calls. VNS does not support Nx64 super-rate connections.

This feature is intended to work with video codecs that implement H.222 or BONDING protocol only.

Example

Display configuration values for channels 9.1.3 through 9.1.5.

cnfdch 9.1.3—5

```
sw176          TRM   StrataCom       IGX 8420    9.3    Apr. 13 2000  17:28 PST

            Maximum EIA     %      DFM Pattern     DFM    Idle Code   PreAge
From 9.1.3  Update Rate   Util     Length        Status     Suppr      (usec)
9.1.3-5         -          -         -            -       Disabled        0


This Command: cnfdch 9.1.3-5
```

cnfdchtp (configure data channel interface type)

Configures a CDP, CVM, or LDP or LDM DDS port interface type to OCU or DSU. When configuring DDS operations, this command returns an error if executed on a slot with an EIA/TIA-232 back card. It forces a back card slot from EIA/TIA-232 mode to DDS mode if a back card is not installed and there are no connections. Any Y-cable association is deleted in this case. The clocking tracks the DDS port interface type. OCU type interfaces are configured as looped, and DSU type interfaces are configured as normal. The default interface is DSU.

When configuring CDP, CVM, LDP, or LDM operation, this command configures DCE types as normal clocking and DTE types as looped clocking. The default type is DCE. For T1 lines, DS0A on T1 unassigned signaling is configurable. When a connection is not present, voice channels are converted to data channels.

Syntax

cnfdchtp <channel> <interface type> [unassigned signaling]

Parameters

Parameter	Description
<channel>	Specifies the channel to configure in the format <slot>. <port>.
<interface type>	Specifies the interface type to configure. An LDP or LDM DDS port can be configured as DSU or OCU (enter ds or oc). A CDP or CVM port can be configured as DCE or DTE (enter dce or dte).
[unassigned signaling]	Optionally specifies an optional parameter for T1 lines to indicate DS0A or T1 unassigned signaling. Enter d for DS0A or t for T1.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Example

Configure DDS channel 31.1 as OCU.

cnfdchtp 31.1 oc

```
beta           TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 17:30 MST

Data Channel:      31.1
Interface:         DDS-4   OCU Config
Clocking:          Looped

            Interface Control Template for Connection while ACTIVE

 Lead  Output Value   Lead     Output Value
 DSR   ON             CTS      ON
 DCD   ON


Last Command: cnfdchtp 31.1 oc


Next Command:
```

Example

Configure channel 22.1 as DCE with T1 unassigned signaling.

cnfdchtp 22.1 dce

```
beta           TRM   YourID:1        IGX 32    9.3    Apr. 13 2000  17:30 MST

Data Channel: 22.1
Interface:MissingDDS0A DCE Configuration
Clocking:Normal

            Interface Control Template for Connection while ACTIVE

 LeadOutput ValueLeadOutput Value
 DSRONCTSON
 DCDON



Last Command: cnfdchtp 22.1 dce t


Next Command:
```

cnfdclk (configure data channel clocking type)

The clock configuration of each channel of a connection determines how the clock will be propagated through the network, and how external equipment should be synchronized.

If clocking is not set correctly, there might be no synchronization, and the connection would operate in a plesiochronous mode. Each data port can be configured independently to act as either DCE or DTE by adjusting the jumper (SDI card) or changing the adapter cable (LDI card) on the data interface card. The effect of the clocking type designated depends on whether each data port is configured as DTE or DCE.

Syntax

cnfdclk <channel> <normal | split | looped>

Parameters

Parameter	Description
<channel>	Specifies the channel to configure in the format <slot>. <port>.
<normal | split | looped>	Specifies the clocking type to assign to the channel. Valid clocking types are: • n for Normal • s for Split • l for Looped for an SDP or HDM (fewer options for an LDP or LDM)

Attributes

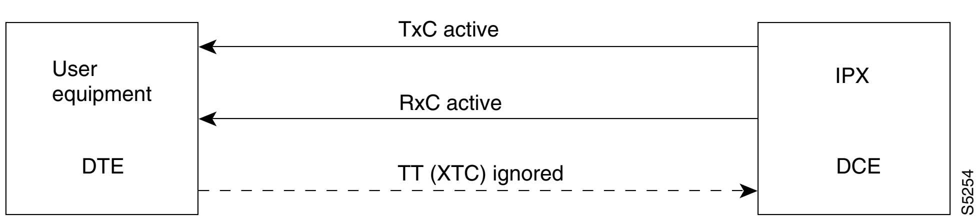
Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

These data clocking configurations are possible with the **cnfdclk** command:

DCE-Configured Data Port: Normal Clocking

When the data port is configured as DCE, selecting a clocking type of n (for normal) results in clocking as illustrated in Figure 3-11. The IGX node, acting as DCE, provides both the transmit and receive data clocks to the user equipment.

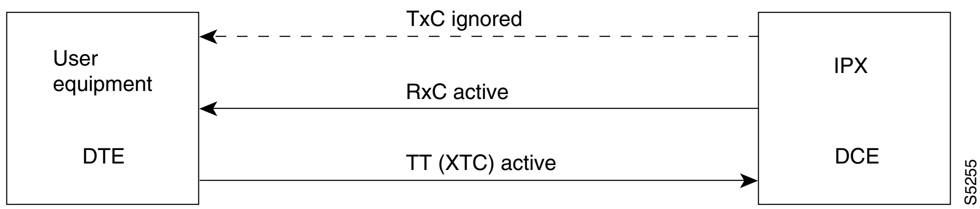
Figure 3-11 Normal Clocking on a DCE



DCE-Configured Data Port: Split Clocking

When the data port is configured as DCE, selecting a clocking type of s (for split) results in clocking as illustrated in Figure 3-12. In split clocking, TT may be generated independently of RxC. The maximum data rate for split clocking is 112 Kbps.

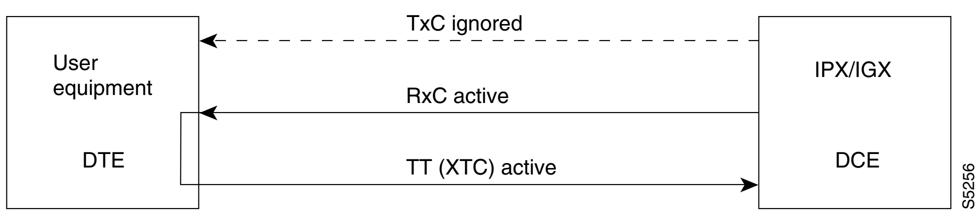
Figure 3-12 Split Clocking on a DCE



DCE-Configured Data Port: Looped Clocking

When the data port is configured as DCE, selecting a clocking type of l (for looped) results in clocking as illustrated in Figure 3-13. The Terminal Timing signal, called TT or XTC, is simply RxC looped back from the user equipment. In this configuration, it is important that the two clocks (RxC and TT) be frequency locked. This clocking configuration is supported for all data rates.

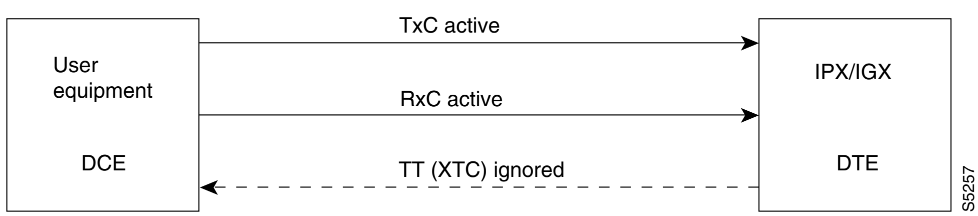
Figure 3-13 Looped Clocking on a DCE



DTE-Configured Data Port: Normal Clocking

When the data port is configured as DTE, selecting a clocking type of n (for normal) results in clocking as illustrated in Figure 3-14. The IGX, acting as DTE, receives both the transmit and receive data clocks from the user equipment. When the user equipment is not referenced to the network clock, the maximum data rate for this configuration is 112 Kbps. The two clocks must be frequency-locked for proper operation.

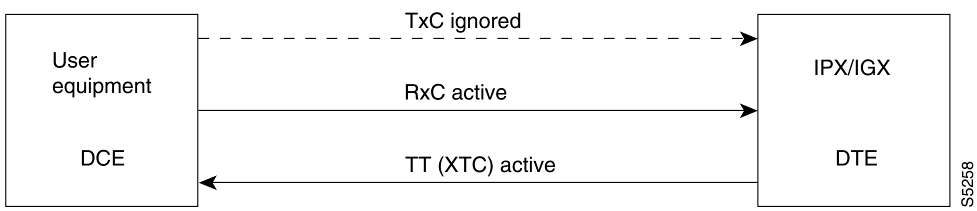
Figure 3-14 Normal Clocking on a DTE



DTE-Configured Data Port: Split Clocking

When the data port is configured as DTE, selecting a clocking type of s (for split) results in the clocking as illustrated in Figure 3-15. When the user equipment is not referenced to the network clock, the maximum data rate for this configuration is 112 Kbps. The two clocks must be frequency-locked for proper operation.

Figure 3-15 Split Clocking on a DTE

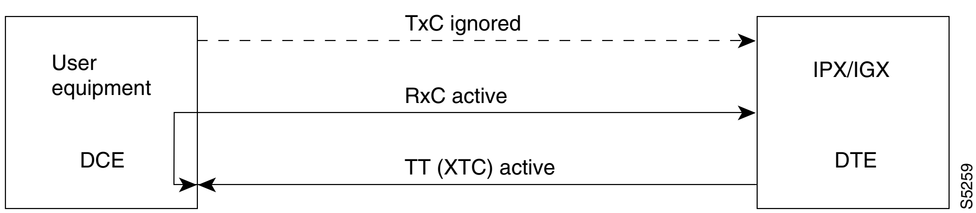


DTE Configured Data Port: Looped Clocking

If you specify clocking type of l (looped) when the data port is in DTE mode, the result is the clocking arrangement shown in Figure 3-16. The RxC clock signal is the TT(XTC) signal looped back to the IGX node by the user equipment. The network supports this clocking configuration for all data rates. The restrictions to the data clocking schemes are:

- Except for special cases, isochronous clocking is limited to data rates of 112 Kbps or less. For higher data rates, all clocks must be frequency-locked to the network.
- For any port there must be only one isochronous clock in a direction. Any situation where user equipment provides two clock signals that are not locked is subject to slippage.
- Slippage may also occur in any situation where there are opposing user clocks for a single direction of data.

Figure 3-16 Looped Clocking on a DTE



Example

Configure the clocking for channel 5.1 to normal.

cnfdclk 5.1 n

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:41 PST

Data Channel:      5.1
Interface:         V35   DCE
Clocking:          Normal

            Interface Control Template for Connection while ACTIVE

 Lead     Output Value   Lead      Output Value
 RI(J)    OFF            DSR (E)   ON
 CTS(D)   ON             TN (K)    OFF
 DCD(F)   ON


Last Command: cnfdclk 5.1 n


Next Command:
```

cnfdiagparm (configure diagnostic test parameters)

Sets various diagnostic test parameters for the nodes. These parameters affect the three IGX and BPX automatic diagnostic tests. Use this command to set test parameters on the internal system clock.

Syntax

cnfdiagparm

Display Parameters

No.	Parameter *	Description	Default *
1	VDP Test Frequency This parameter is OBSOLETE.	Interval between VDP background tests (in seconds).	50
2	LDP tstport delay	Seconds delayed before test data is sent.	10
3	System clock drift (8.192 MHz)	Range of allowable drift of system clock.	±480
4	UEC-B’s PLL railing (8.192 MHz) This parameter is OBSOLETE.	Range of UEC-B's phase lock loop rail.	±2720
5	NPM PLL Min. (8.192 MHz)	Lower limit of controller card's PLL.	- 92000
6	NPM PLL Max. (8.192 MHz)	Upper limit of controller card's PLL.	+ 508000
7	Clock Test Window	Number of samples that make up a window.	10
8	Clock Test Max Error in Window	Errors within window before fault isolation.	4
9	Clock Test Isolation Window	Window size during fault isolation.	10
10	Clock Fault Max. Error in Window	Errors allowed during fault isolation.	3
11	Clock Test Frequency	Interval between clock tests.	200 ms.
12	Clock Test Switch Delay	Delay clock testing after any clock transfers to allow settling.	3000 ms.
13	Card Reset Threshold		255
14	Card Reset Increment		0

* Clock Test parameters—Frequencies are in Hz, offset from 8.192 MHz

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnftstparm

Note Parameters 1 and 4 are obsolete.

Example

cnfdiagparm

```
sw197          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000  01:39 GMT

1. Vdp Test Frequency (seconds)       [50]
2. LDP tstport delay                  [10]
3. System clock drift (8.192 MHz)  +- [480]
4. UEC-B's PLL railing (8.192 MHz) +- [2720]
5. PCC's PLL minimum (8.192 MHz)    - [92000]
6. PCC's PLL maximum (8.192 Mhz)    + [508000]
7. Clock Test Window                  [10]
8. Clock Test Max Error in Window     [4]
9. Clock Fault Isolation Window       [10]
10. Clock Fault Max Error in Window   [3]
11. Clock Test Frequency (msec)       [200]
12. Clock Test Switch Delay (msec)    [2000]
13. Card Reset Threshold              [60]
14. Card Reset Increment              [10]


Last Command: cnfdiagparm


Next Command:
```

cnfdlparm (configure download parameters)

Sets various software and firmware downloader parameters that affect the SW/FW download protocol. It is primarily a debug command, included only to accommodate the possibility that some future software or firmware revision may need to be adjusted for optimizing the downloading process.

Caution You should not change downloader parameters except under specific direction from the Technical Assistance Center (TAC).

When you enter **cnfdlparm**, the system displays an indexed list of parameters.

Syntax

cnfdlparm

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser			BPX, IGX				

Display Fields

No.	Parameter	Description	Range	Default
1	Rmt Blk Freq	For downloads to a remote node, *Rmt Blk Freq* is the time between blocks.	1–9999999 msecs	100 msecs
2	Rmt Blk Size	For downloads to a remote node, *Rmt Blk Size* is the number of bytes in each block.	1–7C0 hex	400 hex
3	Lcl Blk Freq	For downloads to the other processor in the same (local) node, *Lcl Blk Freq* is the time (in msecs) between blocks.	1–9999999 msecs	100 msecs
4	Lcl Blk Size	For downloads to the other processor in the same (local) node, *Lcl Blk Size* is the number of bytes in each block.	1–7C0 hex	400 hex
5	Image Req Freq	The time between requests for a description of an image. When a node seeks a new software image from other nodes, it first sends requests for a full *description* of the image residing on a node to determine if that node has the correct image. The requesting node sends its request one node at a time. *Image Req Freq* is the time between the last request and the request to another node. (This parameter is not a frequency but rather a time period.)	1–9999999 msecs	10000 msecs

No.	Parameter	Description	Range	Default
6	Dnld Req Freq	After a node seeking a new software image has found a node with the correct image, it requests a download of the image. If the node with the correct image is not available to send the image, the requesting node waits a period of time before it again requests the image. *Dnld Req Freq* is the period of time the requesting node waits before it again requests the image. (This parameter is not a frequency but rather a time period.)	1–9999999 msecs	10000 msecs
7	Session Timeout	The time a receiving node waits for a block transfer to resume. If a block transfer stops after downloading begins, the *Session Timeout* is the time the receiving node waits to resume before it gives up and requests the download again.	1–9999999 msecs	30000 msecs
8	Request Hop Limit	Limit on the number of hops the local node can go to request a download. (The number of hops is the number of trunks that are crossed for one node to communicate with another node.) *Request Hop Limit*=1 means the request can go to only an immediate neighbor.	1–9999999	1
9	Crc Throttle Freq	The number of CRC calculations per second. *Crc Throttle Freq* lets you reduce the number of calculations so the node does not use processor time for CRC calculations.	1–9999999	5000
10	Crc Block Size	Number of bytes that a CRC calculation covers. The default is intentionally the same as *Rmt Blk Size* and *Lcl Blk Size*.	1–7C0 hex bytes	400 hex
11	Rev Change Wait	The time to wait before the node actually loads the software for **loadrev** or **runrev** execution.	0–99999 msecs	0
12	CCs Switch Wait	A wait period before the node actually switches control cards during **switchcc** execution. During normal operation, you should have no reason to increase *CCs Switch Wait*.	1–9999999 msecs	1000 msecs
13	Lcl Response TO (Time Out)	On a local node, a processor that is downloading to another processor must receive an acknowledgment from the receiving processor for each block that correctly arrived. If the sending processor does not receive an acknowledgment by the time *Lcl Response TO* (Time Out) has elapsed, the downloading processor sends the block again.	1–9999999 msecs	5000
14	Rmt Response TO (Time Out)	When one node downloads to another node, the sending node must receive an acknowledgment for each block correctly received. If the sending node receives no acknowledgment by the time *Rmt Response TO* (Time Out) has elapsed, the sending node sends the block again.	1–9999999 msecs	30000

No.	Parameter	Description	Range	Default
15	FW Dnld Block TO (Time Out)	The wait period that a controller card waits for an acknowledgment from a receiving card that it correctly received a block.	1–9999999 msecs	50 msecs
16	FW Dnld Msgs/Block	Number of Cbus messages per CRC block CRC check on the payload of the FW download message.	1–9999999 msecs	4
17	Flash Write TO	During flash memory programming, *Flash Write TO* (Time Out) is the time to wait for an acknowledgment that a write cycle finished before timing out.	1–9999999 msecs	16000 msecs
18	Flash Erase TO	During a flash memory erasure, *Flash Erase TO* (Time Out) is the time to wait for an acknowledgment that the erase cycle finished before timing out.	1–9999999 msecs	100
19	Erase Verify TO	*Erase Verify TO* (Time Out) is the time to wait for an acknowledgment of the completion of the second (or "true") verification of the erasure before timing out. The *Erase Verify TO* parameter is useful only if write/erase performance characteristics of a flash memory device change.	1–9999999 msecs	16000 msecs
20	Standby Flash TO	During flash memory programming, *Standby Flash TO* (Time Out) is the time to wait for an acknowledgment that the standby flash is available before timing out.	1–9999999 msecs	300 msecs
21	Lcl Flash Init TO	During flash memory programming, *Lcl* (local) *Flash Init TO* (Time Out) is the time to wait for an acknowledgment that a initialization of local flash memory finished before timing out.	1–9999999 msecs	1000
22	Flsh Write Blk Sz	Number of bytes per write cycle.	1–10000 hex	10000 hex
23	Flsh Verify Blk Sz	Second (or "true") verification of the block write. The *Flsh Verify Blk Sz* parameter is useful only if performance characteristics of a flash memory device change.	1–10000 hex	400 hex
24	Chips Per Write/Erase	Number of bytes per write/erase cycle	1, 2, or 4	1

Example

cnfdlparm

```
pubsbpx1       VT    SuperUser       BPX 8620    9.3       Apr. 13 2000 23:18 GMT

1  Rmt Blk Freq (msec)     [    100]    16 FW Dnld Msgs/Block(dec) [      4]
2  Rmt Blk Size (hex)      [    400]    17 Flash Write TO(msec)    [  16000]
3  Lcl Blk Freq (msec)     [    100]    18 Flash Erase TO(msec)    [    100]
4  Lcl Blk Size (hex)      [    400]    19 Erase Verify TO(msec)   [  16000]
5  Image Req Freq (msec)   [  10000]    20 Standby Flash TO(sec)   [    300]
6  Dnld Req Freq (msec)    [  10000]    21 Lcl Flash Init TO(msec) [   1000]
7  Session Timeout (msec)  [  30000]    22 Flsh Write Blk Sz (hex) [  10000]
8  Request Hop Limit (dec) [      1]    23 Flsh Verfy Blk Sz (hex) [    400]
9  Crc Throttle Freq (dec) [   5000]    24 Chips Per Write/Erase   [      1]
10 Crc Block Size (hex)    [    400]
11 Rev Change Wait(dec)    [      0]
12 CCs Switch Wait(dec)    [   1000]
13 Lcl Response TO(msec)   [   5000]
14 Rmt Response TO(msec)   [  20000]
15 FW Dnld Block TO(msec)  [     50]

This Command: cnfdlparm


Which parameter do you wish to change:
```

cnfecparm (configure echo canceller parameters)

Configures the CDP or CVM integrated echo canceller (IEC) parameters for specified voice circuit line.

The **cnfecparm** command configures IEC parameters associated with all voice channels for the specified circuit line. Setting these parameters allows you to optimize the IEC performance.

The **dspecparm** command description lists the defaults and provides a sample display. Also, refer to the **cnfchec** command.

Syntax

cnfecparm <line> <parameter number> <parameter value>

Parameters

Parameter	Description
<line>	Specifies the circuit line to configure.
<parameter number>	Specifies the number of the parameter to change.
<parameter value>	Specifies the new value to enter for the parameter.

Parameter Values

Index	Parameter	Description	Options
1	Echo Return Loss High	Maximum ERL required for echo canceller to converge on speech (value X 0.1 dB).	0–99 dB
2	Echo Return Loss Low	Minimum ERL required for echo canceller to converge on speech (value X 0.1 dB).	0–99 dB
3	Tone Disabler Type	Selection of protocol to enable tone disabler.	G.164, G.165
4	Non-Linear Processing	Selects type of post-canceller signal.	Center Clipper, Multiplying
5	NLP Threshold	Threshold below which non-linear processing is enabled (value X 0.1 dB).	0–99 dB
6	Noise Injection	Determines if noise will be injected when NLP is active.	Enable, Disable
7	Voice Template	Selection of template to use; normal voice levels or high voice levels.	USA—normal UK—high-level

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	IGX			Yes	

Related Commands

cnfchec, **dspecparm**

Example

Show integrated echo canceller (IEC) parameters for slot 13:

```
sw150          TN    Cisco           IGX 8420  9.3.2Q    Dec. 13 2000 12:41 PST

IEC Slot 13 Parameters
1  IEC Echo Return Loss High (.1 dBs)  [            60] (D)
2  IEC Echo Return Loss Low  (.1 dBs)  [            30] (D)
3  IEC Tone Disabler Type              [         G.164]
4  IEC Non-Linear Processing           [Center Clipper]
5  IEC Non-Linear Processing Threshold [            18] (D)
6  IEC Noise Injection                 [       Enabled]
7  IEC Voice Template                  [           USA]


This Command: cnfecparm 13
```

cnffrcls (configure Frame Relay class)

Configures a system-wide Frame Relay connection class. Be aware of these factors:

- You should configure network-wide classes only when all nodes are reachable.
- Beware of conflicting values with existing, joined networks.
- Changing a class does not affect any existing connections. An altered Frame Relay class affects only connections that are added using the changed class.

Syntax

cnffrcls <class_num> [<BW params>] [<description>]

Parameters

Parameter	Description
<class_num>	Specifies network-wide Frame Relay connection class to be configured.
frp_bw	Optionally specifies individual bandwidth parameters. The parameter name “frp_bw” is the label for the bandwidth parameters described here. The slash (/) between the repeated parameter name shows that you can specify a value for each direction. (FST is the exception.) Two parameters can be either the (default) Cisco versions or the Frame Relay Forum standard parameters. To switch between Cisco and Frame Relay Forum, use the **cnfsysparm** command. **Note** All parameters you select with **cnfsysparm** are network-wide and not confined to the current connection addition. The switchable parameters are: • Cisco Parameters Standard Parameters • PIR (peak information rate)Be (excess burst) • VC_Q (VC queue depth)Bc (committed burst) When you are using the Cisco parameter set, the names and order of specification are: MIR/MIR, CIR/CIR, VC_Q/VC_Q, PIR/PIR, Cmax/Cmax ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl When you are using the parameters with the two Frame Relay Forum versions, the names and order of specification are: MIR/MIR, CIR/CIR, Bc/Bc, Be/Be, Cmax/Cmax, ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl
description	Any text string up to 25 characters terminated by a <RET>. This is used to provide the user with a descriptive identifier for the class.

Attributes

Privilege	Jobs	Log	Node	Lock
1–2	Yes	Yes	IGX	Yes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

addcon, dspfrcls

Example

Configure Frame Relay class #1 to operate with ForeSight. The list of * parameters leaves those parameters unchanged, and “y” enables ForeSight. Because the utilization and description parameters have not been entered, any existing values for these parameters remain in effect.

cnffrcls 1 *

```
alpha          TRM   YourID:1        IGX 8410    9.3    Apr. 13 2000 16:05 PST

                        Frame Relay Connection Classes

 #    MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR   FST
.6/9.6   9.6/9.6  65535/65535    128/128  10/10  65535/65535  9.6/9.6  y
   % Util: 100/100 Description: "Default 9.6"
 2 19.2/19.2 19.2/19.2 65535/65535     */*      10/10  65535/65535 19.2/19.2 n
   % Util: 100/100 Description: "Default 19.2"
 3   16/16     16/16   65535/65535     */*      10/10  65535/65535   16/16   n
   % Util: 100/100 Description: "Default 16"
 4   32/32     32/32   65535/65535     */*      10/10  65535/65535   32/32   n
   % Util: 100/100 Description: "Default 32"
 5   56/56     56/56   65535/65535     */*      10/10  65535/65535   56/56   n
   % Util: 100/100 Description: "Default 56"

Last Command: cnffrcls 1 * * * * * * * y

Continue (y): y
```

____

```
alpha          TRM   YourID:1        IGX 8410    9.3    Apr. 13 2000 16:03 PST

                        Frame Relay Connection Classes

 #    MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR   FST
 6   64/64     64/64   65535/65535     */*      10/10  65535/65535   64/64   n
   % Util: 100/100 Description: "Default 64"
 7  128/128   128/128  65535/65535     */*      10/10  65535/65535  128/128  n
   % Util: 100/100 Description: "Default 128"
 8  192/192   192/192  65535/65535     */*      10/10  65535/65535  192/192  n
   % Util: 100/100 Description: "Default 192"
 9  256/256   256/256  65535/65535     */*      10/10  65535/65535  256/256  n
   % Util: 100/100 Description: "Default 256"
10  512/512   512/512  65535/65535     */*      10/10  65535/65535  512/512  n
   % Util: 100/100 Description: "Default 512"

Last Command: cnffrcls 1 * * * * * * * y

Next Command:
```

cnffrcon (configure Frame Relay connection)

Configures bandwidth parameters or enables ForeSight for an individual Frame Relay connection. Because you normally specify bandwidth parameters through the Frame Relay class or by the option of overriding bandwidth parameters through specific arguments for **addcon**, it is more common to use **cnffrcon** where you need to customize a single connection's bandwidth parameters.

Be sure the MIR you specify is appropriate. If the MIR is too high, bandwidth is wasted. If it is too low, the connection may drop data. The statistics reports are the best source of information to help you determine the appropriate MIR.

The PIR usually is set to the port speed. You can specify a lower PIR if other constraints on the data generation rate exist. If the PIR you specify is too low, frames are dropped. If it is too high, bandwidth may be wasted unless the network has ForeSight.

The Cmax, VC Q, and ECN Q values should be changed only by knowledgeable users and when tuning data is available to support the determination of appropriate values. These values affect system buffering resources, so any change from the defaults requires caution. Refer to the *Cisco WAN Switching System Overview* for more details on connection parameters.

If the connection type has ForeSight (FST = y), the result of the last test round-trip delay command (Test RTD) is displayed. Note that this is not the current RTD but the result of the last, user-specified test. High or low connection priority is displayed for both standard Frame Relay connections and ForeSight connections.

The node checks the bandwidth parameters to promote efficient use of network bandwidth. These messages reflect the checks on bandwidth usage:

- Error: Min cannot exceed peak
- Warning: Min exceeds this port's speed.
- Warning: Sum of mins exceeds port's speed.
- Warning: Peak exceeds this port's speed.

Warning messages are informational and do not indicate that the command is failing to execute. Error messages indicate the command is not executing.

When you specify the frp_bw parameters, enter all changes (or unchanged values indicated by an asterisk) on the line. You must specify either a change or a place-holder (*) up to at least the last changed value (after which place-holders are unnecessary). Decide on any changes before starting this command. The parameters section of this command description lists frp_bw parameters.

Syntax

cnffrcon <channel> [bandwidth_parameters]

Parameters

Parameter	Description
<channel>	Specifies the channel to configure connection parameters. The command configures connection information for one channel at a time. You cannot specify a set of channels. The channel has this format: slot.port.DLCI
[bandwidth_parameters]	Optionally specifies the bandwidth parameters in these format: MIR/MIR, CIR/CIR, VC_Q/VC_Q, PIR/PIR, Cmax/Cmax ECNQ_thresh/ECNQ_thresh, QIR/QIR, FST, %utl/%utl A slash indicates you can specify a value for each direction. FST is either ForeSight enable (y) or disable (n). An "*" is a placeholder for a parameter you do not change.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

addcon, dspcon

Example

Configure Frame Relay connection 14.3.4.

cnffrcon 14.3.4

```
igxr03         VT    Cisco           IGX 8430   9.3.2V    Jan. 18 2001 12:49 PST

Conn:  14.3.4            igxr02      27.3.4             fr       Status:OK
    MIR         CIR      VC Q Depth      PIR      Cmax   ECN QThresh     QIR
   64/64       64/64    65535/65535    64/64    100/100 65535/65535    64/64

Owner: LOCAL  Restriction: NONE  CoS: 0               FST: n  % Util:  25/25
Pri: L  Test-RTD: 0 msec
Path:   igxr03  19.1--12.3igxr02
Pref:   Not Configured



igxr03    UFM:   OK                    igxr02    UFM:   OK
          Line 14.3 : OK                         Line 27.3 : OK



This Command: cnffrcon 14.3.4
```

cnffrcport (configure Frame Relay port)

Configures the port speed and percent of utilization on the concentrated link of a Port Concentrator Shelf (PCS). This is not a standard command. Primarily, you would use **cnffrcport** to adjust the rate on the concentrated link due to some unusual system configuration.

Because this command applies to the FRC interface (the concentrated link) rather than the user port for the CPE, the port number and the range of speeds is the same as that of the FRP or FRM card. Thus, the port numbers are 1–4 with rates varying from 56 Kbps through 2 Mbps. During port configuration, a prompt for each parameter appears. To keep the current value of the parameter, press the Return key without typing anything.

Syntax

cnffrcport <slot.port> <speed>< utilization>

Frame Relay

Parameter	Description
<slot.port>	Specifies the card slot and port number. Because the port number is that of the concentrated link rather than the user port number, the range is 1–4 (not 1–44).
<speed>	Specifies the port clock speed for a 2.0 Mbps FRP-2 or FRM-2. The display shows the *configured* speed as Configured Clock and the *actual* speed as Measured Rx Clock. The available speeds are: 1 port (selected speeds, 56–2048 Kbps) 2 ports (selected speeds, 56–1024 Kbps) 3 ports (selected speeds, 56–672 Kbps) 4 ports (selected speeds, 56–512 Kbps)
< utilization>	Specifies the percent of utilization of the concentrated link.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

upfrport, dnfrport, dspfrport, dspcd

Example

Reconfigure PCS port 6.1 to have a speed of 512 Kbps and a concentrated link utilization of 88 percent. Note that executing **dspcd** for this slot would show a port count of 44, which indicates that the card set supports a PCS. The Configured Clock of 512 Kbps by itself does not indicate a PCS because a standard FRP-2 or FRM-2 also supports this rate.

cnffrcport 6.1 512 88

```
minnow         TN    SuperUser       IGX 8410     9.3       Apr. 13 2000 10:16 PST

Physical Port: 6.1            [INACTIVE]
Interface:  FRI-X21 DCE                      Configured Clock:   512 Kbps
Clocking:   Normal                           Measured Rx Clock:    0 Kbps
                                       Min Flags / Frames          1
Port ID                     1022
Port Queue Depth           65535       OAM Pkt Threshold           3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer       10 sec
DE Threshold                 100 %     N391 Full Status Poll       6 cyl
Signaling Protocol         None       EFCI Mapping Enabled       No
Asynchronous Status           No       CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer      15       IDE to DE Mapping          Yes
N392 Error Threshold           3       Interface Control Template
N393 Monitored Events Count    4          Lead      I
Communicate Priority          No          State   ON
Upper/Lower RNR Thresh  75%/ 25%       Concentrated Link Util    88%

Last Command: cnffrcport 6.1 512 88


Next Command:
```

cnffstparm (configure ForeSight node parameters)

Configures the Optimized Bandwidth Management (formerly called ForeSight) parameters for Frame Relay ports.

This command has an effect only if the Frame Relay Optimized Bandwidth Management option is enabled. The parameter values set by this command apply to all Frame Relay connections enabled with Optimized Bandwidth Management. These parameters must be configured on each node in the network that has Optimized Bandwidth Management connections. (The **cnffrcon** command enables Optimized Bandwidth Management on a connection.)

Syntax

cnffstparm

No line or port number need be entered.

Parameters

Number	Parameter	Description	Default
1	FRP Increase Rate	If free bandwidth is available, the rate at which FRP increases transmission (as a percentage of MIR).	10%
2	FRP Decrease Rate	If free bandwidth becomes unavailable, the rate at which FRP decreases transmission (as a percentage of current rate).	93%
3	FRP Fast Decrease Rate	If a cell is dropped or the TxQ is full, the rate at which FRP decreases transmission (as a percentage of current rate).	50%
4	RTD Measurement Time	The polling interval for measuring round-trip delay on each Frame Relay PVC.	5 sec.
5	Default RTD	The default RTD the connection uses before RTD is measured.	100 ms.
6	Minimum RTD	Min. value used for RTD in FR calculation regardless of measured RTD.	40 ms.
7	Maximum RTD	Max. value used for RTD in FR calculation regardless of measured RTD.	250 ms.
8	FECN for congested mins	When this percentage of packets received have the FECN bit set, a congested minutes field in the **dspfrport** command is indicated.	50%
9	QIR Time-out	Time before the allowable transmit rate is reset to QIR.	10 secs.
10	Max Test Delay Retries	Maximum number of delay test retries after a timeout.	2

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnffrcon

Example

cnffstparm

```
sw66           TN    SuperUser       BPX 15    9.3 Apr. 13 2000 23:50 GMT

1  FST Increase Rate       [   10] (%)
2  FST Decrease Rate       [   93] (%)
3  FST Fast Decrease Rate  [   50] (%)
4  RTD Measurement Time    [    5] (secs)
5  Default RTD             [  100] (msecs)
6  Minimum RTD             [   40] (msecs)
7  Maximum RTD             [  250] (msecs)
8  FECN for congested mins [   50] (%)
9  QIR Time-out            [  244] (secs)
10 Max TstDelay Retries    [  2] (dec)



Last Command: cnffstparm


Next Command:
```

cnffunc (configure system functions)

Enables or disables a specified node function.

Syntax

cnffunc <function_index> <e | d>

Each function has an index number. By entering the command, the index parameter, and the letter "e" or "d," the function is either enabled or disabled.

Function Index Parameters

Index	Function	Description	Default
1	Automatic CLN/TRK Loopback Test on Local/Remote Alarms	A remote-end loopback is automatically set up on a failed line or trunk. Used to check the integrity of the back card alarm circuitry.	enabled
2	FDP Loopback button	For an IGX node, enables loopback button on SDP or HDM card faceplate. (Disable it to prevent accidental operation by contact.)	enabled
3	User Command Logging	All commands entered by the user is entered in the system log when enabled. When disabled, system log does not become so large but there is no audit trail of operator commands kept.	enabled
4	Automatic Card Reset on Hardware Error	The controller card (BCC or NPM) issues a hardware reset to a card when firmware detects an error during normal operation. This allows the node to return a card to service after a firmware error.	enabled
5	TXR Model D Download	(Not used)	enabled
6	Card Error Record Wraparound	Allows the log entry for each card error to wrap for long entries. When disabled, only first ten failures are logged.	enabled
7	Card Test After Failure	Indicates card function self-tests and background test should continue to be executed after a card has been declared as failing these tests.	disabled
8	Download from Remote WAN Manager NMS	Allows a node to download software images from a WAN Manager not directly connected to the node.	disabled
9	Logging of connection events in local event log	All connection event messages are entered in the system log when enabled. When disabled, system log does not become so large but there is no audit trail of connection events kept.	disabled
10	Logging of connection events in WAN Manager event log	All connection event messages are entered in the WAN Manager event log when enabled. When disabled, WAN Manager event log does not become so large but there is no audit trail of connection events kept.	disabled
11	Force Download From a Specific IP address	Forces the node to only download software images from a WAN Manager with the specified IP address.	disabled
12	Logging of SVC connection events	All SVC connection event messages are entered in the local event log when enabled. When disabled, local event log does not become so large but there is no audit trail of SVC connection events kept.	disabled

Index	Function	Description	Default
13	CDP WinkStart Signaling	Toggles WinkStart signaling on the CDP.	disabled
14	Logging of Bus Diagnostic Events in local event log	All Bus Diagnostic event messages are entered in the local event log when enabled. When disabled, local event log does not become so large but there is no audit trail of Bus Diagnostic events kept.	enabled
15	Automatic Card Reset after Burnfw for CBI Cards	While the network is running Release 9.1, use the **cnffunc** command option 15 to disable the **Automatic Card Reset after Burnfw for CBI cards** option. (By default, this option is enabled.) You need to perform this step so that you can burn the UXM firmware revision on the flash and delay execution of the new firmware revision until the card is reset with the **resetcd** command. After the UXM at both ends of the trunk are burned with the new firmware revision, you can reset the UXM cards at the same time so that the new ATM Forum–Compliant protocol is invoked at both ends of the trunk at the same time. It is important that you perform this step, because a node potentially may be not be reached if this is an IMA trunk, and it is the only trunk connected to that remote node. Also note that if an IMA trunk is not used within the Release 9.1 network, then you do not need to perform this step. Then upgrade all UXM cards in the Release 9.1 network with UXM firmware model B.	Enabled/ Disabled [Default: Enabled]

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Upgrading from Release 9.1 to Release 9.2 When IMA Trunks Exist

When IMA trunks exist in a Release 9.1 network, and you are upgrading from Release 9.1 to 9.2, ensure that the following steps have been performed:

- While the network is running Release 9.1, use the **cnffunc** command option 15 to disable the **Automatic Card Reset after Burnfw for CBI cards** option. (Note that this option is enabled by default.) This step is required so that you can burn UXM firmware revision on the flash and delay execution with this new firmware revision, then later reset the card by using the **resetcd** command. After the UXM at both ends of the trunks is burned with the new firmware revision, you can reset the UXM cards at the same time so that the new ATM Forum–Compliant protocol is invoked at both ends at the same time. If this step is not followed, some nodes may not be reachable if this is an IMA trunk, and it is the only trunk connected to that remote node. Note that if an IMA trunk is not used within the 9.1 network, then you do not need to perform this step.
- Upgrade all UXM cards in the Release 9.1 network with UXM firmware model B.

You are now ready to upgrade the switch software from Release 9.1 to 9.2.

Example (IGX)

Enables automatic card testing after a card failure has been detected.

cnffunc 15 e

```
-----------------------------------SCREEN 1--------------------------------------
sw180          TN    Cisco           IGX 8420  9.3.2J    Oct. 25 2000 12:20 GMT

Index Status    Function

1      Enabled   Automatic CLN/PLN Loopback Test on Local/Remote Alarms
2      Enabled   FDP Loopback button
3      Enabled   User Command Logging
4      Enabled   Automatic Card Reset on Hardware Error
5      Enabled   TXR Model D Download
6      Enabled   Card Error Record Wraparound
7      Disabled  Card Test After Failure
8      Disabled  Download From Remote CWM
9      Disabled  Logging of conn events in local event log
10     Disabled  Logging of conn events in CWM event log
11     Disabled  Logging SVC Connection Events
12     Disabled  Force Download From a Specific IP address
13     Disabled  CDP WinkStart Signaling

This Command: cnffunc

Continue?

-----------------------------------SCREEN 2--------------------------------------
sw180          TN    Cisco           IGX 8420  9.3.2J    Oct. 25 2000 12:22 GMT

Index Status    Function

14     Enabled   Logging of Bus Diagnostic Events in local event log
15     Enabled   Automatic Card Reset after Burnfw for CBI cards
16     Enabled   Logging of router state events in CWM event log



Last Command: cnffunc 15 e
```

Example (BPX)

cnffunc 1 e

```
sw53           TN    Cisco           BPX 8620  9.3.2J    Oct. 25 2000 12:18 GMT

Index Status    Function

1      Enabled   Automatic TRK Loopback Test on Local/Remote Alarms
2      Enabled   User Command Logging
3      Disabled  Automatic Card Reset on Hardware Error
4      Enabled   Card Error Record Wraparound
5      Disabled  Card Test After Failure
6      Disabled  Download From Remote Cisco StrataView Plus
7      Disabled  Logging of conn events in local event log
8      Disabled  Logging of conn events in Cisco StrataView Plus  event log
9      Disabled  Force Download From a Specific IP address


Last Command: cnffunc 1 e
```

cnffwswinit (configure FW/SW download initiator IP address)

Specifies the IP address of the machine used to initiate a firmware or software download. With Release 9.3.30 and higher, the **cnffwswinit** command is also used to specify the IP address of the network server used to initiate the configuration save and restore operation using a TFTP Start file or SNMP interface.

This is a safety measure to prevent downloads from being started anywhere in the network. You must have access to a node, and use the **cnffwswinit** command to set the IP address before a download will be accepted from that address.

Syntax

cnffwswinit <IP address>

Parameters

Parameter	Description
<IP address>	Specifies the IP address of the network server that initiates a firmware/software download or a configuration save/restore operation.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

dsppwd, **adduser**, **deluser**, **dspusers**

Example

Configure the IP address of the network server that will initiate the firmware download to the network nodes.

cnffwswinit 172.29.52.17

cnfict (configure interface control template)

Sets the interface control template signals. The signals that can be set by using **cnfict** depend on the type of back card used and whether the hardware is configured for DCE or DTE. On an IGX node, the applicable front cards are the LDM, HDM, FRM, and CVM (for data). Each data channel has a default interface control template for its active, conditioned, and looped near and far states. Use the **cnfict** command is used to individually configure each interface control lead in each template.

When Y-cable redundancy is in effect, the control template configuration for the data channels terminating at the primary slot is also applied to the data channels of the secondary slot. Any configuration information for the secondary slot is ignored.

Note The **cnfict** command is not valid for V.11 and X.21 interfaces. For FRP V.35 and Port Concentrator V.35 and V.28 interfaces, only the active template is usable, and you can configure the leads to On or Off.

Syntax

cnfict <port> <template> <output> <source>

Parameters

Parameter	Description		
port	Specifies the data channel or Frame Relay port whose interface control template is to be configured. Entered as <slot.port>. On an IGX node, the applicable cards are the LDM, HDM, FRM, and CVM.		
template	Specifies which interface control template to configure for the channel and has the format <a | c | l | n | f>. Valid entries are listed below. The only valid template for a Frame Relay port, X.21 or V.35, is the ACTIVE template. Also, all the output leads have steady state values and do not follow local or remote inputs		
	Entry	**Template**	**Description**
	a	Active	The active control template is in effect while the data channel is active (normal operation) i.e., when the connection is routed and not failed.
	Entry	**Template**	**Description**
	c	Conditioned	The conditioned control template is in effect when conditioning is applied to the data channel. The conditioned template is used when the network detects that it cannot maintain the connection because of card failures or lack of bandwidth (the connection failed).
	l	Looped	The looped template is in effect when the data channel is being looped back in either direction. The looped template is used when **addloclp** or **addrmtlp** has been used to loop the connection within the network.

<table>
<tr><th>Parameter</th><th colspan="3">Description</th></tr>
<tr><td></td><td>n</td><td>Near loopback</td><td>The near template is in effect when running a tstport n command or an addextlp n command on a port. The port is configured such that the external near modem is placed in a loopback.</td></tr>
<tr><td></td><td>f</td><td>Far loopback</td><td>The far template is in effect when running a tstport f command or an addextlp f command on a port. The port is configured such that the external far-end modem is placed in a loopback.</td></tr>
<tr><td>output</td><td colspan="3">Specifies the output lead. Refer to the Configurable Lead information in the command description for abbreviations. Configurable output leads vary with the type of data interface (EIA/TIA-232, V.35, X.21, or EIA/TIA -449).</td></tr>
<tr><td>source</td><td colspan="3">Specifies how the lead is to be configured and has the format
<on | off |local | remote> <input> [delay]. Valid source choices follow:</td></tr>
<tr><td></td><td colspan="3">Source Options</td></tr>
<tr><td></td><td>on</td><td colspan="2">The output lead is asserted.</td></tr>
<tr><td></td><td>off</td><td colspan="2">The output lead is inhibited.</td></tr>
<tr><td></td><td>l</td><td colspan="2">Local. Indicates that the output follows a local lead.</td></tr>
<tr><td></td><td>r</td><td colspan="2">Remote. Indicates that the output follows a remote lead.</td></tr>
<tr><td></td><td>input</td><td colspan="2">Specifies the name of the local or remote input lead that the output lead follows.</td></tr>
<tr><td></td><td>delay</td><td colspan="2">Specifies the time in milliseconds that separates the off to on lead transitions. Delay is valid only when the output lead is CTS and the input lead is local RTS. On to Off lead transitions are not subject to this delay.</td></tr>
</table>

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

addextlp, dspict, tstport

Configurable Lead Names and Functions

Table 3-26 shows the configurable leads and the equivalence between EIA/TIA-232C, EIA/TIA-232D, EIA/TIA-449, V.35, and X.21 interfaces. The leads are configurable for each type of data interface supported by the IGX node. An IGX treats leads impartially for non-interleaved connections.

The entries under the IGX Name column indicate the abbreviations to use when specifying input or output leads on the command line. A node treats leads impartially for non-interleaved connections. Any signal received on an EIA pin at one end may be transmitted to any pin at the other end, up to the maximum of 12 EIA leads on any interface type. For interleaved EIA connections, refer to the Fast EIA column. The column shows which leads are carried in the interleaved bytes of the data packets. All remaining leads are carried in standard control lead packets.

Table 3-26 Configurable Lead Names and Functions

Configurable Leads								
Source	**IGX Name**	**EIA/TIA-232C**	**EIA/TIA-232D**	**EIA/TIA-449**	**V.35**	**X.21**	**Fast EIA**	**Function**
DTE	RTS	CA	CA	RS	C		F4	Request to Send
DCE	CTS	CB	CB	CS	D		F4	Clear to Send
DCE	DSR	CC	CC	DM	E		F3	Data Set Ready
DCE	DCD	CF	CF	RR	F		F7	Data Carrier Detect (RLSD)
DCE	QM	QM	QM					Equalizer Mode
DTE	pin 11	11	11					Sometimes used for Data
DCE	SDCD	SCF	SCF					Secondary Data Carrier Detect
DCE	SCTS	SCB	SCB					Secondary Clear to Send
DTE	STxD	SBA	SBA				F5	Secondary Transmit Data
DTE	NS			NS			F7	New Sync
DCE	SRxD	SBB	SBB				F5	Secondary Receive Data
DCE	DCR	DCR						Divided Receiver Clock
DTE	RL		RL	RL			F6	Remote Loopback
DTE	SRTS	SCA	SCA					Secondary Request to Send
DTE	DTR	CD	CD	TR	H		F3	Data Terminal Ready
DCE	SQ	CG	CG	SQ				Signal Quality Detect
DCE	RI	CE	CE	IC	J**			Ring Indicator
DTE	SF	CH	CH	SF				Signal Rate Select (to DCE)
DCE	SI	CI	CI	SI				Signaling Rate Select. (to DTE)
DTE	BSY	BSY		IS			F1	Busy (In Service)
DCE	SB		TST	SB			F1	Test Indicator
DTE	LL			LL			F2	Local Loopback
DCE	TM			TM	K[1]		F6	Test Mode
DTE	SS			SS				Select Standby
DTE	C					C		Control
DCE	I					I		Indicator

1. Applicable to SDP cards only.

Note that pins 11 and 23 on an EIA/TIA-232 port are bidirectional, and their default direction is input. See the **cnfcldir** command for information on changing the direction of these pins. The **cpyict** command can be used to copy an interface control template from one data channel to another. You can then edit it by using the **cnfict** command. The **dspbob** command displays the state of leads at specified intervals.

Example

Configure the conditioned interface control template for channel 31.1 to SB on (DDS).

cnfict 31.1 c SB on

```
beta           TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 17:30 MST

Data Channel:      31.1
Interface:         DDS-4   OCU Config
Clocking:          Looped

            Interface Control Template for Connection while CONDITIONED

Lead     Output Value     Lead     Output Value
SB       ON               RI       OFF
DSR      OFF              CTS      ON
DCD      OFF


Last Command: cnfict 31.1 c   sb  on


Next Command:
```

Example

Configure the active interface control template for channel 25.1 to CTS-on (EIA/TIA-232). CTS-on means that when the port is active, the CTS lead is asserted.

cnfict 25.1 a cts on

```
beta           TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 17:36 MST

Data Channel:      25.1
Interface:         EIA/TIA-232   DCE
Clocking:          Normal

            Interface Control Template for Connection while ACTIVE

 Lead    Output Value                  Lead    Output Value
 RI      OFF                            DSR     ON
 CTS     ON                             SRxD    ON
 DCR     OFF                            DCD     ON
 SCTS    ON                             SDCD    ON
 SQ      ON

Last Command: cnfict 25.1 a cts on


Next Command:
```

Example

Configure the active interface control template for channel 5.1 to CTS on (V.35).

cnfict 5.1 active CTS on

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:29 PST

Data Channel:      5.1
Interface:         V35   DCE
Clocking:          Normal

            Interface Control Template for Connection while ACTIVE

 Lead    Output Value                  Lead     Output Value
 RI  (J) OFF                            DSR (E) ON
 CTS (D) ON                             TM  (K) OFF
 DCD (F) ON

Last Command: cnfict 5.1 a cts on

Next Command:
```

Example

Configure the active interface control template to have RTS-on. This means that when the port is active. the RTS lead is asserted.

cnfict 9.1 a rts on

```
alpha          TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 10:23 PST

Port:       9.1               [ACTIVE  ]
Interface:  FRI-V35 DTE                        Configured Clock:   256 Kbps
Clocking:   Normal                             Measured Rx Clock:    0 Kbps
Port ID                        7
Port Queue Depth           65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer         6 sec
DE Threshold                 100 %     N391 Full Status Poll       10 cyl
Signaling Protocol         None       ForeSight (CLLM)           No
Asynchronous Status           No       CLLM Status Tx Timer         0 msec
T392 Polling Verif Timer      15       Interface Control Template
N392 Error Threshold           3          Lead       State
N393 Monitored Events Count    4           RTS        ON
Communicate Priority          No           DTR        ON
Upper/Lower RNR Thresh  75%/ 25%
Min Flags / Frames            1

Last Command: cnfict 9.1 a rts on

Next Command:
```

Example

Configure the near interface control template for 31.1, to DSR on (DDS trunk).

cnfict 31.1 n dsr on

```
beta           TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 17:38 MST

Data Channel:      31.1
Interface:         DDS-4   OCU Config
Clocking:          Looped

            Interface Control Template for Connection while NEAR EXT LOOPED

 Lead    Output Value                    Lead    Output Value
 DSR     ON                              CTS     ON
 DCD     ON


Last Command: cnfict 31.1 near dsr on

Next Command:
```

cnflan (configure LAN)

Configures node communication parameters, to enable the node to communicate with a Cisco WAN Manager terminal over an Ethernet LAN using TCP/IP protocol. The parameters all contain address information about the Ethernet TCP/IP network that connects the Cisco WAN Manager station to an IGX or BPX node. The values must conform to those of the network. The network administrator can supply the parameters.

With Release 9.3.30, the **cnflan** command supports the first phase of the Automatic Routing Management to PNNI migration. When the XLMI protocol and the LMI Neighbor Discovery feature are enabled (using the advertise interface information parameter from the **cnfport** command) and the LAN IP is the selected Management IP address, the new LAN IP address is sent to the BXM card whenever the LAN IP address is changed. The **cnfnodeparm** command is used to select the Management IP address.

Syntax

cnflan <IP_Address> <IP_Subnet_Mask> <Maximum LAN Transmit Unit> <TCP Service Port>

Parameters

Parameter	Description
<IPAdd>	Specifies the Internet address of the node used in the TCP/IP protocol.
<IP subnet mask>	Specifies a 32-bit mask that contains information about the bit lengths of the subnet ID and host ID address fields. The format of this field uses 1s for the subnet ID field and 0s for the host ID address field as defined in the TCP/IP protocol. Default: 255 255 255.0. This mask denotes both subnet ID and host ID fields as 8-bit fields.
<Max. LAN Transmit Unit>	BPX nodes only: typical length is 1500 bytes.
<TCPServicePort>	Specifies the node’s service point used by the transmission control protocol (TCP).
<GatewayIPAddr>	Specifies the Internet gateway address.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

upln, **dnln**, **cnfln**

Example

Configure node parameters to communicate with Cisco WAN manager.

cnflan

```
sw150          TN    Cisco          IGX 8420  9.3.2Q    Dec. 13 2000 12:51 PST

Active IP Address:                     172.29.10.238
IP Subnet Mask:                        255.255.255.0
IP Service Port:                       5120
Default Gateway IP Address:            172.29.10.1
Maximum LAN Transmit Unit:             1500
Ethernet Address:                      00.C0.43.00.EC.BA

Type       State
LAN        READY
TCP        UNAVAIL
UDP        READY
Telnet     READY
TFTP       READY
TimeHdlr   READY
SNMP       READY

This Command: cnflan


Enter IP Address:
```

cnfleadmon (monitor LDM/HDM data port leads)

Monitors the IGX node’s LDM/HDM ports for failures. You can set each of the twelve control lead types to be monitored by firmware on the LDM/HDM card. The monitor reports only lead state changes; no event is reported if the lead remains up from one poll to the next.

You can also set the interval value that determines how frequently the firmware will check the card’s serial port leads. To turn off the feature, set the interval value to zero.

Syntax

cnfleadmon <index> <interval>

Parameters

Parameter	Description
<index>	Index number of the serial data port leads. Values 1 through 12. When you enter a different lead index number, an arrow moves to highlight the current monitoring data on that lead.
<interval>	The timer value in seconds. This determines how frequently the firmware on the LDM/HDM card will check the specified lead. Values: 5 through 255 seconds Default = 0 Enter 0 to turn off the feature.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
2	Yes	Yes	IGX			Yes	

Related Commands

dsplogcd, dspcd, addjobtrig

Example

Tells the LDM/HDM card firmware to monitor data port lead number 4, every 5 seconds.

cnfleadmon 4 5

```
sw180          TN    Cisco          IGX 8420  9.3.r5    Dec. 20 2000 13:34 GMT

        |      LDM      |  HDM/SDI-RS232   |   HDM/SDI-RS449    |  HDM/SDI-V35  |
  index |  DCE  :  DTE  |  DCE    :  DTE   |   DCE   :   DTE    |  DCE  :  DTE  |
      1         :                  :TST/25   IS/28    :SB/36             :
      2         :        LL/18    :RI/22    LL/10    :IC/15             :RI/J
      3  DTR/20 :DSR/6   DTR/20   :DSR/6    TR/12&30 :DM/11&29  DTR/H  :DSR/E
===>  4  RTS/4  :CTS/5   RTS/4    :CTS/5    RS/7&25  :CS/9&27   RTS/C  :CTS/D
      5         :        STxD/14 :SRxD/16           :                  :
      6         :        RL/21    :         RL/14    :TM/18             :TM/K
      7         :DCD/8            :DCD/8    NS/34    :RR/13&31          :DCD/F
      8         :        SRTS/19 :SCTS/13           :                  :
      9         :                 :SDCD/12           :                  :
     10         :        SF/23    :SI/23    SF/16    :SI/2              :
     11         :                 :                  :SQ/33             :
     12         :        ***/11   :QM/11    SS/32    :                  :
Sampling interval for HDM or LDM control lead shown above ......   5 seconds

Last Command: cnfleadmon 4 5
```

cnfln (configure line)

Configures a line to be compatible with the device to which it connects. The **cnfln** command applies to voice, data, Frame Relay, ATM (including IMA lines). The **cnfcln** command is an alias for **cnfln**.

Because of the variety of line types and characteristics, separate parameters sections are included in this command description to define the parameters for specific line types. The system automatically presents the correct options on the command line for each line type. If a parameter is not applicable to a card type, the system displays the parameter in half-tone or the parameter value field with dashed lines.

Note In Release 9.3.20 and higher, the **cnfln** command is not used to configure the VC Shaping parameter on IGX ATM ports. You must use the **cnfport** command to configure VC Shaping. This change applies to all ATM ports in the IGX, that is, ports on the UXM and URM. Refer to the **cnfport** command for more information specific to ATM port configuration.

Syntax

cnfln <line> <*parameters*>

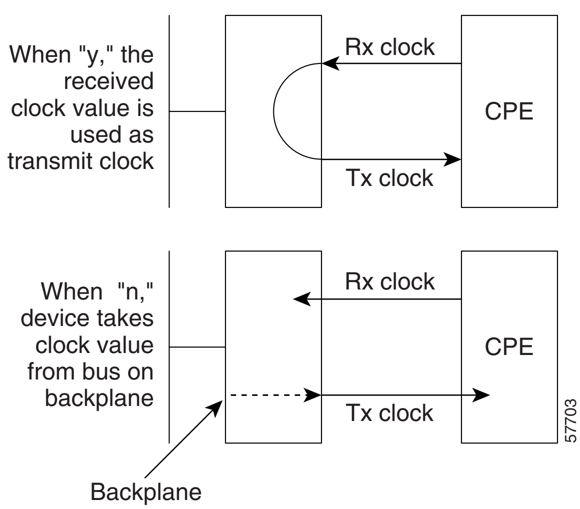
Syntax for IMA

cnfln <slot>.<*primary link*>

Parameters (IGX Voice, Data, Frame Relay Lines)

The following graphic illustrates the loop clock parameter, described in the parameter table that follows.

Figure 3-17 Loop Clock Illustration



Parameter	Description	Default
slot or slot.line	Specifies the line. If the back card has one line connector and cable, enter the slot number. If the card has more than one physical line, include a line number. If the card is a UVM, however, enter just the slot number.	
loop clock	Enables the transmit and receive control leads to use the same clock. Format for the parameter is Y or N.	N
line framing	Configures T1 line framing to be D4 or ESF. Note that UFM-C series is ESF only. With Release 9.3.0, changing the line framing for BXM-T3 cards from PLCP to HEC no longer automatically changes the port's bandwidth to the new maximum. It merely raises the upper limit for the port's bandwidth. After changing the framing, you must use **cnfport** to increase the port's bandwidth.	D4 (ESF on UFM/FRM)
line coding	Configures T1 and E1 coding:	
	T1:ZCS B8ZS AMI	ZCS B8ZS for FRM/UFM/UXM
	E1:HDB3 ZCS	HDB3
line CRC on	Enables CRC-4 detection for E1 lines. Use either Y or N.	N
E1 recv impedance	A parameter, in the range 1–7. 1 is 75 ohm impedance, unbalanced 2 is 75 ohm impedance, unbalanced 3 is 20 ohm impedance, balanced 4 is 0–133 ft impedance, ABAM cable 5 is 133–266 ft impedance, ABAM cable 6 is 266–399 ft impedance, ABAM cable 7 is 399–533 ft, ABAM cable	1
signaling	E1: Common channel signaling (CCS) or ABCD signaling bits with channel associated signaling (CAS)	CAS
	T1: Common channel signaling (CCS), ABCD or ABAB (with ESF line framing) or AB (with D4 line framing).	AB
encoding	A-law mu-law	depends on the back card

Parameter	Description	Default
cable type/length	A parameter, in the range 1–8. 1 = voice circuit: 0–220 ft MAT cable, Frame Relay circuit: CSU Network Interface 2 = voice circuit: 220-440 ft MAT cable, Frame Relay circuit: 0–133 ft ABAM cable 3 = voice circuit: 440-655 ft MAT cable, Frame Relay circuit: 133–266 ft ABAM cable 4 = voice circuit: 0-133 ft ABAM cable, Frame Relay circuit: 266–399 ft ABAM cable 5 = voice circuit: 133-266 ft ABAM cable, Frame Relay circuit: 399–533 ft ABAM cable 6 = voice circuit: 266-399 ft ABAM cable, Frame Relay circuit: 533–655 ft ABAM cable 7 = voice circuit: 399–533 ft, Frame Relay circuit: not used 8 = voice circuit: 533–655 ft, Frame Relay circuit: not used	4
56 Kbps bit stuffing	most significant bit (msb) least significant bit (lsb)	msb
pct fast modem	Expected percentage of fast modem connections on the line. High speed modems preclude the use of ADPCM. Consequently, channel load requirements increase over that required for a voice channel. Range: 0–100	20

Parameters (BPX ATM Line)

Parameter	Description			
line number	Specifies the ATM line to configure.			
line options	Specifies the ATM line options:			
	Parameter	**Description**	**Options**	**Default**
	Loop clock	Enable loop clocking.	Yes/No	No
	Idle Code	Hex data placed in unused payload of cells.	0 - FF (hex)	7F
	Cable Type/Length	Length and type of cable used for trunk.	1 = 0 - 225 2 = >225	1
	HCS Masking	Use a non-zero starting value for the HCS calculation to ensure a non-zero HCS. This is used to aid in the cell delineation algorithm.	Yes | No	Yes
	Payload Scramble	Whether or not to scramble (randomize) the cell payload data. Note: for E3, this must always be set to Yes.	Yes | No	No

Parameters (IGX ATM UXM Line)

Parameter	Description			
slot.line	Specifies which line on which slot to configure.			
line options	Specifies the ATM line options:			
	Parameter	**Description**	**Options**	**Default**
	Loop clock	Enable loop clocking	Yes/No	No
	Idle Code	Hex data placed in unused payload of cells.	0 - FF (hex)	7F
	HCS Masking	Use a non-zero starting value for the HCS calculation to ensure a non-zero HCS. This is used to aid in the cell delineation algorithm.	Yes | No	Yes
	Payload Scramble	Whether or not to scramble (randomize) the cell payload data. Note: for E3, this must always be set to Yes.	Yes | No	Yes
	Frame Scramble	Whether or not to scramble (randomize) the frame data. Note: for E3, this must always be set to Yes.	Yes | No	No
	Cell Framing	Choose the cell framing format. Select either STS-3C (SONET) or STM-1 (SDH).	STS-3C | STM-1 PLCP HEC	STS-3C for OC-3 PLCP for T3 HEC for E3
	Line CRC	Enables E1 CRC-4 protection on E1 multiframed lines.	Yes | No	Yes

Parameters (IGX IMA UXM Lines)

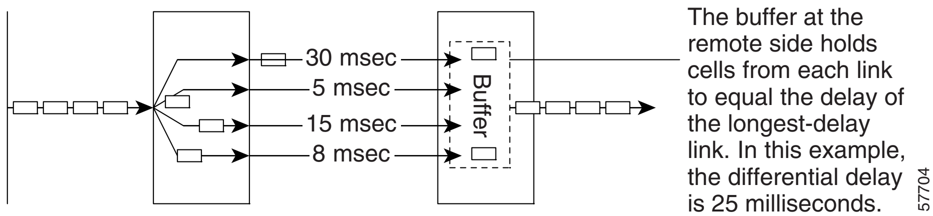
Parameter	Description
slot.line	Specifies which line on which slot to configure.
Line DSO-Map	Line DSO mapping.
IMA Group Members	Specifies the line numbers of the individual links composing the IMA group.

Parameter	Description
Retained Links	The minimum number of links in the IMA group that must be active in order for the IMA line to operate. For an IMA line, you can add or delete links in an IMA group, or specify the number of retained links for an IMA configuration. If the number of links fails and falls below the retained link number specified, the IMA line fails. By default, the number of retained links is the same as the number of lines grouped together when the IMA group is created. For example, the command "**upln** 3.1-4" results in 4 lines in an IMA group with 4 retained links. If one link fails, the IMA line fails. Using the **cnfln** command, you can change the Retained Links parameter to a lesser number, for example, 3. Therefore, if one of the lines fails, the IMA line remains active.
IMA Protocol Option	Specify one of the following: Enable–to enable the IMA protocol on a line Disable–to disable the IMA protocol on a line Note: Changing the protocol option on an active line results in port failure. The user should always make sure that the IMA line is configured the same as the CPE.
IMA Max. Diff. Dly.	Specify a value. Range: 0–200 msec. Default: 200 msec. Defines the maximum time that one T1 or E1 link can be delayed with respect to another T1 or E1 link in the IMA line or trunk bundle. If the delay becomes too great, the proper reassembly of IMA frames will not occur, causing traffic errors. There is limited storage capacity in this buffer, therefore this parameter establishes the maximum differential delay which will be tolerated. Accurately specifying the delay results in optimum performance due to reduced buffer time; overspecifying the delay results in poor performance due to unnecessary cell waits in the buffer. Refer to Figure 3-18 on page 3-247.
IMA Clock Mode:	The clock mode is Common Transmit Clock (CTC).
Loop Clock	Enables the transmit and receive control leads to use the same clock. Specify Yes or No. Default: No.

Parameter	Description
Line Coding	Configures T1 and E1 coding. Default values per line type are: E1–HDB3 T1–ZCS T1–(UFM T1), B8ZS J1–HDB3 E3–HDB3 T3–B8ZS OC3–N/A Possible line coding values for each line type are: E1–HDB3– not configurable T1–ZCS, B8ZS, AMI J1–HDB3– not configurable E3–HDB3–not configurable T3–B8ZS–not configurable OC3–N/A
Line CRC	Enables CRC-4 detection for E1 lines. Use either Y or N. This parameter defaults to “Y” when the line is upped.
Line recv impedance	For E1, a parameter in the range 1–7. 1 is 75 ohm impedance, unbalanced 2 is 75 ohm impedance, unbalanced 3 is 20 ohm impedance, balanced 4 is 0–133 ft impedance, ABAM cable 5 is 133–266 ft impedance, ABAM cable 6 is 266–399 ft impedance, ABAM cable 7 is 399–533 ft, ABAM cable
Idle Code	Hex data placed in unused payload of cells Range: 0 - FF (hex) Default: 7F
HCS Masking	Masking of cell header checksum to disable error checking. Specify either Yes or No. Default: Yes.
Payload Scramble	Whether or not to scramble (randomize) the cell payload data. Specify either Yes or No. Default: No Note: for E3, this must always be set to Yes.

Figure 3-18 illustrates the parameter IMA Max. Diff. Dly., described in the parameter table above.

Figure 3-18 IMA Max. Diff. Delay



Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspln, dsplncnf, dsptsmap, dnln, upport, dspport, dspports

Example

Configure voice line for a UVM.

cnfln 11.1 N D4 ZCS U-LAW AB 4 msb 20 N

```
poego          TN    Cisco           IGX 8420  9.3.u4    May  10 2001 1231 PST

LN  11.1 Config       T1/24                UVM slot11
Loop clock           No
Line framing         D4
Line coding          ZCS
Line encoding        u-LAW
Line T1 signalling   AB
Line cable type      ABAM
Line length          0-133 ft.
Line 56KBS Bit Pos   msb
Line pct fast modem  20
Line cnfg            External
Line cnf slot.line   --
Line CAS-Switching   --
Line SVC-Caching     Off


Last Command cnfln 11.1 N D4 ZCS U-LAW AB 4 msb 20 N
```

Example

Configure a Frame Relay T1 line for the following option: no loop clock.

cnfln 15 N ESF 4

```
sw150          TN    Cisco           IGX 8420  9.3.2T    Dec. 19 2000 22:50 PST

LN  15 Config         T1/24                FRM slot:15
Loop clock:           No
Line framing:         ESF
Line coding:          B8ZS
Line cable type:      ABAM
Line length:          266-399 ft.



Last Command: cnfln 15 N ESF 4
```

Example

Configure ASI port 5.1.

cnfln 5.1

```
sw167          TN    Cisco           BPX 8620  9.3.2R    Dec. 14 2000 13:24 PST

LN   5.1 Config     T3      [96000 cps]    ASI-T3 slot:  5
Loop clock:           No                 Idle code:             7F hex

Line framing:         --
     coding:          --

     recv impedance:   --
     E1 signaling:    --
     encoding:         --                     cable type:
     T1 signaling:    --                     length:           0-225 ft.
                                         HCS Masking:           Yes
                                         Payload Scramble:      No
     56KBS Bit Pos:    --                Frame Scramble:        --
     pct fast modem:   --                Cell Framing:          --

Last Command: cnfln 5.1
```

Example

Configure the UXM-E1 IMA line.

cnfln 5.1 1-15,17-31 1-8 6 200 N 54 Y Y N

```
sw225          TN    StrataCom       IGX 8420  9.3.13    Feb. 2 2000  10:14 GMT

LN   5.1(8) Config    E1/238                UXM slot:10
Line DS-0 map:        1-15,17-31
IMA Group Member(s):  1-8
Retained links:       6
IMA Protocol Option:  Enabled
IMA Max. Diff. Dly:   200 msec.
IMA Clock Mode:       CTC
Loop clock:           No
Line coding:          HDB3
Line CRC:             Yes
Line recv impedance:  75 ohm
Idle code:            54 hex
HCS Masking:          Yes
Payload Scramble:     Yes

This Command: cnfln 5.1 1-15,17-31 1-8 6 200 N 54 Y Y N
```

Example

Configure an E1/30 line on the CVM card in slot 12. Disable the CRC line check.

cnfln 12

```
sw219          TN    Cisco           IGX 8420  9.3.3c    Mar. 16 2001 10:10 GMT

LN  12 Config         E1/30                 CVM slot:12
Loop clock:           No
Line framing:         On
Line coding:          HDB3
Line CRC:             No
Line recv impedance:  75 ohm + gnd
Line E1/J1 signal:    CAS
Line encoding:        A-LAW
Line 56KBS Bit Pos:   msb
Line pct fast modem:  20
Line SVC-Caching:     Off




Last Command: cnfln 12
```

Example (BPX)

cnfln 6.3

```
sw167          TN    Cisco          BPX 8620  9.3.2R    Dec. 14 2000 13:26 PST

LN   6.3 Config     OC3     [353208cps]    BXM slot:     6
Loop clock:            0                   Idle code:             7F hex

Line framing:          --
     coding:           --

     recv impedance:   --
     E1 signaling:    --
     encoding:         --                       cable type:       --
     T1 signaling:    --                       length:           --
                                           HCS Masking:           Yes
                                           Payload Scramble:      Yes
     56KBS Bit Pos:    --                  Frame Scramble:        Yes
     pct fast modem:   --                  Cell Framing:          STS-3C

Last Command: cnfln 6.3
```

Example (IGX)

Configure line 5.3 on a UXM in an IGX node.

cnfln 5.3 N 7F Y Y Y

```
sw180          TN    Cisco          IGX 8420  9.3.2a    July 20 2000 15:35 GMT

LN   5.3 Config       OC3                    UXM slot:5
Loop clock:          No
Line framing:        STS-3C
Idle code:           7F hex
HCS Masking:         Yes
Payload Scramble:    Yes
Frame Scramble:      Yes

Last Command:cnfln 5.3 N 7F Y Y Y
```

cnflnalm (configure line alarm)

Sets the trunk and line alarm values for failures that are statistical in nature. Statistical alarms are declared by the switch software when cards supporting these trunks or lines report too many errors. The switch declares an alarm if the detected error rate equals the **cnflnalm** parameter *error rate* for the period of time designated by the *alarm time* parameter. Error rates that exceed the specified error rate cause an alarm in a proportionately shorter period of time. An alarm is cleared when the error rate remains below the rate specified by *error rate* for a period of time designated by the *clear time*.

You can configure the thresholds for alarms caused by the collection of statistics but not for the alarms caused by a network failure. For example, you can configure the threshold for an alarm caused by a collection of bipolar errors, but you cannot configure an alarm caused by a card failure.

Six parameters exist for each *failure type*—three for minor alarms and three for major alarms. When configuring any item for a minor or major alarm, you must enter a value. You can enter a new value or enter the current value.

The tables show for each *failure type*, the *alarm classes*, the possible *error rate* options, and default *alarm times* and *clear times*.

Syntax

cnflnalm <fail_type> <alarm_class> <rate> <alarm_time> <clear_time>

Parameters

Parameter	Description
Failure type	Specifies the failure type. The list that follows gives the number for each failure type. (Items with an asterisk pertain to ATM only.) 1. Bpv—Bipolar violations 2. Fs—Frame slip 3. oof—Out of frame 4. Vpd—Voice packets dropped (TX) 5. Tspd—Time-stamped packets dropped (TX) 6. Ntspd—Non-time-stamped packets dropped 7. Pkterr—Packet error 8. Los—Loss of signal 9. Fer—Frame error 10. CRC—Cyclic Redundancy Check 11. Pkoof—Packet out of frame 12. Oom—Out of multiframe 13. Ais16—Alarm information signal—E1/E3 Only 14. Bdapd—Bursty data A packets dropped 15. Bdbpd—Bursty data B packets dropped 16. Badclk—Bad clock 17. Pccpd—PCC packets dropped 18. * Lcv—Line code violations 19. * Pcv1—P-bit parity code violations 20. * Pcvp—C-bit parity code violations 21. * Bcv—PLCP BIP-8 code violations 22. * Rxvpd—Receive voice packets dropped 23. * Rxtspd—Receive time stamped packets dropped 24. * Rxntspd—Receive non-time-stamped packets dropped 25. * Rxbdapd—Receive bursty data A packets dropped 26. * Rxbdbpd—Receive bursty data B packets dropped 27. * Rxhppd—Receive high-priority packets dropped

Parameter	Description
Failure type (continued)	**28.** * Atmhec—Cell header HEC errors **29.** * Plcpoof—PLCP out of frame **30.** * 30—Rxspdm: Receive spacer packets dropped
alarm class	Specifies the class of alarm to be configured for the specified alarm type. Valid alarm classes are: • Minor alarm • Major alarm
rates	Specifies the error rate at which the error must occur before an alarm is declared. The choices for error rates vary depending on the *failure type* and the *alarm class*. The choices are called out as Error Rate Options. The default error rates are indicated. With the exception of a Vpd (voice packets dropped) failure, you enter the number corresponding to the error rate. For Vpd (voice packets dropped) failures, you enter a percentage for the dropped packet rate in the range 1%–10%.
alarm time	Specifies the time that a condition must exceed a threshold before an alarm is declared. Range (minor alarms): 3–10 minutes Range (major alarms): 10–250 seconds
clear time	Specifies the time that the condition must exceed the selected threshold before the alarm is cleared. Range (minor alarms,): 3–10 minutes Range (major alarms): 10–250 seconds

Parameters (Error Rate Options)

Error Rate Options		
Option	**Alarm Class**	**Error Rate**
A	**1** - minor	**1** - 1% **2** -.1% **3** -.01% **4** -.001% **5** -.0001%
	2 - major	**1** - 1% **2** -.1% **3** -.01%
B	**1** - minor	**1** - 10E-4 **2** - 10E-5 **3** - 10E-6 **4** - 10E-7 **5** - 10E-8
	2 - major	**1** - 10E-2 **2** - 10E-3 **3** - 10E-4 **4** - 10E-5 **5** - 10E-6

Parameters (Failure Type)

Failure Type	Alarm Class	Error Rate Options *	Alarm Time	Clear Time
1–Bpv	1–minor 2–major	Option B Default = 4 Default = 2	10 Minutes 10 Seconds	3 Minutes 10 Seconds
2–Fs	1–minor 2–major	Option A Default = 3 Default = 2	10 Minutes 10 Seconds	3 Minutes 10 Seconds

Failure Type	Alarm Class	Error Rate Options *	Alarm Time	Clear Time
3–Oof	1–minor	1: 1% 2: 0.1% 3: 0.01% 4: 0.001% 5: 0.0001% (Def.)	10 Minutes	3 Minutes
	2–major	1: 1% 2: 0.1% 3: 0.01% (Def.) 4: 0.001%	10 Seconds	10 Seconds
4- Vpd	1–minor 2–major	Any dropped packet rate from 1% to 10%	5 Minutes 60 Seconds	3 Minutes 10 Seconds
5- Tspd	1–minor 2–major	Option A Default = 3 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
6–Ntspd	1–minor 2–major	Option A Default = 3 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
7- Pkterr	1–minor 2–major	Any error count from 1–10,000	10 Minutes 125 Seconds	3 Minutes 10 Seconds
8-Los	1–minor 2–major	Option A Default = 5 Default = 3	10 Minutes 10 Seconds	3 Minutes 10 Seconds
9- Fer	1–minor 2–major	Option A Default = 3 Default = 2	10 Minutes 200 Seconds	3 Minutes 10 Seconds
10- CRC	1–minor 2–major	Option A Default = 3 Default = 2	10 Minutes 200 Seconds	3 Minutes 10 Seconds
11–Pkoof	1–minor 2–major	Option A Default = 3 Default = 2	10 Minutes 200 Seconds	3 Minutes 10 Seconds
12- Oom	1–minor 2–major	Option A Default = 4 Default = 2	10 Minutes 10 Seconds	3 Minutes 10 Seconds
13- Ais16	1–minor 2–major	Option A Default = 5 Default = 3	10 Minutes 10 Seconds	3 Minutes 10 Seconds
14–Bdapd	1–minor 2–major	Option A Default = 4 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
15- Bdbpd	1–minor 2–major	Option A Default = 4 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
16–Badclk	1–minor 2–major	Option A Default = 2 Default = 1	10 Minutes 50 Seconds	3 Minutes 10 Seconds

Failure Type	Alarm Class	Error Rate Options *	Alarm Time	Clear Time
17–Pccpd	1–minor 2–major	Option A Default = 4 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
18–Lcv	1–minor 2–major	Option B Default = 3 Default = 1	10 Minutes 10 Seconds	3 Minutes 10 Seconds
19–Pcv1	1–minor 2–major	Option B Default = 3 Default = 1	10 Minutes 10 Seconds	3 Minutes 10 Seconds
20–Pcvp	1–minor 2–major	Option B Default = 3 Default = 1	10 Minutes 10 Seconds	3 Minutes 10 Seconds
21–Bcv	1–minor 2–major	Option B Default = 3 Default = 1	10 Minutes 10 Seconds	3 Minutes 10 Seconds
22–Rxvpd	1–minor 2–major	1–10% Default =1% 1–10% Default = 4%	5 Minutes 60 Seconds	3 Minutes 10 Seconds
23–Rxtspd	1–minor 2–major	Option A Default = 3 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
24–Rxbdapd	1–minor 2–major	Option A Default = 3 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
25–Rxbdbpd	1–minor 2–major	Option A Default = 4 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
26–Rxntspd	1–minor 2–major	Option A Default = 4 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
27–Rxhppd	1–minor 2–major	Option A Default = 4 Default = 2	5 Minutes 60 Seconds	3 Minutes 10 Seconds
28–Atmhec	1–minor 2–major	Option A Default = 4 Default = 2	10 Minute 120 Seconds	3 Minutes 10 Seconds
29–Plcpoof	1–minor 2–major	Option A Default = 4 Default = 2	10 Minutes 200 Seconds	3 Minutes 10 Seconds
30–Rxspdm	1–minor 2–major	Option A Default = 4 Default = 2	4 Minutes 10 Seconds	2 Minutes 5 Seconds

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	No	Yes	IGX			Yes	

Related Commands

clrnalm, clrtrkalm, dspclnerrs, dsplnalmcnf, dsptrkerrs

Example

Display current alarm types.

cnflnalm

```
sw180          TN    Cisco           IGX 8420  9.3.p7    Dec. 13 2000 12:54 GMT

  Line Alarm Types

  1) Bpv           13) Tsdp         25) Rxbdbpd         37) Txbdacdscd
  2) Fs            14) Ntsdp        26) Rxntspd         38) Txbdbcdscd
  3) Oof           15) Pccpd        27) Rxhppd          39) Txcbrcdscd
  4) Los           16) Bdapd        28) Atmhec          40) Txabrcdscd
  5) Fer           17) Bdbpd        29) FSyncErr        41) Txvbrcdscd
  6) CRC           18) Lcv          30) Rxspdm          42) TxGwFPdscd
  7) Oom           19) Pcvl         31) CGWpktdscd      43) RxGwCLdscd
  8) Ais16         20) Pcvp         32) CGWcelldscd     44) CGWfrmabrt
  9) Pkoof         21) Bcv          33) Txntscdscd
  10) Pkterr       22) Rxvpd        34) Txhpcdscd
  11) Badclk       23) Rxtspd       35) Txvcdscd
  12) Vpd          24) Rxbdapd      36) Txtscdscd

This Command: cnflnalm

Enter Type:
```

Example

Set Alarm Type 27, the Minor alarm time threshold, to 4 minutes. In this example, the **cnflnalm** command is followed by the alarm type (27), the alarm minor or major (1 for minor, 2 for major), the current rate (which is the default of 0.001%, (which is a 4), the new value for Alarm Time of 4 minutes (which is a “4” entry), and the existing Alarm Clear time of “3.”

cnflnalm 27 1 4 4 3

```
sw180          TN    Cisco          IGX 8420  9.3.p7    Dec. 13 2000 13:01 GMT

                             Line Alarm Configuration

                       Minor                                 Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  25) Rxbdbpd   .001%   5 min       3 min           .1%   60 sec      10 sec
  26) Rxntspd    .01%   5 min       3 min           .1%   60 sec      10 sec
  27) Rxhppd    .001%   4 min       3 min           .1%   60 sec      10 sec
  28) Atmhec      .1%  10 min       3 min            1%  120 sec      10 sec
  29) FSyncErr   .01%  10 min       3 min           .1%  200 sec      10 sec
  30) Rxspdm     .01%   4 min       2 min         .001%   30 sec       5 sec
  31) CGWpktds   .01%   5 min       3 min            1%   60 sec      10 sec
  32) CGWcelld   .01%   5 min       3 min            1%   60 sec      10 sec

Last Command: cnflnalm 27 1 4 4 3
```

cnflnparm (configure ATM line card parameters)

Configures several parameters for ATM lines originating on the BPX or IGX nodes. The **cnflnparm** command is quite similar to the **cnfln** command.

This command configures the circuit line alarm integration times in milliseconds for Red and Yellow circuit line alarms. You should set them to correspond to the local carrier's alarm integration times. The **cnflnparm** range for each of these parameters is 60–3932100 ms. Carrier integration times are typically 800 ms–1500 ms for Red Alarm and 1500–3000 ms for Yellow Alarm.

You can also set the queue depth for the two queues associated with the ASI-0 card, the constant bit rate (CBR) queue and the Variable Bit Rate (VBR) queue. The queue depths may be increased to 16,000 bytes per queue.

Syntax

cnflnparm <slot.port> <option 1–4>

Parameters

Parameter	Description
<slot.port>	Specifies the line to configure.
<option >	Specifies the parameter to configure.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

upln, **dnln**, **cnfln**

Example

cnflnparm 5.1

```
sw197          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000  01:54 GMT

LN  5.1 Parameters
 1  Red Alarm - In/Out  [  2500 /  15000] (Dec)
 2  Yel Alarm - In/Out  [  2500 /  15000] (Dec)



This Command: cnflnparm 5.1


Which parameter do you wish to change: Which parameter do you wish to change:
```

cnflnpass (configure line pass-through)

Configures a pair of ports so that unprocessed channels go from a *primary* UVM to a *secondary* UVM. The **cnflnpass** command primarily applies to channels that use LDCELP or G.729 CACELP (although pass-through is possible on any type of connection except t-type or td-type). For a description of *pass-through*, refer to the UVM description in the *Cisco IGX Reference*.

To return ports to the non-passing configuration, execute **cnflnpass** with a 0 as the second argument.

Syntax

To configure pass-through, enter:
cnflnpass <primary line> <secondary line>

To remove pass-through from the primary and secondary lines, enter:
cnflnpass <primary line> 0

Parameters

Parameter	Description
<primary line>	Specifies the channels that the primary card supports. The format is *slot.port*.
<secondary line>	Specifies the channels that the secondary card supports. The format is *slot.port*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	Yes	IGX			Yes	

Related Commands

dsplncnf

Example

Configure line 13.1 to pass any unsupported channels to line 12.1.

cnflnpass 13.1 12.1

Upon successful execution of the command, the screen displays the slot and line of the passing channel on the right. The screen also shows other characteristics of the line.

```
sw176          TN          IGX 8420    9.3   Apr. 13 2000 00:18 GMT

LN  13.1
E1/30                 UVM slot: 13
Loop clock:          No

Line framing:        On                            cnfg:            Passing
     coding:         HDB3                              slot.line:   12.1
     CRC:            No
     recv impedance: 75 ohm + gnd
  E1/J1 signaling:  CAS
     encoding:       A-LAW
     T1 signaling:  --
     cable type:     --
     length:         --
     56KBS Bit Pos:  msb
     pct fast modem: 20


Last Command: cnflnpass 13.1 12.1


Next Command:
```

Note that, when you remove pass-through by entering a 0 for the secondary line, the screen also still line characteristics but with dashed lines in the column for the secondary (or passing) line.

cnflnsigparm (configure line signaling parameters)

Configures the line signaling parameters associated with a line for the CVM and UVM voice cards.

The CVM and UVM Heartbeat parameter (option 1) is the rate, in seconds, at which the card sends a signaling (ABCD bits) state update to the other end of the connection, even when there is no change in the state of the signaling bits. This is done because signaling packets are time-stamped data packets, and there is a small chance that a signaling packet might be discarded somewhere in the network. This recovery mechanism ensures that on-hook and off-hook notifications are not lost. Increasing this interval will probably have no impact as long as none of the normal signaling time-stamped data packets are being discarded in the network.

In Release 9.2 and higher, the CVM and UVM cards are supported. The CIP and CDP cards are not supported.

Syntax

cnflnsigparm <parameter number> <parameter value>

Parameters

Parameter	Description
<parameter number>	Specifies the number of the parameter to change.
<parameter value>	Specifies the new value to enter.

Parameter Values

No.	Parameter	Description	Range
1	Heartbeat	The current state of the signaling is periodically transmitted to the far end even if no signaling transitions are detected. This interval is determined by the value of the "heartbeat." The CVM & UVM Heartbeat parameter (option 1) is the rate, in seconds, at which the card sends a signaling (ABCD bits) state update to the other end of the connection, even when there is no change in the state of the signaling bits. This is done because signaling packets are time-stamped data packets, and there is a small chance that a signaling packet might be discarded somewhere in the network. This recovery mechanism ensures that on-hook and off-hook notifications are not lost. Increasing this interval will probably have no impact as long as none of the normal signaling TS data packets are being discarded in the network.	2–30 sec.
2	Signal Polling Rate	How often the control card polls the UVM/CVM for the status of the signaling. This parameter is used to update displays and statistics.	2–60 sec.
3	Default Inband Signal Delay	The transmit buffer timer value set after a valid signaling transition for in-band signaling arrives. After timeout, a signaling packet is sent.	30–96 msec.

No.	Parameter	Description	Range
4	Default Inband Playout Delay	The receive buffer timer that "ages" an incoming, time-stamped packet. When the age of the packet reaches the timestamp value, it moves on to depacketization and then to the user equipment. This parameter is used to even out the delay between signaling packets and voice packets.	0–200 msec.
5	Default Pulse Signal Delay	Same as number 3 but applied to pulse signaling.	30–96 msec.
6	Default Pulse Playout Delay	Same as number 4 but applied to pulse signaling.	100–200 msec.
7	CVM Number of Packet Slices		1
8	Packet Rate	Reserves trunk bandwidth for carrying UVM/CVM signaling.	0–1000 packets/sec.
9	Condition CCS Lines	If you specify yes for this parameter, the card applies signaling conditioning during an alarm to all channels on T1 circuit lines to notify PBX of a line failure.	YES or NO
10	Inband Min. Wink	Same as 6 for in-band signaling.	120–300 msec.
11	Pulse Min. Wink	For UVM/CVM connections only, this parameter controls both wink and inter-digit intervals for signaling that arrives over the NPM signaling channel from a far end UVM/CVM.	120–300 msec.
12	Condition T1 Lines?	If you specify yes for this parameter, the card applies signaling conditioning during an alarm to all channels on T1 circuit lines to notify PBX of a line failure.	YES or NO

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			Yes	

Related Commands

cnflnparm, **cnflnstats**, **dsplnstatcnf**, **dsplnstathist**, **upln**, **dnln**, **cnfln**

Example

Configure line signaling for CVM and UVM voice cards.

cnflnsigparm

```
cc2            LAN   SuperUser       IGX 32    9.3     Apr. 13 2000 11:16 PST

1  CVM & UVM Heartbeat                                 [   2] (sec)
2  CVM & UVM Sig. Polling Rate                         [  10] (sec)
3  CVM & UVM Default Inband Sig Delay                  [  96] (msec)
4  CVM & UVM Default Inband Playout Delay              [ 200] (msec)
5  CVM & UVM Default Pulse Sig Delay                   [  96] (msec)
6  CVM & UVM Default Pulse Playout Delay               [ 200] (msec)
7  UVM Number of Packet Slices                         [   1]
8  CVM & UVM Packet Rate                               [ 200] (pkt/sec)
9  CVM & UVM Condition T1 CCS Lines or T1 Lines?       [ YES]
10 UVM Default Inband Min. Wink                        [ 140] (msec)
11 UVM Default Pulse Min. Wink                         [ 140] (msec)
12 CVM & UVM Condition T1 Lines?                       [ YES] (yes/no)



This Command: cnflnsigparm


Which parameter do you wish to change
```

cnflnstats (configure line statistics collection)

Configures statistics collection for a line. Primarily, **cnflnstats** is a debug tool (older alias: **cnfclnstats**). It lets you customize statistics collected on each line. Table 3-26 lists the statistics for FastPacket-based cards with T1 or E1 lines. For other available parameters, refer to the actual screens on a node. The examples show available statistics for a UXM port and an ASI-155 port.

Not all statistic types are available for all lines. Valid statistics appear in full brightness while unavailable types appear dimmed.

Bipolar violations are not generally accumulated on E1 trunk and circuit lines. They are accumulated only on T1 lines connected to Frame Relay ports.

Syntax

cnflnstats <line> <stat> <interval> <e | d> [<samples> <size> <peaks>]

Parameters

Parameter	Description
<line>	Specifies the port to configure.
<stat>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample. Range: 1–255 minutes
<e|d>	Enables/disables a statistic. Range: E to enable, D to disable.
[samples]	Specifies the number of samples to collect. Range: 1–255
[size]	Specifies the number of bytes per data sample. Range: 1, 2, or 4
[peaks]	Enables the collection of one minute peaks. Range: Y to enable, N to disable.

Statistics for FastPacket Cards

Statistic Index Number	Statistic	Line Type
1	Bipolar Violations	E1 and T1
2	Frame Slips	E1 and T1
3	Out of Frames	E1 and T1
4	Loss of Signal	E1 and T1
5	Frame Bit Errors	E1 only
6	CRC Errors	E1 only
7	Out of Multi-Frames	E1 only
8	All Ones in Timeslot 16	E1 only

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

dsplnstatcnf, **dsplnstathist**

Example (FastPacket)

```
cc2            LAN   SuperUser       IGX 8430    9.3     Apr. 13 2000 11:20 PST

Line Statistic Types

 1) Bipolar Violations
 2) Frames Slips
 3) Out of Frames
 4) Losses of Signal
 5) Frames Bit Errors
 6) CRC Errors
 7) Out of Multi-Frames
 8) All Ones in Timeslot 16




Last Command: cnflnstats 15 6 255 e


Next Command:
```

Example (UXM Port)

```
-----------------------------------SCREEN 1-----------------------------------
sw180          TN    Cisco          IGX 8420   9.3.p7    Dec. 13 2000 13:35 GMT

Line Statistic Types

  1) Bipolar Violations                37) Severely Err Secs - Path
  3) Out of Frames                     38) Severely Err Frame Secs
  4) Losses of Signal                  40) Unavail. Seconds
  5) Frames Bit Errors                 41) BIP-8 Code Violations
  6) CRC Errors                        42) Cell Framing Errored Seconds
 29) Line Code Violations              43) Cell Framing Sev. Err Secs.
 30) Line Errored Seconds              44) Cell Framing Sec. Err Frame Secs
 31) Line Severely Err Secs            45) Cell Framing Unavail. Secs.
 32) Line Parity Errors                62) Total Cells Tx to line
 33) Errored Seconds - Line            69) Total Cells Rx from line
 34) Severely Err Secs - Line          98) Frame Sync Errors
 35) Path Parity Errors               141) FEBE Counts
 36) Errored Secs - Path              143) Cell Framing FEBE Err Secs

This Command: cnflnstats 4.1


Continue?  y

-----------------------------------SCREEN 2-----------------------------------
sw180          TN    Cisco          IGX 8420   9.3.p7    Dec. 13 2000 13:36 GMT

Line Statistic Types

144) Cell Framing FEBE Sev. Err. Secs.  202) Section BIP8 Err. Secs.
151) Yellow Alarm Transition Count      203) Line BIP24 Err. Secs.
152) Cell Framing Yel Transitions       204) Line FEBE Err. Secs.
153) AIS Transition Count               205) Path BIP8 Err. Secs.
193) Loss of Cell Delineation           206) Path FEBE Err. Secs.
194) Loss of Pointer                    207) Section BIP8 Severely Err. Secs.
195) OC3 Path AIS                       208) Section Sev. Err. Framing Secs.
196) OC3 Path YEL                       209) Line BIP24 Severely Err. Secs.
```

```
197) Section BIP8                        210) Line FEBE Severely Err. Secs.
198) Line BIP24                          211) Path BIP8 Severely Err. Secs.
199) Line FEBE                           212) Path FEBE Severely Err. Secs.
200) Path BIP8                           213) Line Unavailable Secs.
201) Path FEBE                           214) Line Farend Unavailable Secs.

This Command: cnflnstats 4.1


Continue?   y

------------------------------------SCREEN 3----------------------------------
sw180         TN    Cisco          IGX 8420  9.3.p7    Dec. 13 2000 13:36 GMT

Line Statistic Types

215) Path Unavailable Secs.              228) INVMUX: Tx Failure Count
216) Path Farend Unavailable Secs.       229) INVMUX: Rx Failure Count
217) HCS Uncorrectable Error
218) HCS Correctable Error
219) INVMUX: line violations
220) INVMUX: Severely Err. Secs.
221) INVMUX: Farend Sev. Err. Secs.
222) INVMUX: Unavailable Secs.
223) INVMUX: Farend Unavail Secs.
224) INVMUX: Tx Unusable Seconds
225) INVMUX: Rx Unusable Seconds
226) INVMUX: Farend Tx Unusable Secs.
227) INVMUX: Farend Rx Unusable Secs.

This Command: cnflnstats 4.1


Statistic Type:
```

Example (BXM-155)

```
------------------------------------SCREEN 1----------------------------------
sw53          VT    Cisco          BPX 8620  9.3.m0    Dec. 13 2000 13:52 GMT

Line Statistic Types

 1) Loss of Frames                       39) Path FEBE
 2) Loss of Signal                       40) Section BIP8 Err. Secs.
19) HCS Errors                           41) Line BIP24 Err. Secs.
28) YEL Transitions                      42) Line FEBE Err. Secs.
30) Alarm Indication Signal              43) Path BIP8 Err. Secs.
31) Loss of Cell Delineation             44) Path FEBE Err. Secs.
32) Loss of Pointer                      45) Section BIP8 Severely Err. Secs.
33) OC3 Path AIS                         46) Section Sev. Err. Framing Secs.
34) OC3 Path YEL                         47) Line BIP24 Severely Err. Secs.
35) Section BIP8                         48) Line FEBE Severely Err. Secs.
36) Line BIP24                           49) Path BIP8 Severely Err. Secs.
37) Line FEBE
38) Path BIP8

This Command: cnflnstats 11.1


Continue?  y

------------------------------------SCREEN 2----------------------------------
sw53          VT    Cisco          BPX 8620  9.3.m0    Dec. 13 2000 13:53 GMT
```

```
Line Statistic Types

50) Path FEBE Severely Err. Secs.
51) Line Unavailable Secs.
52) Line Farend Unavailable Secs.
53) Path Unavailable Secs.
54) Path Farend Unavailable Secs.
55) HCS Correctable Error
56) HCS Correctable Error Err. Secs



This Command: cnflnstats 11.1


Statistic Type:
```

The table below provides BXM object names and some line statistics descriptions for the BXM card. Note that the object name given is, in most cases, the same as the screen field name when the **cnflnstats** screen is displayed.

Note Where interface type is not specified it is implied to be of generic nature, and is good for all BXM interfaces (T3, E3, OC-3, OC-12).

Line Statistics Descriptions (BXM Card)

Object ID	Object Name	Range	Description
01	Message Tag	Byte 0-3: Tag ID Byte 4-7: IP Address	Identifier and source IP address sent with CommBus message. Both will be copied into the response, if any is to be sent.
02	Line Number	1 - 12	Identifies the target line number. If multiple line numbers are sent during the operation, then each line number object terminates the configuration for the string of objects for the previous line number.
03	Statistical Subset	Byte 0: Subset # 0: All stats 1-4: Subset # Byte 1-n: List of Stat Objects in subset	The set operator configures the subset template. The get operator uses the subset number to build a response. It ignores the “byte 1-n” string.

Object ID	Object Name	Range	Description
04	Statistics Auto-Reset Option	0: Disabled 1: Enabled	Statistics will be automatically reset after sent to the BCC in an Event Message if the Auto-Reset option is enabled. After the instance of an enable or disable command, the condition will persist until another Auto-Reset command is encountered. Note reset is on a line basis.
05	Total Cells Transmitted	0 - 2^{32}-1	Total cells transmitted at the physical layer interface.
06	Total Cells Received	0 - 2^{32}-1	Total cells received at the physical layer interface.
07	RESERVED		
08	LOS	0 - 2^{32}-1	Number of instances of LOS.
09	LOF	0 - 2^{32}-1	Number of instances of LOF.
0A	Line AIS	0 - 2^{32}-1	Number of instances of AIS.
0B	Line RDI (YEL)	0 - 2^{32}-1	Number of instances of Yellow Alarm detection.
0C	T3/E3 LCV	0 - 2^{32}-1	T3/E3 Line Code Violation Count.
0D	T3 PCV	0 - 2^{32}-1	T3 P-Bit Code Violations (Line) Count.
0E	T3 CCV	0 - 2^{32}-1	T3 C-Bit Code Violations (Path) Count.
0F	T3 FEBE	0 - 2^{32}-1	Far End Block Error.
10	T3/E3 FERR	0 - 2^{32}-1	Framing Errors Count.
11	T3/E3 LES	0 - 2^{32}-1	Line Errored Seconds Count. Incremented for each second there was at least one LCV.
12	T3 PES	0 - 2^{32}-1	T3 P-bit Errored Seconds Count. Incremented for each second there was at least one PES.
13	T3 CES	0 - 2^{32}-1	T3 C-bit Errored Seconds Count. Incremented for each second there was at least one CES.
14	T3/E3 LSES	0 - 2^{32}-1	Line Severely Errored Seconds Count. Incremented for each second there were 44 or more LCVs.
15	T3 PSES	0 - 2^{32}-1	T3 P-bit Severely Errored Seconds Count. Incremented for each second there were 44 or more P-bit Errors.
16	T3 CSES	0 - 2^{32}-1	T3 C-bit Severely Errored Seconds Count. Incremented for each second there were 44 or more C-bit Errors.
17	T3/E3 SEFS	0 - 2^{32}-1	T3/E3 Severely Errored Framing Seconds Count incremented for each second there was one or more Severely Errored Framing Errors (OOF).
18	T3/E3 UAS	0 - 2^{32}-1	Unavailable Seconds. Count starts from the onset of LOS, LOF, or AIS.
19	T3 PLCP LOF	0 - 2^{32}-1	PLCP Loss of Frame. Number of times Loss of Frame was detected by the PLCP.

Object ID	Object Name	Range	Description
1A	T3 PLCP YEL	0 - 2^{32}-1	PLCP Yellow Alarm count.
1B	T3/E3 PLCP BIP-8	0 - 2^{32}-1	PLCP/G.832 BIP-8 Errors. Incremented each BIP-8 Error was detected by PLCP.
1C	T3/E3 PLCP FEBE	0 - 2^{32}-1	T3/E3 PLCP/G.832 Far End Block Errors.
1D	T3 PLCP FOE	0 - 2^{32}-1	T3 PLCP Framing Octet Errors
1E	T3/E3 PLCP BIP-8 ES	0 - 2^{32}-1	T3/E3 PLCP/G.832 BIP-8 Errored Seconds. Incremented each second at least one PLCP BIP-8 Error was detected.
1F	T3/E3 PLCP FEBE ES	0 - 2^{32}-1	T3/E3 PLCP/G.832 FEBE Errored Seconds. Incremented each second at least one PLCP FEBE was detected.
20	T3/E3 PLCP BIP-8 SES	0 - 2^{32}-1	T3/E3 PLCP/G.832 BIP-8 Severely Errored Seconds. Incremented each second there were at least 5 BIP-8 Errors.
21	T3/E3 PLCP FEBE SES	0 - 2^{32}-1	T3/E3 PLCP/G.832 FEBE Severely Errored Seconds. Incremented each second there were at least 5 FEBE Errors.
22	T3 PLCP SEFS	0 - 2^{32}-1	T3 Severely Errored Framing Seconds.Incremented each second there was at least one SEF event. (PLCP OOF).
23	T3 PLCP UAS	0 - 2^{32}-1	T3 PLCP Unavailable Seconds. Count starts at the onset of LOS, LOF, AIS, or PLCP LOF.
24	RESERVED		
25	HCS uncorrectable errors	0 - 2^{32}-1	Number of instances of Loss of Cell Delineation.
26	RESERVED		
27	LOC	0 - 2^{32}-1	Number of instances of Loss of Cell Delineation.
28	OC-3 LOP	0 - 2^{32}-1	Number of instances of Loss of Pointer.
29	OC-3 Path AIS	0 - 2^{32}-1	Number of instances of Path AIS.
2A	OC-3 Path RDI (YEL)	0 - 2^{32}-1	Number of instances of Path Yellow.
2B	OC-3 Section BIP-8 Errors	0 - 2^{32}-1	Number of instances of Section BIP-8 Errors.
2C	OC-3 Line BIP-24	0 - 2^{32}-1	Number of instances of Line BIP-24 Errors.
2D	OC-3 Line FEBE	0 - 2^{32}-1	Number of instances of Line Far-End Blocking Errors.
2E	OC-3 Path BIP-8	0 - 2^{32}-1	Number of instances of Path BIP-8 Errors.

Object ID	Object Name	Range	Description
2F	OC-3 Path FEBE	0 - 2^{32}-1	Number of instances of Path Far-End Blocking Errors.
30	OC-3 Section BIP-8 ES	0 - 2^{32}-1	Number of seconds that had at least one instance of Section BIP-8 Errors.
31	OC-3 Line BIP-24 ES	0 - 2^{32}-1	Number of seconds that had at least one instance of Line BIP-24 Errors.
32	OC-3 Line FEBE ES	0 - 2^{32}-1	Number of seconds that had at least one instance of Line Far-End Blocking Errors.
33	OC-3 Path BIP-8 ES	0 - 2^{32}-1	Number of seconds that had at least one instance of Path BIP-8 Errors.
34	OC-3 Path FEBE ES	0 - 2^{32}-1	Number of seconds that had at least one instance of Path Far-End Blocking Errors.
35	OC-3 Section BIP-8 SES	0 - 2^{32}-1	Number of seconds that had at least 2500/8800 (OC-3/OC-12) instances of Section BIP-8 Errors.
36	OC-3 Section SEFS	0 - 2^{32}-1	Number of seconds that had at least 2500/8800 (OC-3/OC-12) instances of OOF.
37	OC-3 Line BIP-24 SES	0 - 2^{32}-1	Number of seconds that had at least 2500/10000 (OC-3/OC-12) instances of Line BIP-24 Errors.
38	OC-3 Line FEBE SES	0 - 2^{32}-1	Number of seconds that had at least 2500/10000 (OC-3/OC-12) instances of Line Far-End Blocking Errors.
39	OC-3 Path BIP-8 SES	0 - 2^{32}-1	Number of seconds that had at least 2400 instances of Path BIP-8 Errors.
3A	OC-3 Path FEBE SES	0 - 2^{32}-1	Number of seconds that had at least 2400 instances of Path Far-End Blocking Errors.
3B	OC-3 Line UAS	0 - 2^{32}-1	Number of seconds that the line was unavailable, in LOS, LOF, AIS, or after the occurrence of 10 contiguous Line SESs.
3C	OC-3 Line Far End UAS	0 - 2^{32}-1	Number of seconds that the line experienced at least 10 contiguous Line FEBE SESs.
3D	OC-3 Path UAS	0 - 2^{32}-1	Number of seconds that the line was unavailable, in LOP, Path AIS, or after the occurrence of 10 contiguous Path SESs.
3E	OC-3 Path Far End UAS	0 - 2^{32}-1	Number of seconds that the line experienced at least 10 contiguous Path FEBE SESs.
3F	HCS correctable errors	0 - 2^{32}-1	Number of instances of Loss of Cell Delineation.
40 -41	RESERVED		

cnfmode (configure mode)

Selects a *mode* of the card for a UFM-U back card. The mode of a card is combination of maximum port speeds and for specific port numbers. Table 3-27 lists the maximum port speeds and active ports for each mode. The **cnfmode** command lets you select 1 of 27 modes for either a UFI-12V.35 back card or a UFI-12X.21 back card. For a UFI-4HSSI back card, three modes are available.

To specify the actual speed of an individual port, use the command **cnfport**. The IGX documentation describes the application of the modes and the sequence of execution of these commands.

Note The **cnfmode** and **cnfufmumode** commands are the same command.

Syntax

cnfmode <port> <mode>

Parameters

Parameter	Description
slot	Specifies the slot of the UFM-U card.
mode	Specifies the mode of the UFM-U card set. The range for V.35 and X.21 ports is 1–27. The range for HSSI ports is 1–3. You may have to delete connections and down one or more ports before you execute **cnfmode.** To determine if you must delete connection or for a detailed description of the modes of a UFM-U, see the *Cisco IGX 8400 Series Reference*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Node	Yes	IGX			Yes	

Related Commands

cnfport, dspmode, dspmodes

Example

Configure the UFM-U card set in slot 13 to have mode 4. Note that the display shows which ports are active for each mode number but does not show the current mode of the UFM-U. To see the current mode of the UFM-U, use **dspmode**.

cnfmode 13 4

```
w180          TN    SuperUser       IGX 16    9.3 Apr. 13 2000 01:25 GMT

                        UFMU MODES AND PORT AVAILABILITY BITMAP

Mode[ 1]:111111111111   Mode[ 2]:101010101010   Mode[ 3]:100010001000
Mode[ 4]:101011111111   Mode[ 5]:100011111111   Mode[ 6]:101010101111
Mode[ 7]:100010101111   Mode[ 8]:100010001111   Mode[ 9]:100010101010
Mode[10]:100010001010   Mode[11]:111110101111   Mode[12]:111111111010
Mode[13]:111110001111   Mode[14]:111111111000   Mode[15]:101011111010
Mode[16]:111110101010   Mode[17]:101010001111   Mode[18]:101011111000
Mode[19]:111110101000   Mode[20]:111110001010   Mode[21]:100011111010
Mode[22]:100011111000   Mode[23]:111110001000   Mode[24]:101010001010
Mode[25]:101010101000   Mode[26]:100010101000   Mode[27]:101010001000

This Command: cnfmode 13


Enter The New UFMU Mode [1]: 4
```

Table 3-27 Card Modes for Unchannelized Back Cards

	V.35 and X.21 Ports												**HSSI Ports**			
	Group A				**Group B**				**Group C**				**A**		**B**	
Mode	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
1	3	3	3	3	3	3	3	3	3	3	3	3	8	8	8	8
2	8	-	8	-	8	-	8	-	8	-	8	-	16	-	16	-
3	10	-	-	-	10	-	-	-	10	-	-	-	16	-	-	-
4	8	-	8	-	3	3	3	3	3	3	3	3				
5	10	-	-	-	3	3	3	3	3	3	3	3				
6	8	-	8	-	8	-	8	-	3	3	3	3				
7	10	-	-	-	8	-	8	-	3	3	3	3				
8	10	-	-	-	10	-	-	-	3	3	3	3				
9	10	-	-	-	8	-	8	-	8	-	8	-				
10	10	-	-	-	10	-	-	-	8	-	8	-				
11	3	3	3	3	8	-	8	-	3	3	3	3				
12	3	3	3	3	3	3	3	3	8	-	8	-				
13	3	3	3	3	10	-	-	-	3	3	3	3				
14	3	3	3	3	3	3	3	3	10	-	-	-				
15	8	-	8	-	3	3	3	3	8	-	8	-				
16	3	3	3	3	8	-	8	-	8	-	8	-				
17	8	-	8	-	10	-	-	-	3	3	3	3				
18	8	-	8	-	3	3	3	3	10	-	-	-				
19	3	3	3	3	8	-	8	-	10	-	-	-				
20	3	3	3	3	10	-	-	-	8	-	8	-				
21	10	-	-	-	3	3	3	3	8	-	8	-				

Table 3-27 Card Modes for Unchannelized Back Cards (continued)

	V.35 and X.21 Ports												HSSI Ports			
	Group A				Group B				Group C				A		B	
Mode	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
22	10	-	-	-	3	3	3	3	10	-	-	-				
23	3	3	3	3	10	-	-	-	10	-	-	-				
24	8	-	8	-	10	-	-	-	8	-	8	-				
25	8	-	8	-	8	-	8	-	10	-	-	-				
26	10	-	-	-	8	-	8	-	10	-	-	-				
27	8	-	8	-	10	-	-	-	10	-	-	-				

cnfmxbutil (configure muxbus utilization)

Configures the Muxbus or cell bus utilization factor for each FRP or FRM, respectively.

Use the **cnfmxbutil** command to configure the Muxbus or cell bus utilization factor for each FRP or FRM in the node on a slot-by-slot basis. (System software automatically allocates a certain amount of bandwidth for each FRP or FRM in a node. Since the maximum data rate for an FRP or FRM is 2 Mbps, this bandwidth is also the maximum amount of the bus reserved for an FRP or FRM.)

In many applications, each of the four FRP or FRM ports is configured for a large number of 56 or 64 Kbps connections. System software totals the bandwidth required for all the connections, multiplies the total by 121% to reserve extra bandwidth for overhead, then subtracts this amount from the total available bus bandwidth.

However, statistically full utilization is not often required on ports with a large number of connections, so the reserved bus bandwidth may be further reduced. In a node with a T3 or E3 ATM trunk card, much of the bus bandwidth may be assigned to the ATM trunk, so you should exercise caution when allocating the remaining bus bandwidth.

Syntax

cnfmxbutil <slot number> <percentage>

Parameters

Parameter	Description
<slot number>	Specifies the slot number of the associated FRP card.
<percentage>	Specifies the percent of Muxbus or cell bus bandwidth to allocate.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			Yes	

Example

Configure Muxbus Utilization. The screen displays "N/A" for a slot where no FRP or FRM exists. Once the slot is selected, the system displays the message "Enter Utilization Factor." The range is 1–250%. The default is 121%. The extra 21% for the default is for the overhead for encapsulating the Frame Relay frame into the FastPackets or ATM cells.

cnfmxbutil

```
gamma     Cisco WAN Manager     SuperUser      IGX 8420     Rev:  9.3      Apr. 13 2000
14:27 PDT

      Slot  1: N/A      Slot 9:  N/A     Slot 17: 121%     Slot 25: N/A
      Slot  2: N/A      Slot 10: N/A     Slot 18: 121%     Slot 26: N/A
      Slot  3: N/A      Slot 11: N/A     Slot 19: N/A      Slot 27: N/A
      Slot  4: N/A      Slot 12: N/A     Slot 20: N/A      Slot 28: N/A
      Slot  5: N/A      Slot 13: N/A     Slot 21: N/A      Slot 29: N/A
      Slot  6: N/A      Slot 14: N/A     Slot 22: N/A      Slot 30: N/A
      Slot  7: N/A      Slot 15: N/A     Slot 23: N/A      Slot 31: N/A
      Slot  8: N/A      Slot 16: N/A     Slot 24: N/A      Slot 32: N/A


This Command: cnfmxbutil

Enter Slot:
```

cnfname (configure node name)

Specifies the name by which a node is known within the network. It may be changed at any time. The new node name is automatically distributed to the other nodes in the network.

Node names are case sensitive. For example, an upper-case “A” is not considered to be the same as a lower-case “a”. Duplicate names are not allowed in the same network.

Node names may be configured from within a job sequence. If the node name is changed and the corresponding name in the job is not changed, the job will not function properly.

In these situations, the **cnfname** command cannot be executed:

- Another node is attempting to change the network topology by adding or deleting a trunk.
- Another node is notifying all nodes that it has been renamed. Another node is currently adding or deleting a channel connection in the network with the **addcon** or **delcon** commands.
- There is an unreachable node in the network.
- The name chosen is already being used for another node in the network.

Syntax

cnfname <nodename>

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX			Yes	

Related Commands

cnfterm, **cnfprt**, and **window**

Example

The name changes to “alpha.” The network topology screen displays indicating the new name. See the **dspnw** description for more information on the network topology screen.

cnfname alpha

```
alpha          TRM   YourID:1        IGX 8410     9.3    Apr. 13 2000 12:02 PST


NodeName    Alarm  Packet Line        Packet Line        Packet Line
alpha              10- 7/beta         14- 13/beta
beta        MAJOR  7- 10/alpha        9- 10/gamma        13- 14/alpha
                   15- 15/gamma       20- 11/gamma
gamma       MAJOR  10- 9/beta         11- 20/beta        15- 15/beta


Last Command: cnfname alpha


Next Command:
```

cnfnodeparm (configure node parameter)

Sets a variety of general parameters for a node in the network.

The defaults for the network parameters are selected by Cisco engineering to operate under normal conditions. With few exceptions, you should change them only with the guidance of the Cisco TAC.

With the first phase of the Automatic Routing Management to PNNI migration introduced in Release 9.3.30, the BXM interface card supports the Extended LMI (XLMI) protocol. This protocol enables the exchange of topology information between the adjacent BXM and AXSM over the AR-PNNI link. With Release 9.3.30, use the **cnfnodeparm** BPX parameter option 56 to configure the XLMI Management IP address as LAN IP or Network IP address. Whenever the choice of Management IP address is changed, the new Management IP address is sent to the BXM.

With Release 9.3.30, use the **cnflan** and **cnfnwip** commands to configure IP addresses. Use the **cnfport** command to enable XLMI protocol and the LMI Neighbor Discovery feature (using the advertise interface information parameter). Use the **dspnebdisc** command to display the AXSM's neighbor information discovered by the BPX via the LMI Neighbor Discovery procedure.

Syntax

cnfnodeparm

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Parameters (BPX)

Index	Parameter	Description	Default
1	Update Initial Delay (sec.)	This delay, multiplied times the number of nodes in the network, is the delay before conditional updates are transmitted to the network after a BCC switchover.	5000 seconds
2	Update Per-Node Delay (ms.)	Delay between transmission of conditional updates to nodes.	30000 msecs
3	Comm. Break Test Delay (ms.)	Interval between tests for communication breaks on any node.	3000 msecs
4	Comm. Break Test Offset	Factor between number of communication test failures and successful tests to declare a node in communication break condition.	10 (D)
5	Network Time-out Period	The time a node waits for a response to a communication test transmission before it declares a failure. Four failures allowed.	1700 (D)
6	Network Inter-p Period	The time a node waits for a response to a communication test transmission on inter-domain connections before it declares a failure. The maximum number of failures is four.	4000 (D)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
7	NW Sliding Window Size	Controls the number of BCC messages that can be transmitted simultaneously. Defines number of “no acknowledgments outstanding” on a controller before NACKS declared.	1 (D)
8	Num. Normal Time-outs	Number of normal network retransmissions allowed before issuing a communication break condition (for intra-domain connections).	7 (D)
9	Num. Inter-p Time-outs	Number of normal network retransmissions allowed before issuing a communication break condition (for inter-domain connections).	3 (D)
10	Num. Satellite Time-outs	Number of satellite network retransmissions allowed before issuing a communication break.	6 (D)
11	Number of Blind Time-outs	Maximum number of communication fail time-outs and retransmissions performed when using the blind channel. “Blind” refers to the message being sent across the trunk without knowing what node is on the other end of the trunk. The Comm Fail test uses this blind channel.	4 (D)
12	Number of CB Msg Time-outs	Number of communication break time-outs and retransmissions before declaring a communication break (CB) condition. One successful acknowledgment clears CB.	2 (D)
13	Comm. Fail Interval (ms.)	Minimum time allocated for communication fail testing of all trunks terminating on the current node.	10,000 (D)
14	Comm. Fail Multiplier	Number of Comm. Fail Intervals to skip for good lines.	3 (D)
15	CC Redundancy Configured	Yes indicates a redundant controller card is required to prevent an alarm.	Y
16	Stats Memory (x 100 KB)	The amount of controller memory to allocate to statistics collection.	132 (D)
17	Standby Update Timer	Determines how often to send update messages to a standby controller.	10 (D)
18	Stby Updts Per Pass	Number of messages that can be sent to standby card for each update interval.	50 (D)
19	Gateway ID Timer	An inter-domain rerouting timer. How often to look for junction nodes for new route.	30 (D)
20	GLCON Alloc Timer	Another inter-domain rerouting timer controlling the gateway LCON function.	30 (D)
21	Comm Fail Delay	Number of seconds before starting to detect communication failures after a controller switchover.	60 (D)
22	Nw. Hdlr Timer (msec)	Network handler timer determines how long to wait to send messages to or receive messages from a remote node.	50 (D)
23	SAR CC Transmit Rate	Transmit data rate for BCC traffic to standby BCC (Kbps).	560 (D)
24	SAR High Transmit Rate	Transmit data rate for BCC traffic to other BCC nodes (Kbps).	280 (D)
25	SAR Low Transmit Rate	Transmit data rate for BCC traffic to ICC nodes (Kbps).	56 (D)
26	SAR VRAM Cngestn Limit	The threshold for BCC traffic receive queue congestion that causes cell discards.	7680 (D)
27	SAR VRAM Cell Discard	BCC traffic receive queue discard amount in cells.	256 (D)
28	ASM Card Cnfged	Yes indicates an Alarm/Status Monitor card is required or an alarm will be generated.	Y

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
29	TFTP Grant Delay (sec)	The number of seconds the node waits before resending a TFTP request after a TFTP error has occurred. This field is display-only; you set the value in Cisco WAN Manager.	1
30	TFTP ACK Timeout (sec)	The number of seconds the node waits for an acknowledgment of a TFTP request before it declares the request as timed out. This field is display-only; you set the value in Cisco WAN Manager.	10
31	TFTP Write Retries	The number of times the node retries a TFTP operation (not just writes) after a failed attempt. This field is display-only; you set the value in Cisco WAN Manager.	3
32	SNMP Event logging	Enables maintenance logging of global SNMP messages. These SNMP events are not errors but any GET, SET, and so on. Output goes to a printer connected to the node's auxiliary port or a terminal server (accessible via Telnet). Without a connected output device, the parameter is meaningless.	y=yes
33	Job Lock Timeout	Range: 1–1000 seconds Default: 0 (disables this parameter)	60
34	Max Via LCONs	The maximum number of "via" connections a via node can support. The default is the maximum for the node and should remain the default under normal operating conditions.	50000
35	Max Blind Segment Size	The maximum size of each segment of a blind message. (The full message may be longer than the segment, especially in a large network.) A *blind message* is a message the local node sends to the far end node when you execute **addtrk**. If the trunk has many errors, smaller message segments increase the possibility of a successful **addtrk**. Under normal conditions, this parameter should remain the default.	3570
36	Max XmtMemBlks Per NIB	Maximum number of memory blocks available for messages that are awaiting transmission. Under normal conditions, this parameter should remain the default.	3000
37	Max Mem on Stby Q (%)	Maximum number of update messages that can reside in queues awaiting transmission to the standby processor. This percentage is used to determine when to flush the standby message queue when the percentage is reached. Only rare circumstances could provide a reason to change this parameter, so do not change it without first consulting the TAC.	33 (D)
38	Stat Config Proc Cnt	Stat Config Proc Cnt is the number of statistics that will be enabled before pausing and allowing other processes to run. The default value of 1000 specifies that 1000 statistics should be enabled. But the count is checked only once for every object, so if the number of objects exceeds the count there will be one statistic enabled for each object. For example, if there are 1000 connections and the default count is set, one statistic will be enabled for each connection before pausing. If there are 2000 connections, one statistic will be enabled for each connection, then the number of statistics enabled (2000) will be compared to the count (1000). Since the number enabled exceeds the count, the enabling of statistics will pause.	1000 (where count is between 1 and 100000)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
39	Stat Config Proc Delay	Specifies the amount of time in milliseconds (ms) that statistics processing pauses between enabling passes. On a heavily loaded switch, you may increase this number to reduce the load when enabling statistics, but the enabling process takes longer. The total (approximate) amount of time to process a statistics-enable request is calculated as shown below: total_time = (num_of_stats / count_per_pass) * delay_per_pass where num_of_stats is the sum of all statistics for this switch (conns * conn stats + lines * line stats + ...) count_per_pass is described above delay_per_pass is described above Using an example of a switch with 1000 connections (10 statistics per connection), three trunks (10 statistics per trunk), 10 ports (10 statistics per port), and the default settings (count = 1000, delay = 2000 msec) yields the following: total_time = ([(1000 * 10) + (3 * 10) + (10 * 10)] / 1000 * 2000 = (10130 / 1000) * 2000 = 11 * 2000 = 22000 msec = 22 seconds	2000 (where delay is between 50 and 60000 ms)
40	Enable Degraded Mode	Enables or disables the rebuild-prevention feature on the node. Enabling this parameter causes a graceful switchover of the active controller card without having to do a rebuild. User connections and user traffic are maintained even when bugs or system overload would cause repeated aborts. Remaining updates are completed as fast as possible without affecting existing connections. If this parameter is disabled and an abort occurs during the update of the standby processor, the node rebuilds. On the BPX, the active/standby/fail lights on the active card flash at the same time indicating the node is in degraded mode.	No (disabled)
41	Trk Cell Rtng Restrict	Specifies whether connections can be routed using cell-based trunks only. The Trk Cell Rtng Restrict parameter lets you specify a default for an option to the **addcon** command; that is, you can specify what the **addcon** parameter “Trunk cell routing restricted” prompts the user as a default, for example: “Trunk cell routing restricted? y/n [y]” or “Trunk cell routing restricted? y/n [n]”. If “n” is specified, then FastPacket-based routing is used.	[Yes is default] Yes/No

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
42	Enable Feeder Alert	When degraded mode is entered, this parameter is set to yes, then a message is sent to the MGX 8220 interface shelves to update the nodes' status so that connections will not fail. This parameter works in conjunction with degraded mode parameters (for example, Auto Switch on Degrade). If Enable Feeder Alert is disabled (the default) or, due to network congestion, the messages cannot be exchanged between the hub and the feeder to disable LMI, manual intervention can still be achieved by using the **addfdrlp** and **delfdrlp** commands on the BPX. (Note that **addfdrlp** and **delfdrlp** commands are service-level commands and can be used only by Cisco personnel.)	[No is default] Yes/No
43	Reroute on Comm Failure	Default value is False. If there is communication failure, the node will not send the topology update message to the other nodes. If the value is set to True, the node will send out a line change message and the remote nodes (master/slave) will deroute/condition the connections. Also, connections are always rerouted on a Virtual Trunk regardless of whether reroute on path fail is enabled or not. You would sometimes use this parameter in conjunction with the A-bit Notifications on LMI/ILMI Interface feature (which you enable with the **cnfnodeparm** SuperUser command). For information about the A-bit Notifications feature, see the <CommandItalic>Cisco WAN Switch Command Reference.	True/False
44	Auto Switch on Degrade	When degraded mode is entered, the standby card is updated and ready. If the default is enabled (yes) then the card switchover happens automatically. If this parameter is set to yes, when degraded mode is entered, then the standby card is ready, and the card switchover happens automatically.	[Yes is default] Yes/No
45	Max Degraded Aborts	Use this parameter to determine the maximum frequency with which degraded mode aborts can occur before some other action is taken. In other words, they will be used to threshold degraded mode aborts. Another action could be a full rebuild, or it could be entering degraded mode. The allowable configurable range is shown in the Default column to the right. For example, using the default values of 100 for Max Hitless Rebuild Count, and 1000 hours Hitless Counter Reset Time, a maximum of 100 hitless rebuilds can occur within a 1000 hour period before it is determined that degraded mode should be entered. For each hitless rebuild that occurs, if 1000 hours pass without the maximum hitless rebuild count having been exceeded, then that hitless rebuild will have aged beyond the point where it is still considered for thresholding purposes.	100 is default (range is 0–100 or 255 (infinite)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
46	Max Hitless Rebuild Count	Use this parameter to determine the maximum frequency with which hitless rebuilds can occur before some other action is taken. In other words, they will be used to threshold hitless rebuilds. Another action could be a full rebuild, or it could be entering degraded mode. The allowable configurable range is shown in the Default column to the right. For example, using the default values of 100 for Max Hitless Rebuild Count, 1000 hours Hitless Counter Reset Time, a maximum of 100 hitless rebuilds can occur within a 1000 hour period before it is determined that degraded mode should be entered. For each hitless rebuild that occurs, if 1000 hours pass without the maximum hitless rebuild count having been exceeded, then that hitless rebuild will have aged beyond the point where it is still considered for thresholding purposes. If the maximum hitless rebuild counts is set to “255” for “infinite,” then an unlimited number of hitless rebuilds can occur without the thresholding mechanism triggering a full rebuild or a change to degraded mode. In this case, the configurable hitless counter reset time will be ignored, no full rebuilds will be automatically performed. This allows you to determine when the best time is to manually perform a full rebuild, probably during a period of low traffic. At the other extreme, if the maximum hitless rebuild is set to zero, then no hitless rebuilds will be attempted. This disables the feature. When the configurable parameters Max Hitless Rebuild Count and Hitless Counter Reset Time are reconfigured, then the statistical counters for hitless rebuilds will be reset. The Max Hitless Rebuild Count and Hitless Counter Reset Time are stored in BRAM.	100 (range is 0–100 or 255 (infinite)
47	Hitless Counter Reset Time	Use this parameter to determine the maximum frequency with which hitless rebuilds may occur before some other action is taken. In other words, they will be used to threshold hitless rebuilds. Some other action could be a full rebuild, or it could be entering degraded mode. The allowable configurable range is shown in the Default column to the right. For example, using the default values of 100 for Max Hitless Rebuild Count, 1000 hours Hitless Counter Reset Time, a maximum of 100 hitless rebuilds may occur within a 1000 hour period before it is determined that degraded mode should be entered. For each hitless rebuild that occurs, if 1000 hours pass without the maximum hitless rebuild count having been exceeded, then that hitless rebuild will have aged beyond the point where it is still considered for thresholding purposes.	1000 hours (range is 1–1000)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
48	Send A-bit Early	Specifies whether A-bit is sent on deroute. The default is set to no initially. If you issue this command again, the prompt then shows the previously provisioned value. Use the Send A-bit Early parameter (option 48) to enable or disable the A-bit Notifications feature. (The default is N which means the A-bit Notifications feature is disabled.) If the Send A-bit Early parameter is set to N, then the settings for parameter 49 (A-bit Timer Multiplier M) and parameter 50 (A-bit Timer Granularity N) are ignored and have no effect. After you enable the Send A-bit Early parameter by setting it to yes, you can set the A-bit Timer Granularity N and A-bit Timer Multiplier M parameters. The Send A-bit Early parameter works in conjunction with the A-bit Timer Multiplier M and A-bit Timer Granularity N parameters. You must set the Send A-bit Early parameter to yes to enable it, then you can set the A-bit Timer Multiplier M and A-bit Timer Granularity N parameters. Note that a pre-Release 9.1.07 node or Release 9.1.07 node with the Release 9.1.07 **cnfnodeparm** Send A-bit immediately parameter turned off behaves the same way as a Release 9.2 node with the Early A-bit Notifications on ILMI/LMI Interface using Configurable Timer feature disabled. A 9.1.07 node with the **cnfnodeparm** Send A-bit immediately parameter turned on behaves the same as a Release 9.2 node with the Send A-bit Early (option 48 in **cnfnodeparm**) set to yes and the A-bit Timer Multiplier M (option 49 in **cnfnodeparm**) set to 0. The different A-bit behavior in Release 9.2 is completely local to the node and is applicable to the master and slave ends of connections when the connections are derouted. When only one of the nodes connected by a connection has the Send A-bit Early enabled (set to Y), the timing in which that the A-bit notification feature is sent at one end of the connection may be drastically different from the other end of the connection. Thus, it is recommended that the Send A-bit Early parameter be configured the same on all nodes. For more information on the Send A-bit Notification on ILMI/LMI using Configurable Timer feature, refer to the *BPX 8600 Series Installation and Configuration* manual.	[N is default] (Y/N)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
49	A-bit Timer Multiplier M	The A-bit Timer Multiplier M and A-bit Timer Granularity N parameters are used in conjunction with the Send A-bit Early parameter. You must set the Send A-bit Early parameter to yes to enable it, then you can set A-bit Timer Multiplier M and A-bit Timer Granularity N parameters. You can set the A-bit Timer Multiplier M option from 0 to 100. The default value is 0. When you execute the **cnfnodeparm** command, the prompt shows the previously configured value, or the default value if no upgrade or no configuration on these values was done previously. A value X is the time to wait before A-bit = 0 is sent out if the connection is in a derouted state. A connection derouted at a time period between 0 and N will send out A-bit = 0 at a time between X and X + N, if the connection continues to be in a derouted state. In cases where there are many A-bit status changes to report to the CPE, the last A-bit updates may be delayed much longer because A-bit updates process about 47 connections per second. To make a compromise between performance and the granularity of timers, A-bit Timer Multiplier N can be configured to be from 3 to 255 seconds. The bigger the value of N, the better the system performance will be. The value of X is M * N (A-bit Timer Multiplier M * A-bit Timer Granularity N values). To compromise between performance and the granularity of timers, N can be configured to be from 3 to 255 seconds; the bigger the value of N, the better the system performance will be. The value of X (M * N) is set such that M can be configured to be from 0 to 100. The default value for N is 3 seconds. The default value for M is 0, meaning A-bit = 0 sent out on deroute. It is recommended that the value of X (value of A-bit Timer Multiplier M * value of A-bit Timer Granularity N) be set such that when a trunk fails, the connections are given sufficient time to reroute successfully, avoiding the need to send out A-bit = 0. If the value of X is set to be smaller than the normal time to reroute connections when a trunk fails, the time to complete rerouting them may take longer. This can happen for line cards and feeder trunks that have LMI/ILMI protocol runs on those cards, such as BXM on BPX and Frame Relay cards on IGX. Note that it takes time for those cards to process A-bit status information for each connection coming from controller card through CommBus messages. Note that a pre-Release 9.1.07 node or a 9.1.07 node with the Send A-bit Early parameter turned off behaves the same way as a Release 9.2 node with the Release 9.2 Early A-bit Notifications feature disabled. A 9.1.07 node with the Send A-bit Early parameter turned on behaves the same way as a Release 9.2 node with the Send A-bit Early parameter set to on, and the A-bit Timer Multiplier M parameter set to 0. To follow the general Release 9.2 interoperability, it is recommended that the A-bit Notifications feature not be used when the standby control processor is in a locked state.	[Default is 0] (D)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
50	A-bit Timer Granularity N	You can set the A-bit Timer Granularity N option from 3 to 255 seconds. The default value is 3 seconds. You use the A-bit Timer Granularity N and A-bit Timer Multiplier M parameters in conjunction with the Send A-bit Early parameter to configure the Early A-bit Notifications on LMI/ILMI Interface using Configurable Timer feature in Release 9.2 and beyond. (The Send A-bit Early parameter must be enabled before you can set the A-bit Timer Multiplier M and A-bit Timer Granularity N parameters.) The Early A-bit Notifications feature lets the user specify the timer interval to wait before A-bit = 0 is sent out if a connection fails to reroute and is in the derouted state too long. No precise timer is kept for each connection. Instead, all connections derouted during a certain time period go to the same bucket. This time period is N, which defines the granularity of the timers, and is specified by the A-bit Timer Granularity N parameter. Also, the value X is the time to wait before A-bit = 0 is sent out if the connection is in a derouted state. A connection that is derouted at a time period between 0 and N will send out A-bit = 0 at a time between X and X + N if the connection continues to be in a derouted state. In cases where there are many A-bit status changes to report to the CPE, the last A-bit updates may be delayed much longer because A-bit updates process about 47 connections per second. To compromise between performance and the granularity of timers, you can configure the N value (A-bit Timer Granularity N) to be from 3 to 255 seconds. The bigger the value of N, the better the system performance will be. The value of X should be M * N, where M can be configured to be from 0 to 100. The default value for N (specified by the A-bit Timer Multiplier N parameter) is 3 seconds. The default value for M is 0, meaning that A-bit = 0 is sent out on deroute. It is recommended that the value of X (A-bit Timer Multiplier M value * A-bit Timer Granularity N value) be set such that when a trunk fails, the connections are given sufficient time to reroute successfully, avoiding the need to send out A-bit = 0.	[Default is 3 seconds]

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
51	FBTC with PPD Policing	If you have installed a BXM card with the Routing Control Monitoring and Policing (RCMP) chip, which supports PPD on policing, you may enable this feature by setting this parameter to Y. Older BXM cards do not support PPD on policing. After enabling this parameter, a warning appears: “Warning: Must switchyred or reset PPDPolic BXM line cards after change.” Note that these operations are not supported in remote NMS stations. Next you must choose one of two options by entering either Y or N: Y = BXM FBTC on thresholds and PPD policing. This option is supported only on BXM cards with the new version of the RCMP chip that provides this functionality. N = BXM FBTC on thresholds. Provides FBTC on CLP thresholds only. Although it is not recommended to use both an older BXM card and a BXM card that supports PPD on policing on a Y-redundant pair, you can do so. The severity of the feature mismatch is minor because FBTC can still function based on the CLP thresholds on the BXM card that does not support PPD on policing. This parameter is a one-time installation task; it should not be frequently changed.	[N is default] (Y/N)
52	CommBrk Hop Weight	In order to do concentric Comm Break clearing, nodes are ordered by hop count as well as by the time they have been waiting for the Comm Break test. This ensures that the running of route op if no topology change was detected does not change the order of testing. Also, distant nodes are guaranteed to be tested after a finite time regardless of how many nodes go in and out of Comm Break. The function used is: h * w - s Where **h** is the number of hops a node is away, **s** is the number of second since it is in Comm Break (and not in path fail), **w** is the CommBrk Hop Weight.	[25 is the default] (D)
53	CB Fail Penalty Hops	A node that fails a Comm Break test is entered into the list mentioned in the previous description of CommBrk Hop Weight, plus a penalty. The penalty is at least p * w, where **p** (by default 2) is configurable as the CB Fail Penalty Hops parameter. This means the node gets another chance after p rings have been tested. In the old way the node did not get another chance after all nodes had been tested.	[2 is the default] (D)
54	Auto BXM Upgrade	Used for legacy BXM to BXM-E upgrades. If the parameter is set to Y, SWSW upgrades the logical database as soon as both legacy BXMs are replaced by BXM-Es in yred case, or the active legacy BXM is replaced by a BXM-E in non-yred case. Set this parameter to N if you want to manually upgrade. Refer to the *BPX 8600 Installation and Configuration Guide*, *9.3.0 Release*, for upgrade scenarios and procedures.	[Y default is yes] (Y/N)
55	LCN reprgrm batch cnt	Specifies the number of LCN(s) to be reprogrammed in a batch before giving up CPU. This is typically used for dynamic partitioning.	[100 is the default] (D)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
56	Download LAN IP or Network IP Address	Specifies whether to use the configured LAN IP or network IP address as the management IP address used in the ILMI Neighbor Discovery procedure. The management IP address is part of the neighbor information exchanged between the BPX and an attached ATM device, such as CISCO ATM routers or switches, when the ILMI Neighbor Discovery feature is enabled. The management IP address allows a network management system to access the BPX and the attached device. Use the **cnflan** command to configure the LAN IP address. Use the **cnfnwip** command to configure the network IP address. Use the **cnfport** command to enable the ILMI protocol and Advertise Interface Information parameter. Use the **dspnebdisc** command to display the neighbor information discovered by the Neighbor Discovery feature.	[Nw is default] (Lan/Nw)
57	IP Relay Gateway Node Number	Specifies the node number of the node that is to serve as an IP Relay Gateway to a TFTP network server used to save and restore node configuration files. The default value for this parameter is zero to indicate no node. The network server must be reachable through the LAN from the configured IP Relay Gateway. The IP Relay Gateway node must be configured separately on each node in the network. The configured gateway can be the same on all nodes if a dingle IP relay gateway is used for all nodes. Multiple gateways and/or multiple network servers can be used to decrease bottlenecks and the time required to back up the entire network.	0 (default) (range of node numbers is 1–223)

* Enter value in either decimal (D) or hexadecimal (H).

Parameters (IGX)

Index	Parameter	Description	Default
1	Update Initial Delay (sec.)	Specifies a factor for generating a delay before conditional updates are transmitted to the network after a controller card switchover. The *Update Initial Delay* is multiplied by the number of nodes in the network.	5000 (D)
2	Update Per-Node Delay (ms.)	Specifies the delay between transmission of conditional updates to the nodes.	30000 (D)
3	Comm. Break Test Delay (ms.)	Normal interval between tests for communication break on any node.	30000 (D)
4	Comm. Break Test Offset	Factor between number of communication test failures and test successes to declare a node in communication break condition.	10 (D)
5	Network Time-out Period	Number of milliseconds to wait for a response to a communication test transmission before declaring a failure. The maximum is four failures.	1700 (D)
6	Network Inter-p Period	In inter-domain connections, *Network Inter-p Period* is the number of milliseconds to wait for a response to a communication test transmission before declaring a failure. The maximum is four failures.	4000 (D)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
7	Network Sliding Window Size	Controls the number of control card messages that the node can simultaneously transmit to the network. This parameter defines the number of “no acknowledgments outstanding” on a controller before NACKS is declared.	1 (D)
8	Number of Normal Time-outs	For intra-domain connections: *Number of Normal Time-outs* is the maximum number of normal network retransmissions before the node signals a communication break.	7 (D)
9	Number of Inter-p Time-outs	For inter-domain connections: *Number of Inter-p Time-outs* is the maximum number of normal network retransmissions before the node signals a communication break.	3 (D)
10	Number of Satellite Time-outs	Maximum number of satellite network retransmissions before the node signals a communication break.	6 (D)
11	Number of Blind Time-outs	Maximum number of communication fail time-outs and retransmissions performed when using the blind channel. “Blind” refers to the message being sent across the trunk without knowing what node is on the other end of the trunk. The Comm Fail test uses this blind channel, however, the Comm Fail application has a non-configurable limit of three comm failures before declaring Comm Fail. For example, the network handler task will attempt to deliver the Comm Fail request message four times before reporting a failure back to the Comm Fail application, which will retry twice more (each with four retries on the blind channel) before declaring Comm Fail. The Number of Blind Time-outs parameter is the number of communication fail time-outs and retransmissions performed when using the blind channel.	4 (D)
12	Number of CB Msg Timeouts	Number of communication break time-outs and retransmissions before the node declares a communication break condition (CB). One successful acknowledgment clears the CB condition.	2 (D)
13	Comm. Fail Interval (ms.)	Minimum time allocated for communication fail testing of all trunks terminating on the local node.	10,000 (D)
14	Comm. Fail Multiplier	Number of Comm. Fail Intervals to skip for good lines.	3 (D)
15	Temperature Threshold (° C.)	Temperature in the enclosure that causes an over-temperature alarm to go to the controller card.	50 (D)
16	Redundancy Configured	A y indicates a redundant controller card is required. The absence of a redundant controller card generates an alarm.	Y
17	MT3 Pass Through Delay	The parameter is OBSOLETE.	
18	Network Packet TX Rate	Rate for transmitting control card packets to the network. The range is a series of discreet values: 100 200 333 500 1000 1100 1200 1333 1500 2000. The units of measure are packets per second (pps). The purpose of this parameter is to prevent the control card from flooding the trunk with packets.	500 pps
19	TFTP Memory (x 10 KB)	Specifies the amount of controller memory to allocate for statistics collection.	76 (D)
20	Standby Update Timer	Specifies how often to send update messages to standby controller.	10 (D)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
21	Stby Updts Per Pass	Number of messages that can be sent to the standby card for each update interval.	30 (D)
22	Gateway ID Timer	An inter-domain rerouting timer. How often to look for junction nodes for new route.	30 (D)
23	GLCON Alloc Timer	Another inter-domain rerouting timer controlling the gateway LCON function.	30 (D)
24	Comm Fail Delay	Number of seconds before starting to detect communication failures after a controller switch over.	60 (D)
25	Nw Hdlr Timer (msec)	Network handler timer determines how long to wait to send messages to or receive messages from a remote node.	50 (D)
26	CBUS Delay	Specifies the minimum number of milliseconds the NPM must wait before it places the next command on the CBUS.	20 (D)
27	SNMP Event Logging	Enables maintenance logging of global SNMP messages. These SNMP events are not errors but any GET, SET, and so on. Output goes to a printer connected to the node's auxiliary port or a terminal server (accessible via Telnet). Without a connected output device, the parameter is meaningless.	y=yes
28	TFTP Grant Delay (sec)	The number of seconds the node waits before resending a TFTP request after a TFTP error has occurred. This field is display-only; you set the value in Cisco WAN Manager.	1
29	TFTTP ACK Time-out (sec)	The number of seconds the node waits for an acknowledgment of a TFTP request before it declares the request as timed out. This field is display-only; you set the value in Cisco WAN Manager.	10
30	TFTP Write Retires	The number of times the node retries a TFTP operation (not just writes) after a failed attempt. This field is display-only: you set the value in Cisco WAN Manager.	3
31	FRP/FRM Link Status Alarm	Determines whether a signaling failure on an FRP or FRM port causes a major alarm. This parameter applies to any port configured as an NNI.	y=yes
32	Job Lock Time-out	The range is 1–1000 seconds. The default of 0 disables this parameter.	0
33	Max Via LCONs	The maximum number of "via" connections a node can support. (A via connection does not terminate on the node but merely passes through.) This maximum is configurable, but you cannot lower the number below the current limit on the node. The default is the current maximum and should remain unchanged for normal operating conditions.	On an IGX node: 20000 On a BPX node: 50000
34	Max Blind Segment Size	The maximum size of each segment of a blind message. (The full message may be longer than the segment, especially in a large network.) A *blind message* is a message the local node sends to the far end node when you execute **addtrk**. If the trunk has many errors, smaller message segments increase the possibility of a successful **addtrk**. Under normal conditions, this parameter should remain the default.	3570

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
35	Max XmtMemBlks Per NIB	Maximum number of memory blocks available for messages that are awaiting transmission. Under normal conditions, this parameter should remain the default.	3000
36	Max Mem Stby Update Q Size	Maximum number of update messages that can reside in queues awaiting transmission to the standby processor. This percentage is used to determine when to flush the standby message queue when the percentage is reached. Only rare circumstances could provide a reason to change this parameter, so do not change it without first consulting the TAC.	5000
37	Trk Cell Rtng Restrict	Specifies whether or not trunks on a UXM on an IGX node can route only cell traffic. The Trk Cell Rtng Restrict parameter lets you specify a default for an option to the **addcon** command; that is, you can specify what the **addcon** parameter "Trunk cell routing restricted" prompts the user as a default, for example: "Trunk cell routing restricted? y/n [y]" or "Trunk cell routing restricted? y/n [n]." If "n" is specified, then FastPacket-based routing is used. When adding or configuring ATM connections, this prompt will display for all connections (for example, CBR, ABR, UBR, and so on) except for real-time VBR (rt-VBR) connections because rt-VBR connections should not be routed over FastPacket trunks.	Yes/No
38	Stat Config Proc Cnt	Stat Config Proc Cnt is the number of statistics that will be enabled before pausing and allowing other processes to run. The default value of 1000 specifies that 1000 statistics should be enabled. But the count is checked only once for every object, so if the number of objects exceeds the count there will be one statistic enabled for each object. For example, if there are 1000 connections and the default count is set, one statistic will be enabled for each connection before pausing. If there are 2000 connections, one statistic will be enabled for each connection, then the number of statistics enabled (2000) will be compared to the count (1000). Since the number enabled exceeds the count, the enabling of statistics will pause.	1000 (where count is between 1 and 100000)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
39	Stat Config Proc Delay	Specifies the amount of time in milliseconds (ms) that statistics processing pauses between enabling passes. On a heavily loaded switch, you may increase this number to reduce the load when enabling statistics, but the enabling process takes longer. The total (approximate) amount of time to process a statistics-enable request is calculated as shown below: total_time = (num_of_stats / count_per_pass) * delay_per_pass where num_of_stats is the sum of all statistics for this switch (conns * conn stats + lines * line stats + ...) count_per_pass is described above delay_per_pass is described above Using an example of a switch with 1000 connections (10 statistics per connection), three trunks (10 statistics per trunk), 10 ports (10 statistics per port), and the default settings (count = 1000, delay = 2000 msec) yields the following: total_time = ([(1000 * 10) + (3 * 10) + (10 * 10)] / 1000 * 2000 = (10130 / 1000) * 2000 = 11 * 2000 = 22000 msec = 22 seconds	2000 (where delay is between 50 and 60000 ms)
40	Enable Degraded Mode	Enables or disables the rebuild-prevention feature on the node. Enabling this parameter causes a graceful switchover of the active controller card without having to do a rebuild. User connections and user traffic are maintained even when bugs or system overload would cause repeated aborts. Remaining updates are completed as fast as possible without affecting existing connections. If this parameter is disabled and an abort occurs during the update of the standby processor, the node rebuilds. Note that on the IGX, the active/standby/fail lights on the active card do not flash (as they do on the BPX node to indicate that the node is in degraded mode). If enabled, an abort condition will transition the node into degraded mode rather than rebuilding the node. You can disable this parameter (it is enabled by default) so that an abort will result in a rebuild. After degraded has been entered, a minimal set of functionality is available. (See the "High Priority Login" section for more information.) Disabled functions include provisioning and routing, network communications, event logging, and LAN access. However, connections continue to pass traffic. Once in degraded mode, a configurable parameter indicates whether to switch to the standby once it's ready. If Enable Degraded Mode is enabled (Y), an abort condition will transition the node into degraded mode rather than rebuilding the node. You can disable this parameter so that an abort will result in a node rebuild.	Y (enabled)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
41	Enable Feeder Alert	When degraded mode is entered, this parameter is set to yes, then a message is sent to the MGX 8220 interface shelves to update the nodes' status so that connections will not fail. This parameter works in conjunction with degraded mode parameters (for example, Auto Switch on Degrade). If Enable Feeder Alert is disabled (the default) or, due to network congestion, the messages cannot be exchanged between the hub and the feeder to disable LMI, manual intervention can still be achieved by using the **addfdrlp** and **delfdrlp** commands on the BPX. (Note that **addfdrlp** and **delfdrlp** commands are service-level commands and can be used only by Cisco personnel.)	[No is default] Yes/No
42	Trk Cell Rtng Restrict	Specifies whether connections can be routed using cell-based trunks only. The Trk Cell Rtng Restrict parameter lets you specify a default for an option to the **addcon** command; that is, you can specify what the **addcon** parameter "Trunk cell routing restricted" prompts the user as a default, for example: "Trunk cell routing restricted? y/n [y]" or "Trunk cell routing restricted? y/n [n]". If "n" is specified, then FastPacket-based routing is used.	Yes/No
43	Enable Reroute on Comm Fail	Default value is False. If there is communication failure, the node will not send the topology update message to the other nodes. If the value is set to True, the node will send out a line change message and the remote nodes (master/slave) will deroute/condition the connections. You would sometimes use this parameter in conjunction with the A-bit Notifications on LMI/ILMI Interface feature (which you enable with the **cnfnodeparm** SuperUser command). See the A-bit Notifications feature description in the *Cisco WAN Switching Command Reference*.	[F] (T/F)
44	Auto Switch on Degrade	When degraded mode is entered, the standby card is updated and ready. If the default is enabled (yes) then the card switchover happens automatically. If this parameter is set to yes, when degraded mode is entered, then the standby card is ready, and the card switchover happens automatically. After a node has entered degraded mode (see Enable Degraded Mode parameter), this parameter indicates whether to switch to the standby card once it is ready. The default setting is to enable switching. You can set this parameter to disable switching if you want to allow further time to diagnose the problem rather than switching to the other processor, or to stop switching due to repeated aborts.	[Yes is default] Yes/No

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
45	Max Degraded Aborts	Use this parameter to determine the maximum frequency with which degraded mode aborts can occur before some other action is taken. In other words, they will be used to threshold degraded mode aborts. Another action could be a full rebuild, or it could be entering degraded mode. The allowable configurable range is shown in the Default column to the right. This parameter indicates the maximum number of aborts while in the degraded state. In the case where the processor continues to reset while in degraded mode, each reset will result in the processor staying in degraded mode unless this threshold has been reached, in which case the next reset will cause a full rebuild of the node. The desired result is to avoid infinite aborts while in degraded mode, which would essentially lock the node indefinitely. You can set Max Degraded Aborts to its maximum value (255) to indicate that the processor will be allowed to abort indefinitely without going through a full rebuild. This approach can be used to avoid a full rebuild (which will impact the user plane) until an appropriate time is reached when it may be reset or replaced.	100 is default (range is 0–100 or 255 (infinite)
46	Max Hitless Rebuild Count	Use this parameter to determine the maximum frequency with which hitless rebuilds can occur before some other action is taken. In other words, they will be used to threshold hitless rebuilds. Another action could be a full rebuild, or it could be entering degraded mode. The allowable configurable range is shown in the Default column to the right. For example, using the default values of 100 for Max Hitless Rebuild Count and 1000 hours Hitless Counter Reset Time, a maximum of 100 hitless rebuilds can occur within a 1000 hour period before it is determined that degraded mode should be entered. For each hitless rebuild that occurs, if 1000 hours pass without the maximum hitless rebuild count having been exceeded, then that hitless rebuild will have aged beyond the point where it is still considered for thresholding purposes. If the maximum hitless rebuild count is set to "255" for "infinite," then an unlimited number of hitless rebuilds can occur without the thresholding mechanism triggering a full rebuild or a change to degraded mode. In this case, the configurable hitless counter reset time will be ignored, no full rebuilds will be automatically performed. This allows you to determine when the best time is to manually perform a full rebuild, probably during a period of low traffic. At the other extreme, if the maximum hitless rebuild is set to zero, then no hitless rebuilds will be attempted. This disables the feature. When the configurable parameters Max Hitless Rebuild Count and Hitless Counter Reset Time are reconfigured, then the statistical counters for hitless rebuilds will be reset. The Max Hitless Rebuild Count and Hitless Counter Reset Time are stored in BRAM.	100 (range is 0–100 or 255 (infinite)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
47	Hitless Counter Reset Time	Use this parameter to determine the maximum frequency with which hitless rebuilds can occur before some other action is taken. In other words, they will be used to threshold hitless rebuilds. Another action could be a full rebuild, or it could be entering degraded mode. The allowable configurable range is shown in the Default column to the right. For example, using the default values of 100 for Max Hitless Rebuild Count and 1000 hours Hitless Counter Reset Time, a maximum of 100 hitless rebuilds can occur within a 1000 hour period before it is determined that degraded mode should be entered. For each hitless rebuild that occurs, if 1000 hours pass without the maximum hitless rebuild count having been exceeded, then that hitless rebuild will have aged beyond the point where it is still considered for thresholding purposes. If the maximum hitless rebuild count is set to “255” for “infinite”, then an unlimited number of hitless rebuilds can occur without the thresholding mechanism triggering a full rebuild or a change to degraded mode. In this case, the configurable hitless counter reset time will be ignored, no full rebuilds will be automatically performed. This allows you to determine when the best time is to manually perform a full rebuild, probably during a period of low traffic. At the other extreme, if the maximum hitless rebuild is set to zero, then no hitless rebuilds will be attempted. This disables the feature. When the configurable parameters Max Hitless Rebuild Count and Hitless Counter Reset Time are reconfigured, then the statistical counters for hitless rebuilds will be reset. The Max Hitless Rebuild Count and Hitless Counter Reset Time are new in Release 9.2, and will be stored in BRAM.	1000 hours (range is 1–1000)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
48	Send A-bit Early	Specifies whether A-bit is sent on deroute. The default is set to no initially. If you issue this command again, the prompt then shows the previously provisioned value. Use the Send A-bit Early parameter (option 48) to enable or disable the A-bit Notifications feature. (The default is N, which means the A-bit Notifications feature is disabled.) If the Send A-bit Early parameter is set to N, then the settings for parameter 49 (A-bit Timer Multiplier M) and parameter 50 (A-bit Timer Granularity N) are ignored and have no effect. After you enable the Send A-bit Early parameter by setting it to yes, you can set the A-bit Timer Granularity N and A-bit Timer Multiplier M parameters. The Send A-bit Early parameter works on conjunction with the A-bit Timer Multiplier M and A-bit Timer Granularity N parameters. You must set the Send A-bit Early parameter to yes to enable it, then you can set the A-bit Timer Multiplier M and A-bit Timer Granularity N parameters. The different A-bit behavior in Release 9.2 and higher is completely local to the node and is applicable to the master and slave ends of connections when the connections are derouted. When only one of the nodes connected by a connection has the Send A-bit Early enabled (set to Y), the timing in which that the A-bit notification feature is sent at one end of the connection may be drastically different from the other end of the connection. Thus, it is recommended that the Send A-bit Early parameter be configured the same on all nodes. For more information on the Send A-bit Notification on ILMI/LMI using Configurable Timer feature, refer to the *BPX 8600 Series Installation and Configuration Manual*.	[N is default] (Y/N)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
49	A-bit Timer Multiplier M	The A-bit Timer Multiplier M and A-bit Timer Granularity N parameters are used in conjunction with the Send A-bit Early parameter. You must set the Send A-bit Early parameter to yes to enable it, then you can set A-bit Timer Multiplier M and A-bit Timer Granularity N parameters. You can set the A-bit Timer Multiplier M option from 0 to 100. The default value is 0. When you execute the **cnfnodeparm** command, the prompt shows the previously configured value, or the default value if no upgrade or no configuration on these values was done previously. A value X is the time to wait before A-bit = 0 is sent out if the connection is in a derouted state. A connection derouted at a time period between 0 and N will send out A-bit = 0 at a time between X and X + N, if the connection continues to be in a derouted state. In cases where there are many A-bit status changes to report to the CPE, the last A-bit updates may be delayed much longer because A-bit updates process about 47 connections per second. To make a compromise between performance and the granularity of timers, A-bit Timer Multiplier N can be configured to be from 3 to 255 seconds. The bigger the value of N, the better the system performance will be. The value of X is M * N (A-bit Timer Multiplier M * A-bit Timer Granularity N values). To compromise between performance and the granularity of timers, N can be configured to be from 3 to 255 seconds; the bigger the value of N, the better the system performance will be. The value of X (M * N) is set such that M can be configured to be from 0 to 100. The default value for N is 3 seconds. The default value for M is 0, meaning A-bit = 0 sent out on deroute. It is recommended that the value of X (value of A-bit Timer Multiplier M * value of A-bit Timer Granularity N) be set such that when a trunk fails, the connections are given sufficient time to reroute successfully, avoiding the need to send out A-bit = 0. If the value of X is set to be smaller than the normal time to reroute connections when a trunk fails, the time to complete rerouting them may take longer. This can happen for line cards and feeder trunks that have LMI/ILMI protocol runs on those cards, such as BXM on BPX and Frame Relay cards on IGX. Note that it takes time for those cards to process A-bit status information for each connection coming from controller card through Comm Bus messages. To follow the general Release 9.2 interoperability, it is recommended that the A-bit Notifications feature not be used when the standby control processor is in a locked state.	[Default is 0] (D)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
50	A-bit Timer Granularity N	You can set the A-bit Timer Granularity N option from 3 to 255 seconds. The default value is 3 seconds. You use the A-bit Timer Granularity N and A-bit Timer Multiplier M parameters in conjunction with the Send A-bit Early parameter to configure the Early A-bit Notifications on LMI/ILMI Interface using Configurable Timer feature in Release 9.2 and beyond. (The Send A-bit Early parameter must be enabled before you can set the A-bit Timer Multiplier M and A-bit Timer Granularity N parameters.) The Early A-bit Notifications feature lets the user specify the timer interval to wait before A-bit = 0 is sent out if a connection fails to reroute and is in the derouted state too long. No precise timer is kept for each connection. Instead, all connections derouted during a certain time period go to the same bucket. This time period is N, which defines the granularity of the timers, and is specified by the A-bit Timer Granularity N parameter. Also, the value X is the time to wait before A-bit = 0 is sent out if the connection is in a derouted state. A connection that is derouted at a time period between 0 and N will send out A-bit = 0 at a time between X and X + N if the connection continues to be in a derouted state. In cases where there are many A-bit status changes to report to the CPE, the last A-bit updates may be delayed much longer because A-bit updates process about 47 connections per second. To compromise between performance and the granularity of timers, you can configure the N value (A-bit Timer Granularity N) to be from 3 to 255 seconds. The bigger the value of N, the better the system performance will be. The value of X should be M * N, where M can be configured to be from 0 to 100. The default value for N (specified by the A-bit Timer Multiplier N parameter) is 3 seconds. The default value for M is 0, meaning that A-bit = 0 is sent out on deroute. It is recommended that the value of X (A-bit Timer Multiplier M value * A-bit Timer Granularity N value) be set such that when a trunk fails, the connections are given sufficient time to reroute successfully, avoiding the need to send out A-bit = 0.	[Default is 3 seconds]
51	CommBrk Hop Weight	In order to do concentric Comm Break clearing, nodes are ordered by hop count as well as by the time they have been waiting for the Comm Break test. This ensures that the running of route op if no topology change was detected does not change the order of testing. Also, distant nodes are guaranteed to be tested after a finite time regardless of how many nodes go in and out of Comm Break. The function used is: h * w - s Where **h** is the number of hops a node is away, **s** is the number of second since it is in Comm Break (and not in path fail), **w** is the CommBrk Hop Weight.	[25 is the default] (D)

* Enter value in either decimal (D) or hexadecimal (H).

Index	Parameter	Description	Default
52	CB Fail Penalty Hops	A node that fails a Comm Break test is entered into the list mentioned in the previous description of CommBrk Hop Weight, plus a penalty. The penalty is at least p * w, where **p** (by default 2) is configurable as the CB Fail Penalty Hops parameter. This means the node gets another chance after p rings have been tested. In the old way the node did not get another chance after all nodes had been tested.	[2 is the default] (D)
53	Download LAN IP or Network IP Address	Specifies whether to use the configured LAN IP or network IP address as the management IP address used in the ILMI Neighbor Discovery procedure. The management IP address is part of the neighbor information exchanged between the IGX and an attached ATM device, such as CISCO ATM routers or switches, when the ILMI Neighbor Discovery feature is enabled. The management IP address allows a network management system to access the IGX and the attached device. Use the **cnflan** command to configure the LAN IP address. Use the **cnfnwip** command to configure the network IP address. Use the **cnfport** command to enable the ILMI protocol and the Advertise Interface Information parameter. Use the **dspnebdisc** command to display the neighbor information discover by the Neighbor Discovery feature.	[Lan is the default] (Lan/Nw)
54	IP Relay Gateway Node Number	Specifies the node number of the node that is to serve as an IP Relay Gateway to a TFTP network server used to save and restore node configuration files. The default value for this parameter is zero to indicate no node. The network server must be reachable through the LAN from the configured IP Relay Gateway. The IP Relay Gateway node must be configured separately on each node in the network. The configured gateway can be the same on all nodes if a single network server is used for all TFTP configuration backups. Multiple gateways and/or multiple network servers can be used to decrease bottlenecks and the time required to back up the entire network.	0 (default) (range of node numbers is 1–223)

* Enter value in either decimal (D) or hexadecimal (H).

Example (BPX)

cnfnodeparm

```
bpx1           TN    Cisco          BPX 8620  9.3.30    Mar. 19 2000 10:47 GMT

1  Update Initial Delay   [ 5000] (D)   16 Stats Memory (x 100KB) [  132] (D)
2  Update Per-Node Delay  [30000] (D)   17 Standby Update Timer   [   10] (D)
3  Comm-Break Test Delay  [30000] (D)   18 Stby Updts Per Pass    [  150] (D)
4  Comm-Break Test Offset [   10] (D)   19 Gateway ID Timer       [   30] (D)
5  Network Timeout Period [ 1700] (D)   20 GLCON Alloc Timer      [   30] (D)
6  Network Inter-p Period [ 4000] (D)   21 Comm Fail Delay        [   60] (D)
7  NW Sliding Window Size [    1] (D)   22 Nw Hdlr Timer (msec)   [   25] (D)
8  Num Normal Timeouts    [    7] (D)   23 SAR CC Transmit Rate   [  560] (D)
9  Num Inter-p Timeouts   [    3] (D)   24 SAR High Transmit Rate [  280] (D)
10 Num Satellite Timeouts [    6] (D)   25 SAR Low Transmit Rate  [   56] (D)
11 Num Blind Timeouts     [    4] (D)   26 SAR VRAM Cngestn Limit [ 7680] (D)
12 Num CB Msg Timeouts    [    5] (D)   27 SAR VRAM Cell Discard  [  256] (D)
13 Comm Fail Interval     [10000] (D)   28 ASM Card Cnfged        [    Y] (Y/N)
14 Comm Fail Multiplier   [    3] (D)   29 TFTP Grant Delay (sec) [    1] (D)
15 CC Redundancy Cnfged   [    Y] (Y/N) 30 TFTP ACK Timeout (sec) [   10] (D)

This Command: cnfnodeparm


Continue?

bpx1           TN    Cisco          BPX 8620  9.3.30    Mar. 19 2000 10:47 GMT

31 TFTP Write Retries     [    3] (D)   46 Max Htls Rebuild Count [  100] (D)
32 SNMP Event logging     [    Y] (Y/N) 47 Htls Counter Reset Time[ 1000] (D)
33 Job Lock Timeout       [   60] (D)   48 Send Abit early        [    N] (Y/N)
34 Max Via LCONs          [50000] (D)   49 Abit Tmr Multiplier  M [    0] (D)
35 Max Blind Segment Size [ 3570] (D)   50 Abit Tmr Granularity N [    3] (D)
36 Max XmtMemBlks per NIB [ 3000] (D)   51 FBTC with PPDPolicing  [    N] (Y/N)
37 Max Mem on Stby Q (%)  [   33] (D)   52 CommBrk Hop Weight     [   25] (D)
38 Stat Config Proc Cnt   [ 1000] (D)   53 CB Fail Penalty Hops   [    2] (D)
39 Stat Config Proc Delay [ 2000] (D)   54 Auto BXM upgrade       [    Y] (Y/N)
40 Enable Degraded Mode   [    Y] (Y/N) 55 LCN reprgrm batch cnt  [  100] (D)
41 Trk Cell Rtng Restrict [    Y] (Y/N) 56 Dnld LanIP or NwIP     [  Nw](Lan/Nw)
42 Enable Feeder Alert    [    N] (Y/N) 57 IP Relay gateway node  [    0] (D)
43 Reroute on Comm Fail   [    N] (Y/N)
44 Auto Switch on Degrade [    Y] (Y/N)
45 Max Degraded Aborts    [  100] (D)

This Command: cnfnodeparm
```

Example (IGX)

cnfnodeparm

```
sw76           TN    Cisco          IGX 8420  9.3.30    Mar. 19 2000 12:45 GMT

1  Update Initial Delay   [ 5000] (D)   16 CC Redundancy Cnfged   [    Y] (Y/N)
2  Update Per-Node Delay  [30000] (D)   17 MT3 Pass Through Relay [    Y] (Y/N)
3  Comm-Break Test Delay  [30000] (D)   18 Nw Pkt Tx Rate (pps)   [  500] (D)
4  Comm-Break Test Offset [   10] (D)   19 TFTP Memory (x 10KB)   [  210] (D)
5  Network Timeout Period [ 1700] (D)   20 Standby Update Timer   [   10] (D)
6  Network Inter-p Period [ 4000] (D)   21 Stby Updts Per Pass    [   50] (D)
7  NW Sliding Window Size [    1] (D)   22 Gateway ID Timer       [   30] (D)
8  Num Normal Timeouts    [    7] (D)   23 GLCON Alloc Timer      [   30] (D)
9  Num Inter-p Timeouts   [    3] (D)   24 Comm Fail Delay        [   60] (D)
10 Num Satellite Timeouts [    6] (D)   25 Nw Hdlr Timer (msec)   [   25] (D)
11 Num Blind Timeouts     [    4] (D)   26 CBUS Delay (msec)      [   20] (D)
```

```
12 Num CB Msg Timeouts    [     2] (D)   27 SNMP Event logging     [     Y] (Y/N)
13 Comm Fail Interval     [10000] (D)    28 TFTP Grant Delay (sec) [     1] (D)
14 Comm Fail Multiplier   [     3] (D)   29 TFTP ACK Timeout (sec) [    10] (D)
15 Temperature Threshold  [    50] (D)   30 TFTP Write Retries     [     3] (D)

This Command: cnfnodeparm


Continue?


sw76           TN    Cisco           IGX 8420  9.3.30    Mar. 19 2000 12:45 GMT

31 FRP Link Status Alarm  [     Y] (Y/N) 46 Modem polling timer    [     1] (D)
32 Job Lock Timeout       [     0] (D)   47 Verify CBA for non-FRP [     N] (Y/N)
33 Max Via LCONs          [20000] (D)    48 Send Abit early        [     N] (Y/N)
34 Max Blind Segment Size [ 3570] (D)    49 Abit Tmr Multiplier  M [     0] (D)
35 Max XmtMemBlks per NIB [ 3000] (D)    50 Abit Tmr Granularity N [     3] (D)
36 Max Mem on Stby Q (%)  [    33] (D)   51 CommBrk Hop Weight     [    25] (D)
37 Trk Cell Rtng Restrict [     Y] (Y/N) 52 CB Fail Penalty Hops   [     2] (D)
38 Stat Config Proc Cnt   [ 1000] (D)    53 Dnld LanIP or NwIP     [ Lan](Lan/Nw)
39 Stat Config Proc Delay [ 2000] (D)    54 IP Relay gateway node  [     0] (D)
40 Enable Degraded Mode   [     Y] (Y/N)
41 Enable Rrt on Comm Fail[     N] (Y/N)
42 Auto Switch on Degrade [     Y] (Y/N)
43 Max Degraded Aborts    [   100] (D)
44 Max Htls Rebuild Count [   100] (D)
45 Htls Counter Reset Time[ 1000] (D)

This Command: cnfnodeparm


Enter parameter index:
```

cnfnwip (configure network IP address)

Configures an IP address and subnet mask for the node. The network IP address and subnet mask support statistics collection for Cisco WAN Manager. The **cnfnwip** command defines the IP address the system uses to pass messages between Cisco WAN Manager and the node. The Statistics Master process in Cisco WAN Manager Network collects statistics. The Statistics Manager requests and receives statistics using TFTP Get and Put messages. These TFTP messages pass between the node and the Statistics Master using IP Relay. (See the **cnfstatmast** description for details on setting the Statistics Master address.)

The **cnfnwip** command supports the first phase of the Automatic Routing Management to PNNI migration. When the XLMI protocol and LMI Neighbor Discovery feature are enabled and the network IP is the selected Management IP address, the new network IP address is sent to the BXM card whenever the network IP address is changed.

Syntax

cnfnwip <IPAddr> <IPSubnetMask>

Parameters

Parameter	Description
<IPAddr>	IP address of the node: the format is *nnn.nnn.nnn.nnn*, where *nnn* can be 1–255
<IPSubnetMask>	subnet mask: the format is *nnn.nnn.nnn.nnn*

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Example

cnfnwip 199.35.96.217 255.255.255.0

where:

199.35.96.217 is the IP address, and 255.255.255.0 is the subnet mask.

```
axiom       TN    Bootzilla       IGX 32    9.3       Apr. 13 2000  18:25 GMT

Active Network IP Address:            169.134.90.106
Active Network IP Subnet Mask:        255.255.255.0



Last Command: cnfnwip 169.134.90.106 255.255.255.0
```

cnfoamseg (configure connection OAM segment status)

Configures the segment status of an Extended PVC (XPVC) segment in a hybrid Automatic Routing Management-PNNI network. Using **cnfoamseg** for PVC is only applicable for ENNI/EUNI ports. To change the connection segment type for PVCs terminating on ENNI/EUNI ports has no impact to end-to-end OAM cells, such as AIS.

With Release 9.3.30, the BPX 8600 supports an XPVC that spans over an AR-PNNI, or AR-PNNI-AR, hybrid network. The Cisco WAN Manager (CWM) is used to add, modify, and delete XPVCs (using the SNMP Service Agent proxy along with provided CWM-XPVC-CLI scripting capability). The CWM is also used to display XPVC connection details and monitor XPVC status.

The AR BXM and PNNI AXSM interface cards allow Enhanced UNI (EUNI) and Enhanced NNI (ENNI) port types that support XPVC segments. XPVC segments terminating on EUNI/ENNI ports are automatically programmed as “non-segment” endpoints. Non-segment endpoints do not loop back OAM segment loopback cells. With non-segment endpoints, OAM loopback cells are passed through to the adjacent network. Consequently, the CWM test procedures, such as test delay, cannot identify a faulty XPVC segment. When end-to-end XPVC testing fails, the faulty AR or PNNI network and faulty XPVC segment must be identified.

You use the **cnfoamseg** command to change the segment status of an XPVC segment from “non-segment” to “segment”. When the XPVC segment status is “segment”, OAM segment loopback cells are looped back at the terminating EUNI/ENNI endpoint. This allows CWM test procedures to be executed on each XPVC segment to isolate a fault. The command **cnfoamseg** does have SNMP support.

The CWM is notified when the XPVC segment status is changed. The XPVC segment status is persistent. The status is retained for node rebuild and card reset. The secondary BXM card in a Y-redundant pair retains the segment status.

Use the CWM interface to determine fault isolation instead of trying to do this from the CLI. After a fault has been isolated, use the **cnfoamseg** command to reset the XPVC segment status as “non-segment” for normal operation in the AR-PNNI hybrid network. Use the **dspoamseg** command to display the current segment status of an XPVC segment.

Syntax

cnfoamseg <connection_channel> <segment_flag>

Parameters

Parameter	Description
connection channel	Specifies the XPVC segment channel to be configured. Channel is specified in the following format: slot.port.vpi.vci
segment flag	Specifies the segment status of the XPVC segment. The values are Y/N. The default is N. • Y - selects the segment status of “segment” • N - selects the segment status of “non-segment”

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1 - 2	No	No	BPX	Yes	Yes	No	No

Related Commands

dspoamseg

Example

Change the segment status of XPVC segment channel 9.1.10.500 from “non-segment” to “segment”. Verify that the segment status is changed using the **dspoamseg** command.

cnfoamseg 9.1.10.500

```
bpx1           TN    Cisco           BPX 8620  9.3     Feb. 7 2001  16:46 GMT

Connection segment status

The Connection is :       Non-Segment










This Command: cnfoamseg 9.1.10.500

Segment(Y/N): y

----------------------------------------------------------------------------------
bpx1           TN    Cisco           BPX 8620  9.3     Feb. 7 2001  16:40 GMT

Connection segment status

The Connection is :       Segment










Last Command: dspoamseg 9.1.10.500
```

cnfphyslnstats (configure physical line statistics)

Configures parameters for circuit line statistics collection on a UXM card. This is a debug command that applies to physical lines on a UXM card using Inverse Multiplexing Over ATM (IMA)—a *logical trunk* or *logical line* configuration. It primarily applies to debugging and not standard network operation.

Use the **cnfphyslnstats** command to customize statistics collection on each physical line. To see the statistics available for each type of interface, refer to the actual screens for each interface, as in the subsequent examples.

Since Release 9.2, for virtual trunking, physical line statistics apply to each physical port. In the case of IMA trunks, the physical line statistics are tallied separately for each T1 port.

IMA physical line alarms are a special case. Each IMA trunk or line has a configurable number of retained links. If the number of non-alarmed lines is less than the number of retained links, the logical trunks on the IMA trunk or line are placed into major alarm.

For example, consider IMA virtual trunks 4.5-8.2 and 4.5-8.7, with the number of retained links on 4.5-8 configured to 2. If 4.5 and 4.6 go into LOS (loss of signal), physical line alarms are generated for these two physical lines. The logical trunks 4.5-8.2 do not go into alarm because the two retained links are still healthy. In this situation, the bandwidth on the logical trunks is adjusted downward to prevent cell drops, and the connections on those trunks are rerouted. If a third line goes into alarm, the logical trunks are then failed.

IMA Physical Line Statistics

The **cnfphyslnstats** command lets you configure the following additional physical line statistics (which support the ATM Forum–compliant Version 1.0 IMA protocol). A summary and description of these statistics follows in Table 3-28.

Table 3-28 cnfphyslnstats IMA Physical Line Statistics

Statistics Object	Definition
IV-IMA	ICP Violations: count of errored, invalid or missing ICP cells during non-SES-IMA or non-UAS-IMA conditions.
Near End Severely Errored Seconds (SES-IMA)	Count of one-second intervals containing ≥ 30% of the ICP cells counted as IV-IMAs (see note 1), or one or more link defects (e.g., LOS, OOF/LOF, AIS or LCD), LIF, LODS defects during non-UAS-IMA condition.
Far End Severely Errored Seconds (SES-IMA-FE)	Count of one-second intervals containing one or more RDI-IMA defects during non-UAS-IMA-FE condition.
Near End Unavailable Seconds (UAS-IMA)	Unavailable seconds: unavailability begins at the onset of 10 contiguous SES-IMA and ends at the onset of 10 contiguous seconds with no SES-IMA.
Far End Unavailable Seconds (UAS-IMA-FE)	Unavailable seconds at FE: unavailability begins at the onset of 10 contiguous SES-IMA-FE and ends at the onset of 10 contiguous seconds with no SES-IMA-FE.

Table 3-28 cnfphyslnstats IMA Physical Line Statistics (continued)

Statistics Object	Definition
Near End Tx Unusable Seconds (Tx-UUS-IMA)	Tx Unusable seconds: count of Tx Unusable seconds at the NE LSM.
Near End Rx Unusable Seconds (Rx-UUS-IMA)	Rx Unusable seconds: count of Rx Unusable seconds at the NE LSM.
Far End Tx Unusable Seconds (Tx-UUS-IMA-FE)	Tx Unusable seconds at FE: count of seconds with Tx Unusable indications from the FE LSM.
Far End Rx Unusable Seconds (Rx-UUS-IMA-FE)	Rx Unusable seconds at FE: count of seconds with Rx Unusable indications from the FE LSM.
Near End Tx No. of Failures (Tx-FC)	Count of NE Tx link failure alarm conditions.
Near End Rx No. of Failures (Rx-FC)	Count of NE Rx link failure alarm conditions.

Syntax

cnfphyslnstats <port> <line> <stat> <interval> <e|d> [<samples> <size> <peaks>]

Parameters

Parameter	Description
<port>	Specifies the port with the physical line to configure.
<line>	Specifies the physical line to configure.
<stat>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample. Range: 1–255 minutes
<e|d>	Enables/disables a statistic. E to enable; D to disable.
[samples]	Specifies the number of samples to collect. Range: 1–255

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	IGX			Yes	

Related Commands

dspphyslnstats, dspphyslnstathist

Example (IMA)

cnfphyslnstats 7.1

```
------------------------------------SCREEN 1-----------------------------------
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 14:19 PST

Line Statistic Types

  1) Bipolar Violations                  37) Severely Err Secs - Path
  3) Out of Frames                       38) Severely Err Frame Secs
  4) Losses of Signal                    40) Unavail. Seconds
  5) Frames Bit Errors                   41) BIP-8 Code Violations
  6) CRC Errors                          42) Cell Framing Errored Seconds
 29) Line Code Violations                43) Cell Framing Sev. Err Secs.
 30) Line Errored Seconds                44) Cell Framing Sec. Err Frame Secs
 31) Line Severely Err Secs              45) Cell Framing Unavail. Secs.
 32) Line Parity Errors                  62) Total Cells Tx to line
 33) Errored Seconds - Line              69) Total Cells Rx from line
 34) Severely Err Secs - Line            98) Frame Sync Errors
 35) Path Parity Errors                 141) FEBE Counts
 36) Errored Secs - Path                143) Cell Framing FEBE Err Secs

This Command: cnfphyslnstats 7.1

Continue?
------------------------------------SCREEN 2-----------------------------------
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 14:19 PST

Line Statistic Types

144) Cell Framing FEBE Sev. Err. Secs.  202) Section BIP8 Err. Secs.
151) Yellow Alarm Transition Count      203) Line BIP24 Err. Secs.
152) Cell Framing Yel Transitions       204) Line FEBE Err. Secs.
153) AIS Transition Count               205) Path BIP8 Err. Secs.
193) Loss of Cell Delineation           206) Path FEBE Err. Secs.
194) Loss of Pointer                    207) Section BIP8 Severely Err. Secs.
195) OC3 Path AIS                       208) Section Sev. Err. Framing Secs.
196) OC3 Path YEL                       209) Line BIP24 Severely Err. Secs.
197) Section BIP8                       210) Line FEBE Severely Err. Secs.
198) Line BIP24                         211) Path BIP8 Severely Err. Secs.
199) Line FEBE                          212) Path FEBE Severely Err. Secs.
200) Path BIP8                          213) Line Unavailable Secs.
201) Path FEBE                          214) Line Farend Unavailable Secs.

This Command: cnfphyslnstats 7.1

Continue?
------------------------------------SCREEN 3-----------------------------------
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 14:20 PST

Line Statistic Types

215) Path Unavailable Secs.             228) INVMUX: Tx Failure Count
216) Path Farend Unavailable Secs.      229) INVMUX: Rx Failure Count
217) HCS Uncorrectable Error
218) HCS Correctable Error
219) INVMUX: line violations
220) INVMUX: Severely Err. Secs.
221) INVMUX: Farend Sev. Err. Secs.
222) INVMUX: Unavailable Secs.
223) INVMUX: Farend Unavail Secs.
224) INVMUX: Tx Unusable Seconds
225) INVMUX: Rx Unusable Seconds
```

```
226) INVMUX: Farend Tx Unusable Secs.
227) INVMUX: Farend Rx Unusable Secs.

This Command: cnfphyslnstats 7.1


Statistic Type:
```

Example (OC-3)

cnfphyslnstats 14.2

```
------------------------------------SCREEN 1-----------------------------------
sw150          TN    Cisco          IGX 8420  9.3.2Q    Dec. 13 2000 14:31 PST

Line Statistic Types

  1) Bipolar Violations                  37) Severely Err Secs - Path
  3) Out of Frames                       38) Severely Err Frame Secs
  4) Losses of Signal                    40) Unavail. Seconds
  5) Frames Bit Errors                   41) BIP-8 Code Violations
  6) CRC Errors                          42) Cell Framing Errored Seconds
 29) Line Code Violations                43) Cell Framing Sev. Err Secs.
 30) Line Errored Seconds                44) Cell Framing Sec. Err Frame Secs
 31) Line Severely Err Secs              45) Cell Framing Unavail. Secs.
 32) Line Parity Errors                  62) Total Cells Tx to line
 33) Errored Seconds - Line              69) Total Cells Rx from line
 34) Severely Err Secs - Line            98) Frame Sync Errors
 35) Path Parity Errors                 141) FEBE Counts
 36) Errored Secs - Path                143) Cell Framing FEBE Err Secs

This Command: cnfphyslnstats 14.2


Continue?  y

------------------------------------SCREEN 2-----------------------------------
sw150          TN    Cisco          IGX 8420  9.3.2Q    Dec. 13 2000 14:31 PST

Line Statistic Types

144) Cell Framing FEBE Sev. Err. Secs.  202) Section BIP8 Err. Secs.
151) Yellow Alarm Transition Count      203) Line BIP24 Err. Secs.
152) Cell Framing Yel Transitions       204) Line FEBE Err. Secs.
153) AIS Transition Count               205) Path BIP8 Err. Secs.
193) Loss of Cell Delineation           206) Path FEBE Err. Secs.
194) Loss of Pointer                    207) Section BIP8 Severely Err. Secs.
195) OC3 Path AIS                       208) Section Sev. Err. Framing Secs.
196) OC3 Path YEL                       209) Line BIP24 Severely Err. Secs.
197) Section BIP8                       210) Line FEBE Severely Err. Secs.
198) Line BIP24                         211) Path BIP8 Severely Err. Secs.
199) Line FEBE                          212) Path FEBE Severely Err. Secs.
200) Path BIP8                          213) Line Unavailable Secs.
201) Path FEBE                          214) Line Farend Unavailable Secs.

This Command: cnfphyslnstats 14.2


Continue?  y

------------------------------------SCREEN 3-----------------------------------
sw150          TN    Cisco          IGX 8420  9.3.2Q    Dec. 13 2000 14:32 PST

Line Statistic Types

215) Path Unavailable Secs.             228) INVMUX: Tx Failure Count
216) Path Farend Unavailable Secs.      229) INVMUX: Rx Failure Count
217) HCS Uncorrectable Error
218) HCS Correctable Error
219) INVMUX: line violations
220) INVMUX: Severely Err. Secs.
221) INVMUX: Farend Sev. Err. Secs.
222) INVMUX: Unavailable Secs.
223) INVMUX: Farend Unavail Secs.
224) INVMUX: Tx Unusable Seconds
225) INVMUX: Rx Unusable Seconds
```

```
226) INVMUX: Farend Tx Unusable Secs.
227) INVMUX: Farend Rx Unusable Secs.

This Command: cnfphyslnstats 14.2


Statistic Type:
```

Example (UXM T3/636 Trunk)

```
------------------------------------SCREEN 1-----------------------------------
sw150         TN    Cisco          IGX 8420  9.3.2Q    Dec. 13 2000 14:39 PST

Line Statistic Types

  1) Bipolar Violations                37) Severely Err Secs - Path
  3) Out of Frames                     38) Severely Err Frame Secs
  4) Losses of Signal                  40) Unavail. Seconds
  5) Frames Bit Errors                 41) BIP-8 Code Violations
  6) CRC Errors                        42) Cell Framing Errored Seconds
 29) Line Code Violations              43) Cell Framing Sev. Err Secs.
 30) Line Errored Seconds              44) Cell Framing Sec. Err Frame Secs
 31) Line Severely Err Secs            45) Cell Framing Unavail. Secs.
 32) Line Parity Errors                62) Total Cells Tx to line
 33) Errored Seconds - Line            69) Total Cells Rx from line
 34) Severely Err Secs - Line          98) Frame Sync Errors
 35) Path Parity Errors               141) FEBE Counts
 36) Errored Secs - Path              143) Cell Framing FEBE Err Secs

This Command: cnfphyslnstats 8.1


Continue?  y

------------------------------------SCREEN 2-----------------------------------
sw150         TN    Cisco          IGX 8420  9.3.2Q    Dec. 13 2000 14:41 PST

Line Statistic Types

144) Cell Framing FEBE Sev. Err. Secs.  202) Section BIP8 Err. Secs.
151) Yellow Alarm Transition Count      203) Line BIP24 Err. Secs.
152) Cell Framing Yel Transitions       204) Line FEBE Err. Secs.
153) AIS Transition Count               205) Path BIP8 Err. Secs.
193) Loss of Cell Delineation           206) Path FEBE Err. Secs.
194) Loss of Pointer                    207) Section BIP8 Severely Err. Secs.
195) OC3 Path AIS                       208) Section Sev. Err. Framing Secs.
196) OC3 Path YEL                       209) Line BIP24 Severely Err. Secs.
197) Section BIP8                       210) Line FEBE Severely Err. Secs.
198) Line BIP24                         211) Path BIP8 Severely Err. Secs.
199) Line FEBE                          212) Path FEBE Severely Err. Secs.
200) Path BIP8                          213) Line Unavailable Secs.
201) Path FEBE                          214) Line Farend Unavailable Secs.

This Command: cnfphyslnstats 8.1


Continue?  y

------------------------------------SCREEN 3-----------------------------------
sw150         TN    Cisco          IGX 8420  9.3.2Q    Dec. 13 2000 14:42 PST

Line Statistic Types
```

```
215) Path Unavailable Secs.            228) INVMUX: Tx Failure Count
216) Path Farend Unavailable Secs.     229) INVMUX: Rx Failure Count
217) HCS Uncorrectable Error
218) HCS Correctable Error
219) INVMUX: line violations
220) INVMUX: Severely Err. Secs.
221) INVMUX: Farend Sev. Err. Secs.
222) INVMUX: Unavailable Secs.
223) INVMUX: Farend Unavail Secs.
224) INVMUX: Tx Unusable Seconds
225) INVMUX: Rx Unusable Seconds
226) INVMUX: Farend Tx Unusable Secs.
227) INVMUX: Farend Rx Unusable Secs.

This Command: cnfphyslnstats 8.1


Statistic Type:
```

Example (UXM E3/530 Trunk)

```
------------------------------------SCREEN 1-----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 07:41 PST

Line Statistic Types

  3) Out of Frames                      42) Cell Framing Errored Seconds
  4) Losses of Signal                   43) Cell Framing Sev. Err Secs.
  5) Frames Bit Errors                  44) Cell Framing Sec. Err Frame Secs
  6) CRC Errors                         45) Cell Framing Unavail. Secs.
 29) Line Code Violations               62) Total Cells Tx to line
 30) Line Errored Seconds               69) Total Cells Rx from line
 31) Line Severely Err Secs             98) Frame Sync Errors
 32) Line Parity Errors                143) Cell Framing FEBE Err Secs
 33) Errored Seconds - Line            144) Cell Framing FEBE Sev. Err. Secs.
 34) Severely Err Secs - Line          151) Yellow Alarm Transition Count
 38) Severely Err Frame Secs           152) Cell Framing Yel Transitions
 40) Unavail. Seconds                  153) AIS Transition Count
 41) BIP-8 Code Violations             193) Loss of Cell Delineation

This Command: cnfphyslnstats 3.1


Continue?  y

------------------------------------SCREEN 2-----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 07:41 PST

Line Statistic Types

194) Loss of Pointer                   207) Section BIP8 Severely Err. Secs.
195) OC3 Path AIS                      208) Section Sev. Err. Framing Secs.
196) OC3 Path YEL                      209) Line BIP24 Severely Err. Secs.
197) Section BIP8                      210) Line FEBE Severely Err. Secs.
198) Line BIP24                        211) Path BIP8 Severely Err. Secs.
199) Line FEBE                         212) Path FEBE Severely Err. Secs.
200) Path BIP8                         213) Line Unavailable Secs.
201) Path FEBE                         214) Line Farend Unavailable Secs.
202) Section BIP8 Err. Secs.           215) Path Unavailable Secs.
203) Line BIP24 Err. Secs.             216) Path Farend Unavailable Secs.
204) Line FEBE Err. Secs.              217) HCS Uncorrectable Error
205) Path BIP8 Err. Secs.              218) HCS Correctable Error
```

```
206) Path FEBE Err. Secs.             219) INVMUX: line violations

This Command: cnfphyslnstats 3.1


Continue?  y

------------------------------------SCREEN 3-----------------------------------
sw150         TN    Cisco          IGX 8420  9.3.2R    Dec. 14 2000 07:42 PST

Line Statistic Types

220) INVMUX: Severely Err. Secs.
221) INVMUX: Farend Sev. Err. Secs.
222) INVMUX: Unavailable Secs.
223) INVMUX: Farend Unavail Secs.
224) INVMUX: Tx Unusable Seconds
225) INVMUX: Rx Unusable Seconds
226) INVMUX: Farend Tx Unusable Secs.
227) INVMUX: Farend Rx Unusable Secs.
228) INVMUX: Tx Failure Count
229) INVMUX: Rx Failure Count




This Command: cnfphyslnstats 3.1


Statistic Type:
```

Example (T1)

```
------------------------------------SCREEN 1-----------------------------------
igxr02        VT    Cisco          IGX 8430  9.3.2V    Jan. 18 2001 13:37 PST

Line Statistic Types

  1) Bipolar Violations                37) Severely Err Secs - Path
  3) Out of Frames                     38) Severely Err Frame Secs
  4) Losses of Signal                  40) Unavail. Seconds
  5) Frames Bit Errors                 41) BIP-8 Code Violations
  6) CRC Errors                        42) Cell Framing Errored Seconds
 29) Line Code Violations              43) Cell Framing Sev. Err Secs.
 30) Line Errored Seconds              44) Cell Framing Sec. Err Frame Secs
 31) Line Severely Err Secs            45) Cell Framing Unavail. Secs.
 32) Line Parity Errors                62) Total Cells Tx to line
 33) Errored Seconds - Line            69) Total Cells Rx from line
 34) Severely Err Secs - Line          98) Frame Sync Errors
 35) Path Parity Errors               141) FEBE Counts
 36) Errored Secs - Path              143) Cell Framing FEBE Err Secs

This Command: cnfphyslnstats 31.8

Continue?
------------------------------------SCREEN 2-----------------------------------
igxr02        VT    Cisco          IGX 8430  9.3.2V    Jan. 18 2001 13:36 PST

Line Statistic Types

144) Cell Framing FEBE Sev. Err. Secs.  202) Section BIP8 Err. Secs.
151) Yellow Alarm Transition Count      203) Line BIP24 Err. Secs.
152) Cell Framing Yel Transitions       204) Line FEBE Err. Secs.
```

```
153) AIS Transition Count               205) Path BIP8 Err. Secs.
193) Loss of Cell Delineation           206) Path FEBE Err. Secs.
194) Loss of Pointer                    207) Section BIP8 Severely Err. Secs.
195) OC3 Path AIS                       208) Section Sev. Err. Framing Secs.
196) OC3 Path YEL                       209) Line BIP24 Severely Err. Secs.
197) Section BIP8                       210) Line FEBE Severely Err. Secs.
198) Line BIP24                         211) Path BIP8 Severely Err. Secs.
199) Line FEBE                          212) Path FEBE Severely Err. Secs.
200) Path BIP8                          213) Line Unavailable Secs.
201) Path FEBE                          214) Line Farend Unavailable Secs.

This Command: cnfphyslnstats 31.8

Continue?
------------------------------------SCREEN 3-----------------------------------
igxr02         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 13:38 PST

Line Statistic Types

215) Path Unavailable Secs.             228) INVMUX: Tx Failure Count
216) Path Farend Unavailable Secs.      229) INVMUX: Rx Failure Count
217) HCS Uncorrectable Error
218) HCS Correctable Error
219) INVMUX: line violations
220) INVMUX: Severely Err. Secs.
221) INVMUX: Farend Sev. Err. Secs.
222) INVMUX: Unavailable Secs.
223) INVMUX: Farend Unavail Secs.
224) INVMUX: Tx Unusable Seconds
225) INVMUX: Rx Unusable Seconds
226) INVMUX: Farend Tx Unusable Secs.
227) INVMUX: Farend Rx Unusable Secs.

This Command: cnfphyslnstats 31.8


Statistic Type:
```

Example (E1)

```
sw228          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000 18:07 PST

Line Statistic Types

  3) Out of Frames                      198) Line BIP24
  4) Losses of Signal                   199) Line FEBE
  5) Frames Bit Errors                  200) Path BIP8
  6) CRC Errors                         201) Path FEBE
 62) Total Cells Tx to line             202) Section BIP8 Err. Secs.
 69) Total Cells Rx from line           203) Line BIP24 Err. Secs.
151) Yellow Alarm Transition Count      204) Line FEBE Err. Secs.
153) AIS Transition Count               205) Path BIP8 Err. Secs.
193) Loss of Cell Delineation           206) Path FEBE Err. Secs.
194) Loss of Pointer                    207) Section BIP8 Severely Err. Secs.
195) OC-3 Path AIS                       208) Section Sev. Err. Framing Secs.
196) OC-3 Path YEL                       209) Line BIP24 Severely Err. Secs.
197) Section BIP8                       210) Line FEBE Severely Err. Secs.
This Command: cnfphyslnstats 11.4


Continue? y
```

```
sw228          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000 18:07 PST

Line Statistic Types

211) Path BIP8 Severely Err. Secs.
212) Path FEBE Severely Err. Secs.
213) Line Unavailable Secs.
214) Line Farend Unavailable Secs.
215) Path Unavailable Secs.
216) Path Farend Unavailable Secs.
217) HCS Uncorrectable Error
218) HCS Correctable Error




This Command: cnfphyslnstats 11.4
```

cnfport (configure Frame Relay port)

Configures the parameters of a Frame Relay port. The **cnfport** command applies to the UFM/UFI, FRP/FRI, FRM/FRI, and FRM-2/FRP-2. (Note that a command also exists for the concentrated link between the PCS and FRM-2 or FRP-2: **cnffrcport**.)

During port configuration, a prompt for each parameter appears. To keep the current value of the parameter, press the Return key without typing any characters. When a parameter is not configurable for an application, the parameter appears shaded or with dashed lines.

Starting with Release 9.3.10, the ELMI (Enhanced Local Management Interface) Neighbor Discovery feature is supported on ports on the UFM. This feature serves the same purpose as the ILMI Neighbor Discovery feature. For additional information see the "ELMI Neighbor Discovery for UFM" section on page 3-324.

You can mix the data rate for each of the ports if the total for all ports does not exceed the maximum composite data rate that the card set supports. Table 3-29 shows the supported data rates for individual T1 and E1 lines.

Table 3-29 T1 and E1 Data Rates

Data Rates at 56 Kbps Increments				Data Rates at 64 Kbps Increments			
56	112	168	224	64	128	192	256
280	336	392	448	320	384	448	512
504	560	616	672	576	640	704	768
728	784	840	896	832	896	960	1024
952	1008	1064	1120	1088	1152	1216	1280
1176	1232	1288	1344	1344	1408	1472	1536
1400	1456	1512	1568	1600	1664	1728	1792
1624	1680	1736	1792	1856	1920	1984	2048

Table 3-30 shows the available data rates on a single, PCS user-port. For the FRP-2 and FRM-2 cards, the maximum composite data rate over the 44 logical user-ports is 1.792 Mbps.

Table 3-30 PCS Data Rates

Data Rates in Kbps							
9.6	14.4	16	19.2	32	38.4	48	56
64	112	128	168	192	224	256	280
320	336	384					

For a PCS, some additional rules for assigning data rates to the 44 ports apply:

- No single user-port should have a speed greater than 384 Kbps.
- The total for each group of 11 ports should not exceed 448Kbps. The software allows higher rates, but the system may drop data if user-equipment passes data above the aggregate total of 448 Kbps.
- The port numbers for the 11-port groups are 1–11, 12–22, 23–33, and 34–44.

Syntax (basic format)

cnfport <slot.port>[.<vport>] [<parameters>]

Syntax (T1/E1 ports on UFM-C)

cnfport <slot.port> <line.DS0_range> <port queue depth> <ecn queue threshold>
<de threshold> <signaling protocol> [*protocol parameters*]

Syntax (unchannelized ports on UFM-U)

cnfport <slot.port> <port type> <port queue depth> <ecn queue threshold>
<de threshold> <signaling protocol> [*protocol parameters*]

Syntax (T1/E1 ports on FRM or FRP)

cnfport<slot.port> <port queue depth> <ecn queue threshold> <de threshold>
<signaling protocol> [*protocol parameters*]

Syntax (all other ports—for an FRM or FRP)

cnfport <slot.port> <speed> <port queue depth> <clocking> <de_threshold> <min-flags-bet-frames>
<ECN q_threshold> <port ID> <signaling protocol y/n>
[*protocol parameters*]

Note Some parameters are mandatory for T1/E1 lines and optional for other line types. For additional information on signaling protocol see the "Signaling Protocol Timers" section on page 3-325.

Parameters

Parameter	Description
slot.port	Specifies the logical port on the FRP, FRM, or UFM-U in the format *slot.port*. For a T1/E1 line on an FRM or FRP, port is a logical number. For a UFM-C, the range for port is 1–250. (See the description of *slot.port line* in the *Cisco IGX 8400 Series Reference* manual.) For a Port Concentrator Shelf, *port* is to the logical port in the range 1–44.
port type (for a UFM-U) For *port type* on a PCS, see next box.	Specifies whether a port on a UFM-U is DCE or DTE. The prompt appears if the system detects a UFM-U. The default is DCE. For an FRM or FRP, "port Type" is display-only because jumper blocks on the back cards set the mode. When you use **cnfport** in a job, the "Enter mode (line or port)" prompt follows *slot.port*. Note that this *mode* is the interface type of the Frame Relay port rather than the mode of the UFM-U. Valid entries are HSSI, V35, X21, PORT (PORT is generically unchannelized), or LINE (LINE indicates T1 or E1). If the front card is a UFM-U, a subsequent prompt asks you to specify DCE or DTE.

Parameter	Description
port type (for a PCS) (For port type on a UFM-U, see preceding box.)	*Port type* for a PCS tells switch software whether the port is V.35, V.11 or V.28. *Port type* for a PCS does not actually configure the port: to configure the port, you must install the appropriate card in the PCS. See the *port type* description for the UFM-U for information on **cnfport** in a job.
interface type	Specifies an interface type for a Port Concentrator Shelf (PCS). This parameter appears if switch software detects a PCS. It applies to the user interface display only and not the PCS itself because system software does not detect the interface type within the PCS. To change the user-interface type, you must change a card in the PCS.
slot.port line	Specifies the UFM-C slot, port, and line number, where *port* can be 1–250, and *line* can be 1–8. Note that the maximum number of T1/E1 lines per node is 32. This maximum could be, for example, spread over 4 UFM-8C card sets that utilize all 8 lines on each back card.
speed	Specifies a port clock speed in Kbps for a 2.0 Mbps UFM, FRP, or FRM. The *configured* speed appears under the Configured Clock heading. The *actual* clock rate appears under the Measured Rx Clock heading. Note that this option does not apply to T1/E1 lines because these line types use 64 or 56 Kbps timeslots. The range of speeds according to the number of active ports is: • 1 port (selected speeds, 56–2048 Kbps) • 2 ports (selected speeds, 56–1024 Kbps) • 3 ports (selected speeds, 56–672 Kbps) • 4 ports (selected speeds, 56–512 Kbps) Refer to the table at the beginning of this command description for the available clock rates for all port combinations.
clocking	Specifies the port's clock type for HSSI, V.35, and X.21 lines. *Clocking* does not apply to T1, E1, or Port Concentrator lines. The clock is either *normal* or *looped*. Four combinations of clocking are available for the V.35 ports. Two combinations of clocking are available for HSSI and X.21. Note that the clock and data direction in DCE mode is the opposite of the direction for DTE mode. The possibilities are: • FRP, FRM, or UFM-U port is DCE with normal clocking (HSSI, V.35, X.21). • FRP, FRM, or UFM-U port is DCE with looped clocking (V.35 only). • FRP, FRM, or UFM-U port is DTE with normal clocking (HSSI, V.35, X.21). • FRP, FRM, or UFM-U port is DTE with looped clocking (V.35 only). For a description of looped and normal clocking, refer to the appropriate configuration guide.
port ID	Specifies the DLCI associated with the port (0–1024) {0}. A node uses this number when you add bundled connections. Otherwise, port ID can be used as a network destination number in global addressing. The *port ID* does not apply to T1, E1, or PCS ports.

Parameter	Description
port queue depth	Specifies the maximum bytes in the transmission queue at the UFM, FRP, or FRM port. Range: 0–65535 bytes Default: 65535 bytes
ecn queue threshold	Specifies the threshold at which the system begins to generate explicit congestion notification (BECN and FECN bits) for the port. Range: 0–65535 bytes Default: 65535 bytes

Parameter	Description
signaling protocol	Specifies the LMI operation mode. The first time you execute **cnfport** on a port, the command line interface displays the following options for this parameter: "none, Strata LMI, a (for Annex A), and d (for Annex D)." If you enter "a" or "d," the subsequent prompt asks if the interface is NNI. For the *initial* port specification and *subsequent* port specifications for a particular port, you can also use a single digit from the LMI definition list that follows. The total industry standard range is 0–255, but Cisco WAN Switching nodes recognize only the following (the default is internally recognized as LMI=2): LMI = 0 LMI is disabled at this port. LMI = 1 Cisco LMI and the asynchronous update process is enabled at this port. Greenwich Mean Time is also enabled. LMI = 2 LMI is disabled at this port. LMI = 3 Cisco LMI is enabled at this port, but asynchronous update process is disabled. LMI = 4 The port configuration is UNI using CCITT Q.933 Annex A parameters. LMI = 5 The port configuration is UNI using ANSI T1.617 Annex D parameters. LMI = 6 The port configuration is NNI using CCITT Q.933 Annex A parameters. LMI = 7 The port configuration is NNI using ANSI T1.617 Annex D parameters. For any Frame Relay card set that has a maximum frame length of 4510 bytes, the use and type of a signaling protocol results in a limit on the possible number of connections per port (the port here is either physical or logical). The maximum number of connections per port for each protocol is as follows: For Annex A: 899 For Annex D: 899 For Strata LMI: 562 Neither **addcon** nor **cnfport** prevents you from adding more than the maximum number of connections on a port. (You might, for example, use **cnfport** to specify an LMI when too many connections for that particular LMI already exist.) If the number of connections is exceeded for a particular LMI, the LMI does not work on the port, the full status messages that result are discarded, and LMI timeouts occur on the port. A port failure results and also subsequently leads to A-bit failures in other segments of the connection path.
de threshold	Specifies the port queue depth above which the system discards frames with a set Discard Eligibility (DE) bit. Range: 0–100 percent Default: 100 percent A threshold of 100 percent disables DE for the port because a queue cannot contain more than 100 percent of its capacity.

Parameter	Description
asynchronous status	Specifies whether the node should send unsolicited LMI update messages when they appear or wait for the user-device to poll. Enter y (yes) or n (no).
polling verify timer	Specifies a Link Integrity Verification Timer heartbeat (keep-alive) period. Set the timer to 5 secs. more than the setting in the user equipment. Range: 5–30 Default: 15
error threshold	Specifies the number of failures in the monitored events that cause the keep-alive process to report an alarm. A threshold of 0 reverts to 1. A threshold greater than 10 reverts to 10. Theoretical range: 0–255 Valid range: 1–10
monitored events count	Specifies the number of monitored events for the keep-alive process. A port communication-fail condition is cleared after this number of successful polling cycles. A value of 0 reverts to 1, and a value more than 10 reverts to 10. Theoretical range: 0–255 Valid range: 1–10
communicate priority	Specifies whether the system should communicate the SNA priority of the connections to the user-device on the port. Enter y (yes) or n (no). (SNA priority is either H or L.)
upper/lower RNR threshold	Specifies the *receiver not ready* (RNR) thresholds. The upper threshold is the number of receiver not ready indications from the user equipment before an alarm is generated for this port. The lower RNR threshold is the number of indications from the user equipment before an alarm is cleared. Range: 1–255 Default (upper RNR threshold): 75 Default (lower RNR threshold): 25
EFCI mapping enabled	Directs the system to map the ForeSight congestion bit (which is set in the FastPackets by a trunk card) to the FECN and BECN bits on the affected PVC.
CLLM Enabled	Specifies whether the system should use CLLM over the port.
min. flags/frame	Specifies the minimum number of flags between frames when the direction of transmission is from the node to the user-equipment. Any value greater than 0 is valid on the UFM, FRP or FRM. Range (Port Concentrator Shelf): 1–16 Default: 1

Parameter	Description
OAM Packet threshold	Specifies how many OAM FastPackets must arrive from a remote NNI port before the local port generates “A-bit = 0” in the signaling protocol message to the locally attached device. A 0 disables this function. The *OAM FastPacket threshold* setting applies to UNI and NNI ports. The following two paragraphs provide a more detailed explanation of the A-bit and *OAM FastPacket threshold* usage. Range: 0–15 packets Default: 3 packets On any Frame Relay port (UNI or NNI) that is using a signaling protocol (Cisco LMI, Annex A, or Annex D), the FRP or FRM provides a Status message to the attached equipment in response to a Status Enquiry message or as an Asynchronous Update. These Status messages contain details about every PVC configured on the port. In particular, the PVC Active bit (the A-bit) represents whether a PVC is active (A-bit=1) or out of service (A-bit = 0). If the other end of the connection PVC on a UNI port, the only conditions that can cause the local Frame Relay card to send an A-bit=0 are: • The PVC is down (intentionally taken out of service) • The PVC has failed for any reason (such as a hardware failure, trunk failure with no ability to reroute, and so on) If the other end of the PVC terminates on an NNI port, one additional condition can cause the local UFM, FRP, or FRM to send an A-bit=0 to the local device: if the remote NNI port on the card receives an A-bit=0 from the remote network over the remote NNI, then the local card can propagate an A-bit=0 out the local port. The mechanism by which the remote card notifies the local card of the A-bit=0 coming from the remote network is OAM FastPackets. The local node sends one OAM FastPacket every 5 seconds for as long as the A-bit coming from the remote network is 0.
T391 link integrity timer	Specifies the interval after which the system sends Status Enquiry messages across the NNI port. Both networks do not need to have the same T391 value. Range: 5–30 seconds Default: 6 seconds On a Frame Relay NNI port, the Link Integrity Timer (T391) specifies how often the UFM, FRP, or FRM generates a Status Enquiry message to the attached network using the selected NNI signaling protocol (Annex A or Annex D). The card should receive a Status message for every Status Enquiry message it transmits. If the Frame Relay card receives either no responses or invalid responses, a Port Communication Failure results (and causes a minor alarm). Using the default values for N392 Error Threshold and N393 Monitored Events Count in an example: an error occurs when no response (or a bad response) arrives for 3 out of the last 4 Status Enquiry messages. Default (392 Error Threshold): 3 Default (N393 Monitored Events Count): 4
N392 error threshold	Specifies the number of bad or undelivered responses to Status Enquiry messages that can occur before the system records a Port Communication Failure. See the description of the *link integrity timer* parameter for example usage. Range: 1–10 Default: 3

Parameter	Description
N393 monitored events count	Specifies the number of Status Enquiry messages in a period wherein the system waits for responses to the enquiries. See the description of the *link integrity timer* parameter for example usage. Range: 1–10 Default: 4
N391 full status polling cycle	Specifies the interval at which the system sends the Full Status Report request for all PVCs across the NNI port. The Full Status reports the status of *all* the connections across the NNI. Range: 1–255 polling cycles Default: 10 cycles
card type	Specifies the card type when you enter the **cnfport** command in a job. This parameter is not available except when you specify **cnfport** in a job by using the **addjob** command. During the job specification, you enter the *card type* just after the *slot.port* during the command specification phase of **addjob**. Valid *card types* are "V.35," "X.21," "port," and "line," where "line" indicates a T1 or E1 line.
CLLM status Tx Timer	Specifies an interval for the system to send ForeSight congestion messages across the NNI. Both networks must be Cisco WAN Switching networks. Used in conjunction with the CCLM Enabled parameter. Range: 40 ms–350 ms Default: 100 ms
IDE to DE mapping	Specifies whether the destination system should map the internal DE bit (IDE) status in the FastPacket or ATM cell to the Frame Relay DE bit at the destination. Enter y (yes) or n (no). If you specify the non-standard case of CIR=0 with either **addcon** or **cnffrcls**, you must first enable *IDE to DE mapping*. Refer to the appropriate configuration guide for important information on setting CIR=0.

Parameter	Description
interface control template	Specifies the control leads (signal names of the wires in the port connector) and the state (whether the signal is on or off) for V.35 and X.21 physical Frame Relay ports. This template is not a configurable parameter; there is no individual prompt for it. When the parameter Interface is configured to DCE or DTE, the Interface Control Template will change. A different hardware connector pin-out with some different signal leads are used for DCE than is used for DTE. Some leads that may be displayed are: CTS-Clear To Send. Circuit in the EIA/TIA-232 specification that is activated when DCE is ready to accept data from a DTE. DSR-data set ready. EIA/TIA-232 interface circuit that is activated when DCE is powered up and ready for use. DCD-Data Carrier Detect. Signal that indicates whether an interface is active. Some interface types that may be displayed are: DCE-Data circuit-terminating equipment (ITU-T expansion). Devices and connections of a communications network that comprise the network end of the user-to-network interface. The DCE provides a physical connection to the network, forwards traffic, and provides a clocking signal used to synchronize data transmission between DCE and DTE devices. DTE-data terminal equipment. Device at the user end of a user-network interface that serves as a data source, destination, or both. DTE connects to a data network through a DCE device and typically uses clocking signals generated by the DCE.
channel speed	Specifies the bandwidth available to a logical port. The speed is 64 Kbps times the number of DS0s you specify with the *channel range* parameter.
line number	The number of the line, which in this context is the physical network communications channel on a backcard.
channel range	Specifies the DS0s for the T1 or E1 logical port. The value can be 1 or a contiguous combination in the range 1–24 for T1 or 1–31 for E1. For example, 7–12 indicates 6 DS0s for the port, starting with DS0 7. Before you use this command, specify the valid channel range with the **addfrport** command.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

upport, dnport, dspport, dspports, delport, addport

Example (IGX)

Configure UFM-C port 8.1.

cnfport 8.1 65535 65535 100 c y 15 3 4 y 75 25 3 y y 100 y 1

```
sw176          TN    Cisco          IGX 8420  9.3.a5    Apr. 27 2001 09:31 PDT

Port:       8.1               [ACTIVE  ]
Interface:  T1D                              Configured Clock:    320 Kbps
Clocking:   None                             Measured Rx Clock: None

Port ID                       -       Min Flags / Frames           1
Port Queue Depth          65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold       65535       T391 Link Intg Timer        10 sec
DE Threshold                100 %     N391 Full Status Poll        6 cyl
Signalling Protocol    Cisco LMI      EFCI Mapping Enabled       Yes
Asynchronous Status         Yes       CLLM Enabled/Tx Timer  Yes/100 msec
T392 Polling Verif Timer     15       IDE to DE Mapping          Yes
N392 Error Threshold          3       Channel Speed               64
N393 Monitored Events Count   4       Line Number                  1
Communicate Priority        Yes       Channel Range              1-5
Upper/Lower RNR Thresh  75%/ 25%

Last Command: cnfport 8.1 65535 65535 100 c y 15 3 4 y 75 25 3 y y 100 y 1
```

Example

Configure a UFM-U card.

cnfport 9.1DCE 256 NORMAL 0 65535 65535 100 n N N Y 1

```
sw108          TN    Cisco          IGX 8420  9.3.u2    May  23 2001 15:27 GMT

Port:       9.1               [ACTIVE  ]
Interface:  V35     DCE                      Configured Clock:    256 Kbps
Clocking:   Normal                           Measured Rx Clock:   256 Kbps

Port ID                       0       Min Flags / Frames           1
Port Queue Depth          65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold       65535       T391 Link Intg Timer        10 sec
DE Threshold                100 %     N391 Full Status Poll        6 cyl
Signalling Protocol        None       EFCI Mapping Enabled        No
Asynchronous Status          No       CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer     15       IDE to DE Mapping          Yes
N392 Error Threshold          3       Interface Control Template
N393 Monitored Events Count   4          Lead    CTS     DSR    DCD
Communicate Priority         No          State   ON      ON     ON


Last Command: cnfport 9.1 DCE 256 NORMAL 0 65535 65535 100 n N N Y 1
```

ELMI Neighbor Discovery for UFM

Starting with Release 9.3.10, Enhanced Local Management Interface (ELMI) provides a protocol to monitor the status of permanent virtual connections between two Cisco communication devices. Through ELMI for example, the network management system (NMS) becomes aware of the existing connectivity between an IGX 8400 switch and a Cisco IOS router running ATM or Frame Relay.

The enhanced version of ELMI on IOS is called ELMI-AR (Address Resolution). Note that, since IGX switches mainly are connected to routers that run IOS, you must implement the same protocol on IOS, too.

The ELMI protocol enhancements for the UFM serves the same purpose as the ILMI enhancements for the UXM, and implements similar mechanisms to enable Neighbor Discovery. While ILMI Neighbor Discovery works with ATM links, ELMI Neighbor Discovery works with Frame Relay links. ELMI Neighbor Discovery is a Cisco standard, while ILMI is based on the standard ILMI protocol.

Use parameter option 53 from the **cnfnodeparm** command to configure the ILMI Management IP address. The Management IP address is used by the NMS application to access the IGX or the ATM device. Depending upon your network set up, you can configure the IGX to send either the LAN IP address or Network IP address as part of the neighbor information exchange with the attached ATM device. Enter 0 for LAN IP address, or 1 for Network IP address. The IGX switch default is the network IP address.

Once the parameter is set in **cnfnodeparm**, enable Neighbor Discovery using the **cnfport** command. Set the Advertise Interface parameter to "Yes" to enable the feature.

Signaling Protocol Timers

This section introduces the implementation of two signaling timers and related parameters you can specify through the **cnfport** command.

Periodically, devices use *signaling* to request the status of other, connected devices or networks. The signaling can be a simple confirmation of the other device's existence or more detailed information, such as the DLCIs, bandwidth, and state of all PVCs. The signaling described here occurs between:

- The user-equipment and a Frame Relay port across the user-to-network interface (UNI)
- Frame Relay ports in the network across the network-to-network interface (NNI)

Periodically, Frame Relay ports within the network transmit a Status Enquiry and wait for a Status response. These exchanges occur across the UNI and the NNI. At the UNI, the user-equipment periodically sends a series of Status Enquiries and awaits a Status response for each enquiry. At the NNI of any network, a Frame Relay port can generate Status Enquiries and, at alternate times, receive Status Enquiries. In this way, the signaling between networks mirror each other. (Figure 3-19 shows the three possible exchanges.) The timers for Status Enquiry and Status Response and other, related parameters are the:

- *Link integrity timer*—the time period between each Status Enquiry that either the user-equipment or a Frame Relay port in the network generates
- *Polling verification timer*—a time period in which a Frame Relay port waits for a Status Response to a Status Enquiry that the port generated
- *Error threshold*—the number of missing or erroneous events that triggers a Port Communication Failure
- *Monitored events count*—the number of events in a polling cycle
- *Full status polling cycle*—a polling cycle in which the port that has sent the Status Enquiry waits for detailed status information

In the preceding list, an *event* is either a Status Enquiry or a Status Response. The meaning of the event depends on whether the link integrity timer or the polling verification timer is waiting for the event. The link integrity timer waits for *Status Responses*. The polling verification timer waits for *Status Enquiries*.

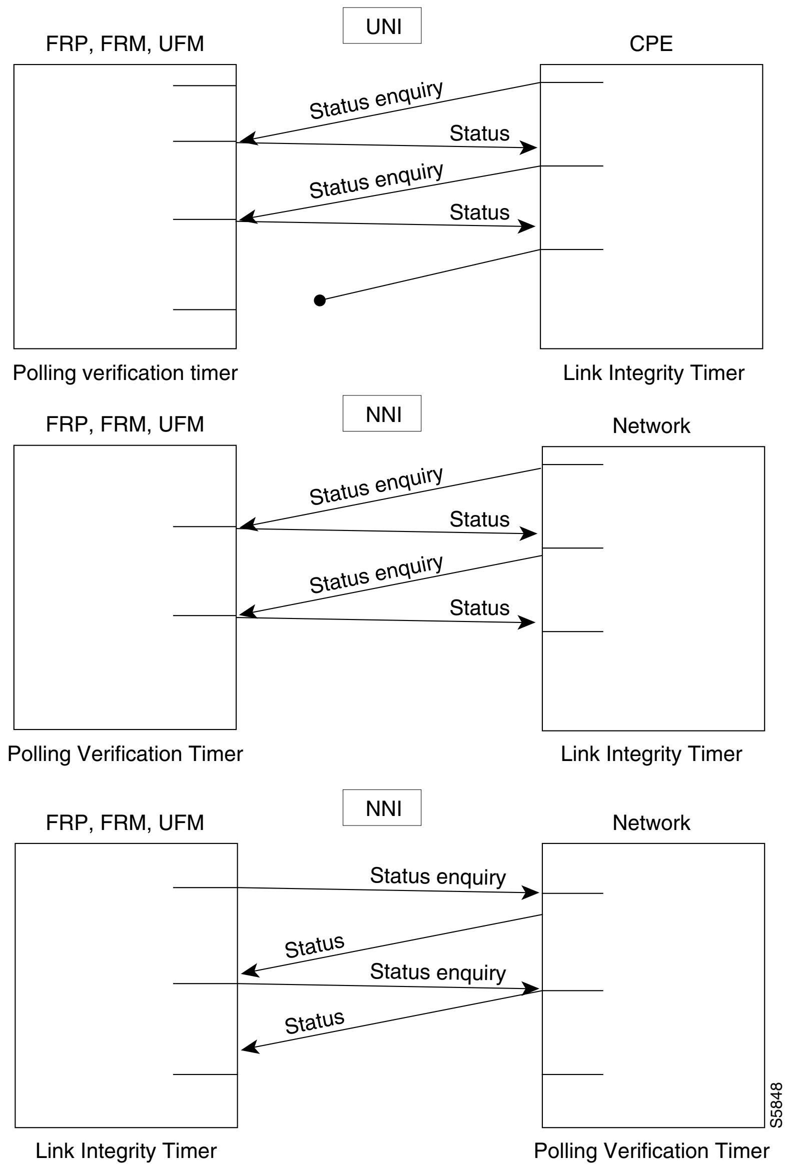
Most Status Enquiries contain only a sequence number. After sending these simple Status Enquiries, the polling device checks for the sequence number. Periodically, a *full status polling cycle* takes place, in which the polling device waits for all applicable information, such as the status of all connections that cross the NNI. For signaling across the UNI, the Frame Relay Forum has recommended a full status polling cycle at every sixth polling cycle. The Frame Relay Forum has not recommended a frequency for the NNI. The **cnfport** command lets you select a frequency in the range of once every 1–10 polling cycles.

The Frame Relay port or user-device counts a user-specified number of errors out of a user-specified number of attempts before it signals a Port Communication Failure. These parameters are the *error threshold* and the *monitored events count*, respectively. The defaults for these parameters are 3 and 4, respectively. To use the defaults in an example: if 3 out of 4 events are either missing or erroneous within the specified time period, the port signals a Port Communication Failure (a minor alarm).

An event has a user-specified amount of time to arrive. The allowed time period for the arrival of a valid event is the number of seconds you assign to a timer. If an enquiry or response is missing or bad within the timer value, the event is failed. Again, using all default values in an example: if the polling verification timer is 15 seconds and no Status Enquiry arrives within that time, the port records a missing Status Enquiry. If no Status Enquiry arrives during the next two 15-second periods, the port signals a Port Communication Failure. In the UNI example in the figure, the third Status Enquiry does not arrive. Note that each time a Status Enquiry arrives, the polling verification timer restarts counting at 0 seconds rather than waiting until the specified number of seconds has elapsed.

Whether the port is on a UNI or NNI, the polling verification timer setting must be longer than the link integrity timer. (Refer to the **cnfport** parameters table for values.) You cannot set the link integrity timer for the user-equipment with **cnfport**. Usually, the link integrity timer on user-equipment is 10 seconds, which you can verify by executing **dspportstats** and counting the number of seconds between statistical updates. On the NNI, you can set both timers (they use either Annex A or Annex D).

Figure 3-19 Signaling Protocol Timing



The data rates available with the 1 Mbps FRI are shown in Table 3-31.

Table 3-31 Data Rates for the 1-Mbps FRI

Port Data Rates in Kbps for 1Mbps FRI			
1024	512	256	128
896	448	224	112
768	384	192	64
672	336	168	56

The rules for assigning data rates to the four ports when using the 1 Mbps FRI are:

- If you assign a data rate of 672 Kbps or higher on any port, you cannot use any other port.
- If you assign a data rate of between 384 Kbps and 512 Kbps to any port, you can specify a second port with an available data rate of 512 Kbps or less.
- If you assign a data rate of 336 Kbps to any port, you can specify two other ports for any available data rates of 336 Kbps or less.

If the data rate of any port does not exceed 256 Kbps, you can specify all four ports with any available data rates of 256 Kbps or less.

cnfport (configure ATM port)

Configures the parameters of an ATM port on the IGX or BPX. The command is used to:

- configure an ATM port on the UXM in the IGX.
- configure the internal ATM port on the Universal Router Module (URM) in the IGX.
- configure an ATM port on the ASI and BXM cards in the BPX.

During port configuration, a prompt for each parameter appears. To keep the current value of the parameter, press the Return key without typing any characters. When a parameter is not configurable for an application, the parameter appears shaded or with dashed lines.

For additional information see the "Traffic Shaping on the UXM and URM" section on page 3-343, the "Traffic Shaping on the BXM" section on page 3-343, and the "Virtual Ports" section on page 3-345.

The **cnfport** command supports the Universal Router Module (URM) on the IGX 8400. The URM provides IOS-based voice support and basic routing functions. It consists of an embedded UXM with one internal ATM port and an embedded IOS-based router. The external interface type of the URM ATM port is defined as *internal*. The internal interface is a logical internal ATM port. The internal ATM port speed is equivalent to an OC-3 port. The default port configuration is the same as the default configuration for a UXM port. The port type is UNI with no protocol. The port cannot be configured as NNI, and the protocol cannot be configured as LMI, as the embedded router does not support the LMI protocol. Switch software reserves the VPI.VCI pair 0.1023 for the internal IPC mechanism used for UXM to router communication.

In Release 9.3.30, the **cnfport** command supports phase one of the Automatic Routing Management to PNNI migration. You use the **cnfport** command to set the BXM port type as Enhanced UNI (EUNI) or Enhanced NNI (ENNI) and to enable the Extended LMI (XLMI) protocol and LMI Neighbor Discovery feature (using the advertise interface information parameter). This port configuration is required to support the Extended PVC (XPVC) segment that links the BPX to the adjacent MGX in the hybrid AR-PNNI, or AR-PNNI-AR, network. See the "Automatic Routing Management to PNNI Migration" section on page 3-339 for more information.

Parameters

Parameter	Description
slot.port[.vport]	Specifies the card slot, physical, and optional virtual port number (BXM only). At this time, virtual ports are not available for ASI, UXM, or URM cards.
port type	Specifies whether the cell header format is NNI, UNI, EUNI, or ENNI. UNI is the default. NNI cannot be configured on the URM embedded UXM port. Specifies the ATM cell header format. Values are: • UNI (default value) • NNI Additional values to support Automatic Routing Management-PNNI links in a hybrid network, BPX only: • Extended UNI (EUNI) • Extended NNI (ENNI) With EUNI/ENNI port types, all new connections are programmed as "non-segment". These non-segment connections do not terminate OAM segment loopback cells. EUNI/ENNI port configuration is allowed only when the XLMI protocol is enabled on the BXM port. EUNI/ENNI port types cannot be configured on ports with existing connections. Only the following combinations are supported: • UNI to EUNI • NNI to ENNI ENNI/EUNI is also support for the BXM-E. If the port type is UNI and the port type required is ENNI, you must first provision the port as NNI, then as ENNI. **Note** Release 9.3.30 Switch Software disables FCES and Policing on the PVC endpoint, which is terminating on the XLMI link.
metro data cell header	Specifies whether the metro data cell header type is used (ASI-T3 cards only).
VPI Range	BPX only: VPI Range is configurable on Virtual Ports and defaults to 0-255/4095 for Physical Ports (based on UNI/NNI type). The VPI Range cannot overlap with any other VPI Range on the physical interface. The range for EUNI port types is the same as for UNI (0-255). The range for ENNI port types is the same as for NNI (0-4095).

Parameter	Description
Bandwidth	BPX only: Bandwidth is configurable on all ports. For Virtual Ports, this parameter specifies the maximum bandwidth available for a Virtual Port. Each port has this parameter configurable. Connections within the Virtual Port may overbook the bandwidth if CAC Override is enabled, but the actual throughput will never be allowed to exceed the Virtual Port bandwidth. **Note** Changing the line framing for BXM-T3 cards from PLCP to HEC no longer automatically changes the port's bandwidth to the new maximum. It merely raises the upper limit for the port's bandwidth. After changing the framing, you must use **cnfport** to increase the port's bandwidth, and **cnfrsrc** to increase the port's Automatic Routing Management bandwidth (PVC Max Bandwidth).
CAC Reserve	BPX only: CAC Reserve is configurable on all ports, but only valid if CAC Override is disabled. This parameter specifies the amount of Automatic Routing Management Port Bandwidth not available for booking by connections if CAC Override is disabled. If CAC Override is enabled, overbooking is permitted. The purpose of this parameter is to reserve some bandwidth to handle bursts of traffic without cell discards.

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>shift h | n</td><td>Specifies whether a one-byte shift on the HCF field of the cell header occurs. Changing the HCF field for a physical port will affect all virtual ports supported on the physical port.

The choice of H (shift) or N (no shift) depends on whether the ATM cloud includes non-Cisco WAN Switching nodes and whether virtual trunking is in operation:

• You typically select H (the default, or shift on) if the cloud includes non-Cisco WAN Switching nodes or if only a physical trunk is configured for the ASI port.
• You typically select N (shift off) if virtual trunks are configured and the ATM cloud consists of Cisco WAN Switching nodes only.

For BPX or IGX ports performing virtual trunking within an ATM cloud to external Cisco equipment, ports should be configured to shift on (that is, shift H) for BNI cards; BXM ports should typically be configured to shift off (shift N).

Note For UXM cards, you cannot configure the Shift parameter—the Shift setting is always N, or shift off.

For example, if the public ATM cloud consists of BPX nodes, the access points to the cloud might be ASI ATM UNI ports. Because the cells transmitted to the ASI trunk interface are coming from a Cisco device, for example, a BNI card, the 16 VCI bits have already been left-shifted by four (4) bits and contain 12 bits of VCI information and four (4) bits of ForeSight information. Therefore, the ASI cards at either end of the cloud should be configured to not shift (that is, shift off). In this case, you would configure shift N on the ASI port.

If the ATM cloud consists of non-Cisco nodes, then the 12 VCI bits + 4 ForeSight bits in the cells coming from the BNI card in the BPX are then passed through untouched as 16 VCI bits. Because it is a non-Cisco network, the ForeSight bits are ignored.

Make sure that you set the HCF field correctly for your network configuration before you add connections. For example, if you are acting as a service provider, and one of your customers wants to configure virtual trunking through the network, if your ports have been previously configured with the incorrect HCF shift field setting, you may need to go back and delete all the connections from each port, configure the port, and add the connections again.

Below are guidelines on how to set the Shift parameter when using BNI virtual trunking through a cloud of Cisco equipment using BXMs, and a cloud using ASIs and BNIs. Also shown is how to set the Shift parameter when using either BXM or UXM virtual trunking through a cloud of Cisco equipment (BXM cards), and a cloud of ASIs and BNIs.</td></tr>
<tr><td></td><td>
<table>
<tr><th></th><th>Non-Cisco Cloud</th><th>Cisco BXM Cloud</th><th>Cisco ASI/BNI Cloud</th></tr>
<tr><td>BNI VT</td><td>X</td><td>No shift</td><td>No shift</td></tr>
<tr><td>BXM/UXM VT</td><td>X</td><td>No shift</td><td>Shift</td></tr>
</table>
</td></tr>
</table>

Parameter	Description
%util	Enables/disables percent utilization. This parameter supports ATM VBR/ABR fairness for ASI terminated connections and applies to only VBR and ABR connections. To change the %util status of a port, no connections can be currently terminating on the port. Therefore, if connections terminate on the port, they must be deleted before **cnfport** execution then re-added after execution of **cnfport**. The port queue bandwidth with %util feature *disabled* is: • For ABR connections Port Queue BW = sum (MCR) • For VBR connections Port Queue BW = sum (PCR) • For CBR connections Port Queue BW = sum (PCR) When the %util feature is enabled, the port queue bandwidth is calculated for ABR and VBR connections as follows: for ABR connections, the port queue bandwidth is the sum of a percentage of the MCRs for the connections terminating on the port; for VBR connections, the port queue bandwidth is the sum of a percentage of the PCRs for connections terminating on the port. The feature is not applied to CBR connections. In summary, the port queue bandwidth with feature %util *enabled* is: • For ABR connections Port Queue BW = sum (MCR * %util) • For VBR connections Port Queue BW = sum (PCR * %util) • For CBR connections Port Queue BW = sum (PCR) For virtual ports, parameter can be set to Enable or Disable and is only pertinent to the specific virtual port.
CAC Override	Controls the allocation of bandwidth on a port. If enabled, connections are allowed to be added to a port even if the bandwidth requirements exceed the port capacity. If disabled, the bandwidth requirements of all connections on the port will not exceed the port capacity.

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>protocol</td><td>
Specifies the use of either an LMI protocol, an ILMI protocol, an IXLMI protocol (BXM only) or no specified protocol. No specified protocol is the default.
LMI cannot be configured on the URM.
When the protocol is enabled on a virtual port, ILMI processing is done only on the BXM card. You cannot configure the protocol to run on the controller card (BCC) with virtual ports. The ILMI configuration performed on one virtual port applies to all virtual ports on the same physical interface.
The ILMI Neighbor Discovery feature on a BXM interface with virtual ports is supported on BPX but not yet supported by CWM.
Note The cnfport command prevents disabling ILMI protocol on a port interface if a VSI ILMI session is active on a VSI partition of the port interface.
Values for protocol are one of the following:
N–(NONE)
L–(LMI)
I–(ILMI)
XL–(XLMI)
The default LMI/XLMI parameters are:

VPI for LMI/XLMI connection: 0 (3 if the protocol is XLMI)
VCI for LMI/XLMI connection: 31
LMI Polling Enable?: N
LMI Status Enquiry Timer (T393): 10 seconds
LMI Update Status Timer (T394): 10 seconds
LMI Polling Timer (T396): 10 seconds
LMI Status Enquiry Retry (N394): 5
LMI Update Status Retry (N395): 5

Note In order to enable the migration topology discovery feature, set:

Protocol to XL
VPI to 3
VCI to 31
Polling to Yes
Protocol on the Card to Yes
Advertise Interface Information to Yes

</td></tr>
</table>

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td>protocol (cont.)</td><td>The default ILMI parameters are:
• VPI for ILMI connection: 0
• VCI for ILMI connection: 16
• ILMI Address Registration Enable?: N
• ILMI Polling Enable?: N
• ILMI Trap Enable?: N
• ILMI T491 Polling Interval: 30 seconds
• ILMI N491 Error Threshold: 3
• ILMI N492 Event Threshold: 4
Note An IMA configuration will display the same protocol values as shown above.</td></tr>
<tr><td>Protocol by Card</td><td>For the BPX, defines the card that runs the LMI/ILMI protocol. The LMI/ILMI protocol can run on either the interface card (BXM) or the controller card. Values are Y/N. The default is N.
• Y – selects the interface card to run the LMI/ILMI protocol
• N – selects the controller card to run the LMI/ILMI protocol
This parameter is supported on BXM interfaces configured with virtual ports. The setting of this parameter on one virtual port applies to all virtual ports on the same physical interface.
This parameter is automatically defaulted to Y when the XLMI protocol is selected. The XLMI protocol runs only on the BXM interface card.
Note For a BXM interface configured with virtual ports, the ILMI protocol runs only on the card. The protocol is blocked from running on the BCC.</td></tr>
<tr><td>Protocol run on the card</td><td>For the IGX, defines the card that runs the ILMI protocol. This must be set to Y for XLMI provisioning support. The ILMI protocol can run on the interface card (UXM and URM) or the controller card. Values are Y/N. The default is Y.
• Y – selects the interface card to run the ILMI protocol
• N – selects the controller card to run the ILMI protocol
This parameter is applicable only when the ILMI protocol is selected and the card supports the LMI/ILMI protocol.
Note For the URM, the ILMI protocol runs only on the card. The protocol is blocked from running on the NPM.</td></tr>
</table>

Parameter	Description
Advertise Interface Information	The advertise interface information parameter defines whether the interface is authorized to advertise its interface information. Values are Y/N. The default is Y. • Y – the switch sends its topology information (such as, the switch management IP address and Interface Name) to its neighbor. • N – the switch does NOT send its topology information to its neighbor. Instead, the switch sends 0.0.0.0 as the management IP address and a NULL string as Interface Name to the neighbor The user is prompted for this parameter when Protocol is ILMI or XLMI, Protocol by Card (BPX) or Protocol run on the card (IGX) is set to Y, and the interface card supports the Neighbor Discovery feature. The setting of this parameter does not affect the incoming neighbor's topology information. If the neighbor sends its topology information to the switch, the switch processes and stores the information. The neighbor's topology information is displayed using the **dspnebdisc** command. **Note** The ILMI Neighbor Discover feature on a BXM interface with virtual ports is supported on the BPX but not yet supported on CWM.
ILMI Reset Flag	BXM only. This indicates whether the ILMI session is to be reset when a PNNI controller is added. The default is Yes.
VC Shaping	IGX ports only. Specify one of the following: Yes—Applies egress traffic shaping to each VC. No—Does not apply egress traffic shaping to each VC. In previous releases the **cnfln** command was used to enable or disable VC shaping on ATM ports in the IGX. The **cnfport** command is now used to configure VC shaping. This change applies to all ATM ports in the IGX, i.e., UXM and URM ports. Refer to Traffic Shaping on the UXM and URM, page 3-343 and Traffic Shaping on the BXM, page 3-343 for more information about this topic.
F4-F5 Mapping	BXM only. Enables/disables the F4 to F5 Mapping feature. Values are "Y" to enable, "N" to disable. The default value is "N". You can enable the feature only when the number of required F4-F5 channels are available. The **cnfport** and **dspport** commands display the number of F4-F5 channels on the port. If F4-F5 mapping is enabled, the field "F4-F5 Used Channels" is displayed. If F4-F5 mapping is disabled, the field "F4-F5 Reqd Chans" is displayed. F4-F5 mapping can not be enabled on ports which have VCCs provisioned with a VCI value of less than 33.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

upport, dnport, dspport, dspports, delport, addport

Example

(BPX) config port 1.6 of a BXM.

cnfport 1.6 353208 UNI H Y L 0 31 Y 10 10 10 5 5 N 0 N Y

```
hugh           TN    Cisco          BPX 8620  9.3.30    Aug. 13 2001 12:49 PDT

Port:     1.6       [FAILED  ]               Bandwidth/AR BW:  353208/353208
Interface:          LM-BXM                   CAC Override:     Enabled
VPI Range:             0 -  255              CAC Reserve:      0
Type:               UNI                      %Util Use:        Disabled
Shift:              SHIFT ON HCF (Normal Operation)
SIG Queue Depth:    640                      Port Load:        0 %
F4-F5 Mapping:      Yes                      F4-F5 Used Chans: 1
Protocol:           LMI                      Protocol by Card: Yes
  VPI.VCI:                            0.31
  LMI Polling Enabled:                Y
  T393 Status Enquiry Timer:         10
  T394 Update Status Timer:          10
  T396 Polling Timer:                10
  N394 Max Status Enquiry Retry:      5
  N395 Max Update Status Retry:       5

Last Command: cnfport 1.6 353208 UNI H Y L 0 31 Y 10 10 10 5 5 N 0 N Y


Next Command:
```

Example

(BPX) Configure BXM port 2.3 to support an Extended PVC (XPVC) segment in a hybrid AR-PNNI network. The configuration is carried out in two steps:

- First Step: Configure BXM port 2.3 for the Extended LMI (XLMI) protocol and enable the LMI Neighbor Discovery feature.
- Second Step: Configure the Enhanced UNI (EUNI) port type.

cnfport 1.1 353208 UNI H N XL 3 31 Y 10 10 10 5 5 N 0 N Y Y

```
sw252          TRM   Cisco          BPX 8620  9.3.e6    Aug. 23 2001 15:20 PST

Port:     1.1       [ACTIVE  ]                Bandwidth/AR BW:  353208/353208
Interface:          LM-BXM                    CAC Override:     Enabled
VPI Range:             0 -  255               CAC Reserve:      0
Type:               UNI                       %Util Use:        Disabled
Shift:              SHIFT ON HCF (Normal Operation)
SIG Queue Depth:    640                       Port Load:        0 %
F4-F5 Mapping:      No                        F4-F5 Reqd Chans: 0
Protocol:           X-LMI                     Protocol by Card: Yes
  VPI.VCI:                           3.31    Advertise Intf Info:  Yes
  LMI Polling Enabled:               Y
  T393 Status Enquiry Timer:        10
  T394 Update Status Timer:         10
  T396 Polling Timer:               10
  N394 Max Status Enquiry Retry:     5
  N395 Max Update Status Retry:      5

Last Command: cnfport 1.1 353208 UNI H N XL 3 31 Y 10 10 10 5 5 N 0 N Y Y



cnfport 1.1 353208 EUNI H N XL 3 31 Y 10 10 10 5 5 N 0 N Y Y
sw252          TRM   Cisco          BPX 8620  9.3.e6    Aug. 23 2001 15:20 PST

Port:     1.1       [ACTIVE  ]                Bandwidth/AR BW:  353208/353208
Interface:          LM-BXM                    CAC Override:     Enabled
VPI Range:             0 -  255               CAC Reserve:      0
Type:               E-UNI                     %Util Use:        Disabled
Shift:              SHIFT ON HCF (Normal Operation)
SIG Queue Depth:    640                       Port Load:        0 %
F4-F5 Mapping:      No                        F4-F5 Reqd Chans: 0
Protocol:           X-LMI                     Protocol by Card: Yes
  VPI.VCI:                           3.31    Advertise Intf Info:  Yes
  LMI Polling Enabled:               Y
  T393 Status Enquiry Timer:        10
  T394 Update Status Timer:         10
  T396 Polling Timer:               10
  N394 Max Status Enquiry Retry:     5
  N395 Max Update Status Retry:      5

Last Command: cnfport 1.1 353208 EUNI H N XL 3 31 Y 10 10 10 5 5 N 0 N Y Y


Next Command:
```

Example

(IGX) Configure port 25.1 of a URM.

cnfport 25.1 N i 10 16 y y 30 3 4 y y 200 0 Y y y

```
bolger         TN    Cisco          IGX 8430  9.3.3o    May  15 2001 19:34 PST

Port:       25.1    [ACTIVE  ]
Interface:          INTERNAL              CAC Override:          Disabled
Type:               UNI                   %Util Use:             Enabled
Speed:              353208 (cps)          GW LCNs:               200
SIG Queue Depth:    640                   Reserved BW:           0 (cps)
Alloc Bandwidth:    353208 (cps)          VC Shaping:            Enabled
Protocol:           ILMI                  Protocol run on the card: Yes
  VPI.VCI:                    10.16       Advertise Intf Info:   Yes
  ILMI Polling Enabled        Y
  Trap Enabled                Y
  T491 Polling Interval      30
  N491 Error Threshold        3
  N492 Event Threshold        4


Last Command: cnfport 25.1 N i 10 16 y y 30 3 4 y y 200 0 Y y y
```

Example

(IGX) Configure IMA port 8.1 of a UXM.

cnfport 8.1 Y I 10 16 Y Y 30 3 4 Y Y 200 0 Y Y Y

```
bolger         TN    Cisco          IGX 8430  9.3.3o    May  15 2001 19:35 PST
Port:       8.1     [ACTIVE  ]
IMA Port Grp:       1-2
Interface:          E1-IMA                CAC Override:          Disabled
Type:               NNI                   %Util Use:             Enabled
Speed:              8905 (cps)            GW LCNs:               200
SIG Queue Depth:    640                   Reserved BW:           0 (cps)
Alloc Bandwidth:    8905 (cps)            VC Shaping:            Enabled
Protocol:           ILMI                  Protocol run on the card: Yes
  VPI.VCI:                    10.16       Advertise Intf Info:   Yes
  ILMI Polling Enabled        Y
  Trap Enabled                Y
  T491 Polling Interval      30
  N491 Error Threshold        3
  N492 Event Threshold        4


Last Command: cnfport 8.1 Y I 10 16 Y Y 30 3 4 Y Y 200 0 Y Y Y
```

Automatic Routing Management to PNNI Migration

With Release 9.3.30, you use the **cnfport** command to provision a BXM port to support the XPVC segment that links the Automatic Routing Management BPX's BXM to the adjacent PNNI MGX's AXSM in the hybrid AR-PNNI network.

EUNI/ENNI Port Types

Release 9.3.30 introduces two new BXM port types: Enhanced UNI (EUNI) and Enhanced NNI (ENNI). With EUNI/ENNI ports types, all new XPVC connections added to the port are programmed as "non-segment". Non-segment connections to NOT terminate OAM segment loopback cells. This allows the OAM cells to start from an edge of the AR-PNNI network and traverse through multiple XPVC segments for end-to-end connection testing. Note that in the AR-PNNI hybrid network, UNI/NNI connections continue to be programmed as segment. Segment connections terminate OAM segment loopback cells.

The EUNI/ENNI port type configuration is required on each junction of the AR-PNNI, or AR-PNNI-AR, network and on both sides of each XPVC segment. Both the AR BXM and the PNNI AXSM port must be either EUNI or ENNI.

The **cnfport** command allows EUNI/ENNI port type configuration only when the XLMI protocol is enabled on the BXM port. EUNI/ENNI port types are only allowed on BXM ports with no existing connections. If the port has existing connections, **cnfport** blocks selection of the EUNI/ENNI port type.

The cnfport command only supports the following port type configuration combinations:

- UNI to EUNI
- NNI to ENNI

If the port type is UNI (the default port type) and the required port type is ENNI, you must first configure the port as NNI, then as ENNI. The CLI prompt specifies the combinations allowed.

The VPI range and default for the EUNI port type is the same as for the UNI port type (0-255). The VPI range and default for the ENNI port type is the same as for the NNI port type (0-4095). VSI partition and virtual ports are not supported on EUNI/ENNI port types.

XLMI Protocol and LMI Neighbor Discovery

Release 9.3.30 introduces a new BXM protocol: Extended LMI (XLMI). The XLMI protocol supports LMI Neighbor Discovery and XPVC status update in the hybrid AR-PNNI network. XLMI is only supported over an AR-PNNI link, and it only runs on the BXM interface card.

The XLMI protocol cannot be enabled if there are existing connections on the BXM port. To enable the XLMI protocol, select the “XL” value for the Protocol parameter. When the XLMI protocol is enabled, **cnfport** sets the default values for the following parameters:

- Protocol by Card: Y. The XLMI protocol cannot run on the BCC controller card.
- Control VC: VPI = 3/VCI = 31. This configuration is required for XLMI.
- LMI Polling Enabled: N. (Although the default is N, set this parameter to Y for the LMI Neighbor Discovery feature)
- T393 Status Enquiry Timer: 10 seconds
- T394 Update Status Timer: 10 seconds
- T396 Polling Timer: 10 seconds
- N394 Max Status Enquiry Retry: 5 seconds
- N395 Max Update Status Retry: 5 seconds

The XLMI protocol cannot be enabled or disabled if there are existing connections on the port. On ports with no connections, a warning is displayed when XLMI is disabled, and you are asked to confirm the action. If the disable is confirmed, the neighbor AXSM’s information, if any, is deleted from the port and the CWM is notified.

To enable the LMI Neighbor Discovery feature, set LMI Polling to “Y” and the Advertise Interface Information parameter to “Y.” When LMI Neighbor Discovery is enabled, the BXM in the Automatic Routing Management network and the AXSM in the PNNI network exchange topology information. This information includes IP address and Interface Name. The BXM reports the AXSM’s neighbor information to the BCC, and the BCC reports it to the CWM.

Use parameter option 56 from the **cnfnodeparm** SuperUser command to configure the Management IP address to be sent to the AXSM as part of the neighbor information exchange with the AXSM. You can configure the BPX to send either the LAN IP address or Network IP address. Enter 0 for LAN IP address, or 1 for Network IP address. The default is the network IP address.

When the Advertise Interface Information is set to “N,” the BXM does not send topology information to the AXSM. However, the setting of this parameter does not affect the neighbor’s information. If the neighbor’s information is available, the BPX reports it to the CWM. When an LMI session is downed, the BXM resets the neighbor’s information to default values. The neighbor’s IP address is set to NULL and the Interface Name is set to NULL string.

With Release 9.3.30, the **cnfport** command performs feature mismatch verification when BXM cards are replaced. If the replacement card does not support the LMI Neighbor Discovery feature, mismatch is declared under the following conditions.

1. For stand-alone BXM card replacement, mismatch is declared if the original BXM card supports LMI Neighbor Discovery and at least one port is configured for LMI Neighbor Discovery.
2. For card replacement in a Y-redundant BXM pair, mismatch is declared if the original card pair supports LMI Neighbor Discovery and at least one port is configured for LMI Neighbor Discovery.

ILMI Neighbor Discovery

The ILMI Neighbor Discovery feature is supported on ports (not virtual ports) on both the UXM and BXM cards. This feature enables a network management system, such as Cisco WAN Manager or CiscoWorks 2000, to discover other attached ATM devices, such as Cisco ATM routers or switches. The attached devices also must support ILMI Neighbor Discovery for this feature to work.

The ILMI Neighbor Discover feature on a BXM interface with virtual ports is supported on the BPX but not yet supported on CWM.

When the Advertise Interface Information parameter is enabled on a port, the BPX or IGX and the attached ATM device exchange their management IP addresses and other interface information using the ILMI protocol. The exchanged information consists of the following:

- atmfMyIfName: physical interface name
- atmfMyIfIdentifier: Interface identifier
- atmfMyIpNmAddress: Management IP Address, either the LAN IP or network IP.
- atmfMySysIdentifier: System Identifier, a 6-byte string read from the BPX NOVRAM, or if not available, the default value is “000001”

Use parameter option 56 (BPX) or 53 (IGX) from the **cnfnodeparm** SuperUser command to configure the ILMI Management IP address. The Management IP address is used by the network management system (NMS) to access the BPX, IGX, or attached ATM device. Depending upon your network set up, you can configure the BPX or IGX to send either the LAN IP address or Network IP address as part of the neighbor information exchange with the attached ATM device. Enter 0 for LAN IP address, or 1 for Network IP address. The default is the network IP address for the BPX or and LAN IP address for the IGX.

While the method for configuring ILMI Neighbor Discovery is the same for the BXM and the UXM, it works a little bit differently for the URM. The URM card has two parts: an embedded router and an embedded UXM port. The router runs Cisco IOS and must have its IP address configured with the router IOS command line interface accessible via an IOS console port located on the backcard of the URM card. Configure the router protocol to ILMI. The UXM port on the URM card must be configured with the

IGX command line interface. Set the protocol to ILMI and enable the Neighbor Discovery feature. With this configuration, the Management IP address of the embedded router is reported to the URM embedded UXM via ILMI.

Once the parameter is set in **cnfnodeparm**, enable the Neighbor Discovery feature using the Advertise Interface Information parameter from the **cnfport** command. Set the parameters that follow, depending upon the switch.

Options that must be set for a BXM port are shown in Table 3-32.

Table 3-32 cnfport—BXM Parameters to Set for ILMI Neighbor Discovery

Parameters	Value
Protocol	ILMI
Protocol by Card	Yes
Advertise Interface Information	Yes
ILMI Polling Enabled	Yes

Options that must be set for a UXM port are shown in Table 3-33.

Table 3-33 cnfport—UXM Parameters to Set for ILMI Neighbor Discovery

Parameters	Value
Protocol	ILMI
Protocol Run On The Card	Yes
Advertise Interface Information	Yes
ILMI Polling Enabled	Yes

"Protocol run on the card" or "Protocol By Card" is prompted only when the protocol is ILMI and the card supports ILMI on the card. The "Advertise Interface Information" parameter is prompted only when "Protocol run on the card" or "Protocol By Card" is set to Yes.

The switch always processes the neighbor's management IP address and IfName.Use the **dspnebdisc** command to display all the neighbor's information discovered by the BPX or the IGX via the ILMI Neighbor Discovery procedure.

The **cnfport** command, in addition to other configuration commands, performs mismatch verification on the BXM and UXM cards. For example, the **cnfport** command verifies that the Y-cabled redundant cards both have LMI/ILMI configured.

Refer to "Feature Mismatching" in the *BPX 8600 Series Installation and Configuration*. The Feature Mismatching capability will not mismatch cards unless the actual feature has been enabled on the card. This allows for a graceful card migration from an older release.

Traffic Shaping on the UXM and URM

The UXM and URM cards support the VC traffic shaping feature. VC traffic shaping shapes each connection by scheduling cells using the WFQ (Weighted Fair Queueing) technique to ensure conformance to the service provider's requirements. In general, traffic shaping provides a tight control on each connection's CDV in order to meet carrier requirements. The feature also prevents domination of bandwidth resources by any one connection.

On the UXM and URM, traffic shaping is configured on a per port basis. Once the traffic shaping parameter is turned on, all connections added afterward will have traffic shaping on. Refer to the *Cisco WAN Switch Software Release 9.2* release notes for additional information on traffic shaping.

Traffic Shaping on the BXM

Traffic shaping lets you choose whether to have VC scheduling performed to your CBR, VBR, UBR, or ABRSTD with VSVD and without FCES traffic streams. You can configure the traffic shaping (which involves weighted fair queuing) option on each BXM interface. In release 9.3.05 onward, traffic shaping is enabled/disabled per QoS by using the **cnfportq** command.

Traffic shaping, and all traffic pertaining to the QoS for this release, is performed on a per-port basis. When a particular QoS is enabled, all traffic exiting the port is subject to the VC scheduling based on the appropriate service parameters you provision. When a particular port is configured to perform traffic shaping, all ATM cells, regardless of class of service, pass through the VC queues before leaving the card. When a traffic class is not configured for traffic shaping, its connections circumvent the VC queues and are scheduled by the Qbins.

No connections should exist on the port before changing the port traffic shaping parameter. If there are existing connections when the port traffic shaping parameter is toggled, then these connections will not be updated unless the card is reset, connections are rerouted, a switchcc occurs, or you modify the connection parameters. Also, traffic shaping is not enabled on a VSVD endpoint if an external segment has been enabled.

Redundant cards must either both support traffic shaping, or neither support traffic shaping. In the non-redundant case, traffic shaping is configurable regardless of whether the BXM card in the target slot supports traffic shaping. If the card does not support traffic shaping, then a BXM card that does support traffic shaping can be inserted later and the traffic shaping configuration will take effect. System software will not perform mismatch checking on the traffic shaping capabilities of the BXM.

The traffic shaping rate parameters are in Table 3-34. The MCR is the minimum cell rate for the connection. This is the lowest rate that the connection will be scheduled from the VC queue into the Qbin. The PCR is the peak cell rate, or the highest rate at which the connection will be scheduled from the VC queue into the Qbin.

Table 3-34 cnfport—Traffic Shaping Rates

Service Type	MCR	PCR
CBR	PCR	PCR
VBR	SCR[1]%Util	PCR
UBR	0	PCR
ABR	MCR %Util	PCR

1. Indicates that the system software issues a warning that traffic shaping is not supported on that specific BXM.

Note Traffic shaping does not generate any alarms. There is no mismatch checking for BXMs that support traffic shaping, so if you insert a BXM card with firmware that does not support it, then the traffic shaping functionality will not exist.

Note Cells can be momentarily received out of order when you reconfigure connections between traffic shaping and non-traffic shaping. This is a limitation of the hardware for which there is no workaround.

Configuring Traffic Shaping

Traffic shaping involves passing ATM traffic through the ATM interface at a VC queue, scheduled rate. With the introduction of traffic shaping, the customer will have the option to perform VC scheduling to his/her ABR, CBR, VBR, and UBR traffic streams. Traffic shaping is performed by the BXM hardware.

Traffic shaping will be performed on a per-port, per-CoS basis.

No connections should exist on the port before you change the port traffic-shaping parameter. If there are existing connections when you toggle the port traffic-shaping parameter, then these connections will not be updated unless you reset the card (by using the **resetcd** command), connections are rerouted, a **switchcc** occurs, or you modify the connection parameters. Also, it should be noted that traffic shaping is not enabled on a VSVD endpoint if external segment has been enabled.

Use **cnfportq** to configure traffic shaping parameters.

Firmware Functionality (BXM)

The BXM firmware supports a new CommBus parameter to enable/disable traffic shaping. When you add a connection, the BXM firmware checks its database to see if traffic shaping is enabled for the port that the connection is to be mapped to. If traffic shaping is enabled, the BXM firmware sets up the ASIC hardware to perform the weighted fair queuing. In the background, the BXM firmware runs a rate-based algorithm.

Existing functionality, such as VC queuing, is used by the traffic shaping feature.

In this release, the BXM firmware supports a new CommBus (CBUS) parameter to enable/disable traffic shaping. When a connection is added, the BXM firmware checks its database to see if traffic shaping is enabled for the port that the connection is to be mapped to. If traffic shaping is enabled for the traffic class on the port, the BXM firmware sets up the ASIC hardware to perform the weighted fair queuing. In the background, the BXM firmware runs a rate-based algorithm similar to what is done today for explicit rate stamping (ERS). The only other interface change includes an egress SCR parameter in the channel (0x52) message.

The algorithm executed by the firmware involves the BXM firmware polling the cell arrival and transmit counters of the Qbins approximately every 15 msec. During this time, the firmware determines the congestion ratio:

rc = rp * out/in

where rp is the previous value of rc, “out” is the number of cells leaving the Qbin, and “in” is the number of cells arriving into the Qbin. Note that if the ratio of out/in is less than 1, then the Qbin is experiencing congestion. The BXM firmware takes the resulting “rc” and divides this value into the sum of all of the PCRs for the Qbin and uses this result as the congestion factor to be programmed into the hardware (SABRE).

Performance of Traffic Shaping

The weighted fair queuing (WFQ) algorithm for traffic shaping runs the same algorithm as the explicit rate stamping (ERS). This processing consumes 12 percent of the bandwidth. Because the algorithm runs once (even if both ERS and WFQ are enabled), traffic shaping will not increase the worst-case demand for BXM processor time.

Errors and Alarm Handling

No alarms will be generated regarding the traffic-shaping feature. As previously mentioned, there is no mismatch checking for BXMs that do not support the feature, so if you insert a BXM with firmware that does not support the feature, then the traffic shaping functionality will not be supported on that card.

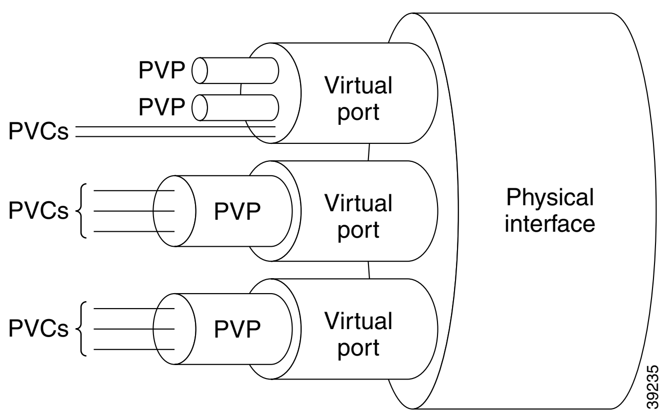
It should be noted that cells can be momentarily received out of order when connections are reconfigured between traffic shaping and non-traffic shaping. This is a limitation of the hardware for which there is no workaround.

Virtual Ports

Virtual ports (Figure 3-20) are logical interfaces like virtual trunks, trunks, and ports. (A maximum of 31 logical entities are available on a BXM card.)

Virtual ports is an optional feature that must be configured by Cisco on the BPX.

Figure 3-20 Virtual Ports



One or more virtual ports may function on a single port connected to CPE devices, directly or through an ATM cloud. Although virtual ports, like ports, can connect directly to CPEs, they are generally used to connect indirectly.

Traffic shaping has previously been supported on ports and on connections. Virtual ports on BPX switches provide hierarchical traffic shaping, which means both virtual port traffic shaping and connection traffic shaping.

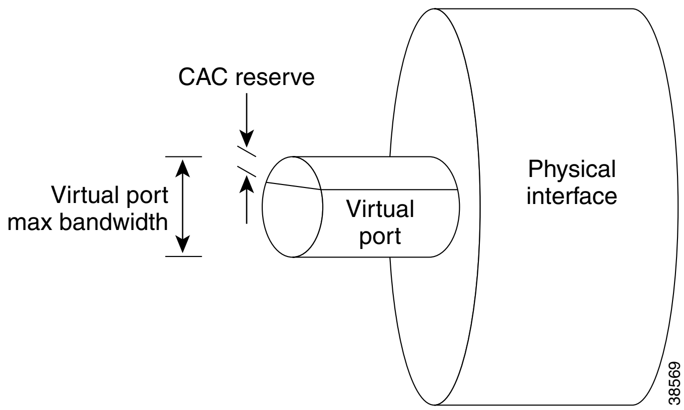
A virtual port may carry multiple PVCs or PVPs. VI traffic shaping capability is provided per virtual port. Additionally, connection traffic shaping is available on a QoS basis. While virtual port shaping is always ON, you can turn connection traffic shaping ON or OFF by using the **cnfportq** command.

Each virtual port supports all Automatic Routing Management (AutoRoute) traffic types that are currently supported by ports.

To set the maximum bandwidth available for use on that virtual port, use the Bandwidth parameter of the command **cnfport** (see Figure 3-21). This parameter is similar to the Bandwidth parameter used for ports. However, while the Bandwidth parameter is configurable on a virtual port, on a port, this parameter is not configurable; it is automatically set to the line speed.

You can configure a virtual port's bandwidth to the full port bandwidth or a subset thereof. However, the bandwidth sum of all virtual ports on a port cannot exceed the port's total bandwidth.

Figure 3-21 Port Bandwidth



Requirements

Virtual ports are available on the BXM card for the BPX. This feature is included in BPX Switch Software 9.3.10. and is independent of firmware. Virtual ports are not supported on ASI card connections.

On the BPX, this feature requires:

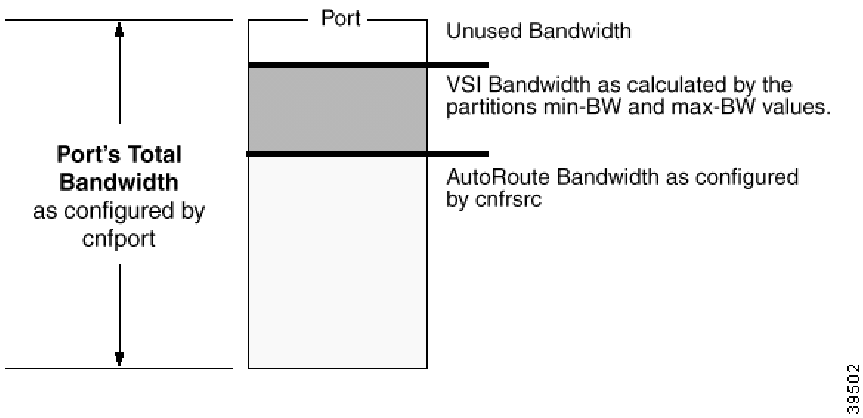
- BCC 3-64 or BCC 4-128 controller card
- BXM card

Depending on the interface type, UNI or NNI, the maximum number of PVPs will be 255 or 4095 respectively. The maximum number of VCIs is 65535.

Port Bandwidth and Line Speed

Figure 3-22 shows the types of bandwidth that make up the port's total bandwidth as configured by **cnfport**.

Figure 3-22 Port Bandwidth and Line Speed



Total Port Bandwidth

The total port bandwidth is the bandwidth of the port. It is configured by the **cnfport** command. Its units are cells per second. If there are multiple ports on a line (physical interface), then the sum of the "Total Port Bandwidths" on that line is limited to be less than or equal to the line speed.

For BXM T3 lines the line speed is based on the framing, PLCP or HEC, and can be reconfigured using the **cnfln** command.

Automatic Routing Management Bandwidth

The Automatic Routing Management Bandwidth is the bandwidth that can be used by Automatic Routing Management connections. It is user configured via the **cnfrsrc** command. Its units are cells per second. It can never be larger than the total port bandwidth.

VSI Bandwidth

The VSI bandwidth is the bandwidth that is currently used by the VSI partitions. It is a calculated value based on the VSI min-BW and max-BW values. Its units are in cells per second. It is "configurable by the user" when the min-BW and max-BW values are modified via the **cnfrsrc** command. When being configured, the min-BW and max- BW parameters cannot be set so that they would consume more than Total Port Bandwidth–Automatic Routing Management Bandwidth.

Unused Bandwidth

The unused bandwidth is whatever is left over. This occurs if some of the non-Automatic Routing Management bandwidth is unused by VSI.

Limitations

The BXM card has 31 Virtual Interfaces (VIs). These VIs can be used for Virtual Ports, Virtual Trunks, Physical Ports or Physical Trunks.

- The maximum number of interfaces (Virtual/Physical Port/Trunk) per BXM is equal to the maximum number of VIs. Therefore, a maximum of 31 (BXM) Virtual Ports are supported per card. The maximum number of Virtual Ports is 31 (BXM), but the number of available Virtual Ports can be lower based on the number of other interface types in use.
- A maximum of 254 ports (physical or virtual), are supported on the BPX node with the BCC 4-128 controller. A maximum of 144 Virtual Ports will be supported on a BPX node running the BCC 3-64 controller. Virtual Ports are not supported on controllers lower than BCC 3-64 (BPX). The maximum Virtual Ports available will be reduced by the number of Physical Ports on the system.
- Some port parameters are physical, and therefore when they are changed on one Virtual Port, they will change the same parameter on all other Virtual Ports that reside on the same Physical Port. Others apply only to the Virtual Port. A description of all the parameters is listed in Table 2-65.
- The total number of connection channels per card is shared by all interfaces on the card. The number of channels used by all the interfaces on a card cannot exceed the total number of channels on the card. The number of channels on a given interface is further limited by the port group to which it belongs.
- The number of port groups limits the number of channels that may be used on an interface. For example, consider an 8-port BXM card with two port groups and a total of *n* channels. Each port group may access a pool of *n*/2 channels. Each port may only access the channels in its port group, so each interface is limited to a maximum of *n*/2 channels.
- The total bandwidth per Physical Port is shared by all the Virtual Ports on that Physical Port. The bandwidth sum of all the Virtual Ports on the Physical Port cannot exceed the bandwidth of the Physical Port.
- Queue depth per port is shared by all the logical (Physical/Virtual Port/Trunk) interfaces on the card. The queues are dynamic, which allows oversubscription of the available queue space. The sum of all the configured queue depths may be larger than the available queue space on the card.
  - **a.** T1 (UXM card only) 3,622 cells/second
  - **b.** T3 (PLCP mode) (BXM) 96,000 cells/second
  - **c.** T3 (HEC/Direct mapping mode) (BXM) 104,000 cells/second
  - **d.** E3 (BXM) 80,000 cells/second
  - **e.** OC3 (BXM) 353,208 cells/second
  - **f.** OC12 (BXM) 1,412,830 cells/second
- Virtual Port traffic shaping is always ON, connection shaping is configurable per QoS.

cnfportq (configure port queue parameters)

Configures queue parameters for a port on an ASI or BXM card on the BPX, or a UXM card on the IGX. Pressing the Return key keeps the current value for the parameter.

You can use **cnfportq** to configure Qbin values separately for rt-VBR and nrt-VBR connection types on ports. (To configure the Qbin values for rt-VBR and nrt-VBR classes of service on trunks, use **cnftrkparm**.) The rt-VBR and nrt-VBR connections use different queues on a port: these are the rt-VBR and nrt-VBR queues, respectively.

For information on configuring trunk queues used by rt-VBR and nrt-VBR connections, see the **cnftrkparm** command.

The VBR class of service type can be either rt-VBR or nrt-VBR, depending on the way the corresponding port (service) queues (both ingress and egress) are configured. For the nrt-VBR class of service type in this release, the corresponding service queues are large enough to provide efficient bandwidth sharing with other non-real-time service types. The service queues for both rt-VBR and nrt-VBR service types can be configured on a node-by-node basis.

In Release 9.3.0, you can enable connection shaping for BXM queues. (See Hierarchical. Traffic Shaping on the BXM Card.)

Syntax

cnfportq <slot.port>[<.vport>] [<params>]

Parameters (ASI)

Parameter	Description
slot.port[.vport]	Specifies the card slot, physical, and optional virtual port number (BXM only). At this time, virtual ports are not available for ASI or UXM cards.
nni/uni	Specifies whether the cell header format is NNI or UNI. Default: UNI
cbr queue parms	Specifies the CBR queue parameters of depth, cbr-hi, cbr-lo, and efci. The ranges are 0 to 24000 for depth and 0 to 100% for all others.
nrt-vbr queue parms	Specifies the nrt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. The ranges are 0 to 24000 for depth and 0 to 100% for all others.
rt-vbr queue parms	Specifies the rt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. The ranges are 0 to 24000 for depth and 0 to 100% for all others.
ubr/abr queue parms	Specifies the ABR queue parameters of depth, abr-hi, abr-low, and efci. The ranges are 0 to 24000 for depth and 0 to 100% for all others.

Parameters (UXM)

Parameter	Description
slot.port[.vport]	Specifies the card slot, physical, and optional virtual port number (BXM only). At this time, virtual ports are not available for ASI or UXM cards.
nni/uni	Specifies whether the cell header format is NNI or UNI. UNI is the default.

Parameter	Description
cbr queue parms	Specifies the CBR queue parameters of depth, cbr-hi, cbr-lo, and efci. The ranges are 0 to 97250 for depth and 0 to 100% for all others.
nrt-vbr queue parms	Specifies the nrt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. The ranges are 0 to 97250 for depth and 0 to 100% for all others.
rt-vbr queue parms	Specifies the rt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. The ranges are 0 to 97250 for depth and 0 to 100% for all others.
ubr/abr queue parms	Specifies the ABR queue parameters of depth, abr-hi, abr-low, and efci. The ranges are 0 to 97250 for depth and 0 to 100% for all others. UBR traffic shares this queue with the ABR traffic.

The total queue size of the UXM card is 97250 cells.

Parameters (BXM)

Parameter	Description
slot.port[.vport]	Specifies the card slot, physical port, and optional virtual port (BXM card only). The optional vport identifier must be between 1-31 inclusive.
VC traffic shaping, connection shaping	Weighted fair queuing (WFQ) can be enabled on a per QoS/Qbin basis. This field is only configurable for BXM cards that support VC shaping. As of Release 9.3.0, VC shaping for BXM cards is no longer enabled on a per line bases. It is now done on a per Qbin/QoS basis. Enable/disable connection shaping within a virtual port. This feature is based on QoS. For example, all CBR connections can have traffic shaping, but all ABR connections may have traffic shaping disabled. The default setting is disabled.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
2	Yes	Yes	BPX, IGX			Yes	

Related Commands

upport, dnport, dspportq

Example (BPX)

Configure the port queue for port 6.3 on a BXM card.

cnfportq 6.3

```
sw167          TN    Cisco          BPX 8620  9.3.2R    Dec. 14 2000 08:59 PST

Port:       6.3     [ACTIVE  ]
Interface:         LM-BXM
Type:              UNI
AR Bandwidth:      353208 (cps)
          QUEUE    DEPTH    CLP HI  CLP LO  EFCI   VC SHAPE
                                    /EPD
             CBR   600       80%     60%     60%   DISABLED
          rt-VBR   5000      80%     60%     60%   DISABLED
         nrt-VBR   5000      80%     60%     60%   DISABLED
         UBR/ABR   20000     80%     60%     20%   DISABLED


Last Command: cnfportq 6.3
```

Example (IGX)

Configure the port queue for port 5.3 on a UXM card.

cnfportq 5.3

```
sw180          TN    Cisco          IGX 8420  9.3.p7    Dec. 14 2000 08:29 GMT

Port:       5.3     [ACTIVE  ]
Interface:         OC3
Type:              UNI
Speed:             353208 (cps)        Alloc Bandwidth:        353208 (cps)

CBR Queue Depth:              600      rt-VBR Queue Depth:              5000
CBR Queue CLP High Threshold: 80%      rt-VBR Queue CLP High Threshold: 80%
CBR Queue CLP Low Threshold:  60%      rt-VBR Queue CLP Low Threshold:  60%
CBR Queue EFCI Threshold:     60%      rt-VBR Queue EFCI Threshold:     60%
nrt-VBR Queue Depth:          5000     ABR Queue Depth:                 20000
nrt-VBR Queue CLP High Threshold: 80%   ABR Queue CLP High Threshold:    80%
nrt-VBR Queue CLP Low Threshold:  60%   ABR Queue CLP Low Threshold:     60%
nrt-VBR Queue EFCI Threshold: 60%      ABR Queue EFCI Threshold:        20%


Last Command: cnfportq 5.3
```

cnfportstats (configure port statistics collection)

Configures parameters for statistics collection on ports. The primary purpose of this command is debugging. Table 3-35 lists the configurable statistics for a Frame Relay port. For port statistics in general, refer to the actual **cnfportstats** screens on a node. Not all statistic types are applied to all ports.

Qbin statistics are Cells Served, Cells Discarded, and Cells Received.

Here is a summary of all Qbin statistics collected by the BPX and IGX:

- UXM and BXM Qbins 1–9 on Automatic Routing Management trunks.
- BXM Qbins 0–3, 9 on Automatic Routing Management ports.
- UXM Qbins 2,3, 7–9 on Automatic Routing Management ports.
- UXM and BXM Qbins 10–15 on VSI ports and trunks.

All other Qbins are unused, and the switch does not provide statistics for them. Starting in switch software release 9.3.10, the switch provides the collection of Qbin Cells Discarded statistics via SNMP for the above mentioned Qbins.

Syntax

cnfportstats <port> <stat> <interval> <eld> [<samples> <size> <peaks>]

Parameters

Parameter	Description
<port>	Specifies the port to configure.
<stat>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample. Range:1–255 minutes
<eld>	Enables/disables a statistic. E to enable; D to disable.
[samples]	Specifies the number of samples to collect. Range: 1–255
[size]	Specifies the number of bytes per data sample. Range: 1, 2 or 4
[peaks]	Enables the collection of one minute peaks. Y to enable; N to disable.

Table 3-35 Configurable Statistics for a Frame Relay Port

Type	Statistic
1–4	Total frames and bytes transmitted and received.
5–6	Frames transmitted with FECN and BECN set.
7–10	Frames received with problems: CRC errors, invalid format, frame alignment errors, wrong length frames.
11	Number of direct memory access (DMA) overruns on a Frame Relay port that are probably due to excessive user-data input.

Table 3-35 Configurable Statistics for a Frame Relay Port (continued)

Type	Statistic
12–17	LMI counts on UNI ports. These include status inquiries, status transmit and update requests, invalid inquiries, and LMI link time-outs.
18	Frames received with DLCIs in error.
19	Frames dropped with DE bit set.
20–24	LMI counts on NNI ports: status inquiries, status receive and update requests, LMI link time-outs, keep-alive sequence errors.
25–26	Frame and byte count totals for Consolidated Link Layer Message (CLLM) frames that transmit Optimized Bandwidth Management messages.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

cnftrkstats, dsportstathist, dsporterrs, dsptrkstathist, cnfstatparm, dspphyslnstats, dspphyslnstathist

Example (UXM on IGX)

cnfportstats 5.3

```
------------------------------------SCREEN 1-----------------------------------
sw180          TN    Cisco           IGX 8420  9.3.p7    Dec. 14 2000 07:57 GMT

Port Statistic Types

34) PORT: Unknwn VPI/VCI cnt            48) PORT: # of cells rcvd
35) VI: Cells rcvd w/CLP=1              49) PORT: # of cells xmt
36) VI: OAM cells received              51) INVMUX: HEC cell errors
37) VI: Cells tx w/CLP=1                52) INVMUX: LCP cell errors
39) VI: Cells received w/CLP=0          53) INVMUX: Cell Hunt Count
40) VI: Cells discarded w/CLP=0         54) INVMUX: Bandwidth Change Count
41) VI: Cells discarded w/CLP=1         55) ILMI: Get Req PDUs rcvd
42) VI: Cells transmitted w/CLP=0       56) ILMI: GetNxt Req PDUS rx
43) VI: OAM cells transmitted           57) ILMI: GetNxt Req PDUS xmt
44) VI: RM cells received               58) ILMI: Set Req PDUs rcvd
45) VI: RM cells transmitted            59) ILMI: Trap PDUs rcvd
46) VI: Cells transmitted               60) ILMI: Get Rsp PDUs rcvd
47) VI: Cells received                  61) ILMI: Get Req PDUs xmt

This Command: cnfportstats 5.3


Continue? y
```

```
------------------------------------SCREEN 2-----------------------------------
sw180          TN    Cisco          IGX 8420  9.3.p7    Dec. 14 2000 07:57 GMT

Port Statistic Types

62) ILMI: Get Rsp PDUs xmt          75) LMI: Invalid LMI PDU length rcvd
63) ILMI: Set Req PDUs xmt          76) LMI: Unknown LMI PDUs rcvd
64) ILMI: Trap PDUs xmt             77) LMI: Invalid LMI IE rcvd
65) ILMI: Unknwn PDUs rcvd          78) LMI: Invalid Transaction IDs
66) LMI: Status messages xmt        79) INVMUX: Unavailable Seconds
67) LMI: Updt Status msgs xmt       80) INVMUX: Near End Fail Count
68) LMI: Status Ack msgs xmt        81) INVMUX: Last Proto Fail Code
69) LMI: Status Enq msgs rcvd       82) INVMUX: Slowest Link
70) LMI: Status Enq msgs xmt        86) Q2 Cells Tx
71) LMI: Status msgs rcvd           87) Tx Q2 CDscd
72) LMI: Updt Status msg rcvd       88) Egr CRx Q2
73) LMI: Status Ack msg rcvd        89) Q3 Cells Tx
74) LMI: Invalid LMI PDUs rcvd      90) Tx Q3 CDscd

This Command: cnfportstats 5.3


Continue?  y

------------------------------------SCREEN 3-----------------------------------
sw180          TN    Cisco          IGX 8420  9.3.p7    Dec. 14 2000 07:58 GMT

Port Statistic Types

91) Egr CRx Q3                      113) Q11 Cells Tx
101) Q7 Cells Tx                    114) Tx Q11 CDscd
102) Tx Q7 CDscd                    115) Egr CRx Q11
103) Egr CRx Q7                     116) Q12 Cells Tx
104) Q8 Cells Tx                    117) Tx Q12 CDscd
105) Tx Q8 CDscd                    118) Egr CRx Q12
106) Egr CRx Q8                     119) Q13 Cells Tx
107) Q9 Cells Tx                    120) Tx Q13 CDscd
108) Tx Q9 CDscd                    121) Egr CRx Q13
109) Egr CRx Q9                     122) Q14 Cells Tx
110) Q10 Cells Tx                   123) Tx Q14 CDscd
111) Tx Q10 CDscd                   124) Egr CRx Q14
112) Egr CRx Q10                    125) Q15 Cells Tx

This Command: cnfportstats 5.3


Continue?  y

------------------------------------SCREEN 4-----------------------------------
sw180          TN    Cisco          IGX 8420  9.3.p7    Dec. 14 2000 07:59 GMT

Port Statistic Types

126) Tx Q15 CDscd
127) Egr CRx Q15





This Command: cnfportstats 5.3


Statistic Type:
```

Example (BXM on BPX) Node

cnfportstats 6.3

```
------------------------------------SCREEN 1-----------------------------------
sw167          TN    Cisco           BPX 8620  9.3.2R    Dec. 14 2000 08:14 PST

Port Statistic Types

 1) Unknown VPI/VCI count               24) Get Request PDUs transmitted
 8) Number of cells received            25) Get Response PDUs transmitted
 9) Number of cells rcvd w/CLP set      26) Trap PDUs transmitted
12) Number of cells xmitted             27) Unknown ILMI PDUs Received
13) OAM cells received count            28) Status messages transmitted
15) Number of cells xmitted w/CLP set   29) Update Status messages transmitted
18) Get Request PDUs received           30) Status Acknowledge msgs transmitted
19) Get Next Request PDUS received      31) Status Enquiry messages received
20) Get Next Request PDUS transmitted   32) Status Enquiry mesgs transmitted
21) Set Request PDUs received           33) Status messages received
22) Trap PDUs received                  34) Update Status messages received
23) Get Response PDUs received          35) Status Acknowledge messages received


This Command: cnfportstats 6.3


Continue?  y

------------------------------------SCREEN 2-----------------------------------
sw167          TN    Cisco           BPX 8620  9.3.2R    Dec. 14 2000 08:15 PST

Port Statistic Types

36) Invalid LMI PDUs received received  48) Last unknown VPI/VCI pair
37) Invalid LMI PDU length received     49) Tx Cells Served on Qbin 0
38) Unknown LMI PDUs received           50) Tx Cells Discarded on Qbin 0
39) Invalid LMI IE received             51) Tx Cells Received on Qbin 0
40) Invalid Transaction IDs             52) Tx Cells Served on Qbin 1
41) Number of cells rcvd w/clp 0        53) Tx Cells Discarded on Qbin 1
42) Number of cells dscd w/clp 0        54) Tx Cells Received on Qbin 1
43) Number of cells dscd w/clp set      55) Tx Cells Served on Qbin 2
44) Number of cells tx w/clp 0          56) Tx Cells Discarded on Qbin 2
45) Tx OAM cell count                   57) Tx Cells Received on Qbin 2
46) Rx RM cell count                    58) Tx Cells Served on Qbin 3
47) Tx RM cell count                    59) Tx Cells Discarded on Qbin 3


This Command: cnfportstats 6.3


Continue?  y

------------------------------------SCREEN 3-----------------------------------
sw167          TN    Cisco           BPX 8620  9.3.2R    Dec. 14 2000 08:16 PST

Port Statistic Types

60) Tx Cells Received on Qbin 3         87) Tx Cells Received on Qbin 12
76) Tx Cells Served on Qbin 9           88) Tx Cells Served on Qbin 13
77) Tx Cells Discarded on Qbin 9        89) Tx Cells Discarded on Qbin 13
78) Tx Cells Received on Qbin 9         90) Tx Cells Received on Qbin 13
79) Tx Cells Served on Qbin 10          91) Tx Cells Served on Qbin 14
80) Tx Cells Discarded on Qbin 10       92) Tx Cells Discarded on Qbin 14
81) Tx Cells Received on Qbin 10        93) Tx Cells Received on Qbin 14
```

```
82) Tx Cells Served on Qbin 11          94) Tx Cells Served on Qbin 15
83) Tx Cells Discarded on Qbin 11       95) Tx Cells Discarded on Qbin 15
84) Tx Cells Received on Qbin 11        96) Tx Cells Received on Qbin 15
85) Tx Cells Served on Qbin 12
86) Tx Cells Discarded on Qbin 12


This Command: cnfportstats 6.3


Statistic Type:
```

cnfpref (configured preferred route for connections)

Specifies the preferred route for a connection or range of connections. Enter **cnfpref** only at a node that is an end point of the connection. This command applies only to connections that exist *within* a domain. Do not attempt to execute **cnfpref** on connections that exist between domains.

The preferred route for a connection is used when possible. If the preferred route is different from the existing route, the connection automatically moves to the preferred route whenever network conditions allow (for example, when trunks are out of alarm and sufficient bandwidth exists).

Syntax

cnfpref <channel | *> <route + | -> [d]

Parameters

Parameter	Description
<channel | *>	Specifies the channel or range of channels for preferred route configuration. The channel specifier has one of the following formats: • Voice connection: *slot.channel* • Data connection: *slot.port* • Frame Relay connection: *slot.port.DLCI* A "*" specifies all locally owned connections and applies only to the "+" and "-".
<route + | ->	Designates the preferred route for the connection(s) to take through the network. The route is designated by one or more "trunk/node name" pairs. At a given node *alpha*, for example, entering a route of "12/delta 6/epsilon", would route the connection from alpha to delta via delta's trunk 12. The connection would then go from delta to epsilon via epsilon's trunk 6. A "+" causes the connection's current route to become the preferred route. A "-" removes the connection's preferred route designation.
[d]	Specifies directed routing. If the preferred route is not available, the connection is failed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

dsprts

Example

Select the preferred route for channel 14.1 to be through beta trunk 13 to beta then to gamma trunk 15. For gamma, the “d” in the command specifies that the route is *directed*.

cnfpref 14.1 13/beta 15/gamma d

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:22 PST

From 14.1          Route
14.1
          alpha   14--13beta    15--15gamma
Pref:(D)  alpha   14--13beta    15--15gamma



Last Command: cnfpref 14.1 13/beta 15/gamma d


Next Command:
```

Example

Remove the preferred route for channel 6.4.

cnfpref 6.4 -

Example

Designate the current routing of all locally owned connections to be the preferred routing. Using a “-” instead of a “+” in the command would remove the preferred routing designation of all locally owned connections.

cnfpref * +

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:48 PST

Chan/Grp  Route
5.1
          alpha   10-- 7beta
Pref:     alpha   10-- 7beta
9.1.100
          alpha   14--13beta    15--15gamma
Pref:     alpha   14--13beta    15--15gamma
9.1.200
          alpha   10-- 7beta    15--15gamma
Pref:     alpha   10-- 7beta    15--15gamma
9.2.400
          alpha   10-- 7beta
Pref:     alpha   10-- 7beta



Last Command: cnfpref * +


Next Command:
```

cnfprt (configure printing functions)

Configures the printing function. To obtain local or remote printing at a node, a printer must connect to the AUX PORT. Also, the configuration must include the correct baud rate and printer type for the port. Use the **cnfterm** and **cnftermfunc** commands to do this.

The **cnfprt** and **cnftermfunc** commands interact. If the auxiliary port on the node is configured for either an External Device Window or the Network Management Log, a "local" printing configuration automatically changes to "no printing." Printing is not possible because the auxiliary port is being used for another purpose.

Establishing a virtual terminal connection with a node does not affect the printing location established for the node that initiates the virtual terminal connection. For example, if node *alpha* is configured so that all alpha information goes to a printer at node *beta* and if *alpha* establishes a virtual terminal connection with node *gamma*, the results of print commands entered on the *alpha* keyboard still print at *beta*. Furthermore, this occurs regardless of the printing location configured for node *gamma*.

Syntax

cnfprt <mode> <remote node name>

Parameters

Parameter	Description
mode	Specifies the printing mode. Enter: "L" for local printing "R" for remote printing "n" for no printing
remote node name	Specifies the remote node whose printer is used for print commands issued by a user who is physically logged on to this node. This option is valid only when remote printing has been selected. A remote node is one within the domain, but not the node where the command is entered.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	Yes	BPX, IGX			Yes	

Related Commands

cnfterm, **dsptermfunc**

Example

Change the configured printing.

cnfprt

```
alpha          TRM   YourID:1        IGX 8410     9.3    Apr. 13 2000 13:17 PST


Printing Mode

Remote Printing at beta
Local Printing
No Printing






This Command: cnfprt


Select Local (l), Remote (r), or None (n):
```

cnfpwd (configure password)

Changes the password associated with a User ID. To change a password, you must log into the node with the User ID whose password you want to change. Passwords are case-sensitive.

In a structured network, each domain requires you to have a password. In each domain, your password and associated privilege level can be the same as or different from those in the other domains. For each domain, you can change the password at any node within the domain, including a junction node.

Syntax

cnfpwd <old password> <new password>

Parameters

Parameter	Description
<old password>	Specifies the old password.
<new password>	Specifies the new password. Passwords must have 6–15 characters. Only letters, numbers, "_", and "-" are allowed in a password. Spaces are not allowed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

dsppwd, **adduser**, **deluser**, **dspusers**

Example

Change your password.

cnfpwd

cnfqbin (configure Qbin)

Configure the Qbin (class of service buffers) on a selected UXM or BXM port, physical trunk, or virtual trunk. The **cnfqbin** command prompts you whether “template” should be used for Qbin parameters.

As an option, you can accept the default values from the interface service class template. For example, you can type in Yes when prompted whether the interface service class template (SCT) should be used, and the command will use the Qbin values from the Qbin templates. You will not be allowed to enter values for any Qbin parameter in this case. If you do not choose the template option, you can enter desired values.

When a VSI interface is activated, the default template (MPLS1) is assigned to an interface. The corresponding Qbin template is copied into the card Qbin data structure for that interface. When you want to change this, by giving new values using the **cnfQbin** command, the Qbin is now user configured as opposed to template configured. This information is displayed on the **dspQbin** screen. It indicates whether the values in the Qbin are from the template assigned to the interface OR the values have been changed to user-defined values.

There are 16 Qbins (numbered 0 through 15) per interface. Only Qbins 10–15 are used by VSI and they are the only VSI Qbins you can configure.

To fine tune traffic delay, use the **cnfqbin** command to adjust the thresholds for the traffic arriving in the VSI Qbins for a given interface.

If you use the **cnfqbin** command to set an existing Qbin to disabled, the egress of the connection traffic to the network is disabled. Re-enable the Qbin to restore the egress traffic.

Note Cell delay variation (CDV) is based on the Qbin depths and the transmission speed of the virtual switch interface. The default Qbin depths are specified in the service class templates (SCTs). You can configure the Qbin depths by using the **cnfqbin** command.
Cell tolerance delay (CTD), which is the fixed delay, is based on a fixed value, and is not configurable.

Syntax

cnfqbin <slot number>.<port number>.<vtrk>

Parameters (UXM)

Parameter	Description
slot.port.vtrk	Specifies the UXM card slot, port, and virtual trunk number.
Qbin ID	Specifies the ID number of the Qbin available for use by the LSC (MPLS Controller) for VSI. Range: 10–15
Enable Qbin	Answer yes or no to enable your Qbin configuration.
Qbin Discard Threshold	Specifies the Qbin depth in units of cells.
CLP Low Threshold	Specifies the threshold in percentage for CLP low. Range: 0–100

Parameter	Description
CLP High Threshold	Specifies the threshold in percentage for CLP high. Range: 0–100
EFCI threshold	Specifies the threshold in percentage for EFCI. Range: 0–100

Parameters (BXM)

Parameter	Description
slot.port	Specifies the BXM card slot and port number.
Qbin ID	Specifies the ID number of the Qbin available for use by VSI controller. Range: 10–15
Enable Qbin	Answer yes or no to enable your Qbin configuration.
Minimum Bandwidth	Specifies the minimum bandwidth in cells per second available for the Qbin. Range: 0–352207 Default: 0
Qbin Discard Threshold	Specifies the Qbin depth in units of cells.
CLP Low Threshold	Specifies the threshold in percentage for CLP low. Range: 0–100
CLP High Threshold	Specifies the threshold in percentage for CLP high. Range: 0–100
EFCI threshold	Specifies the threshold in percentage for EFCI. Range: 0–100
Template	Specifies that the interface service class template should be used to configure the Qbin parameters. Thus the **cnfqbin** command will use the card's Qbin values from the Qbin template. If you do not choose the template option, you can enter your preferred values for the Qbin parameters.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

dspqbin, dspqbint

Example (UXM)

Configure Qbin 10 for UXM port 3.1 on the IGX.

cnfqbin 3.1 10

```
bently         TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  13:30 PST

Qbin Database 3.1 on UXM Qbin 10        (Configured by MPLS1 Template)
                                        (EPD Enabled on this Qbin)

Qbin State:              Enabled
Discard Threshold:       65536 c9.3.10ells
EPD Threshold:           95%
High CLP Threshold:      100%
EFCI Threshold:          100%



This Command: cnfqbin 3.1 10


'E' to Enable, 'D' to Disable [E]:
```

Example (UXM)

Configure the Qbin 10 for port 3.1. Change the Discard Threshold from 65535 to 64000 and change Low EDP Threshold from 95% to 90%.

- **E** to Enable, **D** to Disable [E]: E
- Use default values from template?: N
- Qbin Discard threshold [65535]: 64000
- Low EPD threshold [95] (%): 90
- High CLP threshold [100] (%):
- EFCI threshold [100] (%)

cnfqbin 3.1 10

```
bently         TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  13:36 PST

Qbin Database 3.1 on UXM Qbin 10        (Configured by User)
                                        (EPD Enabled on this Qbin)

Qbin State:              Enabled
Discard Threshold:       64000 cells
EPD Threshold:           90%
High CLP Threshold:      100%
EFCI Threshold:          100%



Last Command: cnfqbin 3.1 10 E N 64000 90 100 100


Next Command:
                                                                   Minor Alarm
```

Example

You can also set the previous parameters for Qbin 15:

cnfqbin **`3.1 15 E N 64000 90 100 100`**

```
bently         TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  13:39 PST

Qbin Database 3.1 on UXM Qbin 15        (Configured by User)
                                        (EPD Enabled on this Qbin)

Qbin State:              Enabled
Discard Threshold:       64000 cells
EPD Threshold:           95%
High CLP Threshold:      100%
EFCI Threshold:          100%



Last Command: cnfqbin 3.1 15 E N 64000 95 100 100


Next Command:
```

Example (BXM)

Configure the parameters of Qbin 10 on BXM OC-3 port 4.1.

cnfqbin 14.1 10

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  17:01 GMT

Qbin Database 4.1 on BXM Qbin 10        (Configured by MPLS1 Template)
                                        (EPD Enabled on this Qbin)

Qbin State:              Enabled
Discard Threshold:       105920 cells
EPD Threshold:           95%
High CLP Threshold:      100%
EFCI Threshold:          100%



This Command: cnfqbin 4.1 10


'E' to Enable, 'D' to Disable [E]:
```

Example (BXM)

Configure Qbin 11 for BXM OC-3 trunk 4.2. Change the Qbin Discard threshold from 105920 to 100000 cells.

- E to Enable, D to Disable [E]: E
- Use default values from template?: N
- Qbin Discard threshold [105920]: 100000
- Low EPD threshold [95] (%)
- High CLP threshold [100] (%):
- EFCI threshold [100] (%):

cnfqbin 4.2 11

```
sw143          TRM   Cisco          BPX 8620  9.3.10    Aug. 2 2000  17:10 GMT

Qbin Database 4.2 on BXM Qbin 11         (Configured by User)
                                         (EPD Enabled on this Qbin)

Qbin State:               Enabled
Discard Threshold:        100000 cells
EPD Threshold:            95%
High CLP Threshold:       100%
EFCI Threshold:           100%


Last Command: cnfqbin 4.2 11 E N 100000 95 100 100
```

Example (BXM)

You can also set the previous parameters for Qbin 15:

cnfqbin 4.2 15 E N 100000 95 100 100

```
sw143          TRM   Cisco          BPX 8620  9.3.10    Aug. 2 2000  17:16 GMT

Qbin Database 4.2 on BXM Qbin 15         (Configured by User)
                                         (EPD Enabled on this Qbin)

Qbin State:               Enabled
Discard Threshold:        100000 cells
EPD Threshold:            95%
High CLP Threshold:       100%
EFCI Threshold:           100%


Last Command: cnfqbin 4.2 15 E N 100000 95 100 100


Next Command:
```

Qbin Dependencies

The available Qbin parameters are shown in Table 3-36. Notice that the Qbins available for VSI are restricted to Qbins 10–15 for that interface.

There are 9 Qbin templates. Each Qbin template is associated with one corresponding service class template. For Qbin default settings, see Table 3-37.

Only MPLS1 (template 1) may be used with IGX.

Table 3-36 Available Qbin Parameters

Template Object Name	Template Units	Template Range/Values
Qbin Number	enumeration	0–15 (10–15 valid for VSI)
Max Qbin Threshold	msec	1–2000000
Qbin CLP High Threshold	% of max Qbin threshold	0–100
Qbin CLP Low Threshold	% of max Qbin threshold	0–100
EFCI Threshold	% of max Qbin threshold	0–100

Table 3-36 Available Qbin Parameters (continued)

Template Object Name	Template Units	Template Range/Values
Discard Selection	enumeration	1: CLP Hysteresis 2: Frame Discard
Weighted Fair Queueing	enable/disable	0: Disable 1: Enable

Table 3-37 lists **cnfqbin** parameters with possible values and ranges.

Table 3-37 Qbin Default Settings

Qbin	Max Qbin Threshold (usec)	CLP High	CLP Low/EPD	EFCI	Discard Selection
LABEL **Template 1**					
10 (Null, Signaling, Tag0,4)	300,000	100%	95%	100%	EPD
11 (Tag1,5)	300,000	100%	95%	100%	EPD
12 (Tag2,6)	300,000	100%	95%	100%	EPD
13 (Default, Tag3,7)	300,000	100%	95%	100%	EPD
14 (Tag Abr)	300,000	100%	95%	6%	EPD
15 (Tag unused)	300,000	100%	95%	100%	EPD
PNNI **Templates 2 (with policing) and 3**					
10 (Null, CBR)	4200	80%	60%	100%	CLP
11 (VbrRt)	53000	80%	60%	100%	EPD
12 (VbrNrt, Signaling)	53000	80%	60%	100%	EPD
13 (Default, Ubr)	105000	80%	60%	100%	EPD
14 (Abr)	105000	80%	60%	20%	EPD
15 (Unused)	105000	80%	60%	100%	EPD
Full Support for ATMF and reduced support for Tag CoS without Tag-Abr **Templates 4 (with policing) and 5**					
10 (Tag 0,4,1,5, Default, UBR, Tag-Abr*)	300,000	100%	95%	100%	EPD
11 (VbrRt)	53000	80%	60%	100%	EPD
12 (VbrNrt, Signaling)	53000	80%	60%	100%	EPD
13 (Tag 2,6,3,7)	300,000	100%	95%	100%	EPD
14 (Abr)	105000	80%	60%	20%	EPD
15 (Cbr)	4200	80%	60%	100%	CLP
Full Support for Tag ABR and ATMF without Tag CoS **Templates 6 (with policing) and 7**					

Table 3-37 Qbin Default Settings (continued)

Qbin	Max Qbin Threshold (usec)	CLP High	CLP Low/EPD	EFCI	Discard Selection
10 (Tag 0,4,1,5,2,6,3,7 Default, UBR)	300,000	100%	95%	100%	EPD
11 (VbrRt)	53000	80%	60%	100%	EPD
12 (VbrNrt, Signaling)	53000	80%	60%	100%	EPD
13 (Tag-Abr)	300,000	100%	95%	6%	EPD
14 (Abr)	105000	80%	60%	20%	EPD
15 (Cbr)	4200	80%	60%	100%	CLP
Full Support for Tag CoS and reduced support for ATMF					
Templates 8 (with policing) and 9					
10 (Cbr, Vbr-rt)	4200	80%	60%	100%	CLP
11 (Vbr-nrt, Abr, Signaling)	53000	80%	60%	20%	EPD
12 (Ubr, Tag 0,4)	300,000	100%	95%	100%	EPD
13 (Tag 1, 5, Tag-Abr)	300,000	100%	95%	6%	EPD
14 (Tag 2,6)	300,000	100%	95%	100%	EPD
15 (Tag 3, 7)	300,000	100%	95%	100%	EPD

cnfrcvsig (configure receive signaling)

Configures the receive signaling bits for a voice channel. Channel signaling bit options are:

- t (transparent)
- 0
- 1
- I (invert)

If signaling is set to “not used” (-) by using **cnfchtp**, the following condition is maintained: A=1, B=1, C=0, D=1.

Syntax

cnfrcvsig <channel(s)> <[A/]Conv> <[B/]Conv> <[C/]Conv> <[D/]Conv>

Parameters

Parameter	Description
channel	Specifies the channel or range of channels to receive signaling.
A/	Optionally specifies the conversion applied to the A bit. <Conv> can be one of: 1:bit is asserted. 0:bit is inhibited. T:bit is passed transparently. I:bit is inverted.
B/	Optionally specifies the conversion applied to the B bit.
C/	Optionally specifies the conversion applied to the C bit.
D/	Optionally specifies the conversion applies to the D bit.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnfxmtsig, dspsigqual

Example

Configure channel 8.1 signaling to transparent for the A-bit, inhibited for the B-bit, inverted for the C-bit and D-bits.

cnfrcvsig 8.1 A/T B/0 C/I D/I

```
beta           TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:36 MST

                                Signaling Qualifiers
From 8.1     TXA-bit  TXB-bit  TXC-bit  TXD-bit  RXA-bit RXB-bit RXC-bit RXD-bit
8.1          T       T       T       T       T      0      I      I
8.2-31       T       T       T       T       T      T      T      T




Last Command: cnfrcvsig 8.1 A/T B/0 C/I D/I


Next Command:
```

cnfrobparm (configure robust alarms parameters)

Sets parameters associated with the Robust Alarms feature. Robust Alarms is a protocol for node-to-Network Management System (NMS) communications. When a node has statistics or alarm information for the NMS, it requires a confirmation from the NMS that the database has been updated.

In Release 9.2 and higher, there are robust alarms for certain alarm conditions that appear in the maintenance log or in the node user interface but are not also reported as SNMP traps to the customer NMS. (Such traps are generated by the Cisco WAN Manager RTM proxy upon receiving Robust Alarms from a switch.) Robust Alarm messages are generated by the following alarm conditions:

- Power supply, temperature, fan, and DC voltage level alarms
- Connection AIS alarm
- Bus failure
- External clock source failure
- Multiple invalid login attempts on a user port
- Excessive CPU and memory usage on switch processor card

The BPX and the IGX generate power supply, temperature, and fan alarms.

Syntax

cnfrobparm <index> <value>

Parameters

Parameter	Description
<index>	Specifies the parameter to configure.
<value>	Specifies new value to be entered for the parameter.

Parameter Values

No.	Parameter	Description	Default
1	Robust State wakeup timer	The Robust State machine becomes active after the specified time period has elapsed. If this timer value increases, the state machine operates less often and places less load on the controller card. Units of measure are seconds.	10 seconds
2	Robust update timer	Once a message has gone to the NMS, another message does not go until this timer expires. Units of measure are seconds.	10 seconds
3	Robust acknowledgment time-out	An acknowledgment must be returned by the NMS within this time period or it is assumed the communications link is down. Units of measure are seconds.	600 seconds
4	Robust acknowledgment reset timeout	After a downed link has been repaired, the next message goes out after this time period has elapsed. The purpose of this time period is to let the link settle after the repair. Units of measure are seconds.	60 seconds

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			Yes	

Example (IGX)

cnfrobparm

```
a34          TRM   SuperUser        IGX 8420    9.3     Apr. 13 2000 15:02 PDT

                           Robust Parameters

1  Robust State wakeup timer (sec) ..................................10
2  Robust update timer (sec) ........................................10
3  Robust acknowledge timeout (sec) .................................600
4  Robust acknowledge reset timeout (sec) ...........................60




This Command: cnfrobparm


Which parameter do you wish to change:
```

cnfrrcpu (configure CPU-based reroute throttling level parameters)

When the CPU utilization exceeds the defined threshold, routing is suspended. Throttling thresholds can be independently set for master, via, and slave routing. In addition, a hysteresis mechanism is provided to prevent excessing oscillation, using the parameter <resume_diff>).

Note Throttling is based on the CPU utilization of the TRNS task and all tasks with the same or higher priority. Hence, activity of low-priority tasks such as FAIL or SNMP will not cause routing to be throttled.

Syntax

cnfrrcpu <m_cpu> <v_cpu> <s_cpu> <resume_diff>

Parameters

Parameter	Description
<m_cpu>	Specifies the % CPU utilization above which master routing will be suppressed. Range: 0–100 Default: 0
<v_cpu>	Specifies the% CPU utilization (TRNS+higher) above which via routing will be suppressed. Range: 0–100 Default: 0
<s_cpu>	Specifies the % CPU utilization (TRNS+higher) above which slave routing will be suppressed. Range: 0–100 Default: 0
<resume_diff>	Specifies the difference between suppression threshold and resume threshold; once routing (of any type) is suppressed, routing will not resume until the CPU utilization (TRNS+higher) drops below (threshold–resume diff)% Range: 0–to (MIN{m_cpu, v_cpu, s_cpu} - 25) Default: 0

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	OK	BPX, IGX	No	OK	No	OK

Example (IGX)

```
sws5           TRM   Cisco           IGX 8420  9.3.f5    Aug. 24 2001 0746 GMT

Master CPU Throttle Level (% CPU)      80
Via    CPU Throttle Level (% CPU)     100
Slave  CPU Throttle Level (% CPU)     100
CPU Resume Difference     (% CPU)      10



    NOTE %CPU refers to CPU utilization by TRNS and higher-priority tasks
```

cnfrsrc (configure resource)

Use the **cnfrsrc** command to partition resources for:

- Automatic Routing Management PVCs
- VSI-MPLS (Multiprotocol Label Switching)
- VSI-PNNI (Private Network to Network Interface)

If you want to configure resources for a VSI-MPLS controller or PNNI SVCs, refer to the subsequent BPX- and IGX-specific command definitions.

Up to two controllers of the same type can be attached to a node and assigned the same partition to provide controller redundancy on that partition. A different set of controllers can be attached to the node and be assigned a different partition to provide controller redundancy on this second partition.

You can configure a virtual trunk to be dedicated to VSI or to Automatic Routing Management. You cannot configure a virtual trunk for both VSI and Automatic Routing Management.

This command supports physical trunks and virtual trunks. After VSI has been enabled, the virtual trunk becomes a "dedicated" VSI virtual trunk. If the trunk has already been added or if the VPI value has not been configured, switch software will prevent you from configuring the VPI value.

The switch software:

- Allows start VPI = 0 for a VSI partition on a port interface, or feeder trunk interface.
- Prevents a second VSI partition from being enabled on a port interface if the first VSI partition uses a start VPI = 0.
- In release 9.2.30 and release 9.3.0, prevents a VSI partition from being disabled on a trunk interface if a PNNI controller is attached to the trunk interface controlling partition being disabled. This restriction has been removed starting with Release 9.3.05) going forward.

Configurable Resources

You can use **cnfrsrc** to configure these resources:

- Template number (new field in Release 9.2)
- Maximum PVC LCNs
- Maximum PVC Bandwidth
- Configure PVC VIP ranges (Y/N)
- Start of PVC VPI range 1
- End of PVC VPI range 1
- Start of PVC VPI range 2
- End of PVC VPI range 2
- Start of PVC VPI range 3
- End of PVC VPI range 3
- Start of PVC VPI range 4
- End of PVC VPI range 4
- Configure Partition (Y/N)
- Partition ID

- Enable Partition (Enable/Disable)
- Minimum VSI LCNs
- Maximum VSI LCNs
- Start VSI VPI
- End VSI VPI - **Warning message will tell you that the end VSI VPI is equal to the start VSI VPI for virtual trunks**
- Minimum VSI Bandwidth
- Maximum VSI Bandwidth

The resources that you can configure are the number of connection IDs (conids) and the trunk bandwidth. You use the **cnfrsrc** command to configure the cell rate and number of connections on a BXM card only. (You cannot use the **cnfrsrc** command on the IGX.)

You configure all port and trunk attributes by using **cnftrk**, **cnftrkparm**, or **cnfrsrc**. When you change a physical port attribute, you are notified that all the logical (physical and virtual) trunks on the port are affected.

When using **cnfrsrc** to configure partition resources for Automatic Routing Management PVCs, you are prompted whether you want to configure VSI options. Enter "n" for No. You will not be prompted to enter any VSI options.

Use the **cnfrsrc** command to configure conids (lcns) and bandwidth. The conid capacity indicates the number of connection channels on the trunk port which are usable by the virtual trunk.

This number cannot be greater than the total number of connection channels on the card. The maximum number of channels is additionally limited by the number of VCI bits in the UNI cell header. For a virtual trunk, the number is divided by the maximum number of virtual trunks on the port to determine the default. Use the **cnfsrc** command to configure this value on the BPX. Table 3-38 lists the number of connection IDs for virtual trunks on various cards.

Table 3-38 Maximum Connection IDs (LCNs)

Port Type	Maximum Conids	Default
BXM/UXM	1–(number of channels on the card)	256
BNI T3/E3	1–1771	256
BNI OC-3	1–15867 (3837 max/vtrk	256

Syntax

cnfrsrc <slot>.<port> <.vport> <maxpvclcns> <maxpvcbw> <partition> <eld> <minvsilcns> <maxvsilcns> <vsistartvpi> <vsiendvpi><vsiminbw> <vsimaxbw>

Parameters

Parameter	Description
slot.port.vtrk	Specifies the BXM card slot and port number and virtual trunk.
Maximum PVC LCNs	The maximum number of LCNs allocated for Automatic Routing Management PVCs for this port. The range depends upon the card type; (1-11771 for the BNI T/E3 and 1-15867 for the BNI OC) 256 is the default. The default is 256 only if 256 are available. If other ports and trunks on the card have been configured to use LCNs such that there are only 100 remaining, then the default value for the newly added port would be 100. In this instance trunk upping would be blocked indicating that there are not enough LCNs to support the trunk. For trunks, there are additional LCNs allocated for Automatic Routing Management that are not configurable. You can use the **dspcd** <slot> command to display the maximum number of LCNs you can configure using the **cnfrsrc** command for the given port. For trunks, configurable LCNs represent the LCNs remaining after the BCC has subtracted the networking LCNs needed. A trunk has 270 networking LCNs, or channels. You can use the **dspcd** command to display VSI channels also. For a port card, a larger number is shown, as compared with a trunk card. This is because a trunk uses 270 networking LCNs, as compared with a port card, which uses no networking LCNs. You can use **dspcd** to display VSI channels also. Setting this field to "0" would disable Automatic Routing Management PVCs on the specified port. **Note** You *must* specify a value greater than 0 for the Maximum PVC LCNs, Maximum PVC Bandwidth, and Maximum VSI LCNs parameters. Otherwise, you will not be able to create any Automatic Routing Management connections on a BXM card. Also, if these parameters do not have values greater than 0, you will be unable to change the connection channel amount when you configure the BXM trunk by using **cnftrk**. **Logical Interface** (**slot.port [.vtrk] for trunks and slot.port for lines**). The bandwidth is **logical interface** based. Default: the line rate of this interface.

Parameter	Description
Maximum PVC Bandwidth	Specifies the maximum bandwidth of the port allocated for Automatic Routing Management use depends upon the card type; (1-11771 for the BNI T/E3 and 1-15867 for the BNI OC); 256 is the default. The default is 256 only if 256 is available. If other ports and trunks on the card have been configured to use LCNs such that there are only 100 remaining, then the default value for the newly added port would be 100. In this instance trunk upping would be blocked indicating that there are not enough LCNs to support the trunk. You can configure the Maximum PVC Bandwidth value for ports, but not for trunks. **Note** You must specify a value greater than 0 for the Maximum PVC LCNs, Maximum PVC Bandwidth, and Maximum VSI LCNs parameters. Otherwise, you will not be able to create any Automatic Routing Management PVCs on the BXM card. **Note** Changing the line framing for BXM-T3 cards from PLCP to HEC no longer automatically changes the port's bandwidth to the new maximum. It merely raises the upper limit for the port's bandwidth. After changing the framing, you must use **cnfport** to increase the port's bandwidth, and **cnfrsrc** to increase the port's Automatic Routing Management bandwidth (PVC Max Bandwidth). You can define the PVC VPI ranges for Automatic Routing Management connections by using the **cnfrsrc** command. However, overlapping of the PVC and VSI VPI ranges are allowed only on a physical port or feeder trunk interface. When configuring the overlapping ranges, you will receive a warning of "Warning - VPI overlaps with AR range x". The command will be stopped if you answer **y** and will proceed if you answers **n**. The **cnfrsrc** screen contains a warning message: Note that the "*" next to the VPI fields indicate the overlapping PVC (Automatic Routing Management and VSI VPI ranges).
Configure PVC VCI Range	You will be prompted when configuring a port or feeder trunk only. Answer Yes or No to begin configuring the PVC VPI range. Enter Y if you are migrating PVCs on this interface to PNNI SPVCs, otherwise answer N. If you enter Y, you will be prompted for the four PVC VPI ranges.
Start of PVC VPI range x	You can define 4 VPI ranges. ALl the existing PVCs have to be using a VPI in one of the defined PVC VIP ranges.
End of PVC VPI range x	Together with Start of PVC VPI range, it defines a VPI range for PVCs.
Configure Partition	Answer yes or no to begin configuring resources for the partition. To configure Automatic Routing Management PVCs, enter n for No. You will not be prompted to enter VSI options to configure VSI partition resources. However, if you want to configure VSI options, enter y for yes, and you will be prompted to configure partition resources for VSI. (Refer to the command cnfrsrc (configure VSI resources for IGX), page 3-382 and cnfrsrc (configuring VSI resources for BPX), page 3-389 for more information on VSI-related options
Partition ID	Specifies the ID number of the partition. In previous releases, use 1. In release 9.1, use 1 for the partition ID. Default: 0 Range: 1 – 3

Parameter	Description
Enable Partition	Answer yes or no to enable your configured partition.
Minimum VSI LCNs	The minimum number of LCNs guaranteed for this partition. Range is from 0 to card limit: 0 is the default. The VSI controller guarantees at least this many connection endpoints in the partition, provided there are sufficient free LCNs in the common pool to satisfy the request at the time the partition is added. When a new partition is added or the value is increased, it may be that existing connections have depleted the common pool so that there are not enough free LCNs to satisfy the request. The BXM gives priority to the request when LCNs are freed. The net effect is that the partition may not receive all the guaranteed LCNs (min LCNs) until other LCNs are returned to the common pool. You can increase this value dynamically when there are enough unallocated LCNs in the port group to satisfy the increase. You may not decrease the value dynamically. All partitions in the same port group must be deleted first and reconfigured in order to reduce this value. To avoid this deficit condition, which could occur with maximum LCN usage by a partition or partitions, it is recommended that all partitions be configured ahead of time before adding connections. Also, it is recommended that all partitions be configured before adding a VSI controller by using the **addshelf** command.
Maximum VSI LCNs	The total number of LCNs the partition is allowed for setting up connections. The min LCNs is included in this calculation. If max LCNs equals min LCNs, then the max LCNs are guaranteed for this partition. Otherwise, (max – min) LCNs are allocated from the common pool on a FIFO basis. If the common pool is exhausted, new connection setup requests will be rejected for the partition, even though the maximum LCNs has not been reached. You may increase this value dynamically when there are enough unallocated LCNs in the port group to satisfy the increase. You may not decrease the value dynamically. All partitions in the same port group must be deleted first and reconfigured in order to reduce this value. Different types of BXM cards support different maximum values. If you enter a value greater than the allowed maximum, a message is displayed with the allowable maximum value. **Note** You must specify a value greater than 0 for the Maximum VSI LCNs, Maximum PVC Channels, and Maximum PVC Bandwidth parameters. Otherwise, you will not be able to add any connections on a BXM card.

Parameter	Description
Start VSI VPI	By default the LSC (for example, the 6400, 7200 or 7500 series router) will use either a starting VSI VPI of 1 or 2 for MPLS, whichever is available. If both are available, a starting VSI VPI of 1 is used. The VPI range should be 2–15 on a BPX 8620 VSI. The VSI range for MPLS on the BPX 8620 is configured as a VSI partition, usually VSI partition number 1. VSI VPI 1 is reserved for Automatic Routing Management PVCs. (This restriction applies only to trunks, not to ports. For a port, you can use any VPI value.) For a port UNI, the VPI range is 1 to 255. For a port NNI, the range is 1 to 4095. For trunks that do not have Automatic Routing Management configured, the VPI ranges are the same as for ports. The VSI partition for MPLS should start at VPI 2. If VPI 2 is not to be used, you can use the MPLS VPI interface configuration on the LSC to override the defaults. For trunks with Automatic Routing Management configured, the range is 2 to 4095. Always set to 2 for trunks. For ports in port mode it should be set to “1”. By default the LSC (for example, 6400, 7200 or 7500 series router) will use either a starting VSI VPI of 1 or 2 for label switching, whichever is available. Default: 1
End VSI VPI	Two VPIs are sufficient, although it may be advisable to reserve a larger range of VPIs for later expansion, for example, VPIs 2–15. Range: <*Start VSI VPI* > value to 4095.
Minimum VSI Bandwidth	The minimum port bandwidth that can be used by this partition in cells per second. Range: 0 to <*Maximum Line Rate*>. For example, the OC-3 line rate is 352207. Default: 0
Maximum VSI Bandwidth	The maximum port bandwidth that can be used by this partition. This value is used for VSI Qbin bandwidth scaling. Range: 0 to <*Maximum Line Rate*>. For example, the OC-3 line rate is 352207. Default: 0

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX (BXM cards only)			No	

Related Commands

dsprsrc

Example

Configure resource for port 9.1, to use Automatic Routing Management PVCs.

cnfrsrc 9.1 256 9600 N N

```
sw215          TN    Cisco          BPX 8620  9.3.f9    May  31 2000 15:29 GMT

Port : 9.1
                                      Full Port Bandwidth: 96000
Maximum PVC LCNS:            256     Maximum PVC Bandwidth: 96000
                                      (CAC Reserve: 0)

PVC VPI RANGE [1]:   -1    /-1        PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Disabled          Disabled          Disabled
  VSI LCNS (min/max):  0      /0         0      /0         0      /0
 VSI VPI (start/end):  0     /0          0     /0          0     /0
    VSI BW (min/max):  0      /0         0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR


Last Command: cnfrsrc 9.1 256 96000 N N


Next Command:
```

Example

Configure the resource of a virtual port 9.6.1 on the BXM card in slot 9 with a maximum of 256 PVC LCNS and a bandwidth of 3096.

cnfrsrc 9.6.1 256 3096

```
w215          TN    Cisco          BPX 8620  9.3.f9    May  31 2000 15:28 GMT

Port : 9.6.1
                                      Full Port Bandwidth: 3096
Maximum PVC LCNS:            256     Maximum PVC Bandwidth: 3096
                                      (CAC Reserve: 0)

PVC VPI RANGE [1]:   -1    /-1        PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Disabled          Disabled          Disabled
  VSI LCNS (min/max):  0      /0         0      /0         0      /0
 VSI VPI (start/end):  0     /0          0     /0          0     /0
    VSI BW (min/max):  0      /0         0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR


Last Command: cnfrsrc 9.6.1 256 3096


Next Command:
```

cnfrsrc (configure VSI resources for IGX)

Configures resources on ports, physical trunks, and virtual trunks.

This command supports both physical trunks and virtual trunks. After VSI has been enabled, the virtual trunk becomes a “dedicated” VSI virtual trunk.

The switch software will prevent you from configuring VSI:

- if the virtual trunk has already been added; or
- if the VPI value has not been configured.

You can configure a virtual trunk to be dedicated to VSI or to Automatic Routing Management. You cannot configure a virtual trunk for both VSI and Automatic Routing Management.

Syntax

cnfrsrc <slot.port.vtrk>

or

cnfrsrc <slot>.<port>.<vtrk> <maxpvclcns> <maxpvcbw> <partition> <e/d> <minvsilcns> <maxvsilcns> <vsistartvpi> <vsiendvpi><vsiminbw> <vsimaxbw>

Parameters

Parameter	Description
slot.port.vtrk	Specifies the UXM card slot and port number and virtual trunk.
Maximum PVC LCNs	The maximum number of LCNs allocated for Automatic Routing Management PVCs for this port. Range: 1–8000 Default: 256 You can use the **dspcd** <slot> command to display the maximum number of LCNs you can configure using the **cnfrsrc** command for the given port. For trunks, configurable LCNs represent the LCNs remaining after the NPM card has subtracted the networking LCNs needed. A trunk has 270 networking LCNs, or channels. By default, when a port or trunk is upped, in addition to the 256 PVC LCNs, 200 Gateway LCNs are allocated for that port/trunk. The Gateway LCNs are used for non-UXM to UXM connections (like Frame Relay or ATFR). When PVC LCNs are reduced using the **cnfrsrc** command, the Gateway LCNs are also reduced so that it is always less than the PVC LCNs. However, when PVC LCNs are increased, the Gateway LCNs are not increased. Use the command **dspchuse** to display the channel usage for all ports, trunks, and virtual trunks of a given slot. Setting this field to “0” would disable Automatic Routing Management PVCs on the specified port. **Note** You must specify a value greater than 0 for the Maximum PVC LCNs and Maximum PVC Bandwidth. Otherwise, you will not be able to create any Automatic Routing Management connections on that UXM port or trunk.

Parameter	Description
Maximum PVC Bandwidth	Specifies the maximum bandwidth of the port allocated for Automatic Routing Management use. You can configure the maximum PVC Bandwidth value for ports, but not for trunks. Range: 0–352207 Default: The bandwidth is based on the logical interface (slot.port). The default value for this object is the line rate of this interface. Card Type | Bandwidth --- UXM E3 | 80000 UXM T3 | 96000 UXM OC-3 | 353208 UXM E1 | 4528 UXM T1 | 3622 You must specify a value greater than 0 for the maximum PVC LCNs and maximum PVC Bandwidth. Otherwise, you will not be able to create Automatic Routing Management PVCs on the UXM port or trunk. This parameter is not prompted and is not configurable for trunks and virtual trunks.
Edit VSI Parms?	To configure AR PVCs or AR bandwidth only, enter **n** for No. You will not be prompted to enter VSI options to configure VSI partition resources. However, if you want to configure VSI options, enter **y** for yes, and you will be prompted to configure partition resources for VSI.
Partition ID	Specifies the ID number of the partition. Range: 1–3
Enable Partition	Answer **e** to enable or d to disable your configured partition.
Minimum VSI LCNs	The minimum number of LCNs guaranteed for this partition. Range: 0–8000 Default: 0 If there are not enough LCNs on the slot to guarantee this minimum number, the switch software will prompt you with the number of available LCNs. You can increase this value dynamically when there are enough unallocated LCNs on the slot to satisfy the increase.
Maximum VSI LCNs	The total number of LCNs the partition is allowed for setting up connections. You may increase or decrease this value dynamically when there are enough unallocated LCNs on the slot to satisfy the change. Note that you must specify a value greater than 0 for the maximum VSI LCNs. Otherwise, you will not be able to add any VSI connections on that partition.

Parameter	Description
Start VSI VPI	VSI connections on this partition start from this VPI. Range: Port UNI: 0–255 Port NNI: 0–4095 Trunk with Automatic Routing Management configured: 2–4095 Trunk with NNI and no Automatic Routing Management configured: 1–4095 Trunk with UNI: 2–255 If the specified VPI is used by Automatic Routing Management connections or the control channel of the VSI controller, a warning will appear and then a prompt for the Start VSI VPI.
End VSI VPI	VSI connections on this partition can use VPIs up to this VPI. The End VSI VPI should be equal to or greater than the Start VSI VPI.
Minimum VSI Bandwidth	The minimum port bandwidth that can be used by this partition in cells per second. Range: 0 to <*Maximum Line Rate*>. For example, the OC-3 line rate is 352207. Default: 0
Maximum VSI Bandwidth	The maximum port bandwidth that can be used by this partition. Range: 0 to <*Maximum Line Rate*>. For example, the OC-3 line rate is 352207. Default: 0

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

dsprsrc

Increasing the Number of VSI LCNs Guaranteed for a VSI Partition

You can increase the number of LCNs guaranteed for a given VSI partition by increasing the Minimum VSI LCNs of the desired partition.

If the new number does not cause the total VSI LCNs to be increased (that is, if your want to increase the minimum VSI LCNs at the expense of the common pool), the request will be denied if there isn't enough free VSI LCNs in the common pool. The UXM card cannot find enough free VSI LCNs to give to the specified partition. More AR LCNs must be made available to VSI for the request to succeed. The **cnfrsrc** will display a message: **Resource not available, maximum available LCN(s) is 50. 100 more LCN needed.** This indicates the number of AR LCNs that should be made available to the VSI.

cnfrsrc 12.1 256 20000 y 1 e 900 1500 300 400 4000 6000

Decreasing the VSI LCNs

You can decrease the VSI LCN range in order to make more LCNs available to AR:

- If the formula result used to compute the number of VSI LCNs, was obtained by using the Minimum VSI LCNs, then you can decrease the VSI LCN range by decreasing the Minimum VSI LCNs of any VSI partition.
- If the formula result was obtained by using the Maximum VSI LCNs, then you can decrease the VSI LCN range by decreasing the Maximum VSI LCNs of the VSI partition whose max was used to get the result of the formula.

In some cases, decreasing the VSI LCN range will fail because there are not enough free VSI LCNs to give to AR. The **cnfrsrc** command will display a failure message giving the number of VSI channels that can be made available to AR (There are only 100 free VSI channels). You can then re-execute the **cnfrsrc** requesting a smaller number of VSI LCNs to be given to AR.

If you must give more VSI LCNs to AR than what is currently free, go to the VSI master and delete or re-route the necessary number of VSI connections to free up the required VSI LCNs by executing the proper commands on the VSI master. You can then reattempt the **cnfrsrc** command.

Sometimes the LCNs that were freed by the VSI master are reused prior to reexecuting the **cnfrsrc** command. You can delete more connections on the VSI master than what is required. Or you can freeze the VSI master so that it does not add any new VSI connections until the **cnfrsrc** command is reexecuted.

cnfrsrc 12.1 256 20000 y 1 e 900 1500 300 400 4000 6000

Expanding the VSI VPI Range

You can expand the VSI VPI range by changing the parameters *Start VSI VPI* and *End VSI VPI*. The command **cnfrsrc** checks whether the new VPI range overlaps with:

- AR connections; or
- a VPI is used by VSI controllers; or
- a VPI used by another partition.

Shrinking the VSI VPI Range

You can shrink the VSI VPI range by increasing the parameter *Start VSI VPI* and/or by decreasing the the parameter *End VSI VPI*. This works only if no VSI connections use the old VPI range. For example, if there is a VSI connection and VPI 10; and if the current VSI VPI range is [5,11], then the VSI VPI range cannot be shrunk to [5,9].

Increasing VSI Bandwidth

You can increase the bandwidth of VSI by increasing the *Minimum VSI Bandwidth* and/or *Maximum VSI Bandwidth* of the appropriate VSI partition. Increasing the bandwidth of VSI may cause AR connections on a trunk to be re-routed in order to free the necessary bandwidth for VSI. You will see a warning (Warning - increasing *Max VSI Bandwidth* will reroute all conns on this trunk). The command will proceed only if you choose to proceed.

cnfrsrc 12.1 256 20000 y 1 e 900 1500 300 400 4000 6000

Decreasing VSI Bandwidth

You can decrease VSI bandwidth of VSI by reducing the values of *Minimum VSI Bandwidth* and/or *Maximum VSI Bandwidth*. This works only if the VSI connections are not using the existing bandwidth.

Example

Changing the PVC max lcn and PVC max bandwidth for a port.

cnfrsrc 4.1 1000 300000 N

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 10:52 PST

Line : 4.1
Maximum PVC LCNS: 1000            Maximum PVC Bandwidth: 300000



              State
Partition 1:   D
Partition 2:   D
Partition 3:   D



Last Command: cnfrsrc 4.1 1000 300000 N

Cnfrsrc successful.
Next Command:
```

Example

Changing the PVC max lcn and PVC max bandwidth for a port.

cnfrsrc 5.1 2000 N

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 10:53 PST

Trunk : 5.1
Maximum PVC LCNS: 2000            Maximum PVC Bandwidth: 3528
                                  (Statistical Reserve: 1000)


              State
Partition 1:   D
Partition 2:   D
Partition 3:   D



Last Command: cnfrsrc 5.1 2000 N

Max PVC lcn maybe adjusted to be consistent with the other end.
Next Command:
```

Example

Enable a partition on a port.

cnfrsrc 4.1 1000 300000 y 1 e 100 200 20 30 1000 50000

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 11:05 PST

Line : 4.1
Maximum PVC LCNS: 1000            Maximum PVC Bandwidth: 300000



              State   MinLCN   MaxLCN   StartVPI   EndVPI   MinBW    MaxBW
Partition 1:   E       100      200      20         30       1000     50000
Partition 2:   D
Partition 3:   D



Last Command: cnfrsrc 4.1 1000 300000 y 1 e 100 200 20 30 1000 50000

Cnfrsrc successful.
Next Command:
```

Example

Enabling a partition on a trunk.

cnfrsrc 5.1 2000 y 2 e 500 2000 55 60 1000 2000

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 11:06 PST

Trunk : 5.1
Maximum PVC LCNS: 2000            Maximum PVC Bandwidth: 1528
                                  (Statistical Reserve: 1000)


              State   MinLCN   MaxLCN   StartVPI   EndVPI   MinBW    MaxBW
Partition 1:   D
Partition 2:   E       500      2000     55         60       1000     2000
Partition 3:   D




Last Command: cnfrsrc 5.1 2000 y 2 e 500 2000 55 60 1000 2000

Cnfrsrc successful.
Next Command:
```

Example

Configure resources on card slot 4, port 2.

cnfrsrc 4.2 256 96000 N

```
sw180          TN    Cisco           IGX 8420  9.3.r3    Dec. 19 2000 13:51 GMT

Line : 4.2
Maximum PVC LCNS: 256            Maximum PVC Bandwidth: 96000



              State
Partition 1:   D
Partition 2:   D
Partition 3:   D



Last Command: cnfrsrc 4.2 256 96000 N
```

Example

Configure resources on port 2 on the UXM card in slot 4.

cnfrsrc 4.2 256 3096 N

```
sw180          TN    Cisco           IGX 8420  9.3.r3    Dec. 19 2000 13:48 GMT

Line : 4.2
Maximum PVC LCNS: 256            Maximum PVC Bandwidth: 3096



              State
Partition 1:   D
Partition 2:   D
Partition 3:   D



Last Command: cnfrsrc 4.2 256 3096 N

Cnfrsrc successful.
```

cnfrsrc (configuring VSI resources for BPX)

Configures resources on ports, physical trunks and virtual trunks. You can partition resources for Automatic Routing Management PVCs, VSI-MPLS (Multiprotocol Label Switching), including VC Merge, or PNNI.

This command supports both physical trunks and virtual trunks. After VSI has been enabled, the virtual trunk becomes a “dedicated” VSI virtual trunk.

The switch software will prevent you from configuring VSI:

- If the virtual trunk has already been added; or
- If the VPI value has not been configured

You can configure a virtual trunk to be dedicated to VSI or to Automatic Routing Management. You cannot configure a virtual trunk for both VSI and Automatic Routing Management.

The switch software prevents a VSI partition from being disabled on a trunk interface if a PNNI controller is attached to the trunk interface controlling partition being disabled.

It is possible to have PVCs terminating on the Label Switch Controller itself. This example reserves approximately 10 Mbps (26000 cells per sec) for PVCs, and allows up to 256 PVCs on the switch port connected to the LSC.

Syntax

cnfrsrc <slot.port.vtrk>

or on physical trunks:
cnfrsrc <slot>.<port>.<vtrk> <maxpvclcns> <maxpvcbw> <y|n> <partition> <eld> <minvsilcns> <maxvsilcns> <vsistartvpi> <vsiendvpi><vsiminbw> <vsimaxbw>

or on feeder trunks/ports:
cnfrsrc <slot>.<port>.<vtrk> <maxpvclcns> <maxpvcbw><y|n> [<pvcstartvpi1> <pvcendvpi1> <pvcstartvpi2><pvcendvpi2><pvcstartvpi3><pvcendvpi3><pvcstartvpi4><pvcendvpi4>]<y|n> <partition> <eld> <minvsilcns> <maxvsilcns> <vsistartvpi> <vsiendvpi><vsiminbw> <vsimaxbw>

or, for VC merge:

cnfrsrc <port number> <maxpvclcns> <maxpvcbw> <partition ID {eld}> By default, the LSC uses either a starting VSI VPI of 1 or 2 for label switching, whichever is available. If both are available, a starting VSI VPI of 1 is used. The VPI range should be 2–3 on a BPX VSI connected to a 6400, 7200 or 7500 AIP. If VPI 2 is not to be used, you can use the label switching VPI interface configuration command on the LSC to override the defaults.

<vsistartvpi> <vsiendvpi> <vsiminbw> <vsimaxbw>

Parameters

The table lists the **cnfrsrc** parameters used for configuring resources for VSI partitions (an MPLS controller, for example).

Object Name	Range/Values	Default	Description
VSI partition	1–3	None	Identifies the partition.
Partition state	0 = Disable Partition 1 = Enable Partition	0	For Partition state = 1, the VSI parameters are mandatory.
Enable Partition	e or d	Enable Partition	Answer e to enable or d to disable your configured partition.
Min VSI LCNs	0 to port_group/card limit	None	Minimum LCNs (conns) guaranteed for this partition. If the parameter for VC merge is set to "e," the feature is enabled by filling at least 1023 VSI channels on any interface on the card. The maximum and minimum logical connections (LCNs) determine the maximum number of virtual connections (VCs) that can be supported on the interface. The number of VCs required on the interface is controller dependent.
Max VSI LCNs	1 to port_group/card limit	None	Maximum LCNs permitted on this partition. The maximum and minimum logical connections (LCNs) determine the maximum number of virtual connections (VCs) that can be supported on the interface. The number of VCs required on the interface is controller dependent.
Edit VSI parms	<y|n>		y= prompt for VSI parameters. n = no prompt for VSI parameters.
Start VSI VPI	1–4095	None	Partition Start VPI. By default, the LSC will use either a starting VSI VPI of 1 or 2 for label switching, whichever is available. If both are available, a starting VSI VPI of 1 is used. The VPI range should be 2–3 on a BPX VSI connected to a 6400, 7200 or 7500 AIP. If VPI 2 is not to be used, you can use the label switching VPI interface configuration command on the LSC to override the defaults.
End VSI VPI	1–4095	None	Partition End VPI. VSI connections on this partition can use VPIs up to this VPI. The end VSI VPI should be equal to or greater than the Start VSI VPI.
Min VSI Bw	0–Line Rate	None	Minimum Partition bandwidth.
Max VSI Bw	0–Line Rate	None	Maximum Partition bandwidth.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

dsprsrc

Feature Mismatching to Verify VSI Support

The **cnfrsrc** and **addshelf** commands, in addition to other configuration commands, perform mismatch verification on the BXM (and UXM) cards. For example, the **cnfrsrc** and **addshelf** commands verify whether the cards both have VSI 2.0 support configured.

The Feature Mismatching capability does not check mismatched cards unless the actual feature has been enabled on the card. This allows for a graceful card migration from an older release.

Resource Partitioning

The VSIs must partition the resources between competing controllers: Automatic Routing Management, MPLS, and PNNI, for example. Different types of controllers can share a node's resources. For example, Automatic Routing Management, and MPLS, or Automatic Routing Management and PNNI (SVCs), but not PNNI and MPLS, can share resources.

Up to three partitions are supported and any three may be of a single type. The user interface will block the activation of partitions with ID higher than 1 if the card does not support multiple partitions.

The resources that you need to configure for a partition are shown in Table 3-39 for a partition designated ifci, which stands for interface controller 1, in this example.

The three parameters that must be distributed are:

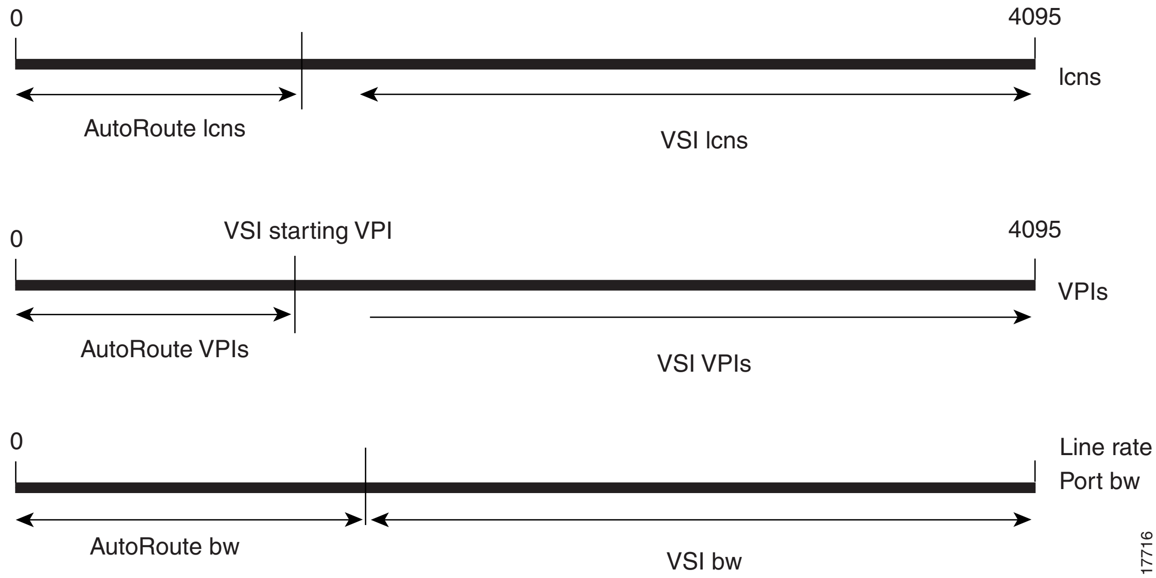
- number of logical connections (LCNs)
- bandwidth (BW)
- virtual path identifiers (VPI)

Table 3-39 ifci—VSI Parameter Ranges

ifci parameters	Min	Max
LCNs	0 to port_group/card limit	1 to port_group/card limit
BW	0–Line Rate	0–Line Rate
VPI	1–4095	1–4095

When you add a trunk, the entire bandwidth is allocated to Automatic Routing Management (formerly known as AutoRoute). To change the allocation to provide resources for a VSI, use the **cnfrsrc** command on the BPX switch.

Figure 3-23 Graphical View of Resource Partitioning, Automatic Routing Management, and VSI



Partition Information Sent to Cisco WAN Manager

When the partition information is configured for the first time or any parameters are changed, Cisco WAN Manager is updated through a robust message.

- pvc_vpi_start_1:
  This field represents start VPI range for range 1.
- pvc_vpi_end_1:
  This field represents the ending VPI range for range 1.
- pvc_vpi_start_2:
  This field represents start VPI range for range 2.
- pvc_vpi_end_2:
  This field represents the ending VPI range for range 2.
- pvc_vpi_start_3:
  This field represents start VPI range for range 3.
- pvc_vpi_end_3:
  This field represents the ending VPI range for range 3.
- pvc_vpi_start_4:
  This field represents start VPI range for range 4.
- pvc_vpi_end_4:
  This field represents the ending VPI range for range 4.
- vsi_min_channels:
  This field represents the minimum guaranteed channels available for a given port.
- vsi_max_bw:
  This field represents the maximum bandwidth available, but not guaranteed, for a port.

Partitioning

On each interface (port or trunk) on the BXM cards used for PNNI/MPLS controllers, two sets of resources must be divided up between traditional PVC connections and switching connections. The traditional PVC connections are configured directly on the BPX platform, and switching connections are set up by the controllers using the VSI. These resources are partitioned on each interface:

- Bandwidth
- Logical Connections
- VPI

As with all ATM switches, the BPX switch supports up to a specified number of connections. On the BPX switch, the number of connections supported depends on the number of port/trunk cards installed. On each interface, space for connections is divided up between traditional BPX switch permanent virtual circuit (PVC) connections, Label Switching VCs (LVCs), and PNNI Switching VCs (SVC).

Soft and Dynamic Partitioning

Release 9.3.10 introduces Soft Partitioning and Dynamic Partitioning in order to support the smooth introduction of another VSI controller into a BPX network already configured with an existing VSI controller, easier tuning of switch resources, and the migration of Automatic Routing Management to PNNI.

Soft Partitioning provides resource guarantees for LCNs and bandwidth per partition and a pool of resources available to all partitions in addition to the guaranteed resources. Dynamic Partitioning provides the ability to rather easily increase the allocation of a resource to a partition.

You define and manage the number of LCNs assigned to a given VSI partition by modifying the "Minimum VSI LCNs" and "Maximum VSI LCNs" fields of the **cnfrsrc** CLI command.

To give more LCNs from Automatic Routing Management to VSI, change the Min LCNs or Max LCNs to cause BPX software to produce a bigger number. To increase the LCNs reserved to a VSI partition, increase the "Minimum VSI LCNs" or "Maximum VSI LCNs" fields of the appropriate VSI partition. The VSI LCN boundary is moved into Automatic Routing Management if there are enough free Automatic Routing Management LCNs to fulfill the request.

If there are not enough free LCNs in the Automatic Routing Management (AR) space, the cnfrsrc command does not fulfill a request to increase the VSI LCN space. In such a case, the **cnfrsrc** command displays a failure message showing the number of currently free AR LCNs. You can reissue the **cnfrsrc** command specifying a smaller increase to the VSI partition. If that is not acceptable, you must first delete and reroute the necessary number of AR connections. Then you can attempt cnfrsrc again.

Moving the VSI LCN boundary into the Automatic Routing Management space might step over LCNs that are currently allocated. BPX software reprogram the necessary channels so that new channels out of the lower AR LCN space are picked instead. Before starting the process of reprogramming the necessary number of AR connections, the cnfrsrc command displays a warning message and waits for your permission to proceed. The warning message shows the number of Automatic Routing Management (AR) connections that will be re-programmed. After reprogramming the necessary channels the LCN boundary is moved into the Automatic Routing Management space.

Note You can migrate Automatic Routing Management (AutoRoute) connections only if the VPI range of the recipient VSI partition is adjacent to Automatic Routing Management. To migrate Automatic Routing Management connections to a non-adjacent VSI partition requires different VPIs within the recipient VPI boundary.

Information about this feature also can be found in the *BPX Installation and Configuration Manual, Release 9.3.10*, Configuring BXM Virtual Switch Interface.

VSI Partitioning

VSI partitioning requires the following commands and procedures:

Defining the PVC VPI Range

You can define the PVC VPI ranges by filling the VSI fields described in the previous section. In the following sample system response of the **cnfrsrc** command, note that the * next to the VPI fields denote that the PVC and VSI VPI space overlap. You are prompted if the overlapping VSI partition is an MPLS partition. If it is, then the command will be abort because overlapping VPI ranges between Automatic Routing Management and MPLS is not supported.

Configuring the PVC VPI ranges requires the BXM card to have VSI level 3 support. An error message is displayed if you want to configured the PVC VPI ranges but the VSI level on the card is lower than 3.

```
swnode1      TRM   Cisco        BPX 8620  9.3.10 June 1 2000  16:27 GMT

Port : 12.3
                                           Full Port Bandwidth: 353208
Maximum PVC LCNS:           256     Maximum PVC Bandwidth: 300000
                                             (CAC Reserve: 0)

PVC VPI RANGE [1]:   0    */255  *    PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1         PVC VPI RANGE [4]: -1    /-1


              Partition :  1                    2                 3
        Partition State :  Enabled             Disabled          Disabled
VSI LCNS (min/max):  100    /200        0      /0            0      /0
   VSI VPI (start/end):  50   */200  *       0     /0            0     /0
   VSI BW (min/max):  10000  /10000    0      /0            0      /0
      VSI ILMI Config:  CLR                  CLR               CLR


______________________________________________________________________
Last Command: cnfrsrc 12.3 256 300000 y 0 255 -1 -1 -1 -1 -1 -1 y 1 E 100 200 50
 200 10000 10000

Warning - VPI overlaps with AR range 1
Is this a MPLS partition? (y/n)?
```

Increasing the VSI LCN Range

You can increase the number of LCNs reserved for VSI by increasing the Minimum VSI LCNs and/or Maximum VSI LCNs of the appropriate VSI partition. Increasing the VSI LCN space may cause a number of AR connections to be reprogrammed. You will see a warning: “Channel conflict, max LCN w/o reprog = 5. LCN(s) to reprogram = 20.” The command will proceed only if you so choose.

```
swnode1       TRM   Cisco          BPX 8620  9.3.10 June 1 2000  16:27 GMT

Port : 12.3
                                        Full Port Bandwidth: 353208
Maximum PVC LCNS:            256     Maximum PVC Bandwidth: 300000
                                          (CAC Reserve: 0)

PVC VPI RANGE [1]:   0    */255  *    PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1         PVC VPI RANGE [4]: -1    /-1


              Partition :  1                   2                3
        Partition State :  Enabled           Disabled         Disabled
VSI LCNS (min/max):  100    /200        0      /0           0      /0
   VSI VPI (start/end):  50   */200  *      0     /0           0     /0
   VSI BW (min/max):  10000  /10000     0      /0           0      /0
      VSI ILMI Config:  CLR                 CLR              CLR


______________________________________________________________________
Last Command: cnfrsrc 12.3 256 300000 y 0 255 -1 -1 -1 -1 -1 -1 y 1 E 100 3000 50
 200 10000 10000

Channel conflict, max LCN w/o reprog = 5. LCN(s) to reprogram = 20.
Continue?
```

Increasing the Number of LCNs Guaranteed for a VSI Partition

You can increase the number of LCNs guaranteed for a given VSI partition by increasing the Minimum VSI LCNs of the desired partition. If the new number does not cause the total VSI LCNs to be increased (that is, if you want to increase the Minimum VSI LCN**s** at the expense of the common pool), the request will be denied if there isn't enough free VSI LCNs in the common pool. The BXM card cannot find enough free VSI LCNs to give to the specified partition. More AR LCNs must be made available to VSI for the request to succeed. The **cnfrsrc** will display a message: "Resource not available, maximum available LCN(s) is 50. 100 more LCN needed." This indicates the number of AR LCNs that should be made available to the VSI.

```
swnode1      TRM   Cisco         BPX 8620  9.3.v7    June 1 2000  16:27 GMT

Port : 12.3
                                         Full Port Bandwidth: 353208
Maximum PVC LCNS:            256     Maximum PVC Bandwidth: 300000
                                          (CAC Reserve: 0)

PVC VPI RANGE [1]:   0    */255  *    PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1         PVC VPI RANGE [4]: -1    /-1


              Partition :  1                  2                3
        Partition State :  Enabled            Disabled         Disabled
VSI LCNS (min/max):  100    /200         0     /0           0     /0
   VSI VPI (start/end):  50   */200  *       0     /0           0     /0
   VSI BW (min/max):  10000  /10000     0     /0           0     /0
      VSI ILMI Config:  CLR                CLR              CLR


Last Command: cnfrsrc 12.3 256 300000 y 0 255 -1 -1 -1 -1 -1 -1 y 1 E 200 200 50
 200 10000 10000

Resource not available, maximum available LCN(s) is 50.   50 more LCN needed.
Next Command:
```

Increasing VSI Bandwidth

You can increase the bandwidth of VSI by increasing the Minimum VSI Bandwidth or Maximum VSI Bandwidth of the appropriate VSI partition.

Note Increasing VSI bandwidth may trigger a rerouting of all connections on that trunk.

```
swnode1      TRM   Cisco         BPX 8620  9.3.v7    June 1 2000  16:27 GMT

Trunk : 12.3
                                              Full Port Bandwidth: 353208
Maximum PVC LCNS:           256     Maximum PVC Bandwidth: 300000
                                                (CAC Reserve: 0)

PVC VPI RANGE [1]:   0    */255  *    PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1         PVC VPI RANGE [4]: -1    /-1


               Partition :  1                    2                3
        Partition State :  Enabled           Disabled         Disabled
VSI LCNS (min/max):  100    /200         0      /0           0      /0
   VSI VPI (start/end):  50   */200  *       0     /0           0     /0
   VSI BW (min/max):  10000  /10000    0      /0           0      /0
      VSI ILMI Config:  CLR                  CLR              CLR


__________________________________________________________________
Last Command: cnfrsrc 12.3 256 300000 y 0 255 -1 -1 -1 -1 -1 -1 y 1 E 100 200 50
 200 10000 20000

Warning - increasing Max VSI Bandwidth will reroute all conns on this trunk
Continue?
```

Disabling Connection Admission Control (CAC) on a Port

To oversubscribe the AR bandwidth on a given port, make sure that the CAC feature is disabled on the port. Use the **cnfport** command for this purpose; the CAC Overrid**e** field should specify "Enabled".

cnfport <*slot.port*>[.*vtrk*] <options for E1 | T1 | E3 | T3 | OC-3 | OC-12 | E2 | HSSI | SR >

```
sw237         TN    StrataCom       BPX 8620  9.2.3g    Sep. 30 1999 10:52 PST

Port:       5.3     [FAILED  ] Primary Y Redundancy
Interface:        LM-BXM                   CAC Override:     Enabled
Type:             UNI                      %Util Use:        Disabled
Shift:            SHIFT ON HCF (Normal Operation)
SIG Queue Depth:    640                    Port Load:         0 %

Protocol:          NONE                    Protocol by Card: No







Last Command: cnfport 5.3


Next Command:
```

Oversubscribing AR Bandwidth on a Port

To oversubscribe the AR bandwidth on a given port, make sure that the CAC feature is disabled on the port. Refer to Disabling Connection Admission Control (CAC) on a Port, page 3-397 for more details.

Use the **cnfrsrc** command to decrease the bandwidth allocated for AR and give it to the VSI partition that is going to receive the AR connections. The **cnfrsrc** command contains 4 fields that specify information about the bandwidth:

- Maximum PVC Bandwidth
  Specifies the maximum bandwidth that can be used by AR.
- Statistical Reserve
  Applicable only to trunks. It specifies the bandwidth that should be set aside for node to node communications.
- Minimum VSI Bandwidth
- Maximum VSI Bandwidth

The **cnfrsrc** command verifies that the sum of the Maximum PVC Bandwidth, Statistical Reserve**,** and the VSI bandwidth of all VSI partitions on the port does not exceed the port speed.

You can decrease the AR bandwidth by decreasing the Maximum PVC Bandwidth field. To increase the VSI bandwidth:

- If the total bandwidth allocated for VSI was obtained by adding the Minimum VSI Bandwidth of all the VSI partitions on the port, you can give more bandwidth to VSI by increasing the Minimum VSI Bandwidth of a given partition.
- If the total bandwidth allocated for VSI was obtained by using the Maximum VSI Bandwidth of a given partition, you can give more bandwidth to VSI by increasing the Maximum VSI Bandwidth field of the partition that was used to compute the VSI bandwidth.

In the example below you can see that all of the AR bandwidth on the port was given to VSI. Note the * next the Maximum PVC Bandwidth shows that the AR bandwidth is oversubscribed.

```
swnode1      TRM   Cisco         BPX 8620  9.3.v7    June 1 2000  16:27 GMT

Port : 12.3
                                          Full Port Bandwidth: 353208
Maximum PVC LCNS:          256     Maximum PVC Bandwidth: 300000
                                            (CAC Reserve: 0)

PVC VPI RANGE [1]:   0    */255  *    PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1         PVC VPI RANGE [4]: -1    /-1


              Partition :  1                   2                3
         Partition State :  Enabled           Disabled         Disabled
VSI LCNS (min/max):  100    /200        0     /0           0     /0
   VSI VPI (start/end):  50   */200  *       0    /0           0    /0
   VSI BW (min/max):  10000  /10000    0     /0          0     /0
      VSI ILMI Config:  CLR                CLR             CLR

_______________________________________________________________________
Last Command: cnfrsrc 12.3 256 0 y 0 255 -1 -1 -1 -1 -1 -1 y 1 E 100 200 50
 200 10000 20000

Warning - increasing Max VSI Bandwidth will reroute all conns on this trunk
Continue?
```

Example

Configure the VSI partition1 for port 4.1 without defining PVC VPI ranges.

cnfrsrc 12.5 256 26000 N Y 1 e 512 16384 2 15 26000 100000

```
n4             TN    SuperUser       BPX 8620    9.3.10     Apr. 4 2000    16:40 PST
Port : 4.1
                                      Full Port Bandwidth: 353208
Maximum PVC LCNS:             256     Maximum PVC Bandwidth: 26000
                                      (CAC Reserve: 0)

PVC VPI RANGE [1]:   -1    /-1        PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Enabled           Disabled          Disabled
  VSI LCNS (min/max):  512    /7000      0      /0         0      /0
 VSI VPI (start/end):2/15          0     /0          0     /0
    VSI BW (min/max):  26000  /100000    0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR


Last Command: cnfrsrc 12.5 256 26000 N Y 1 e 512 7000 2 15 26000 100000

Next Command:
```

Example

Configure the VSI partition1 for port 4.1, defining overlapping PVC VPI ranges. The overlapping VPI ranges are indicated by an asterisk * next to the range values.

cnfrsrc 12.5 256 26000 Y 0 255 -1 -1 -1 -1 -1 -1 Y 1 e 512 16384 2 15 26000 100000

```
n4             TN    SuperUser       BPX 8620    9.3.10     Apr. 4 2000    16:40 PST
Port : 4.1
                                      Full Port Bandwidth: 353208
Maximum PVC LCNS:             256     Maximum PVC Bandwidth: 26000
                                      (CAC Reserve: 0)

PVC VPI RANGE [1]:0     */255 *   PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Enabled           Disabled          Disabled
  VSI LCNS (min/max):  512    /7000      0      /0         0      /0
 VSI VPI (start/end):2    */15 *    0     /0          0     /0
    VSI BW (min/max):  26000  /100000    0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR


Last Command: cnfrsrc 12.5 256 26000 Y 0 255 -1 -1 -1 -1 -1 -1 Y 1 e 512 7000 2 15 26000
100000

Next Command:
```

Example

Configure the VSI partition1 for trunk 12.5. You are not prompted for "configure PVC VPI ranges".

cnfrsrc 12.5 256 26000 Y 1 e 512 16384 2 15 26000 100000

```
n4             TN    SuperUser       BPX 8620    9.3.10     Apr. 4 2000    16:40 PST
Trunk: 4.1
                                      Full Port Bandwidth: 353208
Maximum PVC LCNS:             256     Maximum PVC Bandwidth: 26000
                                      (CAC Reserve: 1000)

PVC VPI RANGE [1]:-1    /-1       PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Enabled           Disabled          Disabled
  VSI LCNS (min/max):  512    /7000      0      /0         0      /0
 VSI VPI (start/end):2    /15       0     /0          0     /0
    VSI BW (min/max):  26000  /100000    0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR


Last Command: cnfrsrc 12.5 256 352207 Y 1 e 512 7000 2 15 26000 100000
```

Example

Enable VC merge on the partition on slot 1.

cnfrsrc 12.1 256 91000 y 1 E 200 200 10 10 0 0

```
m2             TN    Cisco          BPX 8620  9.3.a0    May  8 2001  17:40 GMT

Trunk : 12.1
                                      Full Port Bandwidth: 96000
Maximum PVC LCNS:             256     Maximum PVC Bandwidth: 91000
                                      (Statistical Reserve: 5000)

PVC VPI RANGE [1]:   -1    /-1        PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Enabled           Disabled          Disabled
  VSI LCNS (min/max):  200    /200       0      /0         0      /0
 VSI VPI (start/end):  10    /10         0     /0          0     /0
    VSI BW (min/max):  0      /0         0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR


Last Command: cnfrsrc 12.1 256 91000 y 1 E 200 200 10 10 0 0
```

Example

Disable VC merge by disabling the last partition on a slot.
cnfrsrc 12.1 256 91000 y 1 d

```
m2             TN    Cisco          BPX 8620  9.3.a0    May  8 2001  18:06 GMT

Trunk : 12.1
                                      Full Port Bandwidth: 96000
Maximum PVC LCNS:             256     Maximum PVC Bandwidth: 91000
                                      (Statistical Reserve: 5000)

PVC VPI RANGE [1]:   -1    /-1        PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Disabled          Disabled          Disabled
  VSI LCNS (min/max):  200    /200       0      /0         0      /0
 VSI VPI (start/end):  10    /10         0     /0          0     /0
    VSI BW (min/max):  0      /0         0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR


Last Command: cnfrsrc 12.1 256 91000 y 1 d
```

cnfrtcost (display connection loading)

Configures the cost cap for a connection when cost-based routing is configured.

A maximum allowable cost value (cost cap) is used during route determination to prevent selection of a route that exceeds an acceptable cost. For routing based on delay, the cost cap is the acceptable end-to-end delay for the connection type. This cap is configured network-wide per delay-sensitive connection type.

For routing based on trunk cost, the cost cap is the acceptable end-to-end cost. This cap is configured per connection. The default cost cap is 100, which is derived from the maximum hops per route (10) and default cost per trunk (10). The cost cap can be changed at any time. If the cost cap is decreased below the current route cost, the connection is not automatically rerouted. A manual reroute is required to route the connection to fit under the new cost cap. This gives you more control over the connection reroute outage.

Note The **cnfrtcost** is valid only at the node where the connection was added.

Syntax

cnfrtcost <connection> <max cost>

Parameters

Parameter	Description
<connection>	Indicates the connection endpoint (that is, slot.port.vpi.vci)
<max cost>	Indicates the maximum allowable route cost. Range: 1–100

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspcon, cnfpref, dsprtcache

Example

After configuring the cost cap for a connection, you can check to see the configured value with the **dspcon** command, as is shown in the System Response example. This is the **dspcon** response for 9.2.5.100 with the additional fields of Max Cost (40) and Route Cost (1). For a route optimized on trunk delay, the cost labels are updated to indicate delay: Max Cost becomes Max Delay and Route Cost becomes Route Delay.

cnfrtcost 9.2.5.100 40 1

```
sw203          TN    StrataCom       BPX 8620    9.3    Apr. 13 2000 18:18 GMT

Conn:  9.2.5.100        sw242       14.2.5.100        cbr       Status:OK
   PCR(0+1)     % util    CDVT(0+1)     Policing
     50/50     100/100   10000/10000     4/4
Owner: LOCAL  Restriction: NONE  CoS: 0
TestRTD: 0 msec  Trunk Cell Routing Restrict: Y   Max Cost: 40  Route Cost: 1

Path:   sw203    3.1.1-- 2.1.1sw242
Pref:   Not Configured



sw203         ASI-T3    : OK           sw242     ASI-OC-3   : OK
              Line  9.2 : OK                     Line 14.2 : OK
              OAM Cell RX: Clear                 NNI       : OK
              NNI       : OK

Last Command: dspcon 9.2.5.100


Next Command:
```

cnfrtr (configure router configuration parameters)

Configures the parameters for the Universal Router Module (URM) embedded IOS-based router on a specified router slot. Configurable router parameters include the IOS configuration file source and the router serial port function. The **cnfrtr** command can be invoked on a logically active or standby slot. For additional information on the URM and a complete listing of the CLI commands that support the embedded IOS-based router, see the "Universal Router Module" section on page 2-23.

Upon start-up, reset or restart, the embedded router must load an IOS configuration file. Use the **cnfrtr** command to specify the source, or location, of the IOS configuration file that the router is to use. Starting with Release 9.3.30, there are three IOS configuration file sources. These sources are:

- The NPM BRAM, which stores a default blank, or basic, IOS configuration file. This is the default IOS configuration file source.
- The embedded router NOVRAM, which stores the router's running IOS configuration file.
- The URM Admin flash, which stores an IOS configuration file that is downloaded from a TFTP server. This file location is supported only with the Release 9.3.30 or higher.

By default, the URM is configured to load the basic IOS configuration file from the NPM. The NPM BRAM can be configured as the IOS configuration file source for the embedded router when the URM is installed or replaced.

With Release 9.3.20, the initial configuration on the router must be done manually using the IOS CLI. With the Release 9.3.30 Remote Router Configuration feature, however, the URM Admin flash can store an IOS configuration file that is downloaded from a TFTP server. This downloaded file can be used to start up the router with an initial configuration, eliminating the need for console access to the embedded router. See the "URM Remote Router Configuration Feature" section on page 3-406 for additional information.

During normal operations, the running IOS configuration file is stored in the embedded router NOVRAM. The running IOS configuration file is required for the router to resume normal operation in the event of a card reset or restart. The router NOVRAM can be configured as the IOS configuration file source for the embedded router during normal operations.

Syntax

cnfrtr <router_slot> <IOS_configuration> <serial_port_function>

Parameters

Parameter	Description
router slot	Specifies the virtual shelf slot to support the URM embedded router. Range: 1–32 Switch software manages the embedded router in the URM as if the router resides on a slot in a virtual shelf (of routers). Each slot in the IGX shelf has a corresponding router slot in the virtual shelf. A router slot is considered empty when the equivalent IGX slot is empty or contains an IGX card without an embedded router. If the IGX slot contains a URM card, the router slot is reported as hosting an IOS router.
IOS configuration	Specifies the location, or source, of the IOS configuration file the embedded router is to use at start-up, reset, or restart. Default: NPM (n) n = NPM. This configuration specifies that the default blank, or basic, IOS configuration file is loaded from the NPM BRAM. This configuration file can be used when the URM is installed or replaced. r = Router BRAM. This configuration specifies that the IOS configuration file is loaded from the embedded router BRAM. This configuration is required for the router to resume normal operation in the event of a card restart or rebuild. a = Admin flash. This configuration specifies that the IOS configuration file is loaded from the URM Admin flash. Starting with Release 9.3.30, an IOS configuration file can be downloaded from a TFTP server and stored in the URM Admin flash. This file can be used for initial router configuration at the time of router start-up.
serial port function	Specifies the function of the router serial port. Default: CON 1 = CON (console). This configuration specifies that the router serial port functions as a console external interface. 2 = AUX (auxiliary). This configuration specifies that the router serial port functions as an auxiliary external interface. This configuration is typically used for monitoring purposes.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX	Yes	Yes	Yes	No

Related Commands

burnrtrcnf, clrrtrcnf, cnfrtr, cnfrtrcnfmastip, cnfrtrparm, dspalms, dspcnf, dsprtr, dsprtrcnfdnld, dsprtrslot, dsprtrslots, rstrtr

Example

Configure parameters for the URM embedded router on router slot 10. Select the URM Admin flash as the IOS configuration file source. Select console as the serial port function.

cnfrtr 6

```
sw175          TN    Cisco           IGX 8420  9.3.q6    Mar. 9 2000  05:26 GMT

Configuration for Router Slot 10:                                    Snapshot
    IOS Configuration:       from card's Admin Flash
    Router Serial Port:      CON










Last Command: cnfrtr 10 a 1
```

URM Remote Router Configuration Feature

Starting with Release 9.3.30, the URM supports the Remote Router Configuration feature. This feature allows you to start up or restart the URM embedded IOS router with an IOS configuration file that is downloaded from a TFTP server. The process of passing the IOS configuration file to the URM embedded router is similar to the process of downloading firmware images to cards. The steps in the transfer process, and the IGX CLI commands utilized, are summarized below.

- Clear the NPM RAM buffer of firmware images, save/restore configuration files, and any previous IOS configuration files. Use the **dspcnf** command to display the configuration save/restore status of the network nodes and identify nodes reserved for firmware images or IOS configuration files. Use the **getfwrev** <cardtype>0.0 to clear firmware images. Use the **savecnf** clear command to clear save/restore configuration files. Use the **clrrtrcnf** command to clear IOS configuration files.
- Create a directory and the IOS configuration file on the TFTP server from which the file is to be transferred. Use the **cnfrtrcnfmastip** command to specify the IP address of the authorized TFTP server.
- Send a TFTP Start file (through TFTP put) to the IGX node to initiate transfer of the IOS configuration file to the NPM RAM buffer. The interface for transferring the IOS configuration file is the same interface used to transfer firmware images. Use the **dsprtrcnfdnld** command to monitor the progress of the file transfer.
- Copy (or burn) the IOS configuration file from the NPM RAM buffer to the URM Admin flash. Use the **burnrtrcnf** command to copy the configuration file. Use the **dsprtrcnfdnld** command to monitor the progress of the copy activity.
- Use the **cnfrtr** command to configure the URM Admin flash as the source of the IOS configuration file stored in the URM Admin flash. With this configuration, the router uses the configuration file stored in the URM Admin flash at start up and upon reset or restart.

The interface for transferring the IOS configuration file is the same as the interface for transferring firmware images by TFTP. A Start file is sent to the node through TFTP put. The Start file contains the information to start the IOS configuration file download. Upon receipt of the Start file, the IGX node drives the process of transferring the IOS configuration file from the TFTP server to the NPM RAM buffer. The RAM buffer used is the same buffer used to store firmware images and node configuration save/restore files.

The name of the TFTP Start file for the IOS configuration file is always **dnld.rtr**. The Start file format is described below.

TFTP_REQUEST

- IP: <IP_address>. Specifies the IP address of the TFTP server storing the IOS configuration file.
- Path Name: <pathname>. Specifies the path name to the IOS configuration file stored on the TFTP server.
- File Name: <filename>. Specifies the name of the IOS configuration file stored on the TFTP server.

cnfrtrcnfmastip (configure router configuration download initiator TFTP server IP)

Configures the IP address of the authorized TFTP client which could initiate the TFTP start file transfer. This command ensures that only an authorized client initiates the transfer of the IOS configuration file.

The **cnfrtrcnfmastip** command supports the URM Remote Router Configuration feature introduced in Release 9.3.30. This feature allows you to start up or restart the URM embedded IOS router with an IOS configuration file that is downloaded from a TFTP server. For additional information on the URM and Remote Router Configuration feature see the **cnfrtr** command description.

Syntax

cnfrtrcnfmastip <IP_address>

Parameters

Parameter	Description
IP address	IP address of the authorized TFTP client which initiates transfer of the IOS configuration file. The **cnfrtrcnfmastip** command modifies the same IP address as the **cnffwswinit** command. These two commands can be used interchangeably.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	Yes	IGX	Yes	Yes	Yes	No

Related Commands

burnrtrcnf, clrrtrcnf, cnfrtr, dspcnf, dsprtr, dsprtrcnfdnld, dsprtrslot

Example

cnfrtrcnfmastip

```
sw175          TN    Cisco          IGX 8420  9.3.q6    Mar. 9 2000  07:45 GMT







Last Command: cnfrtrcnfmastip 172.29.10.43
```

cnfrtrparm (configure router service parameters)

Configures service parameters for the embedded router in the Universal Router Module (URM) introduced on the IGX 8400 in Release 9.3.20. The URM provides IOS-based voice support and basic routing functions. It consists of an embedded UXM with one internal ATM port and an embedded IOS-based router.

Syntax

cnfrtrparm <router_slot> <index> <action>

Parameters

Parameter	Description
router slot	Specifies the virtual shelf slot to support the URM embedded router. Range: 1–32 Switch software manages the embedded router in the URM as if the router resides on a slot in a virtual shelf (of routers). Each slot in the IGX shelf has a corresponding router slot in the virtual shelf. A router slot is considered empty when the equivalent IGX slot is empty or contains an IGX card without an embedded router. If the IGX slot contains a URM card, the router slot is reported as hosting an IOS router.
rommon action	Specifies what action ROMMON is to take when the URM embedded router boots up. Range: 1, 2, 3, or 4 Default: 1, load IOS. 1. IOS: if this parameter is set to IOS, the router loads the IOS image from the Flash. 2. BootHelper: if this parameter is set to BootHelper, the router loads BootHelper from the Flash protected area. 3. Rommon-CLI: if this parameter is set to Rommon-CLI, the router enters ROM monitor or maintenance mode. When the router is in this state, you can enter ROM monitor commands from the console port to manually load a system image. 4. Cnfg-register: if this parameter is set to cnfg-register, the router performs the action that was configured in the router's Configuration Register Boot Field.
reset router on IOS IPC failure	Specifies whether the router IOS is reset in the event of an IOS IPC failure. Range: Y to enable or N to disable. Default: Y, enable.
bootflash write enable	Enables write to router BootFlash. Range: Y to enable or N to disable. Default: N, disable.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	IGX			Yes	

Related Commands

cnfrtr, dsprtr, dsprtrslot, dsprtrslots, dspalms, rstrtr

Example: Configure Rommon Action

Configure the Rommon Action parameter by using the **cnfrtrparm** command.

```
sw180          TN    Cisco           IGX 8420  9.3.2J    Nov. 7 2000  07:18 GMT

1   Rommon Action                   [  load IOS         ]
2   Reset Router on IOS IPC Failure [  No               ]
3   BootFlash Write Enable          [  Yes              ]


This Command: cnfrtrparm 15 1


load (1)IOS, (2)BootHelper, (3)Rommon-CLI (4)Cnfg-register:
```

Example: Configure Reset Router Parameter

Configure the Reset Router on IOS IPC Failure parameter by using the **cnfrtrparm** command.

```
sw180          TN    Cisco           IGX 8420  9.3.2J    Nov. 7 2000  07:19 GMT

1   Rommon Action                   [  load IOS         ]
2   Reset Router on IOS IPC Failure [  No               ]
3   BootFlash Write Enable          [  Yes              ]


This Command: cnfrtrparm 15 2


Reset IOS on IPC failure ?
```

Example: Configure Reset Router Parameter

Configure the BootFlash Write Enable parameter by using the **cnfrtrparm** command.

```
sw180          TN    Cisco           IGX 8420  9.3.2J    Nov. 7 2000  07:20 GMT

1   Rommon Action                   [  load IOS         ]
2   Reset Router on IOS IPC Failure [  No               ]
3   BootFlash Write Enable          [  Yes              ]


This Command: cnfrtrparm 15 3


Enable write to router BootFlash?
```

cnfslotalm (configure slot alarm parameters)

Configure the alarm parameters for the various card types. Upon command entry, the system displays a screen with a choice of eight card-alarm types. It then displays “Enter Type” and waits for a number in the range 1–12. Upon entry of the alarm type, the system displays the error rates of the selected type.

Syntax

cnfslotalm <fail_type> <alarm_class> <rate> <alarm_time> <clear_time>

Parameters

Parameter	Description
<fail_type>	Error type
<alarm_class>	Either major or minor
<rate>	Error frequency
<alarm_time>	Duration of prescribed error frequency required to declare an alarm.
<clear_time>	The alarm will clear after this amount of time if the alarm threshold is no longer met

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX			Yes	

Related Commands

dspslotalmcnf, dspslotalms

Example

Configure the alarm parameters.

cnfslotalm 10

```
pubsbpx1       TN    SuperUser       BPX 8620    9.3 Apr. 13 2000 19:43 PST

  Slot Alarm Types

  1) Standby PRBS Errors                  11) Poll Clk Errors
  2) Rx Invalid Port Errs                 12) CK 192 Errors
  3) PollA Parity Errors
  4) PollB Parity Errors
  5) Bad Grant Errors
  6) Tx Bip 16 Errors
  7) Rx Bip 16 Errors
  8) Bframe parity Errors
  9) SIU phase Errors
  10) Rx FIFO Sync Errors

This Command: cnfslotalm


Enter Type:
```

The screen display after selecting alarm type 10:

```
pubsbpx1       TN    SuperUser       BPX 8620    9.3       Apr. 13 2000 19:47 PST

                             Slot Alarm Configuration

                       Minor                               Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  1) SPRBS        .1%  10 min       3 min           1%  100 sec     100 sec
  2) InvP         .1%  10 min       3 min           1%  100 sec     100 sec
  3) PollA        .1%  10 min       3 min           1%  100 sec     100 sec
  4) PollB        .1%  10 min       3 min           1%  100 sec     100 sec
  5) BGE          .1%  10 min       3 min           1%  100 sec     100 sec
  6) TBip         .1%  10 min       3 min           1%  100 sec     100 sec
  7) RBip         .1%  10 min       3 min           1%  100 sec     100 sec
  8) Bfrm         .1%  10 min       3 min           1%  100 sec     100 sec
  9) SIU          .1%  10 min       3 min           1%  100 sec     100 sec
  10) RFifo       .1%  10 min       3 min           1%  100 sec     100 sec

Last Command: cnfslotalm 10


Next Command:
```

cnfslotstats (configure slot statistics collection)

Configures the statistics for a card slot. This command is primarily a troubleshooting tool for use when hardware errors are experienced that might not be detected by the individual care self-test routines. An associated display command (**dspsloterrs**) is available for all users.

This command sets the collection interval for each of the BPX node slot statistics. The default is for no statistics to be collected. The collection interval range is 1 minute–255 minutes (4 1/4 hours).

You must enter the statistic type (1–9) to set the collection interval. When you enter the command, the system responds with the following prompt:

```
Collection Interval (1-255 minutes): __
```

Table 3-40 lists the statistics associated with each slot in the BPX node.

Syntax

cnfslotstats <port> <stat> <interval> <eld> [<samples> <size> <peaks>]

Parameters

Parameter	Description
<port>	Specifies the port to configure.
<stat>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample (1–255 minutes).
<eld>	Enables/disables a statistic. E to enable; D to disable.
[samples]	Specifies the number of samples to collect (1–255).
[size]	Specifies the number of bytes per data sample (1, 2 or 4).
[peaks]	Enables the collection of one minute peaks. Y to enable; N to disable.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	Yes	Yes	BPX			Yes	

Related Commands

dspsloterrs

Table 3-40 Statistics Associated with Each Slot in a BPX Node

Error	Description
Standby Bus Errors	Indicates a background test over the standby bus produced an error.
Rx Invalid Port Errors	Indicates port number was out of the range 1–3.
Polling Bus A Errors	Parity error occurred on this polling bus.

Table 3-40 Statistics Associated with Each Slot in a BPX Node (continued)

Error	Description
Polling Bus B Errors	Parity error occurred on this polling bus.
Bad Grant Errors	Error indicates arbiter did not issue a grant to send data before a time-out.
Tx BIP-16 Errors	Data frame transmitted had a checksum error.
Rx BIP-16 Errors	Data frame received with a checksum error.
Bframe parity errors	Errors detected in the BPX frame on the StrataBus or in a memory operation.
SIU Phase Errors	Serial Interface Unit on the card did not detect the frame synch properly.
Rx FIFO Sync Errors	First-In-First-Out buffer synchronization errors.
Poll Clk Errors	Polling clock errors.
CK 192 Errors	Clock 192 errors.
Monarch Specific Errors	Errors that occur on only the BXM.

Example

cnfslotstats 8

```
sw81           TN    SuperUser       BPX 15    9.3    Apr. 13 2000 15:42 PST

Card Statistics Types

 1) Standby PRBS Errors
 2) Rx Invalid Port Errs
 3) PollA Parity Errors
 4) PollB Parity Errors
 5) Bad Grant Errors
 6) Tx Bip 16 Errors
 7) Rx Bip 16 Errors
 8) Bframe parity Errors
 9) SIU phase Errors
10) Rx FIFO Sync Errors
11) Poll Clk Errors
12) CK 192 Errors
13) Monarch Specific Errors

This Command: cnfslotstats 8
```

cnfsnmp (configure SNMP parameters)

Configures the SNMP GET and SET community strings.

Syntax

cnfsnmp <GET community string> <SET community string>

Parameters

Parameter	Description
get community string	Specifies the GET community string.
set community string	Specifies the SET community string.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

dspsnmp, **dspsnmpstats**

Example

Configure the SNMP GET and SET community string parameters.

cnfsnmp

```
sw180          TN    Cisco           IGX 8420  9.3.p7    Dec. 14 2000 09:06 GMT

Get Community String:                  audit
Set Community String:                  private
Trap Community String:                 private

SNMP Set Request Queue Size:           110
SNMP Queued Request Timeout (secs):    21600
SNMP Trap Event Queue Size:            100



Last Command: cnfsnmp
```

cnfstatmast (configure statistics master SV+ address)

Configures an IP address for the Statistics Master process in WAN Manager. The **cnfstatmast** command defines the IP address for routing the messages to and from the Statistics Master in WAN Manager.

The Statistics Master process requests and receives network statistics by using TFTP Get and Put messages. These TFTP messages pass between the node and the Statistics Master over IP Relay. See the **cnfnwip** description for details on setting a node address.

Syntax

cnfstatmast <IP Address>

Parameters

Parameter	Description
<IP Address>	Specifies the IP address for the Statistics Master. IP addresses have 32-bits. The format of an IP address is x.x.x.x, where x is a value in the range 1–255.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX			Yes	

Related Commands

cnfnwip, **dspnwip**

Example

Configure 199.35.96.217 as the IP address for the Statistics Master.

cnfstatmast 199.35.96.217

cnfstatparms (configure TFPT statistics parameters)

Configures collection of TFTP statistics for the BPX and IGX. This is primarily a Debug command.

Syntax

cnfstatparms <retry> <timeout> <bucket interval> <file interval> <peak> <option>

Parameters

Parameter	Description
<retry>	Number of times TFTP should try again when a TFTP error (such as timeout) occurs. Range: 0–5
<timeout>	TFTP acknowledgement timeout. Range: 0–100 seconds
<bucket interval>	Length of the bucket interval. Valid values: 5, 10, 15, 30, 60 minutes
<file interval>	Length of the file interval. Valid values: 15, 30, 60 minutes. Must be a multiple of Bucket Interval.
<peak>	Enable peak statistics. Values: T(rue) | F(alse)
<option>	Enable all statistics or individually selected ones. Values: 1 (All), 2 (User Defined) Depending on the value entered here, you are prompted for more questions.

Related Commands

dspstatparms, dsptrkerrshist

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX			No	

Example (UXM on the IGX)

cnfstatparms 5 5 5 15 1 2

```
sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Available Statistic Object Types:

1: Connections
2: Service Interfaces
3: Trunks
4: Ports
5: Physical Lines
.: Quit



This Command: cnfstatparms 5 5 5 15 1 2
```

```
Enter Object Type (numeric value): 3

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Available Object Sub-types:

1: Narrow Band
2:
3: BPX 8600 ATM
4: IGX 8400 ATM
.: Quit



This Command: cnfstatparms 5 5 5 15 1 2


Enter Object Sub Type (numeric value): 4
Enter Peak Value (secs): 300

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Virtual Interface Statistic Types

 1) QBIN: Voice Cells Tx to line        14) QBIN: Tx BData A Cells Discarded
 2) QBIN: TimeStamped Cells Tx to ln    15) QBIN: Tx BData B Cells Discarded
 3) QBIN: NTS Cells Tx to line          16) QBIN: Tx CBR Cells Discarded
 4) QBIN: Hi-Pri Cells Tx to line       17) QBIN: Tx ABR Cells Discarded
 5) QBIN: BData A Cells Tx to line      18) QBIN: Tx nrt-VBR Cells Discarded
 6) QBIN: BData B Cells Tx to line      19) QBIN: Tx NTS Cells Received
 7) QBIN: Tx CBR Cells Served           20) QBIN: Tx Hi-Pri Cells Received
 8) QBIN: Tx nrt-VBR Cells Served       21) QBIN: Tx Voice Cells Received
 9) QBIN: Tx ABR Cells Served           22) QBIN: Tx TS Cells Received
10) QBIN: Tx NTS Cells Discarded        23) QBIN: Tx BData A Cells Received
11) QBIN: Tx Hi-Pri Cells Discarded     24) QBIN: Tx BData B Cells Received
12) QBIN: Tx Voice Cells Discarded      25) QBIN: Tx CBR Cells Received
13) QBIN: Tx TS Cells Discarded         26) QBIN: Tx ABR Cells Received

This Command: cnfstatparms 5 5 5 15 1 2
```

```
Continue?

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Virtual Interface Statistic Types

27) QBIN: Tx nrt-VBR Cells Received     40) CGW: Packets Rx From Network
28) VI: Cells rcvd w/CLP=1              41) CGW: Cells Tx to Line
29) VI: OAM cells received              42) CGW: NIW Frms Relayed to Line
30) VI: Cells tx w/CLP=1                43) CGW: SIW Frms Relayed to Line
31) VI: Cells received w/CLP=0          44) CGW: Aborted Frames Tx to Line
32) VI: Cells discarded w/CLP=0         45) CGW: Dscd Pkts
33) VI: Cells discarded w/CLP=1         46) CGW: 0-Length Frms Rx from Network
34) VI: Cells transmitted w/CLP=0       47) CGW: Bd CRC16 Frms Rx from Network
35) VI: OAM cells transmitted           48) CGW: Bd Lngth Frms Rx from Network
36) VI: RM cells received               49) CGW: OAM RTD Cells Tx
37) VI: RM cells transmitted            50) CF: Egress Packet Sequence Errs
38) VI: Cells transmitted               51) CF: Egress Bad HEC from cellbus
39) VI: Cells received                  52) CF: Egress Packets from cellbus

This Command: cnfstatparms 5 5 5 15 1 2


Continue?

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Virtual Interface Statistic Types

53) CF: Egress Cells Tx to Line         66) CF: Ingress Cells from Line
54) CGW: Packets Tx to Network          67) IE: Egress Packets to Extract Buf
55) CGW: Cells Rx from Line             68) IE: Egress Cells injected
56) CGW: NIW Frms Relayed from Line     69) IE: Egress Packets Extract Buf full
57) CGW: SIW Frms Relayed from Line     70) IE: Ingress Cells to Extract Buf
58) CGW: Abrt Frms                      71) IE: Ingress Packets injected
59) CGW: Dscd Cells                     72) IE: Ingress Cells Extract Buf full
60) CGW: 0-Lngth Frms Rx from Line      73) QBIN: Tx Q10 Cells Served
61) CGW: Bd CRC32 Frms Rx from Line     74) QBIN: Tx Q10 Cells Discarded
62) CGW: Bd Lngth Frms Rx from Line     75) QBIN: Tx Q10 Cells Received
63) CGW: OAM RTD Cells Rx               76) QBIN: Tx Q11 Cells Served
64) CGW: OAM Invalid OAM Cells Rx       77) QBIN: Tx Q11 Cells Discarded
65) CF: Ingress Packets to cellbus      78) QBIN: Tx Q11 Cells Received

This Command: cnfstatparms 5 5 5 15 1 2


Continue?

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Virtual Interface Statistic Types

79) QBIN: Tx Q12 Cells Served
80) QBIN: Tx Q12 Cells Discarded
81) QBIN: Tx Q12 Cells Received
82) QBIN: Tx Q13 Cells Served
83) QBIN: Tx Q13 Cells Discarded
84) QBIN: Tx Q13 Cells Received
85) QBIN: Tx Q14 Cells Served
86) QBIN: Tx Q14 Cells Discarded
87) QBIN: Tx Q14 Cells Received
88) QBIN: Tx Q15 Cells Served
89) QBIN: Tx Q15 Cells Discarded
```

```
90) QBIN: Tx Q15 Cells Received


This Command: cnfstatparms 5 5 5 15 1 2


Enter Statistic Type ('.' to quit):

=============================================================================
*** cnfstatparms for IGX UXM Port Statistics
=============================================================================



sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Available Statistic Object Types:

1: Connections
2: Service Interfaces
3: Trunks
4: Ports
5: Physical Lines
.: Quit



This Command: cnfstatparms 5 5 5 15 1 2


Enter Object Type (numeric value): 4

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Available Object Sub-types:

1: Frame Relay Ports
2: ATM Ports
3:
.: Quit









This Command: cnfstatparms 5 5 5 15 1 2


Enter Object Sub Type (numeric value): 2
Enter Peak Value (secs): 300

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Port Statistic Types

 1) Frames Received                    14) LMI UNI Status Update Count
 2) Frames Transmitted                 15) LMI Invalid Status Enquiries
 3) Bytes Received                     16) LMI UNI Link Timeout Errors
 4) Bytes Transmitted                  17) LMI UNI Keepalive Sequence Errors
```

```
 5) Frames Transmitted with FECN        18) Receive Frames Undefined DLCI Count
 6) Frames Transmitted with BECN        19) DE Frames Dropped
 7) Receive Frame CRC Errors            20) LMI NNI Status Enquiries
 8) Invalid Format Receive Frames       21) LMI NNI Status Receive Count
 9) Receive Frame Alignment Errors      22) LMI NNI Status Update Count
10) Illegal Length Receive Frames       23) LMI NNI Keepalive Sequence Errors
11) Number of DMA Overruns              24) LMI NNI Link Timeout Errors
12) LMI UNI Status Enquiries            25) CLLM Frames Transmitted
13) LMI UNI Status Transmit Count       26) CLLM Bytes Transmitted

This Command: cnfstatparms 5 5 5 15 1 2


Continue?

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Port Statistic Types

27) CLLM Frames Received                40) VI: Cells discarded w/CLP=0
28) CLLM Bytes Received                 41) VI: Cells discarded w/CLP=1
29) CLLM Failures                       42) VI: Cells transmitted w/CLP=0
30) Tx Frames Discarded - Queue Overflow43) VI: OAM cells transmitted
31) Tx Bytes Discarded - Queue Overflow 44) VI: RM cells received
32) Tx Frames while Ingress LMI Failure 45) VI: RM cells transmitted
33) Tx Bytes while Ingress LMI Failure  46) VI: Cells transmitted
34) PORT: Unknwn VPI/VCI cnt            47) VI: Cells received
35) VI: Cells rcvd w/CLP=1              48) PORT: # of cells rcvd
36) VI: OAM cells received              49) PORT: # of cells xmt
37) VI: Cells tx w/CLP=1                50) INVMUX: maximum diff delay
38) PORT: Last unknown VPI/VCI pair     51) INVMUX: HEC cell errors
39) VI: Cells received w/CLP=0          52) INVMUX: LCP cell errors

This Command: cnfstatparms 5 5 5 15 1 2


Continue?

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Port Statistic Types

53) INVMUX: Cell Hunt Count             66) LMI: Status messages xmt
54) INVMUX: Bandwidth Change Count      67) LMI: Updt Status msgs xmt
55) ILMI: Get Req PDUs rcvd             68) LMI: Status Ack msgs xmt
56) ILMI: GetNxt Req PDUS rx            69) LMI: Status Enq msgs rcvd
57) ILMI: GetNxt Req PDUS xmt           70) LMI: Status Enq msgs xmt
58) ILMI: Set Req PDUs rcvd             71) LMI: Status msgs rcvd
59) ILMI: Trap PDUs rcvd                72) LMI: Updt Status msg rcvd
60) ILMI: Get Rsp PDUs rcvd             73) LMI: Status Ack msg rcvd
61) ILMI: Get Req PDUs xmt              74) LMI: Invalid LMI PDUs rcvd
62) ILMI: Get Rsp PDUs xmt              75) LMI: Invalid LMI PDU length rcvd
63) ILMI: Set Req PDUs xmt              76) LMI: Unknown LMI PDUs rcvd
64) ILMI: Trap PDUs xmt                 77) LMI: Invalid LMI IE rcvd
65) ILMI: Unknwn PDUs rcvd              78) LMI: Invalid Transaction IDs

This Command: cnfstatparms 5 5 5 15 1 2


Continue?

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Port Statistic Types
```

```
79) INVMUX: Unavailable Seconds         92)
80) INVMUX: Near End Fail Count         93)
81) INVMUX: Last Proto Fail Code        94)
82) INVMUX: Slowest Link                95)
83)                                     96)
84)                                     97)
85)                                     98)
86) Q2 Cells Tx                         99)
87) Tx Q2 CDscd                         100)
88) Egr CRx Q2                          101) Q7 Cells Tx
89) Q3 Cells Tx                         102) Tx Q7 CDscd
90) Tx Q3 CDscd                         103) Egr CRx Q7
91) Egr CRx Q3                          104) Q8 Cells Tx

This Command: cnfstatparms 5 5 5 15 1 2


Continue?

sw144          TN    Cisco           IGX 8420  9.3.1x    Date/Time Not Set

Port Statistic Types

105) Tx Q8 CDscd                        118) Egr CRx Q12
106) Egr CRx Q8                         119) Q13 Cells Tx
107) Q9 Cells Tx                        120) Tx Q13 CDscd
108) Tx Q9 CDscd                        121) Egr CRx Q13
109) Egr CRx Q9                         122) Q14 Cells Tx
110) Q10 Cells Tx                       123) Tx Q14 CDscd
111) Tx Q10 CDscd                       124) Egr CRx Q14
112) Egr CRx Q10                        125) Q15 Cells Tx
113) Q11 Cells Tx                       126) Tx Q15 CDscd
114) Tx Q11 CDscd                       127) Egr CRx Q15
115) Egr CRx Q11
116) Q12 Cells Tx
117) Tx Q12 CDscd

This Command: cnfstatparms 5 5 5 15 1 2


Enter Statistic Type ('.' to quit):
```

Example (BXM on the BPX)

cnfstatparms 5 5 5 15 1 2

```
rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:37
GMT

Available Statistic Object Types:

1: Connections
2: Service Interfaces
3: Trunks
4: Ports
5: Physical Lines
.: Quit

This Command: cnfstatparms 5 5 5 15 1 2

Enter Object Type (numeric value):  3
```

```
rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:37
GMT

Available Object Sub-types:

1: Narrow Band
2:
3: BPX 8600 ATM
4: IGX 8400 ATM
.: Quit

This Command: cnfstatparms 5 5 5 15 1 2

Enter Object Sub Type (numeric value):  3

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:38
GMT

Virtual Interface Statistic Types

 1) Tx Voice Overflow Drpd Cells        14) Tx Bdata B CLP Drpd Cells
 2) Tx TS Overflow Drpd Cells           15) Tx Voice CLP Drpd Cells
 3) Tx NTS Overflow Drpd Cells          16) Tx TS CLP Drpd Cells
 4) Tx Hi-Pri Overflow Drpd Cells       17) Tx NTS CLP Drpd Cells
 5) Tx BData A Overflow Drpd Cells      18) Tx Hi-Pri CLP Drpd Cells
 6) Tx BData B Overflow Drpd Cells      19) Tx CBR Cells Served
 7) Tx Voice Cells Served               20) Tx VBR Cells Served
 8) Tx TS Cells Served                  21) Tx ABR Cells Served
 9) Tx NTS Cells Served                 22) Tx CBR CLP Drpd Cells
10) Tx Hi-Pri Cells Served              23) Tx nrt-VBR CLP Drpd Cells
11) Tx BData A Cells Served             24) Tx ABR CLP Drpd Cells
12) Tx BData B Cells Served             25) Tx CBR Overflow Drpd Cells
13) Tx Bdata A CLP Drpd Cells           26) Tx nrt-VBR Overflow Drpd Cells

This Command: cnfstatparms 5 5 5 15 1 2

Continue? y

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:38
GMT

Virtual Interface Statistic Types

27) Tx ABR Overflow Drpd Cells          40) Egress TS Cells Rx
28) Tx NTS Cells Discarded              41) Egress BData A Cells Rx
29) Tx Hi-Pri Cells Discarded           42) Egress BData B Cells Rx
30) Tx Voice Cells Discarded            43) Egress CBR Cells Rx
31) Tx TS Cells Discarded               44) Egress ABR Cells Rx
32) Tx BData A Cells Discarded          45) Egress VBR Cells Rx
33) Tx BData B Cells Discarded          46) Total Cells Tx from port
34) Tx CBR Cells Discarded              47) Cells RX with CLP0
35) Tx ABR Cells Discarded              48) Cells Rx with CLP1
36) Tx VBR Cells Discarded              49) Cells RX Discard with CLP0
37) Egress NTS Cells Rx                 50) Cells RX Discard with CLP1
38) Egress Hi-Pri Cells Rx              51) Cells TX with CLP0
39) Egress Voice Cells Rx               52) Cells TX with CLP1

This Command: cnfstatparms 5 5 5 15 1 2

Continue? y

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:38
GMT
```

```
Virtual Interface Statistic Types

53) BXM: Total Cells RX                66) Egress Q12 Cells Rx
54) Ingress OAM Cell Count             67) Tx Q13 Cells Served
55) Egress OAM Cell Count              68) Tx Q13 Cells Discarded
56) Ingress RM cell count              69) Egress Q13 Cells Rx
57) Egress RM cell count               70) Tx Q14 Cells Served
58) Tx Q10 Cells Served                71) Tx Q14 Cells Discarded
59) Tx Q10 Cells Discarded             72) Egress Q14 Cells Rx
60) Egress Q10 Cells Rx                73) Tx Q15 Cells Served
61) Tx Q11 Cells Served                74) Tx Q15 Cells Discarded
62) Tx Q11 Cells Discarded             75) Egress Q15 Cells Rx
63) Egress Q11 Cells Rx
64) Tx Q12 Cells Served
65) Tx Q12 Cells Discarded

This Command: cnfstatparms 5 5 5 15 1 2 3 3 60

Enter Statistic Type ('.' to quit):

===============================================================================
*** cnfstatparms for BPX BXM Port Statistics

================================================================================

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:41
GMT

Available Statistic Object Types:

1: Connections
2: Service Interfaces
3: Trunks
4: Ports
5: Physical Lines
.: Quit

This Command: cnfstatparms 5 5 5 15 1 2

Enter Object Type (numeric value): 4

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:41
GMT

Available Object Sub-types:

1: Frame Relay Ports
2: ASI
3: FTC
.: Quit

This Command: cnfstatparms 5 5 5 15 1 2

Enter Object Sub Type (numeric value): 2

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:42
GMT

Port Statistic Types

 1) Unknown VPI/VCI count              13) OAM cells received count
 2) Cell buff overflow (ingress)       14) Tx payload err cnt BIP-16 err
 3) Non-zero GFC count                 15) Number of cells xmitted w/CLP
```

```
set
 4) ISU discard count                   16) Number of cells xmitted w/EFCI
set
 5) ISU free list empty count           17) Tx header err discard
 6) Receive AIS cell count              18) Get Request PDUs received
 7) Receive FERF cell count             19) Get Next Request PDUS received
 8) Number of cells received            20) Get Next Request PDUS
transmitted
 9) Number of cells rcvd w/CLP set      21) Set Request PDUs received
10) Number of cells rcvd w/EFCI set     22) Trap PDUs received
11) Number of BCM cells rcvd            23) Get Response PDUs received
12) Number of cells xmitted             24) Get Request PDUs transmitted

This Command: cnfstatparms 5 5 5 15 1 2

Continue?

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:42
GMT

Port Statistic Types

25) Get Response PDUs transmitted       37) Invalid LMI PDU length received
26) Trap PDUs transmitted               38) Unknown LMI PDUs received
27) Unknown ILMI PDUs Received          39) Invalid LMI IE received
28) Status messages transmitted         40) Invalid Transaction IDs
29) Update Status messages transmitted  41) Number of cells rcvd w/clp 0
30) Status Acknowledge msgs transmitted 42) Number of cells dscd w/clp 0
31) Status Enquiry messages received    43) Number of cells dscd w/clp set
32) Status Enquiry mesgs transmitted    44) Number of cells tx w/clp 0
33) Status messages received            45) Tx OAM cell count
34) Update Status messages received     46) Rx RM cell count
35) Status Acknowledge messages received47) Tx RM cell count
36) Invalid LMI PDUs received received  48) Last unknown VPI/VCI pair

This Command: cnfstatparms 5 5 5 15 1 2

Continue?

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:42
GMT

Port Statistic Types

49) Tx Cells Served on Qbin 0           61)
50) Tx Cells Discarded on Qbin 0        62)
51) Tx Cells Received on Qbin 0         63)
52) Tx Cells Served on Qbin 1           64)
53) Tx Cells Discarded on Qbin 1        65)
54) Tx Cells Received on Qbin 1         66)
55) Tx Cells Served on Qbin 2           67)
56) Tx Cells Discarded on Qbin 2        68)
57) Tx Cells Received on Qbin 2         69)
58) Tx Cells Served on Qbin 3           70)
59) Tx Cells Discarded on Qbin 3        71)
60) Tx Cells Received on Qbin 3         72)

This Command: cnfstatparms 5 5 5 15 1 2

Continue?

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:43
GMT
```

```
Port Statistic Types

73)                                     85) Tx Cells Served on Qbin 12
74)                                     86) Tx Cells Discarded on Qbin 12
75)                                     87) Tx Cells Received on Qbin 12
76) Tx Cells Served on Qbin 9           88) Tx Cells Served on Qbin 13
77) Tx Cells Discarded on Qbin 9        89) Tx Cells Discarded on Qbin 13
78) Tx Cells Received on Qbin 9         90) Tx Cells Received on Qbin 13
79) Tx Cells Served on Qbin 10          91) Tx Cells Served on Qbin 14
80) Tx Cells Discarded on Qbin 10       92) Tx Cells Discarded on Qbin 14
81) Tx Cells Received on Qbin 10        93) Tx Cells Received on Qbin 14
82) Tx Cells Served on Qbin 11          94) Tx Cells Served on Qbin 15
83) Tx Cells Discarded on Qbin 11       95) Tx Cells Discarded on Qbin 15
84) Tx Cells Received on Qbin 11        96) Tx Cells Received on Qbin 15

This Command: cnfstatparms 5 5 5 15 1 2

Enter Statistic Type ('.' to quit):
```

cnfsysparm (configure system parameters)

Configures various system (or network) parameters. Network-wide parameters are configurable only when all nodes in the network are reachable. The parameters you specify with this command apply throughout the network regardless from which node you execute the command. Take special note of the consequences of how you resolve conflicting values when networks are joined.

You can select each parameter by its index number. The “System Parameters” subsection describes each parameter by index number. The “Parameter Values” table lists the defaults and ranges for each parameter.

Warning **Using cnfsysparm requires caution because network rerouting or loss of data may result from changes in system parameters. If necessary, consult with the TAC before you use cnfsysparm.**

Syntax

cnfsysparm <index> <value>

Parameters

Parameter	Description
<index>	Specifies a numerical value that refers to the specific parameter to be changed. Index numbers and descriptions of the system-wide parameters are in the table that precedes the command summary.
<value>	Specifies a numerical value that applies to the selected parameter. See “Parameter Values” table.

System Parameters

The configurable system parameters are listed by index number:

1: *Maximum Time-Stamped Packet Age* is the maximum age a time-stamped packet can have before the switch discards it. If networks are joined and the *Maximum Time-Stamped Packet Age* in the networks differ from each other, the lower value becomes the maximum.

2: *Fail Connections On Communication Break* determines whether connections are conditioned if the node at the other end of the connection becomes unreachable. If networks with different settings are joined, the resolution is to *enable* this parameter for the new network.

3–7: *Maximum Network Delay* for various types of compressed voice and high-speed data connections using LDM/HDM on an IGX node. When the total queueing delay on a route exceeds this value, connection traffic cannot use the route. The units of measure are milliseconds. When networks with different values are joined, the lower value becomes the *Maximum Network Delay.*

8–12: *Maximum Network Delay* for compressed voice and high-speed data connections. When the total queueing delay on a route exceeds the specified number of milliseconds, a connection traffic cannot use the route. When networks with different values are joined, the higher value becomes the *Maximum Network Delay.* Applicable cards are the UVM, CDP, or CVM.

In Release 9.1, when cost-based routing is configured, the delay cost cap is the maximum allowable end-to-end delay for the connection type. Use parameters 3 through 12 to configure this delay network-wide for all delay-sensitive connections.

- 13: *Enable Discard Eligibility* (DE) bit for Frame Relay connections. Frames received with DE set have been sent on connections where the PIR has been exceeded and are eligible to be discarded. Enabling DE automatically enables CLP. CLP is disabled when Discard Eligibility is turned off except on the bursty data B queue when ForeSight is enabled.
- 14: *Use Frame Relay Standard Parameters Bc and Be* allows you to substitute the Frame Relay Forum standard Bc for VC Q depth and Be for PIR when you configure Frame Relay ports and connections. (The affected commands are **cnfport**, **addcon** for Frame Relay, and **cnfcon**.) Screen displays for Frame Relay ports and connections reflect the choice for this parameter. Note that if you change this parameter, a network-wide reset to the default values takes place for all Frame Relay classes, and the terminal displays a warning that the reset occurred.
- Obsolete: 15–20: *Maximum Local Delay for Interdomain UVM, CDP, or CVM to UVM, CDP, or CVM* connections is similar to parameters 8–12 described above. These parameters specify the maximum delay at the local domain in a structured network. These delays can be set only on a domain-by-domain basis (not end-to-end).
- 21: *FastPAD Jitter Buffer Size* is the size of the buffer for neutralizing jitter in connections that terminate on a FastPAD. The units of measurement are milliseconds.
- 22: *Number of Consecutive Invalid Login Attempts to Cause Major Alarm* specifies the number of failed login attempts that causes a major alarm. The default of 0 means that failed login attempts do not cause an alarm. If the threshold is set to 0, the Too Many Invalid Login Attempts service-affecting alarm is disabled and no alarm will be generated.
- 23: *Enable Connection Deroute Delay* is an enable that causes the network to wait a period of time before rerouting connections because of an error on a trunk. With *Enable Connection Deroute Delay* enabled, the network does not immediately reroute connections when statistical errors are occurring or when a trunk momentarily moves into a failure state then returns to normal operation. This feature is relevant when rerouting the connections is more of a disruption than the errors caused by the intermittant trunk.
- 24: *Frame Relay VCs Polling Rate* is the period between the start of polling cycles for both ATM and Frame Relay virtual connections. The possible values are 5, 10, and 15 seconds. As the number of connections in a network grows, greater intervals between cycles may be appropriate. The suggested intervals for the numbers of connections are:
  - 5 minute polling for up to 4000 connections
  - 10 minute polling for up to 8000 connections
  - 15 minute polling beyond 8000 connections.
- 25: *Port Polling Rate* is the time between the start of polling cycles for interval statistics. The possible values are 5, 10, and 15 minutes. (To specify the particular statistics, use the statistics manager in WAN Manager.) As the number of connections in a network grows, greater intervals between cycles may be appropriate. The suggested intervals for the numbers of connections are:
  - 5 minutes for up to 300 connections
  - 10 minutes for up to 500 connections
  - 15 minutes for more than 500 connections.
- 26: *Num of Nodes doing Simultaneous TFTP Cnfg Save/Restore* is the total number of nodes that can perform TFTP configuration data transfers simultaneously. The value must be the same on all nodes in the network. This parameter indicates the maximum number of simultaneous sessions. However, the actual number of simultaneous sessions can be less than this number, depending on the node numbering configuration in the network. When networks with different values of this parameter are joined, the resolution is to take the lower number. Range is 1 to 15 nodes. Default value is four nodes.

Parameter Values

System Parameters

Index	System-Wide Parameter	Default	Range
1	Max Time Stamped Packet Age (in milliseconds).	32	1–60
2	Fail Connections On Communication Break.	No	y or n
3	Max Network Delay for “v” connections (in milliseconds).	14	1–255
4	Max Network Delay for “c” connections (in milliseconds).	27	1–64
5	Max Network Delay for “d” connections (in milliseconds).	14	1–255
6	Max Network Delay for “a” connections (in milliseconds).	27	1–255
7	Max Network Delay for High-Speed Data connections (in milliseconds).	40	1–255
8	Max Network Delay for CDP or CVM to CDP or CVM “v” connections (in milliseconds).	64	1–255
9	Max Network Delay for CDP or CVM to CDP or CVM “c” connections (in milliseconds).	64	1–64
10	Max Network Delay for CDP or CVM to CDP or CVM “t & p” connections (in milliseconds).	64	1–255
11	Max Network Delay for CDP or CVM to CDP or CVM “a” connections (in milliseconds).	64	1–255
12	Max Network Delay for CDP or CVM to CDP or CVM High-Speed Data connections (in milliseconds).	64	1–255
13	Enable Discard Eligibility (DE).	No	y or n
14	Use Frame Relay standard parameters Bc and Be.	No	y or n
15	Obsolete: Max Local Delay for Interdom CDP to CDP “v” connections.	27	1–255
16	Obsolete: Max Local Delay for Interdom CDP to CDP “c” connections.	27	1–64
17	Obsolete: Max Local Delay for Interdom CDP to CDP “t & p” connections.	27	1–255
18	Obsolete: Max Local Delay for Interdom CDP to CDP “a” connections.	27	1–255
19	Obsolete: Max Local Delay for Interdom CDP to CDP High-Speed Data connections.	27	1–255
20	Obsolete: Max Local Delay for Interdom High-Speed Data connections (in milliseconds).	28	1–255
21	FastPAD Dejitter Buffer Depth (in milliseconds).	15	0–255
22	Number of Consecutive Invalid Login Attempts to Cause Major Alarm.	0	3–9
23	Enable Connection Deroute Delay.	Yes	y or n
24	Frame Relay VCs Polling Rate is the number of minutes between polling cycles for both ATM and Frame Relay virtual connections in the network.	5	5, 10, or 15

System Parameters (continued)			
Index	**System-Wide Parameter**	**Default**	**Range**
25	Port Polling Rate is the number of minutes between polling cycles for interval statistics gathered for all ports in the network. As the number of connections in a network grows, greater intervals between cycles may be appropriate. The suggested intervals for the numbers of connections are: • 5 minutes for up to 300 connections • 10 minutes for up to 500 connections • 15 minutes for more than 500 connections.	5	5, 10, or 15
26	Number of Nodes Doing Simultaneous Configuration Save/Restore	4	1–15

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX			Yes	

Example

```
------------------------------------SCREEN 1-----------------------------------
bpx1          TN    Cisco          BPX 8620  9.3.39    Mar. 19 2000 10:52 GMT

                           System-Wide Parameters

1  Max Time Stamped Packet Age (msec) ...............................   32
2  Allow CPU Starvation of Fail Handler .............................  Yes
3  Max Network Delay for 'v' connections (msec)......................   15
4  Max Network Delay for 'c' connections (msec)......................   28
5  Max Network Delay for 't' & 'p' connections (msec)................   15
6  Max Network Delay for 'a' connections (msec)......................   28
7  Max Network Delay for High Speed Data connections (msec)..........   32
8  Max Network Delay for CDP-CDP 'v' connections (msec)..............   64
9  Max Network Delay for CDP-CDP 'c' connections (msec)..............   64
10 Max Network Delay for CDP-CDP 't' & 'p' connections (msec)........   64
11 Max Network Delay for CDP-CDP 'a' connections (msec)..............   64

This Command: cnfsysparm

Continue?
------------------------------------SCREEN 2-----------------------------------
bpx1          TN    Cisco          BPX 8620  9.3.39    Mar. 19 2000 10:52 GMT

                           System-Wide Parameters

12 Max Network Delay for CDP-CDP High Speed Data connections (msec)...   64
13 Enable Discard Eligibility.......................................   No
14 Use Frame Relay Standard Parameters Bc and Be.....................   No
15 Max Local Delay for Interdom CDP-CDP 'v' conns (msec).............   28
16 Max Local Delay for Interdom CDP-CDP 'c' conns (msec).............   28
17 Max Local Delay for Interdom CDP-CDP 't' & 'p' conns (msec)........   28
18 Max Local Delay for Interdom CDP-CDP 'a' conns (msec).............   28
19 Max Local Delay for Interdom CDP-CDP High Speed Data conns (msec)..   28
20 Max Local Delay for Interdom High Speed Data conns (msec)..........   29
21 FastPAD Jitter Buffer Size  (msec)................................   20
22 Number of Consecutive Invalid Login Attempts to Cause Major Alarm .    5

This Command: cnfsysparm

Continue?
------------------------------------SCREEN 3-----------------------------------
bpx1          TN    Cisco          BPX 8620  9.3.39    Mar. 19 2000 10:53 GMT
System-Wide Parameters

23 Enable Connection Deroute Delay feature...........................  Yes
24 Interval Statistics polling rate for ATM VCs......................   15
25 Interval Statistics polling rate for ports on IPX/IGX 8400 nodes...   15
26 Num of Nodes doing Simultaneous TFTP Cnfg Save/Restore............   15


This Command: cnfsysparm
```

cnftcpparm (configure TCP parameters)

Configures the TCP parameter. This command specifies the number of times per second that the BCC checks the IP addresses for attention requests.

Syntax

cnftcpparm <network ip throttle>

Parameters

Parameter	Description
<network ip throttle>	Specifies the number of times that the BCC card polls the LAN for attention requests.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	Yes	Yes	BPX, IGX			Yes	

Related Commands

dsptcpparm

Example

cnftcpparm

```
Sw81           TN    SuperUser       BPX 15    9.3    Apr. 13 2000  15:46 PST

NWIP Bandwidth Throttle (Kbytes/sec):  32



This Command: cnftcpparm


Enter NWIP Bandwidth Throttle (Kbytes/sec):
```

cnfterm (configure terminal port)

Configures data transmission parameters for the control and auxiliary ports. The IGX and BPX nodes support two EIA/TIA-232 serial ports on the upper bus expansion card. The top port is called the Control Terminal port. The lower port is called the Auxiliary Port (AUX).

Parameters can vary with the equipment connected to the port. The control port may connect to a control terminal, a direct-dial modem, or an external EIA/TIA-232 device. The auxiliary port may connect to either a printer or an external EIA/TIA-232 device. After you have set the data transmission parameters for a port, use the SuperUser command **cnftermfunc** to specify the equipment attached to the port. The configuration parameters must match the equipment physically attached to the port.

Syntax

cnfterm <a | c> <baud> <parity> <data_bits> <stop_bits> <output flow control> <input flow control> <CTS flow control> <y | n>

Parameters

Parameter	Description
a | c	Specifies the port to be configured, where “a” means auxiliary port, and “c” means control port.
baud rate	Specifies the baud rate. The rates are 1200, 2400, 4800, 9600, and 19200 bps.
parity	Specifies parity checking for character transmission to and from the port. Valid parity choices are “E” for even parity, “O” for odd parity, and “N” for no parity.
data bits	Specifies the number of bits to be sent for each transmitted character and the number of bits to be expected for each received character. A “7” indicates 7 bits for each character. An “8” indicates 8 bits for each character.
stop bits	Specifies the number of stop bits to be sent with each transmitted character and the number of stop bits to be expected with each received character. A “1” indicates one stop bit with each character; a “2” indicates two stop bits with each character.
output flow control	Specifies the output flow control. An “X” specifies XON/XOFF flow control; an “N” specifies no flow control.
input flow control	Specifies input flow control. An “X” specifies XON/XOFF flow control; an “N” specifies no flow control.
cts flow control	Configures cts flow control. An “X” specifies XON/XOFF flow control; an “N” specifies no flow control. This parameter should be turned off if working with modems on a BPX node.
y | n	Specifies whether the node requires DTR to be asserted to allow or maintain a Login. A “Y” causes the node to require the presence of DTR before allowing a login. A “N” causes the node to ignore DTR.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

cnfterm, **cnfprt**, **window**

Example

Configure an auxiliary control port.

cnfterm

```
lpha          TRM   YourID:1        IGX 8430     9.3    Apr. 13 2000 11:58 PST


Control port                          Auxiliary port

Baud Rate:           1200             Baud Rate:           9600

Parity:              None             Parity:              None
Number of Data Bits: 8                Number of Data Bits: 8
Number of Stop Bits: 1                Number of Stop Bits: 1
Output flow control: XON/XOFF         Output flow control: XON/XOFF
Input flow control:  XON/XOFF         Input flow control:  XON/XOFF
Use DTR signal:      Yes              DTR signal:          Yes




This Command: cnfterm


Select Control port (c) or Auxiliary port (a):
```

cnftermfunc (configure terminal port functions)

Configures port functions for the IGX or BPX control and auxiliary ports. The IGX nodes support two EIA/TIA-232 asynchronous serial ports on the SCC and SCM, respectively. The BPX node supports two EIA/TIA-232 asynchronous serial ports on the BCC. In all cases, the top port is the Control Terminal port, and the lower port is the Aux Port. The Control Terminal port can connect to a control terminal, Cisco WAN Manager, a direct dial-in modem, or any external EIA/TIA-232 device. The Aux Port can connect to a printer, an auto-dial modem to call a control center, or an external EIA/TIA-232 device.

The interface specified for the port must match the equipment physically attached to the port. The baud rate and other data transmission parameters for the port are set with the **cnfterm** command. If either port is configured as an external device window, enter the **window** command to begin a session with the external device.

If the auxiliary port is configured as an auto-dial modem, designate a network ID and a phone number. Configuring the auxiliary port for an auto-dial modem enables the following to occur: When a change in alarm status happens anywhere in the network, the auto-dial modem attached to the auxiliary port dials the specified phone number. If the call goes to the TAC, the alarm is logged under the specified network ID. With this log, Cisco engineers are automatically notified of any problems that occur in the network.

Syntax

cnftermfunc <a | c> <index> [escape_string | (Network_ID_string)] [dial_string]

Parameters

Parameter	Description
<a | c>	Specifies port. a specifies that the auxiliary port will be configured. c specifies that the control port will be configured.
<index>	Control port: 1. VT100/Cisco WAN Manager 2. VT100 3. External device window Auxiliary port: 1. Okidata 184 printer 2. Okidata 184 printer with LOG 3. VT100 4. Alarm Message Collector 5. External Device Window 6. Autodial Modem
escape string	Specifies a string of 1 to 8 characters used to terminate a session with an external device. This parameter is valid only for “External Device Window” interfaces. Default: quit

Parameter	Description
network id string	Specifies a string of 1–12 characters used to identify the network during an auto-dial connection to the TAC. This parameter is valid only for "Autodial Modem" interfaces. Any alarm status change in the network is automatically logged at Cisco by using this network ID. Contact TAC for the ID to use.
dial string	Specifies the telephone number to be dialed when the network is reporting alarm status changes via the auto-dial modem. This parameter is valid only for "Autodial Modem" interfaces. The phone number can be up to 16 characters long and normally consists of digits and commas only. A comma is used to indicate that the auto-dial modem should pause two seconds before continuing to dial. For example, the number "9,4083700736" would cause the modem to dial a "9," pause two seconds, then dial the remaining digits. Contact Cisco TAC for the number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnfterm, **cnfprt**, **dsptermfunc**

Example

Configure an IGX or BPX node control or auxiliary port.

cnftermfunc

Without an argument on the command line, the switch displays a list of parameters:

```
TN    SuperUser       IGX 8420    9.3 Apr. 13 2000  03:46 GMT

Control port                           Auxiliary port

1. VT100/StrataView                    1. Okidata 182 Printer
2. VT100                               2. Okidata 182 Printer with LOG
3. External Device Window              3. VT100
                                       4. Alarm Message Collector
                                       5. External Device Window
                                       6. Autodial Modem



This Command: cnftermfunc


Select Control port (c) or Auxiliary port (a)
```

Example

Configure an auxiliary port. The port configuration screen appears with “Autodial Modem” highlighted to indicate that this interface has been chosen for the auxiliary port. When an alarm occurs on the network, the modem dials 18007674479 to reach the TAC. The alarm is logged on a Cisco computer under the name Intrepid.

cnftermfunc a 5 Intrepid 18007674479

cnftime (configure time)

Sets the time for the entire network. The time is broadcast to all nodes in the network. The time displayed at each node is adjusted for the node's time zone. (See the **cnftmzn** command for more about time zone.) This command can be executed only if the date for the network has already been configured using the **cnfdate** command. If hour, minute, or second is not entered, the current value is kept.

Syntax

cnftime <hour> <minute> <second>

Parameters

Parameter	Description
<hour>	Sets the time for the entire network. The time is broadcast to all nodes in the network. The time displayed at each node is adjusted for the node's time zone. (See the **cnftmzn** command for more information.) This command can only be executed if the date for the network has already been configured using the **cnfdate** command. If hour, minute, or second is not entered, the current value is kept.
<minute>	Specifies the current minute. Range: 0-59
<second>	Specifies the current second. Range: 0-59

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX			Yes	

Related Commands

cnfdate, **cnftmz**

Example

Configure time to 7:31 in the evening. The system displays two warning prompts before it changes the time.

cnftime 19 31 00

```
pubsigx1       TN    SuperUser       IGX 8430    9.3       Apr. 13 2000  19:31 GMT


This Command: cnftime 19 31 00


Warning: Changing time of day affects StrataView statistics timestamps
Hit RETURN to change clock, DEL to abort
```

cnftlparm (configure trunk-based loading parameters)

Configures the trunk-based loading (TBL) parameters. Use the **cnftlparm** command to control the rate of update messages in conjunction with trunk-based loading.

Note Cisco Systems recommends that you leave all parameters at the default values. If you need to change a TBL parameter, first call TAC.

Syntax

cnftlparm <index>

Parameters

No.	Index	Description	Range	Default
1	Enable	Enables or disables automatic TBL update messages. Do not disable unless you first contact TAC.	Yes/No	Yes
2	Normal Interval	Specifies the time interval between checks to determine if the node should send out a TBL update signaling a non-critical change in the trunk load.	0–65000 (times 100 msecs)	150
3	Fast Interval	Specifies the time interval between checks to determine if the node should send out a TBL update signaling a critical change in the trunk load.	0–65000 (times 100 msecs)	50
4	Low Threshold	Algorithm parameters for complex update algorithm.	1–100%	50
5	High Threshold	Algorithm parameters for complex update algorithm.	1–100%	90
6	Min. Percent Chg, Mid 1	Algorithm parameters for complex update algorithm.	1–100%	10
7	Min. Percent Chg, Mid 2	Algorithm parameters for complex update algorithm.	1–100%	6
8	Min. Percent Chg, Mid 3	Algorithm parameters for complex update algorithm.	1–100%	3
9	Min. Percent Chg, Upper	Algorithm parameters for complex update algorithm.	1–100%	2
10	Background Updt Count	Specifies a periodic update. 0=update disabled. If *Background Updt Count* is greater than 0, switch software multiplies it by the value you specify for *Normal Interval*.	0–1000%	0
11	Update Algorithm	Selects the update algorithm. 0=default. 1=complex update algorithm.	0 or 1	0

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnfcmparm

Example

cnftlparm

```
sw66           TN    SuperUser       BPX 15    9.3 Apr. 13 2000 22:31 GMT

1  Enable                   [  Yes]
2  Normal Interval          [  150] (100msecs)
3  Fast Interval            [   50] (100msecs)
4  Low Threshold            [   50] (D)
5  High Threshold           [   90] (D)
6  Min Percent Chg, Mid 1   [   10] (D)
7  Min Percent Chg, Mid 2   [    6] (D)
8  Min Percent Chg, Mid 3   [    3] (D)
9  Min Percent Chg, Upper   [    2] (D)
10 Background Updt Count    [    0] (D)
11 Update Algorithm         [    0] (D)




This Command: cnftlparm


Enter parameter index:
```

cnftmzn (configure time zone)

Configures the time zone for the node. Configuring the time zone for a node ensures that the node's time is correct for the local area regardless of the node at which the network date and time are set. Once configured, the time zone for the node is saved in battery-backed memory. After a power failure, a node's date and time are restored if at least one other node in the network has the current time and date.

Syntax

cnftmzn <timezone | g+ | - hours>

Parameters

Parameter	Description
time zone	• gmt (or g)—Greenwich Mean Time • cst (or c)—Central Standard Time • est (or e)—Eastern Standard Time • mst (or m)—Mountain Standard Time • pst (or p—Pacific Standard Time • yst (or y)—Yukon Standard Time • cdt—Central Daylight Savings Time • edt—Eastern Daylight Savings Time • mdt—Mountain Daylight Savings Time • pdt—Pacific Daylight Savings Time • ydt—Yukon Daylight Savings Time
g+ | - hours	Specifies the difference in hours between local time and Greenwich Mean Time. Instead of entering the time zone, you can enter the hours from Greenwich Mean Time. For example, instead of entering pdt for Pacific Daylight Time, you could enter g-7, which is Greenwich Mean Time minus 7 hours. Range: -12 to +12 hours.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX			Yes	

Related Commands

cnfdate

Example

Configures the time zone to Pacific Standard Time.

cnftmzn pst

```
alpha          TRM   YourID:1        IGX 8420  9.3    Apr. 13 2000 13:19 PST


Last Command: cnftmzn pst


Next Command:
```

cnftrk (configure trunk)

Configures trunk parameters. The typical procedure to add a trunk to the network includes the following steps.

1. Use **uptrk** to "up" or activate the trunk with a default configuration.
2. Use **cnftrk** to configure trunk parameters. You must execute **cnftrk** at both ends of a trunk.
3. Use **addtrk** to add the trunk to the network.

For additional information on adding and configuring trunks, see the <CellCommandItalic>Cisco BPX Series Installation and Configuration guide and the *Cisco IGX 8400 Installation and Configuration* guide. Also see the "Physical and Virtual Trunk Configuration" section on page 3-450, the "IMA-Compliant Trunk Configuration" section on page 3-454, and the "Subrate and Fractional Trunk Configuration" section on page 3-455.

In the display for **cnftrk**, the current value for each parameter appears on screen. At the command line prompt for each parameter, the current or default value appears in parentheses and stays the same if you press Return without entering a new value. Configurable parameters depend on the trunk type. If a displayed parameter is not available for the current trunk type, its name displays at half-intensity, and the value field contains dashes.

If you specify **cnftrk** in a job, prompts appear for line format and line options when you create or edit the job by using **addjob** or **editjob**, respectively.

The **cnftrk** command configures a logical trunk (physical or virtual), so when you change a physical parameter, all trunks on the port (both physical and virtual) are affected. For example, if you change the line framing on a virtual trunk, all virtual trunks on the port are automatically updated to have the modified line framing.

The **cnftrk** command supports the CBR, ABR, and VBR (rt-VBR and nrt-VBR) traffic classes on both physical and virtual trunks.

You use **cnftrk** to configure the Transmit Trunk Rate for all BPX cards except the BXM. For BXM cards, you must use the **cnfrsrc** command to configure the Transmit Trunk Rate (trunk load). For IGX cards, you configure the Transmit Trunk Rate only after a trunk has been added.

You use the **cnftrk** command to assign a VPI value. You cannot configure the VPI value if the virtual trunk is already configured for VSI. If the VSI feature is enabled, and you execute **cnftrk** to decrease the transmit rate, you must confirm whether the Qbin configuration is set up correctly by using the **cnfqbin** command to change the value. The reason for this is that when the transmit rate is decreased, the Qbin depth will be automatically recalculated.

Starting with Release 9.3.30, you can configure an incremental cell delay variance (CDV) on BNI, BXM, UXM, and NTM trunks. For more information about the CDV, see the description of this parameter in parameter table in this section. In addition, you can configure BXM and UXM virtual trunks to recognize receipt of end-to-end F4 OAM AIS alarms from the ATM service provider. See the "Trunk AIS OAM Recognition" section on page 3-451 for more detail.

Also starting with Release 9.3.30, the CRC-4 Protection feature allows you to enable/disable the CRC check on multiframed UXM E1 trunks. This feature applies to all types of UXM E1 trunks except unframed E1 trunks. The two ends of the UXM E1 trunk must be configured to work together. Mismatch of CRC-4 protection configuration between the two ends of the UXM E1 trunk, will result in Out of Frame alarms on the trunk. You use the **cnftrk** Line CRC parameter to enable/disable the CRC check.

Table 3-41 below shows the trunk parameters that you can configure using **cnftrk**. You can specify all physical options on virtual trunks. If you change a physical option on a virtual trunk, the change is propagated to all virtual trunks on the trunk port.

In the table, an X indicates that the parameter is configurable. An X* in the Virtual column indicates that the parameter is a physical parameter, and changing the value for one virtual trunk on the port will automatically cause all virtual trunks on the port to be updated with the same value.

Table 3-41 cnftrk—Parameters That are Configurable on Physical and Virtual Trunks

	BXM		UXM	
Descriptions	**Physical**	**Virtual**	**Physical**	**Virtual**
Transmit Trunk Rate (configurable using **cnfrsrc**)	X	X	X	X
Receive Trunk Rate	X	X	X	X
Pass Sync	X	X*	X	X*
Loop Clock	X	X*	X	X*
Statistical Reserve	X	X	X	X
Header Type NNI	X	X*	X	X*
Trunk VPI		X	X	X
Incremental CDV	X	X	X	X
F4 AIS Detection		X		X
Routing Cost	X	X	X	X
Virtual Trunk Type		X		X
Idle Code	X	X*	X	X*
Restrict PCC traffic	X	X	X	X
Link Type	X	X*	X	X*
Line Framing	X	X*	X	X*
Line Coding			X	X*
Line Cable type			X	X*
Line cable length	X	X*	X	X*
HCS Masking	X	X*	X	X*
Payload Scramble	X	X*	X	X*
Connection Channels	X	X	X	X
Gateway Channels			X	X
Valid Traffic classes	X	X	X	X
Frame Scramble	X	X*	X	X*
Deroute Delay Time	X	X	X	X
VC (Traffic) Shaping	X	X	X	X
Protocol by the Card	X	X	X	X
IMA Differential Delay			X	X
IMA Clock Mode			X	X
IMA Group member			X	X
Retained links			X	X
IMA Differential Delay			X	X

Syntax

cnftrk <slot.port>[.vtrk] <options for E1 | T1 | E3 | T3 | OC-3 | OC-12 | E2 | HSSI | SR >

Parameters

Trunk Option	Type	Description	Possible Entries	Default
slot.port [.vtrk]	All	The number of the trunk to configure.	Any valid slot and port. For cards with one port, use slot.	N/A
Trunk Identification (display only—not configurable)	All	Displays trunk number, trunk type and bandwidth supplied. The card type and slot number of the unit supporting the trunk is also displayed.	T3, E3, T1, E1, E2, fractional T1, fractional E1 subrate, ATM, NTC, NTM, OC-3, STM1, OC-12, STM4.	none
Clock Rate	ATM	This clock rate is required only for HSSI. Actual clock limits depend on the front card.	4 Mbps–50.84 Mbps	
Transmit Trunk Rate (not configurable for BXM)	ATM	This indicates the trunk load and is configurable for all BPX cards except the BXM. You configure Transmit Trunk Rate on the BXM by using the **cnfrsrc** command. On IGX, Transmit Trunk Rate is configurable after a trunk has been added. **Note** The trunk load, which displays in brackets at the end of the first line on the **cnftrk** display, may vary from the Transmit Trunk Rate value. This is due to the way that cells are converted to DS0s, and vice versa, and the way the Rcv Trunk Rate determines the Transmit load at the other end of the trunk. The Transmit Trunk Rate in cells per second (cps) may not fit in the full DS0 and the resulting value may be truncated. The result is that the values displayed in Trunk load field and Transmit Trunk Rate fields may display different values.		
Subrate interface	PKT	Subrate physical interface type.	X.21 | V.35	X.21
Subrate data rate	PKT	Subrate data rate in Kbps. Allows you to specify, in Kbps, the clock rate for the selected subrate interface. Acceptable values are any multiple of 64 Kbps up to a maximum of 1920 Kbps.	64 Kbps, 128 Kbps, 256 Kbps, 384 Kbps, 1.024Mbps, 1.536 Mbps, and 1.920Mbps	1920 Kbps
DS0 map	PKT	Specifies the DS0s to use for a fractional T1 or E1 bundle. Optional “a” = “use alternating channels” (for example, 20–30a means 20, 22, 24, and so on).	x - y[a]	0-31 (E1) 0-23 (T1)

Trunk Option	Type	Description	Possible Entries	Default
Pass sync	All	Enables the trunk to pass a clock for network synchronization.	Yes | No	Yes for standard, no for virtual trunks
Loop Clock	All	Loop receive clock back to transmit.	Yes | No	No
Header Type	ATM	Selects the ATM cell header type: UNI, NNI, or STI. UNI is the default for virtual trunks but you may need to configure this parameter to NNI to match the header type of the VPC provided by the ATM cloud. In this release, this parameter is configurable for physical and virtual trunks. See the *Cisco WAN Switching System Overview* for a description.	UNI | NNI | STI	STI
Statistical Reserve	All	This trunk bandwidth is reserved for non-standard traffic, such as internode controller messages.	0–10666	The recommended stats reserve for T3/E3/OC3/OC12 is 1000 cps and 300 cps for T1/E1 virtual trunks.
Idle code	All	HEX code either in the payload space of an ATM *idle cell* or on an *idle FastPacket trunk* (idle *packets* do not exist)	0–FF (hex)	54 (E1) 7F (T1, ATM)
Gateway Type	ATM	Defines the type of addressing mode for this trunk. See *Cisco WAN Switching System Overview* for a description.	BPX-BPX (BAM) Cloud (CAM) Simple (SAM)	BAM
Connection Channels	ATM	The maximum number of connection channels per trunk. All virtual trunks on the port share this total. The number of connections added to the port cannot exceed the number of connection channels configured for the port. Number of connection channels, or LCNs, on the trunk port that are usable by the virtual trunk. This number cannot be greater than the total number of connection channels on the card. The maximum number of channels is additionally limited by the number of VCI bits in the UNI cell header. For a virtual trunk, divide this number by the maximum number of virtual trunks on the port to get the default.	BNI-T3/E3: max 1771 BNI-OC-3: max 15867 (3837 maximum/virtual trunk) BXM/UXM: 1–(*number of channels allowable on card*)	BNI-T3/E3: 1771 BNI-OC-3: 15867 For Virtual Trunks: BNI-T3/E3: 55 BNI-OC-3: 1442

Trunk Option	Type	Description	Possible Entries	Default
Valid Traffic Classes	BXM UXM	BXM and UXM trunk valid traffic classes are: V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR	V = Voice TS = Time Stamped NTS = Non-Time Stamped FR = Frame Relay FST = ForeSight CBR = ATM constant bit rate RT-VBR = ATM real time (RT) VBR NRT-VBR = ATM non-real time (NRT) VBR N&RT-VBR = Both NRT-VBR and RT-VBR are chosen, screen display only, not prompted. ABR = ATM ABR	N/A
VPI Address	ATM	Virtual path address in ATM cell. The VPI configured for a virtual trunk must match the VPI for the VPC in the cloud. Valid VPC VPIs depend on the port type. Must be non-0 for a virtual trunk.	BXM/UXM (UNI)—1-255 BXM/UXM (NNI)—1-4095 BNI T3/E3—1-255 BNI OC-3—1-63	0
VCI Address	ATM	Virtual circuit address in ATM cell.	0–65,535	0
Restrict CC traffic (requires SuperUser privilege)	All	Restrict node controller messages from a trunk. Restricting CC traffic can cause serious problems. Contact the TAC through Cisco Customer Engineering before you change it.	Y | N	No
Link type	All	Terrestrial or Satellite link.Link Type applies to configuring a route so it can “avoid satellite.”	T | S	T
Routing Cost	ATM	The administrative cost of a trunk for when cost-based routing is configured.	1–50	10 (upon trunk activation)
Line framing	PKT	T1 line framing	D4 | ESF	D4
Line coding	PKT	E1 line coding T1 line coding	HDB3 | AMI ZCS | B8ZS | AMI	HDB3 ZCS

Trunk Option	Type	Description	Possible Entries	Default
Line CRC	PKT ATM	E1 CRC-4 Starting with Release 9.3.30, the CRC-4 Protection feature allows you to enable/disable the CRC check on all multiframed UXM E1 trunks. This feature applies to all types of UXM E1 trunks except unframed E1 trunks. The two ends of the UXM E1 trunk must be configured to work together. Mismatch of CRC-4 protection configuration between the two ends of the UXM E1 trunk, will result in Out of Frame alarms on the trunk.	Yes | No	Yes
Recv impedance	PKT	E1 receive impedance.	1 = 75W unbalanced 2 = 75W balanced 3 = 120W balanced	1
Cable type and cable length	PKT ATM	Length and type of cable used for trunk. Designates the software configurable line build-out to match the cable length from the IGX node to the DSX cross-connect. For BPX, the choices are 0–225 feet and over 225 feet. Cable type is not selectable for BPX. Not applicable to MMF or SMF.	1 = 0–220' MAT 2 = 220–440' MAT 3 = 440–655' MAT 4 = 0 -133' ABAM 5 = 133–266' ABAM 6 = 266–399' ABAM 7 = 399–533' ABAM 8 = 533–655' ABAM 0= 0–225 1= greater than 255	4 0
HCS Masking	ATM	Mask the ATM cell header checksum to disable error checking. HCS Masking applies to E3, OC-3, and OC-12 only.	Yes | No	Yes
Payload Scramble	ATM BNI	Scramble the cell payload.	Yes | No	Yes for BNI-E3 No for all others
End supp BData	PKT ATM	Indicates whether the far end of a trunk supports bursty, Frame Relay data.	Yes | No	No
End supp FST	PKT ATM	Indicates whether the far end of the trunk supports Optimized Bandwidth Management for Frame Relay.	Yes | No	No
IMA Differential Delay		Range: 0–200 milliseconds. Default: Differential delay of 200 msec. Because all physical links share the same line configuration, any changes made to this parameter and IMA Clock Mode parameter will be applied to all physical links of the specified IMA group. This parameter is configurable on virtual trunks that are on top of IMA ports.	0–200 msec	0–200 msec

Trunk Option	Type	Description	Possible Entries	Default
IMA Clock Mode		Two clock mode options are available: Common Transmit Clock Source (CTC mode), and Independent Transmit Clock Source (ITC mode). CTC mode is the default. This parameter is configurable on virtual trunks that are on top of IMA ports.		CTC mode
IMA Group member		Lets you add or delete physical lines of an existing IMA group. You are prompted to enter the physical lines using the following format, for example: IMA Group member: 1,3,5,7 or IMA Group member: where 1,3,5,7 are physical lines that comprise the IMA group. *IMA Group member* is a set of physical lines comprising an IMA group. You can specify the group member as an expression consisting of the primary link followed by a "," (comma), or a hyphen (-), and additional physical links. You then use the following syntax to up a trunk when you specify an IMA group on a UXM trunk: **uptrk** slot.group_member.vtrk	primary link (slot.port)	No default
Retained links		Total number of physical links in the group must be greater than or equal to the number of retained links.		
IMA Protocol Option		Lets you enable/disable the IMA Protocol on trunks that have only *one* physical line.	Enabled/Disabled	Default: IMA protocol disabled on these trunk types
Deroute Delay Time	All	Indicates how long in seconds the network will wait before rerouting connections on a failed trunk. This helps when a trunk momentarily moves into a failure state then returns to normal operation. This feature is relevant when rerouting the connections is more of a disruption than the errors caused by the intermittent trunk. Causes each node not to recognize the trunk as failed until this timer expires at the nodes used by the trunk. This indirectly affects the time that A-bit notifications are sent out because the connection deroute is also delayed.	0–600	0
Virtual Trunk Type	BNI, BXM, UXM	This choice usually comes from the carrier that provides the ATM cloud. This is the VPC type provided by the ATM cloud.	CBR, VBR, ABR	CBR

Trunk Option	Type	Description	Possible Entries	Default
Virtual Trunk VPI	BNI, BXM, UXM	Virtual trunks must be configured to have a greater-than-0 VPI before connections are added by **addcon**. This value usually comes from the carrier that provides the ATM cloud. VPI configured for a virtual trunk matches VPI for VPC in the ATM cloud. Every cell transmitted to this trunk has this VPI value. Valid VPC VPIs depend on the port type.	1–255 for BXM/UXM (UNI) 1–4095 for BXM/UXM (NNI) 1–255 for BNI T3/E3 1–63 for BNI OC-3 (STM1)	
Incremental CDV	BNI, BXM, UXM, NTM	Configures the incremental cell delay variance (CDV) on trunks. The value is specified in units of 125-*u*sec increments. The magnitude of incremental CDV value can be up to 255 units of 125-*u*sec (or, about 32 msec). The default value is zero.	0–255 units of 125-*u*sec	0
F4 AIS Detection	BXM, UXM	Enables/disables the AIS OAM Recognition feature on virtual trunks. With this feature, UXM and BXM virtual trunks recognize receipt of end-to-end F4 OAM AIS alarms from the ATM service provider as virtual trunk path failure. Virtual trunks in a VP-tunnelling configuration (IGX) are not supported.	Yes | No	No

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

addtrk, cnfrsrc, deltrk, dntrk, dsptrkcnf, uptrk

Physical and Virtual Trunk Configuration

Physical and virtual trunk configuration is similar. When you configure a port-level characteristic of a virtual trunk, all the virtual trunks on the port are modified with that characteristic. When the port characteristics of a trunk are modified, all characteristics related to that trunk port are updated.

Virtual trunks (see Table 3-43 for default statistical reserves) appear in the routing topology map as available trunks for routing. The existing physical trunk characteristics, such as bandwidth and satellite/terrestrial type, apply to virtual trunks. The routing algorithm must take into account special restrictions and conid assignments for a virtual trunk. For example, VPCs cannot be routed over a virtual trunk. Also, each virtual trunk has a configurable number of connection channels reserved from the card. The routing algorithm checks for adequate channel availability on a virtual trunk before selecting the trunk for the route.

The connection channel management scheme for the UXM and BXM cards is the same as in the previous release. The conids are selected on a per logical trunk basis. The associated LCNs are selected from a pool of LCNs for the entire card. Each virtual trunk can use the full range of acceptable conid values. The range consists of all the 16-bit values (1–65535), excluding the node numbers and blind addresses. A port uses the VPI to differentiate connections that have the same conid.

The number of channels per virtual trunk can be changed after the trunk has been added to the network. Decreasing the number of channels on an added virtual trunk causes connection reroutes where increasing the number of channels on an added virtual trunk will not cause connection reroutes.

Table 3-42 Default Statistical Reserves for Physical Trunks

	BNI	BXM	UXM
IMA-T1/E1	N/A	N/A	5000cps > T2, E2 1000 cps < T2, E2
T1/E1	N/A	N/A	1000 cps
T3/E3	5000 cps	5000 cps	5000 cps
OC3	5000 cps	5000 cps	5000 cps
OC12	N/A	5000 cps	N/A

T2 = 14490 cps (96 DS0s)

E2 = 19900 cps

N/A = not available

Table 3-43 Default Statistical Reserves for Virtual Trunks

	BNI	BXM	UXM
T1/E1	N/A	N/A	300 cps
T3/E3	1000 cps	1000 cps	1000 cps
OC3	1000 cps	1000 cps	1000 cps
OC12	N/A	1000 cps	N/A

N/A = not available

Trunk AIS OAM Recognition

With the Release 9.3.30 AIS OAM Recognition feature, virtual trunks recognize receipt of end-to-end F4 OAM AIS alarms from the ATM service provider. Prior to Release 9.3.30,virtual trunks recognized ILMI traps/responses as a source of Virtual trunk path failure.

The AIS OAM Recognition feature is provided on BPX BXM and IGX UXM cards only. Virtual trunks in a VP-tunnelling configuration (IGX) are not supported.

The absence or presence of ILMI support from the ATM service provider does not affect the functionality of detecting F4 OAM AIS. Similarly, absence or presence of AIS indication from the ATM cloud does not affect the functionality of ILMI.

The Virtual Trunk Path Fail states have been expanded to distinguish between failures due to ILMI and AIS. The trunk states now include:

- Clear state

- Virtual Trunk Path Fail state due to ILMI trap
- Virtual Trunk Path Fail state due to AIS
- Virtual Trunk Path Fail state due to both ILMI and AIS

You use the **cnftrk** F4 AIS Detection parameter to enable/disable the AIS OAM Recognition feature. You use the **dsptrks** command to display the state of all trunks on the node.

The AIS OAM Recognition feature provides a new entry point into the Virtual Trunk Path Failure alarm. Consequently, more connection rerouting may occur. You can use the **cnftrk** Trunk Deroute Delay timer to avoid excessive rerouting during brief outages.

Receive and Transmit Rates on Physical Trunks

The parameters RCV Trunk Rate and Transmit Trunk Rate apply to physical ATM trunks on an IGX node. On a BPX node, only Transmit Trunk Rate is available. These parameters let you configure lower rates than the maximum line rate for the trunk type. If you adjust a rate, you need to do this at both ends of the trunk. For example, if RCV Trunk Rate on an IGX is 40,000 packets per second (pps), Transmit Trunk Rate on the far end must be 20,000 cells per second (cps). The typical relationship between pps and cps is two FastPackets for each cell.

The default value for Transmit Trunk Rate is the maximum rate for the back card type. You can reduce this rate to any number of cells per second that is less than or equal to the physical port rate. If E3 or T2 is selected, the bandwidth is reduced from the T3 rate.

Note You can configure the Transmit Trunk Rate parameter, which indicates the trunk load, by using the **cnfrsrc** command on BXM cards. On both IGX and BPX nodes, the trunk load displays in cps (cells per second), and the value is displayed in brackets on the first line of the **cnftrk** display.

On the **cnftrk** screen, the Transmit Rate and Transmit Load are always displayed in cps (cells per second). (The Transmit Load displays in brackets above the Transmit Rate field, for example, TRK 13.1.1 Config T3 [2867 cps].) Because switch software performs an internal conversion from DS0s to cells for the receive rate, this receive rate dictates the transmit load at the other end of the trunk, and vice versa. Because the Transmit Load (in cps) may not fit into the full DS0, the resulting number that appears in the Transmit Load field (for example, [2867 cps], could be truncated. For example, if you were to change the Transmit Rate on a routing trunk from 96000 to 104268, **cnftrk** will prompt you to enter a Transmit Rate of 0-104268, and will accept 104268, but it may assign a value of 104150 instead of 104268. The Transmit Load would be the same, for example, 104150 cps, regardless of whether the user configured the Transmit Rate as 104268 or 104269 or 104270.

This shows how the transmit rate is calculated internally by switch software:

1 DS0 = 64000 bits/sec
or
DS0 = 8 bits x 8000 samples/sec = 64000 bits/sec
1 cell long unit = 424 bits/sec
therefore:
Number of cells per second (cps) = DS0 * 8000 / 53 bytes per ATM cell

For any user-provided Transmit Trunk Rate value in T1 cells per second (cps).

Rcv Trunk Rate = T1 x 53 /8000 (in DS0)

(This is the actual value used for everything and dictates the Transmit Trunk Load value at the other end of the trunk.)

The conversion occurs again at the other end:

T2 = R1 * 8000 / 53 (in cps)

The Transmit Load number displayed in brackets is the same, that is, 104150 cells per second, whether the user has given the Transmit Rate as 104268 or 104269 or 104270.

Receive and Transmit Rates on Virtual Trunks

The implementation of XMT Trunk Rate on a virtual trunk differs from the implementation on a physical trunk. On a physical trunk, XMT Trunk Rate limits the rate at which the back card physically generates cells. For a virtual trunk, XMT Trunk Rate does not limit the rate at which the back card generates cells: the line rate stays at the maximum for the line type. However, XMT Trunk Rate is the maximum transmission rate allowed on a virtual trunk.

The provider of the virtual trunk service assigns the value for XMT Trunk Rate. You must have this provider-assigned value for XMT Trunk Rate and enter it when you use **cnftrk**.

The total bandwidth of all the virtual trunks in one port cannot exceed the maximum bandwidth of the port. The trunk loading (load units) is maintained per virtual trunk, but the cumulative loading of all virtual trunks on a port is restricted by the transmit and receive rates for the port.

ILMI Neighbor Discovery on Virtual Trunks

Starting with Release 9.3.10, you can configure the ILMI protocol to run on the interface card (BXM and UXM) or on the controller card (BCC and NPM). The ILMI Neighbor Discovery feature is available for use on virtual trunks on the BXM card and UXM card. This feature enables a network management system (NMS), such as Cisco WAN Manager or CiscoWorks 2000, to discover other attached ATM devices, such as Cisco ATM routers or switches. The attached devices also must support ILMI Neighbor Discovery for this feature to work.

When ILMI Neighbor Discovery is enabled on a virtual trunk, the BPX or IGX and the attached ATM device exchange their management IP addresses and other interface information using the ILMI protocol. The exchanged information consists of the following:

- atmfMyIfName: physical interface name
- atmfMyIfIdentifier: Interface identifier
- atmfMyIpNmAddress: Management IP Address, either the LAN IP or network IP
- atmfMySysIdentifier: System Identifier, a 6-byte string read from the BPX NOVRAM, or if not available, the default value is “000001”

The management IP address is used by the NMS application to access the BPX, IGX, or the ATM device. The management IP address can be either the LAN IP address or network IP address configured for the BPX or IGX node. Use parameter option 56 (BXM) or 53 (UXM) from the **cnfnodeparm** SuperUser command to configure the ILMI management IP address. Enter 0 for LAN IP address, or 1 for network IP address. The default is the network IP address for the BPX and IGX.

Once the parameter is set in **cnfnodeparm**, you enable the ILMI Neighbor Discovery feature by using the **cnftrk** command. Use the parameter ILMI Run On The Card for the UXM, and Protocol By The Card for the BXM.

You use the **dspnebdisc** command to display all the neighbor's information discovered by the BPX or the IGX via the ILMI Neighbor Discovery procedure.

IMA-Compliant Trunk Configuration

The **cnftrk** command has a parameter that lets you add or delete physical lines of an existing IMA group (IMA Group member parameter). You are prompted to enter the physical lines. When you add or delete a physical link, these rules are enforced:

- You cannot delete primary links.
- The total number of physical links in the group must be greater than or equal to the number of retained links. You will be prompted to decrease the number of retained links, if necessary.
- The bandwidth of the deleted physical link will be subtracted from the trunk's Trunk Transmit Rate only. The trunk's Trunk Receive Rate is unaffected. If the Trunk Receive Rate needs to be dropped down, you will be prompted to do this first in a separate operation. You will be warned that connection reroutes may occur.

Note The above functional characteristics apply only to the UXM Firmware Model M, which supports the ATM Forum IMA–Compliant protocol. If a card has UXM Firmware Model A, which supports the Cisco Proprietary protocol, the IMA trunk functions as it did in Release 9.1. For example, you will not be able to add or delete physical links of an existing IMA group.

Primary Link—In an IMA group, you must select one of the physical links to be a primary link. This primary link number is used to refer to this IMA group or trunk. You can use **cnftrk** to add additional links to the group or delete existing links.

When deleting existing links from an IMA group, you cannot delete the primary link. You must first deactivate the trunk using **deltrk**, then use **dntrk** to remove the primary link.

Refer to 9.2 release notes for up-to-date feature support and system requirements.

Physical Lines Comprising an IMA Group

In Release 9.1, it was a requirement that the IMA group had to consist of consecutive physical lines. In this release, you can define an IMA trunk consisting of non-consecutive physical lines. In addition, you can change the group member by deleting a physical line from an existing IMA trunk.

Use the following syntax to specify an IMA group on a UXM trunk:

- **uptrk** *slot.group_member.vtrk*

  where:

  slot is the slot number

  group_member is a set of physical lines composing an IMA group. You can specify the member in an expression consisting of the primary link followed by a, or – and additional physical links.

  vtrk is the optional virtual trunk number. If at least one virtual trunk already exists on this port, you only have to specify the primary link as the group_member.

  For example, 9.1–4 defines trunk 9.1 to consist of four physical links, that is, 1, 2, 3 and 4, where physical link 1 is the primary link. (This example is compatible with Release 9.1.)

  For example, 9.1–3,5 defines trunk 9.1 to consist of four physical links, that is, 1, 2, 3 and 5 where physical link 1 is the primary link.

For example, 9.5–7,2–3 defines trunk 9.5 to consist of five physical links, that is, 2, 3, 5, 6 and 7 where physical link 5 is the primary link.

For example, 9.8,2,4,6 defines trunk 9.8 to consist of all even number of physical links where physical link 8 is the primary link.

Subrate and Fractional Trunk Configuration

For FastPacket trunks, which the NTC and NTM front cards support, you can configure the Subrate interface and Subrate data rate fields only if the back card is a BC–SR. The interface types for a subrate trunk are:

- V.11
- X.21
- V.35
- EIA/TIA-449

Set the data rate to match the subrate facility within the range 64 Kbps–1.920 Mbps.

The DS0 map is used to define fractional E1 and T1 trunks. It consists of a repeating set of specifications in the form:

<x[-y[a]]>
where
"x" and the optional "y" are DS0 numbers 0–23, and
the optional "a" indicates *alternating*.

The value of "y" must be greater than the value of "x." The values of both "x" and "y" cannot be less than 0 or greater than the maximum number of DS-0s for the line type. In the DS0 map for unframed E1, use 0–31. For framed E1, use 1–31. For 30 DS-0 E1, use 1–15, 17–31.

Example (BPX)

Configure a physical trunk.

cnftrk 1.1 353208 Y 5000 7F V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR N 10 N Y N 0

```
hugh           TN    Cisco          BPX 8620  9.3.3o    May  16 2001 1602 PST

TRK  1.1 Config     OC3     [353207cps]    BXM slot     1
Transmit Rate         353208             VPC Conns disabled    No
Protocol By The Card  Yes                Line framing          STS-3C
VC Shaping            No                      coding           --
Hdr Type NNI          Yes                     recv impedance   --
Statistical Reserve   5000    cps             cable type       --
Idle code             7F hex                        length     --
Connection Channels   256                Pass sync             Yes
TrafficV,TS,NTS,FR,FST,CBR,N&RT-VBR,ABR  Loop clock            No
Restrict CC traffic   No                 HCS Masking           Yes
Link type             Terrestrial        Payload Scramble      Yes
Routing Cost          10                 Frame Scramble        Yes
F4 AIS Detection      No                 Vtrk Type / VPI       -- / --
                                          Incremental CDV       0
                                          Deroute delay time    0 seconds
```

```
Last Command cnftrk 1.1 353208 Y 5000 7F V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR
 N 10 N Y N 0
```

Example (BPX)

Configure a virtual trunk.

cnftrk 1.4.1 3000 N 1000 7F V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR N TERRESTRIAL 10 N 0 N N Y Y Y CBR 10 0

```
hugh           TN    Cisco           BPX 8620  9.3.3o    May  16 2001 1604 PST

TRK  1.4.1 Config   OC3     [2867  cps]    BXM slot     1
Transmit Rate         3000               VPC Conns disabled    --
Protocol By The Card  --                 Line framing          STS-3C
VC Shaping            No                      coding           --
Hdr Type NNI          No                      recv impedance   --
Statistical Reserve   1000    cps             cable type       --
Idle code             7F hex                        length     --
Connection Channels   256                Pass sync             No
TrafficV,TS,NTS,FR,FST,CBR,N&RT-VBR,ABR   Loop clock            No
Restrict CC traffic   No                 HCS Masking           Yes
Link type             Terrestrial        Payload Scramble      Yes
Routing Cost          10                 Frame Scramble        Yes
F4 AIS Detection      No                 Vtrk Type / VPI       CBR / 10
                                          Incremental CDV       0
                                          Deroute delay time    0 seconds

Last Command cnftrk 1.4.1 3000 N 1000 7F V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR
 N TERRESTRIAL 10 N 0 N N Y Y Y CBR 10 0
```

Example (BPX)

Configure a BNI trunk.

cnftrk 10.1 80000 5000 7F V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR N TERRESTRIAL 10 0 Y N Y 0

```
hugh           TN    Cisco           BPX 8620  9.3.3o    May  16 2001 1605 PST

TRK 10.1 Config     E3      [80000 cps]    BNI-E3 slot  10
Transmit Rate         80000              VPC Conns disabled    --
Protocol By The Card  --                 Line framing          --
VC Shaping            --                      coding           --
Hdr Type NNI          --                      recv impedance   --
Statistical Reserve   5000    cps             cable type
Idle code             7F hex                        length     0-225 ft.
Connection Channels   1771               Pass sync             Yes
TrafficV,TS,NTS,FR,FST,CBR,N&RT-VBR,ABR   Loop clock            No
Restrict CC traffic   No                 HCS Masking           Yes
Link type             Terrestrial        Payload Scramble      Yes
Routing Cost          10                 Frame Scramble        --
F4 AIS Detection      --                 Vtrk Type / VPI       -- / --
                                          Incremental CDV       0
                                          Deroute delay time    0 seconds

Last Command cnftrk 10.1 80000 5000 7F V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR N
 TERRESTRIAL 10 0 Y N Y 0
```

Example (IGX)

Configure a UXM physical trunk.

cnftrk 9.1 353207 Y N 5000 10 7F N 200 V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR 10 y N

```
bolger         TN    Cisco           IGX 8430  9.3.3o    May  16 2001 16:07 PST
TRK  9.1 Config       OC3      [353207cps]  UXM slot9
Transmit Trunk Rate  353208 cps          Connection Channels  256
Rcv Trunk Rate       353207 cps          Gateway Channels     200
Pass sync            Yes                 TrafficV,TS,NTS,FR,FST,CBR,N&RVBR,ABR
Loop clock           No                  Incremental CDV      10
Statistical Reserve  5000   cps          Frame Scramble       Yes
Header Type          NNI                 Deroute delay time   0 seconds
VPI Address          1                   VC Shaping           Yes
Routing Cost         10                  VPC Conns disabled   No
Idle code            7F hex              F4 AIS Detection     No
Restrict PCC traffic No
Link type            Terrestrial
Line framing         STS-3C
HCS Masking          Yes
Payload Scramble     Yes

Last Command cnftrk 9.1 353207 Y N 5000 10 7F N 200 V,TS,NTS,FR,FST,CBR,NRT-VBR
,ABR,RT-VBR 10 y N
```

Example (IGX)

Configure a UXM IMA trunk.

cnftrk 8.1 1-15,17-31 1-4 4 17962 17962 Y N 1000 NNI 1 10 54 N TERRESTRIAL Y Y Y 200 V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR 0 200 N N N

```
bolger         TN    Cisco           IGX 8430  9.3.3o    May  16 2001 1609 PST

TRK  8.1(4) Config    E1/119   [17962 cps]  UXM slot8
Line DS-0 map        1-15,17-31          Line coding          HDB3
IMA Group Member(s)  1-4                 Line CRC             Yes
Retained links       4                   Line recv impedance  120 ohm
Transmit Trunk Rate  17962  cps          HCS Masking          Yes
Rcv Trunk Rate       17962  cps          Payload Scramble     Yes
Pass sync            Yes                 Connection Channels  256
Loop clock           No                  Gateway Channels     200
Statistical Reserve  1000   cps          TrafficV,TS,NTS,FR,FST,CBR,N&RVBR,ABR
Header Type          NNI                 Incremental CDV      0
VPI Address          1                   IMA Protocol Option  Enabled
Routing Cost         10                  IMA Max. Diff. Dly   200 msec.
Idle code            54 hex              IMA Clock Mode       CTC
Restrict PCC traffic No                  Deroute delay time   0 seconds
Link type            Terrestrial         VC Shaping           No
VPC Conns disabled   No
F4 AIS Detection     No

Last Command cnftrk 8.1 1-15,17-31 1-4 4 17962 17962 Y N 1000 NNI 1 10 54 N TER
RESTRIAL Y Y Y 200 V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR 0 200 N N N
```

Note The ATM Forum–compliant ATM Inverse Multiplexing standard does not support the IMA link autodisable option. Previous to Release 9.2, the IMA link auto disable parameter displayed for IMA links, but it does not display in Release 9.2 or higher. The IMA group member and IMA Differential delay parameters are configurable. The IMA Clock Mode parameter is fixed at CTC and is not configurable. Also, note that you can configure IMA trunk parameters on virtual trunks that are on top of IMA ports.

Example (IGX)

Configure a UXM virtual trunk.

cnftrk 18.3.5 3000 2867 N N 1000 N 10 7F N TERRESTRIAL PLCP 1 Y N200 V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR CBR 10 100 Y y Y

```
bolger         TN    Cisco           IGX 8430  9.3.3o    May  16 2001 1614 PST

TRK 18.3.5 Config     T3/19    [2867  cps]  UXM slot18
Transmit Trunk Rate  3000   cps          Connection Channels  256
Rcv Trunk Rate       2867   cps          Gateway Channels     200
Pass sync            No                  TrafficV,TS,NTS,FR,FST,CBR,N&RVBR,ABR
Loop clock           No                  Vtrk Type / VPI      CBR / 10
Statistical Reserve  1000   cps          Incremental CDV      100
Header Type          NNI                 Deroute delay time   0 seconds
Routing Cost         10                  VC Shaping           Yes
Idle code            7F hex              ILMI run on the card Yes
Restrict PCC traffic No                  F4 AIS Detection     Yes
Link type            Terrestrial
Line framing         PLCP
Line cable length    0-225 ft.
HCS Masking          Yes
Payload Scramble     No

Last Command cnftrk 18.3.5 3000 2867 N N 1000 N 10 7F N TERRESTRIAL PLCP 1 Y N
200 V,TS,NTS,FR,FST,CBR,NRT-VBR,ABR,RT-VBR CBR 10 100 Y y Y
```

cnftrkalm (configure trunk alarms)

Configures trunk alarm reporting. When trunks are upped and added to the network, alarm reporting automatically is enabled. The **cnftrkalm** command lets you disable alarms on a trunk. Disabling alarms may be useful, for example, for trunks that are connected to the node but not yet in service or if the node is experiencing occasional bursts of errors but is still operational.

When the alarms are enabled, they cause an alarm output from the DTI Group Alarm Connector (if present) and an alarm indication on the Cisco WAN Manager terminal.

A virtual trunk also has trunk port alarms that are shared with all the other virtual trunks on the port. These alarms are cleared and set together for all the virtual trunks sharing the same port.

Statistical alarms are provided on cell drops from each of the Advanced CoS Management queues. These alarms are maintained separately for virtual trunks on the same port.

On an IGX node, enabled alarms cause an output from the ARC or ARM card or an indication to Cisco WAN Manager.

Syntax

cnftrkalm <slot.port>[.vtrk] <e | d>

Parameters

Parameter	Description
<slot.port>	Specifies the trunk number.
[.vtrk]	Specifies the virtual trunk number. Optional.
<e | d>	Enables or disables the alarm.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspalms, dsptrks

Trunk Alarms

Table 3-44 shows physical and logical trunk alarms, with the alarm type, the physical interface type, and whether the alarm is a logical, statistical, or integrated alarm.

Table 3-44 Physical and Logical Trunk Alarms Supported on IGX and BPX

Alarm Type	Physical					Logical	Statistical	Integrated
	T1	E1	T3	E3	SONET			
LOS	X	X	X	X	X		X	X
OOF	X	X	X	X	X		X	X
AIS	X	X	X	X	X		X	X
YEL	X	X	X	X	X			X
PLCP OOF			X					X
LOC				X	X			X
LOP					X			X
PATH AIS					X			X
PATH YEL					X			X
PATH TRC					X			X
SEC TRC					X			X
ROOF	X	X						X
FER	X	X						X
AIS16	X	X					X	X
IMA	X	X						X
NTS Cells Dropped						X	X	
TS Cells Dropped						X	X	
Voice Cells Dropped						X	X	
Bdata Cells Dropped						X	X	
BdatB Cells Dropped						X	X	
HP Cells Dropped						X	X	
CBR Cells dropped						X	X	
VBR Cells dropped						X	X	
ABR Cells dropped						X	X	

Statistical alarms are provided on cell drops from each of the Advanced CoS Management queues. These alarms are maintained separately for virtual trunks on the same port.

A virtual trunk also has trunk port alarms that are shared with all the other virtual trunks on the port. These alarms are cleared and set together for all the virtual trunks sharing the same port.

IMA physical line alarms are a special case. Each IMA trunk port has a configurable number of retained links. If the number of non-alarmed lines is less than the number of retained links, the logical trunks on the IMA trunk port are placed into major alarm.

For example, suppose there are IMA virtual trunks 4.5-8.2 and 4.5-8.7. Further, the number of retained links on 4.5-8 has been configured to 2. If 4.5 and 4.6 go into LOS, physical line alarms are generated for these 2 physical lines. The logical trunks 4.5-8.2 and 4.5-8.7 do not go into alarm because the two retained links are still healthy. In this situation, the bandwidth on the logical trunks is adjusted downwards to prevent cell drops, and the connections on those trunks are rerouted. If a third line goes into alarm, the logical trunks are then failed. See Table 3-45 for a list of physical and trunk alarms that are supported on IMA lines.

Table 3-45 Physical and Logical Alarms Supported on IMA Physical Lines

	Physical							
Alarm Type	**T1**	**E1**	**T3**	**E3**	**SONET**	**Logical**	**Statistical**	**Integrated**
LOS	X	X	X	X	X		X	X
OOF	X	X	X	X	X		X	X
AIS	X	X	X	X	X		X	X
YEL	X	X	X	X	X			X
PLCP OOF			X					X
LOC				X	X			X
LOP					X			X
PATH AIS					X			X
PATH YEL					X			X
PATH TRC					X			X
SEC TRC					X			X
ROOF	X	X						X
FER	X	X						X
AIS16	X	X					X	X
IMA	X	X						X
NTS Cells Dropped						X	X	
TS Cells Dropped						X	X	
Voice Cells Dropped						X	X	
BDATA Cells Dropped						X	X	
BDATB Cells Dropped						X	X	
HP Cells Dropped						X	X	
CBR Cells Dropped						X	X	

Table 3-45 Physical and Logical Alarms Supported on IMA Physical Lines (continued)

Alarm Type	Physical					Logical	Statistical	Integrated
	T1	E1	T3	E3	SONET			
VBR Cells Dropped						X	X	
ABR Cells Dropped						X	X	

Example

Disable trunk alarms on trunk 7.

cnftrkalm 7 d

```
beta           TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 15:21 MST

PLN  Type      Current Line Alarm Status               Other End
7    E1/32     Clear - Line OK                         alpha.10
9    T1/24     Clear - Line OK                         gamma.10
13   T1/24     Clear - Line OK                         alpha.14
15   T1/24     Clear - Line OK                         gamma.15
20   T3/3      Major - AIT Missing                       -



Last Command: cnftrkalm 7 d

Next Command:
```

Example

Enable the alarms after they have been disabled.

cnftrkalm 8 d

```
sw180          TN    Cisco           IGX 8420   9.3.p7    Dec. 14 2000 09:44 GMT

TRK          Type   Current Line Alarm Status               Other End
 8           T1/24  Clear - OK                              sw108/14



Last Command: cnftrkalm 8 d
```

Example

cnftrkalm 8 e

```
sw180          TN    Cisco           IGX 8420   9.3.p7    Dec. 14 2000 09:48 GMT

TRK          Type   Current Line Alarm Status               Other End
 8           T1/24  Clear - OK                              sw108/14



Last Command: cnftrkalm 8 e
```

cnftrkict (configure trunk interface control template)

Configures the output lines of an interface control template for a subrate trunk. Table 3-46 shows the configurable signals.

Table 3-46 Configurable Signals in an Interface Control Template

Interface Type	Output Signal	Inputs
X.21	C, I	
V.35	RTS, DTR	CTS, DSR
MIL-188	IS, LL, RL, RS, SF, SS, TR	DM, CS

Syntax

cnftrkict <line> <output> <source>

Parameters

Parameter	Description
<line>	Specifies the trunk for the interface control template.
<output>	Specifies the output lead to be configured. Configurable output leads vary depending on the type of data interface used (X.21or V.35).
<source>	Specifies how the specified output lead is to be configured. The options are as follows: • On, which means the output lead is asserted. • Off, which means the output lead is inhibited. • l (lower case L) Output follows a local input lead. • Input, which specifies the name of the local input lead that the output lead follows. Input leads vary according to the type of data interface supported (X.21 or V.35).

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dsptrkict, prttrkict

Example

Configure output lead "c" as "on" in the interface control template for subrate trunk 9.

cnftrkict 9 c on

```
beta           TRM   YourID:1        IGX8430    9.3    Apr. 13 2000 15:15 MST


Packet Line:9
Interface:X.21DTE

Interface Control Template for Trunk Line

Lead Output Value LeadO Output Value
C /DTR ON



Last Command: cnftrkict 9 c on


Next Command:
```

cnftrkparm (configure trunk card parameters)

Sets specified trunk parameters for these front cards:

- UXM/UXM-E
- AIT
- NTC
- NTM
- BNI
- BXM/BXM-E

Use the **cnftrkparm** command to optimize a network for particular traffic mixes. Use this command to configure any of the trunk-specific parameters associated with a trunk card. It applies to either a FastPacket trunk or a ATM trunk.

For ATM trunks, **cnftrkparm** applies to both physical and virtual trunks. BXM and UXM virtual trunks have the same configuration parameters for queues as physical trunks.

The integrated alarm thresholds for major alarms and the gateway efficiency factor is the same for all virtual trunks on the port. Note that BNI VTs are supported by a single queue and do not support configuration of all the OptiClass queues on a single virtual trunk.

You can also use this command to reconfigure trunk queue depths to meet the CEPT requirement for a maximum end-to-end delay of 10 milliseconds. For this purpose, enter:

cnftrkparm <*trunk number*> <*parameter index*> <*parameter value*>

where:

trunk number specifies the trunk.
parameter index is 2 (which corresponds to the NTS queue).
parameter value is 7 (which is the maximum allowable queue depth).

When the system receives this command and a trunk number, it displays the configurable parameters with an index number for each. The parameters vary with the trunk type, as the subsequent figures and tables show.

Configuring Trunk Queues Used by Real-Time VBR and Non-Real-Time VBR Connections

Qbin values on both ports and trunks used by rt-VBR connections and nrt-VBR connections can be configured separately. (To configure Qbin values on ports, use **cnfportq**.)

The rt-VBR traffic type (or connection class) is supported on the IGX UXM and BPX BXM, ASI, and BNI cards. However, the rt-VBR class of service is not supported for MGX 8850 or MGX 8220 interface shelves.

A rt-VBR connection uses the rt-VBR queue on a trunk. It shares this queue with voice traffic. The rt-VBR and voice traffic shares the default or user-configured parameters for the rt-VBR queue. These parameters are queue depth, queue CLP high and CLP low thresholds, EFCI threshold, and queue priority.

A nrt-VBR connection uses the nrt-VBR queue on a trunk. The configurable parameters are queue depth, queue CLP high and CLP low thresholds, EFCI threshold, and queue priority.

You can configure the Qbin values separately for rt-VBR and nrt-VBR classes on trunks using the **cnftrkparm** command. For rt-VBR, the **cnftrkparm** command configures Q-depth rt-VBR and Max Age rt-VBR. For nrt-VBR, the **cnftrkparm** command configures Q-depth nrt-VBR, Low CLP nrt-VBR, and High CLP nrt-VBR.

For information on configuring port queues used by rt-VBR and nrt-VBR connections, see the **cnfportq** command.

Syntax

cnftrkparm <trk number> <parm index> <parm value>

Parameters

Parameter	Description
<trk number>	Specifies the trunk to configure. To specify a virtual trunk, use this format: *slot.port.vtrk*.
<parm index>	Specifies the parameter to change.
<parm value>	Specifies the value of the parameter.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

dsptrkstathist, **dsptrkstatcnf**

Physical and Virtual Parameters Configurable with cnftrkparm

All virtual trunks on a BNI card are supported by a single queue; therefore, you cannot configure all the Advanced CoS Management queues on a single virtual trunk.

The UXM and BXM share the same queueing architecture. The egress cell traffic out a port is queued in two stages. First they are queued per virtual interface (VI), each of which supports a virtual trunk. Within each virtual interface, the traffic is queued according to its normal Advanced CoS Management traffic type. In other words, voice, Time-Stamped, Non-Time-Stamped, High-Priority, BData, BDataB, CBR, rt-VBR, nrt-VBR, and ABR traffic is queued separately.

The overall queue depth of the virtual interface is the sum of all the queue depths for all the available queues. Since each virtual trunk occupies one virtual interface (VI), the overall queue depth available for the virtual trunk is that of its VI. You do not configure the virtual interface directly, however, you use the **cnftrkparm** command to configure the queues within the virtual trunk.

Although the traffic consists of Frame Relay in cells, the traffic can pass through a BPX node. Therefore, the Bursty Data queues exist in the BPX node.

BXM and UXM virtual trunks have all the configuration parameters for queues that physical trunks have. The integrated alarm thresholds for major alarms and the gateway efficiency factor is the same for all virtual trunks on the port. Note that BNI virtual trunks are supported by a single queue and do not support configuration of all the Advanced CoS Management (formerly OptiClass) queues on a single virtual trunk.

Table 3-47 provides a list of physical and virtual parameters that you can configure using **cnftrkparm**. X in the table indicates that the parameter is configurable. X* in the virtual trunk column indicates the parameter is a physical parameter, and changing the value for one virtual trunk on the port will automatically cause all virtual trunks on the port to be updated with the same value.

Table 3-47 cnftrkparm—Configurable Parameters for Physical and Virtual Trunks

	BXM		UXM	
Description of cnftrkparm Parameters	**Physical**	**Virtual**	**Physical**	**Virtual**
Queue Depth - rt-VBR	X	X	X	X
Queue Depth - NTS	X	X	X	X
Queue Depth - TS	X	X	X	X
Queue Depth - Bdata A	X	X	X	X
Queue Depth - Bdata B	X	X	X	X
Queue Depth - High Priority	X	X	X	X
Queue Depth - CBR	X	X	X	X
Queue Depth - nrt-VBR	X	X	X	X
Queue Depth - ABR	X	X	X	X
Max Age - rt-VBR	X	X	X	X
Red Alm - I/O	X	X*	X	X*
Yel Alm - I/O	X	X*	X	X*
Lo/Hi CLP and EFCN Bdata A	X	X	X	X
Lo/Hi CLP and EFCN Bdata B	X	X	X	X
Lo/Hi CLP for CBR	X	X	X	X
Lo/Hi CLP for VBR	X	X	X	X
Low/Hi CLP, and EFCN for ABR	X	X	X	X
EPD and EFCN for CBR and nrt-VBR			X	X
SVC Queue pool size	X	X		
Gateway Efficiency			X	X*

Display Fields (IGX)

Index	Parameter	Description
1, 18	Yel/Red Alarm In/Out	Specifies a time period relating to when a trunk goes into a red or yellow alarm and after it comes out of the alarm state. The applicable type of alarm here stems from a physical line problem rather than from a statistical error. The purpose of this parameter is to prevent the switch from rerouting the connections after a very brief problem or from prematurely informing switch software that the trunk is back in service (after a failure). The implementation is • The “into” alarm value is the time the card waits after a local (red) or yellow (remote) problem occurs before the card alerts switch software of the problem. • The “out of” alarm value is the time the card waits after a local, physical problem is cleared before the card alerts switch software that the problem no longer exists.
2, 19	Rx/Tx Max. Age: - rt-VBR	Specifies a multiplier for 125-microsecond increments for the maximum age of rt-VBR (or voice) packets. For example, with the default of 20, the node discards rt-VBR (or voice) packets older than 2.5 seconds.
3, 20	Rx/Tx EFCN - BdataB	For packets or cells received from the trunk carrying Optimized Bandwidth Management Frame Relay, the node sets the FECN bit above this threshold.
4	Gateway Efficiency	Specifies an expected average number of FastPackets in each cell arriving from a trunk. The purpose of this parameter is to help switch software regulate bandwidth usage the cell bus in an IGX node. The range is 1.0–3.0. (This parameter does not apply to the BXM card.)
5	EFCN - Rx Space	Same as 3, 20 except that FECN - Rx Space sets the threshold in the Rx space queues in the AIT card. Rx space queues face toward the IGX node.
6, 7	Low-High CLP-Rx Space	Same as 8, 9 except this threshold is for setting CLP in receive spacer queues for data to send to the local node.
8, 9	Rx High CLP (Bdata A/BdataB)	Frame Relay cells/packets received from trunk with CLP bit set above this high threshold will be dropped and will continue to be dropped until the low threshold is crossed. Separate queues for Optimized Bandwidth Management and non-Optimized Bandwidth Management data. Given in terms of percent of queue depth.
10, 11	Rx Low CLP (Bdata A/BdataB)	Same as for 8, 9 except sets low threshold.
12–17	Receive Queue Depth (rt-VBR, NTS, TS, BData A, BData B, High Pri.)	Reserves RAM in the trunk card for each of the receive queues in terms of the number of packets.
25, 26	Tx High CLP	Same as 8, 9 except this is threshold for setting CLP in transmit queues for data to be output to the next link.

Index	Parameter	Description
27, 28	Tx Low CLP	Same as for 25, 26 except sets low threshold.
29–34	Transmit Queue Depth	Reserves RAM in the trunk card for each of the transmit queues in terms of the number of packets.

Example (IGX)

cnftrkparm 13

```
sw83           TN    SuperUser       IGX 8420    9.3       Apr. 13 2000 15:58 PST

PLN 13 Parameters:
 1 Yel Alm-In/Out (D) [   600/   600]      18 Red Alm-In/Out (D) [  2500/ 15000]
 2 Rx Max Age - rt-VBR   (D)   [ N/A]      19 Tx Max Age - rt-VBR   (D)   [  20]
 3 Rx EFCN  - BdataB     (D)   [ N/A]      20 Tx EFCN    - BdataB   (D)   [  30]
 4 Gateway Efficiency    (D)   [ N/A]
 5 EFCN     - Rx Space   (D)   [ N/A]      Tx Age Step2 (D)     Tx Age Step  (D)
 6 Low CLP  - Rx_Space   (%)   [ N/A]      21 BDataA [ 128]     23 BDataA [ 128]
 7 High CLP - Rx_Space   (%)   [ N/A]      22 BDataB [ 128]     24 BDataB [ 128]
Rx High CLP  (%)     Rx Low CLP   (%)      Tx High CLP  (%)     Tx Low CLP   (%)
 8 BDataA [ N/A]     10 BDataA [ N/A]      25 BDataA [ 100]     27 BDataA [ 100]
 9 BDataB [ N/A]     11 BdataB [ N/A]      26 BDataB [  75]     28 BDataB [  25]
Receive Queue Depth              (D)       Transmit Queue Depth              (D)
12 rt-VBR [ N/A]     15 BDataA [ N/A]      29 rt-VBR [  22]     32 BDataA [ 301]
13 Non TS [ N/A]     16 BDataB [ N/A]      30 Non TS [ 114]     33 BDataB [ 301]
14 TS     [ N/A]     17 HighPri[ N/A]      31 TS     [2616]     34 HighPri[ 100]

Last Command: cnftrkparm 13


Next Command:
```

Note For parameter 12, the system displays: "Warning—don't change Voice Q size, use Max Voice Age."

Display Fields (BPX)

Index	Parameter	Description
1	Q Depth - rt-VBR	Specifies the queue depth in cells for rt-VBR and voice traffic. This parameter relates to item 7, Max Age - rt-VBR: if you increase the value for Max Age - rt-VBR, the node increases the size of the rt-VBR (or voice) Packet Queue because more voice packets can accumulate due to a greater age. In Release 9.2, for BXM trunks, the rt-VBR and voice service types share the same queue (the rt-VBR queue). Similarly, for BXM trunks, rt-VBR and voice traffic share the default or user-configured voice Qbin values.
2	Q Depth - Non-TS	Specifies the queue depth in cells for non-time-stamped traffic.
3	Q Depth - TS	Specifies the queue depth in cells for time-stamped traffic.
4	Q Depth - BData A	Specifies the depth in cells for the bursty data A queue.
5	Q Depth - BData B	Specifies the depth in cells for the bursty data B queue.

Index	Parameter	Description
6	Q Depth - High Pri	Specifies the queue depth in cells for high priority traffic.
7	Max Age - rt-VBR	Specifies a multiplier for 125-microsecond increments for the maximum age of rt-VBR (or voice) packets. For example, with the default of 20 microseconds, the node discards rt-VBR (or voice) packets older than 2.5 seconds. This value is the same as the default queue delay. The Max Age - rt-VBR (or voice) Qbin threshold can be calculated as follows: (20 * (125 microseconds) * num_ds0s/53 cells + 2) for any trunk. This parameter relates to item 1, Q Depth - rt-VBR: if you increase the value for Max Age - rt-VBR, the node increases the size of the Voice (or rt-VBR) Packet Queue because more rt-VBR (or voice) packets can accumulate due to a greater age.
8	Red Alm - I/O (Dec)	Specifies a time period relating to when a trunk goes into red alarm and after it comes out of the alarm state. The applicable type of alarm here stems from a physical line problem rather than from a statistical error. The purpose of this parameter is to prevent the switch from rerouting the connections after a very brief problem or from prematurely informing switch software that the trunk is back in service (after a failure). The implementation is: • The “into” alarm value is the time the card waits after a local, physical problem occurs before the card alerts switch software of the problem. • The “out of” alarm value is the time the card waits after a local, physical problem is cleared before the card alerts switch software that the problem no longer exists.
9	Yel Alm - I/O (Dec)	Specifies a time period relating to when a trunk goes into yellow alarm and after it comes out of the alarm state. The applicable type of alarm here stems from a physical line problem rather than from a statistical error. The purpose of this parameter is to prevent the switch from rerouting the connections after a very brief problem or from prematurely informing switch software that the trunk is back in service (after a failure). The implementation is: • The “into” alarm value is the time the card waits after a remote, physical problem occurs before the card alerts local switch software of the problem. • The “out of” alarm value is the time the card waits after a remote, physical problem is cleared before the card alerts local switch software that the problem no longer exists.
10	Low CLP - BData A	Specifies a percent of the Bursty Data A queue. When the number of cells in the queue falls below this percentage, the switch stops discarding cells with CLP=1. The default of 100% disables the function, which causes the switch to discard all cells with CLP=1.

Index	Parameter	Description
11	High CLP - BData A	Specifies a percent of the Bursty Data A queue. When the number of cells in the queue reaches this percentage, the switch begins to discard cells with CLP=1. The default of 100% disables the function, which causes the switch to discard all cells with CLP=1 regardless of the cell count in the queue.
12	Low CLP - BData B	Specifies a percent of the Bursty Data B queue. When the number of cells in the queue falls below this percentage, the switch stops discarding cells with CLP=1.
13	High CLP - BData B	Specifies a percent of the Bursty Data B queue. When the number of cells in the queue reaches this percentage, the switch begins to discard cells with CLP=1.
14	EFCN - BData B	Specifies the number of cells in the Bursty Data B queue that causes the switch to send congestion notification to the destination node. The default is low in relation to the default queue depth so that notification begins to go out as soon as congestion begins.
15	Q Depth - CBR	Specifies the depth of the queue dedicated to CBR traffic.
16	Q Depth - nrt-VBR	Specifies the depth of the queue dedicated to nrt-VBR traffic.
17	Q Depth - ABR	Specifies the depth of the queue dedicated to ABR traffic.
18	Low CLP - CBR	Specifies a percent of the CBR queue. When the number of cells in the queue falls below this percentage, the node stops discarding cells with CLP=1. The default of 100% disables the function, which causes the switch to discard all cells with CLP=1 regardless of the cell count in the queue. The reason the default is 100% is that, with CBR, congestion is not an expected condition.
19	High CLP - CBR	Specifies a percent of the CBR queue. When the number of cells in the queue reaches this percentage, the node begins to discard cells with CLP=1. The default of 100% disables the function, which causes the switch to discard all cells with CLP=1 regardless of the cell count in the queue. The reason the default is 100% is that, with CBR, congestion is not an expected condition.
20	Low CLP - nrt-VBR	Specifies a percent of the nrt-VBR queue. When the number of cells in the queue falls below this percentage, the node stops discarding cells with CLP=1. The default of 100% disables the function, which causes the switch to discard all cells with CLP=1 regardless of the cell count in the queue. The reason the default is 100% is that, with VBR, congestion is not an expected condition.
21	High CLP - nrt-VBR	Specifies a percent of the nrt-VBR queue. When the number of cells in the queue reaches this percentage, the node begins to discard cells with CLP=1. The default of 100% disables the function, which causes the switch to discard all cells with CLP=1 regardless of the cell count in the queue. The reason the default is 100% is that, with VBR, congestion is not an expected condition.
22	Low CLP - ABR	Specifies a percent of the ABR queue. When the number of cells in the queue falls below this percentage, the node stops discarding cells with CLP=1.

Index	Parameter	Description
23	High CLP - ABR	Specifies a percent of the ABR queue. When the number of cells in the queue reaches this percentage, the node begins to discard cells with CLP=1.
24	EFCN - ABR	Specifies the number of cells in the ABR queue that causes the switch to send congestion notification to the destination node. The default is low in relation to the default queue depth so that notification begins to go out as soon as congestion begins.
25	SVC Queue Pool Depth	Specifies the collective size of the queue depth for all SVC connections.

Example (BPX)

cnftrkparm 1.1

```
pubsbpx1       TN    SuperUser       BPX 8620 9.3 Apr. 13 2000 09:37 GMT

TRK 1.1 Parameters
 1 Q Depth - rt-VBR    [  242] (Dec)    15 Q Depth  - CBR      [  600] (Dec)
 2 Q Depth - Non-TS    [  360] (Dec)    16 Q Depth  - nrt-VBR  [ 1000] (Dec)
 3 Q Depth - TS        [ 1000] (Dec)    17 Q Depth  - ABR      [ 9070] (Dec)
 4 Q Depth - BData A   [ 1000] (Dec)    18 Low  CLP - CBR      [ 100] (%)
 5 Q Depth - BData B   [ 8000] (Dec)    19 High CLP - CBR      [ 100] (%)
 6 Q Depth - High Pri  [ 1000] (Dec)    20 Low  CLP - nrt-VBR  [ 100] (%)
 7 Max Age - rt-VBR    [   20] (Dec)    21 High CLP - nrt-VBR  [ 100] (%)
 8 Red Alm - I/O (Dec) [  2500 / 15000] 22 Low  CLP - ABR      [  25] (%)
 9 Yel Alm - I/O (Dec) [  2500 / 15000] 23 High CLP - ABR      [  75] (%)
10 Low  CLP - BData A  [ 100] (%)       24 EFCN     - ABR      [  30] (Dec)
11 High CLP - BData A  [ 100] (%)       25 SVC Queue Pool Size [  144] (Dec)
12 Low  CLP - BData B  [  25] (%)
13 High CLP - BData B  [  75] (%)
14 EFCN     - BData B  [  30] (Dec)

This Command: cnftrkparm 1.1


Which parameter do you wish to change:
```

Example (BXM OC-12 Trunk)

```
sw97           TRM   SuperUser       BPX 8620    9.3 Apr. 13 2000 13:14 GMT

TRK 13.1 Parameters
Trunk Type:        NNI
 1 Q Depth - rt-VBR    [  3000] (Dec)   15 Q Depth  - CBR      [  1200] (Dec)
 2 Q Depth - Non-TS    [  3000] (Dec)   16 Q Depth  - rt-VBR   [ 10000] (Dec)
 3 Q Depth - TS        [  1000] (Dec)   17 Q Depth  - ABR      [ 30000] (Dec)
 4 Q Depth - BData A   [ 20000] (Dec)   18 Low  CLP - CBR      [ 100] (%)
 5 Q Depth - BData B   [ 20000] (Dec)   19 High CLP - CBR      [ 100] (%)
 6 Q Depth - High Pri  [ 1000] (Dec)    20 Low  CLP - rtVBR    [ 100] (%)
 7 Max Age - rt-VBR    [   20] (Dec)    21 High CLP - rt-VBR   [ 100] (%)
 8 Red Alm - I/O (Dec) [  2500 / 15000] 22 Low  CLP - ABR      [  25] (%)
 9 Yel Alm - I/O (Dec) [  2500 / 15000] 23 High CLP - ABR      [  75] (%)
10 Low  CLP - BData A  [ 100] (%)       24 EFCN     - ABR      [  30] (Dec)
11 High CLP - BData A  [ 100] (%)       25 SVC Queue Pool Size [  144] (Dec)
12 Low  CLP - BData B  [  25] (%)
13 High CLP - BData B  [  75] (%)
14 EFCN     - BData B  [  30] (Dec)

Last Command: cnftrkparm 13.1


Next Command:
```

Note In Release 9.2.20 and higher, rt-VBR and voice connections both use the voice Qbin on the trunk. Similarly, rt-VBR and voice traffic both share the default or user-configured voice Qbin values for the trunk—Queue depth, CLP High/Low Threshold, EFCI Threshold, and Queue priority.

Example (BPX Virtual Trunk)

cnftrkparm 1.1.1

```
sw97           TN    SuperUser       BPX 15    9.3       Apr. 13 2000  10:11 GMT

TRK 1.1.1 Parameters
 8 Red Alm - I/O (Dec) [  2500 /  10000]
 9 Yel Alm - I/O (Dec) [  2500 /  10000]
15 Q Depth  - CBR      [ 2678] (Dec)
18 Low  CLP - CBR      [ 100] (%)
19 High CLP - CBR      [ 100] (%)



This Command: cnftrkparm 1.1.1


Which parameter do you wish to change:
```

Example (IGX OC-3 Trunk)

cnftrkparm 6.3

```
sw228          TN    SuperUser       IGX 8420    9.3    Apr. 13 2000 18:25 PST

TRK  6.3 Parameters:
 1 Yel Alm-In/Out (D)  [  2500/ 10000]     18 Red Alm-In/Out (D) [  2500/ 10000]
 2 Rx Max Age - rt-VBR   (D)   [   20]     19 Tx Max Age - rt-VBR   (D)  [   20]
 3 Rx EFCN  - BdataB     (D)   [   30]     20 Tx EFCN    - BdataB   (D)  [   30]
 4 Gateway Efficiency    (D)   [  2.0]
 5 EFCN     - Rx Space   (D)   [  N/A]     Tx Age Step2  (D)   Tx Age Step   (D)
 6 Low CLP  - Rx_Space   (%)   [  N/A]     21 BDataA [  N/A]   23 BDataA [  N/A]
 7 High CLP - Rx_Space   (%)   [  N/A]     22 BDataB [  N/A]   24 BDataB [  N/A]
Rx High CLP   (%)    Rx Low CLP    (%)     Tx High CLP   (%)   Tx Low CLP    (%)
 8 BDataA [  100]    10 BDataA [  100]     25 BDataA [  100]   27 BDataA [  100]
 9 BDataB [   75]    11 BdataB [   25]     26 BDataB [   75]   28 BDataB [   25]
Receive Queue Depth               (D)      Transmit Queue Depth            (D)
12 rt-VBR  [ 1952]    15 BDataA [10000]    29 rt-VBR  [ 1952]   32 BDataA [10000]
13 Non TS [ 2925]    16 BDataB [10000]     30 Non TS [ 2924]   33 BDataB [10000]
14 TS     [ 1000]    17 HighPri[ 1000]     31 TS     [ 1000]   34 HighPri[ 1000]

This Command: cnftrkparm 6.3

sw228          TN    SuperUser       IGX 8420    9.3       Apr. 13 2000 18:26 PST

TRK  6.3 Parameters:
Rx Queue Depth(D)    Tx Queue Depth(D)    Rx EFCN       (D)    Tx EFCN       (D)
35 CBR       [  600]    38 CBR       [  600]
36 nrt-VBR   [ 5000]    39 rt-VBR    [ 5000]
37 ABR       [20000]    40 ABR       [20000]  47 ABR      [   30]    48 ABR    [   30]
Rx High CLP  (%)    Rx Low CLP       (%)      Tx High CLP   (%)    Tx Low CLP    (%)
41 CBR       [  100]   44 CBR     [  100]  49 CBR       [  100]      52 CBR    [  100]
42 nrt-VBR  [  100]   45 nrt-VBR     100]    50 nrt-VBR    [  100]     53 VBR    [  100]
43 ABR      [   75]    46 ABR        [   25]   51 ABR    [   75]    54 ABR    [   25]



This Command: cnftrkparm 6.3
```

Example (IGX) T3 or E3 Trunk

```
sw228          TN    SuperUser       IGX 8420    9.3    Apr. 13 2000 18:25 PST

TRK  8.1 Parameters:
 1 Yel Alm-In/Out (D)  [  2500/ 10000]     18 Red Alm-In/Out (D) [  2500/ 10000]
 2 Rx Max Age - rt-VBR   (D)   [   20]     19 Tx Max Age - rt-VBR   (D)  [   20]
 3 Rx EFCN  - BdataB     (D)   [   30]     20 Tx EFCN    - BdataB   (D)  [   30]
 4 Gateway Efficiency    (D)   [  2.0]
 5 EFCN     - Rx Space   (D)   [  N/A]     Tx Age Step2  (D)   Tx Age Step   (D)
 6 Low CLP  - Rx_Space   (%)   [  N/A]     21 BDataA [  N/A]   23 BDataA [  N/A]
 7 High CLP - Rx_Space   (%)   [  N/A]     22 BDataB [  N/A]   24 BDataB [  N/A]
Rx High CLP   (%)    Rx Low CLP    (%)     Tx High CLP   (%)   Tx Low CLP    (%)
 8 BDataA [  100]    10 BDataA [  100]     25 BDataA [  100]   27 BDataA [  100]
 9 BDataB [   75]    11 BdataB [   25]     26 BDataB [   75]   28 BDataB [   25]
Receive Queue Depth                (D)     Transmit Queue Depth            (D)
12 rt-VBR [  242]    15 BDataA [ 8000]     29 rt-VBR [  242]   32 BDataA [ 8000]
13 Non TS [  360]    16 BDataB [ 8000]     30 Non TS [  360]   33 BDataB [8000]
14 TS     [ 1000]    17 HighPri[ 1000]     31 TS     [ 1000]   34 HighPri[ 1000]

This Command: cnftrkparm 8.1
sw228          TN    SuperUser       IGX 8420    9.3       Apr. 13 2000 18:26 PST

TRK  8.1 Parameters:
Rx Queue Depth(D)    Tx Queue Depth(D)    Rx EFCN       (D)    Tx EFCN       (D)
35 CBR        [  400]    38 CBR    [  400]
36 nrt-VBR    [ 5000]    39 VBR    [ 5000]
37 ABR        [10000]    40 ABR    [10000]    47 ABR    [   30]       48 ABR    [   30]
Rx High CLP   (%)        Rx Low CLP    (%)    Tx High CLP   (%)       Tx Low CLP    (%)
41 CBR       [  100]    44 CBR     [  100]    49 CBR       [  100]    52 CBR     [ 100]
42 nrt-VBR   [  100]    45 nrt-VBR [  100]    50 nrt-VBR    [  100]   53 nrt-VBR [ 100]
43 ABR    [   80]    46 ABR    [   60]    51 ABR    [   80]    54 ABR    [   60]
```

Example (BXM Trunk)

cnftrkparm 2.4

```
pubsbpx1       TN    silves:1        BPX 8620  9.3    Apr. 13 2000 10:50 PDT




TRK 2.4 Parameters
 1 Q Depth - rt-VBR    [  885] (Dec)    15 Q Depth   - CBR     [  600] (Dec)
 2 Q Depth - Non-TS    [ 1324] (Dec)    16 Q Depth   - nrt-VBR [ 5000] (Dec)
 3 Q Depth - TS        [ 1000] (Dec)    17 Q Depth   - ABR     [20000] (Dec)
 4 Q Depth - BData A   [10000] (Dec)    18 Low  CLP  - CBR     [  60] (%)
 5 Q Depth - BData B   [10000] (Dec)    19 High CLP  - CBR     [  80] (%)
 6 Q Depth - High Pri  [ 1000] (Dec)    20 Low  CLP  - nrt-VBR [  60] (%)
 7 Max Age - rt-VBR    [   20] (Dec)    21 High CLP  - nrt-VBR [  80] (%)
 8 Red Alm - I/O (Dec) [  2500 /  10000]22 Low CLP/EPD-ABR     [  60] (%)
 9 Yel Alm - I/O (Dec) [  2500 /  10000]23 High CLP  - ABR     [  80] (%)
10 Low  CLP - BData A  [ 100] (%)       24 EFCN      - ABR     [  20] (%)
11 High CLP - BData A  [ 100] (%)       25 SVC Queue Pool Size [    0] (Dec)
12 Low  CLP - BData B  [  25] (%)
13 High CLP - BData B  [  75] (%)
14 EFCN     - BData B  [  30] (Dec)

This Command: cnftrkparm 2.4
```

cnftrkstats (configure trunk statistics collection)

Configures collection of Qbin statistics for a selected trunk.

You can enable collection of Qbin statistics collected by the BPX and IGX. Qbin statistics are Cells Served, Cells Discarded, and Cells Received.

- UXM and BXM Qbins 1–9 on Automatic Routing Management trunks.
- BXM qbins 0–3, 9 on Automatic Routing Management ports.
- UXM qbins 2,3, 7–9 on Automatic Routing Management ports.
- UXM and BXM Qbins 10–15 on VSI ports and trunks.

All other Qbins are unused, and the switch does not provide statistics for them. Also starting in switch software release 9.3.10, the switch provides the collection of Qbin Cells Discarded statistics via SNMP for the above mentioned Qbins.

The **cnftrkstats** command is primarily a debug command. It configures the collection of statistics for a physical or virtual trunk. After displaying all statistic types for the trunk, the system prompts for "statistic type." Enter the index number associated with the statistic.

Not all types of statistics are available for all lines. Unavailable selections appear in half-tone. Table 3-48 lists the types of statistics that are configurable for FastPacket T1 trunks and ATM T3 trunks. The subsequent figures show the screens associated with T1 packet trunks and T3 ATM trunks.

Table 3-48 Statistics Configurable for FastPacket T1 trunks and ATM T3 Trunks

Categories of Statistics Types	Categories of Statistics Types
Line faults	Line errors and errored seconds
Frame Slips and Loss	Path errors
Transmit packets dropped	Cell framing errors
Packets transmitted for various packet types	EFCN packets transmitted to bus
Packets dropped for various packet types	Queue Service Engine (QSE) cells transmitted
Bursty data CLP packets and cells dropped	Spacer packets transmitted and dropped for each of the 16 queues
Errored seconds	The number of seconds in which errors occurred

Syntax

cnftrkstats <line> <stat> <interval> <e | d> [<samples> <size> <peaks>]

Parameter

Parameter	Description
<line>	Specifies the trunk to configure.
<stat>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample. Range:1–255 minutes
<e | d>	Enables/disables a statistic. E to enable; D to disable.
[samples]	Specifies the number of samples to collect (1–255).

Parameter	Description
[size]	Specifies the number of bytes per data sample (1, 2 or 4).
[peaks]	Enables/disables collection of 10-second peaks. Y enables; N disables.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

dsptrkstatcnf, **dsptrkstathist**

Example (ATM on IGX's AIT Card)

These screens pertain to an ATM trunk (AIT card) on an IGX node. Other trunk types and cards have other parameters. To see the list of these, enter the command and continue from page to page without entering an index number.

```
sw83          TN    SuperUser       IGX 8420    9.3       Apr. 13 2000  14:45 PST

Line Statistic Types
 3) Out of Frames                       22) BDA Packets Transmitted
 4) Losses of Signal                    23) BDB Packets Transmitted
10) Packet CRC Errors                   24) Total Packets Transmitted
12) Tx Voice Packets Dropped            25) BDA CLP Packets Dropped
13) Tx TS Packets Dropped               26) BDB CLP Packets Dropped
14) Tx NTS Packets Dropped              27) BDA EFCN Pkts Transmitted
15) Tx CC Packets Dropped               28) BDB EFCN Pkts Transmitted
16) Tx BDA Packets Dropped              29) Line Code Violations
17) Tx BDB Packets Dropped              30) Line Errored Seconds
18) Voice Packets Transmitted           31) Line Severely Err Secs
19) TS Packets Transmitted              32) Line Parity Errors
20) NTS Packets Transmitted             33) Errored Seconds - Line
21) CC Packets Transmitted              34) Severely Err Secs - Line

This Command: cnftrkstats 11


Continue?
```

```
sw83          TN    SuperUser       IGX 8420    9.3       Apr. 13 2000  14:46 PST

Line Statistic Types
35) Path Parity Errors                  48) Tx nrt-VBR Cells Drpd
36) Errored Secs - Path                 49) Tx TimeStamped Cells Drpd
37) Severely Err Secs - Path            50) Tx NTS Cells Dropped
38) Severely Err Frame Secs             51) Tx Hi-Pri Cells Drpd
39) AIS Signal Seconds                  52) Tx BData A Cells Drpd
40) Unavail. Seconds                    53) Tx BData B Cells Drpd
41) BIP-8 Code Violations               54) Voice Cells Tx to line
42) Cell Framing Errored Seconds        55) TimeStamped Cells Tx to ln
43) Cell Framing Sev. Err Secs.         56) NTS Cells Tx to line
44) Cell Framing Sec. Err Frame Secs    57) Hi-Pri Cells Tx to line
45) Cell Framing Unavail. Secs.         58) BData A Cells Tx to line
46) ATM Cell Header HEC Errs            59) BData B Cells Tx to line
47) Pkts. Rx from Muxbus                60) Half Full cells Tx to ln

This Command: cnftrkstats 11


Continue?
```

```
sw83          TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  14:47 PST

Line Statistic Types
61) Full cells Tx to ln                 74) Rx Hi-pri Pkts Dropped
62) Total Cells Tx to line              75) Rx BDA Pkts Dropped
63) Tx Bdata A CLP Cells Drpd           76) Rx BDB Pkts Dropped
64) Tx Bdata B CLP Cells Drpd           77) Voice pkts Tx to Muxbus
65) Bdata A EFCN Cells Tx ln            78) TS pkts Tx to Muxbus
66) Bdata B EFCN Cells Tx ln            79) NTS pkts Tx to Muxbus
67) Half Full Cells Rx from ln          80) Hi-pri pkts Tx to Muxbus
68) Full Cells Rx from line             81) Bdata A pkts Tx to Muxbus
69) Total Cells Rx from line            82) Bdata B pkts Tx to Muxbus
70) Total pkts Rx from line             83) Rx Bdata A CLP pkts drpd
71) Rx Voice Pkts Dropped               84) Rx Bdata B CLP pkts drpd
72) Rx TS Pkts Dropped                  85) Bdata A EFCN Pkts Tx muxbus
73) Rx NTS Pkts Dropped                 86) Bdata B EFCN Pkts Tx muxbus
```

```
This Command: cnftrkstats 11


Continue?

___________________________________________________________

sw83          TN    SuperUser       IGX 8420    9.3     Apr. 13 2000  14:48 PST

Line Statistic Types
87) Total Pkts Tx to muxbus             100) Rx Spacer 2 Pkts dropped
88) Rx voice cells drpd                 101) Rx Spacer 3 Pkts dropped
89) Rx TimeStamped Cells drpd           102) Rx Spacer 4 Pkts dropped
90) Rx NTS Cells dropped                103) Rx Spacer 5 Pkts dropped
91) Rx Hi-pri Cells dropped             104) Rx Spacer 6 Pkts dropped
92) Rx Bdata A Cells dropped            105) Rx Spacer 7 Pkts dropped
93) Rx Bdata B Cells dropped            106) Rx Spacer 8 Pkts dropped
94) Rx Bdata A CLP cells drpd           107) Rx Spacer 9 Pkts dropped
95) Rx Bdata B CLP cells drpd           108) Rx Spacer 10 Pkts dropped
96) Rx Spacer CLP Pkts drpd             109) Rx Spacer 11 Pkts dropped
97) Spacer EFCN Pkts Tx to Muxbus       110) Rx Spacer 12 Pkts dropped
98) Frame Sync Errors                   111) Rx Spacer 13 Pkts dropped
99) Rx Spacer 1 Pkts dropped            112) Rx Spacer 14 Pkts dropped

This Command: cnftrkstats 11

___________________________________________________________

sw83          TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  14:49 PST

Line Statistic Types
113) Rx Spacer 15 Pkts dropped          126) Spacer 10 Pkts Tx to Muxbus
114) Rx Spacer 16 Pkts dropped          127) Spacer 11 Pkts Tx to Muxbus
115) Rx Spacer Pkts drpd                128) Spacer 12 Pkts Tx to Muxbus
116) Spacer 0 Pkts Tx to Muxbus         129) Spacer 13 Pkts Tx to Muxbus
117) Spacer 1 Pkts Tx to Muxbus         130) Spacer 14 Pkts Tx to Muxbus
118) Spacer 2 Pkts Tx to Muxbus         131) Spacer 15 Pkts Tx to Muxbus
119) Spacer 3 Pkts Tx to Muxbus         132) Spacer 16 Pkts Tx to Muxbus
120) Spacer 4 Pkts Tx to Muxbus         133) Rx Voice QSE Cells Tx
121) Spacer 5 Pkts Tx to Muxbus         134) Rx Time Stamped QSE Cells Tx
122) Spacer 6 Pkts Tx to Muxbus         135) Rx NTS QSE Cells Tx
123) Spacer 7 Pkts Tx to Muxbus         136) Rx Hi Priority QSE Cells Tx
124) Spacer 8 Pkts Tx to Muxbus         137) Rx BData A QSE Cells Tx
125) Spacer 9 Pkts Tx to Muxbus         138) Rx Bdata B QSE Cells Tx

This Command: cnftrkstats 11
______________________________________________________________

sw83          TN    SuperUser       IGX 8420    9.3       Apr. 13 2000  15:02 PST

Line Statistic Types
139) Rx BData A EFCN QSE Cells Tx       152) Cell Framing Yel Transitions
140) Rx BData B EFCN QSE Cells Tx       153) AIS Transition Count
141) FEBE Counts                        161) CGW Packets Rx From IGX Net
142) FERR Counts (M or F bit)           162) CGW Cells Tx to Line
143) Cell Framing FEBE Err Secs         163) CGW Frms Relayed to Line
144) Cell Framing FEBE Sev. Err. Secs.  164) CGW Aborted Frames Tx to Line
145) Cell Framing FEBE Counts           165) CGW Dscd Pkts From Abted Frms
146) Cell Framing FE Counts             166) CGW 0-Lngth Frms Rx from Line
147) ATM CRC Errored Seconds            167) CGW Packets Tx to IGX Net
148) ATM CRC Severely Err. Secs.        168) CGW Cells Rx from Line
149) Bdata A CLP Packets Tx to Line     169) CGW Frms Relayed from Line
150) Bdata B CLP Packets Tx to Line     170) CGW Aborted Frms Rx From Line
151) Yellow Alarm Transition Count      171) CGW Dscd Cells From Abted Frms
```

```
This Command: cnftrkstats 11
 ________________________________________________________

sw83           TN    SuperUser       IGX 8420    9.3       Apr. 13 2000  14:51 PST

Line Statistic Types
172) CGW Bd CRC32 Frms Rx from Line     185) OAM Valid OAM Cells Rx
173) CGW Bd Lngth Frms Rx from Line     186) OAM Loopback Cells Rx
174) CGW Bd CRC16 Frms Rx from IGX      187) OAM AIS Cells Rx
175) CGW Bd Length Frms Rx from IGX     188) OAM FERF Cells Rx
176) CGW 0-Length Frms Rx from IGX      189) OAM RTD Cells Rx
177) OAM Valid OAM Cells Tx             190) OAM RA Cells Rx
178) OAM Loopback Cells Tx              191) OAM Invalid OAM Cells Rx
179) OAM AIS Cells Tx                   192) OAM CC Cells Rx
180) OAM FERF Cells Tx
181) OAM RTD Cells Tx
182) OAM RA Cells Tx
183) OAM Invalid Supv Packets Rx
184) OAM CC Cells Tx

This Command: cnftrkstats 11
```

Example (T1/24 Trunk on IGX)

cnftrkstats 8

```
sw180          TN    Cisco           IGX 8420  9.3.p7    Dec. 14 2000 10:12 GMT

Line Statistic Types

  1) Bipolar Violations                  18) Voice Packets Transmitted
  3) Out of Frames                       19) TS Packets Transmitted
  4) Losses of Signal                    20) NTS Packets Transmitted
  5) Frames Bit Errors                   21) CC Packets Transmitted
  6) CRC Errors                          22) BDA Packets Transmitted
  9) Packet Out of Frames                23) BDB Packets Transmitted
 10) Packet CRC Errors                   24) Total Packets Transmitted
 12) Tx Voice Pkts Dropped               25) BDA CLP Packets Dropped
 13) Tx TS Packets Dropped               26) BDB CLP Packets Dropped
 14) Tx NTS Packets Dropped              27) BDA EFCN Pkts Transmitted
 15) Tx CC Packets Dropped               28) BDB EFCN Pkts Transmitted
 16) Tx BDA Packets Dropped             149) Bdata A CLP Packets Tx to Line
 17) Tx BDB Packets Dropped             150) Bdata B CLP Packets Tx to Line

This Command: cnftrkstats 8


Statistic Type:
```

Example (UXM OC-3 Trunk on IGX)

cnftrkstats 5.1

```
------------------------------------SCREEN 1-----------------------------------
sw180          TN    Cisco          IGX 8420  9.3.p7    Dec. 14 2000 10:20 GMT

Virtual Interface Statistic Types

 1) QBIN: Voice Cells Tx to line        14) QBIN: Tx BData A Cells Discarded
 2) QBIN: TimeStamped Cells Tx to ln    15) QBIN: Tx BData B Cells Discarded
 3) QBIN: NTS Cells Tx to line          16) QBIN: Tx CBR Cells Discarded
 4) QBIN: Hi-Pri Cells Tx to line       17) QBIN: Tx ABR Cells Discarded
 5) QBIN: BData A Cells Tx to line      18) QBIN: Tx nrt-VBR Cells Discarded
 6) QBIN: BData B Cells Tx to line      19) QBIN: Tx NTS Cells Received
 7) QBIN: Tx CBR Cells Served           20) QBIN: Tx Hi-Pri Cells Received
 8) QBIN: Tx nrt-VBR Cells Served       21) QBIN: Tx Voice Cells Received
 9) QBIN: Tx ABR Cells Served           22) QBIN: Tx TS Cells Received
10) QBIN: Tx NTS Cells Discarded        23) QBIN: Tx BData A Cells Received
11) QBIN: Tx Hi-Pri Cells Discarded     24) QBIN: Tx BData B Cells Received
12) QBIN: Tx Voice Cells Discarded      25) QBIN: Tx CBR Cells Received
13) QBIN: Tx TS Cells Discarded         26) QBIN: Tx ABR Cells Received

This Command: cnftrkstats 5.1

Continue?  y

------------------------------------SCREEN 2-----------------------------------
sw180          TN    Cisco          IGX 8420  9.3.p7    Dec. 14 2000 10:21 GMT

Virtual Interface Statistic Types

27) QBIN: Tx nrt-VBR Cells Received     40) CGW: Packets Rx From Network
28) VI: Cells rcvd w/CLP=1              41) CGW: Cells Tx to Line
29) VI: OAM cells received              42) CGW: NIW Frms Relayed to Line
30) VI: Cells tx w/CLP=1                43) CGW: SIW Frms Relayed to Line
31) VI: Cells received w/CLP=0          44) CGW: Aborted Frames Tx to Line
32) VI: Cells discarded w/CLP=0         45) CGW: Dscd Pkts
33) VI: Cells discarded w/CLP=1         46) CGW: 0-Length Frms Rx from Network
34) VI: Cells transmitted w/CLP=0       47) CGW: Bd CRC16 Frms Rx from Network
35) VI: OAM cells transmitted           48) CGW: Bd Lngth Frms Rx from Network
36) VI: RM cells received               49) CGW: OAM RTD Cells Tx
37) VI: RM cells transmitted            54) CGW: Packets Tx to Network
38) VI: Cells transmitted               55) CGW: Cells Rx from Line
39) VI: Cells received                  56) CGW: NIW Frms Relayed from Line

This Command: cnftrkstats 5.1

Continue?   y

------------------------------------SCREEN 3-----------------------------------
sw180          TN    Cisco          IGX 8420  9.3.p7    Dec. 14 2000 10:22 GMT

Virtual Interface Statistic Types

57) CGW: SIW Frms Relayed from Line     78) QBIN: Tx Q11 Cells Received
58) CGW: Abrt Frms                      79) QBIN: Tx Q12 Cells Served
59) CGW: Dscd Cells                     80) QBIN: Tx Q12 Cells Discarded
60) CGW: 0-Lngth Frms Rx from Line      81) QBIN: Tx Q12 Cells Received
61) CGW: Bd CRC32 Frms Rx from Line     82) QBIN: Tx Q13 Cells Served
62) CGW: Bd Lngth Frms Rx from Line     83) QBIN: Tx Q13 Cells Discarded
63) CGW: OAM RTD Cells Rx               84) QBIN: Tx Q13 Cells Received
64) CGW: OAM Invalid OAM Cells Rx       85) QBIN: Tx Q14 Cells Served
73) QBIN: Tx Q10 Cells Served           86) QBIN: Tx Q14 Cells Discarded
74) QBIN: Tx Q10 Cells Discarded        87) QBIN: Tx Q14 Cells Received
75) QBIN: Tx Q10 Cells Received         88) QBIN: Tx Q15 Cells Served
76) QBIN: Tx Q11 Cells Served           89) QBIN: Tx Q15 Cells Discarded
77) QBIN: Tx Q11 Cells Discarded        90) QBIN: Tx Q15 Cells Received
```

```
This Command: cnftrkstats 5.1

Statistic Type:
```

Example (BXM OC-12 Trunk on BPX)

cnftrkstats 11.2

```
-----------------------------------SCREEN 1-----------------------------------
sw167         TN    Cisco          BPX 8620  9.3.2R    Dec. 14 2000 10:48 PST

Virtual Interface Statistic Types

 7) Tx Voice Cells Served              32) Tx BData A Cells Discarded
 8) Tx TS Cells Served                 33) Tx BData B Cells Discarded
 9) Tx NTS Cells Served                34) Tx CBR Cells Discarded
10) Tx Hi-Pri Cells Served             35) Tx ABR Cells Discarded
11) Tx BData A Cells Served            36) Tx VBR Cells Discarded
12) Tx BData B Cells Served            37) Egress NTS Cells Rx
19) Tx CBR Cells Served                38) Egress Hi-Pri Cells Rx
20) Tx VBR Cells Served                39) Egress Voice Cells Rx
21) Tx ABR Cells Served                40) Egress TS Cells Rx
28) Tx NTS Cells Discarded             41) Egress BData A Cells Rx
29) Tx Hi-Pri Cells Discarded          42) Egress BData B Cells Rx
30) Tx Voice Cells Discarded           43) Egress CBR Cells Rx
31) Tx TS Cells Discarded              44) Egress ABR Cells Rx

This Command: cnftrkstats 11.2

Continue?   y

-----------------------------------SCREEN 2-----------------------------------
sw167         TN    Cisco          BPX 8620  9.3.2R    Dec. 14 2000 10:49 PST

Virtual Interface Statistic Types

45) Egress VBR Cells Rx                58) Tx Q10 Cells Served
46) Total Cells Tx from port           59) Tx Q10 Cells Discarded
47) Cells RX with CLP0                 60) Egress Q10 Cells Rx
48) Cells Rx with CLP1                 61) Tx Q11 Cells Served
49) Cells RX Discard with CLP0         62) Tx Q11 Cells Discarded
50) Cells RX Discard with CLP1         63) Egress Q11 Cells Rx
51) Cells TX with CLP0                 64) Tx Q12 Cells Served
52) Cells TX with CLP1                 65) Tx Q12 Cells Discarded
53) BXM: Total Cells RX                66) Egress Q12 Cells Rx
54) Ingress OAM Cell Count             67) Tx Q13 Cells Served
55) Egress OAM Cell Count              68) Tx Q13 Cells Discarded
56) Ingress RM cell count              69) Egress Q13 Cells Rx
57) Egress RM cell count               70) Tx Q14 Cells Served

This Command: cnftrkstats 11.2

Continue?  y

-----------------------------------SCREEN 3-----------------------------------
sw167         TN    Cisco          BPX 8620  9.3.2R    Dec. 14 2000 10:49 PST

Virtual Interface Statistic Types

71) Tx Q14 Cells Discarded
72) Egress Q14 Cells Rx
73) Tx Q15 Cells Served
74) Tx Q15 Cells Discarded
75) Egress Q15 Cells Rx

This Command: cnftrkstats 11.2

Statistic Type:
```

cnftstparm (configure card test parameters)

Sets parameters for the internal diagnostic self-tests that you can perform for each card type in the node.

Upon receiving this command, the system displays a two-page screen illustrating each of the various card types equipped in the node along with their self-test parameters.

Each card has two tests run on standby cards:

- Diagnostic self-test
  The self-test affects the normal operation of the card.
- Background test
  The background test can execute while the card is carrying traffic.

Only background tests are executed on active cards.

Here are the configurable test parameters for each card type:

- Frequency for Test Execution (sec)
- Enable/Disable Self-Test (e or d)
- Self-Test Failure Increment
- Self-Test Failure Threshold
- Time-out For Self Test (sec)
- Enable/Disable Background Test (e or d)
- Background Test Failure Increment
- Background Test Failure Threshold

Universal Router Module

With Release 9.3.20, the IGX 8400 supports the Universal Router Module (URM). The URM provides IOS-based voice support and basic routing functions. The URM is a combination of a URM front card and a 2FE2V back card. The URM hardware consists of an embedded UXM that provides the ATM interface to the IGX network and an embedded IOS-based router. The embedded UXM is based on UXM-E hardware. It is logically a one-port UXM without physical interfaces and provides functionality similar to the UXM/UXM-E modules in the IGX.

The URM supports card self-test and background test. Use the **cnftstparm** command to enable, disable, or configure the self-test and background test on the URM. The tests apply only to the embedded UXM side of the card.

Syntax

cnftstparm <tp> <freq> <s_e> <s_inc> <s_thr> <s_to> <b_e> <b_inc> <b_thr>

Parameters

Parameter	Description
<tp>	Specifies the card type.
<freq>	Specifies the time between the completion of one test and the start of the next (in seconds; default is card-dependent). Range: 1 – 65535 seconds Default for BCC card: 1600 seconds Recommended value for the BCC card: 1600 seconds
<s_e>	Enables/disables the card self-test. E to enable; D to disable.
<s_inc>	Specifies the threshold counter increment for self-test failures. Counter for each card-type: each failure increments. Default:100
<s_thr>	Specifies the failure threshold for self-tests. Default: 300
<s_to>	Specifies time to wait for a self-test response (in seconds). How long to wait for a response depends on the card. The recommended value for the self-test time-out value on the BCC card is 800 seconds. The value on the standby controller card will be maintained even if the active timeout value is less than 800, which prevents the self-test timeout value from changing during a switchover (after a **switchcc** command is run). For example, if you change the self-test time-out value to 900 on the standby controller card, and then do a **switchcc**, the self-test time-out value on the new active controller card will remain 900.
<b_e>	Enables/disables the card background test. E to enable; D to disable. Available tests depend on the card; some are not enabled.
<b_inc>	Specifies the threshold counter increment for background test failures.
<b_thr>	Specifies the failure threshold for background tests.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

cnfdiagparm, **dspcderrs**, **prtcderrs**, **tststats**

Example (BPX)

Here is the first page of the **cnftstparm** display for a BPX node.

```
sw45          TN    SuperUser       BPX 15    9.3 Apr. 13 2000 16:04 PDT

Card    Test    - - - - - - Self Test - - - - - - -   - - Background Test - - -
Type    Freq    Enable         Inc    Thresh  Timeout   Enable        Inc   Thresh
----    -----   --------  -------   -------  -------   --------  -------  -------
BCC      1600   Enabled       100       300      800   N/A           100      300
ASM       300   Disabled      100       300       60   N/A           100      300
BNI-T3    300   Enabled       100       300      150   N/A           100      300
BNI-E3    300   Enabled       100       300      150   N/A           100      300
ASI-E3    900   Enabled       100       300      800   Enabled       100      300
ASI-T3    900   Enabled       100       300      800   Enabled       100      300
ASI-155   900   Enabled       100       300      800   Enabled       100      300
BNI-155   300   Enabled       100       300      150   N/A           100      300
BXM      2000   Disabled      100       300     1800   Enabled       100      300


Last Command: cnftstparm

Next Command:
```

Example (IGX with a URM)

Here is the **cnftstparm** display for an IGX node and the configuration of a Universal Router Module (URM).

```
sw190         TRM   Cisco          IGX 8420  9.3.21    Oct. 10 2000 04:23 GMT

Card   Test     - - - - - - Self Test - - - - - - -   - - Background Test - - -
Type   Freq     Enable         Inc    Thresh  Timeout   Enable        Inc   Thresh
----   -----    --------  -------   -------  -------   --------  -------  -------
PSM      300    Enabled       100       300       31   N/A           100      300
HDM      300    Enabled       100       300       80   Enabled       100      300
LDM      300    Enabled       100       300       80   Enabled       100      300
NTM      300    Enabled       100       300       31   N/A           100      300
FRM      300    Enabled       100       300       80   Enabled       100      300
MT3      300    Enabled       100       300       50   N/A           100      300
CVM      300    Enabled       100       300      300   N/A           100      300
NPM      180    Enabled       100       300      120   N/A           100      300
ARM      300    Enabled       100       300       60   N/A           100      300
BTM      300    Enabled       100       300      120   N/A           100      300
BTM     300   Enabled       100       300       80   Disabled      100      300
UFM      300    Enabled       100       300       80   Enabled       100      300

This Command:cnftstparm

Continue? y

                          --------- Screen 2 ----------

sw190         TRM   Cisco          IGX 8420  9.3.21    Oct. 10 2000 04:24 GMT

Card   Test     - - - - - - Self Test - - - - - - -   - - Background Test - - -
Type   Freq     Enable         Inc    Thresh  Timeout   Enable        Inc   Thresh
----   -----    --------  -------   -------  -------   --------  -------  -------
UFMU     300    Enabled       100       300       80   Enabled       100      300
ALM      300    Enabled       100       300      120   N/A           100      300
UVM      300    Disabled      100       300       60   N/A           100      300
UXM      300    Enabled       100       300      800   Enabled       100      300
URM      300    Enabled       100       300      800   Enabled       100      300

Last Command:cnftstparm URM 300 E 100 300 800 E 100 300
```

Enter the card type at the prompt to begin modifying the test parameter.

cnfuiparm (configure user interface parameters)

Sets control terminal user interface parameters. Use **cnfuiparm** to set user interface parameters for the control terminal on the local node.

It may be necessary to change these parameters in special circumstances, such as when you need to observe a screen for a long period of time or when modem password protection makes logging in difficult.

Syntax

cnfuiparm <parameter number> <value>

Parameters

Parameter	Description
<parameter number>	Specifies the index number of the parameter to set.
<value>	Specifies the new parameter value to enter.

Parameter Values

No.	Parameter	Description	Default*
1	Logout Time	Idle time before a local user is logged out (0=never).	20 minutes
2	VT Logout Time	Idle time before a virtual terminal user is logged out.	4 minutes
3	Prompt Time	Idle time before a parameter prompt times out.	2 minutes
4	Command Time	Idle time before a continuous command times out.	3 minutes
5	UID Privilege Level	Privilege level of User ID allowed to use control terminal. The default is 6, the lowest user level.	6
6	Input Char Echo	If enabled, characters are echoed as you type them.	enabled
7	Screen Update Time	Time between screen updates.	2 seconds

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnfnodeparm, dsptsmap

Example (IGX)

cnfuiparm

```
sw197          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000  04:01 GMT

1. Logout Time ........... 999 minutes
2. VT Logout Time ........ 4 minutes
3. Prompt Time ........... 60 seconds
4. Command Time .......... 3 minutes
5. UID Privilege Level ... 6
6. Input Character Echo .. Enabled
7. Screen Update Time .... 10 seconds



This Command: cnfuiparm


Enter parameter index:
```

cnfuvmchparm (configure channel parameters on a UVM)

Configures default parameters for a channel or range of channels on a UVM. The parameters are:

- Voice codec unit (VCU) level
- PCM interface unit (PIU) level
- VAD threshold
- Modem threshold

Syntax

cnfuvmchparm <channel> <value>

Parameters

Parameter	Description
<channel>	Specifies the channel or range of channels.
<value>	VCU is the Voice codec unit. The value for this parameter is a noise level placed in a voice packet that is added in case a voice packet is dropped. The value you can enter is a multiplier for the base noise level of -10 dB. Range: 1–15 (multiplied by -10 dB). For example, if you enter 6, the level of noise placed in a replacement packet is -60 dB. PIU is the PCM interface unit. The PIU performs a resampling and injects noise in case of lost packets. Range: 1–15 (which is a multiplier for -10 dB). For example, if you enter 6, the level of noise placed in a replacement packet is -60 dB. VAD is the Voice Activity Detection threshold. If the decibel level falls below the specified limit, no packets are transmitted. Range: 0–65535 and is a multiplier of -1 dB, but typical values are around 30–40. Modem threshold is a threshold for modem tone detection. Below this threshold, the tone is ignored (or “not detected”). Range: 0–255 and is a multiplier of -1 dB, but typical values are around 30–40. The other values appear as numbered columns. These are placeholders reserved for future development.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	IGX			Yes	

Example

Configure the parameters for channels 1–23 on port 1 of the UVM in slot 7.

cnfuvmchparm 7.1.1

```
sw109          VT    SuperUser       IGX 8420    9.3 Apr. 13 2000 17:25 PST

From        Parameter:
             VCU   PIU  VAD   mdm
7.1.1        lvl   lvl  thld  thld   5     6     7     8     9     10    11
7.1.1-23      6     6      40  40     0     0     0     0     0     0     0
7.2.1-23      6     6      40  40     0     0     0     0     0     0     0



This Command: cnfuvmchparm 7.1.


Enter VCU Noise Level/-10dB [0-15]:
```

cnfvchparm (configure voice channel parameter)

Modifies CVM or CVM voice channel parameters for:

- Voice Activity Detection (VAD)
- Background noise injection
- VF channel loss
- Echo suppression
- Modem detection

Different versions of firmware for the CVM present different ways of specifying the level of background noise you can select to cover awkward periods of silence at the ends of voice connections. For cards with Model A firmware, you specify the actual level in dBm (deciBels) or dBrnC0. For Model A cards, you can specify the noise levels with a granularity of 0.1 dBm or dBrnC0. For cards with Model B firmware, you enter a number that maps to a noise level.

After you enter **cnfvchparm**, the system displays "Enter channel(s)." After you enter the parameters, the system requests confirmation by displaying "Reconfigure active CDP channels? (y/n)."

Without the **cnfvchparm** command, the other ways to reconfigure channels are

- By switching cards
- By deleting then re-adding connections

Syntax

cnfvchparm <channel> <parameters>

Parameters

Parameter	Description
<channel>	Specifies the voice channel numbers to configure.
<parameters>	Specifies values for the voice parameters.

VF Channel Parameters

Parameter	Description	Default
Sample delay for VAD connections	Adds processing to speech information to prevent front-end clipping due to speech detector latency. One increment is 125 micro seconds. Here are some sample delay values: 01 ------- 0.125 msec. 50 ------- 10 msec. A8 ------- 21 msec.	A8 (H)
Sample delay for non-VAD connections	Same for non-VAD circuits.	01 (H)

Parameter	Description	Default
Background Noise	Sets the level of background noise the far-end card adds to the connection while it receives no voice packets. For Model A firmware, specify levels in actual decibels in 0.1 dB increments. Injected noise levels for Model B firmware: 00 -------- Dynamically set noise level to match the noise detected at the other end. Requires Model B firmware on the CDP or CVM. 0 --------- 0 dBrnC0 or –90 dBm 1 --------- 18 dBrnC0 or –70 dBm 2 --------- 21 dBrnC0 or –67 dBm 3 --------- 23 dBrnC0 or –65 dBm 4 --------- 25 dBrnC0 or –63 dBm 5 --------- 27 dBrnC0 or –61 dBm 6 --------- 30 dBrnC0 or –58 dBm 7 --------- 49 dBrnC0 or –39 dBm	2 (H)
High Pass Filter mode	Enables/disables high-pass filter to assist in VAD and modem detect.	enabled
Floating Priority mode	When enabled, sets higher priority for modem detection on “c” and “v” channels. Effectively changes the trunk queue for the channel.	enabled
V.25 modem detect mode	Enables/disables V.25 modem-detect mode. The default is enabled with “detect-64K,” which specifies that a 2100 Hz tone indicates the presence of V.25-type modem. The options with V.25 modem detect are “disable,” “32” for 32K upgrade, and “64” for 64K upgrade. Enter “32” for fax transmission at 32 Kbps FAX Optimized ADPCM. Use the default “64” for fax transmission at 64 Kbps PCM.	enabled
32K	Auto-upgrade line to 32 Kbps ADPCM when a 32K modem is detected.	disabled
64K	Automatically upgrade line to 64 Kbps clear channel PCM when a high-speed modem is detected.	enabled

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	IGX			Yes	

Related Commands

cnfcvmparm, **dspchan**

Example (Model A)

The screen display illustrates **cnfvchparm** applied to a Model A CDP. The display for Model A cards shows the decibel level of the injected noise.

```
sw110          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000  17:43 PDT

CDP Models All                               None              All
UVM Models All                               None              All
           Sample Delay  Bkgnd               Echo Suppression  V.25    Xmit
From 14.1  VAD  Non-VAD  Noise  HPF  Float   Function    Loss  Detect  Delay
14.1-15    A8   01       67     ON   ON      ON          ON    64K     5
14.17-24   A8   01       67     ON   ON      ON          ON    64K     5




This Command: cnfvchparm 14.1-6 A8 1 67 e e e e


V.25 Modem detect, 'd' - disable, '32' - 32K upgrade, '64' - 64K upgrade:
```

Example (Model B)

The screen displays in the example illustrates **cnfvchparm** applied to a Model B CDP. The display for the Model B shows the number that corresponds to a decibel (or dBrnC0) level of background noise.

```
sw83 TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  17:01 PST
CDP Models All                                  None              All
              Sample Delay   Bkgnd              Echo Suppression  V.25    Xmit
From 11.1     VAD  Non-VAD  Noise  HPF  Float   Function   Loss   Detect  Delay
11.1-15       A8   01       2      ON   ON      ON         ON     ON      5
11.17-31      A8   01       2      ON   ON      ON         ON     ON      5




This Command: cnfvchparm


Next Command:
```

cnfvchtp (configure interface type for voice channels)

Configures an interface signaling type for a voice channel. Most standard signaling types are maintained by the node, but you may build a custom template.

If you enter the **cnfvchtp** command without a specific interface number, the system will present you with a list of valid interface types and their associated on-hook and conditioning information.

To assign an interface type (and its associated on-hook and conditioning information) to the channel or set of channels, enter the number of the desired interface type. Type "1" requires user configuration. Interface type is ignored for "d" type connections.

Syntax

cnfvchtp <channel> <type> [<A> <B> <C> <D> <cond_code>]

Parameters

Parameter	Description
channel	Specifies the channel or range of channels for the interface type configuration. For a CVM or CDP, the format is *slot.channel*[-*channel*]. For a UVM, the format for channel is *slot.line.channel*[-*channel*].
interface type	Specifies the number of the interface type to assign to the channel or range of channels. These types are listed in the table "Interface Types" below. The on-hook column has A-bits on the left and B-bits on the right. The conditioning column has different types of conditioning specified. If you designate interface type number 1 to indicate a user-configured interface type, the system prompts for: on-hook A, on-hook B, on-hook C (if applicable), on-hook D (if applicable), conditioning A, conditioning B, conditioning C (if applicable), conditioning D (if applicable), and conditioning template information. When the IGX receives A-bit, B-bit, C-bit, and D-bits corresponding to the on-hook values, that channel is known to be on-hook. If the A-bit, B-bit, C-bit, and D-bits do not correspond to the on-hook values, that channel is known be off-hook
on-hook A	A-bit value for the on-hook state of a channel or set of channels.
on-hook B	B-bit value for the on-hook state of a channel or set of channels.
on-hook C	C-bit value for the on-hook state of a channel or set of channels.

Parameter	Description
on-hook D	D-bit value for the on-hook state of a channel or set of channels. Possible values: 1 + high 0 = low X= don't care ? = don't know - = not used
conditioning template	One of many predefined or user-defined conditioning templates in the range of 00000000 to 11111111. (See **dspcond** and **cnfcond** commands.) Each interface type, except for option 1, has a predetermined conditioning template associated with it. These represent the A-bit, B-bit, C-bit, D-bit values as well as the substitute PCM voice sample sent to the attached equipment in case the voice connection fails for any reason.

Interface Types

Interface Number	Interface Type	On-hook	Conditioning
1	User Config		
2	Unconfig	? ? - -	a
3	No Sig	? ? ? ?	a
4	Force Sig	? ? - -	a
5	2W E&M	0 X - -	a
6	4W E&M	0 X - -	a
7	FXO	11 - -	b
8	FXS G/S	01 - -	c
9	FXS L/S	0 X - -	d
10	DPO	0 X - -	a
11	DPT	0 X - -	a
12	RPO	0 X - -	a
13	RPT	0 X - -	a
14	SDPO	0 X - -	a
15	DX	0 X - -	a
16	ETO	? ? - -	e
17	PLAR	? ? - -	d
18	PLR	0 X - -	a
19	RD	? ? - -	a
20	R1 (SOCOTEL)	0 - - -	e
21	SSDC5A	1 1 0 1	f
22	R2 (backward)	1 1 - -	e
23	R2 (forward)	1 0 - -	d

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnfchgn, cnfchdl, dspchcnf

Example

Configure the interface type for channel 13.1-24.

cnfvchtp 13.1-24

```
sw150          TN    Cisco          IGX 8420  9.3.2T    Dec. 19 2000 23:48 PST

 No Intf. Type     OnHk        Cond        No  Intf. Type     OnHk        Cond
 1  User Config                            13  RPT            0  X  -  -   a
 2  Unconfig       ?  ?  -  -   a          14  SDPO           0  X  -  -   a
 3  No Sig         ?  ?  ?  ?   a          15  DX             0  X  -  -   a
 4  Force Sig      ?  ?  -  -   a          16  ETO            ?  ?  -  -   e
 5  2W E&M         0  X  -  -   a          17  PLAR           ?  ?  -  -   d
 6  4W E&M         0  X  -  -   a          18  PLR            0  X  -  -   a
 7  FXO            1  1  -  -   b          19  RD             ?  ?  -  -   a
 8  FXS G/S        0  1  -  -   c          20  R1 (SOCOTEL)   0  -  -  -   e
 9  FXS L/S        0  X  -  -   d          21  SSDC5A         1  1  0  1   f
10  DPO            0  X  -  -   a          22  R2 (backward)  1  1  -  -   e
11  DPT            0  X  -  -   a          23  R2 (forward)   1  0  -  -   d
12  RPO            0  X  -  -   a


Last Command: cnfvchtp 13.1
```

Example

Configure a user configurable interface type for channel 15.1 to 15.8. The channel configuration screen shows that channels 5–8 of circuit line 15 now has a user-configured interface type with an A-bit on-hook value of X, a B-bit on-hook value of X, an C-bit on-hook value of not used, D-bit on-hook value of not used, and conditioning template b.

cnfvchtp 15.5-8 1 X X - - b

cnfvsiif (assign a service class template to an interface)

Assign a service class templates (SCT) to an interface.

Use the **dspvsiif** command to display a service class template assigned to an interface, as well as display a summary of the resources allocated to the VSI partition on a given interface.

A default service template is assigned to a logical interface (VI) when you up the interface by using **upport** and **uptrk**.

For example:

- **uptrk 1.1**
- **uptrk 1.1.1 (virtual trunk)**
- **upln 1.1 and upport 1.1**

This default template (MPLS1) has the identifier of 1. You can change the service template from service template 1 to another service template by using the **cnfvsiif** command. The **dspvsiif** command allows you to display the template associated with the interface. For example:

- **cnfvsiif 1.1 2**
- **cnfvsiif 1.1.1 2**
- **dspvsiif 1.1**
- **dspvsiif 1.1.1**

Note Only MPLS1 (template 1) may be used with IGX.

Syntax

cnfvsiif <slot.port.vtrk> <tmplt_id>

Parameters

Parameter	Description
<slot.port.vtrk>	Specifies the card slot and port number and virtual trunk.
<tmplt_id>	Specifies the ID number of the service class template to be assigned.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

cnfrsrc, dsprsrc, cnfqbin, dspqbin

Example (IGX)

Assign service class template 2 to port interface 3.1. You will see a warning if partition 3 is active.

cnfvsiif 3.1 1

```
bently          TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  13:49 PST

Port: 3.1

service class template ID: 2


              State   MinLCN   MaxLCN   StartVPI   EndVPI   MinBW    MaxBW
Partition 1:   D
Partition 2:   D
Partition 3:   E       100      200      100        200      10000    10000



Last Command: cnfvsiif 3.1 2

Interface has active VSI partition(s): changing SCT will be service affecting
Next Command:
```

Example (BPX)

Assign service class template 2 to port interface 4.1.

cnfvsiif 4.1 2

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  17:58 GMT

    Port: 4.1

    service class template ID: 2

    VSI Partitions :
                channels         bw              vpi
    Part  E/D   min    max    min     max     start  end       ilmi
    1     D     0      0      0       0       0      0         D
    2     D     0      0      0       0       0      0         D
    3     D     0      0      0       0       0      0         D


Last Command: cnfvsiif 4.1 2


Next Command:
```

cnfvsipart (configure VSI ILMI on VSI partition)

Enable or disable VSI ILMI support.

You may enable VSI ILMI on only one VSI partition on the interface.

Starting with Release 9.3, this command is used only on a trunk interface. To enable VSI ILMI on the port interface, use the **cnfport** command to enable ILMI and Protocol By Card.

Syntax

cnfvsipart <slot.port.[vtrk]> <part_id> <enable_option>

Parameters

Parameter	Description
<slot.port.[vtrk]>	Slot, port (and virtual port if applicable) of the interface.
<part_id>	Partition ID corresponding to the VSI partition.
<enable_option>	This parameter indicates whether to enable or disable VSI ILMI functionality. Valid values: • Y enables the VSI ILMI session. • N disables the VSI ILMI session.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX	Yes	Yes	Yes	No

Related Commands

cnfrsrc, **dspvsipartcnf, cnfport, cnftrk**

Example

Enable VSI ILMI on BXM trunk 4.2, VSI partition 1.

cnfvsipart 4.2 1 Y

```
sw143          TRM   Cisco          BPX 8620  9.3.10    Aug. 2 2000  18:20 GMT


    Trunk: 4.2       Partn: 1  ILMI: E      LCN: 543       Topo: BPX NW IP


Last Command: cnfvsipart 4.2 1 Y


Next Command:
```

cnfxmtsig (configure transmit signaling)

Allows the node to pass A, B, C, and D channel signaling bits through unchanged, or to invert, or hold them at a given value for a CDP or CVM line. It affects signaling bits in the transmit direction (to the PBX or channel bank) in an E1 system. The command configures the transmit signaling. Channel signaling bit options are T (transparent), 0, 1, or I (invert). If signaling is set to "not used" (-) by **cnfchtp**, the following is maintained: A=1, B=1, C=0, D=1.

Syntax

cnfxmtsig <channel(s)> <[A/]Conv> <[B/]Conv> <[C/]Conv> <[D/]Conv>

Parameters

Parameter	Description
channel	Specifies the channel or range of channels to receive signaling.
A/	Specifies the conversion applied to the A-bit. <Conv> can be one of: 1 = bit is asserted. 0 = bit is inhibited. T = bit is passed transparently. I = bit is inverted.
B/	Specifies the conversion applied to the B-bit.
C/	Specifies the conversion applied to the C-bit.
D/	Specifies the conversion applies to the D-bit.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnfrcvsig, dspsigqual

Example

Configure the transmit signaling for channel 8.1 to inverted for the A-bit, inhibited for the B-bit, asserted for the C-bit and transparent for the D-bit.

cnfxmtsig 8.1 a/I b/0 c/1 d/t

```
beta           TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:38 MST

                                signaling Qualifiers
From 8.1    TXA-bit  TXB-bit  TXC-bit  TXD-bit  RXA-bit RXB-bit RXC-bit RXD-bit
8.1         1       0       1       T       T      0      I      I
8.2-31      T       T       T       T       T      T      T      T



Last Command: cnfxmtsig 8.1 a/I b/O c/1 d/t


Next Command:
```

compactrsrc (compact resources)

This command is used to compact the Automatic Routing Management CBAs on a particular slot. It deprograms all the connections (cross-connects) terminated on that card and reprograms them with new CBA values. You can use this command if you need to free up some CBAs to use them for VSI. The command affects all the connections that have been programmed.

Syntax

compactrsrc ar

Parameters

Parameter	Description
ar	Select Automatic Routing Management (AutoRoute)

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	No	IGX	No	Yes	Yes	No

Example

Compacts CBA resources used by Automatic Routing Management connections.

compactrsrc ar

```
sw100   TRM    StrataCom       IGX 8420  9.3.10   July 16 2000   12:18 PST


WARNING - ALL AUTO ROUTE CONNECTIONS WILL BE RE-PROGRAMMED.

THIS WILL CAUSE DROPPING OF CELLS IN ALL PVCs.



This Command: compactrsrc ar

OK to continue (y/n)?
```

cpyict (copy interface control templates)

Copies all control template information associated with a given channel: the active template information, the conditioned template information, and the looped template information for near and far ends.

Once copied, you can edit the control template information by using the **cnfict** command. See the **cnfict** command for more information about the interface control templates.

On an IGX node, the applicable front cards are the LDM, HDM, FRM, and CVM (for data).

Syntax

cpyict <source_port> <destination_port>

Parameters

Parameter	Description
<source_port>	Specifies the data channel or Frame Relay port of the interface control template information to copy.
<destination_port>	Specifies the data channel or Frame Relay port that will receive the copied control template information.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnfict, dspict

Example

Copy the interface control template for data channel 25.1 to channel 25.2.

cpyict 25.1 25.2

```
beta           TRM   YourID:1        IGX 8430    9.3   Apr. 13 2000 17:40 MST

Data Channel:        25.2
Interface:           EIA/TIA 232   DCE
Clocking:            Normal

            Interface Control Template for Connection while ACTIVE

 Lead     Output Value                    Lead   Output Value
 RI       OFF                           DSR      ON
 CTS      ON                            SRxD     ON
 DCR      OFF                           DCD      ON
 SCTS     ON                            SDCD     ON
 SQ       ON

Last Command: cpyict 25.1 25.2

Next Command:
```

cpytrkict (copy trunk interface control template)

Copies the interface control template of one trunk to another trunk. Once copied, the control information can be edited by using the **cnftrkict** command. See the **cnftrkict** description for more information on configuring the trunk interface control templates.

Syntax

cpytrkict <source_trunk> <destination_trunk>

Parameters

Parameter	Description
<source_trunk>	Specifies the trunk number of the interface control template information to be copied.
<destination_trunk>	Specifies the trunk number to which the interface control template information is copied.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnftrkict, dsptrkict

Example

Copy the interface control template for trunk 9 to trunk 11.

cpytrkict 9 11

```
beta           TRM   YourID:1        IGX8430    9.3    Apr. 13 2000 15:15 MST


Packet Line:      9
Interface:        X.21   DTE

Interface Control Template for Trunk Line

Lead  Output Value  Lead   Output Value
                    C/DTR  ON




Last Command: cpytrkict 9 11

Enter destination line number:
```

CHAPTER 4

Alphabetical List of Commands dchst through window

dchst (display channel status)

Displays CDP or CVM card parameters.

This command displays state information for a CDP or CVM channel used for a specific connection.

The Transmit and Receive dBm0 for both CDP or CVM indicate the input (toward the circuit line) and output power (from the circuit line) levels for the channel. Modem state indicates whether modem–detect is on or off.

Syntax

dchst <channel> [interval]

Parameters

Parameter	Description
<channel(s)>	Specifies the voice channel numbers to configure.
<interval>	Specifies the refresh time for the data. Range: 1–60 seconds Default: 5 seconds

Display Fields: Channel Status Parameters for CDP or CVM

Register	Byte	Parameter	Description
0	high low	zcr total signal state mem	Zero Crossing Total Signal State Memory
1	high low	hpf z1 hi-hi hpf z1 hi-lo	High-Pass Filter High-Pass Filter
2	high low	sam - hi sam - lo	Encoded Voice Sample Encoded Voice Sample

Register	Byte	Parameter	Description
3	high low	vad state-hi vad state-lo	Voice Activity Detector state Voice Activity Detector state
4	high low	sil cnt mad signal state	Silent Count Modem Activity Detector Signal State
5	high low	mad wnd cnt mad fail cnt	Modem Activity Detector Wnd. Count Modem Activity Detector Fail Count
6	high low	mad state-hi mad state-lo	Modem Activity Detector state Modem Activity Detector state

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			Yes	

Related Commands

cnfcdpparm

Example

dchst 11.1

```
alpha            TRM       SuperUser        Rev: 9.3  Apr. 13 2000 16:30 PST

CDP state display for channel 11.1                                  Snapshot

Transmit dBm0:
Receive dBm0:

Register 0  =
Register 1  =
Register 2  =
Register 3  =
Register 4  =
Register 5  =
Register 6  =



Last Command: dchst 11.1


Next Command:
```

delalmslot (delete alarm slot)

Disables the ARC (IPX) or ARM (IGX) alarm indicators and ARI external alarms. See the **addalmslot** description for more information on ARC/ARM alarm relays and adding alarm slots.

Upon receiving the command, the system places the alarm card set in the standby state and displays the current alarm status.

Syntax

delalm <slot number>

Parameters

Parameter	Description
slot number	Specifies the slot number of the alarm card set to activate.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	Yes	IGX			Yes	

Related Commands

addalmslot, **dspalms**

Example

Disable the alarm indicators on the ARM card set in slot 11. (The system subsequently displays alarm status.)

delalmslot 11

```
pubsigx1       TN    SuperUser       IGX 8430    9.3       Apr. 13 2000 02:09 GMT

Alarm summary   (Configured alarm slots: None)
Connections Failed:       None
Groups Failed:            None
TRK Alarms:               None
Line Alarms:              None
Cards Failed:             None
Missing Cards:            None
Remote Node Alarms:       1 Minor
Remote Domain Alarms:     None

Routing Network Alarms:   None

                                           Cabinet Fan(s) Failed


FastPAD Node Alarms:      None

Last Command: delalmslot 11
Next Command:
```

delapsln (delete a SONET APS line)

The **delapsln** command deletes SONET Automatic Protection Switching (APS) for the lines. You must enter the working slot.port pair. When you execute the **delapsln** command, the **dspapsln** display appears, showing you that the line you deleted is gone. (The **delapsln** display will be empty, or show only the remaining APS lines.)

SONET APS is a standard that describes the switching of SONET lines from the active line to a standby line to provide hardware line redundancy. The SONET APS feature applies only to BXM OC-3 and OC-12 cards in this release.

For background information on how SONET APS for BXM cards works, refer to "APS Command Summary" in this chapter.

When you execute the **delapsln** command, the switch software does verifies that the slot.port arguments support APS.

Syntax

delapsln <slot.port1> < slot.port2> <protocol>

Parameters

Parameter	Description
slot.port1	The desired working line number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX			Yes	

Related Commands

addapsln, cnfapsln, cnfcdaps, dspapsln, dsplog, dspalms

Example

delapsln 11.1

```
sw119          TRM   StrataCom       BPX 8620  9.3.10    Date/Time Not Set

Work/Protect Actv Active Line      Standby Line     Current APS     Last User
(Work1/Work2)Line Alarm Status     Alarm Status     Alarm Status    Switch Req






Last Command: delapsln  11.1
```

delcon (delete connection)

Removes connections from the network. The same command with differing syntax may be used to delete voice connections, data connections, Frame Relay connections, or ATM connections.

You can use **delcon** to delete data or FRP connections that are terminated on UXM/UXM-E cards for IGX 8400 interface shelves, and terminated on routing network feeder trunks for IGX 8400 routing nodes.

You can use **delcon** to remove one or more voice connections from a network. You can delete connections at either end of the connection. After entry of the channel or range of channels to delete, a prompt requests confirmation of the selection.

Do not delete a connection when the node at the other end of the connection is unreachable. The unreachable node does not recognize the deletion. You must not delete a connection to an unreachable node then connect that deleted channel to another node.

To verify connection deletions, use the **dspcons** command. To add channel connections to the network, use the **addcon** command.

Syntax

delcon <channels>

Parameters

Parameter	Description
channels	Specifies a channel or range of channels to delete. The format for channel on a CDP or CVM is *slot.channel.* The format for channel on a UVM is *slot.line.channel.* The format for an ATM channel is *slot.port.vpi.vci.* For a range of channels, separate the first and last channel with a hyphen (-). Range (FRP *port*): 1–24 Range (FRM *port*): 1–31 Range (UFM-C *port*): 1–250 (For connections on a UFM-C, *line* is not necessary because of the port-to-line mapping through **addfrport**.) Range (UFM-U *port* for V.35 or X.21): 1–12 Range (UFM-U *port* for HSSI): 1–4 (unless Y-cable redundancy exists on the HSSI, in which case *port* can be only “1”). Range (*DLCI*): 16–1007

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

addcon, dspcon, dspcons

Example

Delete connection 10.1.1. The proposed deletions are highlighted, and a prompt requests confirmation of the deletion. Enter a "**y**" to delete the highlighted connections or an "**n**" to keep the highlighted connections. The example shows the screen before deletion of 10.1.1.

delcon 10.1.1

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 12:24 PST

 From           Remote      Remote
 10.1.1         NodeName    Channel         State  Type     Compress   Code COS
 10.1.1         igxr02      20.1.1          Ok     p                        0
 10.1.3-4       igxr02      20.1.3-4        Ok     v        VAD             2
 10.1.5-6       igxr02      20.1.5-6        Ok     t                        0
 10.1.9-10      igxr02      20.1.9-10       Ok     a24      ADPCM           2
 10.1.11-12     igxr02      20.1.11-12      Ok     c24      VAD/ADPCM       2
 10.1.13-14     igxr02      20.1.13-14      Ok     a32      ADPCM           2
 10.1.15-16     igxr02      20.1.15-16      Ok     c32      VAD/ADPCM       2
 10.1.19-20     igxr02      20.1.19-20      Ok     l16v     VAD/LDCELP      2
 10.2.1         igxr02      20.2.1          Ok     p                        0
 10.2.3-4       igxr02      20.2.3-4        Ok     a24      ADPCM           2
 10.2.5-6       igxr02      20.2.5-6        Ok     a32      ADPCM           2
 10.2.7         igxr02      20.2.7          Ok     l16      LDCELP          2
 10.2.9         igxr02      20.2.9          Ok     l16v     VAD/LDCELP      2

This Command: delcon 10.1.1

Delete these connections (y/n)?
```

Example

Delete connection 6.4.

delcon 6.4

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 12:38 PST

 From           Remote      Remote
 6.4            NodeName    Channel         State  Type     Compress   Code COS
 6.4            igxr02      18.4            Ok     128      DFM        7/8  0
 10.1.1         igxr02      20.1.1          Ok     p                        0
 10.1.3-4       igxr02      20.1.3-4        Ok     v        VAD             2
 10.1.5-6       igxr02      20.1.5-6        Ok     t                        0
 10.1.9-10      igxr02      20.1.9-10       Ok     a24      ADPCM           2
 10.1.11-12     igxr02      20.1.11-12      Ok     c24      VAD/ADPCM       2
 10.1.13-14     igxr02      20.1.13-14      Ok     a32      ADPCM           2
 10.1.15-16     igxr02      20.1.15-16      Ok     c32      VAD/ADPCM       2
 10.1.19-20     igxr02      20.1.19-20      Ok     l16v     VAD/LDCELP      2
 10.2.1         igxr02      20.2.1          Ok     p                        0
 10.2.3-4       igxr02      20.2.3-4        Ok     a24      ADPCM           2
 10.2.5-6       igxr02      20.2.5-6        Ok     a32      ADPCM           2
 10.2.7         igxr02      20.2.7          Ok     l16      LDCELP          2

This Command: delcon 6.4

Delete these connections (y/n)?
```

Example

Delete connection 14.3.4. The connections to delete are highlighted. A prompt asks you to confirm the deletion. Respond with "y" for yes.

delcon 14.3.4

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 12:56 PST

 From           Remote      Remote
 14.3.4         NodeName    Channel         State  Type     Compress   Code COS
 14.3.4         igxr02      27.3.4          Ok     fr                        0
 14.3.5         igxr02      27.3.5          Ok     fr                        0
 14.3.6         igxr02      27.3.6          Ok     fr                        0
 14.3.7         igxr02      27.3.7          Ok     fr                        0
 14.3.8         igxr02      27.3.8          Ok     fr                        0
 14.3.9         igxr02      27.3.9          Ok     fr                        0
 14.3.10        igxr02      27.3.10         Ok     fr                        0
 14.3.11        igxr02      27.3.11         Ok     fr                        0
 14.3.12        igxr02      27.3.12         Ok     fr                        0
 14.3.13        igxr02      27.3.13         Ok     fr                        0
 14.3.14        igxr02      27.3.14         Ok     fr                        0
 14.3.15        igxr02      27.3.15         Ok     fr                        0
 14.3.16        igxr02      27.3.16         Ok     fr                        0

This Command: delcon 14.3.4

Delete these connections (y/n)?
```

Example

Delete connection 11.1.180.150. The connections to delete are highlighted, and a prompt appears asking you to confirm the deletion. Respond with "**y**", for yes, and connection 11.1.180.150 is deleted.

delcon 11.1.180.150

```
sw53           VT    Cisco           BPX 8620  9.3.m0    Dec. 19 2000 09:57 GMT

 From            Remote      Remote                            Route
 11.1.180.150    NodeName    Channel         State  Type       Avoid COS O
 11.1.180.150    sw180       15.1.11.100     Ok     ubr               0  R
 11.1.180.530    sw180       5.3.53.530      Ok     ubr               0  L
 11.1.180.1000   sw180       15.1.53.1000    Ok     nrt-vbr           0  L
 11.1.180.1001   sw180       15.1.53.1001    Ok     abrstd            0  L



This Command: delcon 11.1.180.150


Delete these connections (y/n)?
```

delctrlr (delete MPLS controller from an IGX)

Deletes an MPLS controller attached to a line on a UXM card.

When the controller is deleted, the VSI control channels used to communicate between the VSI master on the MPLS controller and the VSI slaves on the UXM cards are also deleted. The control VCs associated with other controllers attached to the node will not be affected.

Syntax

delctrlr <controller id>

Parameters

Parameter	Description
controller id	Controller ID number corresponding to the MPLS controller you are deleting. ID numbers should correspond to an active MPLS controller. Range: 1–16

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

addctrlr, dspctrlrs

Example

Delete an MPLS controller.

delctrlr 3

```
arnold         TN    Cisco          IGX 8430  9.3.1p    Aug. 16 2000 17:12 PST

                   VSI Controller Information

CtrlrId   PartId     ControlVC            Intfc    Type     CtrlrIP
                    VPI    VCIRange








Last Command: delctrlr 3

Controller deleted successfully!
Next Command:
```

delctrlr (delete VSI capabilities from an AAL5 feeder interface)

Deletes VSI capabilities on a trunk interface to which a feeder of type AAL5 is attached. Use this command to delete a controller, such as a PNNI SES controller, from a BPX node. It deletes the VSI control channels used to communicate between the VSI master on the PNNI controller and the VSI slaves on the BXM cards.

Run this command as the first step in deleting a PNNI controller from a BPX node. The second step is to run the command to delete the AAL5 feeder.

Note Do not use **delctrlr** to delete a VSI Label Switching controller from a BPX node; you must use **delshelf** to delete a VSI Label Switching controller from a BPX node.

PNNI runs on the Service Expansion Shelf (SES) hardware.

To add VSI controller capabilities onto the newly created AAL5 interface, you use the **addctrlr** command. You are prompted to enter the controller ID and partition ID. This creates an interface through which a PNNI controller can use the VSI protocol to control the node resources that were previously specified by using the **cnfrsrc** command.

Remove a PNNI controller from a node by using the **delctrlr** command. For example, this might be a VSI controller such as a PNNI controller configured with VSI capabilities as an AAL5 interface shelf to a BPX. When you delete one of the controllers by using the **delctrlr** command, the master-slave connections associated with this controller are deleted. The control VCs associated with other controllers managing the same partition will not be affected.

Note To add a VSI Label Switch Controller, use **addshelf** and **delshelf** commands.

Syntax

delctrlr <slot.port> <controller id>

Parameters

Parameter	Description
slot.port	Slot and port numbers corresponding to the feeder trunk.
controller id	Controller ID number corresponding to the PNNI controller you are deleting. ID numbers should correspond to an active PNNI controller. Range: 1–32

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

addctrlr, dspctrlrs, dspnode

Example

Delete VSI controller with interface shelf (feeder) type of AAL5 connected on trunk 10.3 from the list of controllers connected to BPX node named "night."

delctrlr 10.3

```
night          TN    StrataCom       BPX 8600    9.3.10   Apr. 11 2000 14:31 GMT


                        BPX Controllers Information

Trunk    Name     Type    Part Id     Ctrl Id    Ctrl IP     State
10.3     PAR       VSI     1           2          192.0.0.0   Enabled
11.1     VSI       VSI     2           2          192.0.0.0   Disabled




Last Command: delctrlr 10.3
```

Example

Deletes controller from port 3 on slot 10, with controller name E, and controller ID of 1.

delctrlr <slot.port><controller_id>

```
night          TN    StrataCom       BPX 8600    9.3.10   Apr. 11 2000 14:31 GMT


                        BPX Controllers Information

Trunk    Name     Type     Part Id    Ctrl Id    Ctrl IP      State
10.3     PAR      VSI      1          1          192.0.0.0    Enabled
11.1     VSI      VSI      2          2          192.0.0.0    Disabled




Last Command: delctrlr 10.3
```

delfrport (delete Frame Relay port using T1 or E1 lines)

Deletes logical ports on FRP, FRM, or UFM-C cards and “unassigns” associated DS0/timeslots. The information in this definition applies only to Frame Relay ports using a T1 or E1 line.

The deleted DS0/timeslots are available for you to assign to new logical ports by using the **addport** (alias **addfrport**) command. The port display (normally visible through **dspport** [alias **dspfrport**] command) appears regardless of whether the port has been successfully deleted. The screen displays the defined port numbers for the specified line. Table 4-1 lists the error and warning messages for this command.

Table 4-1 delfrport—Warnings and Error Messages

Messages	Reason for Message
“Slot is out of range”	Line number is not correct for FRP T1/E1.
“Port does not exist”	Logical port number does not exist.
“You must first down the port”	Logical port is up.
“You must first down the port”	Specified port is not first DS0/timeslot of logical port.

Syntax

For FRM or FRP:
delfrport <slot.port>

For UFM:
delfrport <slot.port> <line.ds0_range>

Parameters

Parameter	Description
slot	Specifies logical port numbers for the physical FRP or FRM T1 or E1 line. Range for T1 lines: 1–24 Range or E1 lines: 1–31
port	Specifies the logical port number of the port to delete.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	IGX			Yes	

Related Commands

addfrport, dspfrport

Example

Delete Frame Relay port 14.1.

delfrport 14.1

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 13:04 PST

Port configuration for UFM 14

Port   Line   Chan     Speed     Interface           State         Protocol
1      1      1-24    1536 Kbps  T1D                 ACTIVE        None
2      2      1-24    1536 Kbps  T1D                 ACTIVE        None
3      3      1-24    1536 Kbps  T1D                 ACTIVE        None
4      4      1-24    1536 Kbps  T1D                 ACTIVE        None



This Command: delfrport 14.1

You must first down the port
Enter port:
```

deljob (delete a job)

Deletes a job. To delete a job, you must have a privilege level at least as high as the job itself. A job that is currently running cannot be deleted. If necessary, use **stopjob** to stop the job so that you can delete it.

Syntax

deljob <job_number>

Parameters

Parameter	Description
job number	Specifies the number of the job.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

addjob, dspjob, dspjobs

Example

Delete job 4.

deljob 4

```
pubsigx1       TN    SuperUser       IGX 32    9.3       Apr. 13 2000 19:54 GMT

                                  Job 4
Last Execution Results: None                     Status: Locked
Next Execution Time:                             Interval:

 1: prtlog
   - Failure Reaction: Abort                           Exec. Results: None
 2: dncd 6
   - Failure Reaction: Repeat 12 Times and Abort       Exec. Results: None
 3: dncd 6
   - Failure Reaction: Repeat 12 Times and Continue    Exec. Results: None

This Command: deljob 4


Delete this job (y/n)?
```

deljobtrig (delete a job trigger)

Deletes a job trigger. The **deljobtrig** command deletes one trigger at a time. If you delete a job by using the **deljob** command, all associated job triggers are deleted.

Syntax

deljobtrig <job_number> <trig_num>

Parameters

Parameter	Description
<job_number>	Specifies the number of the job.
<trig_num>	Specifies the number of the trigger to delete.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

addjobtrig, dspjobs

Example

Delete job trigger 1 for job 1.

deljobtrig 1 1

```
pubsigx1       TN    SuperUser       IGX 32    9.3    Apr. 13 2000 18:19 GMT

Job   Description       Next Execution      Status     Interval    Access Group
1     test1                                 Idle                   SuperUser
      Trigger 1 -  PLN     2             FAILURE
2                                           Idle                   SuperUser
3     test3             09/02/97 11:11:11   Idle       1 days      SuperUser
4                                           Idle                   SuperUser
5                                           Idle                   SuperUser
6                                           Idle                   SuperUser

This Command: deljobtrig 1


Enter trigger number:
```

dellp (delete loopback from connections or a port)

Deletes an external, local, remote, or local-remote (tiered nets) loopback from the designated channel, set of channels, or port. After the loopback is deleted, any conditioning applied during the loopback process is removed and service is restored.

- Add local loopbacks by using the **addloclp** command.
- Add remote loopbacks by using the **addrmtlp** command.
- Add external loopbacks by using the **addextlp** command.

A local loop can be deleted only from the node that added it. However, a remote loop can be deleted from the node at either end of the connection.

Add local-remote loopbacks by using the **addlocrmtlp** command. Note that with local-remote loopbacks, execution of **dellp** is mandatory after testing is complete, otherwise continuity errors will result.

The **addloclp** and **addlocrmtlp** commands support the two-segment connection at the hub node port endpoint in a network of IGX routing hubs and SES interface shelves. The **addloclp** and **addlocrmtlp** commands are blocked at the interface shelf trunk endpoint. The **addrmtlp** command is not supported at either endpoint of the connection. You can use the **dellp** command to remove the local (or local remote) loopbacks that have been added; however, you cannot use the **dellp** command at the trunk endpoint of the connection—it will be blocked. Loops of any kind are not supported for the middle segment of a three-segment connection.

Syntax

dellp <channel>

Parameters

Parameter	Description
channel	Specifies the channel or set of channels whose loopback is to be deleted. The format for *channel* depends on the type of connection is: Voice connection: *slot.channel* Data connection: *slot.port* Frame Relay connection: *slot.port.DLCI* ATM connections: *slot.port.vpi.vci*

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

addextlp, addloclp, addlocrmtlp, addrmtlp

Example

Delete the loopback on channel 5.1.121. The connections screen appears with connection 5.1.121 highlighted. (The highlighting is not visible in the screen example, but the loop symbols indicates loopback.) The display prompts you to confirm deletion of the loopback. To confirm, enter "**y**."

dellp 5.1.121

```
pubsipx1       TN    SuperUser       IGX 8420    9.3    Apr. 13 2000 19:16 PDT

 Local          Remote      Remote
 Channel        NodeName    Channel         State  Type      Compress  Code COS
 5.1.121       )pubsipx1    8.33.133        Ok     atfr
 5.1.122        pubsipx1    8.34.134        Ok     atfr
 5.2.111        pubsipx1    8.45.155        Ok     atfr
 5.2.112        pubsipx1    8.45.156        Ok     atfr
 8.33.133       pubsipx1   (5.1.121         Ok     atfr
 8.34.134       pubsipx1    5.1.122         Ok     atfr
 8.45.155       pubsipx1    5.2.111         Ok     atfr
 8.45.156       pubsipx1    5.2.112         Ok     atfr




This Command: dellp 5.1.121


Delete these loopbacks (y/n)?
```

delport (delete port)

This command is required to delete ports from the IGX and BPX. Use this command to:

- delete an ATM port from the BPX (for example, ASI, BXM, physical, or virtual port).
- delete the internal ATM port from the embedded UXM in the Universal Router Module (URM) (introduced in Release 9.3.20 on the IGX 8400).
- delete a Frame Relay port from the IGX (for example FRM, UFM, physical).

The **dnport** command is required before the ports can be deleted.

Syntax

delport <slot.port>[.<vport>]

Parameters

Parameter	Description
<slot.port>	Specifies the slot number of the card, the physical port, and optional virtual port (BXM card only).
[.<vport>]	The optional vport identifier. Range: 1–31

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

addport, upport cnfport, dnport

Example

Delete the internal ATM port 11.1 on the Universal Router Module (URM) in an IGX node.

delport 11.1

```
sw190          TRM   Cisco           IGX 8420  9.3.e9    Oct. 6 2000  05:23 GMT

Port configuration for ATM 11

Port   Chan        Speed      Interface       State       Protocol    Type










Last Command:delport 11.1
```

Example (BPX)

Delete port 3 on the BXM card in slot 11.

delport 11.3

```
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 19 2000 12:45 GMT

Port configuration for ATM 11

From        VPI Min/Max     Bandwidth    Interface   State      Protocol  Type






Last Command: delport 11.3
```

delshelf (delete an interface shelf)

Deletes an interface shelf from a tiered network. The identifier for an interface shelf is either the trunk number or the name of the shelf. Normally, you do not execute **delshelf** only at the hub node or the BPX core switch shelf, but on the IGX/AF itself.

The **delshelf** command has the single function of letting you turn off LMI if the trunk is not allowing communication. In contrast to the **deltrk** command, you can execute **delshelf** at any time if no connections terminate at the trunk.

In Release 9.2 and above, when you use **delshelf** to remove an MGX 8850 interface shelf trunk from a BPX routing hub, or an SES interface shelf (or feeder) trunk from an IGX 8400 routing node, the Annex G signaling channel and IP relay programming for the MGX 8850 or SES interface shelf is removed.

Deleting a Controller

You remove a controller from the node by using the **delshelf** command. When one of the controllers is deleted by using the **delshelf** command, the master-slave connections associated with this controller is deleted. The control VCs associated with other controllers managing the same partition are not affected.

The deletion of the controller triggers a new VSI configuration CommBus (internal BPX protocol) message that includes the list of the controllers attached to the node and is sent to all active slaves in the shelf. The controller deleted is removed from the list. In cluster configurations, deleting a controller is communicated to the remote slaves by the slave directly attached through the interslave protocol.

While there is at least one controller attached to the node controlling a given partition, the resources in use on this partition should not be affected by the deletion of a controller. The slaves release all the VSI resources used on a partition only when that partition is disabled.

Syntax

delshelf <trunk> | <shelf-name>

Parameters

Parameter	Description
trunk or shelf name	Specifies the slot and port number of the trunk or the name of the interface shelf.

Related Commands

addshelf, **dspnode**

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX	Yes	Yes	Yes	No

Example

Delete shelf trunk A241 from a BPX node.

delshelf 4.1

```
nmsbpx23       TN    SuperUser       BPX 8600    9.3.10     July 16 2000 13:26 PST

                        BPX Interface Shelf Information

Trunk    Name      Type      Alarm
 1.3     AXIS240   AXIS      OK
11.2     A242      AXIS      OK






Last Command: delshelf A241

Shelf has been deleted
Next Command:
```

deltrk (delete a trunk from the network)

Deletes a trunk. Because deleting a trunk removes the communication path between two nodes, using **deltrk** may split a network into two separate networks. If executing **deltrk** splits the network, then the connections that are using the deleted trunk are also deleted.

If both nodes on the trunk are reachable, you need only to execute **deltrk** on one node. If you delete a trunk on a node while the node at the other end is unreachable, the unreachable node does not detect that the trunk to the other node has been deleted; therefore, be sure to delete the trunk at both nodes in such a case.

After you delete a trunk, it still carries framing signals but no traffic. Also, the trunk can generate alarms for counting. To remove a trunk completely, use **dntrk** after executing the **deltrk** command**.**

In these situations, the node does not allow **deltrk** to execute:

- Another node is attempting to change the network topology by adding or deleting a trunk.
- Another node is notifying all other nodes that it has a new node name.
- Another node is adding or deleting a channel connection in the network with the **addcon** or **delcon** command.

In Release 9.1.07, when the A-bit Notifications on LMI/ILMI Interface feature is enabled (by using **cnfnodeparm**), after deleting the trunk, the master node will deroute all the connections on the trunk. The slave end will receive the A7 (CMUP_DEROUTE) message before the reroute message from the master node.

Regarding the A-bit Notifications feature, each pass in the Connection Management routing state machine involves two activities: deroute and then followed by routing connections. However, connections can be derouted without going through the reroute state machine (for example**, deltr**k). There are several ways to kick off the routing state machine resulting in slightly different deroute and reroute behavior. See the **deltrk**, **dncd**, and **cnfcmparm** (SuperUser) commands.

Syntax

deltrk <slot.port>[.vtrk]

Parameters

Parameter	Description
<slot.port>	Specifies the physical trunk number.
[.vtrk]	Optionally specifies the virtual trunk portion of the trunk identifier.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX			Yes	

Related Commands

addtrk, dntrk, dspnw, dsptrks, uptrk

Example

Delete trunk 7 from the network.

deltrk 7

```
beta           TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 15:02 MST

PLN  Type      Current Line Alarm Status               Other End
7    E1/32     Clear - Line OK                         -
9    T1/24     Clear - Line OK                         gamma.10
13   T1/24     Clear - Line OK                         alpha.14
15   T1/24     Clear - Line OK                         gamma.15
20   T3/3      AIT   - AIT Missing                     -




Last Command: deltrk 7


Next Command:
```

deltrkred (delete ATM trunk redundancy)

Removes redundancy from a UXM, or AIT trunk. After you execute **deltrkrd**, you can remove the backup card without causing an alarm.

The trunk redundancy feature (not the Automatic Protection Switching redundancy feature) is supported on the IGX platforms. This is different from the Automatic Protection Switching redundancy feature. APS is supported only on BXM SONET trunks, and can be used with virtual trunks. That is, the trunk port supporting virtual trunks can have APS line redundancy configured in the same way it would be configured for a physical trunk. The APS commands **addapsln**, **delapsln**, **switchapsln**, and **cnfaplsn** are all supported on virtual trunk ports.

Note that the trunk redundancy feature is not supported for virtual trunks. The **addtrkred, deltrkred,** and **dsptrkred** commands are rejected for virtual trunks.

Note that Y-cable redundancy is supported for both the UXM and BXM trunk cards at the edge of the ATM cloud.

Syntax

deltrkred <backup ATM trunk number>

Parameters

Parameter	Description
<backup ATM trunk number>	Specifies of the ATM card set assigned as the backup.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	Yes	IGX			Yes	

Related Commands

addtrkred, dsptrkred

Example

Remove ATM trunk redundancy for the card set in slot 5.

deltrkred 5

```
beta           TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 15:15 MST

ATM LineBackup ATM Line

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Last Command: deltrkred 5

Next Command:
```

deluser (delete a user)

Deletes a user from the network. You can delete users at any lower privilege level.

Syntax

deluser <user_id>

Parameters

Parameter	Description
<user_id>	Specifies the name of the user to delete from the network.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	Yes	BPX, IGX			Yes	

Related Commands

adduser, **dspusers**

Example

deluser john

Delete the user named "john."

```
alpha          TRM   YourID:1        IGX 8410    9.3    Apr. 13 2000 13:52 PST

YourID       1
Sarah        5



\



Last Command: deluser John


Next Command:
```

delyred (delete Y-cable redundancy)

This command disables Y-cable redundancy for the card set in the specified primary slot number. If the secondary card slot is in use as the active slot at the time you use the **delyred** command, the system attempts to switch back to the primary slot. The substitution takes place only if the primary slot has a complete set of cards and the cards are in a Standby or a Standby-F state (not if they are Failed).

See the **dspcds** description for information on card states. See the **addyred** and **dspyred** commands for more information on Y-cable redundancy.

When you issue the **delyred** command, it always completes. If the primary card is incomplete, control is given to the primary card.

If the secondary card slot is being used as the active slot at the time you use the **delvred** command, the system attempts to switch back to the primary slot. The substitution takes place only if the primary slot has a complete set of cards and the cards are in a Standby or a Standby-F state (not if they are Failed). See the **dspcds** description for information on card states.

Because YRED (Y redundancy) could be considered a misnomer for the SONET APS two-slot case, these alias commands support card redundancy:

- **addcdred**—same functionality as **addyred**
- **dspcdred—**same functionality was **dspyred**
- **delcdred**—same functionality as **delyred**
- **prtcdred—**same functionality as **prtyred**
- **switchcdred—**same functionality as **switchyred**

Syntax

delyred <primary slot>

Parameters

Parameter	Description
<primary slot>	Specifies the number of the primary slot for which you are deleting Y-cable redundancy.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

addyred, **dspyred**, **prtyred**

Example (IGX)

Disable Y-cable redundancy at slot 12.

delyred 12

```
arnold         TN    Cisco           IGX 8430  9.3.1p    Aug. 16 2000 17:31 PST

     Slot Other Front  Back   Channel Configuration
Slot Type Slot  Card   Card     1    2    3    4    5    6    7    8







Last Command: delyred 12


Next Command:
```

Example (BPX)

Disable Y-cable redundancy at slot 2.

delyred 2

```
sw53           VT    Cisco           BPX 8620  9.3.2o    Dec. 6 2000  10:48 GMT

     Slot Other Front   Back
Slot Type Slot  Card    Card







Last Command: delyred 2
```

diagbus (diagnose failed IGX bus)

Diagnose a failed IGX Muxbus or IGX cell bus. This command runs detailed diagnostics to isolate Muxbus problems to a failed card or bus. It is used when a minor alarm is indicated and displaying the alarm (**dspalms**) screen indicates the message "bus needs diagnosis."

This command can be run only locally with a terminal connected directly to the Control port or remotely from a modem connection. It can not be executed through a virtual terminal (VT) command or when the node's Control port is configured for Cisco WAN Manager mode.

Caution This command can cause a major disruption in service on all lines and connections and should be run only at a time when disruption can be tolerated. It should not be performed except as a last resort.

To fully isolate the failure might require manual removal of cards, including controller cards and so forth. For this reason, the command may not be executed over a Virtual Terminal connection.

If the test is successful, and no problems found, the system displays:

Both buses are OK

Otherwise, the system displays various messages to the operator for additional steps to perform in isolating the problem. These messages depend on the results of the diagnostics testing.

Syntax

diagbus

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			Yes	

dncd (down a card)

Downs (deactivates) a card. When you down a card, it is no longer available as a node resource. You should down a card before you remove it from a card cage. Before it actually downs an active card, the node determines if a standby card is available. If no standby card is present, the node gives you an opportunity to abort the command. If a standby card of the same type is available and you execute **dncd**, the standby card is activated. If no standby card is available and you execute the command, a major alarm results. To activate a downed card, use the **upcd** command.

Note If you remove a card from a card cage without first executing **dncd**, no warning appears.

You cannot down a control card (NPM or BCC). Use **switchcc** for control cards.

If the A-bit Notifications on LMI/ILMI Interface feature is enabled (with **cnfnodeparm**), after downing the trunk, the master node deroutes the connections or condition the connections due to path fail.

Syntax

dncd <slot number>

Parameters

Parameter	Description
slot number	Specifies the slot number of the card to be downed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspcds, resetcd, upcd

Example

Down the card in slot 9.

dncd 9

```
sw180          TN    Cisco          IGX 8420  9.3.g0    Oct. 20 2000 09:14 GMT


   FrontCard  BackCard                         FrontCard  BackCard
   Type  Rev  Type      Rev  Status            Type  Rev  Type      Rev  Status
1  NPM   BVS                 Standby      9  FRM   KSB  FRI-T1    AL   Down
2  NPM   BWS                 Active       10 Empty universal backplane
3  Empty universal backplane              11 Empty universal backplane
4  UXM   CD23 T3        AA   Active       12 URM   AA11 2FE2V     EW   Active
5  UXM   CA23 OC3       AD   Active       13 LDM   CK03 232-8     AJ   Standby-T
```

```
6  FRM   DHZ  FRI-V35  BD   Standby      14 URM   AA13 2FE2V    P03  Active
7  Empty universal backplane             15 URM   AA12 2FE2V    EW   Active
8  Empty                                 16 NTM   FHF  T1       AL   Active


Last Command: dncd 9
```

dncon (down connection)

Deactivates (downs) a connection, bundle of connections, a connection group or all connection in a COS or COS range. The **dncon** command temporarily removes one or more connections from the network. This command is useful for temporarily removing voice connections when additional bandwidth is necessary for other types of connections.

Connections can be downed immediately or with courtesy. Even with immediate downing, a prompt appears that requests confirmation. With courtesy downing, the system waits until the connection is on-hook before downing the connection.

Courtesy downing is possible only if the on-hook status has been configured by using the **cnfvchtp** command. The **upcon** command reactivates the voice connections. The up/down status of the voice connections appears in the "State" field of the **dspcons** screen.

Syntax

dncon {<group | local_chan(s)> | COS <cos_range>} {i | c}

Parameters

Parameter	Description
<group | local_chan(s)>	Specifies a group, or a channel, or a range of channels to down.
COS <cos_range>	Specifies the COS or COS range. Range: 0–15
i | c	Specifies immediate downing (i) of the specified connections or courtesy downing (c) of the specified connections.

Display Fields

State	Description
"OK" (routed)	Connection is activated and able to carry traffic.
"Down"	Connection has been added to the network database but is not activated and is not able to carry traffic.
"OK(Dn)"	Waiting for on-hook to occur to allow courtesy down to take place for connection(s) that have been courtesy downed using the **dncon** command.
"Failed"	Unrouted, but trying to reroute.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

upcon

Example

Down connection 14.1 with courtesy.

dncon 14.1 c

Example

Down connection 14.1 immediately.

dncon 14.1 i

Example

Courtesy down on-hook connections network-wide with COS 4 through 8. This command marks all connections that may be courtesy downed at one time and does not monitor new connections or those that later fit the COS.

dncon cos 4–8 c

Example

Immediately down connection 3.1.100.

dncon 3.1.100 i

```
pubsigx1       TN    SuperUser       IGX 32    9.3      Apr. 13 2000 16:51 GMT

 Local          Remote      Remote
 Channel        NodeName    Channel          State  Type      Compress  Code COS
 3.1.100        pubsigx1    3.2.200          Ok     fr
 3.2.200        pubsigx1    3.1.100          Ok     fr




This Command: dncon 3.1.100 i


Down these connections (y/n)?
```

Example

Immediately down all connections network-wide with COS 4 through 8. This command executes once, so if individual connections are subsequently upped or new connections added in this COS range, they remain up.

dncon cos 4–8 i

dnln (down line)

Deactivates ("downs") a line. After **dnln** executes, the line no longer generates framing, and no statistics are gathered. (Alias: the **dncln** command is identical.)

Before you deactivate a line, use **delcon** to remove all connections on the line and use **dnport** to deactivate the port associated with the line.

The **dnln** command is also used to deactivate an IMA line on the IGX only. As with the other lines, you must remove all connections on the IMA line (**delcon** or **delcongrp**), then deactivate the port by using the **dnport** command. You then can deactivate the line by using **dnln.**

For the BPX: before you can down a line, all ports must be detected by using the **delport** command. Downing will not remove the port.

Syntax

dnln <[slot.] [line number]>

Parameters

Parameter	Description
[slot.]	Specifies the slot number, if the back card (such as a UXM card) has one line.
[line number]	Specifies the line. If the card has more than one line, include a line number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX, IPX			Yes	

Related Commands

upcln, dsplns, dsptsmap

Example

Deactivate line 5.1 (the primary link for an IMA line). After this command executes, the system displays the status of the line using the same information as **dsplns** displays.

dnln 5.1

```
sw225          TRM   StrataCom       IGX 8420  9.3.a6    Mar. 10 2000 05:54
GMT

Line        Type   Current Line Alarm Status
 8.1        T1/24  Clear - OK
 9          E1/30  Clear - OK


Last Command: dnln 5.1
```

dnport (down port)

Deactivates (or downs) the specified port (Frame Relay, ASI, BXM, virtual, or physical port). Before downing a port, you must remove all connections from the port (see **delcon** definition).

Syntax

dnport <slot.port>[.<vport>]

For UFM-U, FRM, or FRP:
dnport <slot.port>

For UFM-C:
dnport <slot.port> <line.ds0_range>

Parameters

Parameter	Description
slot	Specifies the slot number of the Frame Relay card with the port to down.
port	Specifies the port number to deactivate on the card specified by *slot*. Range (FRP or FRM): 1–24 or 1–31 Range (UFM-C): 1–250 Range (UFM-U with a V.35 or X.21 interface): 1–12 Range (UFM-U with a HSSI interface): 1–4
[.vport]	The optional vport identifier on the BXM card only. Range: 1–31
line	The physical line on UFM-C card sets (not used for UFM-U cards).

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

cnfport, dspport, upport, addport, delport, cnffrport, dspfrport, upfrport

Example

Down port 3 on the BXM card in slot 11.

dnport 11.3

```
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 19 2000 13:04 GMT

Port:     11.3      [INACTIVE]                Bandwidth/AR BW:  353208/353208
Interface:          LM-BXM                    CAC Override:     Enabled
VPI Range:             0 -  255               CAC Reserve:      0
Type:               UNI                       %Util Use:        Disabled
Shift:              SHIFT ON HCF (Normal Operation)
SIG Queue Depth:    640                       Port Load:        0 %
```

```
Protocol:           NONE                      Protocol by Card: No


Last Command: dnport 11.3
```

Example

Down Frame Relay port 9.2.

dnport 9.2

```
sw108          VT    Cisco           IGX 8420  9.3.q2    Dec. 20 2000 12:56 GMT

Port:        9.2                [INACTIVE]
Interface:  V35     DCE                         Configured Clock:    256 Kbps
Clocking:   Normal                              Measured Rx Clock:     0 Kbps

Port ID                        0       Min Flags / Frames           1
Port Queue Depth           65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer        10 sec
DE Threshold                 100 %     N391 Full Status Poll        6 cyl
Signalling Protocol         None       EFCI Mapping Enabled        No
Asynchronous Status           No       CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer      15       IDE to DE Mapping          Yes
N392 Error Threshold           3       Interface Control Template
N393 Monitored Events Count    4          Lead    CTS     DSR    DCD
Communicate Priority          No          State   ON      ON     ON
Upper/Lower RNR Thresh  75%/ 25%

Last Command: dnport 9.2
```

dntrk (down trunk)

Downs a trunk, after which it no longer carries framing or statistics. Before you can down a trunk by using **dntrk**, you must remove it from the network by using **deltrk** (or **delshelf** in a tiered network).

Syntax

dntrk <slot.port>[.vtrk]

(No space exists between the port number and the "." for the virtual trunk specification.)

Parameters

Parameter	Description
slot.port	Specifies the physical trunk.
vtrk	Specifies a virtual trunk number (applies to BNI only). Range (T3/E3): 1–32 Range (OC-3) 1–11

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

addtrk, deltrk, uptrk, dsptrks

Example (IGX)

Deactivate trunk 3.4.

dntrk 3.4

```
sw108          VT    Cisco          IGX 8420  9.3.q2    Dec. 19 2000 12:17 GMT

TRK         Type   Current Line Alarm Status               Other End
 4.2        OC3    Clear - OK                              sw180/5.1
 4.4        OC3    Clear - OK                              sw53/11.2
14          T1/24  Clear - OK                              sw180/8




Last Command: dntrk 3.4
```

dport (display port)

Display port Qbin information.

Syntax

dport <slot.port>[.<vport>] qbn | *

Parameters

Parameter	Description
<slot.port>	Specifies the slot number of the card and the physical port.
[.<vport>]	Optionally specifies a virtual port number. BXM card only. Range: 1–31

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			Yes	

Related Commands

addport, dspportq, cnfportq

Example

Display Qbin 1 database information for port 11 on BXM card 1.

dport 11.1 1

```
sw53           VT    Cisco          BPX 8620  9.3.m0    Dec. 19 2000 11:05 GMT

Qbin Database 11.1 on BXM qbin 1


algorithm          3
depth              20000
clp hi             80
clp lo             60
efci               20
vc shaping         Disabled
BW INC Cells       200
BW INC Pages       1





Last Command: dport 11.1 1
```

Example

Display Qbin summary information for port 11.1 on a BXM card.

dport 11.1 *

```
sw53           VT    Cisco           BPX 8620  9.3.m0    Dec. 19 2000 11:06 GMT

Qbin Bandwidth Database 11.1 on BXM

Qbin Bandwidth   Increment              Qbin Bandwidth   Increment
0    50          1                      8    0           0
1    200         1                      9    0           0
2    50          1                      10   0           0
3    0           0                      11   0           0
4    0           0                      12   0           0
5    0           0                      13   0           0
6    0           0                      14   0           0
7    0           0                      15   0           0


Last Command: dport 11.1 *
```

drtop (display route op table)

Displays the routing table from the local node to each connected remote node.

The **drtop** command displays the routing table from the local node to each remote node to which it connects. It shows how NPM/B.C. traffic is routed to other nodes in the network. Use **drtop** to find which trunks are used to send control cells or packets to other nodes.

The display includes remote node name, number of hops to the remote node, the trunks used, and number of satellite hops if any, and the number of unused DS0s (open space), if any, on the route.

Syntax

drtop

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

dsptrkcons

Example

drtop

```
pubsipx2       VT    SuperUser       IGX 8430    9.3      Apr. 13 2000  02:27 GMT

Node Number   Node Name     Hops To  Via Trk  SAT Hops  No HP Hops  Open Space
1             npubsbpx1      2       6         0         0           3
2             npubsigx1      3       6         0         0           3
3             npubsigx2      0       0         0         0           0
5             npubsigx1      1       6         0         0           24
7             npubsigx3      2       6         0         0           24




Last Command: drtop


Next Command:
```

dspabortlog (display abort log)

Displays the abort errors log. The log contains up to six entries. When the log is full, additional aborts overwrite the oldest entries.

Log contains only fatal entries. The log for software errors (**dspswlog** command) contains only non-fatal entries.

A lighted icon “AB” at the bottom of the command line interface indicates that a software abort has been logged. Not related to the command, but also displayed at the bottom of the command line interface, the “CD” icon indicates a card or hardware error, and the “SW” icon indicates a software error.

Syntax

dspabortlog [<d> | <number> | <c>]

Parameters

Parameter	Description
<d>	Displays the detailed version of the log, including stack dumps. Page through the detailed version of the log by using the arrow keys or the Return key.
<number>	When an entry number is entered (found under the **No.** column), displays the detailed version of a specific entry in the log.
<c>	Clears the log. Optionally, you can use the **clrabortlog** command.

Display Fields

Field	Description
No.	Abort entries in the table, numbered from 1–12.
Type Error	The entry identifier. For the **dspabortlog** command, the identifier is “abort.” Occasionally, the identifier “BadType,” is displayed, indicating a problem within the table itself.
Number	The number that identifies a specific abort problem.
Data (Hex)	A 4-byte field containing information that may be useful in solving a problem. It is different for every abort number.
PC (Hex)	Program Counter. The address of the place in memory where the software was running when the abort was logged; this identifies where the problem was detected.
PROC	Process or Task. This field indicates which process was running when the problem occurred. In the above example, TN_2 is the second Telnet user task. Use the **dspprf** command to display all of the tasks.
SwRev	Switch software version operating on this node.
Date	Date of the abort.
Time	Time of the abort.

Related Commands

clrswlog, **dspswlog**, **clrabortlog**

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Example

Displays a detailed log for abort number 1.

dspabortlog 1

```
sw150          TRM   StrataCom       IGX 8420   9.3.0L    Feb. 2 2000  12:35 GMT

Active Control Card's Software Log
No.  Type    Number      Data(Hex)  PC(Hex)    PROC   SwRev   Date     Time
 1.  Abort   1000001     00000000   301EAED2   TN_2   9.3.0L 02/02/00 11:09:12

SSP 306B1310 10 00 30 28 F8 C2 70 08  30 6B 06 40 00 81 00 81  ..0(..p.0k.@....
SSP 306B1320 00 01 00 81 30 53 55 E8  30 6B 06 6C 00 00 00 0C  ....0SU.0k.l....
USP 306B066C 00 00 00 00 00 00 00 01  00 00 00 04 31 5A B7 7C  ............1Z.|
USP 306B067C 30 53 D6 F8 31 5A DE 28  00 00 02 40 30 53 D6 F8  0S..1Z.(...@0S..
USP 306B068C 00 00 00 4F 30 52 1A 56  00 00 00 01 00 00 00 01  ...O0R.V........
USP 306B069C 30 6B 07 34 30 52 46 50  00 00 00 01 31 5A D1 64  0k.40RFP....1Z.d
USP 306B06AC 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  ................
USP 306B06BC 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  ................
USP 306B06CC 00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  ................
USP 306B06DC 00 0D 00 00 00 00 00 00  31 5A B7 7C 00 00 00 01  ........1Z.|....


Last Command: dspabortlog 1
```

dspalms (display current node alarms)

Displays major and minor alarms throughout the network and specific alarms at the local node. The **dspalms** command displays:

- The number of failed connections on the node.
- The number of sources failed.
- The number of major and minor circuit line alarms on the node.
- The number of major and minor trunk alarms on the node. Trunk alarms are differentiated between those trunks that are disabled and trunks that are not disabled.
- The number of failed cards on the node.
- The number of missing cards on the node.
- The number of alarms on other nodes in the network.
- The number of APS lines in alarm.
- The number of junction node alarms when the Cisco WAN Manager terminal is at a junction (physically, or **vt**).
- The number of unreachable nodes in the network.
- The power supply and power monitor failures on the node.
- Bus failures (either "Failed" or "Needs Diagnostics").
- FR/ATM Port Communication Failed (OAM Packet Threshold exceeded).
- FR/ATM NNI A-bit Alarms (connections with A-bits=0).
- Slot alarms on IGX due to insufficient bus bandwidth allocation on a slot containing a UXM card.
- ASM card alarms on BPX nodes.
- The number of APS lines that are in alarm. Statistical alarms are not cleared on an APS switch. This is consistent with the way card redundancy works (sometimes referred to as "YRED"). Statistical alarms are not cleared on a YRED switch.
- IOS-status alarms on the Universal Router Module (URM) embedded router.

The URM is supported on the IGX 8400 with Release 9.3.20. The URM provides IOS-based voice support and basic routing functions. It consists of an embedded UXM with one internal ATM port and an embedded IOS-based router. The internal ATM port is the communication bridge between the embedded router and switch software.

When the router is not operational (in other words, it cannot route packets among its interfaces, including the internal ATM interface), switch software generates a minor alarm and fails all connections that terminate on the internal port. When an embedded router is not operational, **dspalms** shows the URM slot number and reports the router status as unavailable (IOS field). A "Minor Alarm" is also displayed in the bottom right corner of the **dspalms** screen.

For more details on each type of alarm, use the "display" command associated with each failed item. Table 4-2 shows the display commands that show error information.

Table 4-2 Commands that Display Error Information

Command	Description
dspcds	Displays cards in the node, with F for failures.
dsplns	Displays circuit lines.
dspcons	Displays connections.
dsplog	Displays events affecting the node.
dspnds	Displays unreachable nodes within a network.
dspnw	Displays the network topology and includes alarm status of each node in the network.
dsptrks	Displays trunks.
dsppwr	Displays power supply status and internal temperature.
dsprtrslot	Displays operational information and alarm status for a specified URM embedded router.
dsprtrslots	Displays operational information and alarm status for all URM embedded routers in a node.

Syntax

dspalms

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dspcds, dsplns, dspcons, dsplog, dspnw, dsptrks, dsppwr, dsprtrslot, dsprtrslots

Example (BPX)

Display a summary of all alarms affecting the BPX node.

dspalms

```
sw167          TN    Cisco           BPX 8620  9.3.2Q    Dec. 13 2000 14:17 PST

Alarm summary   (Configured alarm slots: None)
Connections Failed:     None
TRK Alarms:             None
Line Alarms:            None
Cards Failed:           None
Slots Alarmed:          None
Missing Cards:          None
Remote Node Alarms:     1 Minor
APS Alarms:             None

Interface Shelf Alarms: 1 Minor
```

```
ASM Alarms:             None



Last Command: dspalms
```

Example

Display APS alarms.

dspalms

```
alexa       TRM    genre         BPX 8620      9.3         Apr. 13 2000   16:35 PDT


Alarm summary   (Configured alarm slots: None)
Connections Failed:                                        None
TRK Alarms:                                                None
Line Alarms:                                               None
Cards Failed:                                              None
Slots Alarmed:                                             1 Major
Missing Cards:                                             1
Remote Node Alarms:                                        1 Minor
APS Alarms:                                                1 Minor

Interface Shelf Alarms:                                    None
ASM Alarms:                                                None



Last Command: dspalms
```

Example (IGX)

Display the current alarms on an IGX node.

dspalms

```
sw150         TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:23 PST

Alarm summary   (Configured alarm slots: None)
Connections Failed:       None
TRK Alarms:               None
Circuit Line Alarms:      None
Physical Line Alarms:     None
Cards Failed:             2
Missing Cards:            None
Remote Node Alarms:       1 Unreachable, 2 Majors, 5 Minors


Interface Shelf Alarms:   None



FastPAD/Access Dev Alms:  None

Last Command: dspalms


Next Command:
                                                                    MAJOR ALARM
```

Example

Display the current alarms on an IGX node with a Universal Routing Module (URM). Check the operational status of the embedded IOS-based router. When the router is not operational, the IOS field shows the router as unavailable and reports the URM slot number. A "Minor Alarm" is also displayed when the router is not operational.

dspalms

```
sw190          TRM   Cisco          IGX 8420  9.3.e8    Oct. 4 2000  10:38 GMT

Alarm summary   (Configured alarm slots:None)
Connections Failed:      None
TRK Alarms:              None
Circuit Line Alarms:     None
Physical Line Alarms:    None
Cards Failed:            None
Missing Cards:           None
Remote Node Alarms:      None

IOS Unavailable in 1 slot
Interface Shelf Alarms:  None



FastPAD/Access Dev Alms: None

Last Command:dspalms


Next Command:
                                                                     Minor Alarm
```

dspapsln (display APS lines)

The **dspapsln** command displays the currently configured APS lines and their status.

Syntax

dspapsln

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	No	BPX			No	

Related Commands

addapsln, delapsln, cnfapsln, cnfapsln, dspapsln, dsplog, dspalms

Example

Display all the currently configured APS lines and their status.

dspapsln

```
alexa       TRM    genre         BPX 8600          9.3       Apr. 13 2000    16:25 PDT

                Actv  Active Line    Standby Line      Current APS         Last User
Work/Protect    Line  Alarm Status   Alarm Status      Alarm Status        Switch Req

2.1  3.1        PROT  OK             OK                Loss of Sig(RED)    Clear
5.1  5.2        WORK  OK             LOS               LOS                 Lockout
6.3  6.4        NONE  Deactivated    APS Deactivated
10.1  11.1      PROT  OK             OK                Standard Mismatch   Clear

Command: dspapsln
```

Example

Display currently configured APS lines and their status.

dspapsln

```
sw117       TRM    genre       BPX 8620         9.3       Apr. 13 2000      16:25 PDT

Work/Protect     Actv   Active Line         Standby Line    Current APS      Last User
(Work 1/Work 2)  Line   Alarm Status        Alarm Status    Alarm Status     Switch Req
2.2    3.2       WORK   Loss of Sig (RED)   Remote (YEL)    Remote (YEL)     Clear



Command: dspapsln
```

dspasich (display ASI channel routing entry)

Displays the ATM channel routing entries for an ASI card.

Syntax

dspasich <line> <channel>

Parameters

Parameter	Description
<line>	Specifies the line in the format *slot.port*.
<channel>	Specifies the channel in the format *vpi.vci*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	No	BPX			Yes	

Example: ASI Channel Routing Entry

dspasich 5.1 1 N

```
pubsbpx1       VT    SuperUser       BPX 15    9.3       Apr. 13 2000 21:09 GMT
ASI Channel Configuration Query & Display

Slot.port.lcn:5.1.1
Status:       Added        BF hdr: 4145 9002 8012 0501 8640 0000 2DEB
[00] BF tp:   4      [11] VCI:   00000064 [22] UPC CDV: 0      [33] FST up:  0
[01] Pri SDA: 5      [12] Con tp:  VC     [23] UPC CIR: 500    [34] FST dn:  0
[02] Dst Prt: 1      [13] Rmt tp:  ASI    [24] UPC CBS: 1000   [35] FST fdn: 0
[03] Dst lcn: 2      [14] Srv tp:  VBR    [25] UPC IBS: 0      [36] FST rmx: 0
[04] BCF tp:  0      [15] Gen AIS: N      [26] UPC MFS: 200    [37] Q max:64000
[05] Qbin#:   12     [16] Mcst:    0      [27] CLP enb: Y      [38] EFCI: 100
[06] BF VPI:  64     [17] Mc grp:  1      [28] FST enb: N      [39] CLP hi: 100
[07] BF VCI:  0      [18] & msk: 0000000F [29] FST MIR: 500    [40] CLP lo: 100
[08] Pl Cls:  0      [19] | msk: 06400640 [30] FST PIR: 500    [41] BCM:    N
[09] Rmt lp:  N      [20] Prt QBN: 2      [31] FST QIR: 500    [42] Inhibit:N
[10] VPI:   00000064 [21] UPC GCR: 0      [32] QIR TO:  0      [43] UPC enb:Y


Last Command: dspasich 5.1 1 N

Next Command:
```

dspasm (display ASM card)

Displays BPX node alarms that, when active, produce an external alarm output (relay closure). These alarms are associated with powering and cooling the node as well as a statistics count.

For example, a minor alarm is generated when a fan speed drops below 2000 rpm. Because the single ASM card is always located in slot 15, you do not need to enter a card slot for this command. To configure the ASM alarms, use **cnfasm** (a SuperUser command)**.**

Syntax

dspasm

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	No	BPX			Yes	

Related Commands

cnfasm

Example

Display the ASM card parameters.

dspasm

```
D1.jea         TRM   SuperUser       BPX 8620    9.3    Apr. 13 2000 12:24 GMT

ASM Status:             Active          ASM Alarms
Statistics count:       7               Fan #1 RPM out of range
Statistics timeouts:    0               Fan #2 RPM out of range
Cabinet temperature:    21 C            Fan #3 RPM out of range
Power voltage A/B:      0.0 / 0.0 V

PSU  Ins Type Rev SerNum Failure
 A    N  N/A  N/A   N/A    N/A
 B    N  N/A  N/A   N/A    N/A

FAN    1    2    3
     0000 0000 0000 RPM

Last Command: dspasm


Next Command:
```

dspatmcls (display ATM connection class)

Displays the current parameters for an ATM connection class template. There are ten number classes. The parameters and the values for each varies with the connection type (CBR, VBR, ABR, and ATFR).

Syntax

dspatmcls <class number>

Parameters

Parameter	Description
class number	Specifies the class whose current parameters you want to see. Range: 1–10

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			No	

Related Commands

addcon, cnfatmcls, dspcls, cnfcls, dspcon, dspcons

Example

Display the parameters for configuration class 1.

dspatmcls 1

```
night          TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 13:22 GMT

                        ATM Connection Classes
Class:  1
Type:  VBR

UPC       SCR           IBS           MBS      ABR       PCR          ABR PCR
 y     500/500        10/10       1000/1000     -    500/500           -/-

     ICR        ICR TO Rate Up Rate Dn Rate FastDn Max Adjust    CDVT[in cells]
     -/-          -       -       -         -          -         64000/64000

  EFCI    % Util FGCRA      MFS      CLP  CLP Hi  CLP Lo   BCM
100/100  100/100  n/n       -/-       y  100/100 100/100   n/n

       Description: "Default VBR 500"


Last Command: dspatmcls 1

Next Command:
```

Example

Display the parameters for configuration class 1.

dspatmcls 1

```
night          TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 13:22 GMT

                  ATM Connection Classes
Class:  3                                       Type:  rt-VBR
PCR(0+1)     %Util       CDVT(0+1)        AAL5 FBTC       SCR
2000/2000    100/100     10000/10000        n           2000/2000

  MBS        Policing
1000/1000       3


       Description: "Default rt-VBR 2000"

_____________________________________________

Class:  4                                       Type:  rt-VBR
PCR(0+1)     %Util       CDVT(0+1)        AAL5 FBTC       SCR
8000/8000    100/100     10000/10000        n           8000/8000

  MBS        Policing
1000/1000       3


       Description: "Default nrt-VBR 8000"

Last Command: dspatmcls 1


Next Command:
```

dspbmpparm (display priority bumping parameters)

Displays the priority bumping parameters.

Syntax

dspbmpparm

Parameters

Parameter	Values	Description
Priority Bumping Enabled	ON or OFF Default: OFF	This flag specifies whether the priority bumping feature is activated on the node.
Priority Bumping Bundle	1–50 Default: 10	The number of connections that can be selected in a priority bumping routing request when PB is enabled.
Bumping Band 1	1–15 Default: 2	The lowest value in the second most important COS band. Connections with a COS value below *Bumping Band 1* are implicitly grouped as the most important band, Band0. Connections in Band 0 can bump those in other bands, but cannot be bumped. Connections in Band 1 can bump those in bands 2–7, and can only be bumped by those in Band 0.
Bumping Band 2	1–15 Default: 4	The lowest value in the third most important COS band. Connections in this band can bump those in bands 3–7, and can be bumped by those in bands 0-1. *Bumping Band 2* cannot be less than *Bumping Band 1*.
Bumping Band 3	1–15 Default: 6	The lowest value in the fourth most important COS band. Connections in this band can bump those in bands 4–7, and can be bumped by those in bands 0–2. *Bumping Band 3* cannot be less than *Bumping Band 2*.
Bumping Band 4	1–15 Default: 8	The lowest value in the fifth most important COS band. Connections in this band can bump those in bands 5–7, and can be bumped by those in bands 0-3. *Bumping Band 4* cannot be less than *Bumping Band 3*.
Bumping Band 5	1–15 Default: 10	The lowest value in the sixth most important COS band. Connections in this band can bump those in bands 6–7, and can be bumped by those in bands 0–4. *Bumping Band 5* cannot be less than *Bumping Band 4*.
Bumping Band 6	1–15 Default: 12	The lowest value in the seventh most important COS band. Connections in this band can only bump those in Band7, and can be bumped by those in bands 0–5. *Bumping Band 6* cannot be less than *Bumping Band 5*.

Parameter	Values	Description
Bumping Band 7	1–15 Default: 14	The lowest value in the least important COS band. Connections in this band cannot bump, but can be bumped by those in bands 1-6. *Bumping Band 7* cannot be less than *Bumping Band 6*.
Priority Bumping Active on this node?	YES or NO Default: NO	Indicates whether priority bumping is enabled or disabled on a particular node.
Number of Priority Bumping Bands	0–7	Indicates the number of priority bands enabled. If priority bumping is not enabled, this value is 0.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX, IGX			Yes	

Related Commands

cnfbmpparm

Example

Use **dspbmpparm** to view the priority bumping parameters. Priority bumping for the whole network is shown at the top of the display, and then at the bottom for a specific node.

```
igxr2          TN    StrataCom       IGX 8420  9.3.0K    Jan. 26 2000 15:19 PDT

1  Priority Bumping Enabled                [ YES]
2  Priority Bumping Bundle                 [  10] (D)
3  Priority Bumping Bands:
   Bumping Band 1                          [   2] (D)
   Bumping Band 2                          [   4] (D)
   Bumping Band 3                          [   6] (D)
   Bumping Band 4                          [   8] (D)
   Bumping Band 5                          [  10] (D)
   Bumping Band 6                          [  12] (D)
   Bumping Band 7                          [  14] (D)

   Priority Bumping Active on this node    [ YES]
   Number of Priority Bumping Bands        [   7] (D)

Last Command: dspbmpparm

bpx1           TN    StrataCom       BPX 8620  9.3.0K    Jan. 26 2000 14:20 PST

1  Priority Bumping Enabled                [ YES]
2  Priority Bumping Bundle                 [  10] (D)
3  Priority Bumping Bands:
   Bumping Band 1                          [   2] (D)
   Bumping Band 2                          [   4] (D)
   Bumping Band 3                          [   6] (D)
   Bumping Band 4                          [   8] (D)
   Bumping Band 5                          [  10] (D)
   Bumping Band 6                          [  12] (D)
```

```
   Bumping Band 7                          [  14] (D)

   Priority Bumping Active on this node    [  NO]
   Number of Priority Bumping Bands        [   0] (D)


Last Command: dspbmpparm
```

dspbmpstats (display priority bumping statistics)

Displays priority bumping operational statistics for the priority bumping feature.

Syntax

dspbmpstats

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	Yes	Yes	BPX, IGX			Yes	

Related Commands

dspbmpparm, cnfbmpparm, dsprrst s, rrtinf

Display Fields

Statistics Object	Description
Latest bumping band	The band value of the latest reroute connection that originates from this node.
Latest bumped band	The band value of the latest connection that is bumped from this node. The bumped connection can be mastered or slaved on this node. It can even be simply traversing this node. The bumping connection also can be mastered on, slaved on, or simply that originates from this node.
Hvm bumping band	The high water mark, since the last resetting of statistics, of the band value of any reroute connection that traverses this node
Lwm bumped band	The low water mark, since the last resetting of statistics, of the band value of any connection that has been bumped from this node.
Latest # bumping conns/req	The number of reroute candidate connections in the most recent reroute request. If there are many similar connections to be routed to the same destination, this value usually represents the bundle size of the Priority Bumping reroute request.
Latest # bumped conns/req	The number of connections selected to be bumped from this node in the most recent reroute request.
Hwm # bumping conns/req	The high water mark, since the last resetting of statistics, of the number of reroute candidate connections in any reroute request.
Hwm # bumped conns/req	The high water mark, since the last resetting of statistics, of the number of connections selected to be bumped from this node in any reroute request.
Accum # bumping conns	The total number, since the last resetting of statistics, of successfully routed connections.
Accum # bumped Lcons	The total number, since the last resetting of statistics, of master or slave connections bumped from this node.

Statistics Object	Description
Avg # bumping conns/req	The average number, since the last resetting of statistics, of successfully routed connections in a reroute request.
Accum # bumped VLcons	The total number, since the last resetting of statistics, of via connections bumped from this node.

Example (BPX)

dspbmpstats

```
sw67          TN    StrataCom       BPX 8620  9.3.0L    Jan. 28 2000 18:57 PST

PB Routing Statistic

 Latest bumping band               -     Latest bumped band               -
 Hwm bumping band                  -     Lwm bumped band                  -

 Latest # bumping conns/req        0     Latest # bumped conns/req        0
 Hwm # bumping conns/req           0     Hwm # bumped conns/req           0

 Accum # bumping conns             0     Accum # bumped Lcons             0
 Avg # bumping conns/req        0.00     Accum # bumped VLcons            0

Last Command: dspbmpstats
```

dspbob (display breakout box)

Shows the current state of all inputs from user equipment to the node the state of all outputs from the node to the user equipment. The display is real-time and updated at a user-specified interval. The display refreshes at the designated interval until the Delete key is pressed or until it times out.

See the **cnfict** description for information on configuring data interfaces. When used with Frame Relay T1/E1 applications, **dspbob** displays the message “This FRP does not support V.35 ports.”

Displaying Signal Status for Port Concentrator Ports

If an FRM-2 or FRP-2 card connects to a Port Concentrator Shelf (PCS), you can specify up to 44 ports by using the *port* parameter. In this case, **dspbob** displays the signal status for ports on the PCS. The PCS relays any changes in signal states to the FRM-2 or FRP-2, so a slight delay occurs when signals are updated.

When used for PCS ports, **dspbob** has an optional parameter measuring port clock speed. Selection of this parameter temporarily interrupts all traffic on the logical port. The events that take place upon input of this parameter are:

1. The port is disabled.
2. Two invalid frames are timed as they go out the port.
3. The port is reactivated.

Syntax

dspbob <slot><port> [interval] [(measure clock speed) y | n]

Parameters

Parameter	Description
<slot>	Specifies the slot number of the card containing the port whose input and output pins are to be displayed.
<port>	Specifies the data port or Frame Relay port whose input and output pins are to be displayed.
[interval]	Optionally specifies the time in seconds, between updates of the breakout box display. If no interval is specified, the display is updated at five second intervals. Do not use an interval of “1” second in a busy network. Range: 1 to 60 seconds
[(measure clock speed) y	n]	For Port Concentrator Shelf (PCS) only, optionally directs the system to measure the clock speed. If a Port Concentrator port is selected, the last measured clock speed is displayed on the Clocking line. When Measure Clock Speed is entered as an optional parameter, the clock is measured first, and the results are displayed. Clock speed measurement for PCS ports is described in the *Cisco WAN Switching System Overview* information for the PCS.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			Yes	

Related Commands

cnfict, dspcon, dspict

Example

See the breakout box display for channel 5.1.

dspbob 5.1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:29 PST

Port:           5.1
Interface:      V35   DCE
Clocking:       Normal       (255999 Baud)

      Inputs from User Equipment              Outputs to User Equipment
 Lead  Pin  State   Lead  Pin  State     Lead  Pin  State   Lead  Pin  State
 RTS   C    Off                          CTS   D    On
 DTR   H    Off                          DSR   E    On
 TxD   P/S  Idle                         DCD   F    Off
 TT    U/W  Unused                       RI    J    Off
                                         TM    K    Off
                                         RxD   R/T  Idle
                                         RxC   V/X  Active
                                         TxC   Y/a  Active


This Command: dspbob 5.1


Hit DEL key to quit:
```

Example

See the breakout box display for Frame Relay connections.

dspbob 9.1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:29 PST

Port:           9.1
Interface:      FRI-V35   DTE
Clocking:       Normal

      Inputs from User Equipment              Outputs to User Equipment
 Lead  Pin  State   Lead  Pin  State     Lead  Pin  State   Lead  Pin  State
 CTS   D    Off                          RTS   C    On
 DSR   E    Off                          DTR   H    On
 DCD   F    Off                          LT    L    Off
 (TM)  n    Off                          (RLB) N    Off
```

```
This Command: dspbob 9.1

Hit DEL key to quit:
```

dspbpnv (display backplane NOVRAM)

Issue the **dspbpnv** command to see the NOVRAM setting for the backplane. For some operations, you must verify if the node has the new backplane or the old backplane. For example, in order for the BPX 8600 to operate at 19.2 Gbps with the BCC-4V, it must have the NOVRAM Word #2 set to 0001 (which indicates that the backplane version is new). If it instead has the NOVRAM Word# set to 0000 (indicating that the backplane version is old) the switch cannot run with a 19.2 Gbps peak throughput. If you visually verify that the backplane is a 19.2 Gbps backplane (see note below), but the backplane NOVRAM Word #2 has not been set to 0001, then issue the **cnfbpnv** command to program the NOVRAM.

Note You can visually identify the 19.2 backplane by the small white card slot fuses at the bottom rear of the backplane. These fuses are approximately 1/4 inch high and1/8 inch wide. The 9.6 Gbps backplane does not have these fuses. If your BPX switch is a late model, then a 19.2 Gbps backplane is installed.

The following table details the bit fields for the BCC Backplane NOVRAM format. The display in the field Word 2 describes the backplane type.

16 Bit Word	Byte # (hex)	Contents
0	0,1	Hardware revision
1	2,3	Backplane Type (usually 0x65=101 decimal)
2	4,5	Backplane version (0x0000old 0x0001new)
3	6,7	Backplane serial number in ASCII - MSB
4	8,9	Backplane serial number in ASCII - MSB
5	A,B	Backplane serial number in LSB
6	C,D	Board FAB number, in ASCII - MSB
7	E,F	Board FAB number, in ASCII - LSB
8	10,11	Board FAB number, in ASCII - LSB
9	12,13	Board FAB number, in ASCII - LSB
A	14,15	Board FAB number, in ASCII - LSB
B	16,17	Board FAB number, in LSB
C	18,19	Unused
D	1A,1B	Unused
E	1C,1D	Unused
F	1E,1F	Checksum bytes - NOT SUPPORTED

Syntax

dspbpnv

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
Any user	No	No	BPX	No	OK	Yes	No

Related Commands

cnfbpnv

Example (BPX)

View the NOVRAM settings on a BPX 8620.

dspbpnv

```
sw217          TN    Cisco          BPX 8620  9.3.x5    June 11 2001 14:34 GMT

BackPlane NOVRAM
----------------
WORD  0: 0x0096      WORD  1: 0x0065
WORD  2: 0x0000      WORD  3: 0x3232
WORD  4: 0x3037      WORD  5: 0x3632
WORD  6: 0x0000      WORD  7: 0x0000
WORD  8: 0x0000      WORD  9: 0x0000
WORD 10: 0x0000      WORD 11: 0x0000
WORD 12: 0x0000      WORD 13: 0x0000
WORD 14: 0x0000      WORD 15: 0x9997


Last Command: dspbpnv
```

dspbusbw (display cell bus bandwidth for UXM cards)

Displays the amount of bandwidth allocated on the cell bus on an IGX node. By default, the system allocates enough bus bandwidth for one OC-3 when the first line is upped by using the **upln** command. If there is not enough allocated cell bus bandwidth, the line is not upped. Cell bus bandwidth must be allocated before adding connections on the UXM card.

Syntax

dspbusbw <slot> [u]

Parameters

Parameter	Description
<slot>	Specifies the slot number of the card containing the universal bus bandwidth information to display.
[u]	Optionally specifies that the card should update the information with the latest information calculated in firmware. If not provided, the system will prompt you.

Display Fields

Display	Description
Minimum Required Bandwidth	Minimum bandwidth in FastPackets per second and cells per second required for all connections currently configured on this card. This is calculated by UXM firmware as connections are added.
Maximum Port Bandwidth	Total bandwidth of all active trunks/ports on this card in FastPackets per second, cells per second, and UBUs.
Average Bandwidth and Peak Used Bandwidth	Statistics counters maintained by UXM firmware. These statistic counters display FastPackets per second, cells per second, and UBUs. Use this information when calculating the amount of bus bandwidth to be allocated. These counters are cleared when the UXM card is reset.
Last Updated time	Shows the time when the counters were last updated. This is the current time if you answered yes to the `Get updated bandwidth info from card (Y/N)?` prompt or entered the command with the u parameter.
Allocated Bandwidth	The bandwidth allocated for this card using the **cnfbusbw** command. Refer to the *Cisco WAN Switching SuperUser Commands* manual for more information. Allocated bandwidth is specified in FastPackets per second, cells per second and converted to UBU units by the system.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX (with UXM)			Yes	

Related Commands

cnfbusbw

Example

Display the amount of bandwidth allocated on the cell bus on the UXM card in slot 6 of the IGX node.

dspbusbw 6

```
Get updated bandwidth info from card (Y/N)? n

sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  17:52 GMT

1\NBus Bandwidth Usage for UXM card in slot 6   Last Updated on 04/07/98 12:03:0
0
                          FPkts/sec   Cells/sec    UBUs
Minimum Reqd Bandwidth:           0           0      0
Average Used Bandwidth:           0           0      0
Peak    Used Bandwidth:           0           0      0
Maximum Port Bandwidth:           -       10866      3

Allocated    Bandwidth:                              8
           (Cell Only):           -       32000
           (Cell+Fpkt):       16000       24000
           (Fpkts / 2 + Cells)   <=       32000

Reserved     Bandwidth:           -        4000      1

Last Command: dspbusbw 6

Next Command: dspbusbw 6

Get updated bandwidth info from card (Y/N)? y

sw199          TN    StrataCom       IGX 16    9.3    Apr. 13 2000  17:53 GMT

1\NBus Bandwidth Usage for UXM card in slot 6   Last Updated on 04/09/98 17:53:2
2
                          FPkts/sec   Cells/sec    UBUs
Minimum Reqd Bandwidth:           0           0      0
Average Used Bandwidth:           0           0      0
Peak    Used Bandwidth:           0           0      0
Maximum Port Bandwidth:           -       10866      3

Allocated    Bandwidth:                              8
           (Cell Only):           -       32000
           (Cell+Fpkt):       16000       24000
           (Fpkts / 2 + Cells)   <=       32000

Reserved     Bandwidth:           -        4000      1

Last Command: dspbusbw 6
```

dspbuses (display bus status)

Displays the available Muxbus or cell bus bandwidth. The display does not dynamically receive updates and is therefore a snapshot. The **dspbuses** command lists the dedicated and pooled bandwidth units as well as the status of the available Muxbus.

As a safeguard against bus failure, each node is equipped with redundant System Buses: Bus A and Bus B. Either bus can be configured as the active bus with the other bus as standby. Use the **cnfbus** command to switch the active bus.

Each System Bus contains these buses:

- Control Bus
- Time Division Multiplex (TDM) bus
- clock bus
- power bus

In addition to showing which System Bus is active and which is standby, the **dspbuses** command also shows which sub-bus needs diagnostics or has failed. Bus status is displayed at the bottom of the screen. Table 4-3 shows the possible status displays and their meaning.

Table 4-3 Possible Bus Status Displays

Status	Description
OK	Bus operation satisfactory
Failed TDM	A failed TDM Bus
Failed CNTL	A failed Control Bus
Needs Diagnostics TDM	The TDM bus needs diagnostics
Needs Diagnostics CNTL	The Control Bus needs diagnostics

The remaining cell bus bandwidth available to assign to cards and circuits is displayed. This is primarily used when configuring the AIT card on the IGX node. You can assign CELLBUS bandwidth for the IGX node.

Available bandwidth falls into two categories:

- Dedicated
  Dedicated bandwidth is reserved by the system for specific purposes, such as Statistical Reserve for PCC traffic.
- Pooled
  Pooled bandwidth can be assigned to any use but primarily is used for an ATM trunk.

Cell bus bandwidth is assigned in quantities of “switches,” “slices,” and “circuits” and the available bandwidth is displayed in three rows accordingly. A single DS0 circuit occupies 333 packets per second (pps) of cell bus bandwidth, a “slice” of bandwidth is equivalent to three DS0 circuits for a total of 1000 pps. A switch is eight slices for a total of 8000 packets/second of bus bandwidth.

In a newly installed node with no cards and no circuits installed, the total bus bandwidth that is available to be assigned is listed in the right column of the following table, which is the sum of the dedicated and pooled bandwidth. As cards and circuits are added to the node, the available bandwidth decreases accordingly.

Table 4-4 Bandwidth Units and Capacity

Unit of BW	Quantity	Cell Bus Capacity
switch	8 slices or 8000 pps	20
slice	3 DS0s or 1000 pps	160
DS0	333 pps	480

Syntax

dspbuses

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

cnfbus

Example (BPX)

dspbuses

```
bpx1       TN    SuperUser       BPX 15    9.3 Apr. 13 2000  13:22 GMT

                               Bus Status

Bus A (slot 7): Active - OK

Bus B (slot 8): Standby - OK

Last Command: dspbuses

Next Command:
```

Example (IGX)

dspbuses

```
sw197          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000  04:10 GMT

                                Bus Info

Bus Bandwidth usage in Fastpackets/second   (Snapshot)

    Allocated = 86000      ( 8%)
Available = 1082000    (92%)

-----------
Bus A: Active - OK
Bus B: Standby - OK

Last Command: dspbuses
```

Example (IGX)

Display status and bandwidth available. The status of Bus A and Bus B is displayed. In this example, both buses are OK and B is the active control bus (normal operation is for bus A to be the active bus).

dspbuses

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 13:34 PST

                                Bus Info

Available MUXBUS bandwidth (snapshot)

Dedicated  Pooled  Units
---------  ------  -----
0          13      8000 pkts/sec
5          104     1000 pkts/sec
22         312     ds0 circuits

Bus Status
-----------
Bus A: Standby - OK
Bus B: Active - OK


Last Command: dspbuses


Next Command:
```

dspcdstats (display UXM card statistics)

The **dspcdstats** command displays the collected UXM card statistics for the selected node slot.

Syntax

dspcdstats <slot number>

Parameters

Parameter	Description
<slot number>	Specifies the shelf and slot.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	Yes	Yes	BPX			Yes	

Related Commands

cnfslotstats, dspsloterrs (for BXM)

Example (IGX)

Display UXM Card Statistics

dspcdstats 9

```
bolger         TN    Cisco           IGX 8430  9.3.3q    May  25 2001 12:23 PST

Slot 9
Collection Time: 1 day(s) 03:15:51                   Clrd:  Date/Time Not Set
Type                                      Count
QBIN: Ingress Cells Rcv from ln               22
QBIN: Ingress Cells Tx to net                 22
QBIN: Ingress Cells discarded                  0
QBIN: Ingress FPs Rcv from ln              68013
QBIN: Ingress FPs Tx to net                68013
QBIN: Ingress FPs discarded                    0




This Command: dspcdstats 9
```

Example (IGX) Field Descriptions

Table 4-5 Display Fields for Example UXM

Field	Description
Ingress Cells Rcv from ln	Ingress Cells received from the line (cells into the UXM from it’s node).
Ingress Cells Tx to net	Ingress Cells transmitted to the network (cells out of the UXM to the network).
Ingress Cells discarded	Ingress Cells discarded by the UXM.
Ingress FPs Rcv from ln	Ingress fast packets received from the line (fast packets into the UXM from it’s node).
Ingress FPs Tx to net	Ingress fast packets transmitted to the network (fast packets out of the UXM to the network).
Ingress FPs discarded	Ingress fast packets discarded by the UXM.

dspcbause (display CBA block usage)

Queries the specified slot and displays information about the CBA blocks. While running this command, it periodically queries the card and the display continuously updates the CBA parameters, showing block usage among AutoRoute and VSI.

To display a summary of CBA usage on all active UXMs on the node, enter **dspcbause** with no parameters.

To display CBA usage on a specific active UXM card, enter **dspcbause** with the slot number parameter.

Syntax

dspcbause [slot_no] [interval]

Parameters

Parameter	Description
[slot_no]	Optionally specifies the slot number of a particular UXM card.
[interval]	Optionally specifies the interval in seconds. Default: 10 seconds.

Display Fields

Parameter	Description
CBABlocksAllocated	The number of CBA blocks allocated. 32 CBAs are equal to one block.
CBABlocksUsed	Number of CBA blocks used by the slot for connections.
CBAsUsed	Number of CBAs used by the slot for connections.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	No	IGX	Yes	Yes	Yes	No

Example

dspcbause

Display CBA and CBA block use of Automatic Routing Management and VSI (on a node).

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 11:10 PST

VSI CBA allocation summary for all slots :


  Slot     VSI LCNs        CBA Blks          Actual CBA Blks
                         to be alloced          alloced
   4         200           7                     7
   5        2000          63                    63
```

```
Last Command: dspcbause


Next Command:
```

Example

Display CBA and CBA block use among AutoRoute and VSI (on a slot).

dspcbause 5

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 11:11 PST

                CBA Usage for slot 5

    CBA Blocks allocated    =    63          CBA Blocks used     =  16

CBA Block Bitmap:
 80 :    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
140 :    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
200 :    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
2C0 :    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
380 :    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
440 :    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
500 :    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
5C0 :    0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
680 :    0  0 F8 FF  7  0  0  0  0  0  0  0


This Command: dspcbause 5


Hit DEL key to quit:
```

dspcd (display card)

Displays the status, revision, serial number, and top assembly number of a card. If a back card is present, its type, revision, and serial number appear. The displayed information can vary with different card types and appears on a single-page display.

Syntax

dspcd <slot number>

Parameters

Parameter	Description
<slot number>	Specifies the slot number of the card for which you wish to see status and identifying information.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX	Yes	Yes	No	Yes

Related Commands

dncd, **dspcds**, **resetcd**, **upcd**

Example (BPX) BXM-155

Display features supported (Support fields) on the BXM card in slot 2. The front card supports the Neighbor Discovery feature (NbrDisc) and the XLMI protocol (XL). Both the LMI Neighbor Discovery feature and XLMI protocol are required for AR-PNNI links in a hybrid network.

dspcd 1

```
BPX02          TN    Cisco           BPX 8620  9.3.3W    Aug. 13 2001 11:24 PDT

Detailed Card Display for BXM-155 in slot 1
Status:          Active
Revision:        FA21             Backcard Installed
Serial Number:   A66165             Type:          LM-BXM
Top Asm Number:  80033333           Revision:      BB
Queue Size:      524280             Serial Number: 770491
Supp:8 Pts, OC3, FST, VcShp         Top Asm Number:
Supp: VT,ChStLv 1,VSI(Lv 3,ITSM)    Supp: 8 Pts,OC3,MMF,RedSlot:NO
Supp: APS(FW), F4F5
Support: LMIv 1,ILMIv 1,NbrDisc,XL
Supp: OAMLp,TrfcGen,PPDPolic,OAM-E
#Ch:32768,PG[1]:32736,PG[2]:32736
PG[1]:1,2,3,4,PG[2]:5,6,7,8,
#Sched_Ch:61440 #Total_Ch:61376
Type: BXME, revision DX
```

```
Last Command: dspcd 1
```

Table 4-6 Display Fields for Example (BPX) BXM-155

Field	Value	Description
BXM Front Card Fields		
Status Displays the status of a card.	Active	Card in use, no failure detected.
	Active—F	Card in use, failure detected.
	Active—T	Card active, test in progress.
	Active—F-T	Card active, minor failure detected, test in progress.
	Standby	Card idle, no failure.
	Standby—F	Card idle, failure detected.
	Standby—T	Card idle, test in progress.
	Standby—F-T	Card idle, failure detected, test in progress.
	Failed	Card failed.
	Down	Card downed by user.
	Down—F	Card downed, failure detected.
	Down—T	Card downed, failure detected, test in progress.
	Mismatch	Mismatch between front card and back card.
	Update *	Configuration RAM being updated from active control card.
	Locked*	Old software version is being maintained in case it is needed.
	Dnlding*	Downloading new system software from the active PCC adjacent node from WAN Manager.
	Dnldr*	Looking to adjacent nodes or WAN Manager for either software to load or other software needs you have not specifically requested.
	Program	Occurs when new firmware is being burned on the card.
Revision		The firmware/hardware version ID.
Serial Number		The serial number of the card.
Top Asm Number		The card's 800-level part number.
Queue Size		The sum of the sizes of the ATM cell queues in one direction. Queue size = size of HP+TS+BDATA+BDATB+CBR+VBR +SIG+ABR queues.
Support or Supp		The features that the card’s firmware and hardware supports.
	Pts	The number of physical ports supported by card hardware: OC3 | OC12 |T3 | E3
	The card type supported	Indicates firmware supports Foresight.
	VcShp	Indicates firmware supports VCshaping.

Table 4-6 Display Fields for Example (BPX) BXM-155 (continued)

Field	Value	Description
	VT	Indicates firmware supports virtual trunks
	ChStLv	The multilevel channel statistics level currently programmed 0-3. The statistics level is configured using the command **cnfcdparm**. Refer to cnfcdparm (configure card parameters), page 3-143 for more information about multilevel channel statistics.
	VSI	The VSI attributes supported. Values are: lv-VSI level supported by firmware. The level is 0, 1, 2, or 3; the level represents the resources supported, i.e. LCNs, VPI, etc. ITSM-VSI level supported by firmware. I = ILMI support. T = topology support. S = signalling, QBIN support. M = multiple partition support. V = VC merge support.
	APS	The APS attributes supported. Values are: APS(FW)-APS is supported by card firmware. APS(HW1+1)-APS 1+1 is supported by card hardware. APS(ChHlv)-The number of channels supported by card is halved in order to support APS 1:1.
	F4F5	F4 AIS detection on trunks and F4 AIS to F5 AIS mapping on ports is supported by card firmware.
	LMIv	LMI version supported by card firmware.
	ILMIv	ILMI version supported by card firmware.
	NbrDisc	ILMI neighbor discovery is supported by card firmware.
	OAMLp	OAM loopback testing is supported by card firmware.
	XL	XLMI protocol supported by card firmware.
	TrfcGen	Traffic Generation testing is supported by card firmware.
	PPDPolic	
	OAM-E	OAM Ping feature supported by card firmware.
#Ch		The total number of channels supported by all port groups.
	PG[1]:8160 PG[2]:8160	The number of channels contained in each port group.
	PG[1]:1,2,3,4, PG[2]:5,6,7,8	The card physical ports.
#Sched_Ch		The number of scheduler channels supported by card.
#Total_Ch		The total number of channels reported by the BXM cards.
BXM Back Card Fields		

Table 4-6 Display Fields for Example (BPX) BXM-155 (continued)

Field	Value	Description
Type		The type of backcard: LM-BXM, T3-3, E3-3, T3-2, E3-2, SMF, MMF, SMFLR, LMASM, STM1, UTP, STP.
Revision		The hardware version ID.
Serial Number		The serial number of the card.
Top Asm Number		(TAN) The 800-level part number of the card.
Supp		The resources and features this card supports. For example: 8 Pts,OC3,SMF,APS,RedSlot:2
	Pts	The number of ports on the backcard
	OC3	Supports SONET OC3 with SMF
Supp (cont.)	APS	Supports APS 1:1
	RedSlot:<slot number>	If APS 1+1 supported by the backcard, and configured, this field shows the redundant card's slot number. Values are: ??- If APS 1+1 supported by the backcard, but not configured. NO- If APS 1+1 is not supported by the backcard.

Example (IGX) UXM

Detailed Card Display for UXM card in slot 9.

dspcd 9

```
sbolger         TN    Cisco           IGX 8430  9.3.3o    May  17 2001 17:43 PST

Detailed Card Display for UXM in slot 9

Status:          Active                Front Card Supports:
Revision:        CD02                   Vtrunks, OAMLpbk & TrfcGen, ILMI ver 1,
Serial Number:   284344                 Neighbor Discovery, SIW, CGW, CellFwd,
Top Asm Number:  28216402               Hot Standby, Trfc Shaping, IMA,
Backplane Installed                     ChnStatLvl 1, NumChans = 8000,
Backcard Installed                      NumRCMP = 8191, VSI ver 2, VSI Ctrlr
  Type:          OC3
  Revision:      AD
  Serial Number: 258051
  Top Asm Number: 28226303
  Ports:         4
  Line Mode:     SMF


Last Command: dspcd 9


Next Command:
```

Table 4-7 Display Fields for Example (IGX) UXM

Field	Value	Description
BXM Front Card Fields		
Status Displays the status of a card.	Active	Card in use, no failure detected.
	Active—F	Card in use, failure detected.
	Active—T	Card active, test in progress.
	Active—F-T	Card active, minor failure detected, test in progress.
	Standby	Card idle, no failure.
	Standby—F	Card idle, failure detected.
	Standby—T	Card idle, test in progress.
	Standby—F-T	Card idle, failure detected, test in progress.
	Failed	Card failed.
	Down	Card downed by user.
	Down—F	Card downed, failure detected.
	Down—T	Card downed, failure detected, test in progress.
	Mismatch	Mismatch between front card and back card.
	Update *	Configuration RAM being updated from active control card.
	Locked*	Old software version is being maintained in case it is needed.
	Dnlding*	Downloading new system software from the active PCC adjacent node from WAN Manager.
	Dnldr*	Looking to adjacent nodes or WAN Manager for either software to load or other software needs you have not specifically requested.
	Program	Occurs when new firmware is being burned on the card.
Revision		The firmware/hardware version ID.
Serial Number		The serial number of the card.
Top Asm Number		The card's 800-level part number.
Backplane Installed		Indicates if a backplane is installed. It either shows a Single slot Universal backplane in installed or that no backplane, meaning a backplane other than a single slot Universal backplane.is installed.
Backcard Installed, No Backcard Installed		Shows whether there is a backcard installed.
Front Card Supports		The features that the card's firmware and hardware supports.
	Vtrunks	Indicates firmware supports virtual trunks.

Table 4-7 Display Fields for Example (IGX) UXM (continued)

Field	Value	Description
	OAMLpbk	OAM loopback testing is supported by card firmware.
	TrfcGen	Traffic Generation testing is supported by card firmware.
	ILMI ver	ILMI version supported by card firmware.
	Neighbor Discovery	ILMI neighbor discovery is supported by card firmware.
	SIW	Service Interworking supported by card firmware.
	CGW	Complex gateway supported by card firmware.
	CellFwd	Cell forwarding supported by card firmware.
	Hot Standby	Redundant card hot standby supported by card firmware.
	Trfc Shaping	Traffic shaping supported by card firmware.
	IMA	Inverse Multiplexing for ATM supported by card firmware.
	ChnStatLvl	The channel statistics level programmed
	NumChans	The total number of channels supported by card.
	NumRCMP	The number channels reserved for routing control monitoring and policing.
	VSI ver	VSI version level supported by card firmware.
	VSI Ctrlr	VSI controller supported by card firmware.
UXM Back Card Fields		
Type		The type of backcard: E1 | E1-IMA | T1 | T1-IMA | T3 | E3 | OC3 | Missing.
Revision		The hardware version ID.
Serial Number		The serial number of the card.
Top Asm Number		(TAN) The 800-level part number of the card.
Ports		The number of physical port the backcard supports.
Line Mode		Backcard fiber modes, present only if this is a SONET card. For Example: [SMF | MMF | SMFLR | STM1 | UTP |STP]
	SMF	Single mode fiber.
	MMF	Multi mode fiber.
	SMFLR	SMF long reach.
	SNM	Mixed SMF and MMF card.
	STM1	STM-1 back card.
	XLR	XLR back card.
	UTP	OC3 UTP back card.
	STP	OC3 STP back card.

Example (BPX)

Displays Neighbor Discovery support under the Front Card Supports field for a BXM card in slot 13, and VC Merge support, designated by V in:

```
Supp: VT,ChStLv 1,VSI(Lv 3,ITSMV)
```

dspcd 13

```
ssw177          TN    Cisco           BPX 8620  9.3.c3    May  4 2001
23:39 GMT

Detailed Card Display for BXM-155 in slot 13
Status:          Active
Revision:        FAL              Backcard Installed
Serial Number:   A66604             Type:          LM-BXM
Top Asm Number:  8000309303         Revision:      BB
Queue Size:      260090             Serial Number: A84438
Support: 4 Pts, OC3, FST, VcShp     Top Asm Number:
Supp: VT,ChStLv 1,VSI(Lv 3,ITSMV)  Supp:8 Pts,OC3,MMF,RedSlot:NO
Supp: APS(FW)
Support: LMIv 1,ILMIv 1,NbrDisc,XL
Support: OAMLp, TrfcGen, PPDPolic
#Ch:32768,PG[1]:32736,PG[2]:32736
PG[1]:1,2,PG[2]:3,4,
#Sched_Ch:61440 #Total_Ch:61376
Type: BXME, revision DX
```

dspcderrs (display card errors)

Displays detailed card failure information resulting from card diagnostics testing at the local node.

This command displays a history of card failures associated with a specified slot. If no argument is specified, a summary is displayed, indicating which slots have failures recorded against them. The command displays the results of the self-tests and background tests as well as the total hardware errors.

To clear the card error counters, use the **clrcderrs** command. To obtain a hard copy of the report, use the **prtcderrs** command.

Syntax

dspcderrs [<slot>]

Parameters

Parameter	Description
[<slot>]	Specifies the shelf slot in the local node.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

clrcderrs, **prtcderrs**

Example

Display card errors on the card in slot 11.

dspcderrs 11

```
sw83           TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  17:56 PST

AIT in Slot 11 : 176767 Rev AEF     Failures Cleared: Apr. 13 2000 11:25:29 PST
----------------------------------- Records Cleared: Apr. 13 2000 13:14:03 PST
Self Test          Threshold Counter: 0          Threshold Limit: 300
Total Pass: 0             Total Fail: 0             Total Abort: 0
First Pass:                           Last Pass:
First Fail:                           Last Fail:

Hardware Error     Total Events: 0     Threshold Counter: 0
First Event:                          Last Event:


Last Command: dspcderrs 11


Next Command:
```

dspcdred (display redundant cards)

The command **dspcdred** has the same functionality as the command **dspyred**; therefore, please use the command **dspyred.** For information about **dspyred** command usage, refer to dspyred (display Y-cable redundancy), page 4-402.

dspcds (display cards)

Displays the cards in a shelf, front and back, with their type, revision, and status. For front and back card sets, the status field applies to the cards as a set. A “T” opposite a card indicates that it is running a self-test or a background test. An “F” opposite a card indicates that it has failed a test.

If lines or connections have been configured for a slot, but no suitable card is present, the display lists the missing cards at the top of the screen.

If a special backplane is installed or if a card was previously installed, empty slots are identified as “reserved.”

For a two-shelf node, the screen initially displays only the upper shelf with a “Continue?” prompt. Typing “y” to the prompt displays the cards in the lower shelf. For an IGX 8410 node, the card information appears in only the left column.

Syntax

dspcds [l]

Parameters

Parameter	Description
l	Directs the system to display status of the cards on just the lower shelf of an IGX 32 node.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dncd, **dspcd**, **resetcd**, **upcd**

Display Cards Update and Status Display Fields

- Active — Card in use, no failure detected.
- Active—F — Card in use, failure detected.
- Active—T — Card active, test in progress.
- Active—F-T — Card active, minor failure detected, test in progress.
- Standby — Card idle, no failure.

• Standby—F	Card idle, failure detected.
• Standby—T	Card idle, test in progress.
• Standby—F-T	Card idle, failure detected, test in progress.
• Failed	Card failed.
• Down	Card downed by user.
• Down—F	Card downed, failure detected.
• Down—T	Card downed, failure detected, test in progress.
• Mismatch	Mismatch between front card and back card.
• Update *	Configuration RAM being updated from active control card.
• Locked*	Old software version is being maintained in case it is needed.
• Dnlding*	Downloading new system software from the active PCC adjacent node from WAN Manager.
• Dnldr*	Looking to adjacent nodes or WAN Manager for either software to load or other software needs you have not specifically requested.
• Program	Occurs when new firmware is being burned on the card.

In the preceding messages, an asterisk (*) means an additional status designation for BCC or NPM cards. An “F” flag in the card status indicates that a non-terminal failure was detected. Cards with an “F” status are activated only when necessary (for example, when no other card of that type is available). Cards with a “Failed” status are never activated.

The “reserved for” logic in Release 9.2 reserves the slot for a BXM if SONET APS (Automatic Protection Switching) has been configured on the slot.

To support the Hitless Rebuild feature in Release 9.2, after a switchover has occurred and the standby updates are about to begin, the **dspcds** command shows the standby processor card as missing temporarily. This is a result of the delay in performing the full rebuild on the standby processor, which is necessary as part of the hitless rebuild sequence.

Following any processor card switchover, the new standby rebuilds, preserving the critical databases needed for a hitless rebuild. When database updates can start, the standby rebuilds again doing a normal standby rebuild. If there is a failure on the new active card that causes it to switch back before updates can start, the card taking over performs a hitless rebuild. Under most conditions, the second switchover is not necessary, and a full rebuild is done on the standby processor. As this process begins, the standby card briefly appears to be missing.

Example (URM on IGX)

Display the status of cards in an IGX node with Universal Router Module (URM) cards.

dspcds

```
sw175          TN    Cisco          IGX 8420  9.3.q6    Mar. 9 2000  05:21 GMT

Missing Cards: 1 NPM

   FrontCard  BackCard                          FrontCard  BackCard
   Type  Rev  Type      Rev  Status             Type  Rev  Type      Rev  Status
1  NPM   FMR                 Active          9  FRM   ESX  FRI-T1    AL   Standby
2  Empty reserved for NPM                    10 URM   BA03 2FE       P03  Standby
3  Empty                                     11 URM   BA04 2FE       P03  Standby-T
4  Empty                                     12 NTM   EKJ  Empty          Standby
5  UXM   CAA  Empty          Standby         13 Empty
6  URM   BA04 Empty          Standby         14 Empty
7  UXM   BDJ  E1-IMA    AC   Standby-T       15 Empty
8  Empty                                     16 URM   BA03 2FE       P03  Standby


Last Command:dspcds
```

Example (OC-12 on BPX)

Display status of cards on a BPX node. The two-port BME card with OC-12 interface is in slot 11.

dspcds

```
sw60           TN    SuperUser       BPX 15    9.3      Apr. 13 2000 11:36 GMT
Missing Cards: 1 BCC

   FrontCard  BackCard                          FrontCard  BackCard
   Type   Rev  Type     Rev  Status              Type     Rev  Type     Rev  Status
1  BNI-T3 CCF  T3-3     BE   Active          9  BNI-155   BDK  MMF-2    CM   Standby
2  Empty                                     10 Empty
3  ASI-T3 BJF  T3-2     AA   Standby         11 BME-622   K08  11LM-BXM P02AB Active
4  ASI-E3 BMJ  E3-2     BE   Standby         12 ASI-155   BDK  MMF-2    AB   Standby
5  BNI-E3 CMF  E3-3     EY   Standby         13 Empty
6  Empty                                     14 Empty
7  BCC    BWF  LMBCC    AC   Active          15 ASM   ACA  LMASM    AC   Active
8  Empty reserved for Card

Last Command: dspcds
```

dspcftst (display communication fail test pattern)

Displays the test pattern used for the communications fail test.

This test pattern is used to test the controller communication path to a node that does not respond to normal controller traffic. The test pattern defaults to an alternating 8-byte sequence of 00 and FF. Refer to **cnfcftst** command for other patterns and how to reconfigure this pattern.

Syntax

dspcftst

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

cnfcftst

Example

dspcftst

```
sw83           TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  17:57 PST


Comm Fail Test Pattern.

    Byte  0: FF     Byte 12: 00     Byte 24: FF     Byte 36: 00     Byte 48: FF
    Byte  1: FF     Byte 13: 00     Byte 25: FF     Byte 37: 00     Byte 49: FF
    Byte  2: FF     Byte 14: 00     Byte 26: FF     Byte 38: 00     Byte 50: FF
    Byte  3: FF     Byte 15: 00     Byte 27: FF     Byte 39: 00     Byte 51: FF
    Byte  4: 00     Byte 16: FF     Byte 28: 00     Byte 40: FF     Byte 52: 00
    Byte  5: 00     Byte 17: FF     Byte 29: 00     Byte 41: FF     Byte 53: 00
    Byte  6: 00     Byte 18: FF     Byte 30: 00     Byte 42: FF     Byte 54: 00
    Byte  7: 00     Byte 19: FF     Byte 31: 00     Byte 43: FF     Byte 55: 00
    Byte  8: FF     Byte 20: 00     Byte 32: FF     Byte 44: 00     Byte 56: FF
    Byte  9: FF     Byte 21: 00     Byte 33: FF     Byte 45: 00     Byte 57: FF
    Byte 10: FF     Byte 22: 00     Byte 34: FF     Byte 46: 00     Byte 58: FF
    Byte 11: FF     Byte 23: 00     Byte 35: FF     Byte 47: 00     Byte 59: FF


Last Command: dspcftst


Next Command:
```

dspchan (display channel configuration)

Displays the configuration of IGX voice channels. This is primarily a debug command that allows you to inspect the data structure defining a channel. Parameters for voice and signaling processing on a CVM voice channel are displayed by this command. Table 4-8 lists the displayed CVM parameters. Many of these parameters are also displayed elsewhere.

Syntax

dspchan <channel>

Parameters

Parameter	Description
<channel>	Specifies the voice channel connection to display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	IGX			No	

Related Commands

cnfcdpparm

CVM Voice Channel Parameters

Table 4-8 Parameters Configurable on a CVM Voice Channel

Parameter	Parameter	Parameter	Parameter
VC Index	Dial Type	TX Sig	iec converge.
In Loss	TX A–D bit	RX Sig	Hi Pass F
Out Loss	RX A–D bit	Clr Chn	es loss
Chan Type	Signaling	Sig Rate	Fmodem
Sig. Intg	Echo supr	PLY MSBhx	ADV
Xmt. dlay	Wink Puls	PLY LSBhx	Cond ID
Smpl dlay	TX A–D Qual	In use	iec erl lvl
Bk noise	RX A–D Qual	DPU	iec Hregs.
DSI smple	TX Code	iec cancel	iec tone dsbl
Chan Util	RX Code	iec nlp	adpcm flag
Onhk A–D			

Example (IGX)

dspchan 7.1

```
sw83           TN    SuperUser       IGX 8420    9.3     Apr. 13 2000  18:06 PST

Channel Data Base for CDP card  7  chan. 000000 at address 30BF29EC

VC Index      -1                Onhk C         4
In Loss       0                 Onhk D         4
Out Loss      0                 Dial Type      0
Chan Type     1                 TX A bit       1
Sig. Intg     96                TX B bit       1
Xmt. dlay     5                 TX C bit       0
Smpl dlay     1                 TX D bit       1
Bk noise      67                RX A bit       1
DSI smple     168               RX B bit       1
Chan Util     40                RX C bit       0
Onhk A        3                 RX D bit       1
Onhk B        3                 Signaling     TSP MODE

This Command: dspchan 7.1

Continue?

sw83           TN    SuperUser       IGX 8420    9.3     Apr. 13 2000  18:07 PST

Channel Data Base for CDP card  7  chan. 000000 at address 30BF29EC

TX CODE       3                 iec cancel     0
RX CODE       3                 iec nlp        1
TX SIG        0                 iec converg.   1
RX SIG        0                 iec erl lvl    1
CLR CHN       0                 iec Hregs.     1
SIG RATE      0                 iec tone dsbl  1
PLY MSBhx     1                 adpcm flag     0
PLY LSBhx     90
In use        0
DPU           -

Last Command: dspchan 7.1

Next Command:
```

Example (BPX)

dspchan 11.1

```
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 12 2000 12:16 GMT

Channel Data Base for 11.1 on BXM at address 0x325C48DA

pcnfg_nm_chans     0                  apc_metro          0
pcnfg_bandwidth    353208             pcnfg_basis        0
pcnfg_frst_indx    0                  apc_t1_basis       0
pcnfg_chan_cnt     5                  apc_nni_port       0
pcnfg_loop         0
pcnfg_state        1
pcnfg_cnfg         1
pcnfg_hipri        0
pcnfg_com_fail     0
pcnfg_ptp_conn     0

Last Command: dspchan 11.1
```

dspchcnf (display channel configuration)

Displays configuration details for voice, data, ATM, or Frame Relay channels.

Voice Channels

When you specify a voice channel with **dspchcnf**, the display shows configuration details for all channels on the specified circuit line starting with the specified channel:

- Percent of channel utilization
- Adaptive voice enable status
- Fax enable status
- Gain in both directions (in decibels)
- Dial Type
- Interface type (such as 2w E&M)
- Onhook and conditioning specifications

Data Channels

The data cards that support this command are the HDM, LDM, UVM, and CVM/CVP cards on the IGX node.

For data connections on the specified card and starting with the specified channel, the **dspchcnf** command displays configuration details for all channels on the specified data card (CDP, SDP, or LDP) starting with the specified channel:

- Maximum EIA update rate
- Percentage of channel utilization
- DFM pattern length
- DFM status (enabled or disabled)
- Idle code suppression (enabled or disabled)
- PreAge (in microseconds)

Frame Relay Channels

The display includes configuration details for all channels on the specified FRP port starting with the specified channel. If you specify a Frame Relay port only with no DLCI, the display includes configuration details for all channels on the Frame Relay port specified. The display also indicates either Cisco parameters or standard Frame Relay parameters where appropriate.

When you specify a Frame Relay channel with **dspchcnf**, the display shows:

- Minimum Information Rate
- VC Queue Buffer Size or Bc
- Peak Information Rate or Be
- Maximum Credits
- ECN Queue Buffer Size

- Quiescent Information Rate
- ForeSight enabled or not
- Percentage Utilization

Syntax

dspchcnf <start_channel>

Parameters

Parameter	Description
<start_channel>	Specifies the channel to begin the display. The format for a CDP or CVM is *slot.channel.* The format for a UVM is *slot.line.channel.* The format for an IMA-compliant line is *slot.line.start_channel—end_channel*. The format for Frame Relay is *slot.port.DLCI.* The DLCI parameter is optional.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfdch, cnfchadv, cnfchdfm, cnfchdl, cnfcheia, cnfchgn, cnfchtp, cnfchutl, cnffrcon, cnfchpri

Example (UVM on IGX)

Display the channel configuration of line 7.1.1-24. The card in slot 7 is a UVM.

dpchcnf 7.1.1

```
sw109          VT    cisco      IGX 8420    9.3  Apr. 13 2000 18:59 PST

           %   Adaptive          Gain (dB)  Dial   Interface       OnHk    Cond
Channels  Util Voice       Fax    In  Out    Type   Type          A  B  C  D Crit
7.1.1-24   40  Enabled  Disabled  0    0    Inband  2W E&M        0  X  -  -  a
7.2.1-24   40  Enabled  Disabled  0    0    Inband  Unconfig      ?  ?  -  -  a



Last Command: dspchcnf 7.1.1


Next Command:
```

Example (CVM on IGX)

Show channel configuration of line 13. The card in slot 13 is a CVM.

dspchcnf 13.1

```
sw150          TN    Cisco           IGX 8420  9.3.2T    Dec. 19 2000 23:32 PST

           %   Adaptive          Gain (dB)  Dial   Interface       OnHk    Cond
Channels  Util Voice      Fax     In  Out    Type  Type          A  B  C  D Crit
13.1-24    60  Enabled    -        0    0   Inband  Unconfig     ?  ?  -  -  a







Last Command: dspchcnf 13.1
```

Example (Data Channels on IGX)

Show data channels starting at 13.1.

dspchcnf 13.1

```
sw180          TN    Cisco           IGX 8420  9.3.o1    Nov. 30 2000 12:15 GMT

            Maximum EIA     %      DFM Pattern     DFM     Idle Code   PreAge
Channels    Update Rate    Util      Length       Status     Suppr     (usec)
13.1-8           2        100          8         Enabled      -            0







Last Command: dspchcnf 13.1
```

Example (Frame Relay on IGX)

Show data channels starting at 13.1.

dspchcnf 9.1

```
sw108          VT    Cisco           IGX 8420  9.3.q2    Dec. 20 2000 12:29 GMT

                Frame Relay Channel Configuration  Port: 9.1

 From           MIR     CIR     VCQ Dep  PIR     Cmax ECNQ Th   QIR    FST %Utl
 9.1.918        59.5    59.5    61440    59.5    10   21504     59.5    n  100
 9.1.919        19.2    19.2    61440    19.2    10   21504     19.2    n  100
 9.1.920        19.2    19.2    61440    19.2    10   21504     19.2    n  100






Last Command: dspchcnf 9.1
```

dspchdlcnf (display channel dial type configurations)

Displays dial type configurations for all channels on a circuit line:

Syntax

dspchdlcnf <start_channel>

Parameters

Parameter	Description
<start_channel>	Specifies the channel at which the display begins. For a CDP or CVM, the format is *slot.channel*. For a UVM, the format is *slot.line.channel*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfchdl

Display Fields

Channel Type	Dial Type	Description
All	Dial Type	Inband, pulse, or user-configured.
User-configured	signaling delay	The signaling delay on a channel. Range: 12 ms–96 ms
	minimum wink	The minimum wink on the channel. Minimum wink does not apply to a CDP or CVM channel. Range: 3 ms–765 ms
	interdigit time	The interdigit times on a channel. Interdigit time does not apply to a CDP or CVM channel. Range: 3 ms–765 ms
	playout delay	The playout delay on a channel. Range: 12 ms–96 ms

Example

Display the dial type configuration for all channels beginning with 14.1.

dspchdlcnf 14.1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 09:45 PST


Channels  Type   Sig Delay   Min Wink  IntDigit Time  Playout Delay
14.1-24   Inband      12        141           300           -







Last Command: dspchdlcnf 14.1


Next Command:
```

dspchec (display channel echo canceller configuration)

Displays the integrated echo canceller (IEC) parameters for one or more voice channels. The **dspchec** command does not apply to CAS or data channels. The specified channels must be on a CDP, CVM, or UVM. See Table 4-4 for what **dspchec** displays.

Table 4-9 Information in the dspchec Display

Category	Possible Value
Echo cancellation	Enabled or Disabled
Echo Return Loss (.1 dBs)	High/low (loss is in units are 0.1 dBs)
Tone Disabler	Enabled or Disabled
Convergence	Enabled or Disabled
Nonlinear Processing	Enabled or Disabled
Voice Template	USA, other

Syntax

dspchec <channel>

Parameters

Parameter	Description
<channel>	Specifies the channel or channels to display. For a CVM or CDP, the format is *slot.channel(s)*. For a UVM, the format is *slot.line.channel(s)*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfchec

Display Fields

Category	Possible Value
Echo cancellation	Enabled or Disabled
Echo Return Loss (.1 dBs)	High/low (loss is in units are 0.1 dBs)

Category	Possible Value
Tone Disabler	Enabled or Disabled
Convergence	Enabled or Disabled
Nonlinear Processing	Enabled or Disabled
Voice Template	USA, other

Example

Display the echo canceller configuration for channel 7.1.

dspchec 7.1

```
pubsipx1       TN    cisco      IGX 8420    9.3    Apr. 13 2000   06:10 PDT

          Echo     Echo Return    Tone      Conver-  Non-Linear Voice
Channels  Cancel   Loss (.1 dBs)  Disabler  gence    Processing Tmplt
7.1       Enabled  High  60       Enabled   Enabled  Enabled    USA
7.2-31    Disabled High  60       Enabled   Enabled  Enabled    USA






Last Command: dspchec 7.1


Next Command:
```

dspchstatcnf (display statistics enabled for a channel)

Displays the configuration of enabled statistics for a channel to help debug problems with statistics gathering.

Use the **cnfcdparm** command to configure the channel statistics level (level 1, 2, or 3) on BXM and UXM cards.

The command output is a list of the connection statistics as set by the **cnfchstats** command, by Cisco WAN Manager, or by IGX features.

The Owner column identifies who or what set the statistic. If the Owner column shows "Automatic," the node's features set the statistic. If the node name appears under Owner, Cisco WAN Manager set the statistic. If the user name appears under Owner, the **cnfchstats** command executed from the command line interface set the statistic.

Syntax

dspchstatcnf <channel>

Parameters

Parameter	Description
<channel>	Specifies the channel whose statistics configuration you want to display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	IGX			Yes	

Related Commands

cnfchstats, **dspchstathist**, **cnfcdparm**

Example (FR channel)

dspchstatcnf 5.1.100.100

```
pubsbpx1       VT    SuperUser       BPX 15    9.3       Apr. 13 2000 23:13 GMT
Statistics Enabled on Channel 5.1.100.100

    Statistic                          Samples Interval Size Peaks  Owner
    ---------------------------------- ------- -------- ---- -----  ----------
41) AAL5 Cells Discarded for VCQ Full        1       30    4  NONE  TFTP
42) Average VCq Depth in Cells               1       30    4  NONE  TFTP
43) Cells lost due to Rsrc Overflow          1       30    4  NONE  TFTP
44) Cells discarded for SBIN full            1       30    4  NONE  TFTP
45) Cells Transmitted with EFCI(Port)        1       30    4  NONE  TFTP
46) Cells Transmitted(Port)                  1       30    4  NONE  TFTP
47) Cells Received from Network              1       30    4  NONE  TFTP
48) Cells discarded for QBIN full            1       30    4  NONE  TFTP
49) Cells discarded when QBIN>CLP            1       30    4  NONE  TFTP
```

```
50) Cells Transmitted with CLP (Port)          1        30     4  NONE   TFTP
51) BCM Cells Received(Port)                   1        30     4  NONE   TFTP

This Command: dspchstatcnf 5.1.100.100

Continue?
```

dspchstathist (display statistics history for a channel)

Displays a history of statistics configured as enabled for a selected channel. This command is intended for debugging problems with statistics gathering. It displays the data for the number of samples specified in the configuration of the channel statistic. You select a statistic from the list in the **dspchstathist** display. Specify only an enabled statistic.

You can use the **cnfdparm** command to configure the channel statistics level on the BXM and UXM cards. Make a note of the statistics types enabled, the collection interval, and owner; you will need this information to obtain the statistics history. Use **cnfchstats** to enable a statistic if it is not already enabled.

Syntax

dspchstathist <channel> <stat> <owner> <interval>

Parameters

Parameter	Description
<channel>	Specifies the channel.
<stat>	Specifies the number of the statistic to view.
<owner>	Specifies the source of the selected statistics's original configuration (the choices are "auto," "user," and "tftp"). You might need to enter "AUTO" in all capital letters.
<interval>	Specifies the time period of statistics collection to display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnfchstats, **cnfchlevel**, **dspchstatcnf**

Example

A display for channel 6.1 packets transmitted (1 second interval) history.
dspchstathist 6.1 7 1 AUTO

```
gamma            TRM       SuperUser        Rev:  9.3  Apr. 13 2000 13:53 PDT

Packets Transmitted on Channel 6.1
Interval: 1 Minute(s), Data Size: 4 Byte(s), NO Peaks, Owner: Automatic

0    -       1699
-1    -       1698
-2    -       1698
-3    -       1699
-4    -       1698
```

```
-5   -      1698
-6   -      1698
-7   -      1699
-8   -      1697
-9   -      1699

Last Command: dspchstathist 6.1 7 1 AUTO

Next Command:
```

dspchstats (display summary statistics for a channel)

Displays summary statistics. This command is intended for debugging problems with statistics gathering. It displays the data for the last five occurrences of the channel statistic.

The multilevel channels statistics feature provides additional levels of channel statistics configuration for the BXM/UXM cards. You can use the **cnfcdparm** command to configure the channel statistic level on the BXM and UXM cards. For more information see the **cnfcdparm** command description.

The examples show these statistics categories:

- From the port (something coming into a port, typically from an external device/box)
- To the network (something going out of the switch; typically trunks)
- Discarded (received from the attached device but not transmitted to the network)
- From the network (received in; typically, into the trunk)
- To the port (transmitted out of the port, to an external device or cloud)
- Discarded (received from the network but not transmitted to the attached device)

Syntax

dspchstats <channel> [interval]

Parameters

Parameter	Description
<channel>	Specifies the channel defined according to the channel type. ATM format: *slot.port.vpi.vci* Frame Relay format: *slot.port.DLCI* Voice or data format: *slot.port*
<interval>	Specifies the refresh interval for displaying data. Range:1–60 seconds Default: 10 seconds If the Rx Q depth and the Tx Q depth fields remain “0”, make sure that a value other than “0” is specified for the *interval* parameter.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnfchstats, **dspchstatcnf**

Display Fields (Frame Relay Channel Statistics)

Table 4-10 displays 35 statistics are available for each Frame Relay PVC channel. Note that the statistic field name listed may be slightly different from the field name on the **dspchstats** screen.

Table 4-10 Frame Relay Channel Statistics in IGX

Statistic	Description
Frames Received (Ingress)	This statistic provides a count of the number of frames received from the attached equipment. This statistic is incremented even when the received frame is invalid or discarded for any reason. (See possible reasons below.)
Receive Frames Discarded (Ingress)	This statistic provides a count of the number of frames received from the attached equipment that were discarded before being sent into the network or aborted after some portion had been already sent into the network. Possible reasons for discard are: • Invalid CRC—that is, the CRC calculated by the IGX does not match the CRC provided by the attached equipment in the last two octets of the frame. (Frames received with an invalid CRC are also included in the port Receive Frame CRCs Errors statistic.) • Invalid Frame Length—that is, the length of the received frame, including the header and frame check sequence (FCS, or CRC) octets, is either too short (less than five octets) or too long (more than 4510 octets). (Frames received with an invalid frame length are also included in the port Illegal Length Receive Frames statistic.) • Invalid Alignment—that is, the length of the received frame is not an integral number of octets. (Frames received with an invalid alignment are also included in the port Receive Frame Alignment Errors statistic.) Frame received with DE = 1 and the PVC's ingress queue is filled at least to the DE threshold and the global DE feature is enabled (using the **cnfsysparm** command). Frames discarded for this reason are specifically counted in the PVC DE Frames Dropped statistic (below). • PVC failed (due to endpoint hardware failure/absence or inability to find a route through the network) or downed (intentionally out of service due to operator action). Frames discarded for this reason are specifically counted in the PVC Rx Frames Discarded - Deroute/Down statistic (below). • PVC ingress queue full. The queue may fill (and overflow) due to sustained transmission above the PVC's MIR or as a result of MUXBUS oversubscription. Frames discarded for this reason are specifically counted in the PVC Rx Frames Discarded - VC Q Overflow statistic (below). This statistic is a subset of the PVC Frames Received statistic.
Frames Transmitted (Egress)	This statistic provides a count of the number of frames transmitted to the attached equipment.

Table 4-10 Frame Relay Channel Statistics in IGX (continued)

Statistic	Description
Transmit Frames Discarded	This statistic provides a count of the number of frames that were not able to be transmitted to the attached equipment. Possible reasons for discard are: Port Transmit Queue Overflow—that is, the frame traversed the network successfully but encountered a full egress port queue. Frames discarded for this reason are specifically counted in the PVC **Tx Frames Discarded - Q Overflow** statistic (below) and the port **Tx Frames Discarded - Queue Overflow** statistic (above). Incomplete Frame at Egress—that is, no end-of-frame (EOF) packet received for any reason. The most common cause is a CRC error detected at ingress; that is, the beginning of the frame traversed the network successfully but the end of the frame was never sent because a CRC error was detected at the end of the frame at ingress. Frames discarded due to a missing EOF packet (because of ingress CRC error or EOF packets dropped in a trunk) are specifically counted in the PVC **Tx Frames Discarded - Ingress CRC** statistic (below). Ingress CRC errors are also counted in the ingress port **Receive Frame CRC Errors** statistic (above). Incorrect Frame Length—that is, the expected frame length (recorded in the end-of-frame packet) is different from the total payload of all the packets that arrive. Such a frame length error could be caused by: • one or more packets being missing due to discard(s) on a trunk, or • a transmission bit error on the frame length field in the end-of-frame packet. Frames discarded for this reason are counted in the PVC **Tx Frames Discarded - Trunk Discard** statistic (below). Invalid Frame Length—that is, the frame is longer than 4510 octets long. This could occur if the end-of-frame packet from one frame and the start-of-frame packet of the next frame are both missing due to discards on a trunk, resulting in a concatenated frame. Frames discarded for this reason are counted in the PVC **Tx Frames Discarded - Trunk Discard** statistic (below). Frame CRC error—that is, the calculated CRC at the destination does not match the original frame's CRC (contained within the received packets). This situation can occur as a result of transmission bit errors on payload bits on one or more packets of the frame. Frames discarded for this reason are specifically counted in the PVC **Tx Frames Discarded - Trunk Discard** statistic (below).

Table 4-10 Frame Relay Channel Statistics in IGX (continued)

Statistic	Description
Packets Received	This statistic provides a count of the number of packets received across the network. These are the packets that are used to recreate all the frames which are counted in the PVC **Frames Transmitted** and **Transmit Frames Discarded** statistics (above).
Receive Packets Discarded	This statistic provides a count of the number of packets received across the network but whose payload was ultimately discarded because they contained portions of the frames which are discarded and counted in the **Transmit Frames Discarded** statistic (above).
Packets Transmitted	This statistic provides a count of the number of packets submitted to the network. These packets are **all** the packets that were generated from the non-errored received frames (**Frames Received** minus **Receive Frames Discarded**) as well as **some** of the packets from the errored-received frames (**Receive Frames Discarded**). Some packets from errored receive frames may be submitted to the network because the IGX does not wait to receive the entire frame before starting to packetize the frame and send it through the network. Consequently, if an error is detected at the end of the frame (for example, CRC error, alignment error, length error), the frame is aborted only after some packets may have been sent.
Bytes Received	This statistic provides a count of the number of octets in the frames counted in the **Frames Received** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets.
Receive Bytes Discarded	This statistic provides a count of the number of octets in the frames counted in the **Receive Frames Discarded** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets.
Bytes Transmitted	This statistic provides a count of the number of octets in the frames counted in the **Frames Transmitted** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets.
Transmit Bytes Discarded	This statistic provides a count of the number of octets in the frames counted in the **Transmit Frames Discarded** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets.
Seconds in Service	This statistic provides a count of the number of seconds during which the PVC was in service. The PVC is considered in service any time the PVC is not failed (due to endpoint hardware failure/absence or inability to find a route through the network) or downed (intentionally out of service due to operator action).

Table 4-10 Frame Relay Channel Statistics in IGX (continued)

Statistic	Description
Frames Transmitted with FECN	This statistic provides a count of the number of frames transmitted to the attached equipment with the Forward Explicit Congestion Notification (FECN) bit set, regardless of where in the network the congestion was experienced. This statistic is a subset of the PVC **Frames Transmitted** statistic. This statistic is also a subset of the port **Frames Transmitted with FECN** statistic.
Frames Transmitted with BECN	This statistic provides a count of the number of frames transmitted to the attached equipment with the Backward Explicit Congestion Notification (BECN) bit set, regardless of where in the network the congestion was experienced. This statistic is a subset of the PVC **Frames Transmitted** statistic. This statistic is also a subset of the port **Frames Transmitted with BECN** statistic.
Minutes Congested	This statistic provides a count of the number of minutes during which 50 percent or more of the frames transmitted to the attached equipment have the Forward Explicit Congestion Notification (FECN) bit set.
	The threshold (default: 50 percent) that defines congestion is configurable (by a SuperUser) using the **cnffstparm** command.
DE Frames Received	This statistic provides a count of the number of frames received from the attached equipment with the Discard Eligible (DE) bit already set. This statistic is a subset of the PVC **Frames Received** statistic
DE Frames Transmitted	This statistic provides a count of the number of frames transmitted to the attached equipment with the Discard Eligible (DE) bit set, regardless of why or where the DE bit was set. If IDE-to-DE mapping is enabled on the port, this statistic includes those frames that have their DE bit set by the IDE-to-DE mapping function. This statistic is a subset of the PVC **Frames Transmitted** statistic.

Table 4-10 Frame Relay Channel Statistics in IGX (continued)

Statistic	Description
DE Frames Dropped	This statistic provides a count of the number of frames received from the attached device which were discarded because the frame's DE bit is set and the PVC's ingress buffer has reached the DE threshold. The DE threshold is configured as part of the port configuration (**cnfport** command). This statistic is a subset of the PVC **Frames Received** statistic. This statistic is a subset of the PVC **Receive Frames Discarded** statistic. This statistic is a subset of the PVC **DE Frames Received** statistic.
DE Bytes Received	This statistic provides a count of the number of octets in the frames counted in the **DE Frames Received** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets. This statistic is a subset of the PVC **Bytes Received** statistic.
Frames Received in Excess of CIR	This statistic provides a count of the number of frames received from the attached equipment which exceed the configured Committed Information Rate (CIR) for the PVC. Whether a frame is considered "in excess of CIR" depends on whether the DE feature is enabled (using the **cnfsysparm** command). • **If the DE feature is enabled**, only frames with DE=0 are counted against Bc. Thus, this statistic only counts those frames which exceeded Bc **and** had DE=0. (If a frame is received with DE=1, only the **DE Frames Received** statistic is incremented and the frame is not counted against Bc.) • **If the DE feature is not enabled**, all frames are counted against Bc. If the frame exceeds Bc, it is included in this statistic. This statistic is a subset of the PVC **Frames Received** statistic
Bytes Received in Excess of CIR	This statistic provides a count of the number of octets in the frames counted in the **Frames Received in Excess of CIR** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets. This statistic is a subset of the PVC **Bytes Received** statistic.

Table 4-10 Frame Relay Channel Statistics in IGX (continued)

Statistic	Description
Frames Transmitted in Excess of CIR	This statistic provides a count of the number of frames transmitted to the attached equipment which: • were determined at ingress to exceed the configured Committed Information Rate (CIR) for the PVC, or • were received at ingress with DE=1 and the DE feature is enabled, or • were received at ingress when the VC_Q exceeded the configured DE threshold and the DE feature is enabled. All of these conditions have in common that the packets carrying these frames all have CLP=1. It is actually the status of the CLP bits in the arriving packets that is monitored at egress. This statistic is a subset of the PVC **Frames Transmitted** statistic.
Bytes Transmitted in Excess of CIR	This statistic provides a count of the number of octets in the frames counted in the **Frames Transmitted in Excess of CIR** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets. This statistic is a subset of the PVC **Bytes Transmitted** statistic.
Rx Frames Discarded—Deroute/Down	This statistic provides a count of the number of frames received from the attached equipment which are discarded because the PVC is routed (due to endpoint hardware failure/absence or inability to find a route through the network) or "downed" (intentionally out of service due to operator action). This statistic is a subset of the PVC **Frames Received** statistic.
Rx Bytes Discarded—Deroute/Down	This statistic provides a count of the number of octets in the frames counted in the **Rx Frames Discarded - Deroute/Down** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets. This statistic is a subset of the PVC **Bytes Received** statistic. This statistic is also a subset of the PVC **Receive Bytes Discarded** statistic.
Rx Frames Discarded—VC Q Overflow	This statistic provides a count of the number of frames received from the attached equipment which are discarded because the PVC ingress buffer (VC Q) is full. This statistic is a subset of the PVC **Frames Received** statistic.

Table 4-10 Frame Relay Channel Statistics in IGX (continued)

Statistic	Description
Rx Bytes Discarded—VC Q Overflow	This statistic provides a count of the number of octets in the frames counted in the **Rx Frames Discarded - VC Q Overflow** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets. This statistic is a subset of the PVC **Bytes Received** statistic. This statistic is also a subset of the PVC **Receive Bytes Discarded** statistic.
Tx Frames Discarded—Q Overflow	This statistic provides a count of the number of frames which were not able to be transmitted to the attached equipment because the port's egress buffer is full. The port's egress buffer may fill (and overflow) due to oversubscription. This statistic is a subset of the PVC **Transmit Frames Discarded** statistic. This statistic is a subset of the port **Tx Frames Discarded - Q Overflow** statistic.
Tx Bytes Discarded—Q Overflow	This statistic provides a count of the number of octets in the frames counted in the **Tx Frames Discarded - Q Overflow** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets. This statistic is a subset of the PVC **Transmit Bytes Discarded** statistic. This statistic is a subset of the port **Tx Bytes Discarded - Q Overflow** statistic.

Table 4-10 Frame Relay Channel Statistics in IGX (continued)

Statistic	Description
Tx Frames Discarded—Ingress CRC	This statistic provides a count of the number of frames which were not able to be transmitted to the attached equipment because the frame is incomplete. Specifically, this statistic is incremented any time an end-of-frame (EOF) packet is missing. In other words: • a start-of-frame packet is followed by another start-of-frame packet, or start-of-frame packet is followed by an encapsulated-frame packet, or • a middle-of-frame packet is followed by a start-of-frame packet, or • middle-of-frame packet is followed by an encapsulated-frame packet The most likely cause of any of these conditions is a CRC error detected at ingress causing the end of the frame (including at least the end-of-frame packet and maybe one or more middle-of-frame packets) to not be sent. A less likely cause for the missing EOF packet is that the packet was dropped due to a transmission bit error in the packet header that is detected by a trunk along the PVC's path. Such conditions are included in this statistic. This statistic is a subset of the PVC **Transmit Frames Discarded** statistic.
Tx Bytes Discarded—Ingress CRC	This statistic provides a count of the number of octets in the frames counted in the **Tx Bytes Discarded - Ingress CRC** statistic (above). The octets counted include the Frame Relay header octets as well as any octets which arrived successfully. This statistic is a subset of the PVC **Transmit Bytes Discarded** statistic.

Table 4-10 Frame Relay Channel Statistics in IGX (continued)

Statistic	Description
Tx Frames Discarded—Trunk Discard	This statistic provides a count of the number of frames that were not able to transmitted to the attached equipment because the frame: has an incorrect length, that is, the expected frame length (recorded in the end-of-frame packet) is different than the total payload of all the packets which arrive. Such a frame length error could be caused by: • one or more packets being missing due to discard(s) on a trunk, or • a transmission bit error on the frame length field in the end-of-frame packet. • has an invalid length, that is, the frame is longer than 4510 octets long. This could occur if the end-of-frame packet from one frame and the start-of-frame packet of the next frame are both missing due to discards on a trunk, resulting in a concatenated frame. In any of the cases above, a packet could be discarded on a network trunk either due to extreme trunk congestion or a detected transmission bit error on the packet header. This statistic is a subset of the PVC **Transmit Frames Discarded** statistic.
Tx Bytes Discarded—Trunk Discard	This statistic provides a count of the number of octets in the frames counted in the **Tx Bytes Discarded - Trunk Discard** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets. This statistic is a subset of the PVC **Transmit Bytes Discarded** statistic.
Tx Frames During Ingress LMI Failure	This statistic provides a count of the number of frames that were transmitted to the attached equipment while the signaling protocol on the local port was failed (that is, when the port was in a Port Communication Failure state). This statistic is a subset of the PVC **Frames Transmitted** statistic
Tx Bytes During Ingress LMI Failure	This statistic provides a count of the number of octets in the frames counted in **the Tx Frames During Ingress LMI Failure** statistic (above). The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets.

Table 4-11 At Ingress (before FRP Firmware Release FDS/FES)

DE Feature Enabled	DE = 1	> CIR	VC_Q > DE Threshold	Action
No	Don't care	No	Don't care	Send
No	Don't care	Yes	Don't care	Set CLP=E1 in all packets
Yes	No	No	No	Send
Yes	No	No	Yes	Set CLP=E1 in all packets
Yes	No	Yes	No	Set CLP=E1 in all packets
Yes	No	Yes	Yes	Set CLP=E1 in all packets Set IDE=1 in last packet
Yes	Yes	Don't care	No	Set CLP=E1 in all packets
Yes	Yes	Don't care	Yes	Discard frame

Table 4-12 At Ingress (FRP Firmware Release FDS/FES and later)

DE Feature Enabled	DE=1	> CIR	VC_Q > DE Thresh	Action
No	Don't care	No	Don't care	Send
No	Don't care	Yes	Don't care	Set CLP=1 in all packets
Don't care	No	No	No	Send
Don't care	No	No	Yes	Set CLP=1 in all packets
Don't care	No	Yes	No	Set CLP=1 in all packets
Don't care	No	Yes	Yes	Set CLP=1 in all packets Set IDE=1 in last packet
Yes	Yes	Don't care	No	Set CLP=1 in all packets
Yes	Yes	Don't care	Yes	Discard frame

Table 4-13 At Ingress (FRP firmware Release FDV/FEV and later)

DE Feature Enabled	DE=1	> CIR	Action
No	Don't care	No	Send
No	Don't care	Yes	Set CLP=1 in all packets
Don't care	No	No	Send
Don't care	No	Yes	Set CLP=1 in all packets Set IDE=1 in last packet
Yes	Yes	Don't care	Set CLP=1 in all packets

Table 4-14 At Egress (DE bit setting)

IDE = 1	IDE = 1	IDE to DE Mapping Enabled	Action
Yes	Don't care	Don't care	DE=1 (No change to DE bit) --> Tx_Q
No	No	Don't care	DE=1 (No change to DE bit) --> Tx_Q
No	Yes	No	DE=1 (No change to DE bit) --> Tx_Q
No	Yes	Yes	DE=1 (Change DE bit) --> Tx_Q

Table 4-15 At Egress (Transmit queue behavior)

DE Feature Enabled	DE=1	Tx_Q > DE Threshold	Action
No	Don't care	Don't care	If space available, put frame into Tx_Q
Yes	No	Don't care	If space available, put frame into Tx_Q
Yes	Yes	No	If space available, put frame into Tx_Q
Yes	Yes	Yes	Discard frame

Example (IGX)

Display the channel statistics for connection 14.1.1.

The system response shows these statistics categories:

- From the port (something coming into a port, typically from an external device/box)
- To the network (something going out of the switch; typically trunks)
- Discarded (received from the attached device but not transmitted to the network)
- From the network (received in; typically, into the trunk)
- To the port (transmitted out of the port, to an external device or cloud)
- Discarded (received from the network but not transmitted to the attached device)

dspchstats 14.1.1

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 13:07 PST

Channel Statistics: 14.1.1        Cleared: Jan. 15 2001 09:06   (|)
MIR: 64/64 kbps         Collection Time: 3 day(s) 04:09:55      Corrupted: NO
                     Frames   Avg Size Avg    Util          Packets     Avg
                              (bytes)  (fps)  (%)                      (pps)
From Port:                0          0      0    0
To Network:               0          0      0    0                0         0
Discarded:                0          0      0    0
From Network:             0          0      0    0                0         0
To Port:                  0          0      0    0
Discarded:                0          0      0    0                0         0
                   ECN Stats:  Avg Rx VC Q:             0    ForeSight RTD    --
Min-Pk bytes rcvd: --          FECN Frames:             0    FECN Ratio (%)    0
Minutes Congested: --          BECN Frames:             0    BECN Ratio (%)    0
Frames rcvd in excess of CIR:       0  Bytes rcvd in excess of CIR:         0
Frames xmtd in excess of CIR:       0  Bytes xmtd in excess of CIR:         0
```

```
This Command: dspchstats 14.1.1


Hit DEL key to quit:
```

Example (BPX)

Display the channel statistics for connection 4.1.50.1.

dspchstats 4.1.50.1

```
night          TN    SuperUser       BPX 15    9.3     Apr. 13 2000 02:46 GMT

Channel Statistics for 4.1.50.1    Cleared: Apr. 13 2000 02:53  (|)
MCR: 0 cps              Collection Time: 0 day(s) 18:10:22      Corrupted: NO
   Traffic      Cells      CLP      Avg CPS   %util  Discards:        Cells
From Port   :     14710          0        0       0  VcQ > CLP:            0
To Network  :     14710    ---            0       0  VcQ Full :            0
From Network:     14710    ---            0       0  Qbin Full:            0
To Port     :     14710      14710        0       0  Qbin> CLP:            0
                                                     Failed   :        14710
                           OAM           Cells       RsrcOVL  :            0
VC Q        :         0   Tx OAM :          29608    NonCompliant:         0
Rx EFCI     :         0   Rx AIS :          14710
Tx EFCI     :         0   Rx FERF:              0    ForeSight       Cells
                          Rx BCM :              0     Adj Up :             0
                          Tx BCM :              0     Adj Dn :             0
AAL-5 Frames:         0                               Adj Fdn:             0

This Command: dspchstats 4.1.50.1


Hit DEL key to quit:
```

Example (IGX)

Display statistics for connection 13.1.100 with a 10-second interval between screen updates.

dspchstats 13.1.100 10

```
sw142          TN    SuperUser       IGX 16    9.3 Apr. 13 2000 14:38 PDT

Channel Statistics: 13.1.100      Cleared: Apr. 13 2000 11:50   (/)
MCR:   150 cps          Collection Time: 0 day(s) 00:00:00      Corrupted: NO

                  Cells         Avg       Util
                               (cps)       (%)

From Port:            0           0          0
To Network:           0           0          0
Discarded:            0           0          0
From Network:         0           0          0
To Port:              0           0          0
Discarded:            0           0          0

This Command: dspchstats 13.1.100

Hit DEL key to quit:
```

Example (UXM on IGX)

Display statistics for connection 9.2.1.100. The card in slot 9 is a UXM.

dspchstats 9.2.1.100

```
sw199          TN    SuperUser       IGX 16    9.3    Apr. 13 2000 09:25 PDT

Channel Statistics: 9.2.1.100                                       Snapshot
Collection Time: 0 day(s) 13:28:47                     Clrd:  08/27/97 19:47:24
Type                                      Count
Cells Received from Port                        0
Cells Transmitted to Network                    0
Cells Received from Network                     0
Cells Transmitted to Port                       0
EOF Cells Received from Port                    0
Cells Received with CLP=1                       0
Cells Received with CLP=0                       0
Non-Compliant Cells Received                    0
Average Rx VCq Depth in Cells                   0
Average Tx Vcq Depth in Cells                   0
Cells Transmitted with EFCI=1                   0
Cells Transmitted with EFCI=0                   0
Ingress Vsvd Allowed Cell Rate                  0
Egress Vsvd Allowed Cell Rate                   0
OAM state (0:OK,1:FERF,2:AIS)                   0
Good Pdu's Received by the Sar                  0
Good Pdu's Transmitted by the Sar               0
Rx pdu's discarded by the Sar                   0
Tx pdu's discarded by the Sar                   0
Invalid CRC32 pdu rx by the sar                 0
Invalid Length pdu rx by the sar                0
Shrt-Lgth Fail detected by the sar              0
Lng-Lgth Fail detected by the sar               0

Last Command: dspchstats 9.2.1.100
```

Example (BPX)

Display statistics for connection 2.1.1.1 (with a VPI of 1, and VCI of 1), and an interval of 1.

dspchstats 2.1.1.1 1

```
sw57           TRM   StrataCom       BPX 8620    9.3    Date/Time Not Set

Channel Statistics for 2.1.1.1     Cleared: Date/Time Not Set   (\)  Snapshot
MCR: 96000/96000 cps    Collection Time: 0 day(s) 00:01:45      Corrupted: NO
   Traffic      Cells      CLP      Avg CPS   %util  Chan Stat Addr: 30EBB36C
From Port   :         0          0        0       0
To Network  :         0    ---            0       0
From Network:         0          0        0       0
To Port     :         0    ---            0       0

NonCmplnt Dscd:         0  Rx Q Depth    :         0  Tx Q Depth    :         0
Rx Vsvd ACR   :         0  Tx Vsvd ACR   :         0  Bkwd SECB     :         0
Bkwd Lost Cell:         0  Bkwd Msin Cell:         0  Bkwd BIPV     :         0
Fwd SECB      :         0  Fwd Lost Cell :         0  Fwd Msin Cell :         0
Fwd BIPV      :         0

Last Command: dspchstats 2.1.1.1 1


Next Command:
```

```
                    CD                                   Minor Alarm
```

Example (IGX)

Display statistics for connection 10.1.205.101 (with a VPI of 205 and VCI of 101).

dspchstats 10.1.205.101

```
m2a          TN    StrataCom      IGX 8420    9.3    Apr. 13 2000 14:19 GMT

Channel Statistics: 10.1.205.101
Collection Time: 0 day(s) 23:02:58                    Clrd:  05/13/98 14:33:00
Type                                      Count    Traffic       Rate (cps)
Cells Received from Port                   82978   From port             0
Cells Transmitted to Network               82978   To network            0
Cells Received from Network                82978   From network          0
Cells Transmitted to Port                  82978   To port               0
EOF Cells Received from Port                   0
Cells Received with CLP=1                      0
Cells Received with CLP=0                  82978
Non-Compliant Cells Received                   0
Average Rx VCq Depth in Cells                  0
Average Tx Vcq Depth in Cells                  0
Cells Transmitted with EFCI=1                  0
Cells Transmitted with EFCI=0              82978

This Command: dspchstats 10.1.205.101
```

Segmentation, Assembly, and Reassembly (SAR) Statistics for BXM Card

Table 4-16 provides some statistics information for SAR on the BXM card. The switch software collects miscellaneous statistics regarding the Monarch SAR (Segmentation, Assembly, and Reassembly). Note that the object name typically maps to the screen field name on the **dspchstats** screen.

Table 4-16 SAR Statistics for BXM Card

Object ID	Object Name	Range/Values	Default	Description
01	Message Tag	Byte 0-3 : Tag ID Byte 4-7 : IP Address	0	Identifier and source IP address sent with CommBus message. Both will be copied into the response, if any is to be sent.
02	Ingress Unknown AAL5 Discards	0 - 2^{32}-1	N/A	Number of unknown AAL5 PDUs discarded in the ingress.
03	Egress Unknown ALL5 Discards	0 - 2^{32}-1	N/A	Number of unknown AAL5 PDUs discarded in the egress.
04	Ingress Frame Ready FIFO Overruns	0 - 2^{32}-1	N/A	Number of ingress frame-ready FIFO overruns.
05	Egress Frame Ready FIFO Overruns	0 - 2^{32}-1	N/A	Number of egress frame-ready FIFO overruns.

Table 4-16 SAR Statistics for BXM Card (continued)

Object ID	Object Name	Range/Values	Default	Description
06	Ingress Frame Ready FIFO Fulls	0 - 2^{32}-1	N/A	Number of ingress frame-ready FIFO fulls.
07	Egress Frame Ready FIFO Fulls	0 - 2^{32}-1	N/A	Number of egress frame-ready FIFO fulls.
08	Ingress Frame Ready FIFO Half-Fulls	0 - 2^{32}-1	N/A	Number of ingress frame-ready half-fulls.
09	Egress Frame Ready FIFO Half-Fulls	0 - 2^{32}-1	N/A	Number of egress frame-ready half-fulls.
0A	Inverse ARP Requests Rcv	0 - 2^{32}-1	N/A	Number of inverse ARP requests received.
0B	Inverse ARP Replies Rcv	0 - 2^{32}-1	N/A	Number of inverse ARP replies received.
0C	Bad /errored ARP packets rcv	0 - 2^{32}-1	N/A	Number of invalid or unknown type ARP packets received.
0D	Inverse ARP Requests Xmt	0 - 2^{32}-1	N/A	Number of inverse ARP requests transmitted.
0E	Inverse ARP Replies Xmt	0 - 2^{32}-1	N/A	Number of inverse ARP replies transmitted.
0F	Errored ARP packet Xmt	0 - 2^{32}-1	N/A	Number of invalid or unknown type ARP packets transmitted.
10	Bad LLC/NSAP PDUs Rcv	0 - 2^{32}-1	N/A	Number of illegal LLC/NSAP packets received.

dspchuse (display channel usage)

Displays a summary of the channel distribution in a given slot of a BPX or IGX switch. It shows the distribution of channels between the following:

- Automatic Routing Management PVCs
- Networking channels
- VSI management channels
- Channels allocated to the VSI slave
- Channels used for F4-F5 mapping

If you do not enter a slot number, a summary of channels allocated for all the BXM or UXM cards that are active will be displayed. You are then prompted to enter a slot number.

Syntax

dspchuse <slot>

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	No	BPX, IGX	Yes	Yes	Yes	No

Display Fields

Parameter	Description
Max	Maximum number of channels supported on the card.
Used	Number of channels currently used; this includes all types of channels: networking channels, PVCs, VSI master-slave VCs, and channels allocated to VSI partitions
Avail	Number or channels still available for use.
Netw	Number of network channels used. For each trunk interface (feeder trunk, physical trunk, or virtual trunk) that is up, 270 channels are reserved for networking. For an enhanced UXM card, 270 channels are allocated for networking when the first trunk is upped. For all the subsequent trunks, networking channels are allocated from the RCMP reserve.
PVC cnfg	Number of channels configured for PVCs (AR connections).
F4-F5	Number of channels used to support F4-F5 mapping.
VSI mgmt	Number of channels used for VSI master-slave VCs.
VSI cnfg	VSI channels reserved for use by the slave to set up connections requested via the VSI interface.
PVC used	Channels currently used by Automatic Routing Management connections.

Parameter	Description
vsi min	VSI min channels configured for a partition via the **cnfrsrc** command.
vsi max	VSI max channels configured for a partition via the **cnfrsrc** command.

Example (BPX)

Display channel management summary for slot 11.

dspchuse 13

```
BPX02          TN    Cisco           BPX 8620  9.3.3 0    Aug. 13 2001 12:43 PDT

                   Channel Management Summary for Slot 13

                max    used   avail  netw   pvc cnfg  f4-f5  vsi mgmt  vsi cnf

card 13:       61376  61277     99    542    332         0      3     60400
port grp 1:    32736  30066   2670      0     66         0      0     30000
port grp 2:    32736  31209   1527    542    266         0      1     30400

             pvc cnfg  pvc used  nw used   f4-f5   vsi mgmt  vsi min   vsi max

phy if 1:      20         0         0         0       0       ---       ---
 phy port:     20         0         0         0
phy if 2:      26         0         0         0       0       ---       ---
 phy port:     26         0         0         0
  part 3:                                                       0     30000
Last Command: dspchuse 13
Continue? y

BPX02          TN    Cisco           BPX 8620  9.3.3 0    Aug. 13 2001 12:46 PDT

                   Channel Management Summary for Slot 13

             pvc cnfg  pvc used  nw used   f4-f5   vsi mgmt  vsi min   vsi max

phy if 3:       0         0         0         0       0       ---       ---
phy if 4:      20         1         0         0       0       ---       ---
 phy port:     20         1         0         0
phy if 5:      10         1         0         0       0       ---       ---
 phy port:     10         1         0         0
phy if 6:     256         0       271         0       0       ---       ---
 vtrk 1:      256         0                 ---
phy if 7:       0         0         0         0       0       ---       ---
phy if 8:       0         0       271         0       1       ---       ---
 phy trk:       0         0                 ---
  part 3:                                                       0     30400

Last Command: dspchuse 13
```

dspclksrcs (display network clock sources)

Displays all clock sources for the network. The display for unreachable or failed clock sources flashes on and off.

Syntax

dspclksrcs

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfclksrc, dspcurclk

Example

Display the network clock sources.

dspclksrcs

```
bootzilla       TRM   YourID: Numba 1   IGX 8430    9.3    Apr. 13 2000 15:32 MST

                            Network Clock Sources

Primary
bootzilla CLN   15

Secondary
None

Tertiary
None


Last Command: dspclksrcs


Next Command:
```

dspclnerrs (display circuit line errors)

Displays the accumulated error count since the last time errors were reset. Table 4-17 lists the types of circuit line errors. The **clrclnerrs** command clears the error counters for circuit lines.

The **dsplnerrs** and **dspclnerrs** commands are the same.

Table 4-17 Errors Displayed by the dsplnerrs Command

Type	Explanation
Bipolar errors	Number of times that two consecutive pulses had the same polarity (applies to AMI coding only).
Frame slips	Number of times a frame was discarded to re-establish synchronization.
Out of frames	Number of times a loss-of-frame synchronism was detected on this circuit line.
Loss of signal	Number of times the signal level at the circuit line input went below the minimum acceptable level.
Frame bit errors	Number of times the frame bit failed to alternate (frame error).
CRC errors	Number of times the generated CRC character did not match the received CRC character (applies only if CRC checking is enabled).
Out of MFrames	Number of times a multiframe synch error was detected (E1 lines only).
AIS - 16	Number of times the Alarm Information Signal (Blue signal) was received.

Syntax

dspclnerrs [slot | slot.line]

Parameters

Parameter	Description
slot or slot.line	For most circuit lines, the slot number is the line number. To use this optional parameter on a UFM, enter one of the line numbers. With no optional parameter specification, a summary screen for all line errors appears.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

clrclnerrs, prtclnerrs

Example

Display a summary of all circuit line errors.

dspclnerrs

```
sw151          TN    SuperUser       IGX 16    9.3       Apr. 13 2000 12:45 GMT

Total Errors

      Code    Frame   Out of  Loss of Frame   CRC     Out of
CLN   Errors  Slips   Frames  Signal  BitErrs Errors  MFrames AIS-16
 9         0       -       0       0       -       0       -       -
 5.1       0       -       0       0       -       0       -       -
12         0       0       0       0       -       0       -       -
 5.2       0       -       0       0       -       0       -       -




Last Command: dspclnerrs


Next Command:
```

Example

Display the circuit line errors for line 5.1 on the UFM card in slot 5.

dspclnerrs 5.1

```
sw151          TN    SuperUser       IGX 16    9.3       Apr. 13 2000 12:38 GMT

Circuit Line  5.1 Status:Major - Out of Frm (RED)       Clrd: 06/20/96 12:08:38
Type               Count ETS   Status    Type               Count ETS   Status
Bipolar Err           0     0            Loss of Sig (RED)     0     -
Frame Slips           -     -            AIS         (BLU)     0     -
Out of Frms           0     0            Out of Frms (RED)     2     -
Loss of Sig           0     0            Frm Err Rate(RED)     -     -
Frame BitErrs         -     -            AIS-16      (RED)     -     -
CRC Err               0     0            Rmt Oof     (YEL)     0     -
AIS-16                -     -            Out of MFms (RED)           -
Out of MFms           -     -            Rmt Oom     (YEL)     -     -
                                         Local CGA   (RED)     -     -
                                         Remote CGA  (YEL)     -     -




Last Command: dspclnerrs 5.1


Next Command:

                   SW                                                MAJOR ALAR
```

dspclnstatcnf (display circuit line statistics configuration)

Displays statistics configured for a selected circuit line as enabled by the **cnflnstats** (or alias **cnfclnstats)** command, by Cisco WAN Manager, or by IGX features. (Note that the **dsplnstatcnf** command is an older alias for **dspclnstatcnf**.)

The Owner column identifies who or what set the statistic. If the Owner column shows "Automatic," the node's features set the statistic. If the node name appears under Owner, Cisco WAN Manager set the statistic. If the user name appears under Owner, the **cnfchstats** command executed from the command line interface set the statistic.

Syntax

dspclnstatcnf <line>

Parameters

Parameter	Description
<line>	Specifies the circuit line in the format *slot* or *slot.line*. If the card has only one line, you can enter just the slot.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnfclnstats

Example (IGX)

dspclnstatcnf 4.1

```
sw180          VT    Cisco           IGX 8420  9.3.p7    Dec. 12 2000 12:57 GMT

Statistics Enabled on Circuit Line 4.1

Statistic                           Samples  Interval  Size  Peaks  Owner
-----------------------------------  -------  --------  ----  -----  ----------
  1) Bipolar Violations                   60         0     4   NONE  AUTO
  3) Out of Frames                        60         0     4   NONE  AUTO
  4) Losses of Signal                     60         0     4   NONE  AUTO
  5) Frames Bit Errors                    60         0     4   NONE  AUTO
  6) CRC Errors                           60         0     4   NONE  AUTO
 29) Line Code Violations                 60         0     4   NONE  AUTO
 32) Line Parity Errors                   60         0     4   NONE  AUTO
 35) Path Parity Errors                   60         0     4   NONE  AUTO
 41) BIP-8 Code Violations                60         0     4   NONE  AUTO
 98) Frame Sync Errors                    60         0     4   NONE  AUTO
Last Command: dspclnstatcnf 4.1
                                                            1
```

dspclnstathist (display statistics history for a circuit line)

Displays a history of statistics enabled for a circuit line, including the last five occurrences of the circuit line statistic. When you first enter **dspclnstathist,** you select the circuit line statistic from the displayed list.

Use the **dspclnstatcnf** to display the statistics enabled for the selected channel. Use **cnfclnstats** to enable a statistic.

Syntax

dspclnstathist <line> <statistic number> <interval> <owner>

Parameters

Parameter	Description
<line>	Specifies the circuit line in the format *slot.line*. If the card set supports only one line, you can enter just the slot number.
<statistic number>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample. Range: 1–255 minutes
<owner>	Specifies the source of the configuration ("auto," "user," or "tftp"). You might have to enter owner "AUTO" in all capital letters.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			Yes	

Related Commands

cnfclnstats, **dspclnstatcnf**

Example

A display for T1 circuit line 14 bipolar violations (60-second interval) history.

dspclnstathist 14 1 60 AUTO

```
gamma            TRM       SuperUser        Rev:  9.3  Apr. 13 2000 14:00 PDT

Bipolar Violations on Circuit Line 14
Interval: 60 Minute(s), Data Size: 4 Byte(s), 10 S Peaks, Owner: Automatic

 0   -          0(0)
-1   -          0(0)
-2   -          0(0)
-3   -          0(0)
-4   -          0(0)
Last Command: dspclnstathist 14 1 60 AUTO
Next Command:
```

dspcls (display connection class)

Displays the current parameters for a connection class template. There are ten number classes. The parameters and the values for each varies with the type of connection (CBR, rt-VBR, nrt-VBR, ABR, and ATFR). Connection parameters for the rt-VBR and nrt-VBR connection classes display separately.

```
dspcls             - Display ATM or Frame Relay Connection Classes
Cannot be included in Jobs.
Usage: dspcls atm | fr
```

Syntax

dspcls <atm | fr>

Parameters

Parameter	Description
<atm | fr>	Specifies either ATM or Frame Relay

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			No	

Related Commands

addcon, cnfcls, dspcon, dspcons

Example (IGX)

Display the parameters for ATM on IGX.

dspcls atm

```
-----------------------------------SCREEN 1-----------------------------------
sw180          TN    Cisco          IGX 8420  9.3.o1    Nov. 30 2000 13:01 GMT

                        ATM Connection Classes
Class:  1                                                    Type: ABRSTD
   PCR(0+1)       % Util      MCR            CDVT(0+1)       AAL5 FBTC     VSVD
96000/96000      100/100 96000/96000        10000/10000         n          n

  Policing
      4

       Description: "Default ABR 96000"


This Command: dspcls atm

Continue? y

-----------------------------------SCREEN 2-----------------------------------
```

```
sw180          TN    Cisco           IGX 8420  9.3.o1    Nov. 30 2000 13:06 GMT

                        ATM Connection Classes
Class:  2                                                         Type: nrt-VBR
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
 1000/1000     100/100      10000/10000          n        1000/1000

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

       Description: "Default nrt-VBR 1000 "


This Command: dspcls atm


Continue? y

-----------------------------------SCREEN 3-----------------------------------
sw180          TN    Cisco           IGX 8420  9.3.o1    Nov. 30 2000 13:06 GMT

                        ATM Connection Classes
Class:  3                                                         Type: rt-VBR
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
 4000/4000     100/100      10000/10000          n        4000/4000

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

       Description: "Default rt-VBR 4000 "


This Command: dspcls atm


Continue? y

-----------------------------------SCREEN 4-----------------------------------
sw180          TN    Cisco           IGX 8420  9.3.o1    Nov. 30 2000 13:03 GMT

                        ATM Connection Classes
Class:  4                                                         Type: nrt-VBR
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
 8000/8000     100/100      10000/10000          n        8000/8000

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

       Description: "Default VBR nrt-8000 "


This Command: dspcls atm


Continue? y

-----------------------------------SCREEN 5-----------------------------------
sw180          TN    Cisco           IGX 8420  9.3.o1    Nov. 30 2000 13:04 GMT

                        ATM Connection Classes
Class:  5                                                         Type: nrt-VBR
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
16000/16000    100/100      10000/10000          n       16000/16000
```

```
     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

       Description: "Default nrt-VBR 16000 "


This Command: dspcls atm


Continue? y

-----------------------------------SCREEN 6-----------------------------------
sw180         TN    Cisco          IGX 8420  9.3.o1    Nov. 30 2000 13:07 GMT

                        ATM Connection Classes
Class:  6                                                        Type: nrt-VBR
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
32000/32000    100/100      10000/10000          n       32000/32000

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

       Description: "Default nrt-VBR 32000 "


This Command: dspcls atm


Continue? y

-----------------------------------SCREEN 7-----------------------------------
sw180         TN    Cisco          IGX 8420  9.3.o1    Nov. 30 2000 13:08 GMT

                        ATM Connection Classes
Class:  7                                                        Type: nrt-VBR
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
96000/96000    100/100      10000/10000          n       96000/96000

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

       Description: "Default nrt-VBR 96000 "

This Command: dspcls atm


Continue? y

-----------------------------------SCREEN 8-----------------------------------
sw180         TN    Cisco          IGX 8420  9.3.o1    Nov. 30 2000 13:09 GMT

                        ATM Connection Classes
Class:  8                                                        Type: CBR
   PCR(0+1)      % Util       CDVT(0+1)       Policing   VC Qdepth       CLP Hi
  500/500       100/100      10000/10000          4      160/160         80/80

    CLP Lo
    35/35

       Description: "Default CBR 500 "


This Command: dspcls atm
```

```
Continue? y

-----------------------------------SCREEN 9-----------------------------------
sw180         TN    Cisco           IGX 8420  9.3.o1    Nov. 30 2000 13:09 GMT

                        ATM Connection Classes
Class:  9                                                        Type: CBR
   PCR(0+1)      % Util       CDVT(0+1)       Policing   VC Qdepth       CLP Hi
 1000/1000      100/100      10000/10000          4      160/160         80/80

    CLP Lo
    35/35

       Description: "Default CBR 1000 "


This Command: dspcls atm


Continue? y

-----------------------------------SCREEN 10----------------------------------
sw180         TN    Cisco           IGX 8420  9.3.o1    Nov. 30 2000 13:09 GMT

                        ATM Connection Classes
Class: 10                                                        Type: CBR
   PCR(0+1)      % Util       CDVT(0+1)       Policing   VC Qdepth       CLP Hi
 4000/4000      100/100      10000/10000          4      160/160         80/80

    CLP Lo
    35/35

       Description: "Default CBR 4000"


Last Command: dspcls atm
```

dspcnf (display configuration save/restore status)

Displays the status for the configuration save and restore processes on all nodes in the network.

The display lists the various nodes, the backup ID name of the saved configuration, the time and date saved, and the Cisco WAN Manager terminal it is saved on.

If the status displays "Reserved for Firmware," a firmware image is maintained in memory after it is loaded. Use the **getfwrev 0.0** command to clear the firmware image.

If a configuration image is displayed, clear the old configuration image by using **savecnf clear** or **loadcnf clear**.

If an IGX node status displays "Reserved for Router Configuration," an IOS configuration file for the URM embedded router is stored in NPM memory. Starting with Release 9.3.30, the Universal Router Module (URM) Remote Router Configuration feature enables the transfer of an IOS configuration file from a TFTP server to the NPM. Use the **clrrtrcnf** command to clear the IOS configuration file from NPM memory. For additional information on the URM Remote Router Configuration feature, see the **cnfrtr** command description.

Caution Do not use **clrcnf** without first discussing the action with TAC.

Syntax

dspcnf

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

savecnf, **loadcnf**, **runcnf**

Fields Displayed

Field	Description
nodename	Specifies the name of the node that had its configuration saved. The wildcard option, specified by an asterisk (*), is used in place of nodename to indicate all nodes are to have their configuration saved. This also can be a CWM nodename, specifies the name of the node that has the CWM attached.
backup ID	Specifies the name of the configuration file to be saved. The name must be 1-8 alphanumeric characters, and the first character must be alphabetic. Configuration names are case-sensitive. When the directory and files are on CWM, the backup is on /usr/users/svplus directory. The directory containing the configuration files will be named <backup_id>_Cfgdir.
Revision	The firmware/hardware version ID.
Date/Time (GMT)	The timestamp of the action listed under "status."
Status	Current status of the configuration save and restore process. In 9.3.30 and higher, the IP address of the CWM or the TFTP server is displayed for proprietary or TFTP download, respectively. For releases earlier than 9.3.30, the SV+ node nbame is displayed. Another possible status is that the NPM RAM buffer is occupied with IOS config file.

Example

dspcnf

```
bpx1           TN    Cisco          BPX 8620  9.3.h1    Mar. 9 2001  15:16 GMT

Node     Backup ID Revision Date/Time (GMT)   Status
-------- --------- -------- ----------------- ---------------------------------
bpx1     cisco111  9.3.h1   03/08/01 23:32:16 Save on 172.29.10.72 complete
sw200                                         Reserved for firmware image
sw76     cisco111  9.3.j3   03/08/01 23:32:16 Save on 172.29.10.72 complete
magneto  cisco111  9.3.h1   03/08/01 23:32:16 Save on 172.29.10.72 complete

Last Command: dspcnf
```

Example

dspcnf

```
sw83           TN    SuperUser      IGX 8420    9.3     Apr. 13 2000  18:21 PST

Node     Backup ID Revision Date/Time (GMT)   Status
-------- --------- -------- ----------------- ---------------------------------
sw78     mark      9.2.00 02/22/97 16:36:26 Unreachable
sw81     mark      9.2.00 02/22/97 16:36:26 Unreachable
sw84     mark      9.2.00 02/22/97 16:36:26 Save on Cisco WAN Manager at sw78 complete
sw79     mark      9.2.00 02/22/97 16:36:26 Save on Cisco WAN Manager at sw78 complete
sw86     mark      9.2.00 02/22/97 16:36:26 Unreachable
sw83     mark      9.2.00 02/22/97 16:36:26 Save on Cisco WAN Manager at sw78 complete

Last Command: dspcnf
```

dspcntrstats (display counter status statistics)

Displays counter status statistics for both BPX and IGX (such as Connection, Port, Trunk, and so on) for a given statistics object.

Syntax

dspcntrstats <stat_object_type><oid>

Parameters

Parameter	Description
<stat_object_type>	Specifies the object type for statistics display.
<oid>	Object ID. Identifies the object for statistics display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

cnfcntrstats

Example (BPX)

Display Counter Statistics for Virtual Port 6 on card 3 in slot 4 of the BPX.

dspcntrstats 4 3.6

```
Counter Stats for Port 3.6

       RTC STATS          Value                  RTC STATS          Value
Inv LMI PDU Rx          : 0             Inv LMI len Rx          : 0
Unk LMI PDU Rx          : 0             Inv LMI IE Rx           : 0
Inv Trans IDs           : 0             Rx Clp 0 Cells          : 0
Rx Clp 0 Dscd           : 0             Rx Clp 1 Dscd           : 0
Tx Clp 0 Cells          : 0             Tx OAM Cells            : 0
Rx RM Count             : 0             Tx RM Count             : 0
Lst Unk VpiVci          : 0             Qbin 0 CTXL             : 0
Tx Q0 CDscd             : 0             Egr QBIN0 CRx           : 0
Qbin 1 CTXL             : 0             Tx Q1 CDscd             : 0
Egr QBIN1 CRx           : 0             Qbin 2 CTXL             : 0
Tx Q2 CDscd             : 0             Egr QBIN2 CRx           : 0
Qbin 3 CTXL             : 0             Tx Q3 CDscd             : 0

This Command: dspcntrstats 4 3.6


Next/previous page? (+/-/DEL key to quit):
```

```
NODENAME       TRM   Cisco          BPX 8620  9.3.10    Date/Time Not Set

Counter Stats for Port 3.6

       RTC STATS          Value                RTC STATS          Value
Egr QBIN3 CRx           : 0             Qbin 9 CTXL             : 0
Tx Q9 CDscd             : 0             Egr QBIN9 CRx           : 0
Qbin 10 CTXL            : 0             Tx Q10 CDscd            : 0
Egr QBIN10 CRx          : 0             Qbin 11 CTXL            : 0
Tx Q11 CDscd            : 0             Egr QBIN11 CRx          : 0
Qbin 12 CTXL            : 0             Tx Q12 CDscd            : 0
Egr QBIN12 CRx          : 0             Qbin 13 CTXL            : 0
Tx Q13 CDscd            : 0             Egr QBIN13 CRx          : 0
Qbin 14 CTXL            : 0             Tx Q14 CDscd            : 0
Egr QBIN14 CRx          : 0             Qbin 15 CTXL            : 0
Tx Q15 CDscd            : 0             Egr QBIN15 CRx          : 0


This Command: dspcntrstats 4 3.6


Previous page? (-/DEL key to quit):
```

Example (IGX)

Display Counter Statistics for Trunk 5.2 of the IGX.

dspcntrstats 5.2

```
Enter Object Type:

neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:48 GMT

Counter Stats for Trunk 5.2 (ltrk = 1)

       RTC STATS          Value                RTC STATS          Value
Txntscdscd              : 0             Txhpcdscd               : 0
Txvcdscd                : 0             Txtscdscd               : 0
Txbdacdscd              : 0             Txbdbcdscd              : 0
Txcbrcdscd              : 0             Txabrcdscd              : 0
Txvbrcdscd              : 0             VI: Cells transmitted   : 0
VI: Cells received      : 0             TxQ10cdscd              : 0
TxQ11cdscd              : 0             TxQ12cdscd              : 0
TxQ13cdscd              : 0             TxQ14cdscd              : 0
TxQ15cdscd              : 0
```

Example (IGX)

Display Counter Statistics for Port 5.1 on card 4 of the IGX.

dspcntrstats 4.5.1

```
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:48 GMT

Counter Stats for Port 5.1

       RTC STATS          Value                RTC STATS          Value
PORT: Unknwn VPI/VCI cnt: 0             VI: Cells rcvd w/CLP=1  : 0
VI: OAM cells received  : 0             VI: Cells tx w/CLP=1    : 0
VI: Cells transmitted   : 0             VI: Cells received      : 0
ILMI: Get Req PDUs rcvd : 0             ILMI: GetNxt Req PDUS rx: 0
ILMI: GetNxt Req PDUS xmt:0             ILMI: Set Req PDUs rcvd : 0
ILMI: Trap PDUs rcvd    : 0             ILMI: Get Rsp PDUs rcvd : 0
```

```
ILMI: Get Req PDUs xmt  : 0            ILMI: Get Rsp PDUs xmt  : 0
ILMI: Trap PDUs xmt     : 0            ILMI: Unknwn PDUs rcvd  : 0
LMI: Status messages xmt: 0            LMI: Updt Status msgs xmt:0
LMI: Status Ack msgs xmt: 0            LMI: Status Enq msgs rcvd:0
LMI: Status Enq msgs xmt: 0            LMI: Status msgs rcvd   : 0
LMI: Updt Status msg rcvd:0            LMI: Status Ack msg rcvd: 0

This Command: dspcntrstats 4 5.1


Next page? (+/DEL key to quit):
```

Example (IGX)

Display Counter Statistics for Physical Line 5.2 of the IGX.

dspcntrstats 5.2

```
neelix         TRM   Cisco           IGX 8420  9.3.10    May  31 2000 01:49 GMT

Counter Stats for Physical Line 5.2 (l_physln = 1)

       RTC STATS          Value                  RTC STATS          Value
Bpv                     : 0             Oof                     : 1
Los                     : 1             Fer                     : 0
CRC                     : 0             Lcv                     : 262140
Pcvl                    : 2             Pcvp                    : 2
Bcv                     : 3             Total Cells Tx to line  : 0
Total Cells Rx from line: 0             FSyncErr                : 1



This Command: dspcntrstats 5.2


Hit DEL key to quit:
```

dspcon (display connection)

Displays connection information for a specified channel. The information displayed includes:

- The channel numbers for both the local and remote ends of the connection.
- The routing restriction.
- The class of service (CoS) of the connection (see **cnfcos** description for details).
- The connection route listing the end nodes and any intermediate nodes.
- The preferred route for the connection (if configured).
- If cost-based routing is configured, displays maximum and current costs for a connection route.
- The status of the cards associated with the connection.
- Any Y-cable conflicts (LDI, CDP for example).
- The type of the compression, if applicable (VAD, ADPCM, LDCELP, CACELP for voice; repetitive pattern suppression (RPS) applies to data connections).
- The type or data rate of the connection.
- The connection priority (low or high).
- The status of the front and back cards and access devices associated with the connection.
- If one endpoint is a CDP or CVM, the compression status (VAD on or off, ADPCM on or off).
- The bandwidth parameters for the connection.
- The ForeSight enable status.
- The percent of utilization.
- The connection descriptor (if configured).
- The circuit round-trip delay (RTD) if ForeSight is enabled.

The status that may be displayed includes:

OK	Connection good
FAILED	Connection failed

Syntax

dspcon <channel>

Parameters

Parameter	Description
<channel>	Specifies the channel for the connection details display. The command displays connection information for one channel at a time. The format for *channel* on a CDP or CVM is *slot.channel.* The format for a channel on a UVM is *slot.line.channel.* *slot.port.connection_ID*. Range for *connection_ID* : 1–252

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	Yes	IGX			No	

Related Commands

addcon, cnfcos, cnfpref, cnfrtcost, dspcons

Example

Display connection information for voice channel 10.1.1.

dspcon 10.1.1

```
igxr03         VT    Cisco           IGX 8430   9.3.2V    Jan. 18 2001 12:26 PST

Conn:  10.1.1            igxr02      20.1.1             p        Status:OK



Owner: LOCAL  Restriction: NONE  COS: 0 Compression: NONE
Path:   igxr03  19.1--12.3igxr02
Pref:   Not Configured





igxr03    UVM:   OK                    igxr02    UVM:   OK
          Line 10.1 : OK         OFFHK           Line 20.1 : OK



Last Command: dspcon 10.1.1
```

dspcon (display data connections)

Displays connection information for a specified channel. The information displayed includes:

- The channel numbers for both the local and remote ends of the connection
- The node names at both ends of the connection
- The routing restriction
- The class of service (CoS) of the connection
- The connection route listing the end nodes and any intermediate nodes
- The preferred route for the connection (if configured)
- If cost-based AutoRoute is configured, displays maximum and current costs for a connection route
- The status of the cards associated with the connection
- Any Y-cable conflicts
- The compression status (VAD on or off, ADPCM on or off, DFM on or off, Frame Relay compression on or off)
- The connection descriptor (if configured)

The status that may be displayed includes:

OK	Connection OK
FAILED	Connection failed

Syntax

dspcon <channel>

Parameters

Parameter	Description
channel	Specifies the channel. The command displays connection information for one channel at a time. The format for channel specification is *slot.channel*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfchec, cnfrtcost

Example

Display information for data channel 6.4.

dspcon 6.4

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 12:36 PST

Conn:  6.4              igxr02      18.4            128 7/8     Status:OK



Owner: REMOTE  Restriction: NONE  COS: 0 Compression: DFM
Path:   igxr03  19.2--12.4igxr02
Pref:   Not Configured




igxr03    HDM:   OK                    igxr02    HDM:   OK
          SDI:   OK                              SDI:   OK
          Clock: OK                              Clock: OK


Last Command: dspcon 6.4
```

dspcon (display Frame Relay connections)

Displays connection information for a channel. The information displayed includes:

- The channel number at both the local and remote ends of the connection
- The node name at both ends of the connection
- The type or data rate of the connection
- The routing restriction
- The class of service (CoS) of the connection
- The connection route, which lists the end nodes and any intermediate nodes
- The preferred route for the connection (if configured)
- If cost-based AutoRoute is configured, displays maximum and current costs for a connection route
- The status of the cards associated with the connection
- Any Y-cable conflicts (LDI, CDP for example)
- The compression status (VAD on or off, ADPCM on or off, DFM on or off, Frame Relay compression on or off)
- The connection bandwidth parameter values for Frame Relay
- The circuit round trip delay (RTD) if ForeSight is enabled

A failure that affects the connection flashes on the screen. For Frame Relay NNI ports, the NNI value indicates the A-bit value was received over the NNI from the remote network. The possible status messages are:

- OK — Connection OK.
- FAILED — Connection failed.
- MISSING — DLCI was deleted in other network at NNI. A previous status report indicated a valid DLCI was present but an updated report did not.
- UNUSED — Indicates the UNI port does not support reporting of NNI A-bit status.

Syntax

dspcon <slot.port.DLCI>

Parameters

Parameter	Description
channel	Specifies the Frame Relay channel in the format *slot.port.DLCI*. The **dspcon** command displays information for one connection at a time.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

addcon, cnfcos, cnfpref, cnfrtcost, dspcons

Example

Display connection information for Frame Relay channel 14.1.1.

dspcon 14.1.1

```
igxr03         VT    Cisco          IGX 8430  9.3.2V    Jan. 18 2001 13:09 PST

Conn:  14.1.1            igxr02      27.1.1             fr       Status:OK
    MIR         CIR      VC Q Depth      PIR      Cmax   ECN QThresh     QIR
   64/64       64/64    65535/65535    64/64    100/100 65535/65535    64/64

Owner: LOCAL  Restriction: NONE  COS: 0                FST: n  % Util:  25/25
Pri: L  Test-RTD: 0 msec
Path:   igxr03  19.2--12.4igxr02
Pref:   Not Configured



igxr03    UFM:   OK                    igxr02    UFM:   OK
          Line 14.1 : OK                         Line 27.1 : OK



Last Command: dspcon 14.1.1
```

dspcon (display ATM connections)

Displays connection information for a specified channel. The information displayed includes:

- The channel numbers for both the local and remote ends of the connection, including, for an Extended PVC (XPVC) that spans over a hybrid AutoRoute (AR)-PNNI, or AR-PNNI-AR, network, connection details for an XPVC segment linking the Automatic Routing Management and PNNI endpoints (the connection segment status). The node names at both ends of the connection.
- The node names at both ends of the connection.
- The type or data rate of the connection.
- The routing restriction.
- Trunk cell routing restriction.
- The Class of Service (CoS) of the connection.
- The connection route, listing the end nodes and any intermediate nodes.
- The maximum and current costs for a connection route when cost-based Automatic Routing Management is configured.
- The preferred route for the connection (if configured).
- The status of the cards associated with the connection.
- Any Y-cable conflicts.
- The compression status.
- The connection bandwidth parameter values.
- The connection/type descriptor (if configured). (If the connection is a VP tunnelling DAX connection, the type is displayed as cbrvp, abrstvp, abrfsvp, and so on.)
- The circuit round-trip delay (if ForeSight is enabled).
- Any failures that affect the connection flash on the screen.

For Frame Relay NNI ports, the NNI value indicates the A-bit value received across the NNI from the remote network. The status that may be displayed includes:

OK	Connection OK
FAILED	Connection failed
MISSING	VPI.VCI was deleted in other network at NNI. A previous status report indicated a valid VPI.VCI was present but an updated report did not.
UNUSED	Indicates the UNI port does not support reporting of NNI A-bit status

In Release 9.2 switch software for an IGX 8400 routing hub, **dspcon** does the following:

- Shows the new connection segment. Because the connection type is based on the master end of the connection (either voice, data, Frame Relay, or ATM connections), the **dspcon** command displays that and shows the feeder trunk endpoint as the slave end and the incoming A-bit status.
- Indicates connection failures at feeder endpoints.

In Release 9.2.20, rt-VBR and nrt-VBR connection service types display separately.

With Release 9.3.20, **dspcon** supports the Universal Router Module (URM) introduced on the IGX 8400. The URM provides IOS-based voice support and basic routing functions. It consists of an embedded UXM with one internal ATM port and an embedded IOS-based router. The URM embedded UXM has no physical line interfaces. Therefore, **dspcon** does not display line status information for the URM endpoints. For example, if a connection has one endpoint on the URM internal ATM port and the other on a UXM port, **dspcon** displays the line status information for the UXM endpoint but not for the URM endpoint. For the URM end point, **dspcon** displays port status information instead. This information includes port communication failure and IOS unavailable (if the router connected to the internal port is not able to provide services because IOS is not up and running).

Syntax

dspcon <channel>

Parameters

Parameter	Description
channel	Specifies the channel for which to display connection details. The command displays connection information for one channel at a time. You cannot specify a set of channels. Channel is specified in the following format: slot.port.vpi.vci

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

addcon, cnfcon, cnfpref, cnfrtcost

Example (VBR on BPX)

Display connection information for channel 11.1.180.1000 (an nrt-VBR connection).

dspcon 11.1.180.1000

```
------------------------------------SCREEN 1-----------------------------------
sw53          VT    Cisco          BPX 8620  9.3.2o    Nov. 30 2000 11:23 GMT

Conn:  11.1.180.1000    sw180       15.1.53.1000      nrt-vbr   Status:OK
    PCR(0+1)    % Util    CDVT(0+1)    FBTC       SCR           MBS     PLC
     50/50     100/100  250000/250000   n        50/50       1000/1000    3
Owner: LOCAL  Restriction: NONE  COS: 0
TestRTD: 0 msec  Trunk Cell Routing Restrict: Y
Path:   sw53    11.2-- 4.4sw108    4.2-- 5.1sw180
Pref:   Not Configured


sw53          BXM       : OK          sw180     URM       : OK
              Line 11.1 : OK                    Port 15.1 : OK
              OAM Cell RX: Clear                NNI       : OK
              NNI       : OK

This Command: dspcon 11.1.180.1000


Continue?  y

------------------------------------SCREEN 2-----------------------------------
sw53          VT    Cisco          BPX 8620  9.3.2o    Nov. 30 2000 11:24 GMT

Conn:  11.1.180.1000    sw180       15.1.53.1000      nrt-vbr   Status:OK
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
   50/50       100/100     250000/250000        n          50/50

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

Trunk Cell Routing Restrict: Y


Last Command: dspcon 11.1.180.1000
```

Example (CBR on BPX)

Display connection information for channel 11.1.108.61 (CBR).

dspcon 11.1.108.61

```
------------------------------------SCREEN 1-----------------------------------
sw53          VT    Cisco          BPX 8620  9.3.2o    Nov. 30 2000 11:29 GMT

Conn:  11.1.108.61      sw108       6.1.53.111        cbr       Status:OK
   PCR(0+1)     % Util    CDVT(0+1)     Policing
     50/50     100/100   10000/10000     4/4
Owner: LOCAL  Restriction: NONE  COS: 0
TestRTD: 0 msec  Trunk Cell Routing Restrict: Y
Path:   sw53    11.2-- 4.4sw108
Pref:   Not Configured


sw53          BXM       : OK          sw108     URM       : OK
              Line 11.1 : OK                    Port  6.1 : OK
              OAM Cell RX: Clear                NNI       : OK
```

```
              NNI       : OK

This Command: DSPCON 11.1.108.61


Continue? y

------------------------------------SCREEN 2-----------------------------------
sw53           VT    Cisco           BPX 8620  9.3.2o    Nov. 30 2000 11:29 GMT

Conn:  11.1.108.61      sw108       6.1.53.111        cbr       Status:OK
   PCR(0+1)      % Util       CDVT(0+1)       Policing   VC Qdepth       CLP Hi
   50/50        100/100      10000/10000          4      160/160         80/80

    CLP Lo
    35/35

Trunk Cell Routing Restrict: Y


Last Command: DSPCON 11.1.108.61
```

Example (ABR on BPX)

Display connection information for channel 12.1.1.100 (an ABR connection).

dspcon 12.1.1.100

```
ca20           LAN   SuperUser       BPX 15    9.3     Apr. 13 2000 10:31 PST

Conn:  12.1.1.100       ca20
    SCR           MBS           MCR         ABR PCR     UPC FST CLP  % util
20000/20000      50/50      20000/20000   96000/96000    y   y   y  100/100
  ForeSight RTD: 0 msec

Path:   Route information not applicable for local connections

ca20          ASI-T3    : OK           ca20      ASI-T3    : OK
              Line 12.1 : OK                     Line 12.2 : OK

Last Command: dspcon 12.1.1.100
```

Example (ABRSTD on BPX)

Display connection information for channel 11.1.0.1023 (an ABRSTD connection).

dspcon 12.1.1.100

```
------------------------------------SCREEN 1-----------------------------------
sw53          VT    Cisco          BPX 8620  9.3.2o    Nov. 30 2000 11:32 GMT

Conn:  11.1.0.1023      sw180       5.3.0.1023        abrstd    Status:OK
   PCR(0+1)     % Util     MCR          CDVT(0+1)   FBTC  FST  VSVD  FCES
     50/50     100/100     50/50      250000/250000  y     n    n    n
Owner: LOCAL  Restriction: NONE  COS: 0
TestRTD: 0 msec  Trunk Cell Routing Restrict: Y
Path:   sw53    11.2-- 4.4sw108    4.2-- 5.1sw180
Pref:   Not Configured

sw53          BXM       : OK           sw180     UXM       : OK
              Line 11.1 : OK                     Line  5.3 : OK
              OAM Cell RX: Clear                 NNI       : OK
              NNI       : OK

This Command: dspcon 11.1.0.1023

Continue? y

------------------------------------SCREEN 2-----------------------------------
sw53          VT    Cisco          BPX 8620  9.3.2o    Nov. 30 2000 11:32 GMT

Conn:  11.1.0.1023      sw180       5.3.0.1023        abrstd    Status:OK
   PCR(0+1)       % Util      MCR           CDVT(0+1)       AAL5 FBTC     VSVD
   50/50         100/100    50/50          250000/250000         y          n

  Policing
      4

Trunk Cell Routing Restrict: Y

Last Command: dspcon 11.1.0.1023
```

Example (ATFST on BPX)

Display connection information for channel 4.1.2.1 (an ATFST connection).

dspcon 4.1.2.1

```
sw53          TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 13:40 GMT

Conn:  4.1.2.1          sw53        4.3.2.1           atfst    Status: OK
    SCR           MBS           MCR         ABR PCR     UPC FST CLP  % util
   25/25       1000/1000       25/25         25/25       y   y   y  100/100
  ForeSightRTD: 0 msec

Path:   Route information not applicable for local connections

sw53          BNI-T3    : OK           sw53      BNI-T3    : OK
              Line  4.1 : OK                     Line  4.3 : OK
              OAM Cell RX: Clear                 NNI       : OK
              NNI       : OK

Last Command: dspcon 4.1.2.1
```

Example (CBR on IGX)

Display connection information for channel 12.1.1.* (a CBR VP tunnelling DAX connection).

dspcon 12.1.1.*

```
sw224          TRM            IGX 8420  9.3           Apr. 13 2000  11:10 PST

Conn:  12.2.1.*          sw224       12.1.1.100         cbrvp      Status:OK

   PCR(0+1)     % Util    CDVT(0+1)     Policing

   1000/1000   100/100   10000/10000     4/4

Pri: L  Test-RTD: 0 msec

Path:   Route information not applicable for local connections

sw224     UXM:   OK                    sw224     UXM:   OK

          Line 12.2 : OK                         Line 12.1 : OK

          OAM Cell RX: Clear                     NNI:   OK

          NNI:   OK

This Command: dspcon 12.2.1.*
```

Example (URM on IGX)

Display connection information for channel 11.1.1.100 on the internal ATM port in the Universal Router Module (URM).

dspcon 11.1.1.100

```
sw190          TRM   Cisco           IGX 8420  9.3.e9    Oct. 6 2000  05:31 GMT

Conn: 11.1.1.100        sw190       10.1.1.100         nrt-vbr  Status:OK
    PCR(0+1)    % Util    CDVT(0+1)    FBTC       SCR           MBS     PLC
   1000/1000   100/100   10000/10000    n      1000/1000     1000/1000    3

Pri:L  Test-RTD:0 msec
Path:  Route information not applicable for local connections

sw190     URM:  OK                     sw190     URM:  OK
          Port 11.1 :OK                          Port 10.1 :OK
          OAM Cell RX:Clear                      NNI:  OK
          NNI:  OK

This Command:dspcon 11.1.1.100

Continue?

                         --------- Screen 2 ----------
sw190          TRM   Cisco           IGX 8420  9.3.e9    Oct. 6 2000  05:31 GMT

Conn: 11.1.1.100        sw190       10.1.1.100         nrt-vbr  Status:OK

   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
 1000/1000     100/100      10000/10000          n       1000/1000

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

Last Command:dspcon 11.1.1.100
```

dspconcnf (display connection configuration)

Displays information for a connection's configuration:

- The channel numbers for both the local and remote ends of the connection
- The node names at both ends of the connection
- The preferred route for the connection, if configured
- The bandwidth parameter values for ATM connections
- VC queue depth
- The connection type, if configured
- Other values (see examples)

The rt-VBR and nrt-VBR connection service types are displayed separately

Syntax

dspconcnf <channel>

Parameters

Parameter	Description
<channel>	Specifies the channel for which to display connection configuration. The command displays connection information for one channel at a time. You cannot specify a set of channels. Channel is specified in the following format: slot.port.vpi.vci

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX			No	

Related Commands

addcon, dspcon, dspcons, delcon

Example (ABRSTD on BPX)

Display the configuration for 11.1.108.60 (for ABRSTD).

dspconcnf 11.1.108.60

```
sw53           VT    Cisco           BPX 8620  9.3.2o    Nov. 30 2000 10:57 GMT

Conn:  11.1.108.60      sw108       6.1.53.110        abrstd    Status:OK
   PCR(0+1)       % Util      MCR            CDVT(0+1)       AAL5 FBTC     VSVD
   50/50         100/100    50/50          250000/250000         y          n

  Policing
```

```
      4

Trunk Cell Routing Restrict: Y

Last Command: dspconcnf 11.1.108.60
```

Example (RT-VBR on BPX)

Display the configuration for 11.1.108.60 (for RT-VBR).

dspconcnf 11.1.108.112

```
sw53           VT    Cisco           BPX 8620  9.3.2o    Nov. 30 2000 11:02 GMT

Conn:  11.1.108.112     sw108       6.1.53.112        rt-vbr    Status:OK
   PCR(0+1)     % Util       CDVT(0+1)       AAL5 FBTC        SCR
   50/50       100/100     250000/250000         n          50/50

     MBS       Policing   VC Qdepth    CLP Hi     CLP Lo
 1000/1000         3     1280/1280     80/80      35/35

Trunk Cell Routing Restrict: Y


Last Command: dspconcnf 11.1.108.112
```

dspcond (display conditioning criteria)

Displays the signaling bit patterns from the specified template. Refer to the description of the **cnfcond** command for the purpose of the conditioning template.

Syntax

dspcond <identifier>

Parameters

Parameter	Description
<identifier>	Specifies the identifier of the template.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfchtp, cnfcond

Example

Display the conditioning template identified as “a.”

dspcond a

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000   09:56 PST

Conditioning criterion a:

  Data Pattern
  01010100 - E1
  01111111 - T1


  Signalling Pattern
  A            0(40)/1
  B            1
  C            1
  D            1




Last Command: dspcond a


Next Command:
```

dspcons (display connections)

Displays information about the connections on an IGX or BPX node. The Display Fields table lists all possible information headings that appear in the display. The actual headings that appear depend on the choice of selected optional parameters—including no parameters. Entering the command with no parameters displays all connections.

All parameters are displayed even though some parameters are meaningless on a BPX.

You can use **dspcons** to display those connections that have failed the OAM loopback test.

You can display the rt-VBR and nrt-VBR service types separately.

As you configure VP tunnelling connections on a node, you can display all the VP tunnelling connections on a particular node by using the **dspcons -tun** command. VP tunnelling connections are indicated by a connection type of "cbrvp", for example, in the Type column of the **dspcons** screen. For more information on VP tunnelling on UXM cards, see the *IGX Installation and Configuration* manual.

Syntax

dspcons [start_channel] [nodename] [state] [type]
[-g | +d | -v | -d | -f | -abit | -fabit | -atfr | -siw | -fail | -down | -tun | -siw]]

Parameters

Parameter	Description
start_channel	Specifies the channel to begin the display. Specify *start channel* in one of these formats: Frame Relay channel (IGX): *slot.port.DLCI* Frame Relay Group Connection (IGX): *remote node.group_name* ATM channel (IGX, BPX): *slot.port.vpi.vci* CDP or CVM channel (IGX): *slot.channel* UVM channel (IGX): *slot.line.channel* If you do not specify a starting channel, the display begins at the first connection.
nodename	Specifies that only connections to this remote node from the local note be displayed. If no *nodename* is designated, connections from the local node to all other nodes are displayed.
-a	
–f	Display Frame Relay connection only.
–v	Display only voice connections.
–d	Display only data connections and do so in Kbps.
–atfr	Display Frame Relay to ATM interworking connections (also displays atfr with ForeSight).

Parameter	Description
–abit	Show status of the A-bit. In Release 9.3.30 and higher, use the **dspcons -abit** command to display the connection status of an XPVC segment linking the AR and PNNI endpoints. The local and remote A-bit status values are interpreted as follows: • Status "OK" (A-bit equals 1): The connection exists in the PNNI network. The operational status of the connection at the PNNI network may be active, failed, or downed. • Status "FAILED" (A-bit equals 0): The connection is deleted from the PNNI network. **Note** Only the local AR node information is displayed for XPVC segments. The Remote Node Name and Remote Channel fields remain blank. You must use the CWM or MGX CLI to display the remote PNNI node connection details.
–fabit	Show only connections with failed A-bits.
–fail	Show only failed connections.
–down	Show only downed connections.
–tun	Shows VP tunneled connections (IGX only).
–siw	Shows service interworking connections (IGX only).
-oam	Displays only connections that have failed the OAM loopback Test (IGX only).

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dspcon, addcon

Owner: from 3rd table

ABRSTD=OFF: from 3rd table

Display Fields

Fields	Description
Local Channel	The connection's channel at this node.
Remote Node Name	The name of the node at the other end of the connection.
Remote Channel	The connection's channel at the remote node.
State	The possible connections states are:

State	Description

Fields	Description	
	OK	Routed, A-bit = 1
	Down	Downed.
	Failed	Unrouted, but trying; A-bit = 0
	Unused	The UNI port does not support reporting of NNI A-bit status.
	OAM	Connections that have failed the OAM Loopback test, but are otherwise OK.
	OAM-F	Indicates OAM Loopback failure
Type	The type of connection. For example, this can be Frame Relay, Frame Relay with interworking, voice, data, and so on.	
Only __	If one parameter preempts another, this heading appears with the accepted parameter type. To name two examples: If the parameter is –d for data, this heading either “Only d” If the parameter is –fail for failed connections only, this heading becomes “Only fail”	
Code	The encoding used for data connections (7/8 = data byte is 7 bits of user data plus a “1” in the last bit position, 8/8 = data byte is 8 bits of user data, 8/8I = data byte is 8 bits of inverted user data).	
Route Avoid	The type of lines to avoid when routing (satellite lines, terrestrial lines, lines with zero code suppression).	
Compression	The type of compression applied to the connection (PCM, PCM and VAD, ADPCM, VAD and ADPCM for voice connections), (DFM for data connections).	
COS	The Class of Service.	
Local/Remote A-bit	A bit status on the local and remote nodes if -abit option selected. Note that -abit is incompatible with -v, -d, and +d.	
Loopback	This is not a heading but rather the standard loopback symbols indicating the presence of a test loop.	
Owner		The end of the connection in control of rerouting.
ABRSTD=OFF		The policing value for the connection.

Example (BPX)

Display a summary of all connections on a BPX.

dspcons

```
sw53          VT    Cisco          BPX 8620  9.3.2o    Nov. 30 2000 10:17 GMT

 Local            Remote      Remote                             Route
 Channel          NodeName    Channel         State  Type        Avoid COS O
 11.1.0.1023      sw180       5.3.0.1023      Ok     abrstd            0  L
 11.1.108.60      sw108       6.1.53.110      Ok     abrstd            0  L
 11.1.108.61      sw108       6.1.53.111      Ok     cbr               0  L
 11.1.108.112     sw108       6.1.53.112      Ok     rt-vbr            0  R
 11.1.108.113     sw108       6.1.53.113      Ok     nrt-vbr           0  R
 11.1.108.200     sw108       6.1.53.200      Ok     cbr               0  R
 11.1.180.150     sw180       15.1.11.100     Ok     ubr               0  R
 11.1.180.530     sw180       5.3.53.530      Ok     ubr               0  L
 11.1.180.1000    sw180       15.1.53.1000    Ok     nrt-vbr           0  L
```

```
 11.1.180.1001   sw180       15.1.53.1001    Ok     abrstd            0  L


Last Command: dspcons
```

Example (BPX)

Show a summary of connections starting with 11.1.180.1.

dspcons 11.1.180.1

```
sw53          VT    Cisco           BPX 8620  9.3.2o    Nov. 30 2000 10:37 GMT

 From            Remote      Remote                            Route
 11.1.180.1      NodeName    Channel         State  Type        Avoid COS O
 11.1.180.150    sw180       15.1.11.100     Ok     ubr               0  R
 11.1.180.530    sw180       5.3.53.530      Ok     ubr               0  L
 11.1.180.1000   sw180       15.1.53.1000    Ok     nrt-vbr           0  L
 11.1.180.1001   sw180       15.1.53.1001    Ok     abrstd            0  L

Last Command: dspcons 11.1.180.1
```

Example (IGX)

Display a summary of all connections on an IGX.

dspcons

```
sw108         VT    Cisco           IGX 8420  9.3.2o    Nov. 30 2000 08:46 GMT

 Local          Remote      Remote
 Channel        NodeName    Channel         State  Type     Compress   Code COS
 6.1.20.3       sw180       4.1.20.3        Ok     rt-vbr                    0
 6.1.53.110     sw53        11.1.108.60     Failed abrstd                    0
 6.1.53.111     sw53        11.1.108.61     Failed cbr                       0
 6.1.53.112     sw53        11.1.108.112    Failed rt-vbr                    0
 6.1.53.113     sw53        11.1.108.113    Ok     nrt-vbr                   0
 6.1.53.200     sw53        11.1.108.200    Ok     cbr                       0
 9.1.918        sw180       15.1.9.18       Ok     atfx                      0
 9.1.919        sw180       15.1.9.19       Ok     atft                      0
 9.1.920        sw180       15.1.9.20       Ok     atfr                      0

This Command: dspcons

Continue direction - Previous/Quit? (p/q)
```

Example (BPX)

Display connections and A-bit status.

dspcons -abit

```
sw53          VT    Cisco           BPX 8620  9.3.2o    Nov. 30 2000 10:42 GMT

 Local           Remote      Remote                      Local      Remote
 Channel         NodeName    Channel         State        A-bit      A-bit
 11.1.0.1023     sw180       5.3.0.1023      Ok          OK         OK
 11.1.108.60     sw108       6.1.53.110      Ok          OK         OK
 11.1.108.61     sw108       6.1.53.111      Ok          OK         OK
 11.1.108.112    sw108       6.1.53.112      Ok          OK         OK
 11.1.108.113    sw108       6.1.53.113      Ok          OK         OK
 11.1.108.200    sw108       6.1.53.200      Ok          OK         OK
 11.1.180.150    sw180       15.1.11.100     Ok          OK         OK
 11.1.180.530    sw180       5.3.53.530      Ok          OK         OK
```

```
 11.1.180.1000   sw180       15.1.53.1000    Ok        OK        OK
 11.1.180.1001   sw180       15.1.53.1001    Ok        OK        OK

Last Command: dspcons -abit
```

Example (IGX)

Display connections and A-bit status.

dspcons -abit

```
sw180          TN    Cisco           IGX 8420  9.3.o1    Nov. 30 2000 09:04 GMT

 Local          Remote      Remote                     Local     Remote
 Channel        NodeName    Channel          State      A-bit     A-bit
 4.1.2.2        sw108       4.3.1.2          Ok        OK        OK
 4.1.10.1       sw108       4.1.10.1         Ok        OK        OK
 4.1.20.1       sw108       6.1.20.1         Ok        OK        OK
 4.1.20.2       sw108       6.1.20.2         Ok        OK        OK
 4.1.20.3       sw108       6.1.20.3         Ok        OK        OK
 4.2.10.1       sw108       4.3.10.1         Ok        OK        OK
 5.3.0.11       sw180       5.3.0.50         Ok        OK        OK
 5.3.0.50       sw180       5.3.0.11         Ok        OK        OK
 5.3.0.1023     sw53        11.1.0.1023      Ok        OK        OK
 5.3.1.1        sw180       5.3.1.1          Ok        OK        OK
 5.3.10.1       sw108       3.3.10.1         Ok        OK        OK
 5.3.53.530     sw53        11.1.180.530     Ok        OK        OK
 14.1.10.1      sw108       3.1.10.1         Ok        OK        OK

This Command: dspcons -abit

Continue direction - Next/Quit? (n/q)
```

Example (IGX)

Display voice connections.

dspcons -f

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 12:20 PST

 Local          Remote      Remote                 Only
 Channel        NodeName    Channel          State  v        Compress   Code COS
 10.1.1         igxr02      20.1.1           Ok     p                        0
 10.1.3-4       igxr02      20.1.3-4         Ok     v        VAD             2
 10.1.5-6       igxr02      20.1.5-6         Ok     t                        0
 10.1.9-10      igxr02      20.1.9-10        Ok     a24      ADPCM           2
 10.1.11-12     igxr02      20.1.11-12       Ok     c24      VAD/ADPCM       2
 10.1.13-14     igxr02      20.1.13-14       Ok     a32      ADPCM           2
 10.1.15-16     igxr02      20.1.15-16       Ok     c32      VAD/ADPCM       2
 10.1.19-20     igxr02      20.1.19-20       Ok     l16v     VAD/LDCELP      2
 10.2.1         igxr02      20.2.1           Ok     p                        0
 10.2.3-4       igxr02      20.2.3-4         Ok     a24      ADPCM           2
 10.2.5-6       igxr02      20.2.5-6         Ok     a32      ADPCM           2
 10.2.7         igxr02      20.2.7           Ok     l16      LDCELP          2
 10.2.9         igxr02      20.2.9           Ok     l16v     VAD/LDCELP      2

Last Command: dspcons -v
```

Example (IGX)

Display data connections.

dspcons -d

```
igxr03         VT    Cisco          IGX 8430  9.3.2V    Jan. 18 2001 12:30 PST

 Local          Remote      Remote                 Only
 Channel        NodeName    Channel         State  d        Compress   Code COS
 6.1            igxr02      18.1            Ok     1024                7/8  0
 6.2            igxr02      18.2            Ok     256                 7/8  0
 6.3            igxr02      18.3            Ok     256                 7/8  0
 6.4            igxr02      18.4            Ok     128      DFM        7/8  0
 10.1.5-6       igxr02      20.1.5-6        Ok     t                        0
 11.17-24       igxr02      21.17-24        Ok     t                        0
 15.3           igxr01      12.4            Ok     128      DFM        7/8  0
 15.4           igxr01      12.3            Ok     128      DFM        7/8  0
 22.1           igxr02      19.1            Ok     16       DFM        7/8  0
 22.2-8         igxr02      19.2-8          Ok     19.2     DFM        7/8  0


Last Command: dspcons -d
```

Example (IGX)

Display the connection with descriptors.

dspcons

```
sw180          TN    Cisco          IGX 8420  9.3.o1    Nov. 30 2000 09:38 GMT

 Local          Remote      Remote
 Channel        NodeName    Channel         State  Type       Descriptor
 4.1.2.2        sw108       4.3.1.2         Ok     cbr
 4.1.10.1       sw108       4.1.10.1        Ok     cbr
 4.1.20.1       sw108       6.1.20.1        Ok     nrt-vbr
 4.1.20.2       sw108       6.1.20.2        Ok     nrt-vbr
 4.1.20.3       sw108       6.1.20.3        Ok     rt-vbr
 4.2.10.1       sw108       4.3.10.1        Ok     cbr
 5.3.0.11       sw180       5.3.0.50        Ok     cbr
 5.3.0.50       sw180       5.3.0.11        Ok     cbr
 5.3.0.1023     sw53        11.1.0.1023     Ok     abrstd
 5.3.1.1        sw180       5.3.1.1         Ok     cbr
 5.3.10.1       sw108       3.3.10.1        Ok     cbr
 5.3.53.530     sw53        11.1.180.530    Ok     ubr
 14.1.10.1      sw108       3.1.10.1        Ok     rt-vbr

This Command: dspcons +d

Continue direction - Next/Quit? (n/q)
```

Example (IGX)

Display a summary of connections starting with 5.3.

dspcons 5.3

```
sw180          TN    Cisco          IGX 8420  9.3.o1    Nov. 30 2000 09:50 GMT

 Local          Remote      Remote
 Channel        NodeName    Channel         State  Type     Compress   Code COS
 5.3.0.11       sw180       5.3.0.50        Ok     cbr
 5.3.0.50       sw180       5.3.0.11        Ok     cbr
```

```
 5.3.0.1023     sw53        11.1.0.1023     Ok     abrstd                  0
 5.3.1.1        sw180       5.3.1.1         Ok     cbr
 5.3.10.1       sw108       3.3.10.1        Ok     cbr                     10
 5.3.53.530     sw53        11.1.180.530    Ok     ubr                     0
 14.1.10.1      sw108       3.1.10.1        Ok     rt-vbr                  0
 14.1.15.5      sw108       3.1.15.5        Ok     cbr                     0
 14.1.15.6      sw108       3.1.15.6        Ok     cbr                     0
 14.1.15.7      sw108       3.1.15.7        Ok     cbr                     0
 14.1.15.8      sw108       3.1.15.8        Ok     cbr                     0
 14.1.15.9      sw108       3.1.15.9        Ok     cbr                     0
 14.1.15.10     sw108       3.1.15.10       Ok     cbr                     0

This Command: dspcons 5.3

Continue direction - Next/Quit? (n/q)
```

Example (IGX)

Display Frame Relay connections only.

dspcons –f

```
igxr01         TN    Cisco           IGX 8420  9.3.2V    Jan. 18 2001 10:59 PST

 Local          Remote      Remote                 Only
 Channel        NodeName    Channel         State  f        Compress   Code COS
 9.1.1          igxr03      26.1.1          Ok     fr                       0
 9.1.2          igxr03      26.1.2          Ok     fr                       0
 9.1.3          igxr03      26.1.3          Ok     fr                       0
 9.1.4          igxr03      26.1.4          Ok     fr                       0
 9.1.5          igxr03      26.1.5          Ok     fr                       0
 9.1.6          igxr03      26.1.6          Ok     fr                       0
 9.1.7          igxr03      26.1.7          Ok     fr                       0
 9.1.8          igxr03      26.1.8          Ok     fr                       0
 9.1.9          igxr03      26.1.9          Ok     fr                       0
 9.1.10         igxr03      26.1.10         Ok     fr                       0
 9.1.11         igxr03      26.1.11         Ok     fr                       0
 9.1.12         igxr03      26.1.12         Ok     fr                       0
 9.1.13         igxr03      26.1.13         Ok     fr                       0

Last Command: dspcons -f
```

Example (BPX)

Displays all connections starting with 4.1.1.4.

dspcons 4.1.1.4

```
ca19           VT    SuperUser       BPX 15    9.3    Apr. 13 2000 19:44 GMT

 Local           Remote      Remote                             Route
 Channel         NodeName    Channel         State  Type        Avoid COS O
 4.1.1.4         ca20        12.1.1.4        Ok     CBR                 0  R
 4.1.1.5         ca20        12.1.1.5        Ok     rt-VBR              0  R
 4.1.1.6         ca20        12.1.1.6        Ok     ABR                 0  R
 4.1.1.7         ca20        12.1.1.7        Ok     nrt-VBR             0  R


Last Command: dspcons

Next Command:
```

Example (IGX)

Display only VP tunnelling connections on that node.

dspcons -tun

```
sw224          TRM   StrataCom       IGX 8420  9.3    Apr. 13 2000  11:10 PST

 Local          Remote      Remote
 Channel        NodeName    Channel         State  Type     Compress   Code COS
 12.1.1.100     sw224       12.2.1.*        Ok     cbrvp
 12.2.1.*       sw224       12.1.1.100      Ok     cbr



Last Command: dspcons
```

dspconst (display connection state for line connections)

Displays the status of the circuit line(s) and continues to display the status until you press the Delete key. While the display is on the screen, the status is automatically updated. The update frequency is one second for each circuit line being displayed. (For example, if only one line is displayed, the update frequency is once per second, if three circuit lines are displayed, the update frequency is once per three seconds.) Table 4-18 shows the connection type. The **cnfchtp** command must be correctly configured.

Table 4-18 Types of Connection Status

Symbol	Description
+	off-hook
-	on-hook
m	slow modem
M	fast modem
F	FAX
blank	channel not connected

Syntax

dspconst [circuit line]

Parameters

Parameter	Description
[circuit line]	Specifies the number of the line for the channel state display. If you do not specify a line, all upped circuit lines (up to a maximum of eight at once) are displayed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfchtp

Example

Display the condition state for the voice channels on the node.

dspconst

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000   09:55 PST

Connection status display
```

```
+ offhook, - onhook, m slow modem, M fast modem, F FAX
                      1 1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 2 3 3
CLN   1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1

14    +


This Command: dspconst


Hit DEL key to quit:
```

dspctrlrs (display all controllers on a BPX node)

Displays the controllers, such as an PNNI SES controller on a BPX node or an MPLS controller on the IGX.

Displays all the VSI controllers on a BPX node. You can also the **dspnode** command to display the VSI controllers on a BPX node. To add and delete a VSI controller such as a Label Switch Controller to a BPX node, use **addshelf** and **delshelf**.

The **dspctrlrs** command lists:

- controller ID
- partition the controller uses
- trunk or interface to which a controller is attached
- controller type (always an MPLS controller)
- interface type (AAL5, VSI Label Switching) or MGX 8220 interface shelf
- the name of the controller/entity that the controller exists on (that is, node name, equipment name)
- VPI used for the control channel
- VCI range used for the control channel
- IP address of the controller

Syntax

dspctrlrs <slot.port><controller name string><partition_id><controller_id>

Parameters

Parameter	Description
<slot.port>	
<controller name string>	
<partition_id>	
<controller_id>	

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX	Yes	Yes	No	No

Related Commands

addctrlr, cnfctrlr, delctrlr, dspnode, addshelf

Example (IGX)

Display all the VSI Controllers attached to an IGX node.

dspctrlrs

```
arnold         TN    Cisco          IGX 8430  9.3.1p    Aug. 16 2000 17:09 PST

                   VSI Controller Information

CtrlrId   PartId     ControlVC            Intfc    Type     CtrlrIP
                    VPI    VCIRange
   2         1       0      75-105         12.1     MPLS     0.0.0.0
   3         2       0      40-70          12.1     MPLS     0.0.0.0






Last Command: addctrlr 12.1 2 1 0 75

Controller added successfully!
Next Command:
```

Example (BPX)

Display VSI controllers on a BPX node.

dspctrlrs

```
sw174          TRM    StrataCom       BPX 8620    9.3.10   Sep 20 2000 14:31 GMT


                        BPX 8620 VSI controller information

Ctrl Id   Part Id    Trunk   Ctrlr Type    Intfc Type    Name
1        1           2.1     VSI           AAL5         SIMFDR0



Last Command: dspctrlrs
```

dspcurclk (display current clock sources)

Displays the current clock source. The display for **dspcurclk** contains:

- Source Node: the node in the network where the clock source originates.
- Source Line: the type of line used as the clock source and its back slot number (for example, "CLN 15", TRK 22, "EXTERNAL 2", or "INTERNAL").
- Clock Type: the clock type configured for the source clock (primary, secondary, or tertiary). If the source clock for the node is an internal oscillator, no clock type is given.
- Clock Frequency: the received clock frequency as measured by the local BCC.
- Path to Source: the path from the current node to the node of the originating clock source. This includes all intermediate nodes and trunks.

Syntax

dspcurclk

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfclksrc, dspclksrcs

Example

Display the current clock source.

dspcurclk

```
bootzilla          TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 15:33 MST

                             Current Clock Source

Source Node:     gamma
Source Line:     Internal
Clock Type:
Clock Frequency: 1544015

Path to Source:
   bootzilla 9--10gamma



Last Command: dspcurclk


Next Command:
```

dspdnld (display download)

Displays the status of a download to a nodes.

This command displays the status of any software or firmware download operation from Cisco WAN Manager to the node controller card. You should be connected to the node being downloaded either directly or via a virtual terminal connection. The display download command shows:

- download destination—Node currently being downloaded.
- download type—Destination of the downloaded image, standby RAM or active or standby ROM, or firmware.
- download source—Where the image to be downloaded is currently stored, Cisco WAN Manager, an active or standby controller, or a remote node.
- download image—Where the image is located, ROM or RAM.

This command can be used to check how far along the download has progressed. Blocks of data already downloaded appear highlighted; the remaining blocks appear dim. If there was no download initiated when this command was entered, the blocks of data appear as all zeros.

Syntax

dspdnld

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

loadrev, **getfwrev**

Example (IGX)

dspdnld

```
sw83           TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  18:23 PST

dl_dest:  Active CC                    dl_source: Active CC
dl_type:  None                         dl_image:  ROM

30010800  30020800  30030800  30040800  30050800  30060800  30070800  30080800
30090800  300A0800  300B0800  300C0800  300D0800  300E0800  300F0800  30100800
30110800  30120800  30130800  30140800  30150800  30160800  30170800  30180800
30190800  301A0800  301B0800  301C0800  301D0800  301E0800  301F0800  30200800
30210800  30220800  30230800  30240800  30250800  30260800  30270800  30280800
30290800  302A0800  302B0800  302C0800  302D0800  302E0800  302E3E7C

Last Command: dspdnld

Next Command:
```

dspdutl (display data channel utilization)

Displays the percentage of channel utilization of data connections.

This command displays the percentage utilization for the data connections starting at the back slot (bslot) number you specify. All data connections for the node are displayed (maximum of 32).

The percentage is calculated by dividing the number of packets transmitted over the total number of packets allocated to the specified channel. Only transmit packet rates are used. If percentage use exceeds the use configured, the channel appears in reverse video.

Use the clear option to clear all slots. Use **dsputl** to display utilization for voice channels.

Syntax

dspdutl <start bslot> [clear]

Parameters

Parameter	Description
<start bslot>	Specifies the slot where the data card is located.
[clear]	Specifies that all data channel utilization buffers should be cleared after the display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	IGX			No	

Related Commands

dsputl

Example

dspdutl 13

```
sw150          TN    SuperUser       IGX 8420    9.3    Apr. 13 2000   20:07 GMT

Percentage utilization        Last Cleared: Date/Time Not Set         Snapshot
From
Slot  1  2  3  4  5  6  7  8    Slot  1  2  3  4  5  6  7  8
13    6 99 99



Last Command: dspdutl 13


Next Command:
```

dspecparm (display echo canceller parameters)

Displays statistics configured as enabled for a selected CDP echo canceller. This command displays the Integrated Echo Canceller card parameters associated with the specified circuit line. Set these parameters by using the **cnfecparm** command.

Syntax

dspecparm <line>

Parameters

Parameter	Description
<line>	Specifies the circuit line to display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			No	

Related Commands

cnfecparm

Display Fields

Number	Parameter	Description
1	Echo Return Loss High	Maximum ERL required for echo canceller to be enabled.
2	Echo Return Loss Low	Minimum ERL required for echo canceller to be enabled.
3	Tone Disabler Type	Selection of protocol to enable tone disabler.
4	Non-Linear Processing	Selects type of post-canceller signal.
5	NLP Threshold	Threshold to enable non-linear processing.
6	Noise Injection	Determines if noise will be injected when NLP is active.
7	Voice Template	Selection of echo canceller template to use.

Examples

dspecparm 7

```
sw83          TN    SuperUser       IGX 8420    9.3     Apr. 13 2000  18:34 PST

IEC Line 7 Parameters
1  CDP IEC Echo Return Loss High (.1 dBs)  [            60] (D)
2  CDP IEC Echo Return Loss Low  (.1 dBs)  [            30] (D)
```

```
3  CDP IEC Tone Disabler Type              [         G.164]
4  CDP IEC Non-Linear Processing           [Center Clipper]
5  CDP IEC Non-Linear Processing Threshold [            18] (D)
6  CDP IEC Noise Injection                 [       Enabled]
7  CDP IEC Voice Template                  [           USA]

Last Command: dspecparm 7

Next Command:
```

dspeventq (display event queue)

Display information about any configured event queues from the *fail event handler*.

Syntax

dspeventq

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

clreventq

Example

Display the contents of the fail event handler on the current node.

dspeventq

```
swstorm        TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 11:00 GMT

  QUEUE                  LENGTH           THROTTLING
NUM NAMES           MAX   HIGH CURRENT      POINT
 1  Fail_Xid               4      1       14000
 2  Fail_ Q                4      0




Last Command: dspeventq


Next Command:
```

dspfrcbob (display FRC/FRM breakout box)

Displays the current state of the signals on the FRM-2 or FRP-2 physical port. The display is real-time and updated according to the *interval* parameter. The display refreshes at a user-specified interval until either the Delete key is pressed or until a timeout occurs.

This command does not show inputs from the user equipment. It shows inputs from the Port Concentrator module to the FRI-2.

For the Inputs from the User Equipment, the display shows the signals as either On, Off, Active, or Inactive.

For the Outputs to User Equipment, the display shows the signals as either On, Off, Active, or Inactive.

X.21 State Names and Leads for DTC and DCE interfaces are also displayed as ON or OFF.

Syntax

dspfrcbob <slot.port> <interval>

Parameters

Parameter	Description
<slot.port>	Specifies the slot and port of an FRM-2/FRC-2 physical port. Range: 1–4
<interval>	Specifies the screen update interval in seconds. Default: five seconds

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	No	No	IGX			Yes	

Related Commands

dspbob, dspfrcport

Example

Display the signals states for port 2 in slot 5.

dspfrcbob 5.2

```
bootzilla LAN   SuperUser       IGX 8430    9.3    Apr. 13 2000  15:09 GMT

Physical Port:  5.2
Interface:      FTI-X21   DCE
Clocking:       Normal       (512224 bps)

      Inputs from User Equipment              Outputs to User Equipment
 Lead  Pin  State   Lead  Pin  State     Lead  Pin  State   Lead  Pin  State
 C     3/10 On                           I     5/12 On
```

```
 T     2/9  Active                       R     4/11 Active


             X.21 State Name    DTE Lead T  C    DCE Lead R  I
              1 Ready                    1  OFF           1  OFF
             13 S Send Data              D  ON            1  OFF
             13 R Receive Data           1  OFF           D  ON
             13 Data Transfer            D  ON            D  ON

This Command: dspfrcbob 6.2 1


Hit DEL key to quit:
```

dspfrcls (display Frame Relay classes)

Displays the configuration of a Frame Relay class. Network-wide classes are available to provide a shortcut for adding Frame Relay connections.

The */* in the PIR (Peak Information Rate) column means that if a connection is added using this Frame Relay class, the PIR for this connection will be equal to that of the port speed on which the connection was added. For example, if the port speed for port 6.1 = 64 Kbps, and if a connection 6.1.100 is adding using the Frame Relay class, it will have a value of 64 Kbps for the PIR parameter.

Syntax

dspfrcls

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	IGX			No	

Related Commands

addcon, cnffrcls

Example

Display the Frame Relay class configurations. The screen display is the same as that for the **cnffrcls** command.

dspfrcls

```
sw83           TN    SuperUser       IGX 8420    9.3      Apr. 13 2000 13:43 GMT

                        Frame Relay Connection Classes

 #    MIR       CIR      VC Q Depth       PIR      Cmax     ECN QThresh
 1  9.6/9.6   9.6/9.6  65535/65535       */*      10/10    65535/65535
   QIR:  9.6/9.6  FST: n % Util: 100/100 Description: "Default 9.6"
 2 19.2/19.2 19.2/19.2 65535/65535       */*      10/10    65535/65535
   QIR: 19.2/19.2 FST: n % Util: 100/100 Description: "Default 19.2"
 3   16/16     16/16   65535/65535       */*      10/10    65535/65535
   QIR:   16/16   FST: n % Util: 100/100 Description: "Default 16"
 4   32/32     32/32   65535/65535       */*      10/10    65535/65535
   QIR:   32/32   FST: n % Util: 100/100 Description: "Default 32"
 5   56/56     56/56   65535/65535       */*      10/10    65535/65535
   QIR:   56/56   FST: n % Util: 100/100 Description: "Default 56"


This Command: dspfrcls


Continue?
```

dspfrcport (display FRC-2/FRM-2 port configuration)

Displays physical port configuration for FRM-2 or FRP-2 ports connected to a Port Concentrator.

The screen displayed with this command includes fields for standard Frame Relay ports on the FRM card. Only the fields in the following table have meaning for a Port Concentrator.

Syntax

dspfrcport <slot.port> <interval>

Parameters

Parameter	Description
slot.port	Specifies the physical slot and port of the Frame Relay card set. Range: 1–4
interval	Specifies the screen update interval in seconds. Default: five seconds

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			No	

Related Commands

dspfrcport, dspbob

Display Fields

Field	Meaning
Interface	Always *FRI-X.21 DCE* for PCS ports.
Clocking	Always *Normal* for PCS ports.
Port Type	Specifies port type, always FR (Frame Relay) for PCS ports.
Port ID	Specifies the DLCI for the port, always 1022 for PCS ports.
Port Queue Depth	Specifies the maximum bytes queued for transmission from the FRM-2 or FRP-2 port. Range: 0–65535 Default: 65535

Field	Meaning
DE Threshold	Specifies the port depth queue above which frames with the Discard Eligibility bit set will be discarded. Range: 0–100 percent, Default: 100 percent 100 percent effectively disables DE for the port.
Signaling Protocol	For Frame Relay ports, specifies LMI operation mode. For PCS ports, this is set to *None*.
Measured Rx Clock	The actual speed of received data as clocked by the FRM-2 or FRP-2. Under normal operation, this should always display the fixed concentrated link speed of 512 Kbps. Clock speed is measured by the FRM-2 or FRP-2 once per minute.
Concentrated Link Util	Current utilization percentage of the concentrated link. Utilization is defined as the percentage of the fixed link speed (512K) used for data. Because the maximum allowable aggregate for each link's 11 ports is 448 Kbps, 88 percent is the maximum value for this field.
Min Flags / Frames	Specifies the minimum number of flags per frame. All values greater than zero are valid. Default: 1
OAM Pkt Threshold	Specifies the OAM FastPackets used within the local node to transmit the NNI status from the remote network. Range: 0–15 packets. Default: 3 A 0 disables this function.

Example

Display the configuration of port 3.1.

dspfrcport 3.1

```
tecate         LAN   SuperUser       IGX 8420   9.2     Apr. 13 2000  10:25 PST
Physical Port:       3.1           [ACTIVE]
Interface:  FRI-X.21 DCE                       Configured Clock:   512 Kbps
Clocking:   Normal                            Measured Rx Clock:  512 Kbps
Port Type                    FR       Min Flags / Frames           1
Port ID                    1022
Port Queue Depth          65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold       65535       T391 Link Intg Timer         6 sec
DE Threshold                100 %     N391 Full Status Poll       10 cyl
Signalling Protocol        None       ForeSight (CLLM)            No
Asynchronous Status          No       CLLM Status Tx Timer         0 msec
T392 Polling Verif Timer     15       IDE to DE Mapping          Yes
N392 Error Threshold          3       Interface Control Template
N393 Monitored Events Count   4          Lead I
Communicate Priority         No          State   ON
Upper/Lower RNR Thresh  75%/ 25% Concentrated Link Util 88%


Last Command: dspfrcport 3.1

Next Command:
```

dspfwrev (display firmware revision)

Displays the status of card firmware revision image loaded in the controller card's RAM.

This command displays the revision level and an indication of the length of the firmware in the controller card. It might require two screens to display all the parameters (see example).

You can use this command while firmware is downloading to a node to get an idea of how far along the downloading process has progressed. The blocks already downloaded appear normal. Blocks that are yet to be downloaded appear shaded.

If no **getfwrev** command was issued, nothing displays. If "Configuration image present" displays, use the **loadcnf clear** command to clear this status.

Syntax

dspfwrev

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

getfwrev, **burnfwrev**

Example

dspfwrev

```
gamma            TRM       SuperUser        Rev:  9.3  Apr. 13 2000  14:28 PDT

Firmware        Size        Status
F.D.A           256 K       Complete

File            Address     Length      CRC           Burn Address
File            Address     Length      CRC           Burn Address
1               800800      410         22996DDA
1               800800      410         22996DDA
3               805E60      480         85CB29EA
4               80A630      70          57A938AE
4               80A630      70          57A938AE
6               810000      10000       338E45F6
7               820000      4400        95990113
8               835000      1810        875771B2
9               8368A0      15D0        4C597B97


This Command: dspfwrev


Continue?
```

```
gamma            TRM       SuperUser        Rev:  9.3  Apr. 13 2000  14:29 PDT

Firmware         Size        Status
F.D.A            256 K       Complete

File             Address     Length      CRC           Burn Address
10               838000      20F0        0F4898D2
11               83A100      1E20        175F4B39
12               83C000      2FC0        F39B0302
13               83F000      1B0         E755FE4E
14               83FFFE      2           A1F4726D



Last Command: dspfwrev


Next Command:
```

dsphitless (display statistical history of hitless rebuilds)

Displays the statistical history of hitless rebuilds that may have occurred within the configured thresholding period. (This thresholding period is described in the **cnfnodeparm** command definition, under Index #42, Maximum Hitless Rebuild Count, and Index #43, Hitless Counter Reset Time parameters.)

Hitless rebuild is a modified control software restart on the processor card that prevents a full configuration rebuild of the node.

Normally, if it is necessary to restart the control software, and a switchover is not possible, then the node does a full rebuild. A node with many connections may take two hours to restore itself fully to the network. In the meantime, communications are broken with some nodes and some network connections are not routed or are not on their preferred routes.

The Hitless Rebuild feature provides the ability for a node to effectively rebuild without affecting user traffic. Hitless rebuild avoids resetting the line or trunk cards, or interfering with user traffic in any way during the control software restart. During most software restarts, the interface cards are not reset to preserve their configurations. Even if the standby processor card is failed or absent and the active card must abort, a full rebuild is avoided. This substantially decreases the time it takes for the BPX software to settle into its normal operating state after a rebuild.

Certain databases containing configuration data (such as current and preferred routes) are stored in BRAM (battery-backed RAM) so that they survive system initializations and power outages. A statistical history of hitless rebuilds is also stored in BRAM so that this history survives a full rebuild. Two records of hitless rebuilds are maintained: one contains information within the current thresholding window. When a full rebuild occurs, the hitless rebuild statistics from the current window are moved to a saved area, and a new current window begins. Optional parameters allow you to display either a summary screen or a detailed screen giving the history of hitless rebuilds. There are two versions of each screen, one for the current window and one for the saved previous window.

The Hitless Rebuild feature is internal to the switch software on a node. If there is a problem with the node, switch software takes care of it; no user intervention is needed.

As part of the Hitless Rebuild feature, the Autobus diagnostic feature on the node is disabled because it requires the node to undergo a series of full rebuilds causing the node to be out of the network for a long duration of time.

Syntax

dsphitless [-d] [-p] [-c] [-s]

Parameters

Parameter	Description
-d	Detailed screen. Default: summary screen
-p	Previous window. Default: Active window
-c	Clear statistics for current window
-s	Standby statistics

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	No	No	BPX, IGX			No	

Related Commands

cnfnodeparm, resetcd, switchcc, dspcds, dsplog

Example

dsphitless

```
sw99      TN     SuperUser     BPX 8620     9.3     Apr. 13 2000 14:59 GMT

  current hitless rebuild count:       7
  high water mark:                     9
  cnf max before full rebuild:         10
  cnf reset timer:                     24 hours
  most recent hitless rebuild:         08/27/98 14:27:09
  oldest hitless still in count:       08/27/98 11:42:18
  Hitless stats cleared:               07/29/98 12:00:05
  Action when cnf max is exceeded:     full rebuild




Last Command: dsphitless

Next Command:
```

Example

dsphitless d p

```
sw99        TN      SuperUser        BPX 15    9.3      Apr. 13 2000 14:59 GMT


1   04/07/98 14:27:09   software abort 1000003
2   04/07/98 13:58:46   software abort 1000003
3   04/07/98 13:32:24   software abort 1000003
4   04/07/98 12:57:36   software abort 1000003
5   04/07/98 12:28:29   software abort 1000003
6   04/07/98 12:07:16   software abort 1000003
7   04/07/98 11:42:18   software abort 1000003




Last Command: dsphitless d p

Next Command:
```

Software Revisions and Interoperability

The Hitless Rebuild feature requires Release 9.2 or later switch software, and works on both the BPX and IGX platforms. This feature is local to a node. Hitless rebuild functions correctly on nodes running software that contains the feature, even in a network with mixed software releases, some of which do not have the feature.

Hitless rebuild will operate during upgrades, but will not operate during a downgrade. If a failure occurs that would normally result in a controller card switchover, but the switchover needs to be suppressed due to the different software releases running on the two processors, then a hitless rebuild will be done instead.

If a backoff must be done from an upgrade, then a full rebuild will occur. A *backoff* refers to the state where the new switch software revision has been loaded as the secondary image, and the decision is made to go back to the original revision.

There are no operational problems if, during an upgrade, the new release of software has the Hitless Rebuild feature and the older release does not. Hitless Rebuild will just operate on the processor card with the newer release.

Most aspects of a full rebuild and a hitless rebuild function the same way. For example, initial synchronization between the switch and Cisco WAN Manager and the loss of statistics information will remain the same.

Safe Switchover

Sometimes shortly after a switchover, the new active processor card will run some diagnostics and detect a failure, causing it to switch back to the original active card. The Hitless Rebuild feature improves this situation under most conditions. Following any processor card switchover, the new standby will rebuild, preserving the key databases needed for a hitless rebuild (11 seconds). When database updates can start, the standby will rebuild again doing a normal standby rebuild (11 seconds). If there is a failure on the new active card that causes it to switch back before updates can start, the card taking over will do a hitless rebuild. If the active processor card fails while still updating its standby, it will perform a hitless rebuild.

Action Taken If the Control Card Fails

During any active control card failure, a decision must be made about the type of initialization to undertake. Table 4-19 shows the possible conditions, and the corresponding actions.

Table 4-19 What Happens when a Control Card Restarts or Aborts

Reason	Standby Ready	Standby Updating	Standby Not Ready, Not Updating	Standby State Unknown	Standby Does Not Exist	Standby in Upgrade	Standby State Not Applicable
Aborts (examples include: • bad logical ptr • bad nib DB • bad topology • memory allocs • out of buffers • bad primary revision	Switch	Hitless	Hitless	Hitless	Hitless	Hitless	N/A
Abort (CC mastership error. Active now is standby card)	N/A	N/A	N/A	N/A	N/A	N/A	Full standby rebuild (DBs are corrupted)
Exceptions • Write Protect • Address Error • Trap Error • Bus Unknown	Switch	Hitless	Hitless	Hitless	Hitless	Hitless	N/A
Exceptions • Parity Error	Switch	Hitless	Hitless	Hitless	Hitless	Hitless	N/A
Exceptions • Spurious Int	Switch	Hitless	Hitless	Hitless	Hitless	Hitless	N/A
Bad Image CRC	Switch	Hitless	Hitless	Hitless	Hitless	Hitless	N/A
WatchDog Time-out	Switch	Hitless	Hitless	Hitless	Hitless	Hitless	N/A
User Command • **clrallcnf** • **clrcnf** • **resetcd H**	N/A	N/A	N/A	N/A	N/A	N/A	Full rebuild
Bad CommBus	N/A	N/A	N/A	N/A	N/A	N/A	Degrade Mode
Bus Diagnostics (destructive)	N/A	N/A	N/A	N/A	N/A	N/A	Full rebuild

Table 4-19 What Happens when a Control Card Restarts or Aborts (continued)

Reason	Standby Ready	Standby Updating	Standby Not Ready, Not Updating	Standby State Unknown	Standby Does Not Exist	Standby in Upgrade	Standby State Not Applicable
configuration Changes • **runcnf**	N/A	N/A	N/A	N/A	N/A	N/A	Full rebuild
Bad BCC card	Switch	Ignore	Ignore	Ignore	Ignore	Ignore	N/A
Bad CrossPoint	Ignore	Ignore	Ignore	Ignore	Ignore	Ignore	Ignore
Preparation for revision change (happens only on the standby card)	N/A	N/A	N/A	N/A	N/A	N/A	Full standby rebuild
Revision Switch	Switch	N/A	N/A	N/A	N/A	N/A	Hitless rebuild on standby
Primary Revision Change	N/A	N/A	N/A	N/A	N/A	N/A	Full rebuild on either card
Starting the updates to the standby card—message is sent by the active card	N/A	N/A	N/A	N/A	N/A	N/A	Full rebuild on the standby card
User **switchcc** (hitless on standby card)	Switch	Switch • Full rebuild on newly active • Hitless rebuild on standby	Switch • Hitless rebuild on standby • Active rebuild depends on rebuild flag state	N/A	N/A	N/A	Hitless rebuild on the standby card

When a controller card switchover to the new card occurs, the new standby card (unless shown differently in Table 4-19) performs a hitless rebuild. These databases are maintained, allowing the card to take over without affecting traffic until the updates are started. After the updates have started, the new standby card does a full rebuild to get ready to receive the updates.

When the threshold is exceeded and the node is to enter degraded mode, a hitless rebuild occurs first. After the hitless rebuild completes the node enters degraded mode.

How Memory is Managed During Hitless Rebuilds

Full rebuilds result in the complete initialization of all RAM memory regions. Before the Hitless Rebuild feature, there was no need to save any databases in RAM through an initialization. All databases were rebuilt from configuration stored in BRAM. For a rebuild to be hitless, databases containing certain types of critical information related to trunks, connections, and so on, must survive intact in RAM.

Configuration data that must survive a hitless rebuild is moved to regions where it remains intact. These “hitless regions” regions are managed by a memory management algorithm.

When logged into a node, you can see the changes by using the Profiler. The commands **dspprf** and **dspprfhist** show some statistics related to memory usage. Refer to the service commands for descriptions of **dspprf** and **dspprfhist** commands. You must have service-level privileges to use the debug, or service-level commands.

Errors and Alarm Handling

The Hitless Rebuild feature does not cause many changes to errors or alarms. However, most of the conditions that cause a hitless rebuild will themselves generate errors or alarms. There are no changes to these.

The Hitless Rebuild feature introduces two new events, indicating the end of a hitless rebuild or a full rebuild. These will be logged into the local event log on the node (which you can view with **dsplog**).

Corresponding Robust Card Alarm messages are sent from the node to Cisco WAN Manager, and these generate traps that are sent to Cisco WAN Manager’s RTM proxy. The traps make the information available to external network management systems that register for traps on Cisco WAN Manager.

As always, the Robust Alarm mechanism does not guarantee that all alarm state transitions will result in messages being sent to Cisco WAN Manager. The mechanism guarantees that “current state” information is sent; however, when multiple transitions occur close together, only the last one is guaranteed. During a rebuild, a few changes may occur quickly.

The Robust Card Alarm messages sent to Cisco WAN Manager have the following values:

- Trap Type: The current state of the card. (Fail, Active, Down, and so on)
- Alarm Class: (1) Info
- Reason: (3107) BCC Completed hitless rebuild.
- (3108) BCC Completed full rebuild. This Robust Card Alarm messages will result in Cisco WAN Manager traps of the following type:
- TrapType: (20004) Card Alarm
- TrapReason: (3107) BCC Completed hitless rebuild
- (3108) BCC Completed full rebuild

Consistency Checking

When a hitless rebuild is completed, the node goes through consistency checks to verify the databases. Some of these include topology checking, and verification of LCONS and VIA LCONS to have valid end points.

During normal switch operation, or during normal switchovers into hot standby processor cards, the Hitless Rebuild feature should have no impact on the performance of switch software.

Normal switchcc

The following chart shows the steps for a normal **switchcc**. The standby is ready (in Standby state). Up to step 4 the new standby (card 7) can do a hitless rebuild if necessary. A standby card rebuild is not the same as an active card rebuild. This is the same for both normal and hitless rebuilds.

The normal abort case is almost identical to this case. In step 1, the abort causes an automatic switch. The remaining steps are the same.

	Card 7	Card 8
Step 1	Active BCC.	Standby BCC—Ready
Step 2	User issues **switchcc**.	
Step 3	Does Standby Hitless Rebuild, not ready to receive updates, can do Hitless Rebuild.	Activates itself.
Step 4		Kicks off standby updates. Can now do a Hitless Rebuild.
Step 5	Does normal standby rebuild.	Waits for standby.
Step 6	Enters normal standby mode, ready to receive updates, cannot do Hitless Rebuild.	
Step 7		Starts standby updates and network updates.

Abort—Standby not Ready

All the action is on the part of the active card (see Table 4-20).

Table 4-20 What Happens During an Abort, and Standby Card is Not Ready

	Card 7	Card 8
0	Active BCC.	Standby BCC—Not Ready
1	Abort occurs. For example, the card ran out of memory.	
2	Does active hitless rebuild.	
3	Tries to start standby updates.	
4	Starts network updates.	

CommBus Failure

In the case of a CommBus failure, the active card is no longer certain of the state of any other card. In particular, it can make no assumptions about the state of the standby BCC.

	Card 7	Card 8
0	Active BCC	Standby BCC—Any
1	Commbus failure detected.	
2	Enter Degraded Mode if feature is enabled; otherwise, a full rebuild will occur	

dspict (display interface control template)

Displays interface control template information for data channels and Frame Relay ports:

- The specified channel.
- The type of template: a, c, l, n, or f.
- The associated output leads and their status:

  ON.
  OFF.
  Following a local input.
  Following a remote input.

For Frame Relay ports, the entire port configuration screen is displayed (see **dspfrport** command). Any RTS to CTS delay is also shown.

Syntax

dspict <port> <template>

Parameters

Parameter	Description
<port>	Specifies the physical slot and port of the Frame Relay card set.
<template>	Specifies which control template to display for the channel. Three templates are available for data channels and one (a) for Frame Relay ports. You also specify which end of the circuit. a = Active control template (normal operation). The only choice for a Frame Relay port. c = Conditioned control template (when connection fails). l = Looped control template (with local or remote loopback). n = Near. f = Far.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	IGX			No	

Related Commands

cnfict, cpyict

Example

Display the active interface control template for channel 25.1.

dspict 25.1 a

```
beta           TRM   YourID:1        IGX32    9.3    Apr. 13 2000 17:33 MST

Data Channel:      25.1
Interface:         RS232   DCE
Clocking:          Normal

            Interface Control Template for Connection while ACTIVE

 Lead    Output Value                    Lead    Output Value
 RI      OFF                             DSR     ON
 CTS     ON                              SRxD    ON
 DCR     OFF                             DCD     ON
 SCTS    ON                              SDCD    ON
 SQ      ON

Last Command: dspict 25.1 a

Next Command:
```

Example

Display the Frame Relay data channel 9.1 interface control template.

dspict 9.1 a

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:26 PST

Port:       9.1               [ACTIVE  ]
Interface:  FRI-V35 DTE                       Configured Clock:   256 Kbps
Clocking:   Normal                            Measured Rx Clock:    0 Kbps
Port ID                        7
Port Queue Depth          65535      OAM Pkt Threshold           3 pkts
ECN Queue Threshold       65535      T391 Link Intg Timer        6 sec
DE Threshold                100 %    N391 Full Status Poll      10 cyl
Signalling Protocol        None      ForeSight (CLLM)           No
Asynchronous Status          No      CLLM Status Tx Timer        0 msec
T392 Polling Verif Timer     15      Interface Control Template
N392 Error Threshold          3         Lead       State
N393 Monitored Events Count   4          RTS        ON
Communicate Priority         No          DTR        ON
Upper/Lower RNR Thresh  75%/ 25%
Min Flags / Frames           1

Last Command: dspict 9.1 a

Next Command:
```

dspjob (display job)

Displays information about a job:

- Job number and description
- Next execution date and time
- Status
- The time interval between successive executions of the job
- The results of the last execution of the job

This command requires at least the same privilege level as the person who created the job.

Syntax

dspjob <job_number>

Parameters

Parameter	Description
job number	Specifies the the number of the job to display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

addjob, deljob, dspjob

Example (IGX)

Display job number 2.

dspjob 2

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 14:17 PST

                                  Job 1   test
Last Execution Results: None                    Status: Idle
Next Execution Time: 08/17/97 20:20:30          Interval: 1 days

 1: prtlog
   - Failure Reaction: Repeat 2 Times and Abort        Exec. Results: None


Last Command: dspjob 1

Next Command:
```

dspjobs (display jobs)

Displays information on each job:

- Job number
- Job description
- Next execution date and time
- Execution interval between jobs
- Access Group: The privilege level required to run or display the job

To see details of an individual job, use the **dspjob** command.

Syntax

dspjobs

Related Commands

addjob, deljob, dspjob

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Example (IGX)

Display a summary of all jobs stored at the node.

dspjobs

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 14:16 PST

Job   Description       Next Execution      Status     Interval    Access Group
1     test              08/17/97 20:20:30   Idle       1 days      Group 1







Last Command: dspjobs


Next Command:
```

dsplancnf (display LAN interface connection)

Displays the addresses and configuration for the LAN Ethernet. The **dsplancnf** screen displays configuration fields showing the type of network capability and if it is ready or unavailable.

Syntax

dsplancnf

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	No	No	BPX, IGX			No	

Related Commands

cnflan (SuperUser)

Display Fields

Field	Description
<IPAdd>	Specifies the Internet address of the node used in the TCP/IP protocol.
<IP subnet mask>	Specifies a 32-bit mask that contains information about the bit lengths of the subnet ID and host ID address fields. The format of this field uses 1s for the subnet ID field and 0s for the host ID address field as defined in the TCP/IP protocol. This mask denotes both subnet ID and host ID fields as 8-bit fields. Default (decimal notation): 255 255 255.0
<Max. LAN Transmit Unit>	BPX only: typical amount is 1500 bytes.
<TCPServicePort>	Specifies the node's service point used by the transmission control protocol (TCP).
<GatewayIPAddr>	Specifies the Internet gateway address.
Type	List of socket types (for example, TCP, UDP, and SNMP) that are open (in READY state) for communication between the node and the LAN. In the system response shown, the TCP socket is no longer used by switch software, indicated by the UNAVAIL state. The TimeHndlr (or Daytime) socket is related to TFTP. It lets an external node retrieve the day and time from the switch. The Tunneling socket is used for communication between a BPX and an INS (Intelligent Network Server).
State	State of communication socket between the node and the LAN. READY indicates that the socket is open for communication between the node and the LAN. UNAVAIL indicates that the socket is not available for communication between the node and the LAN.

Example (BPX)

Display the LAN configuration for the current node.

dsplancnf

```
pubsbpx1       TN    SuperUser       BPX 8620    9.3    Apr. 13 2000   13:23 GMT

Active IP Address:                     204.179.31.104
IP Subnet Mask:                        255.255.255.0
IP Service Port:                       5120
Default Gateway IP Address:            None
Maximum LAN Transmit Unit:             1500
Ethernet Address:                      00.C0.43.00.21.F0

Type      State          Type      State
LAN       READY          TUNL      READY
TCP       UNAVAIL
UDP       READY
Telnet    READY
TFTP      READY
TimeHdlr  READY
SNMP      READY

Last Command: dsplancnf
```

dsplanip (display LAN IP addresses)

Displays the LAN IP address and subnet mask of the local node and the LAN IP address of all other nodes reachable from a given node in the network, including feeder nodes. Feeder nodes are displayed with a blank node name, and they appear immediately beneath the hub node to which they are attached.

Similar to the **dspnwip** command, the **dsplanip** command supports Out-of-Band network management which enables management traffic to be sent over IP to the switches' LAN Ethernet interface, thereby reducing the load on trunk bandwidth and node processor times.

Service-Affecting Alarms and Out-of-Band Network Management Features

The service-affecting alarms feature enhances reporting of switch alarm conditions to Cisco WAN Manager, and to a customer network management system (NMS) through the Cisco WAN Manager RTM Proxy. Robust Alarm messages are generated from existing switch events that could affect service.

Out-of-Band network management enables management traffic to be sent over IP to switches' LAN Ethernet interface to Cisco WAN Manager, thereby reducing the load on trunk bandwidth and node processor times. For WAN Manager to be able to manage a switch out of band, these things must be done:

- To support out-of-band management feature and service-affecting alarms, SV+ must be running Release 9.2 or higher.
- The LAN IP address of the switch must be configured.
- LAN Ethernet access must be provided from the Cisco WAN Manager workstation to the switches' LAN port.
- You may use only the "lanip" option for Cisco WAN Manager, which enables out-of-band management, if all switch nodes in the network are running switch software Release 9.2 or higher.
- For an MGX 8220 (AXIS) interface shelf to send LAN IP address changes to a routing node, it must be running MGX 8220 release 4.0.20 or higher.

To change the LAN IP address of a routing node, use the **cnflan** command. The Out-of-Band Network Management software detects a change to the LAN IP address on a routing or feeder note and forwards an update message to Cisco WAN Manager.

The service-affecting alarms and out-of-band network management features in Release 9.2 can interoperate in mixed networks of one or more nodes running switch software Release 9.1 or 8.5.

Syntax

dsplanip

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

dspphyslns, dsptrks

Example (BPX)

Display the LAN IP address of local node, and all other reachable nodes in network.

dsplanip

```
sw248      TN      StrataCom       BPX 15 9.3     Apr. 13 2000 18:28 GMT

Active LAN IP Address:           172.29.9.155
Active LAN IP Subnet Mask:       255.255.255.0

NodeName      LAN IP Address
sw252         172.29.9.159
              172.29.9.175
sw263         172.29.9.167
              172.29.9.163
sw8           172.29.9.124
sw248         172.29.9.155
              172.29.9.134
              172.29.9.173


Last Command: dsplanip
```

dsplm (display load model table)

Verify target node load models by issuing the **chklm** and **dsplm** commands. These commands compare sections of the current node's database with all other nodes in the network. These commands are useful before a software upgrade since ideally, the network should be alarm free at the time of the software upgrade. If this is not possible, at least the reason for all major alarms should be identified and noted, and then suitable reconfiguration should be made in order to remove the alarm.

Issue the **chklm** command on every node in the network sequentially. When complete, return to the first node and run the **dsplm** command. The P in the output stands for pass, which indicates that everything is in order. Any failures are indicated by an F in the **dsplm** command output screen.

Note For software Releases above 8.4, the **dsplm** command will give incorrect results if the network topology has recently changed.

Syntax

dsplm

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
Super group	Yes	No	BPX, IGX	No	Yes	No	No

Related Commands

chklm

Display Fields

Field	Description
Nd	Node numbers of the nodes in the network.
T	Trunk database.
L	Load model.
C	Connection identifier database.
LC	Logical Connection database.
V	Virtual path connection database.

GL	Gateway logical connection database
PB	Priority bumping band load database. PB displays the following values: P = Pass F = Fail "-" = priority bumping feature not enabled

Example (BPX)

Display the load mode; table.

dsplm

```
sw217          TN    Cisco           BPX 8620  9.3.x3    June 8 2001  07:49 GMT

Nd  T L C LC V GL PB
1   P P P P  P P  -
3   P P P P  P P  -


Last Command: dsplm
```

dsplmistats (display Annex G LMI statistics)

Displays Annex G LMI statistics for the trunk that connects an IGX/AF interface shelf to the BPX core switch shelf. To execute this command from the access shelf itself, you must Telnet to the IGX/AF. The **dsplmistats** command provides information to help you analyze problems that might arise while you set up a tiered network.

Syntax

On an access shelf:
dsplmistats

On an IGX node:
dsplmistats <trunk_number>

On a BPX node:
dsplmistats <slot.port>[.vport] [clear]

Parameters

Parameter	Description
slot.port[.vport]	Specifies the card slot, physical, and optional virtual port number (BXM only). Virtual ports are not available for ASI or UXM cards.
clear	On a BPX node only, the optional *clear* argument clears the current statistics after **dsplmistats** executes.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX/AF, BPX			No	

Example (IGX/AF)

Display the LMI statistics for the trunk attached to the hub.

dsplmistats

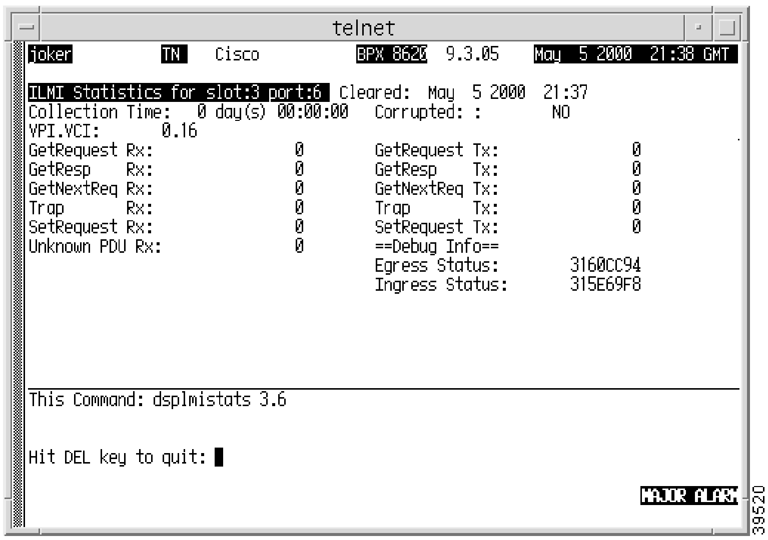
```
batman               SuperUser       IGX/AF    9.3      Apr. 13 2000 18:04 PST

              Annex G  LMI Statistics for slot:1 port:1
VPI.VCI:       0.0                    Lmi enabled         Lmi polling enabled
Invalid Pdu      Rx:           0       Status Polling Timer (T396)     :    10
Invalid Pdu Len  Rx:           0       Status Enquiry Timer (T393)     :    10
Unknown Pdu Type Rx:           0       Max Status Enquiry Retry (N394):     5
Unknown IE Type  Rx:           0       Update Status Timer (T394)      :    10
Bad Transaction  Rx:           0       Max Update Status Retry (N395) :     5
Status           Rx:        1384       Spc Polling Timer               :     3
Status Enq       Tx:        1384       Spc Retry Timer                 :     0
Status Enq       Rx:        1384       Spc Retry Counter               :     1
Status           Tx:        1384       Node Status Retry Timer         :     0
Status Ack       Rx:           8       Node Status Retry Counter       :     0
```

```
Update Status    Tx:          8       Node Status Polling Timer      :     2
Update Status    Rx:          8
Status Ack       Tx:          8

Last Command: dsplmistats


Next Command:
```

Example (BXM on BPX)

Display LMI statistics for port 6 on the BXM card in slot 3.

dsplmistats 3.6



Functional Description of LMI Statistics for BXM Card

An internal firmware command provides the capability for the controller card to fetch ILMI/LMI statistics on ILMI/LMI sessions on the BXM card. The BXM must be firmware-capable. Refer to LMI Statistics and Descriptions in Table 4-21 for **dsplmistats** (ATM) for BXM Card.

Table 4-21 LMI Statistics and Descriptions for dsplmistats (ATM) for BXM Card

Object ID	Object Name	Range/Values	Default	Description
01	Message Tag	Byte 0–3 : Tag ID Byte 4–7 : IP Address	0	Identifier and source IP address sent with CommBus message. Both will be copied into the response, if any is to be sent.
02	Port Number	1–12	R	Identifies the target port. If multiple port numbers are sent during the operation, then each port number object terminates the configuration for the string of objects for the previous port number.
03	Virtual Port #	1–255	R	Identifies the target virtual port.

Table 4-21 LMI Statistics and Descriptions for dsplmistats (ATM) for BXM Card (continued)

Object ID	Object Name	Range/Values	Default	Description
04	Status Sync	0 : Clear 1 : Get Status	R	Sync up ingress status information to bcc.
05	Session Status	0 : Okay 1 : Failed	0	Indicates whether or not the ILMI/LMI session on this logical interface is failed.
06	BPX/Feeder IP Address	$0–2^{32}$-1	0	Valid for feeder connections. Indicates the IP address of the feeder.
07	BPX/Feeder Name	Byte 0..8 : String	N/A	Valid for feeder connections. Indicates the name of the feeder.
08	BPX/Feeder Serial Number	Byte 0..8 : String	N/A	Valid for feeder connections. Indicates the serial number of the feeder.
09	BPX/Feeder Alarm Status	0 : Clear 1 : Minor 2 : Major	N/A	Valid for feeder connections. Indicates the alarm status of the feeder.
0A	BPX/Feeder Line Rate	$0–2^{32}$-1	N/A	Valid for feeder connections. Indicates the line receive rate of the feeder.
0B	BPX/Feeder LAN IP Address	$0–2^{32}$-1	0	Valid for feeder connections. Indications the LAN IP address of the feeder.
0C-0F	RESERVED			
10	ILMI Number of Get Req Rx'd	$0–2^{32}$-1	N/A	ILMI number of Get Requests received.
11	ILMI No. of Get Next Req Rx'd	$0–2^{32}$-1	N/A	ILMI number of Get Next Requests received.
12	ILMI No. of Get Next Req Tx'd	$0–2^{32}$-1	N/A	ILMI number of Get Next Requests transmitted.
13	ILMI No. of Set Req Rx'd	$0–2^{32}$-1	N/A	ILMI number of Set Requests received.
14	ILMI No. of Traps Rx'd	$0–2^{32}$-1	N/A	ILMI number of traps received.
15	ILMI No. of Get Resp. Rx'd	$0–2^{32}$-1	N/A	ILMI number of Get Responses received.
16	ILMI No. of Get Req. Tx'd	$0–2^{32}$-1	N/A	ILMI number of Get Requests transmitted.
17	ILMI No. of Get Resp. Tx'd	$0–2^{32}$-1	N/A	ILMI number of Get Responses transmitted.
18	ILMI No. of Traps Tx'd	$0–2^{32}$-1	N/A	ILMI number of traps transmitted.
19	ILMI Unknown PDUs Rx'd	$0–2^{32}$-1	N/A	ILMI number of unknown PDUs received.
1A-1F	RESERVED			

Table 4-21 LMI Statistics and Descriptions for dsplmistats (ATM) for BXM Card (continued)

Object ID	Object Name	Range/Values	Default	Description
20	LMI No. of Status Tx'd	$0–2^{32}-1$	N/A	LMI number of Status transmitted.
21	LMI No. Update Status Tx'd	$0–2^{32}-1$	N/A	LMI number of Update Status transmitted.
22	LMI No. of Status Ack. Tx'd	$0–2^{32}-1$	N/A	LMI number of StatusAck. transmitted.
23	LMI No. of Status Enq. Rx'd	$0–2^{32}-1$	N/A	LMI number of Status Enquiries received.
24	LMI No. of Status Enq. Tx'd	$0–2^{32}-1$	N/A	LMI number of Status Enquiries transmitted.
25	LMI No. of Status Rx'd	$0–2^{32}-1$	N/A	LMI number of Status received.
26	LMI No. Update Status Rx'd	$0–2^{32}-1$	N/A	LMI number of Update Status received.
27	LMI No. of Status Ack. Rx'd	$0–2^{32}-1$	N/A	LMI number of StatusAck. received.
28	LMI No. of Invalid PDU Rx'd	$0–2^{32}-1$	N/A	LMI number of invalid PDUs received.
29	LMI No. of Invalid PDU Len. Rx'd	$0–2^{32}-1$	N/A	LMI number of invalid PDU lengths received.
2A	LMI No. Unknown PDUs Rx'd	$0–2^{32}-1$	N/A	LMI number of unknown PDUs received.
2B	LMI No. of Invalid IEs Rx'd	$0–2^{32}-1$	N/A	LMI number of Information Elements received.
2C	LMI No. of Invalid T.ID Rx'd	$0–2^{32}-1$	N/A	LMI number of invalid Transaction IDs received.

dsplnalmcnf (display line alarm configuration)

Displays alarm configuration by alarm type. Each alarm type includes:

- The minor alarm threshold
- The minor alarm time
- The minor alarm clear time
- The major alarm threshold
- The major alarm time
- The major alarm clear time

The alarm threshold, alarm time, and alarm are set by using the **cnflnalm** command.

Syntax

dsplnalmcnf

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnflnalm, dspclnerrs, dsptrkerrs

Example

View the line alarm threshold configured for a node.

dsplnalmcnf

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:51 PST

                              Line Alarm Configuration

                        Minor                                   Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  1) Bpv        10E-7  10 min       3 min         10E-3   10 sec      10 sec
  2) Fs           .01%  10 min       3 min           .1%   10 sec      10 sec
  3) Oof       .0001%  10 min       3 min          .01%   10 sec      10 sec
  4) Vpd           2%   5 min       3 min            5%   60 sec      10 sec
  5) Tsdp        .01%   5 min       3 min           .1%   60 sec      10 sec
  6) Ntsdp       .01%   5 min       3 min           .1%   60 sec      10 sec
  7) Pkterr      .01%  10 min       3 min           .1%  125 sec      10 sec
  8) Los       .0001%  10 min       3 min          .01%   10 sec      10 sec


This Command: dsplnalmcnf

Continue?

---------------
```

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:51 PST

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  9) Fer         .01%  10 min       3 min           .1%  200 sec      10 sec
  10) CRC        .01%  10 min       3 min           .1%  200 sec      10 sec
  11) Pkoof      .01%  10 min       3 min           .1%  200 sec      10 sec
  12) Oom       .001%  10 min       3 min           .1%   10 sec      10 sec
  13) Ais16    .0001%  10 min       3 min          .01%   10 sec      10 sec
  14) Bdapd     .001%   5 min       3 min           .1%   60 sec      10 sec
  15) Bdbpd     .001%   5 min       3 min           .1%   60 sec      10 sec
  16) Badclk      .1%  10 min       3 min            1%   50 sec      10 sec

This Command: dsplnalmcnf

Continue?

alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:52 PST

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  17) Pccpd     .001%   5 min       3 min           .1%   60 sec      10 sec
  18) Lcv       10E-6  10 min       3 min         10E-2   10 sec      10 sec
  19) Pcvl      10E-6  10 min       3 min         10E-2   10 sec      10 sec
  20) Pcvp      10E-6  10 min       3 min         10E-2   10 sec      10 sec
  21) Bcv       10E-6  10 min       3 min         10E-2   10 sec      10 sec
  22) Rxvpd        1%   5 min       3 min            4%   60 sec      10 sec
  23) Rxtspd     .01%   5 min       3 min           .1%   60 sec      10 sec
  24) Rxntspd    .01%   5 min       3 min           .1%   60 sec      10 sec

This Command: dsplnalmcnf

Continue?

----------------

alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 10:52 PST

                             Line Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  25) Rxbdapd   .001%   5 min       3 min           .1%   60 sec      10 sec
  26) Rxbdbpd   .001%   5 min       3 min           .1%   60 sec      10 sec
  27) Rxhppd    .001%   4 min       3 min           .1%   60 sec      10 sec
  28) Atmhec      .1%  10 min       3 min            1%  120 sec      10 sec
  29) Plcpoof    .01%  10 min       3 min           .1%  200 sec      10 sec
  30) Rxspdm     .01%   4 min       2 min         .001%   10 sec       5 sec


Last Command: dsplnalmcnf
Next Command:
```

dsplncnf (display line configuration)

Displays the configuration of a line. The display fields that actually contain data depend on the type of line.

Syntax

dsplncnf <line number>

Parameters

Parameter	Description
<line number>	Identifies the line in the format *slot* or *slot.line*. If the back card has one line connector and cable, enter the slot number. If the card has more than one physical line, such as a UXM, enter a slot and line number. In the case of a UVM, however, enter just the slot number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfln (obsolete name: **cnfcln**)

Display Fields

Screen Item	Description	Options
LN configuration	Line type and the number of channels.	T1 E1
Loop clock	Specifies whether the receive clock is looped back to the transmit clock.	Y N
Line framing	Identifies the type of line framing used by the circuit line.	DS4 for T1 ESF for T1 PLCP for T3/E3 HEC for T3/E3 STS-SC for OC-3 STM-1 for OC-3
Line coding	Identifies the line coding used by the circuit line.	E1:HDB3, AMI T1:ZCS, B8ZS, AMI
CRC	Specifies the CRC checking on E1 lines.	Y N

Screen Item	Description	Options
recv impedance	Nominal impedance for the receive line.	75 ohms balanced or unbalanced 120 ohms balanced
E1 signaling	Identifies the signaling type used for E1.	CCS or ABCD with CAS
encoding	Specifies the voice encoding scheme.	micro-law A-law
T1 signaling	Identifies the signaling type used for T1.	ABCD or ABAB (with ESF line framing) or AB (with D4 line framing); CCS is available in timeslot 24 if applicable PBXs need it.
56 Kbps Bit Pos:	Position in word for bit stuffing on 56 Kbps data channels.	MSB or LSB
Pct fast modem		
Cable type	Specifies the T1 or E1 cable type (used for equalization).	MAT ABAM
Cable length	Specifies the T1 or E1 cable length in feet to the CSU or digital cross-connect.	0–220220–440440–655 0–133133–262262–393 393–524524–655 T3/E3 = 0-255 ft.lgreater than 255 ft.
Cnfg	Applies to the UVM: cnfg shows the mode of an individual UVM port. The *slot.line* identifies the line.	External, Passing, Blocked, or Inserting See the UVM documentation in the *Cisco IGX 8400 Series Reference* for a description of these modes.
Transmit Line Rate	Applies to ATM line cards: the display shows the transmit line rate (the direction is away from the node).	The value is always the maximum for the line and is in cells per second (cps): 96000 cps for T3 80000 cps for E3 353208 cps for OC-3.
Receive Line Rate	Applies to ATM line cards: the display shows the user-configured receive line rate (the direction is towards the node).	The value is in cells per second (cps). Range for T3: 150–9600 cps Range for E3: 150–80000 cps Range for OC-3: 353208 cps
Header Type	Applies to ATM cards: the display shows the user-specified header type.	The header type is VCC or VPC.
Payload Scramble	Applies to ATM cards: the display shows whether payload scramble is on.	The display shows Yes or No.

Example (IGX)

Displays the configuration for an IMA line in slot 5. The **dsplncnf** shows the same screen as **cnfln** without prompting for configuration.

dsplncnf 5.1

```
sw225          TRM   StrataCom       IGX 8420  9.3.a6    Mar. 10 2000 05:55
GMT

LN   5.1(4) Config    E1/119                UXM slot:5
```

```
Line DS-0 map:         1-15,17-31
IMA Group Member(s):  1-4
Retained links:        4
IMA Protocol Option:  Enabled
IMA Max. Diff. Dly:   200 msec.
IMA Clock Mode:       CTC
Loop clock:           No
Line coding:          HDB3
Line CRC:             Yes
Line recv impedance:  75 ohm
Idle code:            54 hex
HCS Masking:          Yes
Payload Scramble:     Yes
VC Shaping:           No

Last Command: dsplncnf 5.1
```

Example (IGX)

Displays configuration for line 1 of the UVM in slot 20. The “cnfg” field shows “External,” so all DS0s terminate on line 1. Also, CAS switching is off, and SVC caching is on.

dsplncnf 20.1

```
igxr02         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 13:51 PST

LN  20.1 Config       T1/24                 UVM slot:20
Loop clock:           No
Line framing:         D4
Line coding:          ZCS
Line encoding:        u-LAW
Line T1 signalling:   AB
Line cable type:      ABAM
Line length:          0-133 ft.
Line 56KBS Bit Pos:   msb
Line pct fast modem:  20
Line cnfg:            External
Line cnf slot.line:   --
Line CAS-Switching:   Off
Line SVC-Caching:     Off


Last Command: dsplncnf 20.1
```

Example (IGX)

Display configuration for line 12 of the CVM in slot 12.

dsplncnf 12

```
sw150          TN    Cisco           IGX 8420  9.3.2T    Dec. 19 2000 23:09 PST

LN  12 Config         T1/24                 CVM slot:12
Loop clock:           No
Line framing:         D4
Line coding:          ZCS
Line encoding:        u-LAW
Line T1 signalling:   AB
Line cable type:      ABAM
Line length:          0-133 ft.
Line 56KBS Bit Pos:   msb
Line pct fast modem:  20
Line SVC-Caching:     Off
```

```
Last Command: dsplncnf 12
```

Example (BPX)

Show card in slot 11 as a BXM in a BPX node.

dsplncnf 11.2

```
sw53          VT    Cisco          BPX 8620  9.3.2o    Dec. 5 2000  09:47 GMT

LN  11.1 Config     OC3     [353208cps]    BXM slot:     11
Loop clock:            0                   Idle code:             7F hex

Line framing:          --
     coding:           --

     recv impedance:   --
     E1 signalling:    --
     encoding:         --                       cable type:       --
     T1 signalling:    --                       length:           --
                                           HCS Masking:           Yes
                                           Payload Scramble:      Yes
     56KBS Bit Pos:    --                  Frame Scramble:        Yes
     pct fast modem:   --                  Cell Framing:          STS-3C


This Command: dsplncnf 11.2
```

Example (IGX)

Show the UXM OC-3 card in slot 5 of an IGX node.

dsplncnf 5.3

```
sw180         TN    Cisco          IGX 8420  9.3.o1    Dec. 5 2000  09:42 GMT

LN   5.3 Config       OC3                   UXM slot:5
Loop clock:           No
Line framing:         STS-3C
Idle code:            7F hex
HCS Masking:          Yes
Payload Scramble:     Yes
Frame Scramble:       Yes


Last Command: dsplncnf 5.3
```

dsplnerrs (display line errors)

Displays the accumulated error count since the last time errors were reset. The **clrlnerrs** command clears the error counters for circuit lines by resetting all error counts to 0.

Syntax

dsplnerrs [line_number]

Parameters

Parameter	Description
line number	Specifies the circuit for the error count display. Otherwise, a summary screen for all lines appears.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

clrclnerrs, prtclnerrs

Display Fields: Line Error Types

Type	Explanation
Bipolar errors	Number of times two consecutive pulses have the same polarity (occurs only when the line uses AMI coding).
Frame slips	Number of times a frame is discarded to re-establish synchronization.
Out of frames	Number of times a loss-of-frame synchronism is detected on this line.
Loss of signal	Number of times the signal level at the circuit line input went below the minimum acceptable level.
Frame bit errors	Number of times the frame bit failed to alternate (frame error).
CRC errors	Number of times the generated CRC character did not match the received CRC character (applies only if CRC checking is enabled).
Out of MFrames	Number of times a multiframe synch error was detected (E1 lines only).
AIS - 16	Number of times the Alarm Information Signal (Blue signal) was received.

Example

dsplnerrs

```
sw108          VT    Cisco           IGX 8420  9.3.2o    Dec. 5 2000  10:12 GMT

Total Statistical Errors

           Code   Frame  Out of LossOf Frame  CRC    Out of
CLN        Errors Slips  Frames Signal BitErs Errors MFrms  AIS-16
 3.1          0      -      0      0      0      0      -      -
 3.2          0      -      0      0      0      0      -      -
 3.3          0      -      0      0      0      0      -      -
 4.1          0      -      0      0      0      0      -      -
 4.3          0      -      0      0      0      0      -      -


Last Command: dsplnerrs
```

dsplns (display lines)

Displays basic configuration and status information for all the lines on the node. The **dsplns** command is the same as the **dspclns** command.

The **dsplns** information includes the line number, the type of line, and the line alarm status. The line type shows whether the line is J1, T3, E3, T1, E1, or OC-3 and shows the number of configured DS0s. This command also shows the primary line in an IMA line configuration and the line alarm status. Line alarm status categories include:

• Clear—Line OK	Alarm Information Signal
• Loss of Signal	Remote Out of Frame
• Out of Frame	Remote Out of Packet Frame
• Minor—Bad clock source	Loss of Multiframe

With Release 9.3.20, the **dsplns** command supports the Universal Router Module (URM) introduced on the IGX 8400 to provide IOS-based voice support and basic router functions. It consists of an embedded UXM with one internal ATM port and an embedded IOS-based router. The internal ATM port has no physical line interfaces. However, switch software resource management uses one entry from the line database for each active URM port. Consequently, the number of physical lines available in the node is reduced by the number of active URM ports.

The **dsplns** command accounts for the active URM ports. The **dsplns** command displays:

- The default display is a detailed display of lines used and includes a prompt for display of a line summary screen. The line summary screen reports the number of lines available in the node. The number of lines available is reduced by the number of active URM ports. The line summary screen can also be displayed by using the **dsplns s** command.
- The detailed display of lines used in the node. This is the same display provided by the **dsplns** command. However, it does not include a prompt for display of the line summary screen.
- The line summary calculates the number of lines available in the node. The number of lines available is the total IGX node lines minus the number of activated lines *and* the number of activated URM ports. The number of activated URM ports is reported in the “Active Router Ports” field.

Syntax

dsplns [s | d]

Parameters

Parameter	Description
s	Displays the line summary for an IGX node. The summary includes the number of active lines, the number of active router ports, and the number of available lines.
d	Displays detailed information for each line in an IGX node.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dnln, dsptrks, upln, dspphyslns

Example (BPX)

Display circuit lines on the node.

dsplns

```
sw53          VT    Cisco          BPX 8620  9.3.2o    Dec. 5 2000  09:29 GMT

Line      Type     Current Line Alarm Status
11.1      OC3      Clear - OK
11.8      OC3      Clear - OK

Last Command: dsplns
```

Example (IGX)

Display the lines within an IMA configuration. Line 5.1 designates the primary line (the line first added to the configuration) and (8) designates that eight lines are grouped together to form this IMA line. The overall IMA group alarm status is shown in the **dsplns** display. The **dspphyslns** command shows the alarm status on each of the 8 physical lines within the IMA group.

dsplns

```
sw225         TN    StrataCom      IGX 8420  9.3.13    Feb. 2 2000  10:15 GMT

Line        Type   Current Line Alarm Status
 5.1(8)     E1/238 Clear - OK

Last Command: dsplns
```

Example (URM on IGX)

Display the line detail and summary information for an IGX node with two active Universal Router Module (URM) ports. The summary screen is displayed by answering “yes” (y) to the prompt. The number of “Available Lines” is the “Total Lines” minus the “Active Lines” *and* the “Active Router Ports”.

dsplns

```
sw180         TN    Cisco          IGX 8420  9.3.2a    July 20 2000 15:33 GMT

Line        Type   Current Line Alarm Status
 4.1        T3/636 Clear - OK
 4.2        T3/636 Clear - OK
 5.3        OC3    Clear - OK
 5.4        OC3    Clear - OK
 7.1        E1/30  Clear - OK
```

```
This Command:dsplns

Display the summary lines output?


--------------------- Screen 2 --------------------

sw180          TN    Cisco           IGX 8420  9.3.2a    July 20 2000 15:34 GMT

Line Summary:

Active Lines         5
Active Router Ports  2
Available Lines     57

Total Lines         64

Last Command:dsplns
```

Example (URM on IGX)

Display the detail for the activated lines on an IGX node with active URM ports.

dsplns d

```
sw180          TN    Cisco           IGX 8420  9.3.2a    July 20 2000 15:33 GMT

Line        Type   Current Line Alarm Status
 4.1        T3/636 Clear - OK
 4.2        T3/636 Clear - OK
 5.3        OC3    Clear - OK
 5.4        OC3    Clear - OK
 7.1        E1/30  Clear - OK

Last Command:dsplns d
```

Example (URM on IGX)

Display the line summary for an IGX node with active URM ports.

dsplns s

```
sw180          TN    Cisco           IGX 8420  9.3.2a    July 20 2000 15:33 GMT

Line Summary:
Active Lines         5
Active Router Ports  2
Available Lines     57

Total Lines         64

Last Command:dsplns s
```

dsplnstathist (display statistics data for a line)

Displays a history of statistics configured as enabled for a selected line. This command displays the last five occurrences of the line statistic. You select the line statistic from the list displayed when you enter the command. Use the **dsplnstatcnf** to display the statistics enabled on the selected channel. Use **cnflnstats** to enable a statistic. (Note that **dspclnstathist** is the same as **dsplnstathist**.)

Syntax

dsplnstathist <line> <statistic number> <interval> <owner>

Parameters

Parameter	Description
<line>	Specifies the circuit line in the format *slot.line*. If the card set supports only one line, you can enter just the slot number.
<statistic number>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample. Range: 1–255 minutes
<owner>	Specifies the source of the configuration (“auto,” “user”, or “tftp”). You might need to enter “AUTO” in all capital letters.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnflnstats, **dsplnstatcnf**

Example (BPX)

dsplnstathist 11.8

```
-------------------------------------SCREEN 1-----------------------------------
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 12 2000 12:27 GMT

Line Statistic Types

 1) Loss of Frames                     39) Path FEBE
 2) Loss of Signal                     40) Section BIP8 Err. Secs.
19) HCS Errors                         41) Line BIP24 Err. Secs.
28) YEL Transitions                    42) Line FEBE Err. Secs.
30) Alarm Indication Signal            43) Path BIP8 Err. Secs.
31) Loss of Cell Delineation           44) Path FEBE Err. Secs.
32) Loss of Pointer                    45) Section BIP8 Severely Err. Secs.
33) OC3 Path AIS                       46) Section Sev. Err. Framing Secs.
34) OC3 Path YEL                       47) Line BIP24 Severely Err. Secs.
35) Section BIP8                       48) Line FEBE Severely Err. Secs.
36) Line BIP24                         49) Path BIP8 Severely Err. Secs.
```

```
37) Line FEBE
38) Path BIP8

This Command: dsplnstathist 11.8


Continue?  y

-------------------------------------SCREEN 2-----------------------------------
sw53          TN    Cisco          BPX 8620  9.3.m0    Dec. 12 2000 12:27 GMT

Line Statistic Types

50) Path FEBE Severely Err. Secs.
51) Line Unavailable Secs.
52) Line Farend Unavailable Secs.
53) Path Unavailable Secs.
54) Path Farend Unavailable Secs.
55) HCS Correctable Error
56) HCS Correctable Error Err. Secs



This Command: dsplnstathist 11.8


Statistic Type:
```

dspload (display connection loading)

Displays both the used and available bandwidth (both in the transmit and receive directions) for each trunk at the specified node. The "transmit" direction is *from* the node specified and *to* the node at the other end of the trunk. In the screen display, the numbers of disabled trunks appear in dim, reverse video on the screen.

The **dspload** display reflects the static load model stored by the node and used to determine the bandwidth available for new connections and reroutes. The display does not represent changes due to the dynamic utilization of the trunks. Some types of connections, such as voice connections using adaptive voice and data connections using Data Frame Multiplexing (DFM), suppress packets. In contrast, Frame Relay connections may generate additional packets when bandwidth permits.

When this command is executed at a local node in structured networks, the information displayed is for any node on the intra-domain lines belonging to the same domain. The node uses the terminating and through routed connections' calculated load to calculate the trunk load. The connection type (v, c, a, or d) or baud rate (9.6 Kbps, 56 56 Kbps, and so on) and other factors determine its basic load. The calculated trunk load may also be modified by using the **cnfchutl** command for connections that use VAD, DFM, or Frame Relay.

A certain amount of bandwidth is reserved for each trunk (when using **cnftrk**). The reserved bandwidth is available only for high priority packets (for example, PCC traffic). The node cannot route connections using this reserved bandwidth. The following loading, in packets per second, is calculated for each trunk in each direction:

total trunk capacity = current load + open space + statistical reserve

Syntax

dspload [nodename] [line number] [-cos]

Parameters

Parameter	Description
nodename	Specifies the local node.
line number	Specifies the physical line whose loading information is displayed.
-cos	Displays loading based on all cos band values.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dsptrkutl, cnfcmparm

Example (IGX)

Display the load for all trunks that terminate on the current node.

dspload

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:54 PST

Trunk loads for node 'alpha'

        Units       Used        Available   Reserved    Cmax In Use Cmax In Use
PLN      Xmt   Rcv   Xmt   Rcv   Xmt   Rcv   Xmt   Rcv   XmtA  RcvA  XmtB  RcvB
10      Pkts  Pkts   1760  1744  8304  8320   600   600     0     0     0     0
14      Pkts  Pkts    504   504  6896  6896   600   600    20    20     0     0



Last Command: dspload


Next Command:
```

Example (IGX)

Display the load for the trunk in slot 10 of the current node. If the **dspload** arguments include a trunk number, detailed information for each of the packet types on that line appears. Additional categories of information for Frame Relay loads on the trunk include Cmax In Use, Cmax Available, and Cmax Capacity.

dspload 10

```
sw151          TN    SuperUser       IGX 16    9.3       Apr. 13 2000 17:05 GMT

Configured Trunk Loading:  TRK sw151 10--10 sw150

       Load Type        Xmt-p  Rcv-p                        lcl
       NTS               2016   2016   Conid In Use           11
       TS                 432    432   Conid Available      1760
       Voice              208    208   Total Capacity       1771
       BData A              0      0
       BData B              0      0   Line type is Terrestrial
       CBR                  0      0   Line supports BData Load
       rt-VBR               0      0   Line does not use ZCS
       nrt-VBR             50     50
       ABR                  0      0   Traffic class:
       Total In Use      2656   2656        V TS NTS FR FST CBR nrt-VBR ABR rt-VBR
       Reserved           992    992
       Available        76352  76352
       Total Capacity   80000  80000

Last Command: dspload 10


Next Command:
```

Example (BPX)

Displays the load for trunk 1 in slot 1 of the current node based on load type (CBR, ABR, etc.). The trunk queue delay is also displayed if routing with delay is enabled. The **dspload** screen displays the bandwidth used by rt-VBR and nrt-VBR connections on a trunk.

dspload 1.1

```
sw203          TN    SuperUser       BPX 8620    9.3       Apr. 13 2000 17:05 GMT

Configured Trunk Loading:  TRK sw203 1.1-- 1.1 sw242

       Load Type        Xmt-c  Rcv-c                        lcl
       NTS                  0      0   Conid In Use         1068
       TS                   0      0   Conid Available       703
       Voice                0      0   Total Capacity       1771
       BData A              0      0
       BData B              0      0   Trunk cost:  26
       CBR              23100  23100   Trunk V Qdelay:  2.5 msec
       rt-VBR           14300  14300   Trunk NTS Qdelay:  31.9 msec
       nrt-VBR          14300  14300   Trunk end doesn't support complex gateway
       ABR              18901  18901   Trunk is Terrestrial
       Total In Use     56301  56301   Trunk does not use ZCS
       Reserved          1000   1000   Trunk end doesn't support complex gateway
       Available        38699  38690   Traffic class:  V TS NTS FR FST CBR nrt-VBR ABR
       Total Capacity   96000  96000                   rt-VBR

Last Command: dspload 1.1


Next Command:
```

Example (BPX)

Displays the "cos based" load for trunk 1 in slot 1 of the current node. The -cos option displays the load categorized by bands. This is applicable and meaningful only when the Priority Bumping option is enabled.

dspload 1.1 -cos

```
sw67           TRM   StrataCom       BPX 8620  9.3.a7    Mar. 2 2000
13:52 GMT

Configured Trunk Loading:  TRK  sw67  1.1--13.1 sw66
Band:  CoS           Xmt-c    Rcv-c
B0  : 0- 1              50       50  Conid In Use+Avail:       1+
1770= 1771
B1  : 2- 3               0        0  VPC conids:               0/256
B2  : 4- 5               0        0
B3  : 6- 7               0        0  Trunk is Terrestrial
B4  : 8- 9               0        0  Trunk supports cell routing
B5  :10-11               0        0  Trunk does not use ZCS
B6  :12-13               0        0  Trunk end doesn't support complex
gateway
B7  :14-15               0        0  Traffic: V TS NTS FR FST CBR
NRT-VBR ABR
Total In Use            50       50           RT-VBR
Reserved              5000     5000  Lcn/GwLcn bmap, oe: 00/00,00/00
Available            90950    90950
Total Capacity       96000    96000

Last Command: dspload 1.1 -cos
```

dsplog (display event log)

Displays the event log for a node. Events affecting the node are displayed in chronological order with the most recent events at the top of the log. The display includes a description of the event, the date and time of the event, and the alarm class of the event. A Continue? prompt is displayed if more than one screen is required to display all the log entries. Events generating alarms are marked Major or Minor, and events clearing alarms are marked Clear.

When you enter parameters with the **dsplog** command, they may all be used and entered in any order (except the <i> parameter, which cannot be used with <p>).

The **dsplog** entries show the virtual trunk number of a trunk, for example, *slot.port.vtrk*.

For UXM cards with ATM Forum IMA compliant trunks, a trunk is displayed in **dsptrks** as:

<slot>.<primary_port>x<num ports>

For example, an IMA trunk would display in the TRK column in the **dsptrks** display as:

5.1x4

In this case, 5.1x4 indicates an ATM Forum–compliant IMA trunk 5.4 which consists of four physical lines. To see all physical lines belonging to this IMA trunk, you can enter the **dspphyslns** command.

For IMA trunks, you can configure nonconsecutive physical lines.

To support ATM Forum compliant IMA trunks, the UXM card must have Model B firmware. (Model A firmware supports Cisco proprietary IMA protocol trunks, but not the ATM Forum–compliant trunks.)

The **dsplog** displays an SES interface shelf (feeder) when it is added to or removed from an IGX 8400 routing hub.

When you execute the **dsplog** command a message tells you when a Hitless Rebuild of the node occurred. See Example 2, which shows even log entries indicating that a hitless rebuild has occurred.

When a hitless rebuild occurs, event log entries indicating the occurrence of the rebuild will be logged. You view these event log entries by using **dsplog**.

Whenever the polling type changes, this event is logged in the event log (displayed by using **dsplog** command) on the switch.

Degraded Mode Conditions

Related to degraded mode conditions, which may occur when a node has exhausted its internal resources due to excessive messaging (among other possible causes) which leads the node to abort, the node either switches to the standby CC if it is available, or else it goes to into the degraded mode, assuming that this mode has been enabled. A node indicates that it is in degraded mode by: displaying degraded on the console screen; remote nodes generating degraded mode alarms; remote nodes showing the degraded mode as unreachable/degraded (UNDeg). The abort that put the node into degraded mode is logged in the switch software log, which you can display by using the **dsplog** command.

After a node enters the degraded mode, communication is halted with the rest of the network. All the network nodes immediately transition to communication break with the node in degraded mode.

The communication break generates a Minor Alarm for the network nodes. Each node inserts a special communication break message into the local event log (**dsplog**). For a locally attached Cisco WAN Manager, the message is also inserted into the Cisco WAN Manager event log. This message indicates the communication break was caused by a degraded mode at the remote node.

In addition to the log entries, a Communication Break Robust Alarm trap is generated to Cisco WAN Manager. This trap contains a new alarm type (code 997), which indicates the communication break was caused by a degraded mode at the remote node.

After a node exits the degraded mode, communication resumes with the rest of the network. All the network nodes clear communication break with the node.

The clearing of the communication break clears the Minor Alarm for the network nodes. Communication break clear messages are inserted into the local and Cisco WAN Manager event logs. A Communication break Robust Alarm trap is generated with the clear alarm type (code 998). The log messages and the robust trap for the communication break clear do not indicate that the communication break was caused by the node being in a degraded mode.

Display Fields: APS Alarms

The **dsplog** command displays SONET APS (Automatic Protection Switching) events and alarms shown in Table 4-22. APS alarms are also propagated to Cisco WAN Manager. APS events are indicated in the table by "Info" class type.

Table 4-22 APS Alarms Displayed with dsplog Command

Class	dsplog Text	Description
Minor	APS standard mismatch	In a two-card APS 1+1 configuration, one card is programmed for GR-253 and the other card is programmed for ITUT.
Minor	APS card missing	Indicates that either a BXM front card or back card supporting this APS line is detected as missing by a BXM.
Clear	APS OK	APS line is up with no alarms
Clear	APS deactivated	APS line is down
Minor	APS lines looped	APS line is looped
Minor	APS remote signal failure	A remote signal indicates that there is a problem with the far end signaling information in the K1K2 bytes.
Minor	APS channel mismatch	Can happen only in bidirectional mode and indicates that there is a problem with the underlying APS channel protocol. The receive K2 channel number does not equal the transmit K1 channel number.
Minor	APS protection switch byte failure	Protection switch byte failure or PSB. In bidirectional mode, indicates that there is an invalid K1 byte. The receive K1 request does not match the reverse request and is less than the transmit K1 request. In all modes, a PSB alarm indicates that K1/K2 protocol is not stable.

Table 4-22 APS Alarms Displayed with dsplog Command (continued)

Class	dsplog Text	Description
Minor	APS far end protection failure	Far end protection failure indicates that the far end's protection line is failing. When there is signal failure on the protection channel, the remote end sees Far End Protection Fail.
Minor	APS architecture mismatch[1]	Architecture mismatch means that the APS configuration on one end of the line does not match the APS configuration at the other side of the line. Specifically, GR-253 at one end and ITUT at the other or 1+1 at one end and 1:1 at the other.
Info	APS Init/Clear/Revert	A BXM APS event indicating that the BXM APS has been initialized or a clear switch has occurred or a revert switch has occurred.
Info	Cannot perform a Clear/Revert switch	A BXM APS event indicating that the BXM APS was unable to perform a clear/revert switch.
Info	APS manual switch	A BXM APS event indicating that the BXM APS has performed a user requested manual switch.
Info	Cannot perform a manual switch	A BXM APS event indicating that the BXM APS was unable to perform a user requested manual switch.
Info	APS signal degrade LoPri switch	A BXM APS event indicating that the BXM APS performed a switch due to a low-priority signal degrade condition. An automatically initiated switch due to a "soft failure" condition resulting from the line BER exceeding a preselected threshold (**cnfapsln**).
Info	Cannot perform a signal degrade LoPri switch	A BXM APS event indicating that the BXM APS was unable to perform a switch due to a low-priority signal degrade condition.
Info	APS signal degrade HiPri switch	A BXM APS event indicating that the BXM APS performed a switch due to a high-priority signal degrade condition. An automatically initiated switch due to a "soft failure" condition resulting from the line BER exceeding a preselected threshold (**cnfapsln**).
Info	Cannot perform a signal degrade HiPri switch	A BXM APS event indicating that the BXM APS was unable to perform a switch due to a high-priority signal degrade condition.

Table 4-22 APS Alarms Displayed with dsplog Command (continued)

Class	dsplog Text	Description
Info	APS signal failure LoPri switch	A BXM APS event indicating that the BXM APS performed a switch due to a low-priority signal failure condition. An automatically initiated switch due to a signal failure condition on the incoming OC-N line including loss of signal, loss of frame, AIS-L defects, and a line BER exceeding 10-3.
Info	Cannot perform a signal failure LoPri switch	A BXM APS event indicating that the BXM APS was unable to perform a switch due to a low-priority signal failure condition.
Info	APS signal failure HiPri switch	A BXM APS event indicating that the BXM APS performed a switch due to a high-priority signal failure condition. An automatically initiated switch due to a signal failure condition on the incoming OC-N line including loss of signal, loss of frame, AIS-L defects, and a line BER exceeding 10-3.
Info	Cannot perform a signal failure HiPri switch	A BXM APS event indicating that the BXM APS was unable to perform a switch due to a high-priority signal failure condition.
Info	APS forced switch	A BXM APS event indicating that the BXM APS has performed a user requested forced switch.
Info	Cannot perform a forced switch.	A BXM APS event indicating that the BXM APS was unable to perform a user requested forced switch.
Info	APS lockout switch	A BXM APS event indicating that the BXM APS has performed a user requested switch that prevents switching from working line to protection line from taking place.
Info	Cannot perform a lockout switch	A BXM APS event indicating that the BXM APS was unable to perform a user requested lockout of protection switch.
Info	WTR switch	A BXM APS event indicating that the BXM APS performed a switch due to a Wait to Restore time-out. A state request switch due to the revertive switch back to the working line because the wait-to-restore timer has expired.

Table 4-22 APS Alarms Displayed with dsplog Command (continued)

Class	dsplog Text	Description
Info	Cannot perform a WTR switch	A BXM APS event indicating that the BXM APS was unable to perform a switch due to a WTR condition.
Info	Exercise switch	Not supported.
Info	Cannot perform an exercise switch	Not supported.
Info	Reverse switch	A BXM APS event indicating that the BXM APS performed a switch due to a reverse request. A state request switch due to the other end of an APS bidirectional line performing an APS switch.
Info	Cannot perform a reverse switch	A BXM APS event indicating that the BXM APS was unable to perform a switch due to a reverse switch request.
Info	No Revert switch	A BXM APS event indicating that the BXM APS performed a switch due to a Do Not Revert. A state request due to the external user request being cleared (such as a forced switch) while using non-revertive switching.
Info	Cannot perform a No Revert switch	A BXM APS event indicating that the BXM APS was unable to perform a switch due to a Do Not Revert switch request.
Minor	Standby line section trace	APS standby line alarm
Minor	Standby line path trace	APS standby line alarm
Minor	Standby line path yellow alarm	APS standby line alarm
Minor	Standby line path AIS	APS standby line alarm
Minor	Standby line loss of pointer	APS standby line alarm
Minor	Standby line loss of cell	APS standby line alarm
Minor	Standby line pclp yellow alarm	APS standby line alarm
Minor	Standby line plcp out of frame alarm	APS standby line alarm
Minor	Standby line yellow alarm	APS standby line alarm
Minor	Standby line alarm indication signal (AIS)	APS standby line alarm
Minor	Standby line out of frame alarm (LOF)	APS standby line alarm
Minor	Standby line loss of signal alarm (LOS)	APS standby line alarm

1. Architecture mismatch indicates that one side supports APS 1+1, and the other end of line is configured for 1:1, or the directional or revertive parameter does not match. Firmware cannot bring the two ends into compliance on the fly—the user must correct the configuration error.

There is no APS power supply alarm.

Syntax

dsplog <r> <p> <t> <i>

Parameters

Parameter	Description
<r>	Reverses the entry order in the log. Normally, the log displays the most recent entries at the top (newest to oldest. When you use the <r> parameter, entries are displayed oldest to newest.
<p>	Allows you to page through the log. Use “n” to go to the next page, “p” to go to the previous page, and “q” to quit the log.
<t>	Searches the log for an exact or closest timestamp. The syntax is: [pli] [r] [t yyyy mm dd hh mm ss] For example: 2000 3 16 8 46 58 For fields that you do not search, insert a zero. For example: 2000 3 16 0 0 0
<i>	***This parameter is available only for service level privilege and above.*** Displays all log entries, software error entries (**dspswlog**), and aborts (**dspabortlog**). Software error and abort entries are integrated by timestamp. This parameter can be used with either the <r> or <t> parameter.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dspabortlog, dspswlog, clrogs, dspphyslns, dsptrks

Example (BPX)

Displays the log in reverse order, oldest entries first.

dsplog r

```
sw215          TRM   Cisco          BPX 8620  9.3.r7    Mar. 16 2000 08:49 PST

Least recent log entries (most recent at bottom)
Class  Description                                            Date     Time
Info   Log Cleared                                            Date/Time Not Set
Info   BCC 8 Restarted due to a Primary Revision Change       Date/Time Not Set
Info   CC 8 Starting rebuild due to Primary Revision Change    Date/Time Not Set
Info   Full Rebuild Occurred                                  Date/Time Not Set
Info   Invalid Login Attempt via Control Port (Local)         Date/Time Not Set
```

```
Info   BCC 8 downloading Flash with Revision 9.3.r7           Date/Time Not Set
Info   ASM Inserted                                           Date/Time Not Set
Info   ASM 15 Activated                                       Date/Time Not Set
Info   Polling type changed to 2                              Date/Time Not Set
Clear  LMASM 15 Inserted - Activated                          Date/Time Not Set
Minor  Fan #1 RPM out of range                                Date/Time Not Set
Minor  Fan #2 RPM out of range                                Date/Time Not Set
Minor  Fan #3 RPM out of range                                Date/Time Not Set

This Command: dsplog r
```

Example (BPX)

Displays the log in pages. Use “n” for next, “p” for previous, and “q” to quit out of the log.

dsplog p

```
sw215          TRM   Cisco          BPX 8620  9.3.r7    Mar. 16 2000 08:50 PST

Snapshot of log entries (most recent at top)
Class  Description                                            Date     Time
Info   AXIS shelf on TRK 2.1: Added                           03/16/00 08:48:07
Info   BCC 8 downloaded Flash with Revision 9.3.r7            03/16/00 08:47:58
Clear  TRK 2.1 OK                                             03/16/00 08:47:51
Clear  TRK 2.1 Activated                                      03/16/00 08:47:51
Info   BNI-T3 2 Activated                                     03/16/00 08:47:51
Info   BCC 8 downloading Flash with Revision 9.3.r7           03/16/00 08:47:25
Info   Port 3.1 Activated                                     03/16/00 08:47:25
Info   BCC 8 Restarted due to a Primary Revision Change       03/16/00 08:47:21
Clear  LN 3.1 OK                                              03/16/00 08:47:21
Clear  LN 3.1 Activated                                       03/16/00 08:47:21
Info   ASI-T3 3 Activated                                     03/16/00 08:47:21
Clear  Fan #3 RPM out of range                                03/16/00 08:46:58
Clear  Fan #2 RPM out of range                                03/16/00 08:46:58

This Command: dsplog p
Continue direction - Next/Previous/Quit? (n/p/q)
```

Example (BPX)

Displays the log by timestamp.

dsplog t 2000 3 16 8 46 58

```
sw215          TRM   Cisco          BPX 8620  9.3.r7    Mar. 16 2000 08:52 PST

Snapshot of log entries (most recent at top)
Class  Description                                            Date     Time
Clear  Fan #3 RPM out of range                                03/16/00 08:46:58
Clear  Fan #2 RPM out of range                                03/16/00 08:46:58
Clear  Fan #1 RPM out of range                                03/16/00 08:46:58
Info   T3-2 3 Inserted                                        03/16/00 08:46:55
Info   ASI-T3 3 Inserted                                      03/16/00 08:46:55
Info   MMF-2 14 Inserted                                      03/16/00 08:46:53
Info   BNI-155 14 Inserted                                    03/16/00 08:46:53
Info   Time changed from: Date/Time Not Set                   03/16/00 08:46:52
Info   SMF-2 6 Inserted                                       Date/Time Not Set
Info   BNI-155 6 Inserted                                     Date/Time Not Set
Info   Name change from NODENAME to sw215                     Date/Time Not Set
Info   LM-BXM 11 Inserted                                     Date/Time Not Set
Info   BXM 11 Inserted                                        Date/Time Not Set

This Command: dsplog t 2000 3 16 8 46 58
```

Example (BPX)

For service level privilege and above. Displays log entries, software error entries, and aborts. This example shows a **dsplog** screen where notification is given when high-priority mode is in use by the High Priority! string on the screen. The local event log indicates when the high-priority mode is entered and exited.

These strings are logged:

- Info User StrataCom logged in (Local High Priority)
- Info User StrataCom logged out (Local High Priority)

When in local high-priority mode, using the **vt** command to execute commands on another node provides a high-priority virtual terminal session. If you log into a control port at high priority, and then use the **vt** command to remotely log into another node with high priority VT, then both nodes will be at a high priority. The local node operates at the control port high priority, while the remote node serves you at a priority just below the network handler. When using the high-priority **vt** command, the screen shows High Priority VT and the local event log shows these strings.

- Info User StrataCom logged in (Virtual Terminal High Pri)
- InfoUser StrataCom logged out (Virtual Terminal High Pri)

Similar to the console screen, the Cisco WAN Manager and maintenance log show only the normal VT strings.

dsplog i

```
sw215          TRM   Cisco           BPX 8620  9.3.r7    Mar. 16 2000 09:00 PST

Most recent log entries (most recent at top)
Class  Description                                           Date     Time
Info   BCC 8 Restarted due to a Software Abort               03/16/00 08:59:38
Info   Abort  9000000 Data:00000001 PC:30200A30/USR1 9.3.r7    03/16/00 08:59:19
Info   User Cisco logged in (Local)                          03/16/00 08:59:03
Info   Hitless Rebuild Occurred                              03/16/00 08:59:01
Info   CC 8 Starting rebuild due to Software Abort           03/16/00 08:59:00
Info   User Cisco logged in (Local)                          03/16/00 08:59:02
Info   User Service logged out (Local)                       03/16/00 08:58:51
Info   User Service logged in (Local)                        03/16/00 08:58:34
Info   User SuperUser logged out (Local)                     03/16/00 08:58:29
Info   User SuperUser logged in (Local)                      03/16/00 08:57:22
Info   Invalid Login Attempt via Control Port (Local)        03/16/00 08:57:03
Info   User Cisco logged out (Local)                         03/16/00 08:56:57
Info   Error     1015 Data:DEADBEEF PC:302B74A6/USR1 9.3.r7    03/16/00 08:56:53

Last Command: dsplog i
```

dspmode (display mode)

Displays the *mode* of the card. The mode applies only to a UFM-U back card. The UFM-U back cards are the UFI-12V.35, UFI-12X.21, and UFI-4HSSI. A card mode is a combination of maximum port speeds and for specific port numbers. For a description of the UFM-U modes, see the UFM-U description in the *Cisco IGX 8400 Series Reference*.

Syntax

dspmode <slot>

Parameters

Parameter	Description
slot	Specifies the slot of the UFM-U card.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	IGX			Yes	

Related Commands

cnffrport, cnfmode, dspmodes

Display Fields

Table 4-23 lists the maximum port speeds and active ports for each card mode.

Table 4-23 Card Modes for Unchannelized Back Cards

	V.35 and X.21 Ports												HSSI Ports			
	Group A				Group B				Group C							
Mode	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
1	3	3	3	3	3	3	3	3	3	3	3	3	8	8	8	8
2	8	-	8	-	8	-	8	-	8	-	8	-	16	-	16	-
3	10	-	-	-	10	-	-	-	10	-	-	-	16	-	-	-
4	8	-	8	-	3	3	3	3	3	3	3	3				
5	10	-	-	-	3	3	3	3	3	3	3	3				
6	8	-	8	-	8	-	8	-	3	3	3	3				
7	10	-	-	-	8	-	8	-	3	3	3	3				
8	10	-	-	-	10	-	-	-	3	3	3	3				
9	10	-	-	-	8	-	8	-	8	-	8	-				

Table 4-23 Card Modes for Unchannelized Back Cards (continued)

	V.35 and X.21 Ports												HSSI Ports			
	Group A				Group B				Group C							
Mode	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**	**4**
10	10	-	-	-	10	-	-	-	8	-	8	-				
11	3	3	3	3	8	-	8	-	3	3	3	3				
12	3	3	3	3	3	3	3	3	8	-	8	-				
13	3	3	3	3	10	-	-	-	3	3	3	3				
14	3	3	3	3	3	3	3	3	10	-	-	-				
15	8	-	8	-	3	3	3	3	8	-	8	-				
16	3	3	3	3	8	-	8	-	8	-	8	-				
17	8	-	8	-	10	-	-	-	3	3	3	3				
18	8	-	8	-	3	3	3	3	10	-	-	-				
19	3	3	3	3	8	-	8	-	10	-	-	-				
20	3	3	3	3	10	-	-	-	8	-	8	-				
21	10	-	-	-	3	3	3	3	8	-	8	-				
22	10	-	-	-	3	3	3	3	10	-	-	-				
23	3	3	3	3	10	-	-	-	10	-	-	-				
24	8	-	8	-	10	-	-	-	8	-	8	-				
25	8	-	8	-	8	-	8	-	10	-	-	-				
26	10	-	-	-	8	-	8	-	10	-	-	-				
27	8	-	8	-	10	-	-	-	10	-	-	-				

Example (UFM-U on IGX)

Display the mode of the UFM-U in slot 13.

dspmode 13

```
sw180          TN    SuperUser       IGX 16    9.3 Apr. 13 2000 01:39 GMT


                         UFMU Card Mode Configuration

Slot Number   Configured Mode     Available Ports    Currently Activated Ports

    13              1            [111111111111]        [100000000000]



Last Command: dspmode 13


Next Command:
```

dspmodes (display modes)

Displays the ports that are active with each *mode* of an unchannelized UFM. The mode applies only to a UFM-U back card. The UFM-U back cards are the UFI-12V.35, UFI-12X.21, and UFI-4HSSI.

A card mode is a combination of maximum port speeds and specific port numbers. Refer to the **dspmode** definition for the table that lists the maximum port speeds and active ports for each mode. For a description of the UFM-U modes, see the UFM-U description in the Cisco IGX documentation.

The **dspmodes** command takes no parameters. Also, note that only the first three modes apply to a UFI-4HSSI.

Syntax

dspmode

Related Commands

cnffrport, cnfmode, dspmode

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Example (IGX)

Display the possible modes.

dspmodes

```
sw180          TN    SuperUser       IGX 16    9.3 Apr. 13 2000 01:39 GMT

                         UFMU Card Mode Configuration

Slot Number   Configured Mode     Available Ports    Currently Activated Ports

    13               1            [111111111111]        [100000000000]



Last Command: dspmode 13


Next Command:
```

dspnds (display all nodes)

Displays the name, type, and alarm status of all nodes within the network of the node executing the command. The remote node alarm is provided. You can use the **vt** command to reach the remote node and obtain the alarm information.

If a node is in alarm, its name is highlighted and the alarm type (major/minor), is displayed. A major alarm will be a flashing word. A junction node is identified with "Yes" printed under the Jct column.

Syntax

dspnds [+n | -p | -d | domain]

Parameters

Parameter	Description
+n	Specifies the node number. Assigning a node number requires SuperUser privilege.
-p	Specifies that the display include the type of controller card in the node. The types are BCC, NPM, and so on.
-d	Specifies that the display include the type of node for each named node. The type is either "IGX" or "BPX."

Related Commands

dspnw

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Example

Display the alarm status of all nodes within the network.

dspnds

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000  09:42 PST

NodeName Alarm
alpha    MAJOR
beta     MAJOR
gamma    MAJOR


Last Command: dspnds

Next Command:
```

dspnebdisc (display neighbor discovery)

Displays the Neighbor Device's topology information. You can display the neighbor information for all ports on an interface card in a specified slot or for all ports on all interface cards in the switch.

Syntax

dspnebdisc <slot number>

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			No	

Example (BPX)

Display the neighbor information for all ports in the BPX. The protocol field displays the protocol running on the BXM port.

```
sw52           TN    Cisco           BPX 8620  9.3.30    Jan. 30 2001 20:05 GMT
Node Neighbor Discovery
Port     Enable State    NbrIpAddress      Protocol NbrIfName
2.2      No     FAILED   N/A               X-LMI    N/A
2.3      Yes    FAILED   10.1.1.50         X-LMI    atmVirtual.01.1.1.01


Last Command: dspnebdisc
```

Example (IGX)

Use the **dspnebdisc** command to display all the neighbor's information discovered by the IGX via the ELMI Neighbor Discovery procedure.

dspnebdisc

```
top            TN    Cisco           IGX 8420  9.3.10 July 25 2000 09:31 GMT

 Port Neighbor Discovery
Port     Enable    State     IpAddress          IfIndex/IfName
5.1      Yes       ACTIVE    2.2.2.2            11
7.1      Yes       INACTIVE  0.0.0.0            0
7.2      No        ACTIVE    2.2.2.2            2
7.3      Yes       ACTIVE    0.0.0.0            0
7.4      No        INACTIVE  0.0.0.0            0
7.5      Yes       ACTIVE    1.1.1.1            5
7.6      No        INACTIVE  0.0.0.0            0
7.7      No        INACTIVE  0.0.0.0            0
7.8      No        INACTIVE  0.0.0.0            0
7.9      No        ACTIVE    0.0.0.0            0
7.10     No        INACTIVE  0.0.0.0            0
7.11     No        ACTIVE    0.0.0.0            0


This Command: dspnebdisc
```

Example (UXM on IGX)

Display the neighbor information for all ports on all UXM cards in the IGX.

- Port 4.2 is failed, so the IpAddress is N/A and IfName is N/A even the ILMI is run on the card and Neighbor Discovery is configured to Yes.
- Port 4.3 is showing Neighbor's IpAddress 172.29.200.154 and IfName "ATM3/IMA0."
- Port 9.1 has the same situation as port 4.2.
- Port 9.4 does not configure ILMI to be run on the card. Slot 5 and 10 are not UXM cards.

dspnebdisc

```
igxf1          VT    Cisco           IGX 8420  9.3.10 July 26 2000 23:32 PST

 Port Neighbor Discovery
Port     Enable    State     IpAddress          IfIndex/IfName
4.2      Yes       FAILED    N/A                N/A
4.3      Yes       ACTIVE    172.29.200.154     ATM3/IMA0
5.1      Yes       INACTIVE  0.0.0.0            0
5.5      Yes       INACTIVE  0.0.0.0            0
6.1      No        ACTIVE    0.0.0.0            0
6.2      Yes       INACTIVE  0.0.0.0            0
6.4      Yes       INACTIVE  0.0.0.0            0
9.1      Yes       FAILED    N/A                N/A
9.4      No        ACTIVE    N/A                N/A
10.1     Yes       INACTIVE  0.0.0.0            0
10.2     No        ACTIVE    0.0.0.0            0
10.3     No        INACTIVE  0.0.0.0            0


This Command: dspnebdisc
```

dspnode (display node)

Displays a summary of the interface shelves.

The **dspnode** command can isolate the shelf where an alarm has originated. For example, when you execute **dspalms**, the display indicates the number of shelves with alarms but does not identify the shelves. Therefore, execute **dspnode** on the IPX/BPX core switch shelf to determine which interface shelf generated the alarm.

To execute a command from an IGX/AF itself, you must either Telnet to the shelf or use a control terminal attached to the shelf.

Use the **dspnode** command to display the VSI controllers on a BPX node. You can display the control_VPI and control_VCI_start of the particular controller.

If the BPX cannot communicate LMI messages to its feeders, then the LMI status at the feeders must be maintained to keep the connections "active" to their external devices. If the BPX hub is flooded with network messages, then LMI/ILMI communication with its feeders may be interrupted. LMI normally runs a keep-alive between the hub and feeder. If the keep-alive fails, then the other end changes the status of all connections to "failed." If the outage is due to a network message flood, then it is desirable to override this mechanism to keep the connection status as "active."

Syntax

dspnode

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX, IGX/AF, BPX			Yes	

Related Commands

addshelf, **delshelf**, **dsptrks**

Example (BPX)

Display information about the loopbacks on feeders to the BPX node.

dspnode

```
sazu       TN       StrataCom      BPX 8620    9.3         Apr. 13 2000 11:11 GMT

BPX Interface Shelf Information

Trunk    Name      Type      Alarm
10.2     sw157     IPX/AF    MAJ  (L)




Last Command: dspnode
```

Example (BPX)

dspnode

```
sw167          TN    Cisco           BPX 8620  9.3.2T    Dec. 18 2000 21:47 PST

                   BPX 8620 Interface Shelf Information

Trunk    Name      Type     Part Id   Ctrl Id      Control_VC       Alarm
                                                  VPI  VCIRange
 1.1     sw250     AXIS        -         -          -       -        MIN
12.1     sw156     IGX 8400/   -         -          -       -        OK


Last Command: dspnode
```

Example (BPX)

dspnode

```
bpx03          VT    Cisco           BPX 8620  9.3.2V    Jan. 19 2001 08:37 PST

                   BPX 8620 Interface Shelf Information

Trunk    Name      Type     Part Id   Ctrl Id      Control_VC       Alarm
                                                  VPI  VCIRange
 5.1     SES1      AAL/5       2         2          0    40-54       OK
 5.3     VSI       VSI         1         1          0    40-54       OK



Last Command: dspnode
```

Example (IGX)

dspnode

```
sw150          TN    Cisco           IGX 8420  9.3.2Q    Dec. 13 2000 08:01 PST

                   IGX Interface Shelf Information

Trunk    Name      Type          Alarm
 3.1     sw134     IGX 8400/AF   OK

Last Command: dspnode
```

dspnw (display network)

Displays the network topology in tabular form. Alarms appear in a column, and added trunks (by **addtrk**) appear to the right to the node name. Each trunk entry shows the local back card slot number and the node name and back card slot number on the other end of the line.

Conventions:

- ~ indicates that the trunk is a satellite line.
- Flashing entry indicates a failed line.
- Blinking node name indicates a node executing downloader software.

If the network has more nodes and trunk connections than are currently on the screen, a "Continue?" prompt appears. Press the Return key to display other parameters, or enter "**n**" to exit the command.

Syntax

dspnw [+b | -b] [+z | -z]

Parameters

Parameter	Description
+b	Display only the lines that support bursty data.
-b	Display only the lines that do not support bursty data.
+z	Display only the lines that use ZCS encoding.
-z	Display only the lines that do not use ZCS encoding.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dspnds, prtnw

Example (IGX)

dspnw

```
------------------------------------SCREEN 1------------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:18 PST


NodeName    Alarm                      Packet Line
sw197
    6.1-4.1/sw94
sw290
    13.1-4.2/sw69
sw167       Minor
```

```
    4.2-4.2/sw147                       9.1-9.1/sw69
    4.1-4.1/sw147                       3.1-2.1/sw69
    2.1-2.1/sw58                        2.2-2.2/sw58
    2.3-2.3/sw58                        14.1-11.1/sw64
    11.2-12.2/sw69




This Command: dspnw


Continue?  y

------------------------------------SCREEN 2----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:18 PST


NodeName    Alarm                      Packet Line
sw64
    11.1-14.1/sw167                     2.1-6.1/sw147
    2.3-6.3/sw147                       2.5-6.5/sw147
    1.2-1.2/sw94                        5.1-14.5/sw94
    5.2-14.6/sw94





This Command: dspnw


Continue?  y

------------------------------------SCREEN 3----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:19 PST


NodeName    Alarm                      Packet Line
sw147       Minor
    4.1-4.1/sw167                       2.1-3.1/sw94
    6.1-2.1/sw64                        6.3-2.3/sw64
    6.5-2.5/sw64                        1.3-3.1/sw69
    4.2-4.2/sw167                       10.2-11.2/sw94
    9.2-11.2/sw69                       2.2.1-2.2.1/sw94
    2.2.2-2.2.2/sw94                    2.2.3-2.2.3/sw94
    2.2.4-2.2.4/sw94                    5.2-14.3/sw94
    2.2.23-2.2.23/sw94                  2.2.5-2.2.5/sw94
    2.2.6-2.2.6/sw94                    2.2.12-2.2.12/sw94
    2.2.24-2.2.24/sw94                  2.2.7-2.2.7/sw94
    2.2.8-2.2.8/sw94                    2.2.9-2.2.9/sw94
    2.2.10-2.2.10/sw94                  2.2.11-2.2.11/sw94

This Command: dspnw


Continue?  y
```

```
------------------------------------SCREEN 4-----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:19 PST


NodeName    Alarm                      Packet Line
sw147       Minor
    2.2.13-2.2.13/sw94                  2.2.14-2.2.14/sw94
    2.2.15-2.2.15/sw94                  2.2.16-2.2.16/sw94
    2.2.17-2.2.17/sw94                  2.2.18-2.2.18/sw94
    2.2.19-2.2.19/sw94                  2.2.20-2.2.20/sw94
    2.2.21-2.2.21/sw94                  2.2.22-2.2.22/sw94
    2.2.30-2.2.30/sw94                  2.2.25-2.2.25/sw94
    2.2.26-2.2.26/sw94                  2.2.27-2.2.27/sw94
    2.2.28-2.2.28/sw94                  2.2.29-2.2.29/sw94
    2.2.31-2.2.31/sw94                  2.2.32-2.2.32/sw94




This Command: dspnw


Continue?  y

------------------------------------SCREEN 5-----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:19 PST


NodeName    Alarm                      Packet Line
sw58
    1.3-1.3/sw69                        10.1-9.1/sw94
    3.1-2.1/sw94                        9.1-11.1/sw69
    2.1-2.1/sw167                       2.2-2.2/sw167
    2.3-2.3/sw167                       12.1-11.1/sw94
    5.1-3.3/sw150                       1.2.1-1.2.1/sw69
    1.2.2-1.2.2/sw69                    1.2.3-1.2.3/sw69
    1.2.4-1.2.4/sw69                    1.2.5-1.2.5/sw69
    1.2.6-1.2.6/sw69





This Command: dspnw


Continue?  y

------------------------------------SCREEN 6-----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:20 PST


NodeName    Alarm                      Packet Line
sw150
    5.3-4.1/sw69                        14.2.6-4.6.6/sw69
    8.1-5.2/sw94                        14.2.3-4.6.3/sw69
    14.2.1-4.6.1/sw69                   14.3-4.8/sw69
    14.2.2-4.6.2/sw69                   14.2.7-4.6.7/sw69
    14.2.4-4.6.4/sw69                   14.2.5-4.6.5/sw69
    3.3-5.1/sw58                        14.2.13-4.6.13/sw69
    14.2.8-4.6.8/sw69                   14.2.9-4.6.9/sw69
    14.2.10-4.6.10/sw69                 14.2.11-4.6.11/sw69
    14.2.12-4.6.12/sw69                 14.2.14-4.6.14/sw69
    9.1-14.1/sw94
```

```
This Command: dspnw


Continue?  y

------------------------------------SCREEN 7-----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:20 PST


NodeName    Alarm                      Packet Line
sw94
    3.1-2.1/sw147                       1.2-1.2/sw64
    4.1-6.1/sw197                       2.1-3.1/sw58
    9.1-10.1/sw58                       14.3-5.2/sw147
    14.5-5.1/sw64                       2.2.23-2.2.23/sw147
    11.1-12.1/sw58                      1.1-2.3/sw69
    2.2.1-2.2.1/sw147                   2.2.2-2.2.2/sw147
    2.2.3-2.2.3/sw147                   2.2.4-2.2.4/sw147
    11.2-10.2/sw147                     5.2-8.1/sw150
    14.6-5.2/sw64                       2.2.12-2.2.12/sw147
    2.2.9-2.2.9/sw147                   2.2.5-2.2.5/sw147
    2.2.6-2.2.6/sw147                   2.2.7-2.2.7/sw147
    2.2.8-2.2.8/sw147                   14.1-9.1/sw150

This Command: dspnw


Continue?  y

------------------------------------SCREEN 8-----------------------------------
sw150          TN    Cisco           IGX 8420  9.3.2R    Dec. 14 2000 09:20 PST


NodeName    Alarm                      Packet Line
sw94
    3.1-2.1/sw147                       1.2-1.2/sw64
    4.1-6.1/sw197                       2.1-3.1/sw58
    9.1-10.1/sw58                       14.3-5.2/sw147
    14.5-5.1/sw64                       2.2.23-2.2.23/sw147
    11.1-12.1/sw58                      1.1-2.3/sw69
    2.2.1-2.2.1/sw147                   2.2.2-2.2.2/sw147
    2.2.3-2.2.3/sw147                   2.2.4-2.2.4/sw147
    11.2-10.2/sw147                     5.2-8.1/sw150
    14.6-5.2/sw64                       2.2.12-2.2.12/sw147
    2.2.9-2.2.9/sw147                   2.2.5-2.2.5/sw147
    2.2.6-2.2.6/sw147                   2.2.7-2.2.7/sw147
    2.2.8-2.2.8/sw147                   14.1-9.1/sw150

Last Command: dspnw
```

dspnwip (display network IP interface)

Displays the IP address for each node in the network. The IP address is used to route TFTP messages transferring bulk statistics between the node and the WAN Manager Statistics Master.

Syntax

dspnwip

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfwip

Example

Display network IP addresses.

dspnwip

```
axiom1       TN    bootzilla       IGX 32    9.3       Apr. 13 2000  18:18 GMT

Active Network IP Address:              169.134.90.106
Active Network IP Subnet Mask:          255.255.255.0

NodeName   IP Address
axiom1   169.134.90.111
         169.134.90.105
         169.134.90.101
axiom2   169.134.90.102
axiom3   169.134.90.103
axiom1   169.134.90.106


Last Command: dspnwip


Next Command:
```

dspoamseg (display connection OAM segment status)

Displays the segment status of an Extended PVC (XPVC) segment in a hybrid AutoRoute (AR)-PNNI network.

The BPX 8600 supports an XPVC that spans over an AR-PNNI, or AR-PNNI-AR, hybrid network. The Cisco WAN Manager (CWM) is used to add, modify, and delete XPVCs. The CWM is also used to display XPVC connection details and monitor XPVC status.

The AR BXM and PNNI AXSM interface cards allow Enhanced UNI (EUNI) and Enhanced NNI (ENNI) port types that support XPVC segments. XPVC segments terminating on EUNI/ENNI ports are automatically programmed as “non-segment” endpoints. Non-segment endpoints do not loop back OAM segment loopback cells. With non-segment endpoints, OAM loopback cells are passed through to the adjacent network. Consequently, the CWM test procedures, such as test delay, cannot identify a faulty XPVC segment. When end-to-end XPVC testing fails, the faulty Automatic Routing Management or PNNI network and faulty XPVC segment must be identified.

You use the **cnfoamseg** command to change the segment status of an XPVC segment from “non-segment” to “segment”. When the XPVC segment status is “segment”, OAM segment loopback cells are looped back at the terminating EUNI/ENNI endpoint. This allows CWM test procedures to be executed on each XPVC segment to isolate a fault. You use the **dspoamseg** command to display the current segment status of an XPVC segment.

Syntax

dspoamseg <connection_channel>

Parameters

Parameter	Description
connection channel	Specifies the XPVC segment channel to be configured. Channel is specified in the following format: slot.port.vpi.vci

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
Super Group	No	No	BPX	Yes	Yes	No	No

Related Commands

cnfoamseg

Example

Display the segment status for the XPVC segment channel 9.1.10.500.

dspoamseg 9.1.10.500

```
bpx1           TN    Cisco           BPX 8620  9.3.2X    Feb. 7 2001  16:40 GMT

Connection segment status

The Connection is :       Non-Segment



Last Command: dspoamseg 9.1.10.500
```

dspospace (display open space for a route)

Displays the open space for a connection route.

Syntax

dspospace <connection | group>

Parameters

Parameter	Description
<connection	group>	Specifies the connection.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	Yes	BPX, IGX			Yes	

Example

Display the open space for the ATM Frame Relay connection 4.1.1. The line interface card is a UFM-8C.

dspospace 4.1.1

```
sw110          TN    SuperUser       IGX 16    9.3 Apr. 13 2000 19:11 GMT

Open Space for 4.1.1                                                Snapshot

Domain
Local:  sw110      8--10.3sw86     6.2-- 6.1sw81
          ms_cur_pkts: 524272      ms_cur_cells: 12576
          sm_cur_pkts: 4368        sm_cur_cells: 11296


Last Command: dspospace 4.1.1


Next Command:
```

dsppcs (display port concentrator shelf)

Displays status and level information for either a specific Port Concentrator Shelf or all Port Concentrators attached to the node. When the command has a specific slot number for an argument, information appears for each concentrated link. The information for each concentrated link is:

- Status, where OK means the FRM-2 or FRP-2 is communicating with the PCS, and "Failed" means the FRM-2 or FRP-2 is not communicating with the PCS on the concentrated link.
  - No Test means no test (**tstpcs** command) has occurred since last reset.
  - Passed means the last PCS test (**tstpcs** command) detected no errors in the PCS hardware.
  - Failed means the last PCS test (**tstpcs** command) detected errors in the PCS hardware.
  - Testing means a test (**tstpcs** command) is in progress.
- FW Revision is the firmware revision of the PCS module.
- Boot PROM Date is the boot firmware date of PCS module.
- Boot PROM Revision is the boot firmware revision of PCS module.

The first example shows the results when a slot number is specified. When the command executes without a specified slot, a general status statement and the firmware revision for each port appear as shown in the second example.

Syntax

dsppcs [slot]

Parameters

Parameter	Description
slot	Specifies slot associated with the ports you want to display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	No	No	BPX, IGX			No	

Related Commands

cnffrport, dspfrcport, dspfrcbob, dspportstats

Example

Display PCS information for port 6.

dsppcs 6

```
singha         TN    SuperUser       IGX32    9.2       July 7 1997  14:04 GMT

Detailed Port Concentrator Display For FRP in slot 6
```

```
Link Number:         1              Link Number:         3
Status:              Failed         Status:              OK
Test Status:         No Test        Test Status:         Passed
FW Revision:                        FW Revision:         P3
Boot PROM Date:                     Boot PROM Date:      11/9/95
Boot PROM Revision:                 Boot PROM Revision:  P3

Link Number:         2              Link Number:         4
Status:              Failed         Status:              OK
Test Status:         No Test        Test Status:         Passed
FW Revision:                        FW Revision:         P3
Boot PROM Date:                     Boot PROM Date:      11/9/95
Boot PROM Revision:                 Boot PROM Revision:  P3


Last Command: dsppcs 6

 Next Command:
```

Example

Display information for all Port Concentrator Shelves.

dsppcs

```
singha         TN    SuperUser       IGX32    9.2    July 7 1997  14:02 GMT

Port Concentrator Status

Slot.Port    Status        FW Revision
6.1          Failed
6.2          Failed
6.3          OK            P3
6.4          OK            P3







Last Command: dsppcs


Next Command:
```

dspphyslnerrs (display physical line errors)

Displays the accumulated line error counts, by failure type, for the specified physical lines. If no slot number is entered with the command, a one-line summary of errors for al physical lines at the local node is displayed. If a slot number is entered with the command, a detailed analysis is displayed.

The summary for physical lines include the cell count in the transmit and receive directions, and error counts associated with the port. The display indicates the date and time that the statistics were cleared and the statistics collection time since they were last cleared. Cells transmitted indicates the amount of data transmitted out the port to the user device. Cells received indicates the amount of data received from the user device at the port. Corrupted statistics result from channel/port loopbacks or port tests. A yes in this field indicates that such a loopback or port test has occurred since the statistics were last cleared.

The **clrphyslnerrs** command resets all error counts to 0. Table 4-24 contains a brief description of each error.

Physical line statistics are displayed on the **dspphyslnstats, dspphyslnstathist,** and **dspphyslnerrs** screens. These commands accept only physical line numbers (that is, slot.port).

Table 4-24 Errors in the dspphyslnerrs Display

Line Type	Error	Explanation
All except ATM	Bipolar errors	Number of times two consecutive pulses have the same polarity (AMI coding only).
	Frame slips	Number of times a frame is discarded to re-establish synchronization.
	Out of frames	Number of times a loss-of-frame synchronism is detected on this circuit line.
	Loss of signal	Number of times the signal level at the circuit line input went below the minimum acceptable level.
	Frame bit errors	Number of times the frame bit failed to alternate (frame error).
	CRC errors	Number of times the generated CRC character did not match the received CRC character (applies only if CRC checking is enabled).
	Out of MFrames	Number of times a multiframe synch error was detected (E1 lines only).
	AIS - 16	Number of times the Alarm Information Signal (Blue signal) was received.
Only ATM	Out of Frames	Number of times a momentary loss of-DS3 frame alignment was detected.
	Loss of sync (XX)	Number of times a loss of DS3 frame alignment lasting more than XX seconds was detected.
	Packet Error	Number of CRC errors for a packet address.
	Line Code Errors	Number of B3ZS code errors detected.
	P-bit Parity Errors	Number of parity errors for the DS3 parity bit (P-bit) sequence.
	C-bit Parity Errors	Number of parity errors for the DS3 control bit (C-bit) sequence.

Table 4-24 Errors in the dspphyslnerrs Display (continued)

Line Type	Error	Explanation
	Comm Fails	Number of BCC failed to communicate to the other node.
	Loss of signal	Number of times the signal level at the trunk line input went below the minimum acceptable level.
Only ATM	AIS (BLU)	Number of times the Alarm Information Signal (Blue signal) was received.
	Out of MFrames	Number of times a loss-of-frame synchronism in the DS3 multiframe alignment was detected.
	Remote Oof	Number of times the DS3 remote alarm (indicating remote end was out of frame alignment) was received.

Syntax

dspphyslnerrs [slot | slot.port]
or
dspphyslnerrs <slot.port> (for virtual physical lines)

Parameters

Parameter	Description
[slot | slot.port]	Specifies a physical line for the error display. For a specific single physical line: *slot* For multi-physical line cards: *slot.port*

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

clrphyslnerrs, prtphyslnerrs

Example

Display a summary of all physical line errors at the local IGX node.

dspphyslnerrs

```
sw150          VT    Cisco           IGX 8420  9.3.2T    Dec. 18 2000 22:28 PST

Total Statistical Errors

           Code   Out of LossOf Frame  CRC
PHYSLN     Errors Frames Signal BitErs Errors
 3.1           -      0      0      0      0
```

```
 3.3           -      0      0      0      0
 5.3          0      0      0      0      0
 8.1          0      0      0      0      0
 9.1          0      0      0      0      0
14.2          0      0      0      0      0
14.3          0      0      0      0      0

Last Command: dspphyslnerrs
```

Example

Display a detailed description of the errors for physical line 4.2 (an OC-3 trunk).

dspphyslnerrs 4.2

```
sw108          VT    Cisco          IGX 8420  9.3.2o    Dec. 5 2000  10:25 GMT

PHYSLN  4.2         Clear - OK                          Clrd:12/04/00 17:26:01
Statistical Alarm Count ETS   Status    Integrated Alarm  Count ETS   Status
Bipolar Err           0     0           Loss of Sig (RED)     0     -
Out of Frms           0     0           AIS         (BLU)     0     -
Loss of Sig           0     0           Out of Frms (RED)     0     -
Frame BitErrs         0     0           Remote      (YEL)     0     -
CRC Err               0     0           Loss of Cell          0     -
Line Code Errs        0     0           Loss of Pointer       0     -
P-bit Parity Errs     0     0           Path AIS              0     -
C-bit Parity Errs     0     0           Path Yellow           0     -
BIP-8 Code Errs       0     0           Frame Sync            0     -
Frame Sync Errs       0     0           Remote Framing        0     -
                                        Rmt Path Trace        0     -
                                        Rmt Section Trace     0     -


Last Command: dspphyslnerrs 4.2
```

Example

Display a detailed description of the errors for physical line 3.1 (an E3/T3 trunk).

dspphyslnerrs 3.1

```
sw150          VT    Cisco          IGX 8420  9.3.2T    Dec. 18 2000 22:29 PST

PHYSLN  3.1         Clear - OK                          Clrd:12/18/00 20:52:07
Statistical Alarm Count ETS   Status    Integrated Alarm  Count ETS   Status
Out of Frms           0     0           Loss of Sig (RED)     0     -
Loss of Sig           0     0           AIS         (BLU)     0     -
Frame BitErrs         0     0           Out of Frms (RED)     0     -
CRC Err               0     0           Remote      (YEL)     0     -
Line Code Errs        0     0           Loss of Cell          0     -
P-bit Parity Errs     0     0           Loss of Pointer       0     -
BIP-8 Code Errs       0     0           Frame Sync            0     -
Frame Sync Errs       0     0           Remote Framing        0     -
                                        Rmt Path Trace        0     -


Last Command: dspphyslnerrs 3.1
```

Example

Display a detailed description of the errors for physical line 11.3 (an E1 trunk).

dspphyslnerrs 11.3

```
sw228          TN    SuperUser       IGX 16    9.3    Apr. 13 2000 17:59 PST

PHYSLN 11.3       Status:Clear - OK
                                                        Clrd: 08/27/97 13:33:15
Type              Count ETS   Status    Type              Count ETS   Status
Out of Frms           0     0           Loss of Sig (RED)     0     -
Loss of Sig           0     0           AIS         (BLU)     0     -
Frame BitErrs         0     0           Out of Frms (RED)     0     -
CRC Err               0     0           Frm Err Rate(RED)     0     -
                                        AIS-16      (RED)     0     -
                                        Rmt Oof     (YEL)     0     -
                                        Loss of Cell          1     -


Last Command: dphyslnerrs 11.3
```

Example

Display a detailed description of the errors for physical line 7.1 (a T1 IMA trunk).

dspphyslnerrs 7.1

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 14:44 PST

PHYSLN  7.1         Clear - OK                           Clrd:01/14/01 17:50:01
Statistical Alarm Count ETS   Status    Integrated Alarm  Count ETS   Status
Bipolar Err           0     0           Loss of Sig (RED)     0     -
Out of Frms           0     0           AIS         (BLU)     0     -
Loss of Sig           0     0           Out of Frms (RED)     0     -
Frame BitErrs         0     0           Rmt Oof     (YEL)     0     -
CRC Err               0     0           Loss of Cell          0     -
Line Code Errs        0     0           IMA Line Failures     0     -
P-bit Parity Errs     0     0           IMA Failures          0     -
C-bit Parity Errs     0     0
BIP-8 Code Errs       0     0
Frame Sync Errs       0     0

Last Command: dspphyslnerrs 7.1
```

dspphyslns (display physical line status)

Displays a list of physical lines and their current alarm status. at the local IGX node. If no slot number is entered, a one-line summary for all physical lines at the local node is displayed. If a specific slot number is entered with the command, all physical lines on that slot only are displayed.

You can configure nonconsecutive physical lines on the same IMA trunk or line. Use **dspphyslns** to display all physical lines belonging to a particular IMA trunk.

IMA physical line alarms are maintained differently than other types of logical (physical and virtual) trunks. Each IMA trunk has a configurable number of retained links. If the number of non-alarmed lines is less than the number of retained links, the logical (physical and virtual) trunks on the IMA trunk or line are placed into major alarm.

To illustrate this, a line has the current configuration: IMA trunks 4.5–8, with the number of retained links set at 2. If 4.5 and 4.6 go into LOS (loss of signal), physical line alarms are generated for these two physical lines. The logical trunks 4.5–8 do not go into alarm because the two retained links are still healthy. In this situation, the bandwidth on the logical trunk is adjusted downward to prevent cell drops, and the connections on those trunks are rerouted. If a third line goes into alarm, the logical trunk is then failed.

Syntax

dspphyslns [slot]

Parameters

Parameter	Description
[slot]	Specifies the slot number.

Display Fields

Parameter	Description
PHYSLN	The physical line number.
Type	Physical line type.
Current Line Alarm Status	The alarm status is one of the following values: • Clear—OK (Alarm Information Signal) • LOS (Loss of Signal) • Out of Frame (Remote Out-of-Packet Frames) • Minor—Bad clock source (Loss of Multiframe)
Trk/Line	Shows the primary line or trunk number. The primary line or trunk is the first line or trunk added to an IMA configuration using the **upln** or **uptrk** command.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

dspphyslnstathist, clrphyslnerrs, prtphyslnerrs

Example

Display a summary of physical lines.

dspphyslns

```
sw150          VT    Cisco           IGX 8420  9.3.2T    Dec. 18 2000 22:12 PST

PHYSLN      Type   Current Line Alarm Status               Trk/Line
 3.1        E3/530 Clear - OK                               3.1-T
 3.3        E3/530 Clear - OK                               3.3-T
 5.3        OC3    Clear - OK                               5.3-T
 8.1        T3/636 Clear - OK                               8.1-T
 9.1        OC3    Clear - OK                               9.1-T
14.2        OC3    Clear - OK                              14.2.1(14)
14.3        OC3    Clear - OK                              14.3-T



Last Command: dspphyslns
```

Example

Display the physical lines on card 4.

dspphyslns 4

```
sw108          VT    Cisco           IGX 8420  9.3.2J    Oct. 31 2000 13:35 GMT

PHYSLN      Type   Current Line Alarm Status               Trk/Line
 4.2        OC3    Clear - OK                               4.2-T
 4.4        OC3    Clear - OK                               4.4-T





Last Command: dspphyslns 4
```

Example

Display a detailed description of the type and current alarm status for the physical lines in slot 7 (a T1 IMA trunk).

dspphyslns 7

```
igxr03         VT    Cisco           IGX 8430  9.3.2V    Jan. 18 2001 14:16 PST

PHYSLN      Type   Current Line Alarm Status               Trk/Line
```

```
 7.1        T1/24  Clear - OK                              7.1(8)-T
 7.2        T1/24  Clear - OK                              7.1(8)-T
 7.3        T1/24  Clear - OK                              7.1(8)-T
 7.4        T1/24  Clear - OK                              7.1(8)-T
 7.5        T1/24  Clear - OK                              7.1(8)-T
 7.6        T1/24  Clear - OK                              7.1(8)-T
 7.7        T1/24  Clear - OK                              7.1(8)-T
 7.8        T1/24  Clear - OK                              7.1(8)-T


Last Command: dspphyslns 7
```

Example

Display a detailed description of the type and current alarm status for the physical lines in slot 5.

dspphyslns 5

```
sw225          TN    StrataCom       IGX 8420  9.3.13    Feb. 2 2000  10:11 GMT

PHYSLN      Type   Current Line Alarm Status              Trk/Line
 5.1        E1/30  Clear - OK                              5.1(8)-L
 5.2        E1/30  Clear - OK                              5.1(8)-L
 5.3        E1/30  Clear - OK                              5.1(8)-L
 5.4        E1/30  Clear - OK                              5.1(8)-L
 5.5        E1/30  Clear - OK                              5.1(8)-L
 5.6        E1/30  Clear - OK                              5.1(8)-L
 5.7        E1/30  Clear - OK                              5.1(8)-L
 5.8        E1/30  Clear - OK                              5.1(8)-L


Last Command: dspphyslns 5
```

dspphyslnstatcnf (display statistics enabled for a physical line)

Displays statistics (see Table 4-25)configured as enabled for a selected line on a UXM card by the **cnfphyslnstats** command, by Cisco WAN Manager, or by node features. (The older command **dsplnstatcnf** is an alias for the IGX only.)

The Owner column identifies who or what set the statistic. If the Owner column shows “Automatic,” the node’s features set the statistic. If the node name appears under Owner, Cisco WAN Manager set the statistic. If the user name appears under Owner, the **cnfchstats** command executed from the command line interface set the statistic.

Table 4-25 Physical Line Statistics

Statistic Object	Stat Type	Card Type	Definition
Total Cells Received	Logical	UXM/BXM	All
Total Cells Transmitted	Logical	UXM/BXM	All
LOS Transitions	Physical	UXM/BXM	All
LOF Transitions	Physical	UXM/BXM	All
Line AIS Transitions	Physical	UXM/BXM	T3/E3/SONET
Line RDI (Yellow) Transitions	Physical	UXM/BXM	T3/E3/SONET
Uncorrectable HCS Errors	Physical	UXM	T3/E3/SONET
Correctable HCS Errors	Physical	UXM	T3/E3/SONET
HCS Errors	Physical	BXM	T3/E3/SONET
Line Code Violations, ES, and SES	Physical	BXM	T3/E3
Line Parity (P-bit]) Errors, ES, and SES	Physical	BXM	T3
Path Parity (C-bit) Errors, ES, and SES	Physical	BXM	T3
Far End Block Errors	Physical	BXM	T3
Framing Errors and SES	Physical	BXM	T3/E3
Unavailable Seconds	Physical	BXM	T3/E3
PLCP LOF and SES	Physical	BXM	T3
PLCP YEL	Physical	BXM	T3
PLCP BIP-8, ES, SES	Physical	BXM	T3
PLCP FEBE, ES, SES	Physical	BXM	T3
PLCP FOE, ES, SES	Physical	BXM	T3
PLCP UAS	Physical	BXM	T3
LOC Errors	Physical	UXM/BXM	E3/SONET
LOP Errors	Physical	UXM/BXM	SONET
Path AIS Errors	Physical	UXM/BXM	SONET
Path RDI Errors	Physical	UXM/BXM	SONET

Table 4-25 Physical Line Statistics (continued)

Statistic Object	Stat Type	Card Type	Definition
Section BIP-8 Counts, ES, and SES	Physical	UXM/BXM	SONET
Line BIP-24 Counts, ES, and SES	Physical	UXM/BXM	SONET
Line FEBE Counts, ES, and SES	Physical	UXM/BXM	SONET
Section SEFS	Physical	UXM/BXM	SONET
Line UAS and FarEnd UAS	Physical	UXM/BXM	SONET
Clock Loss Transitions	Physical	UXM	T1/E1
Frame Loss Transitions	Physical	UXM	T1/E1
Multiframe Loss	Physical	UXM	T1/E1
CRC Errors	Physical	UXM	T1/E1
BPV	Physical	UXM	T1
Frame Bit Errors	Physical	UXM	E1
Unknown VPI/VCI Count	Physical	UXM/BXM	All
Errored LPC Cell Count	Physical	UXM	All
Non-zero GFC Cell Count	Physical	UXM/BXM	
Max Differential Delay	Physical	UXM	T1/E1
Uncorrectable HEC errors	Physical	UXM	All
Cell Hunt Count	Physical	UXM	T1/E1
Bandwidth Changed Count	Physical	UXM	T1/E1
Receive CLP=0 Cell Count	Logical	UXM/BXM	All
Receive CLP=1 Cell Count	Logical	UXM/BXM	All
Receive CLP=0 Cell Discard	Logical	UXM/BXM	All
Receive CLP=1 Cell Discard	Logical	UXM/BXM	All
Transmit CLP=0 Cell Count	Logical	UXM/BXM	All
Transmit CLP=1 Cell Count	Logical	UXM/BXM	All
Receive OAM Cell Count	Logical	UXM/BXM	All
Transmit OAM Cell Count	Logical	UXM/BXM	All
Receive RM Cell Count	Logical	UXM/BXM	All
Transmit RM Cell Count	Logical	UXM/BXM	All
For Each Traffic Type: (V,TS,NTS, ABR, rt-VBR, nrt-VBR, CBR, BdatB, BdatA, HP)			
Cells Served	Logical	UXM/BXM	All

Table 4-25 Physical Line Statistics (continued)

Statistic Object	Stat Type	Card Type	Definition
Maximum Qbin Depth	Logical	UXM/BXM	All
Cells Discarded Count	Logical	UXM/BXM	All

The **dspphyslnstatcnf** command also provides additional physical line statistics (which support the ATM Forum–compliant IMA protocol. See these the IMA physical line statistics under the command **cnfphyslnstats** in Table 3-28 on page 3-306.

Syntax

dspphyslnstatcnf <line>

Parameters

Parameter	Description
<line>	Specifies the line.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnfphyslnstats

Example

Display statistics enabled for a physical line on an IGX.

dspphyslnstatcnf 5.1

```
sw180          VT    Cisco          IGX 8420  9.3.p7    Dec. 12 2000 12:38 GMT

Statistics Enabled on Physical Line 5.1

Statistic                            Samples  Interval  Size  Peaks  Owner
-----------------------------------  -------  --------  ----  -----  ----------
  1) Bipolar Violations                   60         0     4   NONE  AUTO
  3) Out of Frames                        60         0     4   NONE  AUTO
  4) Losses of Signal                     60         0     4   NONE  AUTO
  5) Frames Bit Errors                    60         0     4   NONE  AUTO
  6) CRC Errors                           60         0     4   NONE  AUTO
 29) Line Code Violations                 60         0     4   NONE  AUTO
 32) Line Parity Errors                   60         0     4   NONE  AUTO
 35) Path Parity Errors                   60         0     4   NONE  AUTO
 41) BIP-8 Code Violations                60         0     4   NONE  AUTO
 98) Frame Sync Errors                    60         0     4   NONE  AUTO
```

```
Last Command: dspphyslnstatcnf 5.1
```

dspphyslnstathist (display statistics data for a physical line)

Displays a history of statistics configured as enabled for a selected physical line on an active IMA trunk or line on a UXM card.

This command displays the last five occurrences of the line statistic for a physical line on an active IMA trunk on a UXM card. Select the line statistic from the list displayed when you first enter this command. Use the **dspphyslnstatcnf** to display the statistics enabled on the selected channel. Use **cnfphyslnstats** to enable a statistic.

Syntax

dspphyslnstathist <line> <statistic number> <interval> <owner>

Parameters

Parameter	Description
<line>	Specifies the circuit line in the format *slot.line*. If the card set supports only one line, you can enter just the slot number.
<statistic number>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample. Range: 1–255 minutes
<owner>	Specifies the source of the configuration (“auto,” “user”, or “tftp”). You might need to enter “AUTO” in capital letters.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			Yes	

Related Commands

cnfphyslnstats, **dspphyslnstatcnf**

Example

Display statistics for a physical line on an IGX.

dspphyslnstathist 5.1

```
-----------------------------------SCREEN 1---------------------------------
sw180          VT    Cisco           IGX 8420  9.3.p7    Dec. 12 2000 13:04 GMT

Line Statistic Types

  1) Bipolar Violations                   37) Severely Err Secs - Path
  3) Out of Frames                        38) Severely Err Frame Secs
  4) Losses of Signal                     40) Unavail. Seconds
  5) Frames Bit Errors                    41) BIP-8 Code Violations
  6) CRC Errors                           42) Cell Framing Errored Seconds
 29) Line Code Violations                 43) Cell Framing Sev. Err Secs.
```

```
 30) Line Errored Seconds               44) Cell Framing Sec. Err Frame Secs
 31) Line Severely Err Secs             45) Cell Framing Unavail. Secs.
 32) Line Parity Errors                 62) Total Cells Tx to line
 33) Errored Seconds - Line             69) Total Cells Rx from line
 34) Severely Err Secs - Line           98) Frame Sync Errors
 35) Path Parity Errors                141) FEBE Counts
 36) Errored Secs - Path               143) Cell Framing FEBE Err Secs

This Command: dspphyslnstathist 5.1


Continue? y

------------------------------------SCREEN 2---------------------------------
sw180          VT    Cisco           IGX 8420  9.3.p7    Dec. 12 2000 13:06 GMT

Line Statistic Types

144) Cell Framing FEBE Sev. Err. Secs.  202) Section BIP8 Err. Secs.
151) Yellow Alarm Transition Count      203) Line BIP24 Err. Secs.
152) Cell Framing Yel Transitions       204) Line FEBE Err. Secs.
153) AIS Transition Count               205) Path BIP8 Err. Secs.
193) Loss of Cell Delineation           206) Path FEBE Err. Secs.
194) Loss of Pointer                    207) Section BIP8 Severely Err. Secs.
195) OC3 Path AIS                       208) Section Sev. Err. Framing Secs.
196) OC3 Path YEL                       209) Line BIP24 Severely Err. Secs.
197) Section BIP8                       210) Line FEBE Severely Err. Secs.
198) Line BIP24                         211) Path BIP8 Severely Err. Secs.
199) Line FEBE                          212) Path FEBE Severely Err. Secs.
200) Path BIP8                          213) Line Unavailable Secs.
201) Path FEBE                          214) Line Farend Unavailable Secs.

This Command: dspphyslnstathist 5.1


Continue? y

------------------------------------SCREEN 3---------------------------------
sw180          VT    Cisco           IGX 8420  9.3.p7    Dec. 12 2000 13:06 GMT

Line Statistic Types

215) Path Unavailable Secs.             228) INVMUX: Tx Failure Count
216) Path Farend Unavailable Secs.      229) INVMUX: Rx Failure Count
217) HCS Uncorrectable Error
218) HCS Correctable Error
219) INVMUX: line violations
220) INVMUX: Severely Err. Secs.
221) INVMUX: Farend Sev. Err. Secs.
222) INVMUX: Unavailable Secs.
223) INVMUX: Farend Unavail Secs.
224) INVMUX: Tx Unusable Seconds
225) INVMUX: Rx Unusable Seconds
226) INVMUX: Farend Tx Unusable Secs.
227) INVMUX: Farend Rx Unusable Secs.

This Command: dspphyslnstathist 5.1


Statistic Type:
```

dspport (display port)

Displays the status of all ports in a node, all ports on a specified interface card, or the detailed information for a single specified port. The more specific the port address in the command, the more detail is provided. For a full description of the port configuration parameters, see the **cnfport** command. (The **dspport** command is the same as the alias command **dspfrport)**.

Sample commands:

dspport
Display the states of all ports in the node.

dspport 8
Display the port states for interface card in slot 8.

dspport 8.1
Display the configuration for port 1 of the interface card in slot 8.

dspport 2.1.1
Display the configuration for virtual port 1.1 of the BXM card in slot 2.

Syntax

dspport <slot.port> [.vport]

Parameters

Parameter	Description
slot.port	Specifies the physical slot and port of the Frame Relay or ATM card set. Range: 1–4
[.vport]	Optional virtual port number (BXM only).

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			Yes	

Related Commands

cnfport, upport, dnport, addport, delport

Example (BPX)

Display port 13.1 of a BXM.

dspport 13.1

```
BPX02          TN    Cisco           BPX 8620  9.3.3W    Aug. 13 2001 12:35 PDT

Port:     13.1      [ACTIVE  ]                Bandwidth/AR BW:  353208/353208
Interface:          LM-BXM                    CAC Override:     Enabled
VPI Range:             0 -  255               CAC Reserve:      0
Type:               UNI                       %Util Use:        Disabled
Shift:              SHIFT ON HCF (Normal Operation)
SIG Queue Depth:    640                       Port Load:        0 %
F4-F5 Mapping:      Yes                       F4-F5 Used Chans: 0
Protocol:           NONE                      Protocol by Card: No


Last Command: dspport 13.1


Next Command:
```

Example (IGX)

Display port 9.3 of a UXM.

cnfport 9.3 N i 10 16 y y 30 3 4 N y 200 0 y y y

```
bolger         TN    Cisco           IGX 8430  9.3.3o    May  16 2001 09:33 PST

Port:       9.3     [ACTIVE  ]
Interface:          OC3                   CAC Override:          Disabled
Type:               UNI                   %Util Use:             Disabled
Speed:              353208 (cps)          GW LCNs:               200
SIG Queue Depth:    640                   Reserved BW:           0 (cps)
Alloc Bandwidth:    353208 (cps)          VC Shaping:            Enabled
Protocol:           ILMI                  Protocol run on the card: Yes
  VPI.VCI:                    10.16       Advertise Intf Info:   Yes
  ILMI Polling Enabled        Y
  Trap Enabled                Y
  T491 Polling Interval      30
  N491 Error Threshold        3
  N492 Event Threshold        4


Last Command: cnfport 9.3 N i 10 16 y y 30 3 4 N y 200 0 y y y
```

Example (IGX)

Display port for IMA port 8.1 of a UXM.

dspport8.1

```
bolger         TN    Cisco          IGX 8430  9.3.3o    May  15 2001 18:42 PST

Port:       8.1     [FAILED  ]
IMA Port Grp:       1-2
Interface:          E1-IMA                CAC Override:          Disabled
Type:               NNI                   %Util Use:             Enabled
Speed:              8905 (cps)            GW LCNs:               200
SIG Queue Depth:    640                   Reserved BW:           0 (cps)
Alloc Bandwidth:    8905 (cps)            VC Shaping:            Enabled
Protocol:           ILMI                  Protocol run on the card: Yes
  VPI.VCI:                    10.16       Advertise Intf Info:   Yes
  ILMI Polling Enabled        Y
  Trap Enabled                Y
  T491 Polling Interval      30
  N491 Error Threshold        3
  N492 Event Threshold        4


Last Command: dspport 8.1
```

Example (IGX)

Display port for UFM-C port 8.1

dspport 8.1

```
sw176          TN    Cisco          IGX 8420  9.3.a5    Apr. 27 2001 09:54 PDT

Port:       8.1               [FAILED]
Interface:  T1D                             Configured Clock:    320 Kbps
Clocking:   None                            Measured Rx Clock: None

Port ID                        -      Min Flags / Frames           1
Port Queue Depth           65535      OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535      T391 Link Intg Timer        10 sec
DE Threshold                 100 %    N391 Full Status Poll        6 cyl
Signalling Protocol    Cisco LMI      EFCI Mapping Enabled        No
Asynchronous Status           No      CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer      15      IDE to DE Mapping          Yes
N392 Error Threshold           3      Channel Speed               64
N393 Monitored Events Count    4      Line Number                  1
Communicate Priority          No      Channel Range              1-5
Upper/Lower RNR Thresh  75%/ 25%

Last Command: dspport 8.1
```

Example (IGX)

Display port 9 for UXM card; shows all ports on slot 9.

dspport 9

```
bolger         TN    Cisco           IGX 8430  9.3.3m    Apr. 27 2001 09:09 PST

Port configuration for ATM 9

Port   Chan        Speed      Interface       State       Protocol    Type
2      2        353208 (cps)  OC3             INACTIVE    NONE        UNI
3      3        353208 (cps)  OC3             ACTIVE      ILMI        UNI


Last Command: dspport 9
```

Example (IGX)

Display port 25.1 of a URM.

dspport 25.1

```
bolger         TN    Cisco           IGX 8430  9.3.3o    May  16 2001 09:37 PST

Port:       25.1    [ACTIVE  ]
Interface:          INTERNAL             CAC Override:          Disabled
Type:               UNI                  %Util Use:             Enabled
Speed:              353208 (cps)         GW LCNs:               200
SIG Queue Depth:    640                  Reserved BW:           0 (cps)
Alloc Bandwidth:    353208 (cps)         VC Shaping:            Enabled
Protocol:           ILMI                 Protocol run on the card: Yes
  VPI.VCI:                    10.16      Advertise Intf Info:   Yes
  ILMI Polling Enabled        Y
  Trap Enabled                Y
  T491 Polling Interval      30
  N491 Error Threshold        3
  N492 Event Threshold        4


Last Command: dspport 25.1
```

Example (IGX)

Display port 9.1 on a UFM-U card.

dspport 9.1

```
sw108          TN    Cisco           IGX 8420  9.3.c2    May  16 2001 16:38 GMTPort
9.1               [ACTIVE  ]
Interface  V35     DCE                        Configured Clock    256 Kbps
Clocking   Normal                             Measured Rx Clock   256 Kbps

Port ID                         0       Min Flags / Frames           1
Port Queue Depth            65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold         65535       T391 Link Intg Timer        10 sec
DE Threshold                  100 %     N391 Full Status Poll        6 cyl
Signalling Protocol          None       EFCI Mapping Enabled        No
Asynchronous Status            No       CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer       15       IDE to DE Mapping          Yes
N392 Error Threshold            3       Interface Control Template
N393 Monitored Events Count     4          Lead    CTS    DSR    DCD
Communicate Priority           No          State   ON     ON     ON
Last Command: dspport 9.1
```

dspportids (display port IDs)

Displays port IDs. The port ID is a user-specified identifier for a particular Frame Relay port where several virtual circuits share the same physical interface. The port ID can be any numeric value in the range 1–1024.

The command for specifying a port ID is **cnffrport**. Note that a Port Concentrator does not use port IDs.

Syntax

dspport IDs

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			No	

Related Commands

cnffrport

Example

Display the port IDs throughout the network.

dspportids

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 15:55 PST

Frame Relay Port IDs
ID   Node
7    alpha    |
9    alpha    |




Last Command: dspportids


Next Command:
```

dspportq (display ARM port queue configuration)

Displays the Automatic Routing Management port queue configuration for an ASI or BXM card on a BPX, or a UXM card on an IGX. After you enter this command with the required slot and physical port number parameters, the display shows the detailed port queue configuration information.

Syntax

dspportq <slot.port>[<.vport>]

Parameters

Parameter	Description
slot.port[.vport]	Specifies the card slot, physical, and optional virtual port number (BXM only).

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			No	

Related Commands

cnfportq

Display Parameters (ASI)

Parameter	Description
nni/uni	Specifies whether the cell header format is NNI or UNI. Default: UNI
cbr queue parms	Specifies the CBR queue parameters of depth, cbr-hi, cbr-lo, and efci. Range for depth: 0 to 24000 Range for all others: 0 to 100%
nrt-vbr queue parms	Specifies the nrt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. Range for depth: 0 to 24000 Range for all others: 0 to 100%
rt-vbr queue parms	Specifies the rt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. Range for depth: 0 to 24000 Range for all others: 0 to 100%
ubr/abr queue parms	Specifies the ABR queue parameters of depth, abr-hi, abr-low, and efci. Range for depth: 0 to 24000 Range for all others: 0 to 100%

Display Parameters (UXM)

Parameter	Description
nni/uni	Specifies whether the cell header format is NNI or UNI. Default: UNI
cbr queue parms	Specifies the CBR queue parameters of depth, cbr-hi, cbr-lo, and efci. Range for depth: 0 to 97250 Range for all others: 0 to 100%
nrt-vbr queue parms	Specifies the nrt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. Range for depth: 0 to 97250 Range for all others: 0 to 100%
rt-vbr queue parms	Specifies the rt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. Range for depth: 0 to 97250 Range for all others: 0 to 100%
ubr/abr queue parms	Specifies the ABR queue parameters of depth, abr-hi, abr-low, and efci. UBR traffic shares this queue with the ABR traffic. Range for depth: 0 to 97250 Range for all others: 0 to 100%

Display Parameters (BXM)

Parameter	Description
nni/uni	Specifies whether the cell header format is NNI or UNI. Default: UNI
cbr queue parms	Specifies the CBR queue parameters of depth, cbr-hi, cbr-lo, and efci. Range for depth: 0 to 97250 Range for all others: 0 to 100%
nrt-vbr queue parms	Specifies the nrt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. Range for depth: 0 to 97250 Range for all others: 0 to 100%
rt-vbr queue parms	Specifies the rt-VBR queue parameters of depth, vbr-hi, vbr-low, and efci. Range for depth: 0 to 97250 Range for all others: 0 to 100%
ubr/abr queue parms	Specifies the ABR queue parameters of depth, abr-hi, abr-low, and efci. UBR traffic shares this queue with the ABR traffic. Range for depth: 0 to 97250 Range for all others: 0 to 100%

Example (IGX)

Display the port queue configuration for IGX port 5.3.

dspportq 5.3

```
sw180          TN    Cisco          IGX 8420  9.3.o9    Dec. 5 2000  14:05 GMT

Port:       5.3     [ACTIVE  ]
Interface:          OC3
Type:               UNI
Speed:              353208 (cps)        Alloc Bandwidth:        353208 (cps)
```

```
CBR Queue Depth:              600       rt-VBR Queue Depth:              5000
CBR Queue CLP High Threshold: 80%       rt-VBR Queue CLP High Threshold: 80%
CBR Queue CLP Low Threshold:  60%       rt-VBR Queue CLP Low Threshold:  60%
CBR Queue EFCI Threshold:     60%       rt-VBR Queue EFCI Threshold:     60%
nrt-VBR Queue Depth:          5000      ABR Queue Depth:                 20000
nrt-VBR Queue CLP High Threshold: 80%   ABR Queue CLP High Threshold:    80%
nrt-VBR Queue CLP Low Threshold:  60%   ABR Queue CLP Low Threshold:     60%
nrt-VBR Queue EFCI Threshold: 60%       ABR Queue EFCI Threshold:        20%


Last Command: dspportq 5.3
```

Example (BPX)

Display the port queue configuration for BPX port 11.1.

dspportq 11.1

```
sw53           VT    Cisco           BPX 8620  9.3.2o    Dec. 5 2000  14:07 GMT

Port:       11.1    [ACTIVE  ]
Interface:          LM-BXM
Type:               UNI
AR Bandwidth:       353208 (cps)
SVC Queue Pool Size:          0
          QUEUE    DEPTH    CLP HI  CLP LO  EFCI   VC SHAPE
                                    /EPD
             CBR   600       80%     60%     60%   DISABLED
          rt-VBR   5000      80%     60%     60%   DISABLED
         nrt-VBR   5000      80%     60%     60%   DISABLED
         UBR/ABR   20000     80%     60%     20%   DISABLED


Last Command: dspportq 11.1
```

dspports (display ports)

Displays either all of the ports on the node, or if a slot is specified, all of the ports on the specified slot.

Syntax

dspports [<slot>]

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	BPX, IGX			No	

Related Commands

dspport, addport, upport, dnport, delport

Example (BPX)

Display the status of all the ports on the BXM card.

dspports

```
sw167          TN    Cisco           BPX 8620  9.3.2T    Dec. 19 2000 21:19 PST

 Port States
Port       State
5.1        ACTIVE
5.2        ACTIVE
6.3        ACTIVE
6.4        ACTIVE
6.5        ACTIVE
6.6        ACTIVE
6.7        ACTIVE
6.8        ACTIVE

Last Command: dspports
```

Example (BPX)

Display the status of BXM card slot 6.

dspports 3

```
sw167          TN    Cisco           BPX 8620  9.3.2T    Dec. 19 2000 21:22 PST

Port configuration for ATM 64

Port        VPI Min/Max     Bandwidth    Interface   State      Protocol  Type
6.3            0 /  255    353208 (cps)  LM-BXM      ACTIVE     NONE      UNI
6.4            0 /  255    353208 (cps)  LM-BXM      ACTIVE     NONE      UNI
6.5            0 /  255    353208 (cps)  LM-BXM      ACTIVE     NONE      UNI
6.6            0 /  255    353208 (cps)  LM-BXM      ACTIVE     NONE      UNI
6.7            0 /  255    353208 (cps)  LM-BXM      ACTIVE     NONE      UNI
6.8            0 /  255    353208 (cps)  LM-BXM      ACTIVE     NONE      UNI
Last Command: dspports 6
```

dspportstatcnf (display statistics enabled for FR port)

Displays statistics configured as enabled for a selected Frame Relay port.

These are the statistics set by the **cnfportstats** command, by Cisco WAN Manager, or by node features. The owner column shows what set the statistic. If the Owner column is Automatic, it was set by feature; if it is node name, it was set by Cisco WAN Manager; if it is user, it was set with the **cnfportstats** command.

Syntax

dspportstatcnf <line>

Parameters

Parameter	Description
<line>	Specifies the port in the form *slot.port*: do NOT enter the DLCI.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	IGX			Yes	

Related Commands

cnfportstats

Example

Display port statistics enabled.

dspportstatcnf 8.1

```
gamma            Cisco WAN Manager       YourID           Rev:  9.3  Apr. 13 2000 13:47
PDT

Statistic Enabled on Port 8.1

Statistic                             Samples  Interval  Size  Peaks  Owner
------------------------------------  -------  --------  ----  -----  ----------
Frames Received                             5        60     4    1 M  beta
Frames Received                             5        60     4    1 M  beta
Bytes Received                              5        60     4    1 M  beta



Last Command: dspportstatcnf 8.1
```

dspportstathist (display statistics history for an FR port)

Displays a history of statistics configured as enabled for a selected Frame Relay port. This command displays the data for the last five occurrences of the port statistic.You select the port statistic from the list displayed when you first enter the command. Use **cnfportstats** to enable a statistic.

Syntax

dspportstathist <line> <statistic number> <interval> <owner>

Parameters

Parameter	Description
<line>	Specifies the circuit line in the format *slot.line*. If the card set supports only one line, you can enter just the slot number.
<statistic number>	Specifies the type of statistic to enable/disable.
<interval>	Specifies the time interval of each sample. Range: 1–255 minutes
<owner>	Specifies the source of the configuration (“auto,” “user”, or “tftp”). You might have to enter owner “AUTO” or “USER” in all capital letters.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	IGX			Yes	

Related Commands

cnfportstats, **dspportstatcnf**

Example (UXM on IGX)

dspportstathist 4.1

```
sw144          TN    Cisco           IGX 8420  9.3.10 Date/Time Not Set

Port Statistic Types

34) PORT: Unknwn VPI/VCI cnt            48) PORT: # of cells rcvd
35) VI: Cells rcvd w/CLP=1              49) PORT: # of cells xmt
36) VI: OAM cells received              51) INVMUX: HEC cell errors
37) VI: Cells tx w/CLP=1                52) INVMUX: LCP cell errors
39) VI: Cells received w/CLP=0          53) INVMUX: Cell Hunt Count
40) VI: Cells discarded w/CLP=0         54) INVMUX: Bandwidth Change Count
41) VI: Cells discarded w/CLP=1         55) ILMI: Get Req PDUs rcvd
42) VI: Cells transmitted w/CLP=0       56) ILMI: GetNxt Req PDUS rx
43) VI: OAM cells transmitted           57) ILMI: GetNxt Req PDUS xmt
44) VI: RM cells received               58) ILMI: Set Req PDUs rcvd
45) VI: RM cells transmitted            59) ILMI: Trap PDUs rcvd
46) VI: Cells transmitted               60) ILMI: Get Rsp PDUs rcvd
47) VI: Cells received                  61) ILMI: Get Req PDUs xmt
```

```
This Command: dspportstathist 4.1

Continue?

sw144          TN    Cisco           IGX 8420  9.3.10 Date/Time Not Set

Port Statistic Types

62) ILMI: Get Rsp PDUs xmt             75) LMI: Invalid LMI PDU length rcvd
63) ILMI: Set Req PDUs xmt             76) LMI: Unknown LMI PDUs rcvd
64) ILMI: Trap PDUs xmt                77) LMI: Invalid LMI IE rcvd
65) ILMI: Unknwn PDUs rcvd             78) LMI: Invalid Transaction IDs
66) LMI: Status messages xmt           79) INVMUX: Unavailable Seconds
67) LMI: Updt Status msgs xmt          80) INVMUX: Near End Fail Count
68) LMI: Status Ack msgs xmt           81) INVMUX: Last Proto Fail Code
69) LMI: Status Enq msgs rcvd          82) INVMUX: Slowest Link
70) LMI: Status Enq msgs xmt           86) Q2 Cells Tx
71) LMI: Status msgs rcvd              87) Tx Q2 CDscd
72) LMI: Updt Status msg rcvd          88) Egr CRx Q2
73) LMI: Status Ack msg rcvd           89) Q3 Cells Tx
74) LMI: Invalid LMI PDUs rcvd         90) Tx Q3 CDscd

This Command: dspportstathist 4.1


Continue?


sw144          TN    Cisco           IGX 8420  9.3.10 Date/Time Not Set

Port Statistic Types

91) Egr CRx Q3                         113) Q11 Cells Tx
101) Q7 Cells Tx                       114) Tx Q11 CDscd
102) Tx Q7 CDscd                       115) Egr CRx Q11
103) Egr CRx Q7                        116) Q12 Cells Tx
104) Q8 Cells Tx                       117) Tx Q12 CDscd
105) Tx Q8 CDscd                       118) Egr CRx Q12
106) Egr CRx Q8                        119) Q13 Cells Tx
107) Q9 Cells Tx                       120) Tx Q13 CDscd
108) Tx Q9 CDscd                       121) Egr CRx Q13
109) Egr CRx Q9                        122) Q14 Cells Tx
110) Q10 Cells Tx                      123) Tx Q14 CDscd
111) Tx Q10 CDscd                      124) Egr CRx Q14
112) Egr CRx Q10                       125) Q15 Cells Tx

This Command: dspportstathist 4.1


Continue?

sw144          TN    Cisco           IGX 8420  9.3.10 Date/Time Not Set

Port Statistic Types

126) Tx Q15 CDscd
127) Egr CRx Q15

This Command: dspportstathist 4.1


Statistic Type:
```

Example (BXM on BPX)

dspportstathist 12.3

```
rogue          TN    Cisco           BPX 8620  9.3.10    July 14 2000 11:43
GMT

Port Statistic Types

 1) Unknown VPI/VCI count               24) Get Request PDUs transmitted
 8) Number of cells received            25) Get Response PDUs transmitted
 9) Number of cells rcvd w/CLP set      26) Trap PDUs transmitted
12) Number of cells xmitted             27) Unknown ILMI PDUs Received
13) OAM cells received count            28) Status messages transmitted
15) Number of cells xmitted w/CLP set   29) Update Status messages
transmitted
18) Get Request PDUs received           30) Status Acknowledge msgs
transmitted
19) Get Next Request PDUS received      31) Status Enquiry messages received
20) Get Next Request PDUS transmitted   32) Status Enquiry mesgs transmitted
21) Set Request PDUs received           33) Status messages received
22) Trap PDUs received                  34) Update Status messages received
23) Get Response PDUs received          35) Status Acknowledge messages
received

This Command: dspportstathist 12.3

Continue?

rogue          TN    Cisco           BPX 8620  9.3.10    July 14 2000 11:44
GMT

Port Statistic Types

36) Invalid LMI PDUs received received  48) Last unknown VPI/VCI pair
37) Invalid LMI PDU length received     49) Tx Cells Served on Qbin 0
38) Unknown LMI PDUs received           50) Tx Cells Discarded on Qbin 0
39) Invalid LMI IE received             51) Tx Cells Received on Qbin 0
40) Invalid Transaction IDs             52) Tx Cells Served on Qbin 1
41) Number of cells rcvd w/clp 0        53) Tx Cells Discarded on Qbin 1
42) Number of cells dscd w/clp 0        54) Tx Cells Received on Qbin 1
43) Number of cells dscd w/clp set      55) Tx Cells Served on Qbin 2
44) Number of cells tx w/clp 0          56) Tx Cells Discarded on Qbin 2
45) Tx OAM cell count                   57) Tx Cells Received on Qbin 2
46) Rx RM cell count                    58) Tx Cells Served on Qbin 3
47) Tx RM cell count                    59) Tx Cells Discarded on Qbin 3

This Command: dspportstathist 12.3

Continue?

rogue          TN    Cisco           BPX 8620  9.3.10    July 14 2000 11:44
GMT

Port Statistic Types

60) Tx Cells Received on Qbin 3         87) Tx Cells Received on Qbin 12
76) Tx Cells Served on Qbin 9           88) Tx Cells Served on Qbin 13
77) Tx Cells Discarded on Qbin 9        89) Tx Cells Discarded on Qbin 13
78) Tx Cells Received on Qbin 9         90) Tx Cells Received on Qbin 13
79) Tx Cells Served on Qbin 10          91) Tx Cells Served on Qbin 14
80) Tx Cells Discarded on Qbin 10       92) Tx Cells Discarded on Qbin 14
81) Tx Cells Received on Qbin 10        93) Tx Cells Received on Qbin 14
82) Tx Cells Served on Qbin 11          94) Tx Cells Served on Qbin 15
```

```
83) Tx Cells Discarded on Qbin 11       95) Tx Cells Discarded on Qbin 15
84) Tx Cells Received on Qbin 11        96) Tx Cells Received on Qbin 15
85) Tx Cells Served on Qbin 12
86) Tx Cells Discarded on Qbin 12

This Command: dspportstathist 12.3

Statistic Type:
```

Example (BXM on BPX)

dspportstathist 12.3

```
rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:43 GMT

Port Statistic Types

 1) Unknown VPI/VCI count               24) Get Request PDUs transmitted
 8) Number of cells received            25) Get Response PDUs transmitted
 9) Number of cells rcvd w/CLP set      26) Trap PDUs transmitted
12) Number of cells xmitted             27) Unknown ILMI PDUs Received
13) OAM cells received count            28) Status messages transmitted
15) Number of cells xmitted w/CLP set   29) Update Status messages transmitted
18) Get Request PDUs received           30) Status Acknowledge msgs transmitted
19) Get Next Request PDUS received      31) Status Enquiry messages received
20) Get Next Request PDUS transmitted   32) Status Enquiry mesgs transmitted
21) Set Request PDUs received           33) Status messages received
22) Trap PDUs received                  34) Update Status messages received
23) Get Response PDUs received          35) Status Acknowledge messages received

This Command: dspportstathist 12.3

Continue?

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:44 GMT

Port Statistic Types

36) Invalid LMI PDUs received received  48) Last unknown VPI/VCI pair
37) Invalid LMI PDU length received     49) Tx Cells Served on Qbin 0
38) Unknown LMI PDUs received           50) Tx Cells Discarded on Qbin 0
39) Invalid LMI IE received             51) Tx Cells Received on Qbin 0
40) Invalid Transaction IDs             52) Tx Cells Served on Qbin 1
41) Number of cells rcvd w/clp 0        53) Tx Cells Discarded on Qbin 1
42) Number of cells dscd w/clp 0        54) Tx Cells Received on Qbin 1
43) Number of cells dscd w/clp set      55) Tx Cells Served on Qbin 2
44) Number of cells tx w/clp 0          56) Tx Cells Discarded on Qbin 2
45) Tx OAM cell count                   57) Tx Cells Received on Qbin 2
46) Rx RM cell count                    58) Tx Cells Served on Qbin 3
47) Tx RM cell count                    59) Tx Cells Discarded on Qbin 3

This Command: dspportstathist 12.3

Continue?

rogue          TN    Cisco           BPX 8620  9.3.1Z    July 14 2000 11:44 GMT
Port Statistic Types

60) Tx Cells Received on Qbin 3         87) Tx Cells Received on Qbin 12
76) Tx Cells Served on Qbin 9           88) Tx Cells Served on Qbin 13
77) Tx Cells Discarded on Qbin 9        89) Tx Cells Discarded on Qbin 13
78) Tx Cells Received on Qbin 9         90) Tx Cells Received on Qbin 13
79) Tx Cells Served on Qbin 10          91) Tx Cells Served on Qbin 14
```

```
80) Tx Cells Discarded on Qbin 10       92) Tx Cells Discarded on Qbin 14
81) Tx Cells Received on Qbin 10        93) Tx Cells Received on Qbin 14
82) Tx Cells Served on Qbin 11          94) Tx Cells Served on Qbin 15
83) Tx Cells Discarded on Qbin 11       95) Tx Cells Discarded on Qbin 15
84) Tx Cells Received on Qbin 11        96) Tx Cells Received on Qbin 15
85) Tx Cells Served on Qbin 12
86) Tx Cells Discarded on Qbin 12

This Command: dspportstathist 12.3
Statistic Type:
```

dspportstats (display Frame Relay port statistics)

Displays a summary of port statistics for a Frame Relay port. Statistics include the data byte count in the transmit and receive directions and error counts associated with the port. The display indicates the date and time the statistics were cleared and the amount of time since the node last cleared the statistics. *Bytes transmitted* indicates the amount of data transmitted from the port to the user device. *Bytes received* indicates the amount of data received at the port from the user device.

Corrupted statistics result from channel/port loopbacks or port tests. A "yes" in this field indicates that loopback or port tests have occurred since the statistics were last cleared. The statistics for User-to-Network Interface (UNI) ports (connections to user devices) are displayed with one screen.

Syntax

dspportstats <slot.port> [interval]

Parameters

Parameter	Description
slot	Specifies the Frame Relay card set slot.
port	Specifies the port on the back card. Range (FRI-V.35 or FRI-X.21 back cards): 1–4 Range (channelized ports FRI-T1): 1–24 Range (channelized ports FRI-E1): 1–31 Range (UFI back card): 1–250
[interval]	Specifies the refresh interval time for data. Range: 1–60 seconds Default: 1 second

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			Yes	

Related Commands

clrportstats

The **dspportstats** command also displays the statistics as shown in Table 4-26:

Table 4-26 UNI Port Statistics for Frame Relay

Frame Errors	LMI Statistics	Miscellaneous Statistics
Invalid CRC	Status Enquiries Received	Average TX Port Q
Invalid Alignment	Status Transmitted	FECN Frames
Invalid Frame Length	Update Transmit	FECN Ratio (%)
Invalid Frame Format	Invalid Requests	BECN Frames
Unknown DLCIs	Sequence # Mismatches	BECN Ratio (%)
Last Unknown DLCI	Timeouts	Resource Overflow
	Signaling Protocol	DE Frames Dropped (Egress)

Network to Network (NNI) ports require two screens to display all the parameters. The first screen is the same as described previously for UNI ports—you display the second screen by responding with a "y" for yes to the Continue? prompt. The second screen compares receive LMI statistics (see Table 4-27) with transmit LMI statistics. The LMI receive statistics are repeated from the middle column of the first screen and displayed again so you can compare them. This table lists the usage statistics in screen 2.

Table 4-27 LMI Statistics for Frame Relay

LMI Receive Protocol Stats	LMI Transmit Protocol Statistics
Status Enquiries Received	Status Inquiries Transmitted
Status Enquiries Transmitted	Status Received
Asynchronous Status Transmitted	Asynchronous Status Received
Sequence # Mismatches	Sequence # Mismatches
Timeouts	Timeouts
Invalid Frames	
Signaling Protocol	

The command displays frame error (see Table 4-28), LMI (see Table 4-29), miscellaneous statistics (see Table 4-30), and CCLM statistics (see Table 4-31).

Table 4-28 Frame Error Statistics

Statistics	Description
CRC Errors	Based on a CRC CCITT 16-bit frame check sequence, which is a cyclic redundancy check. If the frame received at a port has an incorrect CRC, it is flagged as a CRC error, and the frame is discarded. **Receive Frame CRC Errors (Ingress).** Provides a count of the number of frames received from the attached equipment in which the CRC calculated by the IGX does not match the CRC provided by the attached equipment in the last two octets of the frame. Any frame received with an incorrect CRC is discard by the network. However, the IGX does not wait to receive the entire frame before starting to packetize the frame and send it through the network. As long as the frame header format is valid (see Invalid Format Receive Frames statistic) and the DLCI field in the frame header is recognized (see Receive Frames Undefined DLCI Count statistic below), packets containing the beginning of the frame are created—(one start-of-frame (SOF) packet and subsequent middle-of-frame (MOF) packets)—and sent as soon as possible. If the frame is short and if there are other packets already waiting to be sent, the detection of the CRC error will cause all the packets of the frame to be discarded. However, if the frame is long and there is no congestion in the ingress VC queue, some packets are sent through the network before the CRC error is detected. As soon as the CRC error is detected, any portion of the frame that has not yet been sent is discarded. In particular, no end of frame (EOF) packet is ever sent. At the far end, when an SOF packet arrives that does not immediately follow an EOF packet, the incomplete frame is discard and counted in the PVC statistic of Transmit Frames Discarded. If the CRC is incorrect because of a bit error in the DLCI field in the frame header, then the error will also be recorded as a Receive Frame with Undefined DLCI unless the errored DLCI is also configured on the port. This statistic is a subset of the Frames Received statistic.

Table 4-28 Frame Error Statistics (continued)

Statistics	Description
Alignment error	Frame was not an integral number of bytes. **Receive Frame Alignment Errors (Ingress)**. This statistic provides a count of the number of frames received from the attached equipment in which the total frame length is not an integral number of octets. Any frame received with an incorrect alignment is discarded by the network. However, the IGX does not wait to receive the entire frame before starting the packetize the frame and send it to the network. As long as the frame header format is valid (See Invalid Format Receive Frames statistic), and the DLCI field in the frame header is recognized (see Receive Frames Undefined DLCI Count statistic), packets containing the beginning of the frame are created—(one start-of-frame (SOF) packet and subsequent middle-of-frame (MOF) packets)—and sent as soon as possible. If the frame is short or if there are other packets already waiting to be sent, the detection of the alignment error will cause all the packets of the frame to be discarded. However, if the frame is long and there is no congestion in the ingress VC queue, some packets are sent through the network before the alignment error is detected. As soon as the alignment error is detected, any portion of the frame that has not yet been sent is discarded. In particular, no end-of-frame (EOF) packet is ever sent. When the next frame arrives, a new SOF packet is sent, etc. At the far end, when an SOF packet arrives that does not immediately follow an EOF packet, the incomplete frame is discarded and counted in the PVC statistic of Transmit Frames Discarded. This statistic is a subset of the Frames Received statistic.
Frame length errors	Frames <5 bytes or> 4096 bytes. **Illegal Length Receive Frames (Ingress).** Provides a count of the number of frames received from the attached equipment in which the total frame length is either too short or too long. To be accepted, a frame must be at least five octets, but no more than 4510 octets long, including the header and frame check sequence (FCS, or CRC) octets. Any frame received with an invalid length is discard by the network. A frame that is too short is immediately detected and discarded. For a frame that is too long, the IGX does not wait to receive the entire frame before starting to packetize the frame and send it through the network. As long as the frame header format is valid (see Invalid Format Receives Frames statistic), and the DLCI field in the frame header is recognized (see Receive Frames Undefined DLCI Count statistic below), packets containing the beginning of the frame are created—(one start of frame (SOF) packet, and sent as soon as possible. Since the frame is very long, it is very likely that some packets are sent through the network before the length error is detected. As soon as the length error is detected, any portion of the frame that has not yet been sent is discarded. In particular, no end-frame (EOF) packet is ever sent. When the next frame arrives, a new SOF packet arrives that does not immediately follow an EOF packet, the incomplete frame is discarded and counted in the PVC statistic of Transmit Frames Discarded. This statistic is a subset of the Frames Received statistic.

Table 4-28 Frame Error Statistics (continued)

Statistics	Description
Frame format errors	Occurs when either of the least significant bits in the first two bytes of the Frame Relay header are set incorrectly. These two bytes are the frame's address field. The first byte's least significant bit is defined to be a zero, meaning that there is a second byte to the address. The second byte's least significant bit is defined to be a one, meaning this is the last byte of the address because it's a two byte address field. **Invalid Format Receive Frames (Ingress).** Provides a count of the number of frames received from the attached equipment in which the Extended Address (EA) bits (the least significant bit in each of the two Frame Relay header octets) is incorrect. The IGXIGX must see a r0s as the least significant bit of the first octet and a r1s as the least significant bit of the second octet. Any frame received with incorrect EA bits is discarded immediately. This statistic is a subset of the Frames Received statistic.
Unknown DLCIs	Occurs when a frame arrives at a Frame Relay port and the DLCI has not been mapped and the frame is discarded. **Received Frames Undefined DLCI Count (Ingress)**. Provides a count of the number of frames received with a DLCI for which no PVC is provisioned on this port. This count includes any signaling protocol frames received while no signaling protocol is enabled or the wrong signaling protocol is enabled (such as by enabling the Strata LMI signaling protocol while the attached equipment is generating Annex A or Annex D signaling protocol frames, or vice versa). Any frame received with an undefined DLCI is discarded immediately. This statistic is a subset of the Frames Received statistic.
Last unknown DLCI	Displayed so that the user can see the unknown DLCI.

Table 4-29 LMI Statistics

Statistics	Description
Status inquiries transmitted/received	Provides a count of the number of status enquiry frames received from the attached equipment as part of the selected signaling protocol. This statistic is valid for any UIN signaling protocol chosen (Strata LMI, ANSI Annex D, or CCITT Annex A). This statistic is a subset of the Frames Received statistic. **LMI UNI Status Enquiries (Ingress)**. Provides a count of the number of status enquiry frames received from the attached equipment as part of the selected signaling protocol. This statistic is valid for any UNI signaling protocol chosen (Strata LMI, ANSI Annex D, or CCITT Annex A). This statistic is also valid for any NNI signaling protocol chosen (ANSI Annex D, or CCITT Annex A). This statistic is a subset of the Frames Received statistic. LMI NNI Status Enquiries (Egress). Provides a count of the number of status enquiry frames transmitted to the attached equipment as part of the selected signaling protocol. This statistic is valid for any NNI signaling protocol chosen (ANSI Annex D or CCITT Annex A). This statistic is a subset of the Frames Transmitted statistic.

Table 4-29 LMI Statistics (continued)

Statistics	Description
Status transmit/received	The number of Status messages sent to the user device. **LMI UNI Status Transmit Count (Egress)**. Provides a count of the number of status frames transmitted to the attached equipment as part of the selected signaling protocol. This statistic is valid for any UNI signaling protocol. This statistic is valid for any UNI signaling protocol chosen (Strata LMI, ANSI Annex D, or CCITT Annex A). This statistic is a subset of the Frames Transmitted statistic.
Async status Xmit	The number of asynchronous status messages sent to the user device. Provides a count of the number of asynchronous status update frames transmitted to the attached equipment as part of the selected signaling protocol. This statistic is valid for any UNI signaling protocol chosen (Strata LMI, ANSI Annex D, or CCITT Annex A). This statistic is also valid for any NNI signaling protocol chosen (ANSI Annex D, or CCITT Annex A). If enabled as part of the port configuration (**cnfport** command), an asynchronous status update frame is generated any time a PVC is failed or downed and again any time a PVC is repaired or upped. This statistic is a subset of the Frames Transmitted statistic.
Invalid requests	The number of invalid requests received from the user device. **LMI Invalid Status Enquiries (Ingress)**. Provides a count of the number of status enquiry frames with an invalid format received from the attached equipment as part of the selected signaling protocol. This statistic is valid for any UNI signaling protocol chosen (Strata LMI, ANSI Annex D, or CCITT Annex A). This statistic is also valid for any NNI signaling protocol chosen (ANSI Annex D, or CCITT Annex A). This statistic is a subset of the Frames Received statistic.
Timeouts	The number of LMI protocol timeouts. **LMI UNI Link Timeout Errors**. Provides a count of the number of times that the rT392 Polling Verification Timers times out without a Status Enquiry frame having been received. This statistic is valid for any UNI signaling protocol chosen (Strata LMI, ANSI Annex D, or CCITT Annex A). The rT392 Polling Verification Timers is configured as part of the port configuration (**cnfport** command).
Sequence number mismatches	The number of LMI protocol sequence number mismatches. **LMI UNI Keepalive Sequence Errors**. Provides a count of the number of times that there was a discontinuity in the (normally consecutive) sequence numbers contained the Status Enquiry frames received from the attached equipment. This statistic is valid for any UNI signaling protocol chosen (Strata LMI, ANSI Annex D, or CCITT Annex A).
Signaling protocol	The protocol selected for this Frame Relay port interface: Cisco LMI, Annex A UNI, Annex D UNI, Annex A NNI, or Annex D NNI.

Table 4-30 Miscellaneous Frame Relay Use Statistics

Miscellaneous Statistics	
Statistics	**Description**
Average queue depth	The average fill of the VC queue at the input of the FRP or FRM. **Transmit Frames Discarded—Queue Overflow (Egress)**. Provides a count of the number of frames that were discarded because the port's transmit queue (egress queue) was full. The size of the port's transmit queue is configured as part of the port configuration (**cnfport**) command. **Transmit Bytes Discarded—Queue Overflow (Egress)**. Provides a count of the number of octets in the Transmit Frames Discarded—Queue Overflow statistic. The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS or CRC) octets.
BECN frames	Number Explicit Congestion Notification frames transmitted to the receiving router. Number of Explicit Congestion Notification frames transmitted to the transmitting router. Percentage of BECN frames sent to the total number of frames sent. **Frames Transmitted with BECN (Egress)**. Provides a count of the number of frames transmitted to the attached equipment with the Backward Explicit Congestion Notification (BECN) bit set, regardless of where in the network the congestion was observed.
FECN frames	The percentage of FECN frames sent to the total number of frames sent. **Frames Transmitted with FECN (Egress)**. Provides a count of the number of frames transmitted to the attached equipment with the Forward Explicit Congestion Notification (FECN) bit set, regardless of the where in the network the congestion was experienced. This statistic is a subset of the Frames Transmitted statistic.
Rsrc overflow	Resource overflow indicates the number of times the port shut down due to receive frame buffer overflow or receive queue entries.
DE Frames Dropped (Egress)	The total number of frames with Discard Eligibility that were discarded. Provides a count of the number of frames to be transmitted to the attached device that were discarded because the frame's DE bit is set and the port's egress buffer has reached the DE threshold. The DE threshold is configured as part of the port configuration (**cnfport** command). This statistic is a subset of the corresponding PVCs Transmit Frames Discarded statistic.

Table 4-31 CLLM (ForeSight) Statistics

Statistics	Description
CLLM Frames Received	Provides a count of the number of Consolidated Link Layer Management (CLLM) frames received from the attached equipment. CLLM frames are used to exchange PVC congestion information over an NNI port to allow the ForeSight algorithm to regulate the flow of traffic on each PVC based on congestion in the local network as well as congestion in the attached network. This is not intended to be a full implementation of the CLLM suite. The CLLM mechanism is enabled as part of the port configuration (**cnfport** command). This statistic is a subset of the Frames Received statistic.
CLLM Bytes Received (Ingress)	Provides a count of the number of octets in the frames counted in the CLLM Frames Received statistic. The octets counted include the Frame Relay header octets as well as the frame check sequence (FCS, or CRC) octets. This statistic is a subset of the Bytes Received statistic.
CLLM Frames Transmitted (Egress)	Provides a count of the number of Consolidated Link Layer Management (CLLM) frames transmitted to the attached equipment. CLLM frames are used to exchange PVC congestion information over an NNI port to allow the ForeSight algorithm to regulate the flow of traffic on each PVC based on congestion in the local network as well as congestion in the attached network. This is not intended to be a full implementation of the CLLM suite. The CLLM mechanism is enabled as part of the port configuration (**cnfport** command). This statistic is a subset of the Frames Transmitted statistic.
CLLM Bytes Transmitted (Egress)	Provides a count of the number of Consolidated Link Layer Management (CLLM) frames transmitted to the attached equipment. CLLLM frames are used to exchange PVC congestion information over an NNI port to allow the ForeSight algorithm to regulate the flow of traffic on each PVC based on congestion in an attached network. This is not intended to be a full implementation of the CLLM suite. The CLLM mechanism is enabled as part of the port configuration (**cnfport** command). This statistic is a subset of the Frames Transmitted statistic.
CLLM Failures	Provides a count of the number of times that no CLLM frame was received within one second (not configurable), or a CLLM frame was received with any invalid internal format. An invalid CLLM frame that is discarded is included in the statistic of Frames Received.

Example (IGX)

Display the port statistics for Frame Relay port 9.1.

dspportstats 9.1

```
-----------------------------------SCREEN 1------------------------------------
sw108          VT    Cisco          IGX 8420  9.3.2o    Dec. 5 2000  14:45 GMT

Port Statistics for 9.1         Cleared: Dec. 4 2000  17:26
```

```
Port Speed: 256 kbps    Collection Time: 0 day(s) 00:00:00      Corrupted: NO
Sig Protocol: None
                      Bytes      Average (kbps)     Util (%)         Frames
From Port:                0            0               0                  0
To Port:                  0            0               0                  0
Frame Errors               LMI Receive Protocol Stats   Misc Statistics
Invalid CRC            0   Status Enq Rcvd          0   Avg Tx Port Q        0
Invalid Alignment      0   Status Xmit              0   FECN Frames          0
Invalid Frm Length     0   Asynch Xmit              0        Ratio (%)       0
Invalid Frm Format     0   Seq # Mismatches         0   BECN Frames          0
Unknown DLCIs          0   Timeouts                 0        Ratio (%)       0
Last Unknown DLCI      0   Invalid Req              0   Rsrc Overflow        0
                                                        DE Frms Dropd        0


This Command: dspportstats 9.1


Next page? (+/-/DEL key to quit)

-----------------------------------SCREEN 2------------------------------------
sw108         VT    Cisco          IGX 8420  9.3.2o    Dec. 5 2000  14:51 GMT

Port Statistics for 9.1         Cleared: Dec. 4 2000  17:26
Port Speed: 256 kbps    Collection Time: 0 day(s) 00:00:00      Corrupted: NO
Sig Protocol: None
                      Bytes      Average (kbps)     Util (%)         Frames
From Port:                0            0               0                  0
To Port:                  0            0               0                  0
LMI Receive Protocol Stats LMI Transmit Protocol Stats  CLLM (ForeSight) Stats
Status Enq Rcvd          0 Status Enq Xmit      --      Frames Rcvd       --
Status Xmt               0 Status Rcd           --      Bytes Rcvd        --
Asynch Xmit              0 Asynch Rcvd          --      Frames Xmt        --
Seq # Mismatches         0 Seq # Mismatches     --      Bytes Xmt         --
Timeouts                 0 Timeouts             --      CLLM Failures     --
Invalid Frames           0
Elmi Ver Req             0 Elmi Ver Rsp             0
Elmi QOS Req             0 Elmi QOS Rsp             0

Last Command: dspportstats 9.1
```

dspportstats (display ATM port statistics)

Displays a summary of port statistics for the ATM port specified. These include the cell count in the transmit and receive directions, and error counts associated with the port. The display indicates the date and time that the statistics were cleared and the statistics collection time since they were last cleared. Cells transmitted indicates the amount of data transmitted out the port to the user device. Cells received indicates the amount of data received from the user device at the port. Corrupted statistics result from channel/port loopbacks or port tests. A "yes" in this field indicates that such loopback or port tests have occurred since the statistics were last cleared.

Syntax

dspportstats <slot.port>[.<vport>] [interval]

Parameters

Parameter	Description
<slot.port>[.<vport>]	Specifies the slot number of the card, the physical port and optional virtual port (BXM card only). Range (optional vport identifier): 1-31
[interval]	Specifies the refresh interval time for data. Range: 1 and 60 seconds Default: 1 second For BPX only: You must specify a value other than 0 for the "interval" parameter. Otherwise, the screen displayed for UXM and BXM cards will be just a snapshot—it will not be updated periodically. If the Rx Q depth and the Tx Q depth on the BXM and UXM cards remain "0", specify a value for the interval parameter other than 0.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

clrportstats

Statistics Supported for BPX ATM Ports (ASI or BXM Front Card)

The following 45 statistics are available for each BPX ATM port, with an ASI or BXM front card type, and T3, E3, or OC-3 back card type. (Note that the statistics names listed Table 4-32 are displayed in Cisco WAN Manager; the field name that appears on the **dspportstats** screen may vary slightly from the Cisco WAN Manager parameter/field name.)

Table 4-32 BPX Port Statistics Supported for ASI and BXM Front Cards

Statistics Name in Cisco WAN Manager	Statistics ID
Cell Buffer Overflow	1
Cells Rx w/CLP discarded	42
Cells Rx w/CLP=0	40
Cells Rx w/CLP=0 discarded	41
Cells Tx w/CLP=0	43
Egress OAM Cell Count	44
Egress RM Cell Count	46
Get Request Rx	17
Get Request Tx	23
Get Response Rx	22
Get Response Tx	24
GetNext Request Rx	18
GetNext Request Tx	19
Ingress RM Cell Count	45
Invalid LMI IE Rx	38
Invalid LMI Rx	35
Invalid LMI length Rx	36
Invalid Transaction IDs	39
Non-zero GFC Count	2
Number of BCM Cell Rx	10
Number of Cells Rx	7
Number of Cells Rx w/CLP set	8
Number of Cells Rx w/EFCI set	9
Number of Cells Tx	11
Number of Cells Tx w/CLP set	14
Number of Cells Tx w/EFCI set	15
OAM Cells Rx Count	12
Rx AIS Cell	5
Rx FERF Cell	6
SetRequest Rx	20
Status Ack Rx	34
Status Ack Tx	29
Status Enq Rx	30
Status Enq Tx	31
Status Rx	32
Status Tx	27

Table 4-32 BPX Port Statistics Supported for ASI and BXM Front Cards (continued)

Statistics Name in Cisco WAN Manager	Statistics ID
Trap Rx	21
Trap Tx	25
Tx Header Err Discard	16
Tx Payload Err Due to BIP-16 Err	13
Unknown LMI Rx	37
Unknown LMI Tx	26
Unknown VPI/VCI	0
Update Status Rx	33
Update Status Tx	28

Example (BPX)

Display the statistics for BXM port 11.1.

dspportstats 11.1

```
sw53           VT    Cisco           BPX 8620  9.3.2o    Dec. 5 2000  14:26 GMT

Port Statistics for 11.1        Cleared: Dec. 5 2000  14:00
Port Speed: 353208 cps  Collection Time: 0 day(s) 00:25:38      Corrupted: NO

              Cells           CLP         (EFCI)
Rx Port:          0             0           --
Tx Port:        263             0           --


Unkn Addr (UA):       266  Rx OAM Cells  :         0  Rx Clp 0 Cells:         0
Rx Clp 0 Dscd :         0  Rx Clp 1 Dscd :         0  Tx Clp 0 Cells:       263
Tx OAM Cells  :       263  Rx RM Count   :         0  Tx RM Count   :         0
Lst Unk VpiVci:    0.0

UA sums across ports in port group.


This Command: dspportstats 11.1
```

Example (IGX)

Display the statistics for UXM port 11.1.

dspportstats 11.1

```
-----------------------------------SCREEN 1-----------------------------------
sw180          TN    Cisco           IGX 8420  9.3.o9    Dec. 5 2000  14:31 GMT

Port 4.1
Collection Time:   day(s) 02:29:24                   Clrd:  12/05/00 11:51:28
Type                                      Count
VI: Cells received                              0
VI: Cells transmitted                           0
VI: Cells rcvd w/CLP=1                          0
VI: Cells tx w/CLP=1                            0
VI: Cells received w/CLP=0                      0
VI: Cells transmitted w/CLP=0                   0
```

```
VI: Cells discarded w/CLP=1                     0
VI: Cells discarded w/CLP=0                     0
VI: OAM cells received                          0
VI: OAM cells transmitted                       0
VI: RM cells received                           0
VI: RM cells transmitted                        0

This Command: dspportstats 4.1


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-----------------------------------SCREEN 2-----------------------------------
sw180         TN    Cisco          IGX 8420  9.3.o9    Dec. 5 2000  14:33 GMT

Port 4.1
Collection Time: 0 day(s) 02:30:40                  Clrd:  12/05/00 11:51:28
Type                                        Count
PORT: Unknwn VPI/VCI cnt                        40
PORT: Last unknown VPI/VCI pair              0.16
PORT: # of cells rcvd                           0
PORT: # of cells xmt                            0
INVMUX: maximum diff delay                      0
INVMUX: HEC cell errors                         0
INVMUX: LCP cell errors                         0
INVMUX: Cell Hunt Count                         0
INVMUX: Bandwidth Change Count                  0
INVMUX: Unavailable Seconds                     0
INVMUX: Near End Fail Count                     0
INVMUX: Last Proto Fail Code                    0

This Command: dspportstats 4.1


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-----------------------------------SCREEN 3-----------------------------------
sw180         TN    Cisco          IGX 8420  9.3.o9    Dec. 5 2000  14:33 GMT

Port 4.1
Collection Time:      (s) 02:31:06                  Clrd:  12/05/00 11:51:28
Type                                        Count
INVMUX: Slowest Link                            0
ILMI: Get Req PDUs rcvd                         0
ILMI: Get Rsp PDUs rcvd                         0
ILMI: GetNxt Req PDUS rx                        0
ILMI: Trap PDUs rcvd                            0
ILMI: Set Req PDUs rcvd                         0
ILMI: Unknwn PDUs rcvd                          0
ILMI: Get Req PDUs xmt                          0
ILMI: Get Rsp PDUs xmt                          0
ILMI: GetNxt Req PDUS xmt                       0
ILMI: Trap PDUs xmt                             0
ILMI: Set Req PDUs xmt                          0

This Command: dspportstats 4.1


Next page? (+/-/DEL key to quit)

-----------------------------------SCREEN 4-----------------------------------
sw180         TN    Cisco          IGX 8420  9.3.o9    Dec. 5 2000  14:33 GMT

Port 4.1
```

```
Collection Time: 0 day(s) 02:31:31                  Clrd:  12/05/00 11:51:28
Type                                      Count
LMI: Status msgs rcvd                           0
LMI: Updt Status msg rcvd                       0
LMI: Status Enq msgs rcvd                       0
LMI: Status Ack msg rcvd                        0
LMI: Status messages xmt                        0
LMI: Updt Status msgs xmt                       0
LMI: Status Enq msgs xmt                        0
LMI: Status Ack msgs xmt                        0
LMI: Invalid LMI PDUs rcvd                      0
LMI: Invalid LMI PDU length rcvd                0
LMI: Unknown LMI PDUs rcvd                      0
LMI: Invalid LMI IE rcvd                        0

This Command: dspportstats 4.1


Next page? (+/-/DEL key to quit)

-----------------------------------SCREEN 5-----------------------------------
sw180          TN    Cisco           IGX 8420  9.3.o9    Dec. 5 2000  14:34 GMT

Port 4.1
Collection Time: 0 day(s) 02:31:57                  Clrd:  12/05/00 11:51:28
Type                                      Count
LMI: Invalid Transaction IDs                    0






This Command: dspportstats 4.1
```

dspprtcnf (display print configuration)

Displays the current print configuration for the network where the command is entered. The three printing modes, "remote," "local," and "no" are listed and the currently selected mode is highlighted. If remote printing is selected, the node name where the remote printer is located also appears. If the name of the node is flashing, the node is unreachable.

Remote mode indicates that the log for the node prints on the printer at the listed remote node.

Local mode indicates that the log for the node prints on the node's printer.

No printing mode indicates that the log for the node does not print.

Syntax

dspprtcnf

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfprt

Example

Display the print configuration. The example does not show the highlighted field.

dspprtcnf

```
sw83          TN    SuperUser       IGX 8420      9.3       Apr. 13 2000 16:02 PST


Printing Mode

Remote Printing
Local Printing
No Printing





Last Command: dspprtcnf


Next Command:
```

dsppwd (display password)

Displays the password of the current user or any user at any lower privilege level.

Syntax

dsppwd <user_id>

Parameters

Parameter	Description
userid	Specifies the user whose password is displayed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Example

Display the password for user YourID.

dsppwd yourid

```
alpha          TRM   YourID:1        IGX 8410    9.3    Apr. 13 2000 13:56 PST



The password for YourID is liftoff






This Command: dsppwd YourID

This screen will self-destruct in ten seconds
Next Command: dsppwd YourID
```

dsppwr (display power supply status)

Displays the current status of the power supply monitor, the current power supply configuration (which may consist of one to four power supplies depending on node requirements), and the current cabinet temperature.

On the right side of the screen is displayed the internal cabinet temperature in degrees Centigrade and Fahrenheit. The temperature is displayed as a thermometer and the exact temperature appears at the top of the thermometer.

Syntax

dsppwr

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dspcd, **dspcds**

Example (IGX)

Display the power status and temperature inside the current IGX node.

dsppwr

```
sw151          TN    SuperUser       IGX 16    9.3       Apr. 13 2000 11:50 GMT

Power Supply Status                                        Cabinet Temperature

Monitor Rev AK, Ser # 247582  -  Status: Active               30        86

   AC Supply    Status                                     C  60  |  |  140  F
A  1  875W      OK                                         e      |  |       a
B  1  875W      OK                                         n  50  |--|  122  h
C  1  Empty                                                t      |  |       r
D  2  Empty                                                i  40  |  |  104  e
E  2  Empty                                                g      |  |       n
F  2  Empty                                                r  30  |  |  86   h
                                                           a      |  |       e
                                                           d  20  |  |  68   i
                                                           e      `--'       t


Last Command: dsppwr

Next Command:
```

Example (BPX)

Display the power status and temperature inside the current BPX node.

dsppwr

```
bootzilla TN    SuperUser       BPX 8620    9.3       Apr. 13 2000 11:06 GMT

         Power Status                                      Cabinet Temperature

ASM Status: Active                                            21        69

Power voltage A/B:      0 / 49 V                           C  60  |  |  140  F
                                                           e      |  |       a
PSU  Ins Type Rev SerNum Failure                           n  50  |--|  122  h
 A    N  N/A  N/A   N/A    N/A                             t      |  |       r
 B    Y  ????  00 ......  None                             i  40  |  |  104  e
                                                           g      |  |       n
            Fan Status                                     r  30  |  |  86   h
                                                           a      |  |       e
     FAN   1    2    3                                     d  20  |  |  68   i
         0000 3300 3240 RPM                                e      `--'       t


Last Command: dsppwr

Next Command:
```

dspqbin (display Qbin)

Displays the Qbin resources on a selected trunk, port, or virtual trunk:

- the Qbin parameters currently configured for an interface
- whether the Qbin resources have been configured by the user or by a template
- whether the Qbin has EPD enabled/disabled

Only Qbins (Class of Service Buffers) 10 to 15 are used for VSI connections.

To display all VSI Qbins on an interface, pass the wildcard character (the asterisk *) as the Qbin ID to the command.

Syntax

dspqbin <slot.port.vtrk>[qbin-id]

Parameters

Parameter	Description
<slot.port.vtrk>	Specifies the UXM card slot number, port number, and virtual trunk number. For VSI, specifies the ID number of the Qbin available for use by the LSC (MPLS Controller).
[qbin-id]	Specifies the ID number of the Qbin available for use by the LSC (MPLS controller) for VSI. Range: 10–15

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX	Yes	Yes	Yes	No

Related Commands

cnfqbin, dspqbint

Display Parameters

Object (Parameter) Name	Range/Values	Default	Description
Qbin Number	10–15	R	Identifies the target Qbin to modify.
Discard Selection	1: CLP Hysteresis (EPD Disabled) 2: Frame Discard (EPD Enabled) EPD: Early Packet Discard	R	Indicates whether Qbin should perform the CLP Hysteresis or the Frame Discard option. The Qbin can be configured to do only one or the other.
Discard Threshold	0–? cells	R	The Qbin depth: Determines the amount of cell memory dedicated to this Qbin.
CLP High Threshold	0–100%	R	Parameter determines at which level in the Qbin CLP-tagged cells are discarded. Discard continues until the Qbin depth drops below the Qbin CLP Low Threshold.
CLP Low Threshold	0–100%	R	Parameter determines at which level in the Qbin CLP-tagged cells are admitted.
EFCI Threshold	0– 100%	R	Parameter determines at which level in the Qbin EFCI bits are tagged in the departing cells.
EPD Threshold	0–100%	R	Parameter determines at which level the QBIN Frame Discard is activated.

Example (OC-3 on IGX)

Display the current Qbin configuration on Qbin 10 of the OC-3 trunk 13.2.

dspqbin 9.1 10

```
bently          TN     Cisco           IGX 8430   9.3.10    Aug. 3 2000  13:56 PST

Qbin Database 13.2 on UXM qbin 10       (Configured by MPLS1 Template)
                                        (EPD Enabled on this qbin)

Qbin State:               Enabled
Discard Threshold:        65536 cells
EPD Threshold:            95%
High CLP Threshold:       100%
EFCI Threshold:           100%



Last Command: dspqbin 13.2 10

Next Command:
```

Example (UXM on IGX)

Display the current Qbin configuration on slot 13, port 2, Qbin 15.

dspqbin 13.2 15

```
bently         TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  13:57 PST

Qbin Database 13.2 on UXM qbin 15       (Configured by MPLS1 Template)
                                        (EPD Enabled on this qbin)

Qbin State:               Enabled
Discard Threshold:        65536 cells
EPD Threshold:            95%
High CLP Threshold:       100%
EFCI Threshold:           100%


Last Command: dspqbin 13.2 15


Next Command:
```

Example (VSI on IGX)

Display all VSI Qbins on virtual trunk 3.2.1. Answer **yes** when prompted to display the next Qbin.

dspqbin 3.2.1 *

```
bently         TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  13:58 PST

Qbin Database 3.2.1 on UXM qbin 10      (Configured by MPLS1 Template)
                                        (EPD Enabled on this qbin)

Qbin State:               Enabled
Discard Threshold:        900 cells
EPD Threshold:            95%
High CLP Threshold:       100%
EFCI Threshold:           100%



This Command: dspqbin 3.2.1 *


Continue?
```

Example (OC-3 on BPX)

Display the current Qbin configuration on Qbin 10 of the OC-3 trunk 4.2

dspqbin 4.2 10

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  19:45 GMT

Qbin Database 4.2 on BXM qbin 10        (Configured by MPLS1 Template)
                                        (EPD Enabled on this qbin)

Qbin State:               Enabled
Discard Threshold:        105920 cells
EPD Threshold:            95%
High CLP Threshold:       100%
EFCI Threshold:           100%



Last Command: dspqbin 4.2 10

Next Command:
```

Example (BXM on BPX)

Display the current Qbin configuration on slot 10, port 2, Qbin 15.

dspqbin 10.2 15

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  19:48 GMT

Qbin Database 10.2 on BXM qbin 15       (Configured by ATMF1 Template)
                                        (EPD Enabled on this qbin)

Qbin State:              Enabled
Discard Threshold:       131072 cells
EPD Threshold:           60%
High CLP Threshold:      80%
EFCI Threshold:          100%



Last Command: dspqbin 10.2 15


Next Command:
```

Example (VSI on BPX)

Display all VSI Qbins on virtual trunk 10.1.1. Answer **yes** when prompted to display the next Qbin.

dspqbin 10.1.1 *

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  19:51 GMT

Qbin Database 10.1.1 on BXM qbin 10     (Configured by MPLS1 Template)
                                        (EPD Enabled on this qbin)

Qbin State:              Enabled
Discard Threshold:       900 cells
EPD Threshold:           95%
High CLP Threshold:      100%
EFCI Threshold:          100%



This Command: dspqbin 10.1.1 *


Continue?
```

Class of Service Buffer Descriptor Template Configuration

Table 4-33 below lists parameters included in the Class of Service (CoS) Buffer (Qbin) portion of the Service Class Templates. A Qbin is a platform-specific instance, such as BXM, of the more general Class of Service Buffer. A firmware command sends a command (message) to switch software to initialize the CoS Buffer Descriptors in the Service Class Templates. This command may contain multiple instances of Qbin number, each indicating a new Qbin configuration.

Table 4-33 Class of Service Buffer Parameters That Display on dspqbin Screen

Object (Parameter) Name	Range/Values	Default	Description
Qbin Number	10–15	R	Identifies the target Qbin to modify.
Discard Selection	1: CLP Hysteresis (EPD Disabled) 2: Frame Discard (EPD Enabled) EPD: Early Packet Discard	R	Indicates whether Qbin should perform the CLP Hysteresis or the Frame Discard option. You can configure the Qbin to do only one or the other.
Discard Threshold	0–? cells	R	The Qbin depth: Determines the amount of cell memory dedicated to this Qbin.
CLP High Threshold	0–100%	R	Parameter determines at which level in the Qbin CLP-tagged cells are discarded. Discard continues until the Qbin depth drops below the Qbin CLP Low Threshold.
CLP Low Threshold	0–100%	R	Parameter determines at which level in the Qbin CLP-tagged cells are admitted.
EFCI Threshold	0–100%	R	Parameter determines at which level in the Qbin EFCI bits are tagged in the departing cells.
EPD Threshold	0–100%	R	Parameter determines at which level the QBIN Frame Discard is activated.

dspqbinstats (display Qbin statistics)

Displays Qbin summary statistics associated with a trunk or port.

Syntax

dspqbinstats <trunk | port> [interval]

Parameters

Parameter	Description
trunk	Specifies the trunk for statistics display. Format is *slot.port[.vtrk]*
port	Specifies the port for statistics display. Format is *slot.port[.vport]* Range (optional vport identifier): 1–31
[interval]	Specifies the interval (in seconds) between updates of the statistics display. Range 1–30 seconds Default: 10 seconds

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	Yes	BPX, IGX			Yes	

Related Commands

dspstatparms, dsptrkerrshist

Example (BXM on IGX)

Display Qbin statistics for port 3.6 on a BXM (BPX) card.

dspqbinstats 3.6

```
NODENAME       TRM   Cisco          BPX 8620  9.3.10    Date/Time Not Set

QBIN Stats for Port 3.6            Cleared: Date/Time Not Set
Prt TX Rate: 96000 cps     Collection Time: 0 day(s) 00:08:00

    STATS        Cells          STATS        Cells          STATS        Cells
Qbin 0 CTXL    :0           Egr QBIN0 CRx :0            Tx Q0 CDscd   :0
Qbin 1 CTXL    :0           Egr QBIN1 CRx :0            Tx Q1 CDscd   :0
Qbin 2 CTXL    :0           Egr QBIN2 CRx :0            Tx Q2 CDscd   :0
Qbin 3 CTXL    :0           Egr QBIN3 CRx :0            Tx Q3 CDscd   :0
Qbin 9 CTXL    :0           Egr QBIN9 CRx :0            Tx Q9 CDscd   :0
Qbin 10 CTXL   :0           Egr QBIN10 CRx:0            Tx Q10 CDscd  :0
Qbin 11 CTXL   :0           Egr QBIN11 CRx:0            Tx Q11 CDscd  :0
Qbin 12 CTXL   :0           Egr QBIN12 CRx:0            Tx Q12 CDscd  :0
Qbin 13 CTXL   :0           Egr QBIN13 CRx:0            Tx Q13 CDscd  :0
Qbin 14 CTXL   :0           Egr QBIN14 CRx:0            Tx Q14 CDscd  :0
```

```
This Command: dspqbinstats 3.6


Next page? (+/DEL key to quit):

NODENAME       TRM   Cisco           BPX 8620  9.3.10    Date/Time Not Set

QBIN Stats for Port 3.6            Cleared: Date/Time Not Set
Prt TX Rate: 96000 cps     Collection Time: 0 day(s) 00:08:00

    STATS        Cells          STATS        Cells          STATS        Cells
Qbin 15 CTXL  :0           Egr QBIN15 CRx:0           Tx Q15 CDscd  :0











This Command: dspqbinstats 3.6
```

Example (UXM on IGX)

Display Qbin statistics for port 5.1 on a UXM (IGX) card.

dspqbinstats 5.1

```
neelix         TRM   Cisco           IGX 8420  9.3.10    May  31 2000 01:45 GMT

QBIN Stats for Port 5.1            Cleared: May  31 2000 01:26
Prt TX Rate: 96000 cps     Collection Time: 0 day(s) 00:15:00

    STATS        Cells          STATS        Cells          STATS        Cells
Q2 Cells Tx   :0           Egr CRx Q2    :0           Tx Q2 CDscd   :0
Q3 Cells Tx   :0           Egr CRx Q3    :0           Tx Q3 CDscd   :0
Q7 Cells Tx   :0           Egr CRx Q7    :0           Tx Q7 CDscd   :0
Q8 Cells Tx   :0           Egr CRx Q8    :0           Tx Q8 CDscd   :0
Q9 Cells Tx   :0           Egr CRx Q9    :0           Tx Q9 CDscd   :0
Q10 Cells Tx  :0           Egr CRx Q10   :0           Tx Q10 CDscd  :0
Q11 Cells Tx  :0           Egr CRx Q11   :0           Tx Q11 CDscd  :0
Q12 Cells Tx  :0           Egr CRx Q12   :0           Tx Q12 CDscd  :0
Q13 Cells Tx  :0           Egr CRx Q13   :0           Tx Q13 CDscd  :0
Q14 Cells Tx  :0           Egr CRx Q14   :0           Tx Q14 CDscd  :0


This Command: dspqbinstats 5.1


Next page? (+/DEL key to quit):

neelix         TRM   Cisco           IGX 8420  9.3.10    May  31 2000 01:46 GMT

QBIN Stats for Port 5.1            Cleared: May  31 2000 01:26
Prt TX Rate: 96000 cps     Collection Time: 0 day(s) 00:17:41

    STATS        Cells          STATS        Cells          STATS        Cells
Q15 Cells Tx  :0           Egr CRx Q15   :0           Tx Q15 CDscd  :0

This Command: dspqbinstats 5.1
```

dspqbint (display Qbin templates)

Displays the default Qbin parameters for a VSI Qbin in a Qbin template. The Qbin template is associated with the Service Class Template. There are nine Service Class Templates so there are nine corresponding Qbin templates. Each Qbin template contains entries for all VSI Qbins (10-15).

For more detailed information on service class templates and Qbin templates, please read the section on VSI in the *Cisco IGX Series Reference Guide* and the *Cisco BPX Installation and Configuration Guide*.

Syntax

dspqbint <Service_Class_Template #><qbin ID #>

Parameters

Parameter	Description
Service_Class_Template	Specifies the Service Class Template associated with the Qbin.
Qbin ID #	Specifies the ID number of the Qbin available for use by the LSC (MPLS Controller) for VSI. Range: 10–15

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX	Yes	Yes	No	No

Related Commands

dspsct, dspqbin, cnfrsrc, dsprsrc, cnfvsiif, dspvsiif

Example (IGX)

Display the Qbin parameters in Qbin 10 of Service Class Template 1.

dspqbint 1 10

```
bently          TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  14:05 PST

    Service Template: 1         Qbin:  10

Discard Threshold:            300000    (micro secs)
CLP Low/EPD Threshold:        95        (% of Discard Threshold)
CLP High Threshold:           100       (% of Discard Threshold)
EFCI Threshold:               100       (% of Discard Threshold)
EPD:                          Enabled
Vc Shaping:                   Enabled



Last Command: dspqbint 1 10

Next Command:
```

Example (BPX)

Display the Qbin parameters in Qbin 10 of Service Class Template 1.

dspqbint 1 10

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  20:08 GMT

    Service Template: 1         Qbin:  10

Discard Threshold:           300000    (micro secs)
CLP Low/EPD Threshold:       95        (% of Discard Threshold)
CLP High Threshold:          100       (% of Discard Threshold)
EFCI Threshold:              100       (% of Discard Threshold)
EPD:                         Enabled
Vc Shaping:                  Enabled




Last Command: dspqbint 1 10


Next Command:
```

dsprevs (display revisions)

Displays the system configuration and status of the primary and secondary software revisions running on all nodes in the network. The primary revision is the software that is running on the node. The secondary revision is the software that is available in memory but not being run.

Syntax

dsprevs

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

runrev, **loadrev**

Display Fields: Software Revision Status Messages

Status	Description
unavailable	The revision is currently unavailable for the node displayed. The revision has not propagated to the node yet.
available	The node has located the specified revision but has not yet downloaded it.
partial	The revision was only partially downloaded. Indicates the download was temporarily interrupted.
downloading	The revision is in the process of being downloaded. Blocks of data are transferring.
loaded	The revision has completed downloading but is not ready for running.
upgrading	The controller card is being upgraded by the current revision. This process generally occurs immediately following the download.
upgraded	The upgrade procedure has been completed.
running	The primary revision is currently used to run the node.

Example (IGX)

dsprevs

```
sw171          TN    SuperUser       IGX 8420  9.3    Apr. 13 2000 14:52 GMT
                   ------ Primary ------         ----- Secondary -----
NodeName           Status       Revision         Status       Revision
sw29               Running      9.2.h3
sw43               Running      9.2.h5
sw44               Running      9.2.h3
sw171              Running      9.2.h0           Loaded       9.2.h9
sw177              Running
```

```
sw106              Running      9.2.h3
sw181              Running      9.2.h3

        Lowest revision running in net: 9.2.h0

Last Command: dsprevs

Next Command:
```

dsprobst (display robust statistics)

Displays the statistics associated with the Robust Alarms messages between the node and Cisco WAN Manager NMS. The optional "clear" argument clears the statistics buffers.

Syntax

dsprobst [clear]

Parameters

Parameter	Description
[clear]	Specifies that the statistics buffers should be cleared after the display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

cnfrobparm

Example (IGX)

dsprobst

```
sw197          TN    SuperUser       IGX 8420    9.3 Apr. 13 2000  05:43 GMT

Robust Communications Statistics since : Date/Time Not Set

  Updts msg xmit:      0
  Updts msg ackd:      0
  Updts ack tout:      0
  LCBs freed:          0
  Updts ack reset:     0




Last Command: dsprobst


Next Command:
```

dsprrst (display reroute statistics)

Displays the network statistics for connection rerouting resulting from failed trunks. These statistics are useful in determining the performance of the reroute algorithm. Use the "clear" option to clear the counters before accumulating the statistics.

Syntax

dsprrst [s] [t] [clear]

Parameters

Parameter	Description
[s]	Optional parameter that displays connection routing summary and settling information.
[t]	Optional parameter that displays node settling time measurement history. The following statistics are reported: • Start Time: the time that the route measurement started. • Stop Time: the time when the route measurement stopped. If "In Progress" is displayed, routing is still ongoing. • Conns: the number of connections routed during measurement. • Bndls: the number of route bundles routed during measurement. • Avg Bndl: the average bundle size during measurement. • Elapsed(s): the elapsed nodal settling time in seconds during measurement. • E: the efficiency factor. The total real time spent processing routing threads divided by the node settling time. The last ten settling time measurements, including the active measurement, if any, are displayed. Node settling time history is cleared whenever reroute statistics are cleared. For each route initiated, a separate table entry is added. The most recent route initiated is at the top of the table.
[clear]	Specifies that the reroute statistics buffers should be cleared after the display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

rrtcon

Display Fields: Reroute Statistics

Statistic	Description
Number of Completed Routes	The total number of connections routed since the activities were last cleared.
Number of Failed Routes	The number of attempted reroutes that failed for any reason.
Number of Collisions	During a route, the initiating node locks all nodes on the route until routing is done. If another node attempts to reroute through a locked node, a collision occurs, so the second node must wait then retry.
Max. # of Consec. Collisions	The count of consecutive collisions as defined above.
Max/Avg Secs To Select Route	Time taken within the initiating node to select a new route.
Max/Avg Secs To Perform Route	Time taken to contact and lock the nodes on the new route and perform the routing process.
Avg Secs to Route a Conn:	Time to perform a reroute divided by the average number of connections in a bundle.
% of Collisions/Rrt Attempt	Another statistic derived from the number of collisions and the number of route attempts.
Max Secs To NOT find Route	Similar to "max secs to select a route" except that the algorithm finished and no route was found.
Number of Routes not found	Number of routes not found in the rerouting process. This parameter updates periodically as a heartbeat to check for activity.
# of Rrts with rrt req_bit set	Number connections awaiting reroute. If rrt_req bit is set, a reroute was not successful; or trunk deletions or loading additions mean connections must be rerouted. Rerouting clears the rrt_req bit.
Address of Forced Rrt Counts	Memory address for database information.
Max routes checked in search	Maximum number of paths examined in a search for a new route.
Max good rts checked in search	Maximum number of possible routes found before the search ended. The value should be 1.
# our lns rmvd from under us	The number of changes to topology and loading that occurred while rerouting was in progress. This is the number of times we detect, while "cleaning up" a derouted connection, that the involved trunk for the said connection has *just* been deleted. This counter can be incremented more than once even if derouting only one single connection. If the value for this statistic and the statistic # lines rmvd out from under us (see below) is zero, the connection is fine. If one of the values is non-zero, (at least once) this indicates that a trunk has been deleted before affected connections have been properly "cleaned."

Statistic	Description
# lines rmvd out from under us	This counter is incremented as a continuation of the cleanup process. During the course of cleanup of a single connection, if this condition is detected, the process still proceeds to cleanup all sorts of related resources. This counter can be incremented more than once even if derouting only one single connection. If the value for this statistic and the statistic # our lns rmvd from under us (see above) is zero, the connection is fine. If one of the values is non-zero, (at least once) this indicates that a trunk has been deleted before affected connections have been properly "cleaned."
Concurrent RR_CB HWM	Maximum number of reroute control blocks simultaneously allocated. Note the following definitions: • RR_CB: ReRoute Control Block. This is the data structure used to maintain status of a routing thread. • HWM: High-Water Mark.
Concurrent master RR_CB HWM	Maximum number of reroute control blocks simultaneously allocated for master routes.
# Path block saturation	Number of times candidate selection was aborted due to too many path-blocked candidates.
# Slv rejected by path blk	Number of times a candidate was rejected because the slave node was path blocked.
# Rts rejected by path blk	Number of times a route was rejected because a node on the path was path blocked.
# Slv rejected by backoff	Number of times a candidate was rejected because the salve node is in collision backoff.
# Mstr CPU throttle trans	Number of times CPU-based throttling for master routes has transitioned from off to on.
# Via CPU throttle trans	Number of times CPU-based throttling for via routes has transitioned from off to on.
# Slv CPU throttle trans	Number of times CPU-based throttling for slave routes has transitioned from off to on.
# M Rts rej by CPU throttle	Number of times master routing has been deferred due to CPU throttling.
# V Rts rej by CPU throttle	Number of times a via route request was rejected due to CPU throttling.
# S Rts rej by CPU throttle	Number of times a slave route request was rejected due to CPU throttling.

Example

dsprrst

```
sws5           TN    Cisco           IGX 8420  9.3.a4    Mar. 18 2001 02:03 PST

Conn. Routing Statistics LOC_DOMAIN
Number of Completed Routes:         0  Blocked by other st machines:        1
Number of Failed Routes:            0  Timeouts waiting for ACK/NACK:       0
Number of Collisions:               0  Timeouts in LOCKED state:            0
Max # of Consec Collisions:         0  Number of Routes Not found:          0
Max Secs To Select Route:       0.000  # of Rrts with rrt_req bit set:      0
Max Secs To Perform Route:      0.000  Address of Forced Rrt Counts: 3147FDB6
Max Bundle Size Routed:             0  Max routes checked in search:        0
Avg Secs To Select Route:       0.000  Max good rts checked in search:      0
Avg Secs To Perform Route       0.000  # nibs rmvd out from under us:       0
Avg Secs To Route a Conn:       0.000  # our lns rmvd from under us:        0
Avg Bundle Size Routed:             0  # lns rmvd from under us:            0
% of Collisions/Rrt Attempt:        0% Number of conid conflicts:           0
Max Secs To NOT find Route:     0.011  Number of LCON deroutes:             0
Times conns deletd while rtng:      0  Number of VLCON deroutes:            0

This Command: dsprrst
Continue?

sws5           TN    Cisco           IGX 8420  9.3.a4    Mar. 18 2001 02:04 PST

Conn. Routing Statistics LOC_DOMAIN
# conns added to Rrt waitlist:      0  # no destination trunk:             0
# conns unroutable:                 0  # lowest cost route found:          0
# Reroute_Line_Debug:         4000610  # lowest cost route not found:      0
# Reroute_Debug:             FFFFFFFF  # lowest cost route recovered:      0
# Upd_via_info:                     0  # cost exceeded hop recovery:       0
# diff rrt cons number:             0  # unsuccessful cache usage:         0
# hop count exceeded:               0  # successful cache usage:           0
# cost exceeded:                    0  # successful on-demand:             0
# delay exceeded:                   0  # quit msgs sent from mstr:         6
# open cell space too low:          0  # nodal endpt collisions            0
# open packet space too low:        0  # nodal via collisions              0
# open conid space too low:         0
# open GW LCN space too low:        0
# lowest cost path replaced:        0

This Command: dsprrst
Continue?

sws5           TN    Cisco           IGX 8420  9.3.a4    Mar. 18 2001 02:04 PST

Conn. Routing Statistics LOC_DOMAIN
Concurrent RR_CB HWM:             1
Concurrent master RR_CB HWM:      1
# Path block saturation:          0
# Slv rejected by path blk:       0
# Rts rejected by path blk:       0
# Slv rejected by backoff:        0
# Mstr CPU throttle trans:        0
# Via CPU throttle trans:         0
# Slv CPU throttle trans:         0
# M Rts rej by CPU throttle:      0
# V Rts rej by CPU throttle:      0
# S Rts rej by CPU throttle:      0


Last Command: dsprrst
```

Example

Display the connection routing summary and settling information for the IGX node.

dsprrst s

```
sws5           TN    Cisco           IGX 8420  9.3.a4    Mar. 18 2001 06:06 PST

    Connection Routing Summary and Settling Info

Number of Completed Routes:         0       Reroute Repeat Count =  0
Number of Failed Routes:            0

Max Secs To Select Route:       0.000
Max Secs To Perform Route:      0.000

Avg Secs To Select Route:       0.000
Avg Secs To Perform Route:      0.000
Avg Secs To Route a Conn:       0.000

Reroute Duration has never been measured
Settling Time has never been measured


Last Command: dsprrst s
```

Example

Display the settling time measurement history for a BPX node.

dsprrst t

```
sw217          TN    Cisco           BPX 8620  9.3.u4    May  10 2001 1223 PST

Node Settling Time Measurements         Current Measurement State ACTIVE

   Start Time        Stop Time      Conns  Bndls  Avg Bndl Elapsed(s)   E
05/10/01 122301 In Progress           0      0    0.00        7.73  ---
05/10/01 122247 05/10/01 122248      2      2    1.00        0.64   1.23
05/10/01 122241 05/10/01 122241      1      1    1.00        0.35   0.92
05/10/01 000942 05/10/01 004418   1000   1000    1.00    1955.16   0.22



Last Command dsprrst t
```

dsprsrc (display resources)

Displays the partition of all the resources on the specified trunk or port. It also displays virtual trunks for a specified trunk or port. Resources not applicable to virtual trunks are not displayed.

To display all active interfaces with or without partitions on the node, enter the command with no parameters.

To display all active interfaces with or without partitions on a particular slot, enter the command with the slot number.

To display detailed information about all the partitions enabled on an active interface, enter:

dsprsrc slot.port *or* **dsprsrc slot.port.vtrk**

Syntax

dsprsrc <slot>.<port>.<vtrk> [partition_id]

Parameters

Parameter	Description
<slot>	Specifies the card slot.
<port>	Specifies the card port number.
<vtrk>	Specifies the virtual trunk number.
[partition_id]	Specifies the ID number of the partition available for use by the LSC (MPLS Controller) for VSI. Optional. Range: 0–255 Default: 0 Valid partitions: 1, 2, and 3

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX	Yes	Yes	No	No

Related Commands

cnfrsrc, cnfqbin, dspqbin

Example (IGX)

Display partition resources on the IGX node.

dsprsrc

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 11:19 PST

VSI Partitions on this node

 Interface (slot.port)  Part 1  Part 2  Part 3
  Line   4.1               E       D       D
  Trunk  5.1               D       E       D
  Trunk  5.2               D       D       D
  Trunk  5.3               D       D       D
  VTrunk 5.4.1             D       D       E
  Line   5.5               E       E       D


Last Command: dsprsrc
```

Example (IGX)

Display partition resources on slot 5 of the IGX node.

dsprsrc 5

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 11:20 PST

VSI Partitions on this node

 Interface (slot.port)  Part 1  Part 2  Part 3
  Trunk  5.1               D       E       D
  Trunk  5.2               D       D       D
  Trunk  5.3               D       D       D
  VTrunk 5.4.1             D       D       E
  Line   5.5               E       E       D



Last Command: dsprsrc 5
```

Example (IGX)

Display partition resources on port 5 of the UXM card in slot 5 of the IGX node.

dsprsrc 5.5

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 12:05 PST

Line : 5.5
Maximum PVC LCNS: 256            Maximum PVC Bandwidth: 3000
                                 (Reserved Port Bandwidth: 150)


              State   MinLCN   MaxLCN   StartVPI   EndVPI   MinBW    MaxBW
Partition 1:   E       200      500      100        200      100      500
Partition 2:   E       200      500      255        255      250      500
Partition 3:   D



Last Command: dsprsrc 5.5
```

Example (OC-3 on BPX)

Display partition resources on the OC-3 trunk on card slot 3, port 2, and virtual trunk 1 on the BPX node.

dsprsrc 3.2.1

```
sw57          TN    SuperUser       BPX 8620    9.3.10     Mar. 10 2000 10:41 GMT


Virtual Trunk: 3.2.1
                                      Full Port Bandwidth: 3000
Maximum PVC LCNS:            256     Maximum PVC Bandwidth: 1867
                                      (Statistical Reserve: 1000)

PVC VPI RANGE [1]:   -1    /-1        PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Disabled          Disabled          Disabled
  VSI LCNS (min/max):  0      /0         0      /0         0      /0
 VSI VPI (start/end):  0     /0          0     /0          0     /0
    VSI BW (min/max):  0      /0         0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR
```

Example (OC-3 on BPX)

Display partition resources on the OC-3 trunk on port 1 of slot 13 on the BPX to support MPLS.

dsprsrc 13.1

```
sw57          TN    SuperUser       BPX 8620    9.3.10    Mar. 10 2000 10:41 GMT

Trunk : 13.1
                                      Full Port Bandwidth: 353208
Maximum PVC LCNS:            256     Maximum PVC Bandwidth: 352207
                                      (Statistical Reserve: 1000)

PVC VPI RANGE [1]:   -1    /-1        PVC VPI RANGE [2]: -1    /-1
PVC VPI RANGE [3]:   -1    /-1        PVC VPI RANGE [4]: -1    /-1

          Partition :  1                 2                 3
    Partition State :  Enabled           Disabled          Disabled
  VSI LCNS (min/max):  0      /6323      0      /0         0      /0
 VSI VPI (start/end):  60    /70         0     /0          0     /0
    VSI BW (min/max):  0      /0         0      /0         0      /0
     VSI ILMI Config:  CLR               CLR               CLR


Last Command: dsprsrc 13.1
```

dsprtcache (display cost-based route cache)

Displays the cache of all cost-based routing connections. The optional *index* parameter lets you specify a cache entry index. The optional *c* parameter clears the cache.

Syntax

dsprtcache [index] [c]

Parameters

Parameter	Description
[index]	Specifies a particular route entry within the cache. When used with the c parameter, the route is either displayed or cleared from the cache.
[c]	Clears the cache, or if you also enter the index parameter, clears the route cache specified by the index number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX, BPX			No	

Related Commands

dspcon, cnfrtcost, cnfpref

Example

Display route cache contents, and let you monitor and manually clear the cache.

dsprtcache

```
pissaro     TN      StrataCom           BPX 15      9.3     Apr. 13 2000 11:11 GMT
Route Cache (Summary)
Index  Use    No.   Cost  Delay   Restrict  Load   VPC     Hops   RemoteNode
0      Yes ...1.......Yes   No      None      VBR     No       2      lautrec
1      Yes    6       Yes   No      *s        BDB     No       3      vangogh
2      Yes    9       Yes   No      None      BDA     No       3      matisse
3      Yes    3       Yes   No      *t        BDB     No       3      rousseau
4      Yes    1     Yes   No      None     CBR     No      3     seurat  <- current
5      No     0     No    No      None      ---    No      0          ---
6      No     0     No    No      None      ---    No      0          ---
7      No     0     No    No      None      ---    No      0          ---
8      No     0     No    No      None      ---    No      0          ---
9      No     0     No    No      None      ---    No      0          ---
10     No     0     No    No      None      ---    No      0          ---
11     No     0     No    No      None      ---    No      0          ---

Last Command: dsprtcache

Next Command:
```

dsprtr (display router)

Displays the configuration of the Universal Router Module (URM) embedded router on a specified router slot. The configurable router parameters include the IOS configuration file source and the router serial port function. A full description of these parameters is provided in the **cnfrtr** command definition.

Syntax

dsprtr <router_slot>

Parameters

Parameter	Description
router slot	Specifies the virtual shelf slot to support the URM embedded router. Range: 1–32 Switch software manages the embedded router in the URM as if the router resides on a slot in a virtual shelf (of routers). Each slot in the IGX shelf has a corresponding router slot in the virtual shelf. A router slot is considered empty when the equivalent IGX slot is empty or contains an IGX card without an embedded router. If the IGX slot contains a URM card, the router slot is reported as hosting an IOS router.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX	Yes	Yes	No	No

Related Commands

cnfrtrparm, cnfrtr, dsprtrslot, dsprtrslots, dspalms, rstrtr

Example

Display the configuration for the URM embedded router in router slot 10. In this example, the IOS configuration file source is configured as the NPM Admin flash.

dsprtr 10

```
sw175          TN    Cisco           IGX 8420  9.3.q6    Mar. 9 2000  05:44 GMT

Configuration for Router Slot 10:                                    Snapshot
    IOS Configuration:       from card's Admin Flash
    Router Serial Port:      CON




Last Command: dsprtr 10
```

dsprtrcnfdnld (display status of router configuration file)

Displays the status of the IOS configuration file transfer. The display is updated dynamically. Status is reported for two-step file transfer process:

- IOS configuration file transfer from the TFTP server to the NPM RAM buffer.
- IOS configuration file copy (burn) to the URM Admin flash.

The **dsprtrcnfdnld** screen displays the following fields of information.

- The name of the IOS configuration file.
- The size, in bytes, of the IOS configuration file.
- The number of IOS configuration file bytes transferred.
- The status of the file transfer to the NPM RAM buffer or copy to the URM Admin flash.

The file transfer status reports include:

- Complete
- Corrupted
- Unavailable
- File too large
- Abort (shows reason for abort)
- Space occupied (identifies application occupying the space)
- Getting from TFTP server (shows server IP address)
- Burning into slot (shows slot number)

For further information about the URM Remote Router Configuration feature, refer to URM Remote Router Configuration Feature on the IGX, page 2-3.

Syntax

dsprtrcnfdnld

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX	Yes	Yes	No	No

Related Commands

burnrtrcnf, **clrrtrcnf, cnfrtr, cnfrtrcnfmastip, dspcnf, dsprtr, dsprtrslot**

Example

Display the transfer status of the IOS configuration file named 1234.c.

dsprtrcnfdnld

```
sw175          TN    Cisco          IGX 8420   9.3.q6    Mar. 9 2000   05:18 GMT
```

```
Router Config filename         Status
1234.c                         Complete

Router Config fileSize         Bytes Dnld
256050








Last Command: dsprtrcnfdnld
```

dsprtrslot (display router slot)

The display now also includes the IOS configuration file, Admin flash configuration file information, detailed operational information, and alarm status for the Universal Router Module (URM) embedded router on a specified router slot. The display is dynamically updated by IGX switch software.

The IOS configuration file source information includes the name and size of the file stored in URM Admin flash. For a full description of the parameter used to specify the IOS configuration file source, see the **cnfrtr** command.

The URM dynamically reports router operational information to the NPM. The information reported is described in Table 4-34.

Table 4-34 URM Embedded Router Operational Information

Information Type	Description
Router State	The router operational status. Router states include: • Inactive • Rommon • Rommon-CLI • Network-Download-Setup • BootHelp-Setup • IOS-Setup • Network-Download • BootHelper • IOS • Failed
IOS SW Image	The IOS image name and revision (up to 32 characters).
VIC Type	The Voice Interface Card (VIC) type. VIC types include: • E1 • T1 • none

The URM dynamically reports router alarm conditions to the NPM. The alarm conditions for the embedded router are described in Table 4-35.

Table 4-35 URM Embedded Router Alarm Conditions

Alarm Condition	Description
Standby	Indicates the router state is Inactive on a standby URM slot.
Clear	Indicates that the router state is IOS on an active URM logical slot.
Service	Indicates the router state is either BootHelper or Network-Download on an active URM logical slot. When the router is in this condition, all connections on the internal port remain operational. Traffic on these connections, in both ingress and egress directions, is NOT discarded.

Table 4-35 URM Embedded Router Alarm Conditions (continued)

Alarm Condition	Description
Non-Operational	Indicates that the router state on an active logical URM slot is either Inactive, Rommon, Rommon-CLI, Network-Download-Setup, Boothelper-Setup, IOS-Setup, or Failed. When the router is in this condition, all connections on the internal port are FAILED. Traffic on these connections, in both ingress and egress directions, is discarded.
Missing-Card	Indicates that the active logical URM card is either mismatched, down, failed, programming, or missing. When the router is in this condition, all connections on the internal port are FAILED.

Syntax

dsprtrslot <router_slot>

Parameters

Parameter	Description
router slot	Specifies the virtual shelf slot to support the URM embedded router. Range:1–32 Switch software manages the embedded router in the URM as if the router resides on a slot in a virtual shelf (of routers). Each slot in the IGX shelf has a corresponding router slot in the virtual shelf. A router slot is considered empty when the equivalent IGX slot is empty or contains an IGX card without an embedded router. If the IGX slot contains a URM card, the router slot is reported as hosting an IOS router.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfrtrparm, cnfrtr, dsprtr, dsprtrslots, dspalms, rstrtr

Example

Display IOS configuration file source information, operational information, and alarm status for the URM embedded router on router slot 10.

dsprtrslot 10

```
sw175          TN    Cisco           IGX 8420  9.3.q6    Mar. 9 2000  05:39 GMT

Router Slot 10 Operational Info

  Card Type          :  URM
  Router State       :  Inactive
  IOS Status Alrm    :  Standby
  IOS SW Image       :  --
  VIC Type           :  --
  Router config name :  --
  Router config size :  --




Last Command: dsprtrslot 10
```

dsprtrslots (display router slots)

Displays a summary of the operational information and alarm status for all URM embedded routers in the IGX node. The operational information includes router slot number, card type, and Voice Interface Card (VIC) type. The display is dynamically updated by switch software.

Use the **dsprtrslots** command in conjunction with the **dsprtrslot** command. The **dsprtrslot** command displays detailed operational information for the router on a specific router slot. The router states and router alarm conditions reported by the URM are described in the **dsprtrslot** command.

Syntax

dsprtrslots [l | u]

Parameters

Parameter	Description
l | u	Specifies the virtual shelf in a 32-slot IGX for display. • l = lower shelf • u = upper shelf Switch software manages the embedded router in the URM as if the router resides on a slot in a virtual shelf (of routers). Each slot in the IGX shelf has a corresponding router slot in the virtual shelf. A router slot is considered empty when the equivalent IGX slot is empty or contains a legacy IGX card. If the IGX slot contains a URM card, the router slot is reported as hosting an IOS router.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfrtrparm, cnfrtr, dsprtr, dsprtrslot, dspalms, rstrtr

Example

Display the operational information for all URM embedded routers in the IGX node.

dsprtrslots

```
sw108          TN    Cisco          IGX 8420  9.3.2E    Sep. 5 2000  08:51 GMT

                           R O U T E R   S L O T S

   Card VIC          Router                  Card VIC          Router
   Type Type         Status                  Type Type         Status
 1 No router in NPM                        9 --   --           --
 2 No router in NPM                       10 --   --           --
 3 --   --           --                   11 --   --           --
 4 --   --           --                   12 --   --           --
 5 --   --           --                   13 --   --           --
 6 URM  VIC-2E1      Ok                   14 --   --           --
 7 --   --           --                   15 --   --           --
 8 --   --           --                   16 --   --           --


Last Command:dsprtrslots
```

dsprts (display connection routing)

Displays the routes used by all connections at a node. The display shows the trunk numbers and names of all nodes in the path.

Use **dsprts** to see the current cost for all connection routes. A derouted connection shows no current cost. A connection route optimized with trunk delay shows the current total delay. A highlighted connection on the display has exceeded the maximum route cost.

Syntax

dsprts [start group | chan] [nodename]

Parameters

Parameter	Description
start group or channel	Specifies the starting group or channel with which to begin the display. Channel displays are in numeric order. If no starting channel is specified, the display begins with the first connected channel. Start channel is specified in one of the following formats: Voice connection: *slot.channel* Data connection: *slot.port* Frame relay connection: *slot.port.DLCI* Frame relay connection group: *remote node.groupname* Access device connection: *slot.port.device_ID*
node name	Specifies that connections from only the local node to the current node are displayed. If no *nodename* is entered, connections from the local node to all other nodes are displayed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	Yes	Yes	BPX, IGX			Yes	

Related Commands

cnfpref

Example (BPX)

Display the connection routes.

dsprts

```
sw203          TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 17:47 GMT

Conn    Route
```

```
9.1.1.*              (Cost =  5)
        sw203    1.1-- 1.1sw242
Pref:   Not Configured
9.2.5.100            (Cost =  1)
        sw203    3.1.1-- 2.1.1sw242
Pref:   Not Configured
9.2.5.101            (Cost =  1)
        sw203    3.1.1-- 2.1.1sw242
Pref:   Not Configured
9.2.5.102            (Cost =  5)
        sw203    1.1-- 1.1sw242
Pref:   Not Configured



This Command: dsprts


Continue?
```

dspsct (display Service Class Template)

Displays a list of nine Service Class Templates (SCT). There are three levels of operations for this command:

- **dspsct**
  With no arguments, lists all Service Class Templates resident in the node.
- **dspsct <tmplt_id>**
  Lists all the Service Classes (or service types) in the template
- **dspsct <tmplt_id> <Service Type>**
  Lists all the parameters of that Service Class.

Syntax

dspsct [template #][service_type]

Parameters

Parameter	Description
[template #]	Template ID number; lists all the Service Classes (service types) in this template.
[service_type]	Lists the parameters of the specified Service Class

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX	Yes	Yes	No	No

Related Commands

dspqbint, cnfvsiif, dspvsiif

Extended Services Types Support

The service-type parameter for a connection is specified in the connection bandwidth information parameter group. The service-type and service-category parameters determine the Service Class to be used from the Service Template.

Connection Admission Control (CAC)

When a connection request is received by the VSI slave, it is first subjected to a Connection Admission Control process before being forwarded to the firmware layer responsible for actually programming the connection. The granting of the connection is based on these criteria:

LCNs available in the VSI partition

- Qbin
- Service Class

QoS guarantees

- max CLR
- max CTD
- max CDV

When the VSI slave accepts (that is, after CAC) a connection setup command from the VSI master in the Label Switch Controller, it receives information about the connection including service type, bandwidth parameters, and QoS parameters. This information is used to determine an index into the VI's selected Service Template's VC Descriptor table thereby establishing access to the associated extended parameter set stored in the table.

Supported Service Types

The service type identifier is a 32-bit number. However, the service type identifier is represented as a string (service type) on the **dspsct** screen. For example, to specify a Service Class Template number and service type:

dspsct 1 Tag0

A list of supported service templates and associated Qbins, and service types is shown in Table 4-36.

Table 4-36 Service Template and Associated Qbin Selection

Template Type	Service Type ID	Service Type	Parameters	Associated Qbin
VSI Special Types	0x0001	Default	See **dspsct** command for sample parameters for various service types.	13 for templates MPLS1, ATMF1, and ATMF2. 10 for the rest of the templates.
	0x0002	Signaling		10 for template MPLS1
ATMF1 and	0x0100	cbr.1	See **dspsct** command for sample parameters for various service types.	10
ATMF2 templates	0x0101	vbr.rt1		11
(for PNNI controllers)	0x0102	vbr.rt2		11
	0x0103	vbr.rt3		11
	0x0104	vbr.nrt1		12
	0x0105	vbr.nrt2		12
	0x0106	vbr.nrt3		12
	0x0107	ubr.1		13
	0x0108	ubr.2		13
	0x0109	abr		14
	0x010A	cbr.2		10
	0x010B	cbr.3		10
MPLS Types	0x0001	Default	See **dspsct** command for sample parameters for various service types.	13
(for MPLS controllers)	0x0002	Signaling		10
	0x0200	Tag0		10
	0x0201	Tag1		11
	0x0202	Tag2		12
	0x0203	Tag3		13
	0x0204	Tag4		10
	0x0205	Tag5		11
	0x0206	Tag6		12
	0x0207	Tag7		13
	0x0210	TagABR		14

Table 4-36 Service Template and Associated Qbin Selection (continued)

Template Type	Service Type ID	Service Type	Parameters	Associated Qbin
ATMF_tagcos_1 ATMF_tagcos_2	0x0001	Default	See **dspsct** command for sample parameters for various service types.	10
	0x0100	cbr.1		15
	0x0101	vbr.rt1		11
	0x0102	vbr.rt2		11
	0x0103	vbr.rt3		11
	0x0104	vbr.nrt1		12
	0x0105	vbr.nrt2		12
	0x0106	vbr.nrt3		12
	0x0107	ubr.1		10
	0x0108	ubr.2		10
	0x0109	abr		14
	0x010A	cbr.2		15
	0x010B	cbr.3		15
	0x0200	Tag0		10
	0x0201	Tag1		10
	0x0202	Tag2		13
	0x0203	Tag3		13
	0x0204	Tag4		10
	0x0205	Tag5		10
	0x0206	Tag6		13
	0x0207	Tag7		13
	0x0210	TagAbr		14

Table 4-36 Service Template and Associated Qbin Selection (continued)

Template Type	Service Type ID	Service Type	Parameters	Associated Qbin
ATMF_TAGABR_1 ATMF_TAGABR_2	0x0001	Default	See **dspsct** command for sample parameters for various service types.	10
	0x0100	cbr.1		15
	0x0101	vbr.rt1		11
	0x0102	vbr.rt2		11
	0x0103	vbr.rt3		11
	0x0104	vbr.nrt1		12
	0x0105	vbr.nrt2		12
	0x0106	vbr.nrt3		12
	0x0107	ubr.1		10
	0x0108	ubr.2		10
	0x0109	abr		14
	0x010A	cbr.2		15
	0x010B	cbr.3		15
	0x0200	Tag0		10
	0x0201	Tag1		10
	0x0202	Tag2		10
	0x0203	Tag3		10
	0x0204	Tag4		10
	0x0205	Tag5		10
	0x0206	Tag6		10
	0x0207	Tag7		10
	0x0210	TagAbr		13

Table 4-36 Service Template and Associated Qbin Selection (continued)

Template Type	Service Type ID	Service Type	Parameters	Associated Qbin
atmf_TAGCoS_TAGABR_1 atmf_TAGCoS_TAGABR_2	0x0001	Default	See **dspsct** command for sample parameters for various service types.	10
	0x0100	cbr.1		10
	0x0101	vbr.rt1		10
	0x0102	vbr.rt2		10
	0x0103	vbr.rt3		10
	0x0104	vbr.nrt1		11
	0x0105	vbr.nrt2		11
	0x0106	vbr.nrt3		11
	0x0107	ubr.1		12
	0x0108	ubr.2		12
	0x0109	abr		11
	0x010A	cbr.2		10
	0x010B	cbr.3		10
	0x0200	Tag0		12
	0x0201	Tag1		13
	0x0202	Tag2		14
	0x0203	Tag3		15
	0x0204	Tag4		12
	0x0205	Tag5		13
	0x0206	Tag6		14
	0x0207	Tag7		15
	0x0210	TagAbr		13

Details of Connection (VC) Parameters Used in Service Class Templates

Listed below is detailed information on connection (VC) parameters used in Service Class Templates. Some of these parameters may appear on the **dspsct** display.

```
Qbin #
Description      CoS Buffer (Qbin) to use for this CoS
Range/Values:    10 - 15
Units:           enumeration
UPC Enable
Description:     Enable/Disable Policing function. The first 2 values are
consistent with the definition for the older cards. Option #2 and #3 are new and
provide the ability to turn on policing on just GCRA #1 (PCR policing) or #2
(SCR policing).
```

```
Range/Values:    0 -3
0: Disable both GCRAs
1: Enable both GCRAs
2: Enable GCRA #1 only (PCR policing)
3: Enable GCRA #2 only (SCR policing)
Units:           enumeration
UPC CLP Selection
Description:     Selects processing of policing Buckets based on the CLP bit.
Range/Values:    0 -2
0 - Bk 1: CLP (0+1), Bk 2: CLP (0)
1 - Bk 1: CLP (0+1), Bk 2: CLP (0+1)
2 - Bk 1: CLP (0+1), Bk 2: Disabled
Units:           enumeration
Policing Action (GCRA #1)
Description:     Indicates how cells that fail the second bucket (SCR bucket) of
the policer should be handled, if policing is enabled.
Range/Values:    0 - Discard
1 - Set CLP bit
2 - Set CLP of untagged cells, disc. tag'd cells
Units:           enumeration
Policing Action (GCRA #2)
Description:     Indicates how cells that fail the second bucket (SCR bucket) of
the policer should be handled, if policing is enabled.
Range/Values:    0 - Discard
1 - Set CLP bit
2 - Set CLP of untagged cells, disc. tag'd cells
Units:           enumeration
PCR
Description:     Peak Cell Rate; used as default value if not supplied in VSI
connection request.
Range/Values:    0 - 100
Units:           cells/sec
MCR
Description:     Minimum Cell Rate; used as default value if not supplied in VSI
connection request.
Range/Values:    0 - 100
Units:           cells/sec
SCR
Description:     Sustained Cell Rate; used as default value if not supplied in
VSI connection request.
Range/Values:    0 - 100
Units:           cells/sec
ICR
Description:     Initial Cell Rate . Used only for ABR VCs to set initial ACR
value after idle traffic period.
Range/Values:    0 - 100
Units:           cells/sec
MBS
Description:     Maximum Burst Size - used to set bucket depth in policer
function.
Range/Values:    1 - 5M
Units:           cell count
CoS Min BW
 Description:    Bandwidth reserved for this Class of Service; used to initialize
the CoS Buffer (Qbin) Minimum Service Rate (HW param. = ICG), and for CAC
purposes (subject to CAC treatment type).
Range/Values: 0% - 100%
Units:           % of Partition Min BW.
CoS Max BW
Description:      Maximum value allowed for the sum of VC Min. BW's for this CoS;
used by CAC (subject to CAC treatment type).
Range/Values: 0% - 100%
Units:           % of Partition Max BW
Scaling Class
```

```
Description:     Scaling table used for modifying per-VC thresholds under VI or
Global cell-memory congestion.
Range/Values: choices are 0 - 3,
                 0: CBR
                 1: VBR
                 2: ABR
                 3: UBR
Units:           enumeration
CAC Treatment
Description:     Connection Admission Control algorithm used by this CoS
Range/Values:    0 - 256
0: No CAC performed; all connections admitted.
1: LCN_CAC; check for LCN availability only; no BW consideration.
2: MINBW_CAC; LCN + simple min. BW test (sum_of_VC_min_BW <= CoS_max_BW)
3: CAC_2 w/ overbooking allowed
4: ECR_CAC; LCN + ECR calculation (from table) & BW test (sum_of VC_ECR <=
Cos_max_BW).
5: CAC_4 w/ overbooking allowed
6: MEASURED_CAC; LCN + ECR calculation (from dynamic measurement) & BW test
(sum_of VC_ECR <= Cos_max_BW).
Units:           enumeration
VC Max
Description:     Maximum VC-cell-count threshold; all cells are discarded on a
VC when this threshold has been exceeded.
Range/Values:    0 - VI_max_cell_count
Units:           cell count
VC CLPhi
Description:     VC cell count above which CLP=1 cells are discarded
Range/Values:    0 - 100
Units:           % of VC Max threshold
VC CLPlo
Description:     VC cell count below which CLP=1 cells are no longer discarded
(discards having begun when CLPhi was exceeded).
Range/Values: 0 - 100
Units:           % of VC Max threshold

VC EPD
Description:     VC cell count above which AAL-5 frames are discarded
Range/Values:    0 - 100
Units:           % of VC Max threshold
VC EFCI
Description:     VC cell count above which congestion notification is activated
Range/Values: 0 - 100
Units:           % of VC Max threshold
VC Discard Selection
Description:     Choice of frame-based discard (EPD) or CLP-hysteresis
Range/Values:    0 - 1
0: CLP Hysteresis
1: EPD
Units:           enumeration
VSVD/FCES
Description:     For ABR VC's, enable/disable Virtual Source/Virtual Destination
(VSVD) and/or Flow Control on External Segments (FCES) functionality
Range/Values:    0 -2
0: None
1: VSVD
2: VSVD w/ FCES
Units:           enumeration
ADTF             ABR only parameter
Description:     ACR decrease time factor; idle time before ACR -> ICR
Range/Values:    10 - 1023
Units:           milliseconds
RDF              ABR only parameter
```

```
Description:     Rate Decrease Factor
ACR = ACR - (ACR * RDF)
Range/Values: 2 - 512, in powers of 2
Units:           Inverse decrease factor
RIF              ABR only parameter
Description:     Rate Increase Factor
ACR = ACR + (PCR * RDF)
Range/Values:    2 - 512, in powers of 2
Units:           Inverse decrease factor
NRM              ABR only parameter
Description:     Number of data cells between FRM cells
Range/Values:    2 - 512, in powers of 2
Units:           cells
TRM              ABR only parameter
Description:
Range/Values:
Units:
CDF              ABR only parameter
Description:
Range/Values:
Units:
TBE              ABR only parameter
Description:
Range/Values:
Units:

FRTT             ABR only parameter
Description:
Range/Values:
Units:
```

Example (IGX)

Displays all the templates in the IGX node.

dspsct

```
bently         TN    Cisco          IGX 8430  9.3.10    Aug. 3 2000  14:10 PST

                         Service Class Templates

Template   Name

   1       MPLS1
   2       ATMF1
   3       ATMF2
   4       ATMF_tagcos_1
   5       ATMF_tagcos_2
   6       ATMF_TAGABR_1
   7       ATMF_TAGABR_2
   8       atmf_TAGCoS_TAGABR_1
   9       atmf_TAGCoS_TAGABR_2



Last Command: dspsct


Next Command:
```

Example (IGX)

Display all service classes of the MPLS1 template in the IGX node.

dspsct 1

```
bently         TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  14:11 PST

         Service Class Map for MPLS1 Template

Service Class    Qbin    Service Class    Qbin    Service Class   Qbin

    Default       13
    Signaling     10
    Tag0          10
    Tag1          11
    Tag2          12
    Tag3          13
    Tag4          10
    Tag5          11
    Tag6          12
    Tag7          13
    TagAbr        14

Last Command: dspsct 1


Next Command:
```

Example (IGX)

Display service type Default in template 1.

dspsct 1 default

```
bently         TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  14:12 PST

    Service Template: MPLS1 (1)                Service Type:   Default (1)

Service Category               Default (1)
Qbin                           13
UPC Enable                     NONE
Scaling Class                  Scaled 1st
CAC Treatment                  LCN
VC Max Threshold               61440             (cells)
VC Dscd Selection              EPD
VC CLP High                    100               (% of Vc MAX Threshold)
VC EPD                         40                (% of Vc MAX Threshold)
Cell Delay Variation Tolerance 250000



Last Command: dspsct 1 Default


Next Command:
```

Example (IGX)

Display service type Signaling in Template 1.

dspsct 1 Signaling

```
bently         TN    Cisco          IGX 8430  9.3.10    Aug. 3 2000  14:14 PST

    Service Template: MPLS1 (1)                 Service Type:   Signaling (2)

Service Category               Signaling (2)
Qbin                           10
UPC Enable                     NONE
Sustained Cell Rate            0                 (% of PCR)
Maximum Burst Size             0                 (cells)
Scaling Class                  Scaled 1st
CAC Treatment                  LCN
VC Max Threshold               0                 (cells)
VC Dscd Selection              Hystersis
VC CLP High                    75                (% of Vc MAX Threshold)
VC CLP Low                     30                (% of Vc MAX Threshold)
Cell Delay Variation Tolerance 250000


Last Command: dspsct 1 Signaling


Next Command:
```

Example (IGX)

Display service type Tag0 in Template 1.

dspsct 1 Tag0

```
bently         TN    Cisco          IGX 8430  9.3.10    Aug. 3 2000  14:15 PST

    Service Template: MPLS1 (1)                 Service Type:   Tag0 (200)

Service Category               Tag0 (200)
Qbin                           10
UPC Enable                     NONE
Scaling Class                  Scaled 1st
CAC Treatment                  LCN
VC Max Threshold               61440             (cells)
VC Dscd Selection              EPD
VC CLP High                    100               (% of Vc MAX Threshold)
VC EPD                         40                (% of Vc MAX Threshold)



Last Command: dspsct 1 Tag0


Next Command:
```

Example (IGX)

Display service type TagAbr in Template 1.

dspsct 1 TagAbr

```
bently         TN    Cisco          IGX 8430  9.3.10    Aug. 3 2000  14:15 PST

    Service Template: MPLS1 (1)                Service Type:   TagAbr (210)

Service Category               TagAbr (210)
Qbin                           14
UPC Enable                     NONE
Minimum Cell Rate              0                 (% of PCR)
Sustained Cell Rate            0                 (% of PCR)
Initial Cell Rate              100               (% of PCR)
Maximum Burst Size             1024              (cells)
Scaling Class                  Scaled 2nd
CAC Treatment                  LCN
VC Max Threshold               61440             (cells)
VC Dscd Selection              EPD
VC CLP High                    100               (% of Vc MAX Threshold)
VC EPD                         40                (% of Vc MAX Threshold)

This Command: dspsct 1 TagAbr


Continue? Y


bently         TN    Cisco          IGX 8430  9.3.10    Aug. 3 2000  14:16 PST

    Service Template: MPLS1 (1)                Service Type:   TagAbr (210)

VC EFCI                        20                (% of Vc MAX Threshold)
VSVD                           NONE
Decrease Time Factor           500               (milli seconds)
Rate Decrease Factor           16                (Inverse Decrease Factor)
Rate Increase Factor           16                (Inverse Decrease Factor)
data cells b/w Fwd RM Cells    32                (Cells)
Time b/w Fwd RM Cells          0
Cut-Off Decrease Factor        16
Transient Buffer Exposure      16777215
Fixed Round Trip Time          0




Last Command: dspsct 1 TagAbr


Next Command:
```

Example (BPX)

Displays all the templates in the BPX node.

dspsct

```
sw143          TRM   Cisco          BPX 8620  9.3.10    Aug. 2 2000  20:23 GMT

                         Service Class Templates

Template   Name
```

```
    1       MPLS1
    2       ATMF1
    3       ATMF2
    4       ATMF_tagcos_1
    5       ATMF_tagcos_2
    6       ATMF_TAGABR_1
    7       ATMF_TAGABR_2
    8       atmf_TAGCoS_TAGABR_1
    9       atmf_TAGCoS_TAGABR_2


Last Command: dspsct


Next Command:
```

Example (BPX)

Display Service Class Template 2, which displays Service Classes (also referred to as service categories or service sub-categories) for the ATMF1 template, along with designated Qbins.

dspsct 2

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  20:26 GMT

         Service Class Map for ATMF1 Template

Service Class    Qbin    Service Class    Qbin    Service Class   Qbin

    Default       13          Cbr1          10
    Signaling     12          Cbr2          10
    VbrRt1        11          Cbr3          10
    VbrRt2        11
    VbrRt3        11
    VbrNRt1       12
    VbrNRt2       12
    VbrNRt3       12
    Ubr1          13
    Ubr2          13
    Abr           14

Last Command: dspsct 2
```

Example (BPX)

Display Service Class Template 3, which displays service classes for the ATMF2 template, along with designated Qbins.

dspsct 3

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  20:39 GMT

         Service Class Map for ATMF2 Template

Service Class    Qbin    Service Class    Qbin    Service Class   Qbin

    Default       13          Cbr1          10
    Signaling     12          Cbr2          10
    VbrRt1        11          Cbr3          10
    VbrRt2        11
    VbrRt3        11
```

```
    VbrNRt1       12
    VbrNRt2       12
    VbrNRt3       12
    Ubr1          13
    Ubr2          13
    Abr           14

Last Command: dspsct 3


Next Command:
```

Example (BPX)

Display service type VbrRt1 in Template 2.

dspsct 2 VbrRt1

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  20:41 GMT

    Service Template: ATMF1 (2)                Service Type:   VbrRt1 (101)

Service Category              VbrRt (101)
Qbin                          11
UPC Enable                    GCRA_1_2
UPC CLP Selection             CLP01_CLP01
Policing Action 1             DISCARD
Policing Action 2             DISCARD
Sustained Cell Rate           100               (% of PCR)
Maximum Burst Size            1024              (cells)
Scaling Class                 Scaled 3rd
CAC Treatment                 CAC4
VC Max Threshold              1280              (cells)
VC Dscd Selection             Hystersis
VC CLP High                   80                (% of Vc MAX Threshold)

This Command: dspsct 2 VbrRt1


Continue? Y
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  20:42 GMT

    Service Template: ATMF1 (2)                Service Type:   VbrRt1 (101)

VC CLP Low                    35                (% of Vc MAX Threshold)
Cell Delay Variation Tolerance 250000








Last Command: dspsct 2 VbrRt1


Next Command:
```

Example (BPX)

Display service type Abr in Template 2.

dspsct 2 Abr

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  20:43 GMT

    Service Template: ATMF1 (2)                Service Type:   Abr (109)

Service Category              Abr (104)
Qbin                          14
UPC Enable                    GCRA_1
UPC CLP Selection             CLP01
Policing Action 1             DISCARD
Minimum Cell Rate             0                 (% of PCR)
Sustained Cell Rate           0                 (% of PCR)
Initial Cell Rate             0                 (% of PCR)
Maximum Burst Size            1024              (cells)
Scaling Class                 Scaled 2nd
CAC Treatment                 MIN BW
VC Max Threshold              8000              (cells)
VC Dscd Selection             Hystersis

This Command: dspsct 2 Abr

Continue? Y

sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  20:44 GMT

    Service Template: ATMF1 (2)                Service Type:   Abr (109)

VC CLP High                   80                (% of Vc MAX Threshold)
VC CLP Low                    35                (% of Vc MAX Threshold)
VC EFCI                       20                (% of Vc MAX Threshold)
VSVD                          NONE
Decrease Time Factor          500               (milli seconds)
Rate Decrease Factor          16                (Inverse Decrease Factor)
Rate Increase Factor          16                (Inverse Decrease Factor)
data cells b/w Fwd RM Cells   32                (Cells)
Time b/w Fwd RM Cells         0
Cut-Off Decrease Factor       16
Transient Buffer Exposure     16777215
Fixed Round Trip Time         0
Cell Delay Variation Tolerance 250000

Last Command: dspsct 2 Abr


Next Command:
```

Example (BPX)

Display service type Default in Template 1 (MPLS1).

dspsct 1 Default

```
sw143          TRM   Cisco           BPX 8620  9.3.10    Aug. 2 2000  20:44 GMT

    Service Template: MPLS1 (1)                Service Type:   Default (1)

Service Category              Default (1)
Qbin                          13
UPC Enable                    NONE
Scaling Class                 Scaled 1st
CAC Treatment                 LCN
VC Max Threshold              61440             (cells)
VC Dscd Selection             EPD
VC CLP High                   100               (% of Vc MAX Threshold)
VC EPD                        40                (% of Vc MAX Threshold)
```

```
Cell Delay Variation Tolerance 250000


Last Command: dspsct 1 Default
```

Example (BPX)

Display the signaling service type in Template 1 (MPLS1).

dspsct 1 Signaling

```
sw143          TRM   Cisco          BPX 8620  9.3.10    Aug. 2 2000  20:46 GMT

    Service Template: MPLS1 (1)                Service Type:   Signaling (2)

Service Category               Signaling (2)
Qbin                           10
UPC Enable                     NONE
Sustained Cell Rate            0                  (% of PCR)
Maximum Burst Size             0                  (cells)
Scaling Class                  Scaled 1st
CAC Treatment                  LCN
VC Max Threshold               0                  (cells)
VC Dscd Selection              Hystersis
VC CLP High                    75                 (% of Vc MAX Threshold)
VC CLP Low                     30                 (% of Vc MAX Threshold)
Cell Delay Variation Tolerance 250000


Last Command: dspsct 1 Signaling


Next Command:
```

Example (BPX)

Display the service type Tag0 in Template 1 (MPLS1).

dspsct 1 Tag0

```
sw143          TRM   Cisco          BPX 8620  9.3.10    Aug. 2 2000  20:48 GMT

    Service Template: MPLS1 (1)                Service Type:   Tag0 (200)

Service Category               Tag0 (200)
Qbin                           10
UPC Enable                     NONE
Scaling Class                  Scaled 1st
CAC Treatment                  LCN
VC Max Threshold               61440              (cells)
VC Dscd Selection              EPD
VC CLP High                    100                (% of Vc MAX Threshold)
VC EPD                         40                 (% of Vc MAX Threshold)


Last Command: dspsct 1 Tag0


Next Command:
```

Example (BPX)

Display the service type Cbr1 in Template 9.

dspsct 9 Cbr1

```
sw143          TRM   Cisco          BPX 8620  9.3.10    Aug. 2 2000  20:50 GMT

    Service Template: atmf_TAGCoS_TAGABR_2 (9)  Service Type:   Cbr1 (100)

Service Category               Cbr (100)
Qbin                           10
UPC Enable                     NONE
Scaling Class                  Scaled 4th
CAC Treatment                  CAC4
VC Max Threshold               160              (cells)
VC Dscd Selection              Hystersis
VC CLP High                    80               (% of Vc MAX Threshold)
VC CLP Low                     35               (% of Vc MAX Threshold)
Cell Delay Variation Tolerance 250000



Last Command: dspsct 9 Cbr1


Next Command:
```

dspsig (display signaling)

Displays the current signaling state received at the node from the specified voice channel.

This command displays the current signaling state received at the node from the specified voice channel. The status of the transmit and receive A and B signaling bits (for DS1 trunks) or A, B, C and D signaling bits (for E1 trunks) are displayed as a 0 or 1. The status of the bits (0 or 1) depends on the signaling type utilized on the connection displayed. The transmit direction of transmission is toward the remote node; the receive direction is toward the local circuit line.

The **dspsig** command can be used to verify the connection signaling type. If you compare the A/B bit states on-hook and off-hook with those shown in the **dspchcnf** command, you will note that the node passes signaling straight through. The signaling definition is only important for monitoring the on-hook/off-hook state and setting conditioning patterns.

Syntax

dspsig <start_channel>

Parameters

Parameter	Description
<start_channel>	First voice channel in the format *slot.port*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	IGX			No	

Related Commands

cnfclnsigparm, **cnfrcvsig**, **dspclnsigparm**

Example

dspsig 7.1

```
sw83           TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  19:25 PST

                                Signalling Information
From 7.1     TXA-bit  TXBbit  TXCbit  TXDbit  RXA-bit RXBbit RXCbit RXDbit no_serv
7.1-15       1        1       0       1       1       1      0      1
7.17-31      1        1       0       1       1       1      0      1



Last Command: dspsig 7.1


Next Command:
```

dspsigqual (display signaling qualifiers)

Displays the configuration for the A, B, C, and D bit signaling qualifiers for all channels. The only parameter is the starting channel. You set the values for these signaling bits by using the **cnfrcvsig** and **cnfxmtsig** commands. Note that these signaling bit states are different from the states during circuit alarm (signaling conditioning).

During normal operation of the voice circuit, the A, B, C, and D signaling bits may be held at a fixed value (0 or 1), inverted (I), or passed through transparently (T).

Signal direction:

- Transmit direction is toward the PBX or channel bank.
- Receive direction is from the external equipment.

Syntax

dspsigqual <start channel>

Parameters

Parameter	Description
start channel	Specifies the starting channel. On a CDP or CVM, the format is *slot.channel*. On a UVM, the format is *slot.line.channel*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Related Commands

cnfxmtsig, cnfrcvsig

Example

Display the channel signaling bit qualifiers for channel 13.1.

dspsigqual 13.1

```
sw150          TN    Cisco           IGX 8420  9.3.2T    Dec. 19 2000 23:58 PST

                                Signalling Qualifiers
From 13.1   TXAbit  TXBbit  TXCbit  TXDbit  RXAbit RXBbit RXCbit RXDbit
13.1-24     T       T       T       T       T      T      T      T



Last Command: dspsigqual 13.1
```

dspslot (display slot)

Displays system information associated with a specific card in the node.

This command displays system information associated with a specific card in the node. The information can help you debug card failures. When a card failure is reported to the Cisco TAC, the TAC engineer records the parameters for the associated card displayed by using **dspslot**.

The information displayed by the **dspslot** command is unique to the card and is used primarily by the controller card to supervise background system tasks lists the card parameters.

Use this command to add information on a failed card when you return it. Print the screen or otherwise record the information and return it with the faulty card to Cisco.

Syntax

dspslot <slot number>

Parameters

Parameter	Description
<slot number>	Specifies the shelf slot number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Example (IGX)

dspslot 6

```
sw83           TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  19:27 PST

Card Data Base for FRP card in slot 6  at address 30BD820C

  Logical Card        6                     Test in Prog        0
  Verify DB Flag      0                     Slft Res Abort      0
  Info Ptr            30B88C2C              Slft Abort          0
  Last Event          TEST_FREE             Last Test           BKGD_TEST
  Fail Inter          0                     FRP Test Fail       0
  Selftest Fail       0                     FRP Test Fail I     0
  Selftest Inter      0                     FRP Port Test Fail  0
  Selftest Timeout    0                     FRP Port Capacity   31
  Con Test Fail       0                     FRP Line Capable    1
  Red LED Flag        0                     FRP V35 Capable     0
  Restart Reason      Not maintained        FRP X21 Capable     0
  Selftest Results                          FRP NNI/CLLM Cap    1
                                            FRP CGW/ATFR Cap    1

Last Command: dspslot 6


Next Command:
```

Slot Parameters You Can Display on Node

Item	Parameter	Description
1	Logical Card	This number represents the type of card.
2	Verify DB Flag	Verify database flag. Concerned with database and memory.
3	Info Ptr	Information pointer. Concerned with database and memory.
4	Last Event	This is the previous state of the card.
5	Fail Inter	Indicates intermittent card failure.
6	Selftest Fail	Indicates self-test fail condition.
7	Selftest Inter	Indicates intermittent self-test failure.
8	Selftest Timeout	Self-test routine timed out before completion.
9	Con Test Fail	Indicates failure of the test con command.
10	Red LED Flag	Indicates front panel FAIL LED on.
11	Restart Reason	Reason for last card reset.
12	Selftest Results	Results of last self-test for card.
13	Test in Prog	Indicates card test is in progress.
14	Slft Res Abort	Not used.
15	Slft Abort	Not used.
16	Card Stats Up	A “1” indicates statistics are being collected on this card.
17	Sib Pointer	Pointer to database concerning statistics.
18	Summary stats	Pointer to database concerning statistics.
19	Detailed stats	Pointer to database concerning statistics.
20	Bus Mastership	For BCC, this indicates whether this is the slave BCC. For other cards, this is not used.
21	Last Test	Last test performed on card in this slot.

dspslotalmcnf (display slot alarm configuration)

Displays the slot alarm configuration for the BPX node.

Syntax

dspslotalmcnf [slot]

Parameters

Parameter	Description
slot number	Specifies the slot number of the card to be displayed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

dspslotalms

Example (BPX)

Display the slot alarm configuration for the BPX.

dspslotalmcnf 7

```
D1.jea         TRM   SuperUser       BPX 8620    9.3    Apr. 13 2000 12:04 GMT

                             Slot Alarm Configuration

                       Minor                                Major

  Violation    Rate    Alarm Time  Clear         Rate    Alarm Time  Clear
  1) SBus        .01%  10 min       3 min           .1%   10 sec      10 sec
  2) InvP        .01%  10 min       3 min           .1%   10 sec      10 sec
  3) PollA       .01%  10 min       3 min           .1%   10 sec      10 sec
  4) PollB       .01%  10 min       3 min           .1%   10 sec      10 sec
  5) BGE         .01%  10 min       3 min           .1%   10 sec      10 sec
  6) TBip        .01%  10 min       3 min           .1%   10 sec      10 sec
  7) RBip        .01%  10 min       3 min           .1%   10 sec      10 sec
  8) Bfrm        .01%  10 min       3 min           .1%   10 sec      10 sec
  9) SIU         .01%  10 min       3 min           .1%   10 sec      10 sec


Last Command: dspslotalmcnf 7


Next Command:
```

dspslotalms (display slot alarms)

Displays statistical alarms associated with the SIU on each BPX card. The display provides a single line for each slot in a local BPX node occupied by a card. Both the card type and the current card alarm status appears. If a card is operating normally, the display shows “Clear - Slot OK.” If fault conditions continue to cause the slot errors to exceed a preset threshold, the column labeled Current Card Alarm Status reflects this fact. If the alarm condition has disappeared, use the **clrslotalms** command to clear these alarm messages. For a list of slot errors, see the **dspsloterrs** description.

Syntax

dspslotalms <slot>

Parameters

Parameter	Description
slot	Specifies the slot number of the card to display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX			No	

Related Commands

dspsloterrs

Example

Display the status of the card in slot 1.

dspslotalms 1

```
D1.jea         TRM   SuperUser       BPX 8620    9.3    Apr. 13 2000 12:00 GMT

Slot  Type     Current Slot Alarm Status
   7 BCC       Clear - Slot OK
  11 BNI-T3    Clear - Slot OK



Last Command: dspslotalms


Next Command:
```

dspsloterrs (display slot errors)

Displays statistical alarms associated with the SIU on each BPX card. The **dspsloterrs** command takes a slot number as an optional parameter: if you enter **dspsloterrs** without a slot number, the display shows a single line for each slot with statistics that have accumulated for all slots.

Both the card type and current status are displayed. If a card is operating normally, the status is "Clear - Slot OK." If fault conditions persistently cause the slot errors (described in the Display Slot Errors command) to exceed a preset threshold, this fact is displayed under the column labeled Current Card Alarm Status. The **clrslotalm** command clears the alarm messages if the alarm condition has been cleared. The chart below describes the errors is the display.

Display Fields: Statistical Alarms

Error	Description
Standby Bus Errors	Indicates a background test over the standby bus produced an error.
Invalid Port Errors	Indicates port number was out of the range 1–3.
Polling Bus A Errors	Parity error occurred on this polling bus.
Polling Bus B Errors	Parity error occurred on this polling bus.
Bad Grant Errors	Error indicates arbiter did not issue a grant to send data before a timeout.
Tx BIP-16 Errors	Data frame transmitted had a checksum error.
Rx BIP-16 Errors	Data frame received with a checksum error.
SIU Phase Errors	Serial Interface Unit on the card did not detect the frame synch properly.
Bframe Errors	Errors detected in the BPX frame on the StrataBus or in a memory operation.
Rx FIFO Sync Errs	Rx FIFO (first-in-first-out) sync errors indicate that the receive FIFOs used by the BIF-RX circuit either got out of sync with the start of frames or with each other. These errors mean that two frames have been discarded; however, those frames may not have contained any user data (they could just be filler known as Null BFrames). When these occur infrequently, they are simply counted. If they happen too often, a hardware error will be generated because a circuit failure could cause them. Make sure you are using the latest firmware (the BIF-RX has had fixes for this). If the errors continue, replace the card.
Poll Clk Errs	Poll Clock Errors are detected when the POLLCLK, which is distributed by the active BCC to each of the other cards, stops. The count is of 100 millisecond periods in which this happened. Without POLLCLK, the card is unable to transmit data across the backplane.
CK 192 Errs	Errors in a clock distributed by the BCC. The CK-192 is used to synchronize the transmit signal on some cards. If it is not present, the transmit signal is off frequency, in turn generating line and trunk errors.
BXM Errs	BXM errors are BXM card specific errors.

Syntax

dspsloterrs [slot]

Parameters

Parameter	Description
slot	Specifies the slot number of a card for the display.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX			No	

Related Commands

dspslotalms

Example (BPX)

Display the alarm statistics for the card in slot 4.

dspsloterrs 4

```
sw217          TN    Cisco          BPX 8620  9.3.3q    May  25 2001 12:22 PST

BXM 4           Status: Clear - Slot OK                 Clrd: Date/Time Not Set
Type              Count ETS   Status    Type              Count ETS   Status
Stby PRBS Errs        0     0
Rx Invld Prt Errs     0     0
Poll Bus A Parity     0     0
Poll Bus B Parity     0     0
Bad Grant Errs        0     0
Tx BIP-16 Errs        0     0
Rx BIP-16 Errs        0     0
SIU Phase Errs        0     0
Bfrm. Par. Errs       0     0
Rx FIFO Sync Errs     0     0
Poll Clk Errs         0     0
CK 192 Errs           0     0
BXM Errs              0     0

Last Command: dspsloterrs 4
```

dspslotstatcnf (display statistics enabled for a BXM card slot)

Displays enabled statistics for where a BXM card resides. These statistics are set by the **cnfslotstats** command, by Cisco WAN Manager, or by node features.

The Owner column shows what set the statistic:

- If the column shows Automatic, it was set by features.
- If the column shows the node name, it was is set by Cisco WAN Manager.
- If the column shows the name of the user, it was set with the **cnfslotstats** command.

Syntax

dspslotstatcnf <slot>

Parameters

Parameter	Description
<slot>	Specifies the slot where the BXM resides.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX			Yes	

Related Commands

cnfslotstats

Example

dspslotstatcnf 2

```
sw59           TN    SuperUser       BPX 15    9.3 Apr. 13 2000  14:02 GMT

Statistics Enabled on Slot 2

    Statistic                            Samples Interval Size Peaks  Owner
    ------------------------------------ ------- -------- ---- -----  ----------
 1) Standby PRBS Errors                       60        0    4  NONE  AUTO
 2) Rx Invalid Port Errs                      60        0    4  NONE  AUTO
 3) PollA Parity Errors                       60        0    4  NONE  AUTO
 4) PollB Parity Errors                       60        0    4  NONE  AUTO
 5) Bad Grant Errors                          60        0    4  NONE  AUTO
 6) Tx Bip 16 Errors                          60        0    4  NONE  AUTO
 7) Rx Bip 16 Errors                          60        0    4  NONE  AUTO
 8) Bframe parity Errors                      60        0    4  NONE  AUTO
 9) SIU phase Errors                          60        0    4  NONE  AUTO
10) Rx FIFO Sync Errors                       60        0    4  NONE  AUTO
11) Poll Clk Errors                           60        0    4  NONE  AUTO
12) CK 192 Errors                             60        0    4  NONE  AUTO
13) Monarch Specific Errors                   60        0    4  NONE  AUTO

This Command: dspslotstatcnf 2
```

```
Continue?
```

Example

Display thresholds for slot 7.

dspslotstatcnf 7

```
D1.jea         TRM   SuperUser       BPX 8620    9.3    Apr. 13 2000 12:03 GMT

Statistic Enabled on Slot 7

Statistic                          Samples  Interval  Size  Peaks  Owner
-----------------------------------  -------  --------  ----  -----  ----------
Standby PRBS Errors                     60         0     4   NONE  Automatic
Rx Invalid Port Errors                  60         0     4   NONE  Automatic
Polling Bus A Parity Errors             60         0     4   NONE  Automatic
Polling Bus B Parity Errors             60         0     4   NONE  Automatic
Bad Grant Errors                        60         0     4   NONE  Automatic
Transmit Bip 16 Errors                  60         0     4   NONE  Automatic
Receive Bip 16 Errors                   60         0     4   NONE  Automatic
Bframe parity Errors                    60         0     4   NONE  Automatic
SIU phase Errors                        60         0     4   NONE  Automatic


Last Command: dspslotstatcnf 7


Next Command:
```

dspslotstathist (display statistics history for a BXM card)

Displays a history the last five occurrences of the slot statistic enabled for a BXM card slot.

You select the statistic from the list displayed when you first enter this command. Use the **dspslotstatcnf** to display the statistics enabled on the selected slot. Use **cnfslotstats** to enable a statistic.

Syntax

dspslotstathist <port>

Parameters

Parameter	Description
<slot>	Specifies the slot.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX			Yes	

Related Commands

cnfslotstats, **dspslotstatcnf**

dspsnmp (display SNMP parameters)

Display the following SNMP parameters for the current node:

- Get Community String
- Set Community String
- Trap Community String
- SNMP Set Request Queue Size
- SNMP Queued Request Timeout, in seconds
- SNMP Trap Event Queue Size

Syntax

dspsnmp

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfsnmp, **dspsnmpstats**

Example (IGX)

Display the SNMP parameters for the current node.

dspsnmp

```
sw180          TN    Cisco           IGX 8420  9.3.p0    Dec. 6 2000  09:03 GMT

Get Community String:                  audit
Set Community String:                  private
Trap Community String:                 private

SNMP Set Request Queue Size:           110
SNMP Queued Request Timeout (secs):    21600
SNMP Trap Event Queue Size:            100




Last Command: dspsnmp
```

dspsnmpstats (display SNMP statistics)

Displays the following SNMP statistics for the current node:

- SVC Requests Received, the number of SVC requests received.
- SVC Current Queue Length, the number of outstanding SVC requests in the queue.
- SVC Maximum Queue Length, the high watermark of the number of outstanding SVC requests in the queue.
- SVC Requests Timed Out, the number of SVC requests that have timed out.
- Current Trap Managers, the number of managers (up to 10) that are currently registered, their IP addresses and UDP ports.
- Traps Transmitted, the number of traps transmitted.
- TRAP Current Queue Length, the number of outstanding traps in the queue.
- TRAP Maximum Queue Length, the high watermark of the number of outstanding traps in the queue.
- TRAP Queue Events Discarded, the number of traps discarded due to queue overflow.
- Overflow Traps Transmitted, the number of overflow traps transmitted due to queue overflow.

Syntax

dspsnmpstats

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfsnmp, **dspsnmp**

Example (IGX)

Display SNMP statistics for the current node.

dspsnmpstats

```
sw180          TN    Cisco          IGX 8420  9.3.p0    Dec. 6 2000  09:05 GMT

SVC Requests Received:       0         Traps Transmitted:            0

SVC Current Queue Length:    0         TRAP Current Queue Length:    0
SVC Maximum Queue Length:    0         TRAP Maximum Queue Length:    0
SVC Requests Timed Out:      0         TRAP Queue Events Discarded:  0
                                       Overflow Traps Transmitted:   0

Current Trap Managers:       0/10      Snmp_Trap_Db Ptr:             315687BE

Last Command: dspsnmpstats
```

dspstatfiles (display TFTP statistics file information)

The **dspstatfiles** command displays TFTP statistics file information for the current node.

These files contain statistics for switch objects (such as connections, lines, trunks, ports, and so forth) that are reported to the Cisco WAN Manager (CWM) by means of the Trivial File Transport Protocol (TFTP).

Syntax

dspstatfiles [d]

Parameters

Parameter	Description
[d]	Optional. Specifies a detailed display for command output.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX and IGX	No	OK	No	No

Related Commands

dspstatparms, **cnfstatparms**, **cnfnodeparm**, **dspstatmem**

Example

Display TFTP statistics file information for the current node.

Default display example:

```
dspstatfiles
sw62           TN    StrataCom       BPX 8620  9.2.36    Jan. 24 2001 01:24 GMT

KEY:A = Active File, S = Switchover occured, R = Stats Reset, K = Stats Skewed
     E = Stats just enabled, W = Write Failure, M = Made while standby
FILE NAME                FLAGS            FILE NAME                 FLAGS
    sw62.0124010030  M
    sw62.0124010030  M
    sw62.0124010045  M
    sw62.0124010100  SE
    sw62.0124010115  R
    sw62.0000000000  A








Last Command:dspstatfiles
```

```
Next Command:

                   SW CD                                             MAJOR ALARM


Field definitions for default display:
A = Active File          - The active file.
S = Switchover occured   - A CC switch over occurred while the file was active.
R = Stats Reset          - While the file was active a user executed the
                           "rststats" command, or a there was a time change
                           large enough to invalidate the current collection.
K = Stats Skewed         - Due to cbus message throttling some statistics
                           polls may have been skipped. The stats were picked
                           up by a later poll, but due to a file rollover the
                           stats were skewed into the new active file.
E = Stats just enabled   - New statistics were enabled while the file was
                           active.
W = Write Failure        - The file could not be written because the file
                           size exceeded the remaining memory allocated for
                           TFTP files. This is an error condition. The
                           software error 2051 is logged to provide information
                           about the error condition.
M = Made while standby   - The stats in the file were collected by the active
                           CC while the current CC was standby.
```

Display detailed TFTP statistics file information for the current node:

dspstatfiles d

```
sw62           TN    StrataCom       BPX 8620  9.2.36    Jan. 24 2001 01:10 GMT

File:    sw62.0124010030               File:    sw62.0124010030

    Next File Ptr:   0x307C0EB0            Next File Ptr:   0x307C0A30
    Data Block Ptr:  0x307C10F0            Data Block Ptr:  0x307C0C70

    File Length:     53                    File Length:     53
    File Memory:     1152                  File Memory:     1152
    Data Length:     512                   Data Length:     512
    Tftp_File_Size                          Tftp_File_Size
     at creation:    573                    at creation:    573

    Enter Long Fails:0                     Enter Long Fails:0
    Enter Fails:     0                     Enter Fails:     0



This Command:dspstatfiles d


Continue?

                   SW CD                                             MAJOR ALARM
```

dspstatmem (display statistics memory use)

Displays memory usage for statistics collection.

This command displays memory usage for statistics collection. It is intended for debugging statistics collection problems, not everyday use. The command shows the amount of controller card memory allocated by the user to statistics display (defaults to 650 Kbytes).

The memory occupied by USER is used for user-enabled statistics. The memory occupied by USER figure is that used by the Cisco WAN Manager user. Memory occupied by AUTO is that used by node features.

Syntax

dspstatmem

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			No	

Example (IGX)

dspstatmem

```
sw83           TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  19:29 PST




User Configured Statistics Memory (In bytes)  = 624640

Memory Occupied by USER (In bytes) = 0

Memory Occupied by AUTO (In bytes) = 21584




Last Command: dspstatmem


Next Command:
```

dspsv3 (display WAN manager L3 link control blocks)

Displays the Cisco WAN Manager L3 (Layer 3) Link Control Blocks (LCBs). The **dspsv3** command supports the Out-of-Band network management feature, which enables management traffic to be sent over IP to a switch LAN Ethernet interface. This feature reduces the load on trunk bandwidth and node processor times. The **dspsv3** command provides a summary of all LCBs in a node and a detailed display of information for a specified LCB.

The **dspsv3** command displays the LCBs used by a switch to communicate with one or more SV+ workstations. The display shows whether the out-of-band (lanip) option is being used. The **dspsv3** screen distinguishes between the three modes:

- nwip_off
- nwip_on
- lanip

The **dspsv3** command displays counts of pending alarms for SONET APS (Automatic Protection Switching) and robust object types that have updated status.

The **dspsv3** command supports the Universal Router Module (URM) on the IGX 8400, providing IOS-based voice support and basic routing functions. It consists of an embedded UXM with one internal ATM port and an embedded IOS-based router. The **dspsv3** display includes the URM embedded router object and reports router alarm link information.

Syntax

dspsv3 <LCB number>

Parameters

Parameter	Description
LCB number	Number of the Link Control Block for display of detailed information.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			Yes	

Related Commands

dsplanip

The chart below provides a description of the fields in the **dspsv3** LCB summary display.

Display Fields: Summary

Field	Explanation
Serial Admin	Serial link admin window
LAN Admin	LAN Admin window
LCB	Link Control Block number (0 is the gateway link)
Node	SV+ gateway node number (0 is local IO)
IP	IP address (* indicates nwip is enabled)

Display Fields: Detail

The table below provides a description of the fields in the detailed display for one LCB.

Field	Explanation
LCB	LCB number
Alloc	LCB allocated (1) or no (0)
sv3_lcb_ptr	Address of LCB in memory
IP Address	SV+ IP Address
Response Timer	SV+ Link Response Timer
Idle Timer	Display SV+ Link Idle Timer
Retry Count	SV+ Link Retry Count
Current Protocol State	Link state (idle, reset, transfer, poll)
No. of buffers in the data_q	Messages in the data queue
No. of buffers in the xmit_q	Messages in the transmit queue
No. of buffers in the nflow_q	Messages in the non-flow-controlled queue
Subscribed applications	Applications to which SV+ has subscribed
Update	Robust object types that have updated object(s) status
Pending	Robust object types that have been updated to SV+, and are waiting for an acknowledgment from SV+.
Robust Database Updates data	Robust database update bitmap addresses

Example (IGX)

Display Cisco WAN Manager L3 Link Control Blocks summary.

dspsv3

```
nsaigx2        TN    StrataCom     IGX 8420    9.3    Apr. 13 2000  06:11 GMT

Number of Active SV3 Links: 2        Serial Admin: None     LAN Admin: None
LCB:  0 Node:   0 IP:*172.16.64.20
LCB:  1 Node:   3 IP:*172.16.64.20
```

```
>Last Command: dspsv3
```

Example (BPX)

Display Cisco WAN Manager L3 Link Control Blocks summary. The summary display shows three Link 1 LCBs, which connect to three different SV+ workstations. The “N” next to the first IP address indicates the nwip_on option. The “L” next to the second address indicates the lanip option. The absence of a symbol on the third line indicates the nwip_off option.

dspsv3

```
sw248     TN      StrataCom     BPX 15 9.3            Apr. 13 2000 18:05 GMT

Number of Active SV3 Links: 2        Serial Admin: None       LAN Admin: None
LCB:    0 Node: 128 IP:N172.29.9.29
LCB:    1 Node: 128 IP:L172.29.9.53
LCB:    2 Node: 128 IP: 172.29.9.115



Last Command: dspsv3
```

Example (BPX)

Display Cisco WAN Manager L3 Link Control Block 1. The detailed display shows the state on an individual link control block. The display indicates the use of the *lanip* option.

dspsv3 1

```
sw248      TN       StrataCom       BPX 15 9.3        Apr. 13 2000 18:11 GMT

LCB: 1 Alloc: 1 sv3_lcb_ptr: 31514034
IP Address: 172.29.9.53 (lanip)
Response Timer: 0
Idle Timer: 393
Retry Count: 120
Current Protocol State: SV3_TRANSFER
No. of Buffers in the data_q: 0
No. of Buffers in the xmit_q: 0
No. of Buffers in the nflow_q: 0
Comm Break Alarm: Update: 0, Pending: 0
Comm Break Alarm Bitmaps: Update: 314741FC, Pending: 3147449C




Last Command: dspsv3 1
```

Example (IGX)

Display Cisco WAN Manager L3 Link Control Block 0 in an IGX node with a Universal Router Module (URM). Note the “Router Object” and “Router Alarm” fields in the second screen display.

dspsv3 0

```
sw190          TRM   Cisco           IGX 8420  9.3.21    Oct. 10 2000 04:28 GMT

LCB:0 Alloc:1 sv3_lcb_ptr:314F501A
IP Address:172.29.10.43 (nwip on)
Response Timer:0
```

```
Idle Timer:600
Retry Count:3
Current Protocol State:SV3_TRANSFER
No. of Buffers in the data_q:0
No. of Buffers in the xmit_q:0
No. of Buffers in the nflow_q:0
Comm Break Alarm: Update:0, Pending:0
Comm Break Alarm Bitmaps: Update:3149446E, Pending:314941CE



This Command:dspsv3 0


Continue?
--------- Screen 2 ----------

sw190          TRM   Cisco           IGX 8420  9.3.21    Oct. 10 2000 04:28 GMT

LCB:0 Alloc:1 sv3_lcb_ptr:314F501A
Subscribed Applications:Topology MaintLog
                         314F504E
               Update      Pending
Revision:     0           0
Rebuild:      0           0
Subscription: 0           0
Card Obj:     0 314F5FA7  0 314F5FA2   Card Alarm:   0 314F6F24  0 314F6F29
Feeder Obj:   0 314F5FA0  0 314F5FA1   Feeder Alarm: 0 314F6F22  0 314F6F23
Port Obj:     0 314F5750  0 314F5B58   Port Alarm:   0 314F66D2  0 314F6ADA
Conn Obj:     0 314F505E  0 314F53C9   Conn Alarm:   0 314F5FE0  0 314F634B
Cline Obj:    0 314F5734  0 314F573D   Cline Alarm:  0 314F66B6  0 314F66BF
Trunk Obj:    0 314F5746  0 314F574B   Trunk Alarm:  0 314F66C8  0 314F66CD
Periph. Obj:  0 314F5FAF  0 314F5FAC   Periph. Alarm:0 314F6F2E  0 314F6F31
Router Obj:   0 314F5FD6  0 314F5FDB   Router Alarm: 0 314F6F5C  0 314F6F61

This Command:dspsv3 0
--------- Screen 3 ----------

sw190          TRM   Cisco           IGX 8420  9.3.21    Oct. 10 2000 04:28 GMT

LCB:0 Alloc:1 sv3_lcb_ptr:314F501A
Robust Database Updates data:
db_update_flags:    30EBA470 db_pending_flags:   30EBA930
flag_offset_table:  30EBAE30
  1:0     2:0     3:0     4:0     5:0     6:0     7:0     8:0     9:0
 10:1    11:0    12:36C  13:36D  14:0    15:0    16:372  17:0    18:0
 19:372  20:46C  21:0    22:471  23:0    24:0    25:0    26:476  27:0
 28:477  29:0    30:478  31:47D  32:48F  33:0    34:0    35:0    36:498
 37:0    38:0    39:499  40:0    41:0    42:0    43:0    44:0    45:0
 46:49A  47:0    48:0    49:0    50:0    51:0    52:0    53:0    54:0
 55:0    56:0    57:0    58:0    59:0    60:4A0  61:0    62:0    63:0
 64:0    65:0    66:4A1  67:0    68:0    69:0    70:0    71:0    72:0
 73:0    74:0    75:0    76:0    77:0    78:4A2  79:4A3  80:0    81:0
 82:0    83:4BF  84:0    85:0    86:0    87:0    88:0    89:0    90:0
 91:0    92:0    93:0    94:0    95:0    96:0    97:0    98:0    99:0

This Command:dspsv3 0

                          --------- Screen 4 ----------

sw190          TRM   Cisco           IGX 8420  9.3.21    Oct. 10 2000 04:28 GMT

LCB:0 Alloc:1 sv3_lcb_ptr:314F501A
```

```
Robust Database Updates data (continued):
flag_offset_table (continued):  30EBAE30
100:0   101:0   102:0   103:0   104:0   105:0   106:0   107:0   108:0
109:0   110:0   111:0   112:0   113:0
VSI Controller:314F6F5A    314F6F58







Last Command:dspsv3 0
```

dspsvcst (display the voice SVC statistics)

Displays the voice SVC statistics.

Syntax

dspsvcst

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			No	

Example

Display the voice SVC statistics for the current node.

dspsvcst

```
sw91           TN    cisco      IGX 8410     9.3       Apr. 13 2000 14:11 GMT


Number of Active SVC             :         0
Number of SVC Requests           :         0
Number of Failed Requests        :         0
Last Reason for request failure  :         0
Number of Completed SVC Routes   :         0
Number of Failed SVC Routes      :         0
Number of Deleted SVC(s)         :         0
Number of Failed SVC             :         0
Max Secs To Perform SVC Route       :      0.000
Avg Secs To Perform SVC Route       :      0.000




Last Command: dspsvcst


Next Command:
```

dspswlog (display software error log)

Displays the software errors log. The log contains 12 entries, and when the log is full, additional errors overwrite the oldest entries. The **dspswlog** command displays contains non-fatal entries. Use the **dspabortlog** command to display a new log containing abort entries.

A lighted icon “SW” at the bottom of the command line interface indicates that a software error has been logged. Unrelated to this feature, but also at the bottom of the command line interface, the “CD” icon indicates a card or hardware error, while the “AB” icon indicates an abort error:

SW AB CD Job 1

Syntax

dspswlog [<d> | <number> | <c>]

Parameters

Parameter	Description
<d>	Displays the detailed version of the log, including stack dumps. Page through the detailed version of the log using the arrow keys or the Return key.
<number>	When an entry number is entered (found under the No. column), displays the detailed version of a specific entry in the log.
<c>	Clears the log. Optionally, you can use the **clrabortlog** command.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

clrswlog, **dspabortlog**, **clrabortlog**

Display Fields

Field	Description
No.	Error entries in the table numbered from 1–12.
Type Error	The entry identifier. For **dspswlog**, the identifier is "error." Occasionally, the identifier "BadType," is displayed, indicating a problem within the table itself.
Number	The number that identifies a specific error problem.
Data (Hex)	A 4-byte field containing information that may be useful in solving a problem. It is different for every error number.
PC (Hex)	Program Counter. The address of the place in memory where the software was running when the error was logged; this identifies where the problem was detected.
PROC	Process or Task. This field indicates which process was running when the problem occurred. Use the **dspprf** command to display all of the tasks.
SwRev	Switch software version operating on this node.
Date	Date of the error.
Time	Time of the error.

Example

Display the software error log.

dspswlog

```
igxr02         VT    Cisco          IGX 8430  9.3.2V    Jan. 18 2001 13:31 PST

Active Control Card's Software Log
No.  Type    Number      Data(Hex)  PC(Hex)    PROC   SwRev   Date     Time
 1.  Error   509         00000000   303AE716   CBUS   9.3.2V  01/16/01 14:36:26
 2.  Error   101         07000000   301EECCC   CBUS   9.3.2V  01/16/01 14:36:26
 3.  Error   509         00000000   303AE716   CBUS   9.3.2V  01/16/01 14:36:27
 4.  Error   101         07000000   301EECCC   CBUS   9.3.2V  01/16/01 14:36:27
 5.  Error   3018        00000012   30229F02   TRNS   9.3.2V  01/16/01 15:30:26
 6.  Error   3018        00000012   301F57B0   TRNS   9.3.2V  01/16/01 15:30:26
 7.  Error   254         000000CE   303CE002   RSRC   9.3.2V  01/16/01 15:37:53
 8.  Error   254         000000CE   303CE002   RSRC   9.3.2V  01/16/01 15:37:53
 9.  Error   254         000000CE   303CE002   RSRC   9.3.2V  01/16/01 15:37:53
10.  Error   254         000000CE   303CE002   RSRC   9.3.2V  01/16/01 15:37:53
11.  Error   254         000000CE   303CE002   RSRC   9.3.2V  01/16/01 15:37:53
12.  Error   9000        14030098   30546430   TRNS   9.3.2V  01/18/01 13:19:41


Last Command: dspswlog
```

dsptcpparm (display TCP parameters)

The **dspftcpparm** command displays the TCP bandwidth throttle parameter.

Syntax

dsptcpparm

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

cnftcpparm

Example (IGX)

```
cc2           LAN   SuperUser       IGX 8430    9.3     Apr. 13 2000   11:42 PST

NWIP Bandwidth Throttle (Kbytes/sec):  32








Last Command: dsptcpparm


Next Command:
```

dsptermcnf (display terminal port configurations)

Displays the configuration for the control port and auxiliary port at a node. It includes all the asynchronous communications parameters that are specified by the **cnfterm** command.

Syntax

dsptermcnf

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfterm, **cnftermfunc** (a SuperUser command), **dsptermfunc**

Example (BPX)

Display the terminal port configuration data.

dsptermcnf

```
batman         TN    SuperUser       BPX 8620    9.3       Apr. 13 2000 02:55 PST


Control port                         Auxiliary port

Baud Rate:           9600            Baud Rate:           9600

Parity:              None            Parity:              None
Number of Data Bits: 8               Number of Data Bits: 8
Number of Stop Bits: 1               Number of Stop Bits: 1
Output flow control: XON/XOFF        Output flow control: XON/XOFF
Input flow control:  XON/XOFF        Input flow control:  XON/XOFF
CTS flow control:    No              CTS flow control:    Yes
Use DTR signal:      Yes             Use DTR signal:      Yes




Last Command: dsptermcnf


Next Command:
```

dsptermfunc (display terminal port functions)

Displays the port functions configured by the **cnftermfunc** command.

Syntax

dsptermfunc

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfterm, **cnftermfunc**, **dsptermcnf**

Example (BPX)

Display the terminal port configuration data. The highlighted or reverse video items are the currently selected options.

dsptermfunc

```
swstorm        TN    SuperUser       BPX 8620      9.3      Apr. 13 2000 09:42 PST


Control port                           Auxiliary port

1. VT100/StrataView                    1. Okidata 182 Printer
2. VT100                               2. Okidata 182 Printer with LOG
                                       3. VT100
                                       4. Alarm Message Collector
                                       5. External Device Window
                                       6. Autodial Modem


Last Command: dsptermfunc


Next Command:
```

dsptrkbob (display trunk breakout box)

Displays the state of all inputs from subrate line equipment to an IGX node and the state of all outputs from the node to the subrate line equipment. Display updates can occur at an optional, user-specified interval. Otherwise, the display remains on-screen until Delete is pressed or the display times out. The default interval for updating the display is every 5 seconds. If a trunk is disabled, its number appears in dim, reverse video. See **cnftrkict** for configuration details.

Syntax

dsptrkbob <line> [interval]

Parameters

Parameter	Description
<line>	Specifies the subrate trunk.
[interval]	The number of seconds between updates of the breakout box display. Range: 1–60

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	IGX			Yes	

Related Commands

cnftrkict, dsptrkict

Example

Display the breakout for subrate trunk 9.

dsptrkbob 9

```
beta           TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 15:15 MST


Packet Line:9
Interfaces:   X.21    DTE

Inputs from Line Equipment               Outputs to Line Equipment
Lead    Pin    State   Lead   Pin    State     Lead   Pin   State     Lead  Pin  State
RxD     4/11   Idle    TxD    2/9    Active
I/DSR   5/12   On                              C/DTR  3/10  On
S/RxC    6/13   Active

Last Command: dsptrkbob 9


Hit DEL key to quit:
```

dsptrkcnf (display trunk configuration)

Displays trunk configuration. The parameter values that **dsptrkcnf** displays have been set by using **cnftrk** or are default values. See Table 4-37 for default physical trunk statistics and Table 4-38 for default virtual trunk statistics.

The default values for statistical reserves can accommodate sufficient bandwidth for control traffic. The statistical reserve can be changed. However, if you modify the reserve below recommended values, a warning message is displayed. For example, if the statistical reserve is modified below 1000 cps for "upped" T1/E1/T3/OC-3/OC-12 physical trunks and 300 for T1/E1 virtual trunks, this warning message is displayed:

```
"WARNING: Changing stats reserve < {1000 | 300 } may cause a drop in CC traffic"
```

If cost-based routing is configured, **dsptrkcnf** displays the cost of a trunk. Configure the administrative cost of a trunk by using **cnftrk**.

Table 4-37 Default Statistical Reserves for Physical Trunks

	BNI	BXM	UXM	ALM	NTM
IMA-T1/E1	N/A	N/A	5000 cps > T2, E2 1000 cps < T2, E2	N/A	N/A
T1/E1	N/A	N/A	1000 cps	N/A	1000 cps
T3/E3	5000 cps	5000 cps	5000 cps	5000 cps	N/A
OC3	5000 cps	5000 cps	5000 cps	N/A	N/A
OC12	N/A	5000 cps	N/A	N/A	N/A

T2 = 14490 cps (96 DS0s)

E2 = 19900 cps

N/A = not available

Table 4-38 Default Statistical Reserves for Virtual Trunks

	BNI	BXM	UXM
T1/E1	N/A	N/A	300 cps
T3/E3	1000 cps	1000 cps	1000 cps
OC3	1000 cps	1000 cps	1000 cps
OC12	N/A	1000 cps	N/A

N/A = not available

Syntax

dsptrkcnf <slot.port>[.vtrk]

Parameters

Parameter	Description
<slot.port>	Specifies the physical slot and port number of the trunk.
[.vtrk]	Specifies the virtual trunk number. The maximum value on a node is 32. The maximum on a T3 or E3 line is 32. The maximum for user traffic on an OC-3/STM1 trunk is 11.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnftrk

Example (BPX)

Display the configuration for trunk 13.6.1.

dsptrkcnf 13.6.1

```
BPX02          TN    Cisco           BPX 8620  9.3.3W    Aug. 13 2001 11:40 PDT

TRK 13.6.1 Config   OC3     [4528  cps]    BXM slot:     13
Transmit Rate:         4528                VPC Conns disabled:    --
Protocol By The Card:  --                  Line framing:          STS-3C
VC Shaping:            No                       coding:           --
Hdr Type NNI:          No                       recv impedance:   --
Statistical Reserve:   1000    cps              cable type:       --
Idle code:             7F hex                         length:     --
Connection Channels:   256                 Pass sync:             No
Traffic:V,TS,NTS,FR,FST,CBR,N&RT-VBR,ABR   Loop clock:            No
Restrict CC traffic:   No                  HCS Masking:           Yes
Link type:             Terrestrial         Payload Scramble:      Yes
Routing Cost:          10                  Frame Scramble:        Yes
F4 AIS Detection:      Yes                 Vtrk Type / VPI:       CBR / 1
                                           Incremental CDV:       0
                                           Deroute delay time:    0 seconds

Last Command: dsptrkcnf 13.6.1


Next Command:
```

Example (BPX)

Display the configuration for BXM 11.2 trunk.

dsptrkcnf 11.2

```
sw53           TN    Cisco           BPX 8620  9.3.2J    Oct. 31 2000 13:41 GMT
```

```
TRK 11.2 Config     OC3     [353207cps]    BXM slot:     11
Transmit Rate:         353208              VPC Conns disabled:    No
Protocol By The Card:  No                  Line framing:          STS-3C
VC Shaping:            No                       coding:           --
Hdr Type NNI:          Yes                      recv impedance:   --
Statistical Reserve:   5000    cps              cable type:       --
Idle code:             7F hex                         length:     --
Connection Channels:   256                 Pass sync:             No
Traffic:V,TS,NTS,FR,FST,CBR,N&RT-VBR,ABR   Loop clock:            No
SVC Vpi Min:           0                   HCS Masking:           Yes
SVC Channels:          0                   Payload Scramble:      Yes
SVC Bandwidth:         0      cps          Frame Scramble:        Yes
Restrict CC traffic:   No                  Virtual Trunk Type:    --
Link type:             Terrestrial         Virtual Trunk VPI:     --
Routing Cost:          10                  Deroute delay time:    0 seconds

Last Command: dsptrkcnf 11.2
```

Example (BPX)

Display the configuration for BXM T3 virtual trunk.

dsptrkcnf 3.2.3

```
bpx04          VT    Cisco           BPX 8620  9.3.2V    Jan. 19 2001 08:14 PST

TRK  3.2.3 Config   T3      [2867  cps]    BXM slot:     3
Transmit Rate:         3000                VPC Conns disabled:    --
Protocol By The Card:  --                  Line framing:          PLCP
VC Shaping:            No                       coding:           --
Hdr Type NNI:          No                       recv impedance:   --
Statistical Reserve:   250     cps              cable type:       --
Idle code:             7F hex                         length:     0-225 ft.
Connection Channels:   256                 Pass sync:             No
Traffic:V,TS,NTS,FR,FST,CBR,N&RT-VBR,ABR   Loop clock:            No
Restrict CC traffic:   No                  HCS Masking:           Yes
Link type:             Terrestrial         Payload Scramble:      No
Routing Cost:          21                  Frame Scramble:        --
                                           Virtual Trunk Type:    CBR
                                           Virtual Trunk VPI:     3
                                           Deroute delay time:    0 seconds

Last Command: dsptrkcnf 3.2.3
```

Example (IGX)

Display the configuration for trunk 5.1. The trunk is on a UXM OC-3 card set in an IGX node.

dsptrkcnf 5.1

```
sw180          TN    Cisco           IGX 8420  9.3.g0    Oct. 20 2000 11:41 GMT

TRK  5.1 Config       OC3      [353207cps]  UXM slot:5
Transmit Trunk Rate:  353208 cps          Connection Channels:  256
Rcv Trunk Rate:       353207 cps          Gateway Channels:     200
Pass sync:            Yes                 Traffic:V,TS,NTS,FR,FST,CBR,N&RVBR,ABR
Loop clock:           No                  Frame Scramble:       Yes
Statistical Reserve:  5000   cps          Deroute delay time:   0 seconds
Header Type:          NNI                 VC Shaping:           No
VPI Address:          1                   VPC Conns disabled:   No
Routing Cost:         10
Idle code:            7F hex
Restrict PCC traffic: No
```

```
Link type:            Terrestrial
Line framing:         STS-3C
HCS Masking:          Yes
Payload Scramble:     Yes

Last Command: dsptrkcnf 5.1
```

Example (IGX)

Display the configuration for trunk 14.2 on a UXM card.

dsptrkcnf 14.2

```
sw176          TN    Cisco          IGX 8420  9.3.a1    Aug. 13 2001 13:08 PDT

TRK 14.2 Config       T3/636   [96000 cps]  UXM slot:14
Transmit Trunk Rate:  96000  cps          Payload Scramble:     No
Rcv Trunk Rate:       96000  cps          Connection Channels:  256
Pass sync:            Yes                 Gateway Channels:     200
Loop clock:           No                  Traffic:V,TS,NTS,FR,FST,CBR,N&RVBR,ABR
Statistical Reserve:  5000   cps          Incremental CDV:      0
Header Type:          NNI                 Deroute delay time:   0 seconds
VPI Address:          1                   VC Shaping:           No
Routing Cost:         10                  VPC Conns disabled:   No
Idle code:            7F hex
Restrict PCC traffic: No
Link type:            Terrestrial
Line framing:         PLCP
Line cable length:    0-225 ft.
HCS Masking:          Yes

Last Command: dsptrkcnf 14.2


Next Command:
```

Example (IGX)

Display the configuration for virtual trunk 4.3.1. The ILMI protocol is running on the UXM interface card.

dsptrkcnf 4.3.1

```
igxf3          VT    Cisco          IGX 8420  9.3.10 July 26 2000 23:40 PST

TRK  4.3.1 Config     OC3      [2867  cps]  UXM slot:4
Transmit Trunk Rate:  3000   cps          Gateway Channels:     200
Rcv Trunk Rate:       2867   cps          Traffic:V,TS,NTS,FR,FST,CBR,N&RVBR,ABR
Pass sync:            No                  Virtual Trunk Type:   CBR
Loop clock:           No                  Virtual Trunk VPI:    10
Statistical Reserve:  1000   cps          Frame Scramble:       Yes
Header Type:          UNI                 Deroute delay time:   0 seconds
Routing Cost:         10                  VC Shaping:           No
Idle code:            7F hex              ILMI run on the card: Yes
Restrict PCC traffic: No
Link type:            Terrestrial
Line framing:         STS-3C
HCS Masking:          Yes
Payload Scramble:     Yes
Connection Channels:  256

Last Command: dsptrkcnf 4.3.1
```

Example (IGX)

Display the T1 NTM configuration for trunk 14.

dsptrkcnf 14

```
sw108          VT    Cisco           IGX 8420  9.3.2J    Oct. 31 2000 13:20 GMT

TRK 14 Config         T1/24    [8000  pps]  NTM slot:14
Line DS-0 map:        0-23
Pass sync:            Yes
Loop clock:           No
Statistical Reserve:  1000   pps
Routing Cost:         10
Idle code:            7F hex
Restrict PCC traffic: No
Link type:            Terrestrial
Line framing:         D4
Line coding:          B8ZS
Line cable type:      ABAM
Line cable length:    0-133 ft.
Traffic:              V,TS,NTS,FR,FST
Deroute delay time:   0 seconds

Last Command: dsptrkcnf 14
```

dsptrkcons (display trunk connection counts)

Displays the number of connections routed over the specified trunk. This command applies to physical and virtual trunks. It displays the total number of connections being carried by the specified trunk. The connections are summed for each terminating node in the network and lists the connection count for the transmit direction (out of the node).

This command is useful in determining the source of dropped packets in cases where the specified trunk is oversubscribed:

Step 1 Use the **dsptrks** command to list the trunks that originate at each node.

Step 2 Next, use the **dsptrkcons** to determine the number of connections (the more connections per trunk the greater the possibility of over-subscription).

Step 3 Then use the **dsprts** command to identify any through nodes (where the trunk is not terminated).

Step 4 Finally, look at the utilization factor for each of these lines using the **dsputl** and **dspdutl** commands.

Syntax

dsptrkcons <line number>

Parameters

Parameter	Description
<line number>	Trunk number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

dsptrkmcons, **dspplnmcons**

Example (BPX)

dsptrkcons 5.1

```
batman          TN    SuperUser       BPX 15    9.3       Apr. 13 2000  15:57 GMT

Connection Counts For TRK 5.1

Src Node  Conns     Src Node  Conns     Src Node  Conns     Src Node  Conns
batman    1765

Last Command: dsptrkcons 5.1
Next Command:
```

dsptrkerrs (display trunk errors)

Displays the accumulated line error counts, by failure type, for the specified trunk(s). If you do not enter a trunk number, a one-line summary of errors for all trunks at the local node is displayed. If you enter a specific trunk number with the command, a detailed analysis, including error threshold (ETH), is displayed. Disabled trunks have their trunk number displayed in dim, reverse video on the screen.

Error rates to be concerned about are any that are incrementing. For example, a Y-red switchover may cause some statistical errors. These are expected. But if there are errors happening in a stable situation, then they indicate a problem.

The **clrtrkerrs** command resets all error counts to 0.

Syntax

dsptrkerrs
or

dsptrkerrs [slot | slot.port]
or
dsptrkerrs <slot.port.vtrk>

Parameters

Parameter	Description
trunk number	Specifies a trunk for the error display. Without a trunk number, a summary for all physical trunks appears. To display error statistics for virtual trunks, however, you must specify a trunk number in the form *slot.port.vtrk*. For all physical trunk types, the trunk number is optional: entering **dsptrkerrs** without a trunk number lists all trunks with errors. For standard trunks, the form of a specific trunk is *slot* for single-trunk cards or *slot.port* for multitrunk cards.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

clrtrkerrs, prttrkerrs

Display Fields

Line Type	Error	Explanation
All except ATM	Bipolar errors	Number of times two consecutive pulses have the same polarity (AMI coding only).
	Frame slips	Number of times a frame is discarded to re-establish synchronization.
	Out of frames	Number of times a loss-of-frame synchronism is detected on this circuit line.
	Loss of signal	Number of times the signal level at the circuit line input went below the minimum acceptable level.
	Frame bit errors	Number of times the frame bit failed to alternate (frame error).
	CRC errors	Number of times the generated CRC character did not match the received CRC character (applies only if CRC checking is enabled).
	Out of MFrames	Number of times a multiframe synch error was detected (E1 lines only).
	AIS - 16	Number of times the Alarm Information Signal (Blue signal) was received.
Only ATM	Out of Frames	Number of times a momentary loss of DS3 frame alignment was detected.
	Loss of sync (XX)	Number of times a loss of DS3 frame alignment lasting more than XX seconds was detected.
	Packet Error	Number of CRC errors for a packet address.
	Line Code Errors	Number of B3ZS code errors detected.
	P-bit Parity Errors	Number of parity errors for the DS3 parity bit (P-bit) sequence.
	C-bit Parity Errors	Number of parity errors for the DS3 control bit (C-bit) sequence.
	Comm Fails	Number of BCC failed to communicate to the other node.
	Loss of signal	Number of times the signal level at the trunk line input went below the minimum acceptable level.
Only ATM	AIS (BLU)	Number of times the Alarm Information Signal (Blue signal) was received.
	Out of MFrames	Number of times a loss-of-frame synchronism in the DS3 multiframe alignment was detected.
	Remote Oof	Number of times the DS3 remote alarm (indicating remote end was out of frame alignment) was received.

Example (BPX)

Display a summary of all trunk errors at the local node.

dsptrkerrs

```
sw53          VT    Cisco          BPX 8620  9.3.2o    Dec. 6 2000  09:13 GMT

Total Errors
```

```
      Code    Out of  Loss of HCS     Unavail Ln Unav Path Un Tx Cell
TRK   Errors  Frames  Signal  Errors  Seconds Seconds Seconds Dropped
11.2        -       0       0       0       -       0       0       0



Last Command: dsptrkerrs
```

Example (BPX)

Display a detailed description of the errors for trunk 11.2.

dsptrkerrs 11.2

```
------------------------------------SCREEN 1---------------------------------
sw53           VT    Cisco           BPX 8620  9.3.2o    Dec. 6 2000  09:20 GMT

Trunk 11.2      Status: Clear - OK                      Clrd: 12/06/00 06:00:38
Type              Count ETS   Status    Type              Count ETS   Status
Out of Frms           0     0           Comm Fails            0     -
Loss of Sig           0     0           Loss of Sig (RED)     0     -
                                        AIS         (BLU)     0     -
                                        Out of Frms (RED)     0     -
                                        Rmt Oof     (YEL)     0     -




This Command: dsptrkerrs 11.2


Continue? y

------------------------------------SCREEN 2---------------------------------
sw53           VT    Cisco           BPX 8620  9.3.2o    Dec. 6 2000  09:22 GMT

Trunk 11.2      Status: Clear - OK                      Clrd: 12/06/00 06:00:38
Type              Count ETS   Status    Type              Count ETS   Status
HCS Errors            0     0
BXM:Tx NTS CDs        0     0
BXM:Tx HP  CDs        0     0
BXM:Tx V   CDs        0     0
BXM:Tx TS  CDs        0     0
BXM:Tx BDA CDs        0     0
BXM:Tx BDB CDs        0     0
BXM:Tx CBR CDs        0     0
BXM:Tx ABR CDs        0     0
BXM:Tx VBR CDs        0     0
Line Unavail Secs     0     0
Path Unavail Secs     0     0


Last Command: dsptrkerrs 11.2
```

Example (IGX)

Display a summary description of the errors for trunk 16.

dsptrkerrs 16

```
sw108          VT    Cisco           IGX 8420  9.3.2o    Dec. 6 2000  09:10 GMT

Total Statistical Errors
```

```
                                                          TxPkts
           Code   RxPkts Out of LossOf Frame  CRC    /Cells Packet Packet
PLN        Errors Droppd Frames Signal BitErs Errors Droppd Errors Oofs
 4.2           -      -      -      -      -      -      0      -      -
 4.4           -      -      -      -      -      -      0      -      -
14             0      -      0      0      0      0      0      0      0


Last Command: dsptrkerrs
```

Example (IGX)

Display a detailed description of the errors for trunk 14.

dsptrkerrs 14

```
sw108          VT    Cisco           IGX 8420  9.3.2o    Dec. 6 2000  09:16 GMT

TRK 14              Clear - OK                            Clrd:12/04/00 17:26:00
Statistical Alarm Count ETS   Status    Integrated Alarm  Count ETS   Status
Bipolar Err           0     0           Comm Fails             3     -
Out of Frms           0     0           Loss of Sig (RED)      3     -
Loss of Sig           0     0           AIS         (BLUE)     0     -
Frame BitErrs         0     0           Out of Frms (RED)      1     -
CRC Err               0     0           Rmt OOF     (YEL)      0     -
Tx Voice Pkt Drp      0     0           Packet Oofs (RED)      1     -
Tx TS Pkt Drp         0     0           Rmt Alarms  (YEL)      0     -
Tx Non-TS Pkt Drp     0     0           VTRK Path Fails        0     -
Tx CC Pkt Drp         0     0
Tx BData A Pkt Drp    0     0
Tx BData B Pkt Drp    0     0
Packet Err            0     0
Packet Oofs           0     0           Last failure time: 12/05/00 15:19:34

Last Command: dsptrkerrs 14
```

dsptrkict (display trunk interface control templates)

Displays interface control information for the subrate trunks. The displayed information includes:

- Specified line.
- Associated leads and their status (that is, on or off)
- Whether output follows a local input.
- Name of the local or remote input lead that the output lead follows.

To see a list of configurable outputs, and information on how to configure an output, see the **cnftrkict** command. The numbers of disabled trunks are displayed in dim, reverse video on the screen.

Syntax

dsptrkict <line>

Parameters

Parameter	Description
<line>	Trunk number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	No	No	IGX			No	

Related Commands

cnftrkict, prttrkict

Example

Display subrate for the trunk 9 interface control template.

dsptrkict 9

```
beta           TRM   YourID:1        IGX 8430    9.3  Apr. 13 2000 15:15 MST

Trunk:       9
Interface:  X.21   DTE

Interface Control Template for Trunk Line

Lead    Output Value    Lead     Output Value
C/DTR   ON

Last Command: dsptrkict 9

Next Command:
```

dsptrkmcons (display trunk connection counts by master node)

Displays the number of connections routed over the specified trunk (BNI) by the master node. Rather than showing the remote end of the connection, the display lists the connection and the node that owns that connections.

This command is useful in determining the source of dropped packets in cases where the specified trunk is oversubscribed.

Step 1 First use the **dsptrkmcons** command to list the trunks that originate at each node (the more connections per trunk, the greater the possibility of over-subscription).

Step 2 Next, use the **dsprts** command to identify any through-nodes (on which the trunk is not terminated).

Step 3 Finally, look at the utilization for each of these lines by using the **dsputl** and **dspdutl** commands.

Syntax

dsptrkmcons <line number>

Parameters

Parameter	Description
<line number>	Specified trunk number. Note that in a BPX, the line number must include a port number.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

dsptrkcons

Example (BPX)

dsptrkmcons 6.1

```
sw81           TN    SuperUser       BPX 15    9.3    Apr. 13 2000 13:16 PST

Connection Counts For TRK 6.1

Mst Node  Conns    Mst Node  Conns    Mst Node  Conns    Mst Node  Conns
sw86      26

Last Command: dsptrkmcons 6.1

Next Command:
```

dsptrkred (display ATM trunk redundancy)

Displays the backup and primary cards for a trunk.

Syntax

dsptrkred [trunk]

Parameters

Parameter	Description
ATM trunk number	Specifies the slot number of the primary or backup ATM card set to display. Without this optional entry, the screen displays all primary and backup ATM trunks.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	No	BPX, IGX			No	

Related Commands

addtrkred, deltrkred

Example (IGX)

Display all ATM trunks with redundancy.

dsptrkred

```
beta           TRM   YourID:1        IGX 8430    9.3    Apr. 13 2000 15:15 MST

ATM Line  Backup ATM Line
4         5
7          8








Last Command: dsptrkred

Next Command:
```

dsptrks (display trunks)

Displays basic trunk information for all trunks on a node. This command applies to both physical and virtual trunks. The displayed information consists of:

- Trunk number, including the virtual trunk number, if applicable
- Line type (E1, T3, or OC-3, for example)
- Alarm status

In addition, for trunks that have been added to the network by using the **addtrk** command, the information includes the node name and trunk number at the other end. Trunks that have a "–" in the Other End column have been upped by using **uptrk** but not yet added on both ends by using **addtrk**. For disabled trunks, the trunk numbers appear in reverse video on the screen.

For UXM trunks with ATM Forum IMA–compliant trunks, a trunk is displayed in **dsptrks** as:

<slot>.<primary_port>x<num ports>

For example, an IMA trunk would display in the TRK column in the **dsptrks** screen as the following:

5.1x4

In this case, 5.1x4 indicates an ATM Forum–compliant IMA trunk 5.4, which consists of four physical lines. To see all physical lines belonging to this IMA trunk, you can enter the **dspphyslns** command.

The **dsptrks** commands displays all interface shelves attached to a BPX or an IGX routing hub that use the AAL5 protocol.

For IMA trunks, you can configure non-consecutive physical lines. Non-consecutive physical lines are supported.

For VSI "dedicated" virtual trunks, **dsptrks** will indicate this.

Syntax

dsptrks

Related Commands

addtrk, deltrk, dntrk, uptrk

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Example (BPX)

Display information on the trunk configuration and alarm status for the trunks at a node. The trunk numbers with three places represent virtual trunks.

dsptrks

```
sw288           TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 15:39 GMT

TRK     Type      Current Line Alarm Status           Other End
```

```
 4.1    OC-12      Clear - OK                          SIMFDR(AAL5)
11.2    T3        Clear - OK                          redhook/14
11.3    T3        Clear - OK                          sw113/16



Last Command: dsptrks


Next Command:
```

Example (BPX)

Display information on the trunk configuration and alarm status for the trunks at a node. The trunk numbers with three places (*slot.port.vrtk*) represent virtual trunks; for example—trunk 13, port 3, virtual trunk 12. Also, on trunk 4, slot 8, is a simulated interface shelf “SIMFDR0”, with interface shelf type of AAL5.

dsptrks

```
sw288           TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 23:03 GMT

TRK         Type   Current Line Alarm Status                 Other End
 2.1        T3      Clear - OK                               pswbpx1/1.2
 4.8        T3      Clear - OK                               SIMFDR0 (AAL5)
 13.3.12    OC-3     Clear - OK                               rita/4.2.10




Last Command: dsptrks


Next Command:
```

Example (BPX)

Display information on the trunk configuration and alarm status for the trunks at a node. The trunk numbers with three places (*slot.port.vrtk*) represent virtual trunks. An ATM Forum–compliant trunk is configured on slot 11, which has a primary port of 1 and 4 physical lines.

dsptrks

```
sw53           TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 23:03 GMT

TRK      Type       Current Line Alarm Status                Other End
 2.1     T3         Clear - OK                               pswbpx1/1.2
 4.8     T3         Clear - OK                               SIMFDR0 (AAL5)
 11.1x4  T1/92      Clear - OK                               a1c/3.5x4
 15.1    OC-3        Clear - OK                               a1c/3.5x4



Last Command: dsptrks


Next Command:
```

Example (IGX)

Display information on the trunk configuration and alarm status for the trunks at an IGX node showing IMA-compliant links on slot 11.

dsptrks

```
oo1           TN    SuperUser       IGX 8430    9.3    Apr. 13 2000 23:03 GMT

TRK       Type     Current Line Alarm Status                 Other End
 6.1      OC-3      Clear - OK                                oo1p(AAL5)
 8.5      T3       Clear - OK                                n4b/4.5
 8.6      E3/530   Clear - OK                                alc/15
 10       T3/240   Clear - OK                                alc/3.5x4
 11.1x4   T1/92    Clear - OK                                alc/3.5x4
 15.1     OC-3      Clear - OK                                n1a/11.3
 15.2     OC-3      Clear - OK                                n2b/5.3


Last Command: dsptrks
Next Command:
```

Example (IGX)

Display information on the feeders attached to an IGX 8400 routing hub. (The SES feeder uses the AAL5 protocol to communicate with the routing network.) Feeder names appear in the Other End field on the **dsptrks** screen on an IGX routing hub.

dsptrks

```
oo1           TN    SuperUser       IGX 8430    9.3    Apr. 13 2000 23:03 GMT

TRK       Type     Current Line Alarm Status                 Other End
13        E1       Clear - OK                                igx1/12
14.1      OC-3      Clear - OK                                ases1 (AAL5)

Last Command: dsptrks

Next Command:
```

Example

Display trunks including virtual trunks. A VSI trunk is on trunk 2.1.1; **dsptrks** indicates this with "VSI trunk."

dsptrks

```
TRK      Type   Current Line Alarm Status        Other End
 1.1     E3      Clear - OK                      sw58/1.1
 1.2     E3      Clear - OK                      sw183(AXIS)
 2.1.1   OC-3     Clear - OK                      VSI trunk
```

Example (BPX)

The **dsptrks** screen shows VSI trunks 4.1, 4.2, and 4.3 with the "Other End" of 4.1 reading "VSI (VSI)". A typical **dsptrks** screen example showing some VSI trunks configured follows:

dsptrks

```
n4             TN    SuperUser       BPX 15    9.3      Apr. 13 2000  16:45 PST

TRK      Type     Current Line Alarm Status              Other End
 2.1     OC-3      Clear - OK                             j4a/2.1
```

```
 3.1    E3      Clear - OK                                  j6c(AXIS)
 5.1    E3      Clear - OK                                  j6a/5.2
 5.2    E3      Clear - OK                                  j3b/3
 5.3    E3      Clear - OK                                  j5c(IPX/AF)
 6.1    T3      Clear - OK                                  j4a/4.1
 6.2    T3      Clear - OK                                  j3b/4
 4.1    OC-3     Clear - OK                                  VSI(VSI)
 4.2    OC-3     Clear - OK                                  VSI(VSI)
 4.3    OC-3     Clear - OK                                  VSI(VSI)


Last Command: dsptrks
```

dsptrkstatcnf (display statistics enabled for a trunk)

Displays the enabled statistics a physical or virtual trunk.

This command is intended for debugging statistics collection problems. It displays the trunk statistics set by the **cnftrkstats** command, by Cisco WAN Manager, or by node features. The Owner column shows the source of the specification. If the Owner column shows AUTO, the node's features determined the statistics. If the Owner column shows the name of the node, Cisco WAN Manager determined the statistics. If the Owner column shows USER, the **cnftrkstats** command was used to configure the statistics. The display may take up to four screens to display completely depending on statistics displayed.

Syntax

dsptrkstatcnf <line>

Parameters

Parameter	Description
<line>	Specifies the trunk: *line* can have the form *slot*, *slot.port* or *slot.port.vtrk.* The format depends on whether the trunk card has one or more physical ports and whether the trunk is a virtual trunk.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnftrkstats

Example (BPX)

dsptrkstatcnf 11.2

```
sw53          TN    Cisco          BPX 8620  9.3.m0    Dec. 12 2000 13:25 GMT

Statistics Enabled on Trunk 11.2

     Statistic                           Samples Interval Size Peaks Owner
     ----------------------------------- ------- -------- ---- ----- ----------
 28) Tx NTS Cells Discarded                   60        0    4  NONE AUTO
 29) Tx Hi-Pri Cells Discarded                60        0    4  NONE AUTO
 30) Tx Voice Cells Discarded                 60        0    4  NONE AUTO
 31) Tx TS Cells Discarded                    60        0    4  NONE AUTO
 32) Tx BData A Cells Discarded               60        0    4  NONE AUTO
 33) Tx BData B Cells Discarded               60        0    4  NONE AUTO
 34) Tx CBR Cells Discarded                   60        0    4  NONE AUTO
 35) Tx ABR Cells Discarded                   60        0    4  NONE AUTO
 36) Tx VBR Cells Discarded                   60        0    4  NONE AUTO
```

```
Last Command: dsptrkstatcnf 11.2
```

dsptrkstathist (display statistics history for a trunk)

Displays a history of configured statistics for a physical or virtual trunk. The command is used for statistics debugging. It displays the data for the last five occurrences of the selected statistic. The available trunk statistics appear on screen upon entry of the **dsptrkstathist** command. (The **cnftrkstats** command enables individual statistics. The **dsptrkstatcnf** command displays the enabled statistics for a trunk.)

Syntax

dsptrkstathist <trunk>

Parameters

Parameter	Description
<trunk>	Specifies the trunk in one of the following formats: *slot* for a trunk card with one line *slot.port* for a trunk card with more than one line *slot.port.vtrk* for a virtual trunk

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

cnftrkstats, **dsptrkstatcnf**

Example (BPX)

dsptrkstathist 11.2

```
------------------------------------SCREEN 1---------------------------------
sw53          TN    Cisco          BPX 8620  9.3.m0    Dec. 12 2000 13:42 GMT

Virtual Interface Statistic Types

 7) Tx Voice Cells Served              32) Tx BData A Cells Discarded
 8) Tx TS Cells Served                 33) Tx BData B Cells Discarded
 9) Tx NTS Cells Served                34) Tx CBR Cells Discarded
10) Tx Hi-Pri Cells Served             35) Tx ABR Cells Discarded
11) Tx BData A Cells Served            36) Tx VBR Cells Discarded
12) Tx BData B Cells Served            37) Egress NTS Cells Rx
19) Tx CBR Cells Served                38) Egress Hi-Pri Cells Rx
20) Tx VBR Cells Served                39) Egress Voice Cells Rx
21) Tx ABR Cells Served                40) Egress TS Cells Rx
28) Tx NTS Cells Discarded             41) Egress BData A Cells Rx
29) Tx Hi-Pri Cells Discarded          42) Egress BData B Cells Rx
30) Tx Voice Cells Discarded           43) Egress CBR Cells Rx
31) Tx TS Cells Discarded              44) Egress ABR Cells Rx
```

```
This Command: dsptrkstathist 11.2

Continue?  y

------------------------------------SCREEN 2---------------------------------
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 12 2000 13:42 GMT

Virtual Interface Statistic Types

45) Egress VBR Cells Rx                 58) Tx Q10 Cells Served
46) Total Cells Tx from port            59) Tx Q10 Cells Discarded
47) Cells RX with CLP0                  60) Egress Q10 Cells Rx
48) Cells Rx with CLP1                  61) Tx Q11 Cells Served
49) Cells RX Discard with CLP0          62) Tx Q11 Cells Discarded
50) Cells RX Discard with CLP1          63) Egress Q11 Cells Rx
51) Cells TX with CLP0                  64) Tx Q12 Cells Served
52) Cells TX with CLP1                  65) Tx Q12 Cells Discarded
53) BXM: Total Cells RX                 66) Egress Q12 Cells Rx
54) Ingress OAM Cell Count              67) Tx Q13 Cells Served
55) Egress OAM Cell Count               68) Tx Q13 Cells Discarded
56) Ingress RM cell count               69) Egress Q13 Cells Rx
57) Egress RM cell count                70) Tx Q14 Cells Served

This Command: dsptrkstathist 11.2

Continue?  y

------------------------------------SCREEN 3---------------------------------
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 12 2000 13:42 GMT

Virtual Interface Statistic Types

71) Tx Q14 Cells Discarded
72) Egress Q14 Cells Rx
73) Tx Q15 Cells Served
74) Tx Q15 Cells Discarded
75) Egress Q15 Cells Rx

This Command: dsptrkstathist 11.2
```

Example (IGX)

dsptrkstathist 5.1

```
------------------------------------SCREEN 1---------------------------------
sw180          TN    Cisco           IGX 8420  9.3.p7    Dec. 12 2000 14:07 GMT

Virtual Interface Statistic Types

 1) QBIN: Voice Cells Tx to line        14) QBIN: Tx BData A Cells Discarded
 2) QBIN: TimeStamped Cells Tx to ln    15) QBIN: Tx BData B Cells Discarded
 3) QBIN: NTS Cells Tx to line          16) QBIN: Tx CBR Cells Discarded
 4) QBIN: Hi-Pri Cells Tx to line       17) QBIN: Tx ABR Cells Discarded
 5) QBIN: BData A Cells Tx to line      18) QBIN: Tx nrt-VBR Cells Discarded
 6) QBIN: BData B Cells Tx to line      19) QBIN: Tx NTS Cells Received
 7) QBIN: Tx CBR Cells Served           20) QBIN: Tx Hi-Pri Cells Received
 8) QBIN: Tx nrt-VBR Cells Served       21) QBIN: Tx Voice Cells Received
 9) QBIN: Tx ABR Cells Served           22) QBIN: Tx TS Cells Received
10) QBIN: Tx NTS Cells Discarded        23) QBIN: Tx BData A Cells Received
11) QBIN: Tx Hi-Pri Cells Discarded     24) QBIN: Tx BData B Cells Received
12) QBIN: Tx Voice Cells Discarded      25) QBIN: Tx CBR Cells Received
13) QBIN: Tx TS Cells Discarded         26) QBIN: Tx ABR Cells Received
```

```
This Command: dsptrkstathist 5.1

Continue?  y

------------------------------------SCREEN 2----------------------------------
sw180          TN    Cisco           IGX 8420  9.3.p7    Dec. 12 2000 14:08 GMT

Virtual Interface Statistic Types

27) QBIN: Tx nrt-VBR Cells Received     40) CGW: Packets Rx From Network
28) VI: Cells rcvd w/CLP=1              41) CGW: Cells Tx to Line
29) VI: OAM cells received              42) CGW: NIW Frms Relayed to Line
30) VI: Cells tx w/CLP=1                43) CGW: SIW Frms Relayed to Line
31) VI: Cells received w/CLP=0          44) CGW: Aborted Frames Tx to Line
32) VI: Cells discarded w/CLP=0         45) CGW: Dscd Pkts
33) VI: Cells discarded w/CLP=1         46) CGW: 0-Length Frms Rx from Network
34) VI: Cells transmitted w/CLP=0       47) CGW: Bd CRC16 Frms Rx from Network
35) VI: OAM cells transmitted           48) CGW: Bd Lngth Frms Rx from Network
36) VI: RM cells received               49) CGW: OAM RTD Cells Tx
37) VI: RM cells transmitted            54) CGW: Packets Tx to Network
38) VI: Cells transmitted               55) CGW: Cells Rx from Line
39) VI: Cells received                  56) CGW: NIW Frms Relayed from Line

This Command: dsptrkstathist 5.1

Continue?  y

------------------------------------SCREEN 3----------------------------------
sw180          TN    Cisco           IGX 8420  9.3.p7    Dec. 12 2000 14:08 GMT

Virtual Interface Statistic Types

57) CGW: SIW Frms Relayed from Line     78) QBIN: Tx Q11 Cells Received
58) CGW: Abrt Frms                      79) QBIN: Tx Q12 Cells Served
59) CGW: Dscd Cells                     80) QBIN: Tx Q12 Cells Discarded
60) CGW: 0-Lngth Frms Rx from Line      81) QBIN: Tx Q12 Cells Received
61) CGW: Bd CRC32 Frms Rx from Line     82) QBIN: Tx Q13 Cells Served
62) CGW: Bd Lngth Frms Rx from Line     83) QBIN: Tx Q13 Cells Discarded
63) CGW: OAM RTD Cells Rx               84) QBIN: Tx Q13 Cells Received
64) CGW: OAM Invalid OAM Cells Rx       85) QBIN: Tx Q14 Cells Served
73) QBIN: Tx Q10 Cells Served           86) QBIN: Tx Q14 Cells Discarded
74) QBIN: Tx Q10 Cells Discarded        87) QBIN: Tx Q14 Cells Received
75) QBIN: Tx Q10 Cells Received         88) QBIN: Tx Q15 Cells Served
76) QBIN: Tx Q11 Cells Served           89) QBIN: Tx Q15 Cells Discarded
77) QBIN: Tx Q11 Cells Discarded        90) QBIN: Tx Q15 Cells Received

This Command: dsptrkstathist 5.1

Statistic Type:
```

dsptrkstats (display trunk statistics)

Displays the trunk port status, ATM cell loss counts, cell payload errors, and cell header errors for the specified trunk. The chart below lists the other statistics.

To clear the statistics, include the optional *clear* parameter.

Logical trunk statistics refer to counts on trunks that are visible as routing entities. This includes physical and virtual trunks (all logical trunks). Logical trunk statistics are displayed on the **dsptrkstats, dsptrkstathist,** and screens. These commands accept only logical trunk numbers and display only logical trunk statistics. Virtual interface (VI) statistics and queue statistics are both subsets of the logical trunk statistics.

Syntax

dsptrkstats <trunk number>

Parameters

Parameter	Description
slot.port	Specifies the physical part of the logical trunk number.
clear	Directs the system to clear the statistics counters.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1-6	No	No	BPX, IGX			No	

Related Commands

cnftrkstats

Display Fields: Additional

Statistics	Description
Cells dropped due to BFrame parity err.	A parity error was detected in one or more of the P bits in the BFrame header or in the BIP-16 parity check for the header causing the cell to be dropped.
Cell header mismatch error count.	A count of cells received by a BNI in this slot.port with an incorrect header address for that card.
First mismatch cell header VPI/VCI.	This displays the VPI/VCI address of the first header mismatch to be received by the card in this slot.port.

Statistics	Description
BFrame cell data payload error.	A separate BIP-16 parity check is used for the payload data. This number represents the number of errors detected by this parity check. This does not necessarily cause a cell to be dropped.
BFrame cell loss due to admin access.	Internal to the BNI card is an administrative processor. This statistic is a count of the cells that were lost in an internal administrative shuffle.

Trunk Statistics

Statistics are collected on trunks at several different levels.

- **Physical line** statistics apply to each physical port. In the case of IMA trunks, the physical line statistics are tallied separately for each T1 port.

  On both the BPX and the IGX, physical line statistics are displayed on the **dspphyslnstats**, **dspphyslnstathist**, and **dspphyslnerrs** screens. These commands accept only physical line numbers (that is, slot.port). These commands are new to the BPX in this release.
- **Logical trunk** statistics refer to counts on trunks that are visible to users as routing entities. This includes physical trunks and virtual trunks.

  Logical trunk statistics are displayed on the **dsptrkstats**, **dsptrkstahist**, and **dsptrkerrs** screens. These commands accept only logical trunk numbers and display only logical trunk statistics.
- **VI statistics** are a subset of the logical trunk statistics.
- **Queue statistics** are a subset of the logical trunk statistics.
- **Channel statistics** are not polled by software on trunks. However, they are available if the debug command **dspchstats** is used.

Table 4-39 lists trunk statistics including statistics type, card type, and line type, as applicable.

Table 4-39 Trunk Statistics

Statistic	Stat Type	Card Type	Line Type
Total Cells Received	Logical	UXM/BXM	All
Total Cells Transmitted	Logical	UXM/BXM	All
LOS transitions	Physical	UXM/BXM	All
LOF transitions	Physical	UXM/BXM	All
Line AIS transitions	Physical	UXM/BXM	T3/E3/SONET
Line RDI (Yellow) transitions	Physical	UXM/BXM	T3/E3/SONET
Uncorrectable HCS errors	Physical	UXM	T3/E3/SONET
Correctable HCS errors	Physical	UXM	T3/E3/SONET
HCS errors	Physical	BXM	T3/E3/SONET
Line Code Violations, ES, and SES	Physical	BXM	T3/E3
Line Parity(P-bit]) errors, ES, and SES	Physical	BXM	T3
Path Parity(C-bit) errors, ES, and SES	Physical	BXM	T3

Table 4-39 Trunk Statistics (continued)

Statistic	Stat Type	Card Type	Line Type
Far End Block Errors	Physical	BXM	T3
Framing Errors and SES	Physical	BXM	T3/E3
Unavailable Seconds	Physical	BXM	T3/E3
PLCP LOF and SES	Physical	BXM	T3
PLCP YEL	Physical	BXM	T3
PLCP BIP-8, ES, SES	Physical	BXM	T3
PLCP FEBE, ES, SES	Physical	BXM	T3
PLCP FOE, ES, SES	Physical	BXM	T3
PLCP UAS	Physical	BXM	T3
LOC errors	Physical	UXM/BXM	E3/SONET
LOP errors	Physical	UXM/BXM	SONET
Path AIS errors	Physical	UXM/BXM	SONET
Path RDI errors	Physical	UXM/BXM	SONET
Section BIP-8 counts, ES, and SES	Physical	UXM/BXM	SONET
Line BIP-24 counts, ES, and SES	Physical	UXM/BXM	SONET
Line FEBE counts, ES, and SES	Physical	UXM/BXM	SONET
Section SEFS	Physical	UXM/BXM	SONET
Line UAS and FarEnd UAS	Physical	UXM/BXM	SONET
Clock Loss Transitions	Physical	UXM	T1/E1
Frame Loss Transitions	Physical	UXM	T1/E1
Multiframe Loss	Physical	UXM	T1/E1
CRC errors	Physical	UXM	T1/E1
BPV	Physical	UXM	T1
Frame bit errors	Physical	UXM	E1
Unknown VPI/VCI count	Physical	UXM/BXM	All
Errored LPC cell count	Physical	UXM	All
Non-zero GFC cell count	Physical	UXM/BXM	
Max Differential Delay	Physical	UXM	T1/E1
Uncorrectable HEC errors	Physical	UXM	All
Cell Hunt count	Physical	UXM	T1/E1
Bandwidth Changed count	Physical	UXM	T1/E1
Receive CLP=0 cell count	Logical	UXM/BXM	All
Receive CLP=1 cell count	Logical	UXM/BXM	All
Receive CLP=0 cell discard	Logical	UXM/BXM	All

Table 4-39 Trunk Statistics (continued)

Statistic	Stat Type	Card Type	Line Type
Receive CLP=1 cell discard	Logical	UXM/BXM	All
Transmit CLP=0 cell count	Logical	UXM/BXM	All
Transmit CLP=1 cell count	Logical	UXM/BXM	All
Receive OAM cell count	Logical	UXM/BXM	All
Transmit OAM cell count	Logical	UXM/BXM	All
Receive RM cell count	Logical	UXM/BXM	All
Transmit RM cell count	Logical	UXM/BXM	All
For Each Traffic Type: (V,TS,NTS,ABR,rt-VBR, nrt-VBR,CBR, BdatB, BdatA,HP)			
Cells served	Logical	UXM/BXM	All
Maximum Qbin depth	Logical	UXM/BXM	All
Cells discarded count	Logical	UXM/BXM	All

Example (BPX)

Display cell statistics for trunk 11.2.

dsptrkstats 11.2

```
sw53           TN    Cisco           BPX 8620  9.3.2J    Oct. 31 2000 13:58 GMT

Trunk Statistics for 11.2       Cleared: Oct. 24 2000 06:39          Snapshot
Trunk Speed: 353208 cps Collection Time: 6 day(s) 20:39:41      Corrupted: NO

              Cells           CLP         (EFCI)
Rx Trunk:    227028             0           --
Tx Trunk:    155079             0           --


Unkn Addr (UA):         0  Rx OAM Cells  :         0  Rx Clp 0 Cells:    227028
Rx Clp 0 Dscd :         0  Rx Clp 1 Dscd :         0  Tx Clp 0 Cells:    155079
Tx OAM Cells  :         0  Rx RM Count   :         0  Tx RM Count   :         0
Lst Unk VpiVci:            Percent load TX      0.0%  Percent load RX      0.0%

UA sums across ports in port group.


Last Command: dsptrkstats 11.2
```

Example (IGX)

Display cell statistics for ATM trunk 5.2 on a UXM card.

dsptrkstats 5.2

```
neelix         TRM   Cisco           IGX 8420  9.3.10    May  31 2000 01:50 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:23:49                  Clrd:  05/31/00 01:26:37
Type                                        Count
```

```
QBIN: NTS Cells Tx to line                     0
QBIN: Tx NTS Cells Received                    0
QBIN: Tx NTS Cells Discarded                   0
QBIN: Hi-Pri Cells Tx to line                  0
QBIN: Tx Hi-Pri Cells Received                 0
QBIN: Tx Hi-Pri Cells Discarded                0
QBIN: Voice Cells Tx to line                   0
QBIN: Tx Voice Cells Received                  0
QBIN: Tx Voice Cells Discarded                 0
QBIN: TimeStamped Cells Tx to ln               0
QBIN: Tx TS Cells Received                     0
QBIN: Tx TS Cells Discarded                    0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:50 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:23:49                  Clrd:  05/31/00 01:26:37
Type                                          Count
QBIN: BData A Cells Tx to line                 0
QBIN: Tx BData A Cells Received                0
QBIN: Tx BData A Cells Discarded               0
QBIN: BData B Cells Tx to line                 0
QBIN: Tx BData B Cells Received                0
QBIN: Tx BData B Cells Discarded               0
QBIN: Tx CBR Cells Served                      0
QBIN: Tx CBR Cells Received                    0
QBIN: Tx CBR Cells Discarded                   0
QBIN: Tx nrt-VBR Cells Served                  0
QBIN: Tx nrt-VBR Cells Received                0
QBIN: Tx nrt-VBR Cells Discarded               0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:50 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:00                  Clrd:  05/31/00 01:26:37
Type                                          Count
QBIN: Tx ABR Cells Served                      0
QBIN: Tx ABR Cells Received                    0
QBIN: Tx ABR Cells Discarded                   0
QBIN: Tx Q10 Cells Served                      0
QBIN: Tx Q10 Cells Received                    0
QBIN: Tx Q10 Cells Discarded                   0
QBIN: Tx Q11 Cells Served                      0
QBIN: Tx Q11 Cells Received                    0
QBIN: Tx Q11 Cells Discarded                   0
QBIN: Tx Q12 Cells Served                      0
QBIN: Tx Q12 Cells Received                    0
QBIN: Tx Q12 Cells Discarded                   0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:50 GMT

Trunk  5.2            Clear - OK
```

```
Collection Time: 0 day(s) 00:24:09                  Clrd:  05/31/00 01:26:37
Type                                        Count
QBIN: Tx Q13 Cells Served                         0
QBIN: Tx Q13 Cells Received                       0
QBIN: Tx Q13 Cells Discarded                      0
QBIN: Tx Q14 Cells Served                         0
QBIN: Tx Q14 Cells Received                       0
QBIN: Tx Q14 Cells Discarded                      0
QBIN: Tx Q15 Cells Served                         0
QBIN: Tx Q15 Cells Received                       0
QBIN: Tx Q15 Cells Discarded                      0
VI: Cells received                                0
VI: Cells transmitted                             0
VI: Cells rcvd w/CLP=1                            0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)

neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:50 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:12                  Clrd:  05/31/00 01:26:37
Type                                        Count
VI: Cells tx w/CLP=1                              0
VI: Cells rcvd w/CLP=1                            0
VI: Cells tx w/CLP=1                              0
VI: Cells discarded w/CLP=1                       0
VI: Cells discarded w/CLP=0                       0
VI: OAM cells received                            0
VI: OAM cells transmitted                         0
VI: RM cells received                             0
VI: RM cells transmitted                          0
CGW: Packets Rx From Network                      0
CGW: Cells Tx to Line                             0
CGW: NIW Frms Relayed to Line                     0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)


neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:51 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:19                  Clrd:  05/31/00 01:26:37
Type                                        Count
CGW: SIW Frms Relayed to Line                     0
CGW: Aborted Frames Tx to Line                    0
CGW: Dscd Pkts                                    0
CGW: 0-Length Frms Rx from Network                0
CGW: Bd CRC16 Frms Rx from Network                0
CGW: Bd Lngth Frms Rx from Network                0
CGW: OAM RTD Cells Tx                             0
CGW: Packets Tx to Network                        0
CGW: Cells Rx from Line                           0
CGW: NIW Frms Relayed from Line                   0
CGW: SIW Frms Relayed from Line                   0
CGW: Abrt Frms                                    0

This Command: dsptrkstats 5.2
```

```
Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:51 GMT

Trunk  5.2           Clear - OK
Collection Time: 0 day(s) 00:24:29                  Clrd:  05/31/00 01:26:37
Type                                     Count
CGW: Dscd Cells                                0
CGW: 0-Lngth Frms Rx from Line                 0
CGW: Bd CRC32 Frms Rx from Line                0
CGW: Bd Lngth Frms Rx from Line                0
CGW: OAM RTD Cells Rx                          0
CGW: OAM Invalid OAM Cells Rx                  0
CF: Egress Packet Sequence Errs                0
CF: Egress Bad HEC from cellbus                0
CF: Egress Packets from cellbus                0
CF: Egress Cells Tx to Line                    0
CF: Ingress Packets to cellbus                 0
CF: Ingress Cells from Line                    0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:51 GMT

Trunk  5.2           Clear - OK
Collection Time: 0 day(s) 00:24:39                  Clrd:  05/31/00 01:26:37
Type                                     Count
IE: Egress Packets to Extract Buf              0
IE: Egress Cells injected                      0
IE: Egress Packets Extract Buf full            0
IE: Ingress Cells to Extract Buf               0
IE: Ingress Packets injected                   0
IE: Ingress Cells Extract Buf full             0


This Command: dsptrkstats 5.2

Next page? (+/-/DEL key to quit)

Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:50 GMT

Trunk  5.2           Clear - OK
Collection Time: 0 day(s) 00:23:49                  Clrd:  05/31/00 01:26:37
Type                                     Count
QBIN: BData A Cells Tx to line                 0
QBIN: Tx BData A Cells Received                0
QBIN: Tx BData A Cells Discarded               0
QBIN: BData B Cells Tx to line                 0
QBIN: Tx BData B Cells Received                0
QBIN: Tx BData B Cells Discarded               0
QBIN: Tx CBR Cells Served                      0
QBIN: Tx CBR Cells Received                    0
QBIN: Tx CBR Cells Discarded                   0
QBIN: Tx nrt-VBR Cells Served                  0
QBIN: Tx nrt-VBR Cells Received                0
QBIN: Tx nrt-VBR Cells Discarded               0

This Command: dsptrkstats 5.2

Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:50 GMT
```

```
Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:00                    Clrd:  05/31/00 01:26:37
Type                                     Count
QBIN: Tx ABR Cells Served                      0
QBIN: Tx ABR Cells Received                    0
QBIN: Tx ABR Cells Discarded                   0
QBIN: Tx Q10 Cells Served                      0
QBIN: Tx Q10 Cells Received                    0
QBIN: Tx Q10 Cells Discarded                   0
QBIN: Tx Q11 Cells Served                      0
QBIN: Tx Q11 Cells Received                    0
QBIN: Tx Q11 Cells Discarded                   0
QBIN: Tx Q12 Cells Served                      0
QBIN: Tx Q12 Cells Received                    0
QBIN: Tx Q12 Cells Discarded                   0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)
neelix          TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:50 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:09                    Clrd:  05/31/00 01:26:37
Type                                     Count
QBIN: Tx Q13 Cells Served                      0
QBIN: Tx Q13 Cells Received                    0
QBIN: Tx Q13 Cells Discarded                   0
QBIN: Tx Q14 Cells Served                      0
QBIN: Tx Q14 Cells Received                    0
QBIN: Tx Q14 Cells Discarded                   0
QBIN: Tx Q15 Cells Served                      0
QBIN: Tx Q15 Cells Received                    0
QBIN: Tx Q15 Cells Discarded                   0
VI: Cells received                             0
VI: Cells transmitted                          0
VI: Cells rcvd w/CLP=1                         0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)

neelix          TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:50 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:12                    Clrd:  05/31/00 01:26:37
Type                                     Count
VI: Cells tx w/CLP=1                           0
VI: Cells rcvd w/CLP=1                         0
VI: Cells tx w/CLP=1                           0
VI: Cells discarded w/CLP=1                    0
VI: Cells discarded w/CLP=0                    0
VI: OAM cells received                         0
VI: OAM cells transmitted                      0
VI: RM cells received                          0
VI: RM cells transmitted                       0
CGW: Packets Rx From Network                   0
CGW: Cells Tx to Line                          0
CGW: NIW Frms Relayed to Line                  0

This Command: dsptrkstats 5.2
```

```
Next page? (+/-/DEL key to quit)


neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:51 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:19                   Clrd:  05/31/00 01:26:37
Type                                        Count
CGW: SIW Frms Relayed to Line                     0
CGW: Aborted Frames Tx to Line                    0
CGW: Dscd Pkts                                    0
CGW: 0-Length Frms Rx from Network                0
CGW: Bd CRC16 Frms Rx from Network                0
CGW: Bd Lngth Frms Rx from Network                0
CGW: OAM RTD Cells Tx                             0
CGW: Packets Tx to Network                        0
CGW: Cells Rx from Line                           0
CGW: NIW Frms Relayed from Line                   0
CGW: SIW Frms Relayed from Line                   0
CGW: Abrt Frms                                    0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:51 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:29                   Clrd:  05/31/00 01:26:37
Type                                        Count
CGW: Dscd Cells                                   0
CGW: 0-Lngth Frms Rx from Line                    0
CGW: Bd CRC32 Frms Rx from Line                   0
CGW: Bd Lngth Frms Rx from Line                   0
CGW: OAM RTD Cells Rx                             0
CGW: OAM Invalid OAM Cells Rx                     0
CF: Egress Packet Sequence Errs                   0
CF: Egress Bad HEC from cellbus                   0
CF: Egress Packets from cellbus                   0
CF: Egress Cells Tx to Line                       0
CF: Ingress Packets to cellbus                    0
CF: Ingress Cells from Line                       0

This Command: dsptrkstats 5.2


Next page? (+/-/DEL key to quit)
neelix         TRM   Cisco          IGX 8420  9.3.10    May  31 2000 01:51 GMT

Trunk  5.2            Clear - OK
Collection Time: 0 day(s) 00:24:39                   Clrd:  05/31/00 01:26:37
Type                                        Count
IE: Egress Packets to Extract Buf                 0
IE: Egress Cells injected                         0
IE: Egress Packets Extract Buf full               0
IE: Ingress Cells to Extract Buf                  0
IE: Ingress Packets injected                      0
IE: Ingress Cells Extract Buf full                0


This Command: dsptrkstats 5.2

Next page? (+/-/DEL key to quit)
```

dsptrkutl (display trunk utilization)

Displays dynamic utilization information for a specified trunk. The trunk must be upped and added to use this command. The following tables list the trunk utilization and terminated connection parameters included in the display. The parameter values are updated according to the specified or default interval and the screen remains displayed until the DEL key is depressed. Disabled trunks have their trunk number displayed in dim, reverse video on the screen.

If you notice that data traffic has slowed or stopped due to the very high trunk utilization due to network traffic, it may be because a node is receiving excessive volumes of network traffic (CC). In this case, the node may start dropping messages, which will result in communication breaks with other nodes as well as possible communication failures on some of its trunks.

You can detect the excessive traffic by displaying various statistics such as network statistics (**nwstats**), SAR statistics (**srstats**), and check utilization of the node's trunks by using the **dsptrkutl** command. In the event of excessive traffic, these command displays will show values that are increasing at a high rate. See the **cnfnodeparm** parameters Enable Degraded Mode, Auto Switch on Degrade, and Max Degraded Aborts for descriptions of how to set parameters so that if a node has exhausted its internal resources due to excessive messaging (among other possible causes), which leads the node to abort, the node will either switch to the standby CC if available, or it will enter degraded mode (if the **cnfnodeparm** Enable Degraded Mode parameter is enabled). See Table 4-40 for trunk utilization parameters and statistics, and Table 4-41 for the terminated connection statistics.

Table 4-40 Trunk Utilization Parameters and Statistics

Trunk Utilization Parameters and Statistics	Description
Elapsed time (seconds)	Elapsed time in seconds since the command was started.
Total packets transmitted	Number of packets transmitted during the elapsed time.
Overall packet rate	Number of packets transmitted per second (pps) during the elapsed time.
Overall utilization	Bandwidth used, expressed as a percentage of the available bandwidth during the elapsed time. This is 100 x total packets transmitted/elapsed time x bandwidth (pps).
Peak interval utilization	Bandwidth used, expressed as a percentage of the available bandwidth during the peak interval. This is 100 x total packets transmitted/peak interval x bandwidth (pps).
Last Interval (seconds)	Elapsed time, in seconds, for the last screen update interval.
Interval packets generated	Number of packets transmitted during the last interval.
Interval packet rate (pkts/sec)	Number of packets transmitted per second during the last interval.
Interval utilization	The used bandwidth expressed as a percentage of the available bandwidth during the last interval. The derivation of interval utilization is 100 x interval packets transmitted/last interval x bandwidth (pps).
Total Connections	Total number of connections routed over the trunk.
Terminated/Via	Terminated: Number of connections routed over the trunk that terminate at this node. Via: Number of connections routed over the trunk that do not terminate at this node.

Table 4-41 Terminated Connection Statistics

Terminated Connection Statistics	Description
Voice terminated	Number of voice connections terminated at this node that are routed over his trunk.
Data terminated	Number of data connections terminated at this node that are routed over this trunk.
Frame Relay terminated	Number of Frame Relay connections terminated at this node that are routed over this trunk.
Num voice off-hook	Number of voice connections off-hook that are terminated at this node and routed over this trunk.
Connection type	Voice connection types: c, a, v, p or t.
Connection num	Number of terminated voice connections of each type: c, a, v, p and t.
Modem on	Number of terminated connections with modem detected.
Modem V.25	Number of terminated connections with V.25 modem detected.
VAD enabled	Number of terminated connections with VAD enabled.

Syntax

dsptrkutl <trunk number> [interval]

Parameters

Parameter	Description
trunk number	Specifies the number of the trunk in the format *slot.trunk*. If the card has only one trunk, you can enter just the slot.
interval	Specifies the number of seconds between screen updates. Range: 1–60 Default: 5

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			Yes	

Related Commands

dspload, dspchhist, dsptrkhist

Example (BPX)

Display OC-3 trunk utilization for port 2 of the BXM card in slot 11.

dsptrkutl 11.2

```
sw53           VT    Cisco          BPX 8620  9.3.2o    Dec. 6 2000  10:09 GMT

TRK 11.2 Utilization Display                                      Snapshot

Elapsed time (seconds)         44.8          Terminated Connection Statistics
Total cells transmitted        362           Voice terminated         0
Overall cell rate (cells/sec)  8             Data terminated          0
Overall utilization            1%            Frame Relay terminated   0
Peak interval utilization      1%            Num voice OffHook        0
Last interval (seconds)        7.6           ATM terminated           5
Interval cells generated       58            Connection   Modem Modem VAD
Interval cell rate (cells/sec) 7             Type   Num   On    V.25  Enabled
Interval utilization           1%            c      0     0     0     0
                                             a      0     0     0     -
Terminated Connections         5             v      0     0     0     0
Via Connections and Groups     0             p/t    0     0     0     -


Last Command: dsptrkutl 11.2
```

dsptsmap (display the channel-to-timeslot mapping usage)

Display the channel-to-timeslot mapping usage information on a UVM card on an IGX node. The **dsptsmap** command is for use with the SVC caching feature, which speeds up call setup for most VNS controlled calls. The SVC caching feature avoids some of the call setup/tear-down operations associated with **addcon** and **delcon** as a call originates or terminates. The SVC caching feature reduces the connect time for many switch calls over a busy network.

To use the **dsptsmap** command, the line must have SVC caching enabled on it. You can find out if a channel is disabled by using the **dsptsmap** command.

- The **cnfln** command is used to configure the SVC caching parameter setting.
- The **dspcons** command is used to view disabled connections provided the SVC has not been deleted.
- The **dsplncnf** command will show the value (On/Off) of the SVC caching mode feature.

Refer to the *VNS Installation and Configuration Manual* for more information on SVC caching.

The **dspclns** command is an identical alias for the **dsplns** command.

Syntax

dsptsmap <line_number>[update_interval]

Parameters

Parameter	Description
line_number	The *slot.line* for UVM or line for CVM/CDP.
interval_number	Interval in seconds between screen updates. The default value is controlled by “Screen Update Time” in the **cnfuiparm** command.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfuiparm, cnfln, cnfupcln, dncln, dsptrks, dspln, dsplncnf

Example

Enabled channels are shown on the screen underlined and in reverse video. Disabled (cached) channels are shown with the channel number underlined and in reverse video, while the timeslot is shown in normal video. Channels that have no connection are shown in normal video for both channel number and timeslot.

For example:

- Channel 1 does not have a connection.
- Channel 2 is an enabled connection carrying traffic.
- Channel 3 is a disabled connection.

Specify the *line_number* parameter in *slot.line* format for UVM, and *line* format for CDP/CVM.

Use the optional *update_interval* parameter to control how often the screen gets updated. If you do not enter any value through the CLI, the value of the Screen Update Time parameter set using in the **cnfuiparm** command is used.

dsptsmap 7.2

```
sw176        TRM   StrataCom       IGX 16    9.3     Apr. 13 2000 11:00 PST

Line 7.2 Channel to Timeslot Map

Chan  TS       Chan  TS       Chan  TS       Chan  TS
--------       --------       --------       --------
 1     1         9    14       17    17
 2     2       10    12        18     5
 3    22       11    18        19    19
 4     5       12    10        20    20
 5    11       13    13        21    21
 6     6       14     9        22     3
 7     7       15    15        23    23
 8     8       16     9        24    24


This Command: dsptsmap 7.2

Hit DEL key to quit:
```

dsptsmap (display SNMP parameters)

Displays the following SNMP statistics for the node:

- SVC Requests Received, the number of SVC requests received.
- SVC Current Queue Length, the number of outstanding SVC requests in the queue.
- SVC Maximum Queue Length, the high-water mark of the number of outstanding SVC requests in the queue.
- SVC Requests Timed Out, the number of SVC requests that have timed out.
- Current Trap Managers, the number of managers (up to 10) that are currently registered, their IP addresses and UDP ports.
- Traps Transmitted, the number of traps transmitted.
- TRAP Current Queue Length, the number of outstanding traps in the queue.
- TRAP Maximum Queue Length, the high watermark of the number of outstanding traps in the queue.
- TRAP Queue Events Discarded, the number of traps discarded due to queue overflow.
- Overflow Traps Transmitted, the number of overflow traps transmitted due to queue overflow.

Syntax

dspsnmpstats

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

cnfsnmp, **dspsnmp**

Example (IGX)

Display SNMP statistics for the current node.

dspsnmpstats

```
sw180          TN    Cisco          IGX 8420  9.3.p0    Dec. 6 2000  09:05 GMT

SVC Requests Received:       0         Traps Transmitted:            0

SVC Current Queue Length:    0         TRAP Current Queue Length:    0
SVC Maximum Queue Length:    0         TRAP Maximum Queue Length:    0
SVC Requests Timed Out:      0         TRAP Queue Events Discarded:  0
                                       Overflow Traps Transmitted:   0

Current Trap Managers:       0/10      Snmp_Trap_Db Ptr:             315687BE

Last Command: dspsnmpstats
```

dspusers (display users)

Displays users. The privilege levels in the display are restricted to those of the current user and any privileges below the current user.

Syntax

dspusers

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

adduser, **deluser**, **dspusers**

dspusertask (display user task)

Displays information about the current user task. The displayed information varies with the user task. For example, information about a vt session slightly differs from a Telnet session. The command takes a user task number as an argument. If the user task number is unknown, enter the command without a number to see a list of possible user tasks and the current user task.

The types of user tasks are:

- User, which can be the control terminal user, auxiliary port user, or StrataView
- A Telnet session
- A virtual terminal session (vt)
- An SNMP agent
- A job

Syntax

dspusertask [user task number]

Parameters

Parameter	Description
user task number	Specifies the number of the user task whose information is displayed.

Related Commands

adduser, **cnfpwd**, **deluser**, **dspusers**, **dsppwd**

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Example (BPX)

Display user task information—without specifying a task in this case. This example shows a case in which the user has started a vt session on a node. See also step 2 of this example.

dspusertask

```
sw78           VT    SuperUser       BPX 15    9.3      Apr. 13 2000 15:52 PST

 #  TASK PURPOSE      USER ID            #  TASK PURPOSE      USER ID
 -- ---- ------------ -------            -- ---- ------------ -------
 1  USR1 control port none               13 VT-5 VT           none
 2  USR2 auxilry port none               14 VT-6 VT           none
 3  USR3 lan port(SV) none               15 SNMP agent        n/a
 4  TN-1 lan (telnet) none               16 JOBS runs jobs    n/a
 5  TN-2 lan (telnet) none
 6  TN-3 lan (telnet) none
```

```
 7  TN-4 lan (telnet) none
 8  TN-5 lan (telnet) none
 9  VT-1 VT: sw81     SuperUser   < You
 10 VT-2 VT           none
 11 VT-3 VT           none
 12 VT-4 VT           none


This Command: dspusertask


Please Enter User Number:9
```

Example (BPX)

This example shows the screen after the you enter a 9 at the prompt in the *previous* screen, a case in which you already started a vt session on a node. Note that the display shows the status as a vt slave, and the node on which the vt session originated is sw81.

9

```
sw78           VT    SuperUser       BPX 15    9.3      Apr. 13 2000 15:53 PST


    Task: VT-1
    Logged in as: SuperUser
    VT master:  no
    VT slave:   yes    Master node is: sw81
    VT pending: no

    Public  lock: no
    Private lock: none

    No command is currently running.
    Previous command: dspusertask 9


Last Command: dspusertask 9


Next Command:
```

dspusertasks (display user tasks)

Displays general information about all current user tasks. The types of user tasks are as follows:

- User, which can be the control terminal user, auxiliary port user, or Cisco WAN Manager
- A Telnet session
- A virtual terminal session (vt)
- An SNMP agent
- A job

Syntax

dspusertasks

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

adduser, **cnfpwd**, **deluser**, **dspusers**, **dsppwd**, **dspusertask**

Example (IGX)

Display user task information.

dspusertasks

```
sw151          TN    SuperUser       IGX 8420    9.3       Apr. 13 2000 18:02 GMT

 #  TASK  PURPOSE     USER ID             #  TASK  PURPOSE     USER ID
 -- ---- ------------ -------             -- ---- ------------ -------
 1  USR1 control port SuperUser           13 VT-5 VT           none
 2  USR2 auxilry port none                14 VT-6 VT           none
 3  USR3 lan port(SV) none                15 SNMP agent        n/a
 4  TN-1 lan (telnet) none                16 JOBS runs jobs    n/a
 5  TN-2 lan (telnet) SuperUser   < You
 6  TN-3 lan (telnet) none
 7  TN-4 lan (telnet) none
 8  TN-5 lan (telnet) none
 9  VT-1 VT           none
 10 VT-2 VT           none
 11 VT-3 VT           none
 12 VT-4 VT           none


Last Command: dspusertasks


Next Command:
```

dsputl (display utilization)

The **dsputl** command displays the utilization factor for all voice connections or data channels on a circuit line.

This command displays the actual percentage utilization for all voice connections on a single circuit line specified by the back slot (**bslot**) number. The percentage is calculated by dividing the number of packets transmitted by the total number of packets allocated to the specified channel. Only transmit packet rates are used. If the percentage of actual utilization exceeds the configured utilization the channel appears in reverse video.

Syntax

dsputl <bslot> [clear]

Parameters

Parameter	Description
<bslot>	Specifies the shelf back slot number of the circuit line.
[clear]	Directs the controller card to clear the utilization counters after being displayed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	IGX			Yes	

Related Commands

dspdutl

Example

This is a typical display. In this example, the connections from 11.1 to 11.11 use VAD and the connections from 11.12 to 11.17 do not. The connections using VAD do not use any network bandwidth (0 utilization) until the connection is used. The other connections utilize the full bandwidth (100% utilization) even though they may be idle.

dsputl 11

```
gamma            TRM       SuperUser        Rev:  9.3  Apr. 13 2000  16:36 PDT

Percentage utilization        Last Cleared: Date/Time Not Set         Snapshot

CLN     1  2  3  4  5  6  7  8  9 10 11 12 13 14 15

11      0  0  0  0  0  0  0  0  0  0  0  0 99 99 99

CLN    16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

11       99

Last Command: dsputl 11
Next Command:
```

dspvsiif (display a Service Class Template assigned to an interface)

Display a Service Class Template assigned to an interface (VI). You can also display a summary of the resources allocated to the VSI partition on a given interface. Multiple users may use the **dspvsiif** at one time.

After using **cnfvsiif** command to assign a selected Service Class Template to an interface, you can use the **dspvsiif** command to display the type of Service Class Template assigned to an interface (VI).

Syntax

dspvsiif <slot.port.vtrk>

Parameters

Parameter	Description
slot.port.[vtrk]	Slot, port (and virtual trunk number if applicable) of the interface.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX	Yes	Yes	No	No

Related Commands

cnfrsrc, dsprsrc, cnfqbin, dspqbin

Example (IGX)

Display the service class template assigned to interface 3.1.

dspvsiif 3.1

```
bently         TN    Cisco           IGX 8430  9.3.10    Aug. 3 2000  14:17 PST

Port: 3.1

Service Class Template ID: 2


              State   MinLCN   MaxLCN   StartVPI   EndVPI   MinBW    MaxBW
Partition 1:   D
Partition 2:   D
Partition 3:   E       100      200      100        200      10000    10000


Last Command: dspvsiif 3.1


Next Command:
```

Example (BPX)

Display the Service Class Template assigned to BXM port interface 11.1.

dspvsiif 11.1

```
sw143          TRM   Cisco          BPX 8620  9.3.10    Aug. 2 2000  20:56 GMT

    Port: 4.1

    Service Class Template ID: 2

    VSI Partitions :
                channels         bw              vpi
    Part  E/D   min    max    min      max     start  end      ilmi
    1     D     0      0      0        0       0      0        D
    2     D     0      0      0        0       0      0        D
    3     D     0      0      0        0       0      0        D


Last Command: dspvsiif 4.1 4


Next Command: dspvsiif 4.1
```

dspvsipartcnf (display VSI partition characteristics)

Display VSI ILMI functionality:

- whether VSI ILMI is enabled for a given partition
- the LCN used for the sessions (only for trunk interfaces)

If no partition is specified, **dspvsipartcnf** displays the above information about all the VSI partitions and also the Sys_Id downloaded to the BXM card for ILMI functionality.

Syntax

dspvsipartcnf <slot.port.[vtrk]> [partition_id]

Parameters

Parameter	Description
slot.port.[vtrk]	Slot, port (and virtual trunk number if applicable) of the interface.
partition_id	Partition ID corresponding to the VSI partition. This parameter is optional and, if not specified, this command will display information about all VSI partitions.

Related Commands

cnfrsrc, **cnfvsipart, cnfport, cnftrk**

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	No	BPX			Yes	

dspvsipartinfo (display VSI statistics per partition)

Display VSI statistics for a particular active partition on an interface. You can use the **dspvsipartinfo** command on only one partition at a time, to get VSI statistics on an interface (can be a port or virtual trunk).

You can optionally specify an interval in seconds, which will display VSI statistics for the specified active partition every *x* seconds. The command shows you some of the same parameters that display on the **cnfrsrc** screen, such as Min LCNs and Max LCNs, Used LCNs and Available LCNs, and Min BW, Max BW, and Used BW.

The command also displays a line that provides slave redundancy status. It tells you whether the standby card is in sync with the active card. You must have cards in Y-redundancy configuration for this line to display.

Multiple users may use the **dspvsipartinfo** command at the same time.

The switch software polls the card for the information at the specified interval and displays the information from the card.

Syntax

dspvsipartinfo <interface>.<partition>[<interval>]

Parameters

Parameter	Description
interface	The slot.port.[vtrk] of the interface being monitored
partition	Partition ID for which information is to be displayed.
interval	Refresh interval for displaying data. Range: 1–60 seconds Default: 10 seconds

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX	Yes	Yes	Yes	No

Related Commands

cnfrsrc, dsprsrc

Display Fields

Parameter	Description
Min BW	Configured minimum bandwidth for this partition (for reference only).
Max BW	Configured maximum bandwidth for this partition (for reference only).

Parameter	Description
Used BW	Bandwidth currently used by connections on this partition.
Available BW	Bandwidth currently available to connections on this partition. This is determined based on the minimum and maximum bandwidth configured for the partition and the bandwidth currently available in the common pool.
Min Lcns	Configured minimum LCNs for this partition (for reference only).
Max Lcns	Configured maximum LCNs for this partition (for reference only).
Used Lcns	Number of LCNs currently used by connections in this partition.
Available Lcns	Number of LCNs available to this partition. This is determined based on the minimum and maximum LCNs configured for the partition and the number of connections on the partition.

Example (IGX)

Display the VSI statistics for partition 2 on trunk 5.1.

dspvsipartinfo 5.1 2

```
sw188          TRM   Cisco           IGX 8420  9.3.1c    Aug. 17 2000 12:11 PST

            VSI Resources Status for trunk  5.1 Partition 2

Minimum Lcns       :     500     Minimum BW   (cps) :    1000
Maximum Lcns       :    2000     Maximum BW   (cps) :    2000
Used Lcns          :       0     Used BW      (cps) :       0
Available Lcns     :    1100     Available BW (cps) :    2000
Start VPI          :      55     End VPI            :      60

This Command: dspvsipartinfo 5.1 2

Hit DEL key to quit:
```

Example (BPX)

Display VSI statistics on interface 3.1, partition 1, at an interval of every 10 seconds.

dspvsipartinfo 3.1 1 10

```
sw237          TN    StrataCom       BPX 8620  9.3.10    June 9 2000  17:32 PST

            VSI Resources Status for trunk  3.1 Partition 1

Min Lcns       : 0           Min BW (cps)     : 0
Max Lcns       : 20          Max BW (cps)     : 0
Used Lcns      :             Used BW (cps)    :
Available Lcns :             Available BW(cps):

Next Command: dspvsipartinfo 3.1 1
```

Example (BPX)

Display VSI statistics for interface 11.1, partition 2, at an interval of every 10 seconds.

dspvsipartinfo 11.1 2 10

```
sw53   TN   StrataCom    BPX 8600  9.3.10    Jan. 10 2000   14:31 GMT
```

```
            VSI Resource Status for port 11.1 Partition 2

Min Lcns          1000        Min BW (cps)       20000
Max Lcns          4000        Max BW (cps)       40000
Used Lcns         500         Used BW (cps)      20000
Available Lcns:: 1000        Available BW(cps)   10000


This Command: dspvsipartinfo 11.1 2 10


Hit DEL key to quit:
```

Example (BPX)

Display VSI statistics for interface 4.1, partition 1.

dspvsipartinfo 4.1 1

```
sw237          TN    StrataCom       BPX 8620  9.3.10    May  10 2000 14:58 PST

            VSI Resources Status for trunk  4.1 Partition 1          Snapshot

Min Lcns       :20          Min BW (cps)      :2000
Max Lcns       :30          Max BW (cps)      :3000
Used Lcns      :            Used BW (cps)     :
Available Lcns :             Available BW(cps):


Last Command:dspvsipartinfo 4.1 1
```

Example (BPX)

Display VSI statistics for interface 6.3, partitions 1, 2 and 3.

dspvsipartinfo 6.3

```
sw167          TN    Cisco           BPX 8620  9.3.2R    Dec. 14 2000 11:04 PST



    Port: 6.3        Partn: 1   -- VSI partition DISABLED
    Port: 6.3        Partn: 2   -- VSI partition DISABLED
    Port: 6.3        Partn: 3   -- VSI partition DISABLED


    Sys_Id generation failed!! Using default value = 0.0.0.0.0.1


Last Command: dspvsipartcnf 6.3
```

dspyred (display Y-cable redundancy)

Displays information for Y-cable pairings. You can specify a single slot or you can display all pairings by specifying no slot.

Slot numbers appearing in high intensity indicate active card status. Front card, back card, and channel configuration conflicts appear in reverse video. A conflict occurs when the port interfaces are different for corresponding ports in a redundant slot pair.

The output display shows:

- First column (Slot): the slot of the displayed card.
- Second column (Slot Type): its status, Pri (primary) or Sec (secondary).
- Third column (Other Slot): the slot number of the associated Y-redundant card.
- Fourth column (Front Card): the type of card in the front slot.
- Fifth column (Back Card): the type of card in the back slot.

Remaining columns (Channel Configuration) describe the channel configurations when appropriate.

Syntax

dspyred [slot]

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	Yes	BPX, IGX	Yes	Yes	No	No

Related Commands

addyred, **delyred**, **prtyred, switchyred**

Example (BPX)

Display Y-redundancy for all cards.

dspyred

```
sw11          TN    Cisco           BPX 8620  9.3.c0    May  9 2001  1329 GMT

     Slot Other Front   Back
Slot Type Slot  Card    Card
2    Pri  3     BXM     LM-BXM
3    Sec  2     BXM     LM-BXM



Last Command dspyred
```

editjob (edit a job)

Edits a job. You can change any of these items in a job:

- The job description
- Execution time
- Execution interval
- Individual commands in the job
- Failure reactions for each command

After you enter the **editjob** command, the system displays the template for the job. You can edit, delete, or add a command. Each item in the template is successively displayed on the command line so that you can confirm or change the item.

You cannot change the privilege level of a job.

Use **editjob** to:

- To change an item in the job template, enter or type over the existing information on the command line and press the Return key.
- Use any of the control keys to change information on the command line. To keep the same value of an item, press the Return key at the prompt.
- To add a new command between existing commands in a job, hold down the Control key while you press the **^** key. A new line appears above the command that is highlighted. Enter the new command after the "Enter Cmd:" prompt and press Return.
- To add a new command to the end of a job, press the Return key after the last command in the job template.
- To delete a command from a job, either backspace over the command when it appears on the command line and press the Return key, or hold down the Control key while you press the "x" key.
- To end the editing session, press the Return key when prompted for a new command or press the Del key.

When commands are added to or deleted from a job, the system renumbers the commands. To test an edited job, run it with the **runjob** command.

Syntax

editjob <job_number>

Parameters

Parameter	Description
<job_number>	Specifies the number of the job to edit.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

addjob, deljob, dspjob, dspjobs, runjob

Example

Edit job 1. The template for job 1 appears on the screen. The system displays the existing job description, which you can change or keep. To keep it, press Return. The system then displays the execution time. To change it to August 17, 1998 at 11:00:, for example, enter:

1998 8 17 11 00

If no other items require changing, press the Return key.

editjob 1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 14:19 PST

Job 1 prtlog
Last Execution Results: None                     Status: Editing
Next Execution Time: 08/17/97 11:00:00           Interval: 1 days

 1: prtlog
   - Failure Reaction: Repeat 2 Times and Abort        Exec. Results: None
 2:




Last Command: editjob 1


Next Command:
```

getfwrev (get firmware revision)

The **getfwrev** command gets and loads a firmware image:

- From Cisco WAN Manager, or a remote node.
- To the specified card on the specified node, or on all reachable nodes.

This firmware image can then be downloaded to specific interface cards within the node with the **burnfwrev** command. The firmware image must be already loaded into the Cisco WAN Manager or Cisco WAN Manager terminal before using this command.

When the command is first entered, the status is temporarily "Unavailable" while the node attempts to locate the source of the firmware image. Once the download begins, a list of all of the files that make up the image is displayed and as the downloading progresses, the address of the file is updated.

- **getfwrev a.b.cd ***—Loads firmware revision a.b.cd at all reachable nodes
- **getfwrev BNI-E3 a.b.cd nodename—**Loads firmware revision a.b.cd on the BNI-E3 card at one node only (nodename specifies the node).
- **getfwrev 0.0**—Clears a firmware revision image from memory. Should be issued after every firmware download to clear the memory.
- **getfwrev BNI-E3 0.0 nodename**—Clears a firmware revision image from the BNI-E3 card at one node only (nodename specifies the node).

Caution This command is not to be confused with **loadrev**. The **loadrev** command loads system software, not firmware.

Syntax

getfwrev <card type> <image name> <nodename>

Parameters

Parameter	Description
<card type>	Specifies the card on which to load the revision.
<image name>	Specifies the name assigned to the firmware revision. Image names are generally in all capital letters and are case-sensitive when being entered.
<nodename>	Specifies the node on which to load the revision.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

burnfwrev, **dspfwrev**, **dspdnld**

help or ? (help command)

Displays a help menu. This command accesses the help routine in the system software, providing:

- A short description of the command
- An indication of whether the command can be used in a job
- The command syntax

A more extensive, menu-driven, on-line help function exists within the WAN Manager NMS. Consult the *Cisco WAN Manager Operations Guide* for a complete description of the online help.

The ways to request help on commands are:

- Entering **help** or **?** without an argument lists the command categories. Selecting one of these categories (using arrow keys and Return) displays all the commands in that category. You can select commands in this list by using arrow keys then the Return key.
- Entering a command name displays help for that particular command.
- Entering a partial command name lists all commands that contain that character string. For example, **fr** indicates all commands (such as **cnffrport**) that contain "fr." You select a command in the list by using arrow keys to scroll to the command then press Return.

Syntax

? or **help** [command name | character string]

Parameters

Parameter	Description
command	Specifies a command.
string	Specifies a character string as a search argument.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Example (IGX)

Display the help menu. (Without an argument, the help command shows the command categories.)

help

```
sw180          TN    Cisco          IGX 8420  9.3.g0    Oct. 20 2000 06:14 GMT

All commands fall into one (or more) of the following categories:

Control Terminal
Configuration
Lines
Network
Connections
Cards
Alarms and Failures
Diagnostics
Debug

This Command: ?

Use cursor keys to select category and then hit <RETURN> key:
```

Example (BPX)

Display the help menu. (Without an argument, the help command shows the command categories.)

help

```
sw53           TN    Cisco          BPX 8620  9.3.2J    Oct. 25 2000 06:19 GMT

All commands fall into one (or more) of the following categories:

Control Terminal
Configuration
Lines
Network
Connections
Cards
Alarms and Failures
Diagnostics
Debug

This Command: help


Use cursor keys to select category and then hit <RETURN> key:
```

Example (BPX)

Display the syntax and other information for Display BXM Slot Errors (**dspbxmsloterrs**).

help dspbxmsloterrs

```
sw53           TN    Cisco          BPX 8620  9.3.2J    Oct. 25 2000 06:20 GMT

dspbxmsloterrs     - Display BXM Slot Errors
Cannot be included in Jobs.
Usage: dspbxmsloterrs [slot]

Last Command: help dspbxmsloterrs
```

Example (IGX)

help fr

Display all commands that contain the string “fr.” (These are the Frame Relay commands.) A list of all commands containing the letters “fr” appears on screen. Scroll to a command then press **Return** to display the related help screen.

```
sw180          TN    Cisco           IGX 8420  9.3.g0    Oct. 20 2000 06:47 GMT

Commands that contain the string "fr"

addfrcons         - Add Multiple Frame Relay Connections
addfrport         - Add Frame Relay Port
clrfrcportstats  - Clear Port Concentrator Link Statistics
cnffrcls          - Configure Frame Relay Connection Classes
cnffrcon          - Configure (modify) Frame Relay Connection Parameters
cnffrport         - Configure Frame Relay Port Parameters
cnffrcport        - Configure Port Concentrator Link Parameters
cnfrcvsig         - Configure Received Signalling
cnfrobparm        - Configure Robust Parameter Values
cnfrsrc           - Configure VSI Resource Partition
cnfrtcost         - Configure Maximum Route Cost for a Connection
cnfrtr            - Configure Router Configuration Parameters
cnfrtrparm        - Configure Router Service Parameters

This Command: help fr


Use cursor keys to select command, then hit <RETURN> key for detailed help:
```

killuser (log out a user)

Logs out a user. The command displays a numbered list of users. The number is the argument that **killuser** takes. The display indicates your user number so that you do not log out yourself.

Syntax

killuser <user number>

Parameters

Parameter	Description
<user number>	Specifies the number of the user to log out.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Example (IGX)

killuser

```
sw83           TN    SuperUser       IGX 8420    9.3    Apr. 13 2000  00:11 PST

 #  TASK  PURPOSE     USER ID           #  TASK  PURPOSE     USER ID
 -- ---- ------------ -------           -- ---- ------------ -------
 1  USR1 control port none              13 VT_5 VT           none
 2  USR2 auxilry port none              14 VT_6 VT           none
 3  USR3 lan port(SV) none              15 SNMP agent        n/a
 4  TN_1 lan (telnet) SuperUser   < You 16 JOBS runs jobs    n/a
 5  TN_2 lan (telnet) none
 6  TN_3 lan (telnet) none
 7  TN_4 lan (telnet) none
 8  TN_5 lan (telnet) none
 9  VT_1 VT           none
 10 VT_2 VT           none
 11 VT_3 VT           none
 12 VT_4 VT           none


This Command: killuser


Please Enter User Number:
```

loadcnf (load configuration)

Loads a configuration image from the Cisco WAN Manager (CWM) or a TFTP network server to a node, where the file is stored in the RAM buffer.

Note Starting with Release 9.3.30, the TFTP Configuration Save and Restore feature enables use of the standard TFTP protocol for network configuration backup to a server other than CWM. For detailed information on this feature, see the **savecnf** command description.

This command causes a saved network configuration file to be downloaded to one node or all nodes. (See **savecnf**.) To illustrate this:

loadcnf r93nov17 nodeA * 172.29.9.25 T /usr/users/svplus

– Loads the configuration of one node connected to the TFTP server.

loadcnf r93nov17 * * 172.29.9.25 T /usr/users/svplus

– Loads the configuration of all nodes through one node connected to the TFTP server.

The configuration image downloaded is temporarily stored in a buffer area in a node's controller card memory. The process runs in the background and may take several minutes if the configuration file is large. Although loaded, the configuration is not yet restored. You restore the configuration to the controller card's BRAM memory by using the **runcnf** command.

After loading and restoring a network configuration, you should clear the control card buffer area used for this purpose so it will be available for other downloading processes, such as that of firmware.

To clear the buffer area, execute **loadcnf** with the *clear* parameter specified instead of *backup_id*. Specify the buffer of an individual node with *nodename* or all nodes with *.

To execute this command on an IGX/AF interface shelf, Telnet to the shelf or use a control terminal attached to the shelf.

Syntax

loadcnf <backup_id | clear> <nodename | *> <CWM_nodename | *> [<destination_IP>] [<T>] [<pathname>]

Parameters

Parameter	Description
backup ID	Specifies the name of the configuration file to be restored. To identify file names on CWM, look in the /usr/users/svplus directory. The directory containing the configuration files is named <backup_id>_Cfgdir.
clear	An optional parameter that clears the buffer space in RAM of any old configuration files before the new configuration is copied back to the node. You must explicitly clear the buffer before it can be loaded with a new file.
nodename	Specifies the name of the node that is to have its configuration restored. The wildcard option, specified by an asterisk (*), is used in place of nodename to indicate all nodes are to have their configurations restored.

Parameter	Description
CWM nodename	Specifies the name of the node that has the CWM attached. The node name identifies the gateway node of the CWM that is the source for the configuration restore. As an option, an asterisk (*) can be entered to indicate that the CWM IP address is to be used to identify the source CWM.
destination IP	An optional parameter that specifies the IP address of the CWM or TFTP network server that is the source for the configuration restore. You can only enter this parameter when an asterisk (*) is entered for CWM Nodename.
T	An optional parameter that specifies TFTP is used for data transfer instead of the CWM proprietary protocol.
pathname	A new optional parameter that can be configured when TFTP is being used for data transfer. It indicates the directory path name where the backup files are stored.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX, IGX/AF			Yes	

Related Commands

clrcnf, dspcnf, **runcnf**, **savecnf**

loadrev (load revision)

Loads a secondary system software revision image from Cisco WAN Manager into the specified nodes.

The secondary revision system software is the code that is loaded onto a controller card but is not currently running. Use the **runrev** command (after you have loaded a revision with **loadrev**) to make the secondary revision the primary revision. The primary revision then becomes the secondary.

Examples of this command:

- **loadrev a.b.cd ***—Loads revision a.b.cd at all reachable nodes.
- **loadrev a.b.cd nodename**—Loads revision a.b.cd at nodename only
- **loadrev 0.0**.—Clears a software revision image from controller memory. You should issue this command after every software download to clear the controller memory.

After entering the command, the system responds with this prompt:

```
Enter Rev Number:
```

A prompt is issued if you run the **loadrev** command during a time when statistics collection is enabled. If you select “yes,” statistics collection is disabled before the **loadrev** command is executed.

Use the **dsprevs** command to view the software revisions that are currently loaded in the controller memory. Use the **dspdnld** command to display a running picture of the download procedure status once it has begun. The **runrev** command also displays the lowest revision running in the network.

Caution Do not confuse **loadrev** with **getfwrev**. The **getfwrev** command loads firmware, not system software.

Syntax

loadrev <revision> <node_name | group_name | *>

Parameters

Parameter	Description
<revision>	Specifies the revision level of the system software file to be loaded.
<node_name>	Specifies the target node where the secondary revision is to be loaded.
<group_name>	Specifies a subset of nodes in the network.
<*>	Specifies all nodes in the network.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX, IGX/AF			Yes	

Related Commands

runrev, **dsprevs**, **cnfdlparm, upggrp**

prtapsln (print APS line status)

Prints the **dspapsln** screen, that is, the currently configured APS lines and their status.

Syntax

printapsln

Related Commands

addapsln, delapsln, cnfapsln, cnfcdaps, dspapsln, dsplog, dspalms

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	No	No	BPX			No	

prtcderrs (print card errors)

The **prtcderrs** command prints out detailed card failure information.

Prints a history of card failures associated with a specified slot on the network printer. If no argument is specified, a summary is printed, indicating the slots that have failures recorded against them. Refer to the **dspcderrs** command definition for an example of a typical card error record that might be printed.

Syntax

prtcderrs [<slot>]

Parameters

Parameter	Description
<slot >	Specifies the shelf slot where the selected card is installed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	No	BPX, IGX			Yes	

Related Commands

clrcderrs, **dspcderrs**

prtchcnf (print channel configuration)

Prints the configuration details for voice channels or data channels. This command uses the same syntax, and prints the same information as is displayed by using the **dspchcnf** command. See the **dspchcnf** command definition for syntax and output information.

Syntax

prtchcnf [start_channel]

Parameters

Parameter	Description
[start_channel]	Specifies the starting channel for the print output. On a CDP or CVM, the format is *slot.channel*. On a UVM, the format is *slot.line.channel*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dspchcnf

Example

Print the configuration values of circuit line 14.1.

prtchcnf 14.1

This command produces hardcopy.

prtchdlcnf (print channel dial type configuration)

Prints the dial type configurations for channels on a circuit line.

Syntax

prtchdlcnf <start_channel>

Parameters

Parameter	Description
start channel	Specifies the starting channel for the print output. On a CDP or CVM, the format is *slot.channel*. On a UVM, the format is *slot.line.channel*.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	IGX			Yes	

Related Commands

cnfchdl, dspchcnf

Example

Print the dial type configuration for all channels beginning with 14.1.

prtchcnf 14.1

This command produces hardcopy

prtclnerrs (print circuit line errors)

Prints the accumulated error count since the last time errors were reset. This command uses the same syntax and prints the same information as is displayed by using the **dspclnerrs** command. The **clrclnerrs** command clears the error counters for circuit lines by resetting all error counts to 0.

Syntax

prtclnerrs

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	Yes	IGX			Yes	

Related Commands

clrtrkerrs, prttrkerrs

prtcons (print connections)

Prints a summary of connections terminated at the IGX node. This command uses the same syntax and prints the same information as is displayed using the **dspcons** command. See the **dspcons** command for syntax and output information.

Syntax

prtcons [start_channel] [nodename] [type]

Parameters

Parameter	Description
[start_channel]	Optionally specifies the starting channel. On a CDP or CVM, the format is *slot.channel*. On a UVM, the format is *slot.line.channel*.
[nodename]	Optionally specifies that only connections to this remote node from the local note be displayed. If no “nodename” is designated, connections from the local node to all other nodes are displayed.
[type]	Optionally specifies that only connections of the specified type appear. If you do not include a connection-type argument, all connections appear. Connection types require a hyphen (-). Valid connection type entries are: -v = Display only voice connections. -d = Display only data connections. -atfr = Display Interworking connections. -g = Display grouped connections. -abit = Display A-bit Status. -fabit = Display A-bit Errors. -fail = Display failed connections. -down = Display downed connections. -f = Display Frame Relay connections. -nni = Displays Frame Relay network to network connections for failed connections only. The state that may be displayed for Frame Relay and NNI connection types includes: OK: Connection OK, A-bit = 1. FAILED: Connection failed, A-bit = 0. MISSING: DLCI was deleted in other network NNI. A previous status report indicated a valid DLCI present but an updated report did not. UNUSED: The UNI port does not support reporting of NNI A-bit status.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	IGX			Yes	

Related Commands

dspcons

prtict (print interface control template)

Prints the configuration details for voice channels or data channels. This command uses the same syntax, and prints the same information as is displayed by using the **dspchcnf** command. See the **dspchcnf** command for syntax and output information.

Syntax

prtict <port> <template>

Parameters

Parameter	Description
<port>	Specifies the channel containing the data card. The start channel has the format *slot.port*.
<template>	Specifies which control template to display for the channel. Three templates are available for data channels. One template (option "a") is available for Frame Relay ports. You can also specify the near or far end of the connection. a = Active control template (normal operation). The only choice for a Frame Relay port. c = Conditioned control template (when connection fails). l = Looped control template (with local or remote loopback). n = Near. f = Far.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	No	IGX			Yes	

Related Commands

cnfict, cpyict

Example

Print the active interface control template for 25.1.

prtict 25.1

The command produces hardcopy.

prtjob (print job)

Prints this information about a specific job:

- Job number
- Job description
- Next execution date and time
- Status
- Interval. The time interval between successive executions of the job
- Execution. The results of the last execution of the job

To print a job, you must have at least the same (or higher) privilege level as the person who wrote the job). See the **addjob** command definition for more information. The **prtjob** command uses the same syntax and prints the same information the **dspjob** command.

Syntax

prtjob <job_number>

Parameters

Parameter	Description
<job_number>	Specifies the number of the job to be printed.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

dspjob

prtjobs (print jobs)

Prints this information about all existing jobs:

- Job number
- Job description
- Next execution date and time
- Status
- Execution interval between jobs
- Access Group: The privilege level required to run or display the job

For a printout on a single job, use the **prtjob** command. This command uses the same syntax, and prints the same information as is displayed by using the **dspjobs** command. See the **dspjobs** command definition for syntax and output information.

Syntax

prtjobs

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	Yes	BPX, IGX			Yes	

Related Commands

dspjobs

prtlnerrs (print physical line errors)

Prints the accumulated error count since the last time errors were reset. This command uses the same syntax and prints the same information as the **dsplnerrs** command. The **clrlnerrs** command clears the error counters for circuit lines by resetting all error counts to 0.

Syntax

prtlnerrs

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

dsplnerrs

prtlns (print line configuration)

Prints the current line configuration and line alarm status for a node. This command uses the same syntax, and prints the same information as the **dsplns** command. See the **dspclns** command definition for syntax and output information.

Syntax

prtlns

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

dsplns

prtlog (print event log)

Prints the event log for a node. Events affecting the node are displayed in chronological order with the most recent events at the top of the log. The printout includes a description of the event, the date and time of the event, and the alarm class of the event.

This command uses the same syntax and prints the same information as the **dsplog** command. See the **dsplog** command definition for output information.

Syntax

prtlog

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

dsplog

prtnw (print network topology)

Prints the network topology table. Alarms print in a column, and added trunks (by **addtrk**) appear to the right to the node name. Each trunk entry shows the local back card slot number and the node name and back card slot number on the other end of the line.

These conventions apply:

- An ~ indicates the trunk is a satellite line.
- Flashing entry indicates a failed line.
- Blinking node indicates a node is executing downloader software.

Parameters set Zero Coded Suppression (ZCS) display characteristics. ZCS writes a 1 over the least significant bit of any byte that contains 0s. The purpose is to ensure a minimum occurrence of 1s so that the receiving node can extract timing information. The **prtnw** command uses the same syntax and prints the same information as the **dspnw** command.

Syntax

prtnw [+b | -b] [+z | -z]

Parameters

Parameter	Description
+b	Display only the lines that support bursty data.
-b	Display only the lines that do no support bursty data.
+z	Display only the lines that use ZCS encoding.
-z	Display only the lines that do not use ZCS encoding.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

dspnw

prtrts (print connection routes)

Prints the connection routes for channels on the IGX node. This command uses the same syntax and prints the same information as the **dsprts** command. See the **dsprts** definition for output information.

Syntax

prtrts [start_channel] [dest_nodename]

Parameters

Parameter	Description
[start_channel]	Specifies the channel with which to print. Channels are printed in numeric order. If no starting channel is specified, the display begins with the first connected channel. Start channel is specified in one of these formats: slot.channel voice connection. slot.port data connection. slot.port.DLCI Frame Relay connection. remote node.groupname Frame Relay connection group.
[dest_nodename]	Specifies the printing of connection routes from only the local node to the current node (destination node). Without a specified node name, the printout shows connections from the local node to all other nodes.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	IGX			Yes	

Related Commands

dsprts

prtscrn (print terminal screen)

Prints the information on the screen at the time the command is entered. All information on the terminal screen is printed. If printing is successful, no status message appears. If the printer is unavailable, an appropriate status message appears.

Syntax

prtscrn

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

clrscrn, redscrn

prttrkerrs (print trunk errors)

Prints a summary of the trunk error counts for both physical and virtual trunks on the local node. This is the same information that displays when you use the **dsptrkerrs** command. See the **dsptrkerrs** command definition for output information.

Syntax

prttrkerrs

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

dsptrkerrs

prttrkict (print trunk interface control template)

Prints the interface control template of a subrate trunk. For a list of configurable outputs and configuration steps, see the **cnftrkict** description. The printed information includes:

- Specified line
- Associated leads and their status
- Whether output follows a local input
- Name of the local or remote input lead that the output lead follows

Syntax

prttrkict <*line*>

Parameters

Parameter	Description
line	Specifies the trunk interface control template.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	No	IGX			Yes	

Related Commands

dsptrkict

prttrks (print trunks)

Prints the trunk configuration for the node. This command uses the same syntax and prints the same information as the **dsptrks** command.

Configuration information for trunks includes the trunk number and the type of line (T3, E3, and so on). For trunks that have been added to the network with the **addtrk** command, the configuration information also includes the node name and trunk number at the other end of the line.

Note these printout characteristics:

- Those trunks that show a "–" in the "Other End" column, have been *upped* with the **uptrk** command but not yet *added* with the **addtrk** command.
- The Other End column shows the node name and slot number of the other end of the trunk.
- Names of disabled trunk appear as light text in the printout.

Syntax

prttrks

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			Yes	

Related Commands

dsptrks

prtyred (print Y-cable redundancy)

Prints the Y-cable redundancy configuration for an SDP, LDP, CDP, FRP, FTC, or NTC.

The command **prtcdred** is an alias for **prtyred**.

On an IGX node, the cards are the HDM, LDM, CVM, FRM, NTM, UXM, UFM, and UVM.

On a BPX node, the applicable cards are the BCC, ASI, and BNI.

This command uses the same syntax and prints the same information as the **dspyred** command. See the **dspyred** command definition for details on the format of the command output.

Syntax

prtyred <start slot>

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			Yes	

Related Commands

dspyred, **addyred**, **delyred**

Example (IGX)

Print Y-redundancy for all cards (no starting slot entered)

prtyred

Prints the card redundancy configuration for a BXM card with an OC-3 or OC-3 interface. This command uses the same syntax and prints the same information as the **dspyred** command. See the **dspcdred** command definition for details on the format of the command output.

redscrn (redraw the terminal screen)

Redraws the screen. This command can be useful for communication that involves a modem. If data has become corrupted and caused erroneous characters on the terminal screen, **redscrn** clears them.

Syntax

redscrn

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			No	

Related Commands

clrscrn, prtscrn

Example (IGX)

redscrn

```
sw180          TN    Cisco          IGX 8420  9.3.2J    Oct. 25 2000 06:39 GMT

FrontCard  BackCard                         FrontCard  BackCard
   Type  Rev  Type     Rev  Status             Type  Rev  Type     Rev  Status
1  NPM   BVS                Standby      9  FRM   KSB  FRI-T1   AL   Standby
2  NPM   BWS                Active       10 Empty universal backplane
3  Empty universal backplane             11 Empty universal backplane
4  UXM   CD23 T3       AA   Active       12 URM   AA11 2FE2V    EW   Standby
5  UXM   CA23 OC3      AD   Active       13 LDM   CK03 232-8    AJ   Standby-T
6  FRM   DHZ  FRI-V35  BD   Standby      14 URM   AA13 2FE2V    P03  Standby
7  Empty universal backplane             15 URM   AA12 2FE2V    EW   Active
8  NTM   FHF  T1       AL   Active       16 Empty universal backplane


Last Command: redscrn
```

resetcd (reset card)

Resets the hardware and software for a card. Use the **resetcd** command to switch between a primary and redundant service card that has been configured for Y-cable redundancy. Normally, a failure would cause a switch between Y-cabled cards, but you might want to cause the switch to remove the active card to upgrade its hardware, for example.)

Do not use **resetcd** on an *active* NPM or BCC because resetting an active controller card interrupts traffic while it boots. (Resetting a controller card does not destroy configuration information.) If a redundant controller card is present and you want to switch between controllers, use the **switchcc** command to switch the active controller card to standby and the standby controller card to active. You can subsequently reset the standby controller without bringing it to the active state (and therefore not disrupt service).

You might use the **resetcd r** command is if you ran out of memory and had no standby card. If there were a memory leak problem somewhere in the system, you might execute a **resetcd r** command before you run the **switchcc** command (if you do not have a standby card, or you are not sure of the health of the standby card if there is one), then you might execute it locally on the active processor card (BCC or NPM). You do not need to enter the minus symbol before the “r” in the **resetcd r** command (just **resetcd r**) is acceptable.

The **resetcd** command takes an argument to indicate a hardware or failure reset. A hardware reset (**resetcd h**) is equivalent to physically removing and reinserting the front card and causes the card’s logic to be reset. When you reset the hardware of an active card other than a controller card (an NPM or BCC), a standby card takes over if one is available. A *failure* reset (**resetcd f**) clears the card failures associated with the specified slot. If a slot contains a front card and back card, **resetcd** resets both cards. A **resetcd r** performs a card reset on processor cards (such as an NPM or BCC). Note when the node is in degraded mode, the “r” option is disabled.

You can use the **resetcd** command to initiate a hitless rebuild manually. The Hitless Rebuild feature provides the ability to effectively rebuild without affecting user traffic. It substantially decreases the time it takes for the BPX to settle into its normal operating state after a rebuild.

The option “r” lets you manually initiate a hitless rebuild on processor cards only. The “r” option becomes disabled when the node is in degraded mode.

Syntax

resetcd <slot_num> <reset_type>

Parameters

Parameter	Description
<slot_num>	Specifies the card number to be reset.
h | f	Specifies whether the hardware or failure history for the card is to be reset. h–specifies hardware; performs a hardware test f–specifies failure history; performs a failure reset
b	Specifies to use hardware to reset the card, not the CBUS message. This option is also known as the “arbiter” option. You can use the b option only on BPX nodes.
r	Specifies that a hitless rebuild is performed only on processor cards.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	Yes	Yes	BPX, IGX			Yes	

Related Commands

resetcd

resetpc (reset port concentrator)

Resets a PCS attached to a specified FRM-2 or FRP-2 physical port on the IGX. Concentrated links, logical ports, and all connections are temporarily suspended while the PCS hardware performs a warm boot.

Once the PCS re-establishes communication with the FRM-2 or FRP-2, logical ports are reconfigured and connections repaired. A series of messages describing each of the concentrated links failing and being re-established is generated.

Syntax

resetpc <slot.port>

Parameters

Parameter	Description
slot.port	Specifies the card and port number to reset.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	Yes	Yes	BPX, IGX			Yes	

Related Commands

tstpcs, dsppcs

rrtcon (reroute connection)

Manually reroute one or more connections.

This command forces a group, channel, or range of channels to be rerouted. If a free-routing connection is rerouted by the system for whatever reason, it will not automatically return to its original route when the trouble clears. This might leave the connection on a path that is not the most direct or cost effective.

You can use **rrtcon** to force a reroute that will likely put the connection back to its original route if that route is available. Over time, many routes may need to be rerouted back to their original paths. In this case, use the "*" parameter with **rrtcon** on the node where you originally executed it to reroute all connections.

To use this command you must first vt to the node that owns the connection (local node). If not at the local node, the system displays "This node is not owner of the connection(s)."

There is no provision for specifying a route. The node determines the connection route according to the same rules that are used when adding a new connection. If no network bandwidth is available for rerouting the connection, the node marks the connection as failed.

Caution Using this command on a connection that is in service should be done with some discretion because the reroute interrupts service for as long as it takes to reroute the connection.

Syntax

rrtcon <group | channel | *>

Parameters

Parameter	Description
<group | channel | *>:	Specifies a group, a channel, or a range of channels to be rerouted. A * specifies all locally owned groups and connections.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX			Yes	

Related Commands

drtop

rstrtr (reset router)

Resets the Universal Router Module (URM) on a specified router slot. The URM is functionally equivalent to a UXM card with one ATM port and an IOS router. The **rstrtr** command does not reset or restart the embedded UXM on the URM.

In normal operation, verify the source of the IOS configuration file before using the **rstrtr** command. The source of the IOS configuration file can be either the router BRAM, which stores the running IOS configuration file, or the NPM, which stores a blank default configuration file. Upon reset, the IOS processor reloads the configuration file from the source specified in the IOS-config-file parameter. When the router BRAM is specified as the IOS configuration file source, the router resumes normal operation upon reset.

Use the **dsprtr** command to display the specified source of the IOS configuration file. Use the **cnfrtr** command to change the source of the IOS configuration file.

Syntax

rstrtr <router-slot>

Parameters

Parameter	Description
router-slot	Specifies the virtual shelf slot to support the URM embedded router. Range: 1–32 Switch software manages the embedded router in the URM as if the router resides on a slot in a virtual shelf (of routers). Each slot in the IGX shelf has a corresponding router slot in the virtual shelf. A router slot is considered empty when the equivalent IGX slot is empty or contains an IGX card without an embedded router. If the IGX slot contains a URM card, the router slot is reported as hosting an IOS router.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnfrtrparm, cnfrtr, dsprtr, dsprtrslot, dsprtrslots, dspalms

Example

Reset the URM embedded router on router slot 6.

rstrtr 6

```
sw108          TN    Cisco          IGX 8420  9.3.2E    Sep. 5 2000  09:05 GMT
```

```
This Command:rstrtr 6


Reset router with above configuration ? (y|n) y
```

rststats (reset statistics collection time)

The **rststats** command resets the statistics collection time for the **tststats** command. Executing **rststats** clears all statistics. When you enter it, a prompt warns you that the command clears all statistics and asks if you want to proceed.

The **tststats** command displays a test statistics summary. Before there will be any meaningful statistics, the **tstcon** command must be performed on one or more network connections.

Syntax

rststats

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	No	BPX, IGX			Yes	

Related Commands

tststats

Example (IGX)

rststats

```
alpha32        LAN   SuperUser       IGX 8430      9.3     Apr. 13 2000 13:35 PST









This Command: rststats

Warning: This command clears all statistics
Continue?
```

runcnf (run configuration)

Restores a network configuration image at one or all nodes. This command restores the specified configuration to the controller card's BRAM memory and overwrites the current configuration. Once restored, the specified node (or all nodes) rebuilds with the restored configuration image.

To execute this command on an IGX/AF interface shelf, Telnet to the shelf or use a control terminal attached to the shelf.

This command is usually run after a previous configuration has been lost. If doubts exist about the state of the configuration at other nodes in the network, load the configuration into all nodes by specifying "*" for the node name. The new configuration must have previously been loaded into the controller buffer area by using the **loadcnf** command.

Caution All network nodes must be run with the same configuration.

The system may display two warnings in response to the **runcnf** command:

1. When single node specified:
   - Warning—node_name not reachable. Continue? Y/N.
   - Warning—node_name does not have the specified configuration. Continue? Y/N.
2. When all nodes specified:
   - Warning—all nodes not reachable. Continue? Y/N.
   - Warning—all nodes do not have the specified configuration. Continue? Y/N.

If a single node is not reachable, responding with a "Y" does not affect the operation of the network. If nodes do not all have the specified configuration or all are unreachable, it is not recommended that you continue until after the problem is resolved.

Syntax

runcnf <backup_id> <node_name>

Parameters

Parameter	Description
<backup_id>	Specifies the name of the configuration image loaded from Cisco WAN Manager. Configuration names are case-sensitive.
<node_name>	Specifies the node name to receive the configuration. An asterisk (*) specifies all nodes.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

savecnf, **loadcnf**, **clrcnf**

runjob (run a job)

Runs a job. The **runjob** command runs a job regardless of its execution time. The **runjob** command does not change a job's assigned execution time.

When you enter **runjob**, the system displays the job template and prompts, "Run this job (y/n)?" Enter "**y**" to start the job. Enter "**n**" to exit **runjob**.

After you enter y, four seconds pass before a job begins running. Press any key briefly to suspend a job. Four seconds of no keyboard activity must pass before the jobs resume. While a job is running, the system highlights the current command and updates command results.

You can include the **runjob** command in a job. Therefore, running one job can cause another job to run. The only limitation is that a job cannot cause itself to run. For example, Job 1 cannot include the command "runjob 1." Also, Job 1 cannot include the command "runjob 2" if Job 2 contains the command "runjob 1."

Syntax

runjob <job_number>

Parameters

Parameter	Description
<job_number>	Specifies the number of the job to run.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	Yes	BPX, IGX			Yes	

Related Commands

addjob, dspjobs, editjob, stopjob

Example (IGX)

Run job 1.

runjob 1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 14:23 PST

                                  Job 1   test
Last Execution Results: None                    Status: Idle
Next Execution Time: 03/17/96 11:00:00          Interval: 1 days

 1: prtlog
   - Failure Reaction: Repeat 2 Times and Abort        Exec. Results: None

This Command: runjob 1
Run this job (y/n)?
```

runrev (run revision)

Runs a specific revision of the system software at a node. This command sets the primary revision for the specified nodes. The primary software revision is the one that is actively controlling node operation. You can also load a non-active secondary revision that differs from the primary revision running in the controller. To set the primary software revision, enter one of the following:

- **runrev a.b.cd ***—To run revision a.b.cd at all reachable nodes.
- **runrev a.b.cd nodename**—To run revision a.b.cd at a single node (nodename) only.

After entering the command, the system responds with "Enter Rev Number." Use the **dsprevs** command to determine which revision(s)—primary and secondary—are available on the node. The **runrev** command also displays the lowest revision running in the network. The **runrev** command will be ignored if the required revision is not present on the node.

You might need to load the new revision onto the Cisco WAN Manager terminal and then use **loadrev** command to download the new software image into the standby controller before you issue the **runrev** command. If you enter a revision number that does not exist at the node, the system displays:

"Warning—the node does not have the specified revision. Continue? Y/N"

If statistics collection is enabled at the time the **runrev** command is issued, a prompt is displayed, allowing the user to disable collection. If the user selects "yes," statistics collection is disabled.

Caution All network nodes typically should be run with the same software revision to ensure normal network operation.

Syntax

runrev <revision> <node_name | group_name | *>

Parameters

Parameter	Description
<revision>	Identifies the revision you want to run.
<node_name>	Specifies the node name to rebuild with a new configuration.
<group_name>	Specifies a subset of nodes in the network.
*	Specifies all nodes in the network.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	Yes	BPX, IGX			Yes	

Related Commands

dsprevs, **loadrev**, **cnfdlparm, upggrp**

savecnf (save configuration)

Takes a snapshot of the existing node configuration, saves it in RAM buffer files, then uploads the files to a Cisco WAN Manager (CWM) or TFTP network server, where they are stored on disk.

Note Starting with Release 9.3.30, the TFTP Configuration Save and Restore feature enables use of the standard TFTP protocol for network configuration backup to a server other than CWM. For detailed information on this feature, see the "TFTP Configuration Save and Restore" section on page 4-447.

The **savecnf** command has two possible applications. It saves:

- the configuration of one node or all the configurations for all the nodes in a routing network, or
- it saves the configuration of one IGX/AF interface shelf.

Once saved, you can restore the configuration to the controller card's BRAM by using the **loadcnf** and **runcnf** commands. You should execute **savecnf** in these situations:

- After making any configuration changes in a network
- Before upgrading to a new system software release

Execution on a Routing Node

In a routing network, **savecnf** saves a configuration image for one node or all routing nodes (*nodename* = *) on the Cisco WAN Manager workstation specified by *CWM_nodename* or on a TFTP network server specified by *destination_IP*.

From the CLI, the following example saves the configuration of one node connected to a TFTP server.:

savecnf r93nov17 nodeA * 172.29.9.25 T /usr/users/svplus

The next example from the CLI saves the configuration of all the nodes through one node connected to a TFTP server.

savecnf r93nov17 * * 172.29.9.25 T /usr/users/svplus

Execution on an IGX/AF Interface Shelf

To execute **savecnf** on an IGX/AF, either Telnet to the shelf or use a control terminal attached to it: **savecnf** saves a configuration image of only the current shelf. The image is stored on the workstation with the IP address in the parameter *CWM_nodename*. (In a routing network, *CWM_nodename* is not necessary.) Note that *nodename* and *CWM_nodename* must *both* be the name of the shelf. The IP address of the destination Cisco WAN Manager workstation uniquely identifies where to store the configuration image.

Syntax

savecnf <backup_id | clear> <nodename | *> <CWM_nodename | *> [<destination IP>] [<T>] [<pathname>]

Parameters

Parameter	Description
backup ID	Specifies the name of the configuration file to be saved. The name must be 1-8 alphanumeric characters, and the first character must be alphabetic. Configuration names are case-sensitive.
clear	An optional parameter that clears the buffer space in RAM of any old configuration files before the new configuration snapshot is taken. You must explicitly clear the buffer before it can be loaded with a new file.
nodename	Specifies the name of the node that is to have its configuration saved. The wildcard option, specified by an asterisk (*), is used in place of nodename to indicate all nodes are to have their configuration saved.
CWM nodename	Specifies the name of the node that has the CWM attached. The node name identifies the gateway node of the destination CWM for the configuration save. As an option, an asterisk (*) can be entered to indicate that the CWM IP address is to be used to identify the destination CWM.
destination IP	An optional parameter that specifies the IP address of the CWM or TFTP network server that is the source for the configuration restore. You can only enter this parameter when an asterisk (*) is entered for CWM Nodename.
T	An optional parameter that specifies TFTP is used for data transfer instead of the CWM proprietary protocol.
pathname	A new optional parameter that can be configured when TFTP is being used for data transfer. It indicates the directory path name where the backup files are stored.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	Yes	Yes	BPX, IGX, IGX/AF			Yes	

Related Commands

loadcnf, **runcnf**, **clrcnf, dspcnf**

TFTP Configuration Save and Restore

In Releases prior to 9.3.30, the configuration save and restore facility used a proprietary protocol for communication between the nodes and CWM only. With the Release 9.3.30 TFTP Configuration Save and Restore facility, standard TFTP protocol can be used to backup the BPX/IGX node configuration to a network server other than CWM. The network server can be any machine that is connected to a LAN attached to the network, has a TFTP server and disk, and is used to store configuration files. Configuration files that are saved using the TFTP method can be restored using the proprietary method, and vice versa, as long as the files are stored in the correct directory with the correct file names assumed by the proprietary protocol.

The TFTP Configuration Save and Restore facility also includes an SNMP interface for initiating configuration save and restore requests and reporting errors and status. This new interface allows the use of other network management platforms running SNMP managers for driving network management functionality in the WAN.

The TFTP Configuration Save and Restore facility also includes a TFTP Start file interface for initiating a configuration save and restore request. The TFTP Start file follows the same format used for a firmware download request. The name of the Start file indicates whether a Save or Restore is being requested. A TFTP Put of the start file is sent to the node for a Configuration Save request and a Configuration Restore request. Upon receipt of the TFTP Start file, the node drives the save and restore process in the same manner as it does with a CLI or SNMP request.

The TFTP Configuration Save and Restore process using CLI commands includes the following steps:

- Use the **cnfswfunc** command to enable the configuration save and restore facility. (The **cnfswfunc** command is a Cisco service command.)
- Use the **cnfsysparm** command to specify the parameter "Num of Nodes Doing Simultaneous TFTP Cnfg Save/Restore." This value for the parameter must be the same on all nodes.
- Use the **cnfnodeparm** command to specify the IP Relay Gateway node. This parameter must be configured separately on each node. However, this step is only necessary if the node has no LAN connection to the TFTP server, and therefore, needs to use IP Relay to transfer TFTP data to the server. If the LAN connection to the server exists, it is preferable to use it. Leaving the "IP Relay gateway node" parameter set at the default value of 0 will allow the node to use the LAN connection.
- Use the **cnffwswinit** command to specify the IP address of the network server authorized to initiate the configuration save and restore operation using the TFTP Start file or SNMP interface.
- Use the **dspcnf** command to display the configuration save/restore status for all network nodes.
- Clear the buffer in RAM. The RAM buffer stores files and images from three separate facilities. It is not required to clear the buffer if it currently contains the old configuration files from the previous Save/Restore operation. In fact, a new Save/Restore request can interrupt one that is in process. The RAM buffer only needs to be cleared if it currently contains files from other features; for example firmware or software downloads or a URM Remote Router Configuration download. In such instances, use the **savecnf clear** command to clear old configuration files stored by the configuration save and restore facility. Use the **getfwrev** command to clear firmware images stored by the Firmware Download facility. Use the **clrrtrcnf** command to clear IOS configuration files stored by the URM Remote Router Configuration facility.
- Create a directory and files on the target network server. This step is performed automatically by CWM when proprietary protocol is used. The Configuration Save process stores the files on CWM disk in a newly created directory with the following pathname:

  ```
  /usr/users/svplus/<backup_id>_Cfgdir
  ```

  When TFTP is used, you must create the directory and files manually or create a script that automatically generates the files. Make sure the directory and files have read and writer permissions enabled for everyone to have access; otherwise, the node will not be able to write (save) or read (restore) from the server. Also, the directory and file formats must follow the same conventions as the proprietary protocol. The following is a list of conventions.

  – The backup_id is the name given by the user to the saved configuration. For each node, the configuration consists of three files. If a backup of the entire network is made through a single request, then there will be a single backup_id, and files for all nodes are stored in the same directory. The files have names in the following format, based upon the domain number (currently always 1) and the name of the node:

  - D1.<nodename>.000. A small file containing the basic boot configuration.

    - D1.<nodename>.001. A large file containing online configuration.
    - D1.<nodename>.cfg. A small Image Descriptor file, containing information about the other two files (CRCs, addresses, etc.).
- There is currently a set of user interface commands that is used to create the files indicated above, and to drive the Configuration Save and Restore process. These are described in the next few sections.
- Use the **savecnf** command to start the upload process to CWM or other network server.
- Use the **loadcnf** command to start the download process from CWM or other network server.
- Use the **runcnf** command to restore the node configuration.

stopjob (stop job)

Stops all running and all waiting jobs. When you enter the **stopjob** command, the system prompts, “Stop all running and waiting jobs (y/n)?” Enter a “**y**” to stop running jobs and prevent all waiting jobs from beginning. Enter an “**n**” to exit **stopjob**. Because the **stopjob** command can leave a task partially executed, use **stopjob** with caution. You must have at least the same or higher privilege level of the creator of the jobs you want to stop.

Syntax

stopjob

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	No	No	BPX, IGX			No	

Related Commands

runjob

Example (IGX)

Stop all jobs currently running or queued to run on the node. Confirm by entering **y**.

stopjob

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 14:24 PST

                                  Job 1   test
Last Execution Results: None                   Status: Idle
Next Execution Time: 03/17/96 11:00:00         Interval: 1 days

 1: prtlog
   - Failure Reaction: Repeat 2 Times and Abort        Exec. Results: None





This Command: stopjob


Stop all running and waiting jobs (y/n)?
```

upggrp (upgrade groups)

The **loadrev** and **runrev** commands take “upgrade group” names as arguments, allowing you to upgrade any subset of nodes at the same time.

Previous to Release 9.1, you could specify either a single node name, or an ‘*’ (asterisk) to specify all nodes in the network, as an argument to **runrev** or **loadrev**. An upgrade group is a list of nodes, which could be all nodes in the network. Instead of running **runrev** for each node to be upgraded, upgrading an entire group of nodes at one time leads to a synchronized upgrade process (which the “staggered update mechanism” relies on). The staggered mechanism prevents a situation where many nodes send messages to a single node at the same time.

After an upgrade, each node requests information from every node about its topology and connection database to compensate for any errors or race conditions that may occur during the upgrade. Every node sends its messages to only one node during a given interval. If all nodes start sending these updates at the same time (and the interval is configured the same on all nodes), then all nodes will send messages to different nodes as everyone has a different node number. Whenever the interval ends, they start sending to a node with the next node number. If they would not start at the same time, there would be overlaps as one node could be in its first interval, whereas others are already in the second or third interval.

If all nodes start at the same time, it is guaranteed that one node will exchange updates with only one other node during a given interval, reducing the amount of stress that would occur when multiple nodes send updates to one node at the same time.

This command creates a group of nodes to be upgraded by the **loadrev** and **runrev** commands. To create an upgrade group type

upggrp -c <group name>

You can create up to 20 upgrade groups. Naming the upgrade groups follows the same convention as for node names; that is, choose group names that are different from the node names in the network. If **loadrev** or **runrev** encounter a name conflict, the commands chose the node name interpretation.

Note Upgrade groups are only known on the node where they are created. They are neither sent to the Standby, nor saved in BRAM. It is assumed they are needed for a short time only. Once the upgrade is done, you can delete the groups.

To delete an upgrade group that is no longer needed, freeing up resources, enter:

upggrp -d <group name>

To show (list) the currently defined upgrade groups, enter:

upggrp -s

To list all the member nodes of a group, enter:

upggrp -s <group name>

To remove a node or several nodes from an upgrade group, enter:

upggrp -r <group name> <node 1> <node 2>...

To add several nodes to an upgrade group, enter:

upggrp -a <group name> <node 1> <node 2>...

After the command is executed, the members of the group are listed. You can add nodes to an upgrade group in multiple iterations.

Syntax

upggrp [-c | -d | -s] <group_name>

upggrp [-a | -r] <group_name> <node_list>

Parameters

Parameter	Description
-c	Create a user group.
-d	Delete a user group.
-s	Show the defined upgrades groups.
-a	Add nodes to the group.
-r	Remove list of nodes from group.
<group name>	Name of group of nodes to be upgraded.
<node_list>	The length of the node list can be as long as the command line allows. If an entry is invalid, that is, it is not a valid node name or not a name of a node in the network, an error message prints, and the remainder of the node list is not processed. The nodes before the invalid node are added to the group.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

dsprevs, cnfdlparm, loadrev, runrev

switchapsln (control APS switching interface)

Control the APS switching interface. You use the **switchapsln** command, along with other APS commands such as **addapsln**, **delapsln**, **dspapsln**, **switchapsln**, and **cnfapsln** to configure and control a SONET APS (Automatic Protection Switching) line for a BXM OC-3 or OC-12 card. SONET APS is a standard that describes the switching of SONET lines from the active line to a standby line to provide hardware line redundancy.

Several options are available that determine the type of switch operation:

- *Clear*—clear user switch request. This option clears the last user switch request and sets the switching state machine to fully automatic hardware control.
- *Forced Switch (Working to Protection* or *Protection to Working)*—the forced switch forces hardware to switch to the standby line even if it is in alarm.
- *Manual Switch (Working to Protection* or *Protection to Working)*—the manual switch is lower priority than a forced switch and will cause a switch only if certain conditions are met.

Note It is recommended that you not use the *Manual Switch* option with Annex B configured when the BPX is connected to a third-party vendor's switch.

- *Lockout*—prevents switching from the working line to the protection line from taking place. A lockout request is cleared by a subsequent Clear request.
- *Service*—the service switch for the two-slot solution only. This request causes all lines to be forcibly switched to one back card so that the other card of the pair can be removed for service.

Be sure that the associated front card is active for the back card that is to remain in the rack. You might have to perform a **switchyred (**alias **switchcdred)** so that the back card to which the service switch switches has its associated front card active.

Note When Annex B is configured, **switchapsln** options are not blocked at the command line interface.

Syntax

switchapsln <slot.port> <switchoption> [S]

Parameters

<table>
<tr><th>Parameter</th><th>Description</th></tr>
<tr><td><slot.port></td><td>The working APS line to be switched</td></tr>
<tr><td><switchoption></td><td>Switch options:
1. Clear clears the last user request, returns state back to working line, resets to all defaults, and sets BXM to fully automatic line control.
2. Lockout of Protection—Prevents specified APS pair from being switched to protection line. If protection line is already active, switch is made back to the working line. (For Annex B, the working line is termed the “primary line,” and the Protection line is termed the “secondary line.”)
3. Forced Working to Protection Line Switch—If working line is active, switch is made to protection line unless the protection line is locked out or in the SF condition or Forced Switch is already in effect. Forces hardware to switch to the protection line even if it is in alarm.
4. Forced Protection to Working Line Switch—If protection is active, switch is made to working unless a request of equal or higher priority is in effect. P-->W switch applies only in the 1+1 architecture. If protection line is active, switch is made to working line unless a request of equal or higher priority is in effect.
5. Manual Switch (Working to Protection Line)—Switch from working to protection line unless a request of equal or higher priority is in effect. Will not switch if other line is in alarm.
6. Manual Switch (Protection to Working Line). Not applicable to 1+1, Annex B.</td></tr>
<tr><td>[S]</td><td>If you enter S as an additional parameter, a service switch is performed for all ports on the card such that all lines are forcibly switched to one back card so that the other back card of the pair can be removed for service. Be sure that the associated front card is active for the back card that is to remain in the rack. You may have to perform a switchcdred command so that the back card that the service switch changes to has its associated front card active.</td></tr>
</table>

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1	Yes	Yes	BPX			Yes	

Related Commands

cnfcdaps, addapsln, delapsln, dspapsln, switchapsln, cnfapsln

switchcc (switch control card)

Switches the standby BCC or NPM card to active and the active card to standby. If a standby BCC card is not available, the command is not executed. If a standby BCC is available but is not ready to go active, a prompt asks you to confirm or abort the switch of the control card. Executing **switchcc** (previously called **switchpcc)** has this effect:

- Control is transferred to the standby controller card.
- Any job currently running is aborted.
- The user is logged off.

Immediately after the switch, the controller card that was previously active reverts to a download mode. This is indicated by the flashing front panel FAIL lamp. The system software image that is always stored in ROM is downloaded to RAM in the event that the system software was corrupted.

After this is completed, the configuration database is downloaded from the newly active controller card to complete the download. This process takes a number of minutes so this controller card is not available for standby operation until this download process is completed.

The **switchcc** command results in a very brief interruption of all traffic. Consequently, you should use **switchcc** only when the network can tolerate a brief interruption.

If the Hitless Rebuild feature is enabled (by using **cnfnodeparm** command), the databases needed for a hitless rebuild will be preserved during the subsequent standby rebuild. This allows for a hitless rebuild if the new standby processor encounters a fatal hardware error shortly after the switchover.

Syntax

switchcc [f]

Parameters

Parameter	Description
[f]	Forces a cc switchover even if there are pending updates. If you don't specify the [f] option, the system warns you about pending updates before the switch and gives you a choice to not switch over.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	Yes	No	BPX, IGX			Yes	

Related Commands

dspcd, dspcds

switchyred (switch Y-redundancy cards)

Switches active and redundant cards used for SONET APS (Automatic Protection Switching). The **switchyred** command is the same as the **switchcdred** command, and you can use it on any Y-cable redundancy card pair. You typically would use this command only when you need to perform diagnostics or maintenance, and you need to remove and service the active card.

Note When implementing two-card APS 1+1, it must be implemented with card redundancy. This implementation may also be referred to as "Y-redundancy," because the new card redundancy commands used to configure APS 1+1 are based on Y-redundancy commands used in releases previous to Release 9.2.

When there is a front card failure, front card downed, or the front card fails a self-test, the card switchover should happen automatically (that is, you should not need to execute the **switchyred** command for the card switchover to happen). An automatic switchover typically occurs when the switch software determines that the card is in a worse condition than the redundant pair (that is, a card is in a failed state due to a condition such as self-test, background test, fatal errors). If a standby card is not available, the **switchyred** command will not be executed.

Typically, when APS and card redundancy are implemented together, the term Y-redundancy actually refers to card redundancy because there is no Y-cable connecting two back cards to one line. With SONET APS card redundancy, there is a primary and a secondary front card/back card pair. The redundant front card must be in Hot Standby state before a switchover can occur. When a front card failure is detected, the switchover should happen automatically (when card redundancy has been implemented). However, for the APS application, the active line is not switched if the line status is good. If the line has Loss of Signal (or other defects), it will be switched to the redundant line. (The line refers to the physical cable attached to the output of the back card.)

For APS 1+1, a front card can switch and become the standby card while its associated back card still has the active lines. The APS line will not switch during a card redundancy switch, unless the APS firmware detects that an APS switch is needed.

Following a **switchyred**, or active card reset, the BXM card is sent a message from switch software to have it perform an APS switch to align itself with the last user **switchapsln** switch request. If the last user request is "clear," full automatic APS switching is in effect with the working line in the active state by default. When there is no last user request to switch to any particular line (that is, protection line), the working line becomes active.

Note In the APS 1+1 configuration, if the protection line is active and the last user request is "clear," a **switchyred** will cause the working line to be active if there is no line condition on the working line. When APS 1+1 comes up, it will come up on the working line if the working line is clear. When a **switchyred** is issued, the active card also comes up on the working line if the working line is clear and there is no user request. In cases where the working line is in alarm or there is a user request to switch to the protection line, the card will first come up on the working line, then the card will detect the alarm or the user request and switch to the protection line.

In the APS 1+1 configuration, if the last user request was a W->P switch, then **dsplog** will log a W->P switching event when a **switchyred** is issued. On a **switchyred**, the newly active card comes up on working line first. Then it responds to a user request to switch from working to protection by switching to the protection line and sending an event notification to that effect. You can see the event notification in the event log by using the **dsplog** command.

It may be necessary to perform a **switchyred** command after performing a service switch with the **switchapsln** command so that the back card that the service switch selects has its associated front card active.

The **switchyred** command is sometimes referred to as *soft y-red switching* (also known as the "graceful switching" feature). Use it to access the Y-redundancy switching feature already in the system. Executing the **switchyred** command performs a graceful Y-redundancy switch in that no cards need to be reset in the process of switching from the current active card to the current standby card. Thus, all the existing channel programming on both cards remain intact, and is ready to use in the case of a fault condition (where the newly active card is found to be faulty).

To implement similar preventative maintenance procedures, this command lets you switch active and standby cards, without resetting either card. If you intend to execute the switch once every two weeks, and if the standby card is faulty, in the current scheme, during reprogramming of the reset card, an outage is experienced. To do away with the outage period, the standby card should not go through a rebuild forced by the resetting of the card. With this feature, neither card is reset, and programming is continued on both cards. This type of reprogramming ensures that all channels are programmed again on the same card. It is transparent to the user, since all the channels were never deleted; they are being reprogrammed as is typical today in the case of a regular Y-redundancy switch.

The **switchyred** command operates on these BXM cards:

- Y-redundancy trunk cards
- BXM Y-redundancy port cards
- BXM Y-redundancy feeder cards

In addition, you can use the **switchyred** command on ASI cards and BNI cards. In any case where these cards are not supported, you will be blocked from executing the command at the command line interface. The **switchyred** command initiates the Y-redundancy switch. It can also be initiated through a job. The **switchyred** command is available through the same access login as the **addyred** command.

The **switchred** command lets you switch between cards of a Y-redundancy pair, avoiding any card resets or failures. The feature is needed to allow the customer fast failure recovery in the cases where the previously standby card is found to be at fault. The feature allows for the previously active card to maintain its configuration and availability, allowing you to switch to it, either through another soft Y-redundancy switch request, or through the automated Y-red switching (which executes upon card failure).

The graceful switching command (**switchyred**) is applicable to BXM, ASI cards, and BNI cards.

This command requires Release 9.1 software and beyond. The cards in question have to be programmed to be Y-redundant. The states of the cards have to be Active (for the Primary card) and Standby (for the Secondary card) OR Standby (for the Primary card) and Active (for the Secondary card).

The purpose of a graceful switch is to switch from the current active card of a Y-cable pair, to the current standby card of the pair, without deactivating, resetting, or reprogramming either of the cards.

You initiate a graceful switch by issuing a **switchyred** command at the command line interface or through an SNMP script. The input to the command is the primary card's slot number. You can obtain this information by means of the **dspyred** command, which lists the Primary card of a Y-redundancy pair, and the secondary card of the Y-red pair (see Table 4-42).

Table 4-42 switchyred–Example

Slot	Card Type	Other Slot	Front Card	Back Card
3	Pri	4	BXM	LM-BXM
4	Sec	3	BXM	LM-BXM

In the above example, a Y-red has been configured using slots 3 and 4, where slot 3 is identified as the Primary card (Pri) of the pair. Using the example shown in Table 4-42, the command line would look like this:

Next Command: **switchyred 3**

The **switchyred** command displays errors on the screen for the slot used in the command line if the following conditions exist:

- if the card slot is not configured for Y-redundancy
- if the state of both cards is not valid

The command line issues a warning and prompts you to continue in case any channel programming is in progress. (Continuing at this stage introduces the risk of encountering continuity problems for a short period of time until all remaining channels are programmed.)

After you issue the command, the switch software starts the process of the graceful switch.

First, turn off the laser of the current active card (by sending it an Ox05 cbus message). In effect, stop running traffic on that card.

Next, activate and start running traffic on the current standby card, forcing it to be the new active card of the pair. This process also starts the channel reprogramming of the cards, and allows for the new standby card to be reprogrammed.

All the steps required to complete the graceful Y-redundancy switch are in Release 9.2 with the only possible difference being that neither card is reset.

There are no backward compatibility issues related to the **switchyred** command in Release 9.1.

The **switchyred** feature introduces the concept of deactivating a card without a failed state being present, or deactivating the card, or the need to reprogram all the channels on the card.

The **switchyred** command kicks off the graceful switch process. After you issue the command, the switch software checks for and reports the following error conditions:

- If the input slot number is invalid (the valid ranges for the slot is 1–6 and 9–15).
- If the slot is empty, an error is displayed onto the screen indicating that the slot is empty.
- If the slot is not occupied by a BXM card, an error is displayed on the screen.
- If the card in the slot specified is not configured for Y-redundancy, an error specifies that the graceful switch command is executed for the y-redundancy feature. If no Y-red is configured on the card, graceful switching cannot be performed.

If the Y-redundancy pair (specified through the primary slot) contains cards in the incorrect state, a message is displayed onto the screen indicated the incorrect state of the cards. Valid states for the cards are:

- The primary card is in active state and the secondary is in standby state.
- The primary card is in standby state, and the secondary card is in active state. No other state combination is valid.

You are prompted to continue if the following is true:

- The switch software determines that channel programming is in progress for either of the cards in the Y-redundancy pair.

To choose to continue in this state implies that channels (connections) in the process of being programmed might not exist on the standby card after the graceful switching has completed, that is, the programming must be completed on both cards.

A message displays listing the cards being switched from, and the card being switched to, just before the graceful switching process begins.

After the switching process has been kicked off, the switch software does the following:

- Turns off the laser on the active card (stopping traffic).
- Puts the current active card into the standby state.
- Activates the current standby card to be the active one of the pair.

Event logging does not distinguish between a Y-redundancy switch due to a failure (beyond logging the indication of the failure), and a Y-redundancy switch due to the execution of the **switchyred** command.

Syntax

switchyred

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	Yes	No	BPX			Yes	

Related Commands

addyred, delyred, dspyred, prtyred,

tstbadubus (test NTM corruption problem)

Tests the NTM-UXM/NPM UBU corruption problem. You can use this any time you encounter a possible cell drop problem to make sure the problem is not caused by the UBU allocation. The **tstbadubus** command checks every allocated UBU to see if the above problem exists. If an allocation problem is detected, the falsely allocated UBUs will be displayed.

The NTM card has been known to corrupt Lane 1 of its previous UBU. But it affects only the cells, not FastPackets. Thus it may corrupt data for the UXM card (cells) and NPM (AAL5 cells) if their UBUs are located in front of the one for the NTM card.

For example, if UBU 2 is used by the NTM, the cells (not FastPackets) in Lane 1 of UBU 1 will be corrupted. Because the UXM and NPM are the only cards using the cells in the bus, the UBU immediately before the one used by NTM cannot be allocated to the UXM or NPM.

The UBU allocation software will not assign UBUs for a UXM and an NPM card, if it is next to the one for NTM (to avoid the problem mentioned above).

Workaround

If the **tstbadubus** screen shows something similar to the screen in Example 1, then reallocating the UBU to slot 8 might cure the problem.

Issue the **dspbusbw** <8> command to see how may UBUs are currently allocated to slot 8. If the allocated UBU is 10, then always add one more UBU to the card. Use **cnfbusbw** <*8*> <*11*> to allocate 11 UBUs to slot 8. Most of the time, this change can remove the corruption condition.

If the problem persists, then add two more UBUs to the card. The idea is that by adding one or two more UBUs to the card, the UBU locations to be allocated change, which may cure the problem. Reallocating one or two fewer UBUs may also work.

Syntax

tstbadubus

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
	Yes	Yes	IGX			Yes	

Related Commands

dspbusbw, cnfbusbw

Example

The twenty-fourth UBU in page 3 was "badly" allocated (causing corruption). It is allocated to the NTM located at slot 4. This UBU corrupts the UBU allocated to the UXM located at slot 8. A cell drop will be expected for slot 8 due to the corruption.

tstbadubus

```
sw152          TRM   SuperUser       IGX 8420  9.3    Apr. 13 2000 15:13 GMT

NTM-UXM UBU Corruption Test
```

```
Page UBU  NTM  UXM  Page UBU  NTM  UXM  Page UBU  NTM  UXM  Page UBU  NTM  UXM

 3   24    4    8


Total   1 Corrupted UBUs detected

Last Command: tstbadubus
```

tstcon (test connections)

Tests the integrity of an IGX data path by inserting node-generated test data. The connection service is affected for only a few seconds during the test. You can test only existing connections. One channel at a time is tested to minimize disruption. Because service is disrupted for a short time, no conditioning is applied during the test. If a failure is detected, the fault is isolated to a replaceable IGX node, and the standby card (if available) automatically goes into service. During fault isolation, conditioning is applied to both ends of the connection.

After testing is complete, you must use **dellp** to remove the loopback established by using **addlocrmtlp**.

The Automatic Management Routing **tstcon** procedure is not modified in Release 9.3.30. When **tstcon** is executed, the OAM loopback cells pass through the XPVC segment linking the AR-PNNI networks. When the **tstcon** command is executed on an XPVC segment, however, only the local Automatic Routing node information is displayed. The information for the remote PNNI node is not displayed, and the Remote Node Name and Remote Channel fields are blank. You must use the CWM or MGX Command Line Interface to display the remote PNNI node connection details.

Table 4-43 describes the results of executing **tstcon**.

Table 4-43 Results of tstcon Execution

Result	Description
Completed	Total number of tests that were run.
Aborted	Number of tests that did not run because the connection was not testable because of loopbacks or missing or failed hardware.
Failures	Number of tests that failed.
Repaired	Number of connections that failed a previous test and have passed the current test.

If you enter a range of channels (some with connections and some without), the unconnected channels are skipped. You can enter the **tstcon** command on the node at either end of the connection. Unlike the **addloclp** and **addrmtlp** commands, **tstcon** does not require external test equipment. You cannot test connections with the **tstcon** command if they are currently looped back with either the **addloclp** or **addrmtlp** commands.

Table 4-44 describes examples of the **tstcon** command with various arguments.

Table 4-44 Examples of tstcon Specification

Command	Description
tstcon *	Test all connections.
tstcon * f	Test all Frame Relay connections.
tstcon * v x	Test all voice connections, abort on first failure.
tstcon 1.3	Test connection on channel 1.3.
tstcon 4.2.200	Test connection on channel 4.2.200.
tstcon 1.13-16	Test connections on channels 1.13-16.
tstcon 3.21-24 x	Test connections on channels 3.21-24, abort on first failure.
tstcon 3.11-20 v	Test voice connections only on channels 3.11-20.

Table 4-44 Examples of tstcon Specification (continued)

Command	Description
tstcon 3.11-20 v x	Test voice connections only on channels 3.11-20, abort on first failure.
tstcon 3.21-22 v 5	Test voice connections only on channels 3.21-22 and repeat the test five times.
tstcon 3.14-15 d x 5	Test data connections on channels 3.14-15 and repeat test five times. Abort on failure.

For V.35 ports configured for DTE, these three conditions apply:

- Model D FRP, along with software Release 8.1 or higher, supports ForeSight dynamic congestion avoidance feature. The Model D FRP is required for the AIP application in system software Release 7.1. The enhanced V.35 loopback test is available with this card when using Firmware Revision F and system software 7.1.
- A loopback test pattern signal (Test Mode) is transmitted to a modem or NTU to initiate a loopback. Some modems and NTUs recognize this code but do not return the TM signal even though a loop has been set up. The FRPs, with the exception of the Model D Firmware Rev. F, wait to receive the TM signal from the external equipment before the data test is performed. If the FRP Model D Firmware Rev. F receives the TM signal return, it responds. If FRP Model D Firmware Rev. F does not receive the TM signal, it waits 10 seconds and then sends the test pattern. If the external equipment is inoperative or disconnected, the test fails. After the test is completed, transmission of the codes is terminated and the circuit returns to normal operation. The test result is displayed on the node's terminal **tstport** screen.
- Some external equipment supports loopback testing but does not recognize the loop test pattern signal (Test Mode) in the data stream. The FRP/FRI toggles the V.35 LLB (local loopback) or the LRB (remote loopback) leads and then sends the test pattern after the time-out period (10 seconds). If the external equipment is inoperative or disconnected, the test fails. The IGX control terminal displays the result of **tstport** execution.

Syntax

testcon <channel(s)> [-nolp] [type] [failure abort] [repeat count]

Parameters

Parameter	Description
channels	Specifies the specifies the channel or set of channels whose connections are to be tested. An "*" specifies all connections. Formats: slot.channel-voice connection slot.port–data connection slot.port.DLCI–Frame Relay connection slot.port.vpi.vci–ATM connection
-nolp	No automatic loopback. This parameter applies only to local-remote loopbacks and is mandatory for testing a multisegment connection in a tiered network.

Parameter	Description
type	Restricts the test to the designated connection type. If no connection type is designated, all connections are tested. v–Tests only voice connections. d–Tests only data connections. f–Tests only Frame Relay connections
x	Aborts the test as soon as a failure is detected. If an "x" is not entered, all specified connections are tested regardless of the test results for each individual connection.
repeat count	Specifies the number of times the test is to be repeated. If no test count is specified, the test is run once. Range: 1–50

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX	OK	OK	Yes	No

Related Commands

dspcons, dspcons

Example (IGX)

Test connection 9.1.100. The connections screen appears with the connection for channel 9.1.100 highlighted. The system prompts to confirm the test. A "T" after channel under test indicates that the test is currently running on that channel.

When the first test is completed, a message appears indicating the results of the tests. As each test is completed, the T moves to the next channel to be tested and the message is updated to include the cumulative results of the tests. When the test is completed for all the specified connections, the "T" disappears and the message indicates the total number of tests and the cumulative results of the test.

tstcon 9.1.100

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:04 PST

 Local      Remote      Remote                                        Route
 Channel    NodeName    Channel    State  Type    Compression  Code  Avoid COS O
 5.1 T      beta       )25.1       Ok     256                  7/8          0  L
 9.1.100    gamma       8.1.200    Ok     fr                                0  L
 9.1.200    gamma       8.1.300    Ok     fr                                0  L
 9.2.400    beta        19.2.302   Ok     fr(Grp)                           0  L
 14.1       gamma       15.1       Ok     v                                 0  L

Last Command: tstcon 9.1.100

Tests: Completed = 1, Aborted = 0, Failed = 1, Connections Repaired = 0
Next Command:
```

tstconseg (test connection segment)

Externally tests the integrity of a connection by sending OAM segment loopback cells over the specified channel for the specified number of times.

With Release 9.3.30, the BPX 8600 supports an Extended PVC (XPVC) that spans over an Automatic Routing Management (AR)-PNNI, or AR-PNNI-AR, hybrid network. However, the AR **tstconseg** procedure is not modified. When **tstconseg** is executed, the OAM loopback cells pass through the XPVC segment linking the AR-PNNI networks. When the **tstconseg** command is executed on an XPVC segment, however, only the local AR node information is displayed. The information for the remote PNNI node is not displayed, and the Remote Node Name and Remote Channel fields are blank. You must use CWM or MGX CLI to display the remote PNNI node connection details.

Table 4-45 describes the reported results of executing **tstconseg**.

Table 4-45 Results of Executing tstconseg

Result	Description
Completed	Total number of tests that were run.
Aborted	Number of tests that did not run because the connection was not testable because of loopbacks or missing or failed hardware.
Failures	Number of tests that failed.
Repaired	Number of connections that failed a previous test and have passed the current test.

Syntax

tstconseg <channel> <iteration count> [A | a]

Parameters

Parameter	Description
<channel>	Specifies the slot.port.vpi.vci of the channel to be tested.
<iteration count>	Number of times to repeat the test.
[A | a]	Specifies that the test be aborted if an error occurs (not case-sensitive).

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	BPX, IGX	OK	OK	Yes	No

Related Commands

dspcons

Example (BPX)

Test connection segment 11.2.10.17. The connections screen appears with the connection for channel 11.2.10.17 highlighted. The system prompts to confirm that the test should begin. A "T" after the channel under test indicates the test is currently running on that channel. When the first test is complete, a message appears indicating the results of the tests. As each test is completed, the T moves to the next channel to be tested and the message is updated to include the cumulative results of the tests. When the test is completed for all the specified connections, the T disappears and the message indicates the total number of tests and the cumulative results of the test.

tstconseg 11.2.10.17

```
nmsbpx23       TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 12:37 PST

 Local           Remote      Remote                            Route
 Channel         NodeName    Channel         State  Type       Avoid COS O
 11.2.10.17      nmsbpx23    11.1.11.17      Ok     atfst




This Command: tstconseg 11.2.10.17 1


Perform a tstconseg on this connection (y/n)?

----------------

nmsbpx23       TN    SuperUser       BPX 8620    9.3    Apr. 13 2000 12:38 PST

External Connection Segment Test

Status: Test Complete

Connection ID      Test Count     Failure Count  Success Count
11.2.10.17             1               1              0

Last Command: tstconseg 11.2.10.17 1


Next Command:
```

tstdelay (test connection round-trip delay)

Puts the remote end of the connection into a loopback state, requests the FRP (Frame Relay) or ASI (ATM) to generate a test packet, calculates and displays the round-trip delay (RTD). This delay includes the FRP or ASI and trunk queuing and processing delays throughout the network. The measured delay using **tstdelay** differs from the ForeSight RTD, which uses a high-priority packet and does not include processing and queuing delays.

Using the **tstdelay** command requires that the FRP is at least a Model D. This test interrupts transmission on the connection during the test. Test results appear at the bottom of the screen (this may include a timeout message, as in Example 1).

Testing an IGX node that has been configured as an interface shelf requires execution of **addlocrmtlp** prior to **tstdelay** and a **tstdelay** parameter that applies only to tiered networks (see optional parameter table). After testing is complete, the loopback established with **addlocrmtlp** must be removed by **dellp**.

Cisco BPX 8600 series switches now support an Extended PVC (XPVC) that spans over an Automatic Routing Management (AR)-PNNI, or AR-PNNI-AR, hybrid network. Both the AR BXM and PNNI AXSM interface cards support Enhanced UNI (EUNI) and Enhanced NNI (ENNI) port types. With the EUNI/ENNI port types, all new XPVC segment connections are programmed as “non-segment”. This non-segment status allows OAM segment loopback cells to flow through a multi-segment XPVC in the hybrid AR-PNNI network. Note that the **tstdelay** command cannot be executed at a ENNI endpoint if the XPVC segment connection remains programmed as “non-segment”.

The AR test delay procedure is slightly modified in Release 9.3.30. When **tstdelay** is executed, the OAM loopback cells pass through the XPVC segment linking the AR-PNNI networks. When the **tstdelay** command is executed on an XPVC segment, however, only the local AR node information is displayed. The information for the remote PNNI node is not displayed, and the Remote Node Name and Remote Channel fields are blank. You must use the CWM or MGX CLI to display the remote PNNI node connection details.

Syntax

tstdelay <slot.port.DLCI> [count] | tstdelay <slot.port.vpi.vci> [-nolp] [count] [y | n]

Parameters

Parameter	Description
<slot.port.DLCI>	Specifies the Frame Relay channel of the connection to be tested.
[count]	Specifies the number of times the test is to be repeated. If you do not specify a count, the test runs once. Range: 1–50
tstdelay	**<Reviewers, we need a parm desc.>**
<slot.port.vpi.vci>	Specifies the ATM channel of connection to be tested
[-nolp]	No automatic loopback. This parameter applies to only local-remote loopbacks and is mandatory for testing a multisegment connection in a tiered network.
[y | n]	Specifies that the ForeSight RTD is included and applies to ATM connections only.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–5	Yes	Yes	BPX, IGX	OK	OK	Yes	No

Related Commands

addlocrmtlp, dellp, dspcons, dspcons

Example (IGX)

Test the delay on Frame Relay channel 9.1.100.

tstdelay 9.1.100

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:05 PST

Conn:  9.1.100    gamma       8.1.200     fr
   MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR    FST
 9.6/9.6   9.6/9.6      5/5       256/256    10/10  65535/65535  9.6/9.6   n
% Util: 100/100
Owner: LOCAL  Restriction: NONE  COS: 0                     Status: Failed Test
Group: NONE  Priority: H  TestRTD: 0 msec

Path:     alpha   14--13beta    15--15gamma
Pref:     alpha   14--13beta    15--15gamma


alpha 9.1.100                                   gamma 8.1.200
FRP:   OK                                       FRP:   OK
FRI:   OK                                       FRI:   OK


Last Command: tstdelay 9.1.100

Test delay timed out
Next Command:
```

Example (BPX)

Test the delay on ATM connection 9.1.1.1. The first prompt that follows initial command entry is for whether the ForeSight RTD should be included. The second prompt is for confirming that the test should proceed.

tstdelay 9.1.1.1

```
bpx1           TN    SuperUser       BPX 8620    9.3       Apr. 13 2000 13:45 PST

Conn:  9.1.1.1         ]bpx6        11.1.1.1          abr      Status: OK
    SCR           MBS           MCR          ABR PCR     UPC FST CLP  % util
 4000/4000     1000/1000     4000/4000     4000/4000     y   y   y  100/100
Owner: REMOTE  Restriction: NONE  COS: 0
Group: NONE  ForeSightRTD: 40 msec  TestRTD: 10 msec

Path:   bpx1     1.3-- 3.3bpx6
Pref:   Not Configured


bpx1          ASI-T3    : OK           bpx6      ASI-T3    : OK
```

```
              Line  9.1 : OK                  Line 11.1 : OK
              OAM Cell RX: Clear


Last Command: tstdelay 9.1.1.1 n


Round trip delay is 10 msec.
Next Command:
```

tstpcs (test port concentrator shelf)

Tests the data path for PCS ports for a selected module. The *port* parameter specifies the particular PCS module: an FRM-2 or FRP-2 physical port to which one of the PCS modules connects.

Upon command entry, each of the 11 ports for the PCS goes into a loop state. In this state, data goes to each port and loops back to the PCS module. Test frames go to a port and are checked for integrity when they return. The test frames also go out on the port.

During this test, any Frame Relay connection data received by the FRM-2 or FRP-2 destined for one of the ports is discarded. The other three Port Concentrator modules are unaffected. After the test, the port is returned to its previous configuration.

The PCS tests available RAM, and sets each of the 11 ports into a loop mode. Ten frames of data are sent to each port and checked to make sure the same frames are received in entirety and in order.

During a test, the **dsppcs** screen shows "Testing" then either "Passed" or "Failed." The test takes about 15 seconds.

Syntax

tstpcs <slot.port>

Parameters

Parameter	Description
slot.port	*Slot* is the location of an FRM-2 or FRP-2 card. *Port* selects the physical port to which a PCS module connects. Range: 1–4

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dsppcs, resetpc

tstport (test port)

Executes a port loopback test on the specified data port. Using **tstport** without the optional parameter performs an internal test. The loopback for the internal test is performed on the IGX back card and is used to test just the IGX front and back cards. The test disables the communications for that port and the back card is placed into a loopback mode. The applicable card sets for the **tstport** command are the FRP, FRM, SDP, HDM, LDP, and LDM. The card under test sends several frames of data to the port on the interface card, loops them back, and checks their integrity.

If connections exist on the port being tested, the **dspcons** screen appears. If no connections are present, the **dspport** screen appears. A flashing T in the connections screen indicates those connections affected by the test. Either a "(" character or a ")" character indicates the loopback in the **dspfrport**. If a local or remote test fails, the port itself is automatically tested (internal) to determine if the IGX node caused the failure.

For a Frame Relay port or an LDP or LDM port, an external loopback may be placed at the near (local) or far (remote) modem during the test. For a DDS port, the external loopback is a CSU or DSU loopback at the remote DSU device. If an external port loopback test fails, the internal port loopback test is executed to determine if the IGX node caused the failure. The **cnfict** command can be used to specify the interface control lead template used to condition the output control leads during loopback.

The local and remote modem tests that test the near end and far end modems or NTUs require the IGX back card to operate as a DTE, so the modem acts as a DCE in this case. The back card asserts the local or remote loopback pin of the V.35 port. For X.21 ports, which do not have a loopback pin defined, the back card sends a loopback command in the data stream to cause the NTU to go into loopback mode. The test then begins.

The loopback test operation sends several frames of test data, receives them back, compares them, and verifies their integrity. The loopback pin subsequently returns to the inactive state, and the modems return to normal operation. The local or remote test works with only those modems that recognize a local and remote loopback command.

Before starting a test, you must be sure the cabling is correct for the specific equipment. The test conventions are described in CCITT V.54 and X.21 specifications. Only the near (n) and far (f) options are available for the Model C SDP. If the near or far tests fail, no internal test is executed on the SDP to isolate the problem. The SDP is not failed due to a **tstport** failure.

Syntax

tstport <slot.port> [n | f]

Parameters

Parameter	Description
slot.port	*Slot* is the location of a card. *Port* selects the physical port to which a module connects.
[n | f]	n = near external port loopback test f = far external port loopback test

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

cnfict, dspcons,

Example

Perform an internal port test on a Frame Relay port.

tstport 9.1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:27 PST

Conn:  9.1.100    gamma       8.1.200     fr
   MIR       CIR    VC Q Depth      PIR      Cmax   ECN QThresh    QIR    FST
 9.6/9.6   9.6/9.6      5/5       256/256    10/10  65535/65535  9.6/9.6   n
% Util: 100/100
Owner: LOCAL  Restriction: NONE  COS: 0                     Status: Failed Test
Group: NONE  Priority: H  TestRTD: 0 msec

Path:     alpha   14--13beta    15--15gamma
Pref:     alpha   14--13beta    15--15gamma


alpha 9.1.100                                   gamma 8.1.200
FRP:   OK                                       FRP:   OK
FRI:   OK                                       FRI:   OK


Last Command: tstport 9.1

No external clock is detected for DTE
Next Command:
```

Example

Perform a local (near end) loopback test on port 32.1 (requires port to be configured as DTE).

tstport 32.1 n

Example

Perform a remote (far end) loopback test on port 32.1 (requires port to be configured as DTE).

tstport 32.1 f

Example

Perform a test of an FRP port.

tstport 9.1

tststats (test statistics)

Displays a summary of the test statistics that result from performing a **tstcon** command on various network connections.

Before **tststats** displays any meaningful statistics, the **tstcon** command must run on one or more network connections. The statistics are displayed for voice, data, and Frame Relay connections.

- Tests Completed, Passed, Failed, and Aborted.
- Failure data per failed connection (applies only to voice connections).
- Slot.channel—Indicates which connection has failed.
- Good reads—Indicates number of good reads on the test failure.
- Bad reads—Indicates number of bad reads on the test failure.

Note The **tstcon** command should have run before you enter **tststats**.

Syntax

tststats [clear]

Parameters

Parameter	Description
[clear]	Specifies that the test statistics buffers be cleared.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX, IGX			No	

Related Commands

tstcon

Example (IGX)

tststats

```
sw150          TN    SuperUser       IGX 8420    9.3      Apr. 13 2000  21:54 GMT

Connection Test results since: Date/Time Not Set

Type      Total      Passed      Failed      Aborted
Voice      0          0           0           0
Data       0          0           0           0
Fr Relay   0          0           0           0
Last Command: tststats
Next Command:
```

upcd (up card)

Activates a card you have downed with the **dncd** command. If a slot contains a complete card set, both the front and back card are upped. After a card set is upped, it is available as a node resource.

When you activate a card, it comes up in either the *standby* or *active* state. The initial state depends on whether the network is ready to use the card immediately.

Syntax

upcd <slot>

Parameters

Parameter	Description
slot	Specifies the card slot number of the card

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–3	Yes	No	BPX, IGX			Yes	

Related Commands

dncd, **dspcds**

Example (IGX)

Activate the FRM in slot 9.

upcd 9

```
sw180          TN    Cisco          IGX 8420  9.3.g0    Oct. 20 2000 09:16 GMT


   FrontCard  BackCard                        FrontCard  BackCard
   Type  Rev  Type     Rev  Status            Type  Rev  Type     Rev  Status
1  NPM   BVS                Standby       9   FRM   KSB  FRI-T1   AL   Standby
2  NPM   BWS                Active        10  Empty universal backplane
3  Empty universal backplane              11  Empty universal backplane
4  UXM   CD23 T3       AA   Active        12  URM   AA11 2FE2V    EW   Active
5  UXM   CA23 OC3      AD   Active        13  LDM   CK03 232-8    AJ   Standby
6  FRM   DHZ  FRI-V35  BD   Standby-T     14  URM   AA13 2FE2V    P03  Active
7  Empty universal backplane              15  URM   AA12 2FE2V    EW   Active
8  Empty                                  16  NTM   FHF  T1       AL   Active


Last Command: upcd 9
```

upcon (up a connection)

Ups (activates) a connection, bundle of connections, group of connections, or all connections with a COS or COS range. When a connection is upped, the system tries to route. If the connection cannot immediately be routed, the connection is failed and generates a major alarm. The State display column in an **upcon** or **dspcons** screen has these meanings:

- "OK" means routed.
- "Down" means downed.
- "OK(Dn)" means waiting for on-hook to occur to allow courtesy down to take place for connections that have been courtesy downed by using the **dncon** command.
- "Failed" means not routed, but trying.

Syntax

upcon {<group | local_chan(s)> | COS <cos_range>}

Parameters

Parameter	Description
<group | local_chan(s)>	Specifies a group, a channel, or a range of channels to activate.
COS <cos_range>	Specifies the COS or COS range. Range: 0–15

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	IGX			Yes	

Related Commands

dncon, dspcon, dspcons

Example

Activate connections 5.1.

upcon 5.1

```
alpha          TRM   YourID:1        IGX 8420    9.3    Apr. 13 2000 11:33 PST

 Local      Remote      Remote                                             Route
 Channel    NodeName    Channel     State  Type    Compression  Code Avoid COS O
 5.1        beta       )25.1        Ok     256                  7/8          0  L
 9.1.100    gamma       8.1.200     Ok     fr                                0  L
 9.1.200    gamma       8.1.300     Ok     fr                                0  L
 9.2.400    beta        19.2.302    Ok     fr(Grp)                           0  L
 14.1      )gamma       15.1        Ok     v                                 0  L

Last Command: upcon 5.1
Next Command:
```

Example

Activate a range of connections 9.1-4.

upcon 9.1-4

Example

Activate a Frame Relay group connection.

upcon alpha

Example

Activate all downed connections with a COS of 9.

upcon 9

Example

Activate all downed connections with a COS of 9-12.

upcon cos 9-12

upgdlogcd (upgrade logical card database)

Manually upgrade the logical card database when upgrading from a BXM card to a BXM-E card. This command should be used in conjunction with the **cnfnodeparm** command.

1. Use the **cnfnodeparm** command and set the auto BXM upgrade parameter to N, specifying that you do not want the logical card database to be upgraded automatically when the new BXM-E card replaces the BXM card. The default value for the parameter auto BXM upgrade is N.
2. Replace the BXM card with the BXM-E card.
3. Use the **upgdlogcd** command to manually upgrade the logical card database on the active slot.

Upgrading the logical card database manually instead of automatically allows you to easily switch back to the legacy card *before* the **upgdlogcd** command is executed. By default, the **cnfnodeparm** parameter auto BXM upgrade is set to Y. Using this default setting, the logical card database is automatically upgraded.

Refer to the *BPX 8600 Installation and Configuration Guide* for a list of upgrade options and procedures.

Syntax

upgdlogcd <log_card_num>

Parameters

Parameter	Description
<log_card_num>	Specifies the logical card number; for example, **upgdlogcd 6** upgrades the logical card database on the active BXM-E in slot 6.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX			Yes	

Related Commands

cnfnodeparm, cnfcdparm

Example

Set the auto BXM upgrade parameter to N, specifying that you do not want the logical card database to be upgraded automatically when the new BXM-E card replaces the BXM card.

cnfnodeparm 54 n

Example

Set the Auto BXM Upgrade Parameter to N.

```
w116          TN    StrataCom       BPX 8620  9.3.0S    Feb. 29 2000 16:37 GMT
```

```
1  Update Initial Delay   [ 5000] (D)   16 Stats Memory (x 100KB) [  132] (D)
2  Update Per-Node Delay  [30000] (D)   17 Standby Update Timer   [   10] (D)
3  Comm-Break Test Delay  [30000] (D)   18 Stby Updts Per Pass    [   50] (D)
4  Comm-Break Test Offset [   10] (D)   19 Gateway ID Timer       [   30] (D)
5  Network Timeout Period [ 1700] (D)   20 GLCON Alloc Timer      [   30] (D)
6  Network Inter-p Period [ 4000] (D)   21 Comm Fail Delay        [   60] (D)
7  NW Sliding Window Size [    1] (D)   22 Nw Hdlr Timer (msec)   [   50] (D)
8  Num Normal Timeouts    [    7] (D)   23 SAR CC Transmit Rate   [  560] (D)
9  Num Inter-p Timeouts   [    3] (D)   24 SAR High Transmit Rate [  280] (D)
10 Num Satellite Timeouts [    6] (D)   25 SAR Low Transmit Rate  [   56] (D)
11 Num Blind Timeouts     [    4] (D)   26 SAR VRAM Cngestn Limit [ 7680] (D)
12 Num CB Msg Timeouts    [    5] (D)   27 SAR VRAM Cell Discard  [  256] (D)
13 Comm Fail Interval     [10000] (D)   28 ASM Card Cnfged        [    Y] (Y/N)
14 Comm Fail Multiplier   [    3] (D)   29 TFTP Grant Delay (sec) [    1] (D)
15 CC Redundancy Cnfged   [    Y] (Y/N) 30 TFTP ACK Timeout (sec) [   10] (D)

This Command: cnfnodeparm


sw116          TN    StrataCom       BPX 8620  9.3.0S    Feb. 29 2000 16:37 GMT

1  Update Initial Delay   [ 5000] (D)   16 Stats Memory (x 100KB) [  132] (D)
2  Update Per-Node Delay  [30000] (D)   17 Standby Update Timer   [   10] (D)
3  Comm-Break Test Delay  [30000] (D)   18 Stby Updts Per Pass    [   50] (D)
4  Comm-Break Test Offset [   10] (D)   19 Gateway ID Timer       [   30] (D)
5  Network Timeout Period [ 1700] (D)   20 GLCON Alloc Timer      [   30] (D)
6  Network Inter-p Period [ 4000] (D)   21 Comm Fail Delay        [   60] (D)
7  NW Sliding Window Size [    1] (D)   22 Nw Hdlr Timer (msec)   [   50] (D)
8  Num Normal Timeouts    [    7] (D)   23 SAR CC Transmit Rate   [  560] (D)
9  Num Inter-p Timeouts   [    3] (D)   24 SAR High Transmit Rate [  280] (D)
10 Num Satellite Timeouts [    6] (D)   25 SAR Low Transmit Rate  [   56] (D)
11 Num Blind Timeouts     [    4] (D)   26 SAR VRAM Cngestn Limit [ 7680] (D)
12 Num CB Msg Timeouts    [    5] (D)   27 SAR VRAM Cell Discard  [  256] (D)
13 Comm Fail Interval     [10000] (D)   28 ASM Card Cnfged        [    Y] (Y/N)
14 Comm Fail Multiplier   [    3] (D)   29 TFTP Grant Delay (sec) [    1] (D)
15 CC Redundancy Cnfged   [    Y] (Y/N) 30 TFTP ACK Timeout (sec) [   10] (D)

This Command: cnfnodeparm


Continue? y
sw116          TN    StrataCom       BPX 8620  9.3.0S    Feb. 29 2000 16:38 GMT

31 TFTP Write Retries     [    3] (D)   46 Max Htls Rebuild Count [  100] (D)
32 SNMP Event logging     [    Y] (Y/N) 47 Htls Counter Reset Time[ 1000] (D)
33 Job Lock Timeout       [   60] (D)   48 Send A-bit early        [    N] (Y/N)
34 Max Via LCONs          [50000] (D)   49 A-bit Tmr Multiplier  M [    0] (D)
35 Max Blind Segment Size [ 3570] (D)   50 A-bit Tmr Granularity N [    3] (D)
36 Max XmtMemBlks per NIB [ 3000] (D)   51 FBTC with PPDPolicing  [    N] (Y/N)
37 Max Mem on Stby Q (%)  [   33] (D)   52 CommBrk Hop Weight     [   25] (D)
38 Stat Config Proc Cnt   [ 1000] (D)   53 CB Fail Penalty Hops   [    2] (D)
39 Stat Config Proc Delay [ 2000] (D)   54 Auto BXM upgrade       [    Y] (Y/N)
40 Enable Degraded Mode   [    Y] (Y/N)
41 Trk Cell Rtng Restrict [    Y] (Y/N)
42 Enable Feeder Alert    [    N] (Y/N)
43 Reroute on Comm Fail   [    N] (Y/N)
44 Auto Switch on Degrade [    Y] (Y/N)
45 Max Degraded Aborts    [  100] (D)

This Command: cnfnodeparm


Enter parameter index: 54
Enter 'Yes' or 'No': n
```

```
sw116          TN    StrataCom       BPX 8620  9.3.0S    Feb. 29 2000 16:39 GMT

31 TFTP Write Retries     [    3] (D)   46 Max Htls Rebuild Count [  100] (D)
32 SNMP Event logging     [    Y] (Y/N) 47 Htls Counter Reset Time[ 1000] (D)
33 Job Lock Timeout       [   60] (D)   48 Send A-bit early        [    N] (Y/N)
34 Max Via LCONs          [50000] (D)   49 A-bit Tmr Multiplier  M [    0] (D)
35 Max Blind Segment Size [ 3570] (D)   50 A-bit Tmr Granularity N [    3] (D)
36 Max XmtMemBlks per NIB [ 3000] (D)   51 FBTC with PPDPolicing  [    N] (Y/N)
37 Max Mem on Stby Q (%)  [   33] (D)   52 CommBrk Hop Weight     [   25] (D)
38 Stat Config Proc Cnt   [ 1000] (D)   53 CB Fail Penalty Hops   [    2] (D)
39 Stat Config Proc Delay [ 2000] (D)   54 Auto BXM upgrade       [    N] (Y/N)
40 Enable Degraded Mode   [    Y] (Y/N)
41 Trk Cell Rtng Restrict [    Y] (Y/N)
42 Enable Feeder Alert    [    N] (Y/N)
43 Reroute on Comm Fail   [    N] (Y/N)
44 Auto Switch on Degrade [    Y] (Y/N)
45 Max Degraded Aborts    [  100] (D)

Last Command: cnfnodeparm 54 n
```

Example

Manually upgrade the logical card database on the BXM-E3 in slot 6.

upgdlogcd 6

```
sw116          TN    StrataCom       BPX 8620  9.3.0S    Feb. 29 2000 16:24 GMT

Missing Cards: 1 BCC

   FrontCard    BackCard                    FrontCard    BackCard
   Type    Rev  Type  Rev   Status          Type    Rev  Type  Rev   Status
1  BNI-T3  CHM  T3-3  BE    Standby      9  BNI-155 BDM  Empty       Standby
2  Empty                                 10 Empty
3  Empty                                 11 Empty
4  ASI-T3  CXF  T3-2  BE    Standby-T    12 BNI-T3  CFM  T3-3  BE    Active
5  BNI-T3  CEM  T3-3  FL    Active       13 BNI-T3  CFM  T3-3  BE    Active
6 BXM-E3  FB01 TE3-12BA    Active       14 ASI-155 HDC  MMF-2 AB    Active
7  BCC-3   DRM  LM-2  AC    Active       15 ASM     ABA  LMASM EV    Active
8  Empty reserved for Card



Last Command: dspcds


Next Command: upgdlogcd 6
```

upgdvsilcn (expand VSI LCN to 60K for BXM-E)

Configures a BXM-E card slot to support 60K LCN for VSI. Only BXM-E card models DX and EX support this configuration.The**upgdvsilcn** command hitlessly upgrade the active BXM-E card slot to support 60K LCN for VSI. For additional information on this feature, see the 60K Channel Support for VSI on the BPX, page 2-10.

Channel statistics level 0 or 1 is required for feature operation. If you execute **upgdvsilcn** with channel statistics levels 2 or 3, you receive the following error message: “Logical card does not support 60K LCN for VSI.” Use the **cnfcdparm** command to specify the channel statistics level.

Switch software logs an event when the **upgdvsilcn** command is executed. Use the **dsplog** command to review the event log.

Syntax

upgdvsilcn <slot>

Parameters

Parameter	Description
slot	Specifies the slot number of the BXM-E model DX or EX card.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
SuperUser	No	No	BPX	No	Yes	Yes	No

Related Commands

none

Example

Expand BXM-E card slot 12.

upgdvsilcn 12

```
rogue          TN    Cisco           BPX 8620  9.3.41    Mar. 2 2001  14:50 GMT

Detailed Card Display for BXM-155 in slot 12
Status:          Active
Revision:        FAH              Backcard Installed
Serial Number:   A34332             Type:          LM-BXM
Top Asm Number:  8000309102         Revision:      BA
Queue Size:      524280             Serial Number: 111111
Support: 8 Pts, OC3, FST, VcShp     Top Asm Number:
Supp: VT,ChStLv 1,VSI(Lv 3,ITSM)    Supp: 8 Pts,OC3,MMF,RedSlot:NO
Supp: APS(FW)
Support: LMIv 1,ILMIv 1,NbrDisc
Support: OAMLp, TrfcGen, PPDPolic
#Ch:32768,PG[1]:32736,PG[2]:32736
PG[1]:1,2,3,4,PG[2]:5,6,7,8,
#Sched_Ch:61440 #Total_Ch:61376
Type: BXME, revision DX

Last Command: upgdvsilcn 12
```

upln (up a line)

Activates (ups) a line. Use the **upln** command to make the line available for configuring and to start statistics gathering.

Configure the line's signal characteristics for the data you intend for the line using the **cnfln** command.Once both ends of the line are active, you must activate ports at both ends of the line by executing the **upport** command. Once completed, add connections with the **addcon** command.

A line consists of a cable for transmitting data and the interface circuitry for the line. The cable can be a coaxial wire, fiber optic, or a twisted pair.

As of Release 9.3, you can configure an IMA line for ports as well as trunks. Use the **upln** command to create an IMA group. As of Release 9.3.0, **upln** does not automatically configure a port (for BPX only).

The BXM or UXM card can be a trunk card and a line (port) card at the same time. For example, a BXM slot can up port 1 as a trunk interface while upping port 2 as a line interface.

The first connection in the string becomes the primary link (how the IMA group is recognized in other screens), such as **dspport**, **dspports**, and **cnfln**.

> **upln** 10.1,3,6,8 adds the primary link 10.1 and the non-consecutive physical lines 10.3, 10.6, and 10.8. When you use other commands, such as **dnln** or **cnfln**, this IMA group is known by the primary link, 10.1.
>
> **upln** 10.5-7,2-3 adds the primary link 10.5 and the physical lines 10.5, 10.6, 10.7, 10.2, and 10.3. When you use other commands, such as **dnln** or **cnfln**, this IMA group is known by the primary link, 10.5.

Syntax

upln <line_number>

Parameters

Parameter	Description
<line_number>	For a BPX ATM line: slot.line For IGX only: slot.line<,line,line,...> If the line is not an IMA line, use slot.line, otherwise line in slot.line indicates the first (primary) IMA line that comprises the IMA group, and other line parameters denote other lines on the interface as part of the IMA group.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
			BPX, IGX				

upport (up port)

Activates a single port on Frame Relay (FRP, FRM, or UFM) card or an ASI or BXM card on a BPX, or a UXM card on an IGX. If the port has not been configured, the default configuration values are used to configure the port. **Upport** cannot be used on a virtual port unless the virtual port's VPI range is configured (**cnfport**).

With a Port Concentrator Shelf (PCS), *upping* (activating) the first port causes the FRP-2 or FRM-2 to begin communicating with the four PCS modules and to download code to them if necessary.

As of Release 9.3.0, **upln** does not automatically configure a port. You can verify that the line has been activated by using the **dsplns** command.

Syntax

For ASI, BXM, or UXM:
upport <slot.port>[.<vport>]

For UFM-U, FRM, or FRP:
upport <slot.port>

For UFM-C:
upport <slot.port> <line>

Parameters

Parameter	Description
<slot >	Specifies slot number of the card containing the port.
<port>	Specifies the port. Range on UFM-C: 1–250 Range on UFM-U with a UFI-12V.35 or UFI-12X.21: 1–12 Range on UFM-U with a UFI-4HSS: 1–4 Range on an FRP or FRM: 1–4 Range on an FRP-2 or FRM-2: 1–44
<vport>	The optional vport identifier (BXM card only). Range: 1-31
<line>	Applies to UFM-C only. The line is the physical connector. Range (T1 or E1): 1–8

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Related Commands

dnport, cnfport, cnffrport, upln, addport, delport

Example (BPX)

Activate port 3 on the BXM card in slot 11.

upport 11.3

```
sw53           TN    Cisco           BPX 8620  9.3.m0    Dec. 19 2000 13:00 GMT

Port:     11.3      [FAILED  ]                Bandwidth/AR BW:  353208/353208
Interface:          LM-BXM                    CAC Override:     Enabled
VPI Range:             0 -  255               CAC Reserve:      0
Type:               UNI                       %Util Use:        Disabled
Shift:              SHIFT ON HCF (Normal Operation)
SIG Queue Depth:    640                       Port Load:        0 %

Protocol:           NONE                      Protocol by Card: No




Last Command: upport 11.3
```

Example (IGX)

Activate port 2 on the card in slot 9 of the IGX.

upport 9.2

```
sw108          VT    Cisco           IGX 8420  9.3.q2    Dec. 20 2000 12:37 GMT

Port:       9.2               [FAILED]       CABLE MISMATCH
Interface:  V35     DCE                      Configured Clock:    256 Kbps
Clocking:   Normal                           Measured Rx Clock:     0 Kbps

Port ID                        0       Min Flags / Frames           1
Port Queue Depth           65535       OAM Pkt Threshold            3 pkts
ECN Queue Threshold        65535       T391 Link Intg Timer        10 sec
DE Threshold                 100 %     N391 Full Status Poll        6 cyl
Signalling Protocol         None       EFCI Mapping Enabled        No
Asynchronous Status           No       CLLM Enabled/Tx Timer   No/  0 msec
T392 Polling Verif Timer      15       IDE to DE Mapping          Yes
N392 Error Threshold           3       Interface Control Template
N393 Monitored Events Count    4          Lead    CTS    DSR    DCD
Communicate Priority          No          State   ON     ON     ON
Upper/Lower RNR Thresh  75%/ 25%

Last Command: upport 9.2
```

Activates a port on a Frame Relay card. The applicable cards are all versions of the FRP, FRM, and UFM series of cards. If the port has not been configured through the **cnffrport** command, a set of default configuration values apply.

With a Port Concentrator Shelf (PCS), *upping* the first port causes the FRP-2 or FRM-2 to begin communicating with the four PCS modules and to download code to them if necessary.

uptrk (up trunk)

Activates (or ups) a trunk. If you include the optional *vtrk* parameter for applicable cards, **uptrk** also activates the trunk as a virtual trunk. You also use **uptrk** to enable a feeder trunk on a port.

After you have upped the trunk but not yet added it, the trunk carries line signaling but does not yet carry live traffic. Before you add the trunk by using **addtrk**, the node can monitor the trunk for reliability. Once a trunk has shown reliability and is ready to go into service, add the trunk to the network. If you need to take an active trunk out of service, use **dntrk**. The **dntrk** command causes the node to reroute any existing traffic if sufficient bandwidth is available.

The Ports and Trunks feature lets you configure multiple trunk lines and circuit lines on a single BXM or UXM card simultaneously. In previous releases, when a single port is upped as a trunk (by using the **uptrk** command), all the remaining ports on that card are treated as a trunk. Similarly, when you up a single port as a circuit line (by using the **upln** command), all the remaining ports on the card are treated as circuit line ports.

As of Release 9.3.0, **upln** no longer automatically configures a port. After you add a port (**addport**), you can begin to add connections by using **addcon**. You can verify that the line has been activated by using the **dsplns** command.

This feature allows the BXM and UXM trunks to be trunk line cards as well as circuit line cards, and to allow trunks and circuit lines to coexist on these cards.

For example, assuming that a four-port BXM card is plugged into slot 11, you could do the following:

1. **uptrk** 11.1
   Up a trunk at port 1 on slot 11
2. **upln** 11.2
   Up a line at port 2 of slot 11
3. **upln** 11.3
   Up a line at port 3 of card slot 11
4. **uptrk** 11.4
   Up a trunk at port 4 of card slot 11

You can now mix physical and virtual trunk specifications. For example, after you up a trunk as a standard trunk, you can then add it as a virtual trunk when you execute **addtrunk**. Furthermore, if you want to change trunk types between standard and virtual, you must first down the trunk with **dntrk,** then up it as the new trunk type.

You cannot up a trunk if the required card is not available. Furthermore, if a trunk is executing a self-test, a "card in test" message may appear on-screen. If this message appears, re-enter **uptrk**.

If, after upping a BXM trunk, you get a message telling you to use **cnfrsrc** to configure PVCs, make sure that when configuring resource partitions with **cnfrsrc**, you specify values greater than 0 for the Maximum PVC Channels, Maximum PVC Bandwidth, and Maximum VSI LCNs. Otherwise, you will be unable to create any PVCs on a BXM card. Also, you will not be able to change the Connection Channels amount with **cnftrk** if you do not first use **cnfrsrc** to configure PVCs.

In this release, to support the Multilevel Channels Statistics feature, you will be prompted when you attempt to up the line with **upln** or up the trunk with **uptrk**, warning you to initialize the channel statistics level before activating the card. This warning only applies when upping the first trunk or first line on the card:

```
"Channel Statistic Level must be initialized prior to card activation"
```

Configuring IMA Physical Lines

Release 9.1 supported a Cisco proprietary IMA (Inverse Multiplexing ATM) protocol on UXM trunks, which was able to interoperate only with Cisco products, for example, MGX-8220 IMATM. Release 9.2 supports the ATM Forum–compliant IMA protocol, which allows UXM trunks to interoperate with other vendors' equipment. IMA provides inverse multiplexing of ATM cells across multiple physical lines. The ATM Forum–compliant IMA protocol is supported only on UXM trunks.

The IMA protocol feature requires you to upgrade the UXM firmware to Model B. When you load Model B firmware onto a UXM card, all IMA trunks invoked on that card automatically perform ATM Forum–compliant IMA protocol. You do not need to use any switch software commands to enable the IMA protocol. Note that switch software Release 9.2 is not set up to work with UXM Release 9.1 firmware, so it is advised that you *not* downgrade to Model A firmware, as the software will not work. (The UXM firmware code space is not large enough to hold both versions of the protocol in a single firmware image.)

Note also that the ATM Forum–compliant IMA feature is not compatible with the Cisco proprietary IMA protocol supported in Release 9.1 (which uses UXM firmware Model A). Both ends of the UXM IMA trunk requires UXM firmware Model B. If the UXM trunk is connected to another device, that device must support the ATM Forum–compliant IMA protocol.

A subset of the ATM Forum compliant IMA protocol:

- You can add and delete physical links while the IMA group is active.
- You can up an IMA group with a minimum number of retained links.
- New configurable link (**cnftrk**) parameters:
  - IMA Max. Differential Delay
  - IMA Protocol Option
  - IMA Clock Mode (this parameter is fixed and not configurable)
- Additional IMA group and individual physical link state and statistics can be collected.
- Allows non-consecutive physical links on the same card to be in the same IMA group. This is specific to the UXM card and is not specified as part of the ATM Forum–compliant IMA standard.

Release 9.2 supports virtual trunking on both the BPX and IGX. IMA trunk ports are referenced by the first physical line of the trunk port after **uptrk** has been executed. For example, you can *uptrk 1.5–8.9*. You can then up a second trunk (which, in this case, is a virtual trunk on slot.port 1.5) on the same trunk port using *uptrk 1.5.11*.

You can use a UXM IMA trunk to connect an IGX feeder node to a routing node, either an IGX or a BPX using IMATM. UXM IMA provides redundancy in case one of the physical lines on an IMA trunk should fail. This reduces the chance of a single point of failure when a single feeder trunk is out of service. Also, you may configure the services on a feeder node rather than on a router node; this indirectly allows the network to scale better with respect to the limit of 223 network nodes.

Specifying an IMA Group Member

You can define an IMA trunk consisting of non-consecutive physical lines. In addition, you can change the group member by deleting a physical line from an existing IMA trunk.

Use this syntax to specify an IMA group on a UXM trunk:

- **uptrk** *slot.group_member.vtrk*

  where:

  slot is the slot number

  group_member is a set of physical lines composing an IMA group. You can specify the member in an expression consisting of the primary link followed by a, or – and additional physical links.

  vtrk is the optional virtual trunk number. If at least one virtual trunk already exists on this port, you only have to specify the primary link as the group_member. In the case of adding a UXM IMA feeder trunk from an IGX routing node to an IGX feeder node, you will not know whether the trunk is a regular trunk or feeder trunk. There is no virtual trunk for the feeder.

  For example, 9.1–4 defines trunk 9.1 to consist of four physical links, that is, 1, 2, 3, and 4 where physical link 1 is the primary link. (This example is compatible with Release 9.1.)

  For example, 9.1–3,5 defines trunk 9.1 to consist of four physical links, that is, 1, 2, 3, and 5 where physical link 1 is the primary link.

  For example, 9.5–7,2–3 defines trunk 9.5 to consist of five physical links, that is, 2, 3, 5, 6, and 7 where physical link 5 is the primary link.

  Similarly, 9.8,2,4,6 defines trunk 9.8 to consist of all even number of physical links where physical link 8 is the primary link.

  The **cnftrk** is used to specify the primary link on the IMA trunk.

  Primary Link—In an IMA group, you must select one of the physical links to be a primary link. This primary link number is used to refer to this IMA group or trunk. You can use **cnftrk** to add additional links to the group or delete existing links. When deleting existing links from an IMA group, you cannot delete the primary link. You must deactivate the trunk using **deltrk** followed by **dntrk** to remove the primary link. The **cnftrk** will be blocked after the trunk has been added as a feeder trunk.

Feature Mismatching on Virtual Trunks

The **uptrk** command, in addition to other configuration commands, will perform mismatch verification on the BXM and UXM cards. For example, the **uptrk** command will verify whether the card has virtual trunk support. For more information about Feature Mismatching, refer to the *BPX 8600 Series Installation and Configuration Manual*.

The Feature Mismatching capability will not mismatch cards unless the actual feature has been enabled on the card. This allows for a graceful card migration from an older release.

Syntax

uptrk <slot.port>[.vtrk]

uptrk <slot.group_member.[<vtrk]> for IMA

uptrk <slot>.<group-member(s)>

Parameters

Parameter	Description
<slot.port>	Specifies the slot and port of the trunk to activate. If the card has only one port, the *port* parameter is not necessary. An NTM card, for example, has one port.
<slot.group_ member>	Specifies the slot and a set of physical lines composing an IMA group on an IMA trunk to activate. You can specify the group_member in an expression consisting of the primary link followed by a, or – and additional physical links. (When specifying an IMA group, you must select one of the physical links to be a *primary link*. This primary link number is used to refer to this IMA group or trunk. You can use **cntrk** to add additional links to the group of delete existing links. When deleting existing links from an IMA group, you cannot delete the primary link. You must deactivate the trunk using **deltrk**, followed by **dntrk** to remove the primary link.
[<vtrk>]	Specifies the virtual trunk number. The maximum on a node is 32. The maximum on a T3 or E3 line is 32. The maximum for user traffic on an OC-3/STM1 trunk is 11 (so more than one OC-3/STM1 may be necessary). When specifying an IMA group, if at least one virtual trunk already exists on this port, then you only have to specify the primary link as the group_member.

Related Commands

addtrk, dntrk, cnfrsrc

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–2	Yes	Yes	BPX, IGX			Yes	

Example

Activate (up) trunk 21—a single-port card, in this case, so only the slot is necessary.

uptrk 21 1

Example

Activate (up) trunk 6.1.1—in this case, a virtual trunk, as indicated by the third digit.

uptrk 6.1.1

Example (BPX)

Show BXM trunk 11.3. The "Other End" has not been configured ("upped"). Note the message to "use confreres" to configure PVCs. Note the major alarm status.

putrid 11.3

```
sw53           TN    Cisco          BPX 8620  9.3.2J    Oct. 31 2000 12:32 GMT
```

```
TRK       Type     Current Line Alarm Status               Other End
11.2      OC3      Clear - OK                              sw108/4.4
11.3      OC3      Major - Loss of Sig (RED)               -







Last Command: uptrk 11.3

256 PVCs allocated. Use 'cnfrsrc' to configure PVCs
Next Command:
```

Example (IGX)

Show UXM virtual port 5.2.1. Note that "Other End" has not been configured ("upped"). Note the message to "use **confreres**" to configure LCNs. Note the major alarm status.

putrid 5.2.1

```
------------------------------------SCREEN 1------------------------------------
sw180          VT    Cisco           IGX 8420  9.3.2J    Oct. 31 2000 12:59 GMT

TRK         Type   Current Line Alarm Status               Other End
 5.1        OC3    Clear - OK                              sw108/4.2
 8          T1/24  Clear - OK                              sw108/14







This Command: uptrk 5.2.1

256 LCNs allocated. Use 'cnfrsrc' to configure LCNs
Press any key to continue..
------------------------------------SCREEN 2------------------------------------
sw180          VT    Cisco           IGX 8420  9.3.2J    Oct. 31 2000 13:00 GMT

TRK         Type   Current Line Alarm Status               Other End
 5.2.1      OC3    Major - Loss of Sig (RED)               -
 8          T1/24  Clear - OK                              sw108/14






Last Command: uptrk 5.2.1
```

vt (make a virtual connection)

Establishes a virtual terminal connection to a remote node. A virtual terminal connection has these properties:

- On the remote node, any command except the **vt** command can be executed.
- Multiple **vt** sessions is a purchasable option. With it, more than one user can **vt** to a node.
- During a virtual terminal session, jobs can be executed at any time.

During a **vt** session, the remote node name and date flash on the local terminal screen, and “Virtual Terminal” appears in the lower left corner. The **bye** command terminates a virtual terminal session and returns the terminal to local usage. After a default timeout of four minutes of inactivity, a **vt** connection automatically reverts to a local connection. This timeout is the equivalent of using the **bye** command.

Syntax

vt <nodename>

Parameters

Parameter	Description
node name	Specifies the name of the remote node for the virtual terminal connection. If the specified node name is not valid, the returned message states that the “Node is unknown” and prompts for the correct node name. Also, the main area of the screen names the recognized nodes in the network to help determine the correct name.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–6	Yes	No	BPX, IGX			No	

Related Commands

bye

Example

Establish a virtual terminal connection to the switch named “sw53.”

vt sw53

```
-----------------------------------SCREEN 1--------------------------------------
sw53           VT    Cisco           BPX 8620  9.3.2J    Oct. 25 2000 06:28 GMT




Last Command:


Next Command:

Virtual Terminal      CD

-----------------------------------SCREEN 2--------------------------------------
sw180          TN    Cisco           IGX 8420  9.3.2J    Oct. 25 2000 06:31 GMT





Last Command: vt sw53

Virtual Terminal connection broken
Next Command:
```

window (window to external device)

Provides an interface to an external device.

To establish a session with an external device, first use the **cnftermfunc** command to designate the auxiliary port to serve as the external device window. To begin the session, enter the **window** command and specify the port. The control terminal screen subsequently clears, after which characters entered at the control terminal go to the external device and vice versa.

Because the IGX and BPX nodes "bundle" characters together before transmitting them, a slight transfer delay occurs. Transfers are delayed until the transfer buffer is filled or the keyboard is inactive for over 50 milliseconds. To end the session, enter the escape sequence designated with the **cnftermfunc** command. The default for the escape sequence is ^^ (SHIFT 66).

The **window** command can be executed over a virtual terminal connection. This makes it possible to control external devices from a single point in the network. Devices such as Channel Service Units (CSUs), routers, channel banks and other devices with RS-232 console ports can be accessed remotely with this feature.

Syntax

window <a | c>

Parameters

Parameter	Description
a	Specifies a window into external equipment attached to the node's auxiliary port. This is the default connection.
c	Specifies a window into external equipment attached to the node's control port.

Attributes

Privilege	Jobs	Log	Node	Help	History	Lock	Hipri
1–4	No	No	BPX, IGX			Yes	

Related Commands

cnfterm, **cnftermfunc**

Example

Connect to a local router attached to the auxiliary port. The following dialogue shows the prompts and example responses.

window a

```
Protocol [ip]:

Target IP address: 192.9.202.1

Repeat count [5]:
```

```
Datagram size [100]:

Timeout in seconds [2]:


Extended commands [n]::

Type escape sequence to abort. ^^

Sending 5, 100-byte ICMP Echoes to 192.9.202.1, timeout is 2 seconds:

.......


Success rate is 100 percent

left #
```

APPENDIX A

BXM-E Configured and Actual Bandwidths

The following chart lists the actual output bandwidth versus the configured bandwidth. For example, if a virtual port bandwidth is configured in the1179-1182 range, the actual transmit rate may be up to 1183 if the traffic load on the port is greater than the configured transmit rate.

Table A-1 BXM-E Configured versus Actual Bandwidth

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1	22	23
23	23	24
24	24	25
25	25	26
26	26	27
27	27	28
28	28	29
29	29	30
30	30	31
31	31	32
32	32	33
33	33	34
34	34	35
35	35	36
36	36	37
37	37	38
38	38	39
39	39	40
40	40	41
41	41	42
42	42	43
43	43	44
44	44	45

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
45	45	46
46	46	47
47	47	48
48	48	49
49	49	50
50	50	51
51	51	52
52	52	53
53	53	54
54	54	55
55	55	56
56	56	57
57	57	58
58	58	59
59	59	60
60	60	61
61	61	62
62	62	63
63	63	64
64	64	65
65	65	66
66	66	67
67	67	68
68	68	69
69	69	70
70	70	71
71	71	72
72	72	73
73	73	74
74	74	75
75	75	76
76	76	77
77	77	78
78	78	79
79	79	80
80	80	81

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
81	81	82
82	82	83
83	83	84
84	84	85
85	85	86
86	86	87
87	87	88
88	88	89
89	89	90
90	90	91
91	91	92
92	92	93
93	93	94
94	94	95
95	95	96
96	96	97
97	97	98
98	98	99
99	99	100
100	100	101
101	101	102
102	102	103
103	103	104
104	104	105
105	105	106
106	106	107
107	107	108
108	108	109
109	109	110
110	110	111
111	111	112
112	112	113
113	113	114
114	114	115
115	115	116
116	116	117

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
117	117	118
118	118	119
119	119	120
120	120	121
121	121	122
122	122	123
123	123	124
124	124	125
125	125	126
126	126	127
127	127	128
128	128	129
129	129	130
130	130	131
131	131	132
132	132	133
133	133	134
134	134	135
135	135	136
136	136	137
137	137	138
138	138	139
139	139	140
140	140	141
141	141	142
142	142	143
143	143	144
144	144	145
145	145	146
146	146	147
147	147	148
148	148	149
149	149	150
150	150	151
151	151	152
152	152	153

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
153	153	154
154	154	155
155	155	156
156	156	157
157	157	158
158	158	159
159	159	160
160	160	161
161	161	162
162	162	163
163	163	164
164	164	165
165	165	166
166	166	167
167	167	168
168	168	169
169	169	170
170	170	171
171	171	172
172	172	173
173	173	174
174	174	175
175	175	176
176	176	177
177	177	178
178	178	179
179	179	180
180	180	181
181	181	182
182	182	183
183	183	184
184	184	185
185	185	186
186	186	187
187	187	188
188	188	189

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
189	189	190
190	190	191
191	191	192
192	192	193
193	193	194
194	194	195
195	195	196
196	196	197
197	197	198
198	198	199
199	199	200
200	200	201
201	201	202
202	202	203
203	203	204
204	204	205
205	205	206
206	206	207
207	207	208
208	208	209
209	209	210
210	210	211
211	211	212
212	212	213
213	213	214
214	214	215
215	215	216
216	216	217
217	217	218
218	218	219
219	219	220
220	220	221
221	221	222
222	222	223
223	223	224
224	224	225

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
225	225	226
226	226	227
227	227	228
228	228	229
229	229	230
230	230	231
231	231	232
232	232	233
233	233	234
234	234	235
235	235	236
236	236	237
237	237	238
238	238	239
239	239	240
240	240	241
241	241	242
242	242	243
243	243	244
244	244	245
245	245	246
246	246	247
247	247	248
248	248	249
249	249	250
250	250	251
251	251	252
252	252	253
253	253	254
254	254	255
255	255	256
256	256	257
257	257	258
258	258	259
259	259	260
260	260	261

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
261	261	262
262	262	263
263	263	264
264	264	265
265	265	266
266	266	267
267	267	268
268	268	269
269	269	270
270	270	271
271	271	272
272	272	273
273	273	274
274	274	275
275	275	276
276	276	277
277	277	278
278	278	279
279	279	280
280	280	281
281	281	282
282	282	283
283	283	284
284	284	285
285	285	286
286	286	287
287	287	288
288	288	289
289	289	290
290	290	291
291	291	292
292	292	293
293	293	294
294	294	295
295	295	296
296	296	297

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
297	297	298
298	298	299
299	299	300
300	300	301
301	301	302
302	302	303
303	303	304
304	304	305
305	305	306
306	306	307
307	307	308
308	308	309
309	309	310
310	310	311
311	311	312
312	312	313
313	313	314
314	314	315
315	315	316
316	316	317
317	318	319
319	319	320
320	320	321
321	321	322
322	322	323
323	323	324
324	324	325
325	325	326
326	327	328
328	328	329
329	329	330
330	330	331
331	331	332
332	333	334
334	334	335
335	335	336

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
336	336	337
337	337	338
338	339	340
340	340	341
341	341	342
342	342	343
343	344	345
345	345	346
346	346	347
347	348	349
349	349	350
350	350	351
351	352	353
353	353	354
354	354	355
355	356	357
357	357	358
358	359	360
360	360	361
361	361	362
362	362	363
363	363	364
364	364	365
365	365	366
366	366	367
367	367	368
368	368	369
369	369	370
370	370	371
371	371	372
372	372	373
373	373	374
374	374	375
375	375	376
376	376	377
377	377	378

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
378	378	379
379	379	380
380	380	381
381	381	382
382	382	383
383	383	384
384	384	385
385	385	386
386	386	387
387	387	388
388	388	389
389	389	390
390	390	391
391	391	392
392	392	393
393	393	394
394	394	395
395	395	396
396	396	397
397	397	398
398	398	399
399	399	400
400	400	401
401	401	402
402	402	403
403	403	404
404	404	405
405	405	406
406	406	407
407	407	408
408	408	409
409	409	410
410	410	411
411	411	412
412	412	413
413	413	414

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
414	414	415
415	415	416
416	416	417
417	417	418
418	418	419
419	419	420
420	420	421
421	421	422
422	422	423
423	423	424
424	424	425
425	425	426
426	426	427
427	427	428
428	428	429
429	429	430
430	430	431
431	431	432
432	432	433
433	433	434
434	434	435
435	435	436
436	436	437
437	437	438
438	438	439
439	439	440
440	440	441
441	441	442
442	442	443
443	444	445
445	445	446
446	446	447
447	447	448
448	448	449
449	449	450
450	450	451

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
451	451	452
452	452	453
453	453	454
454	455	456
456	456	457
457	457	458
458	458	459
459	459	460
460	460	461
461	461	462
462	463	464
464	464	465
465	465	466
466	466	467
467	467	468
468	468	469
469	470	471
471	471	472
472	472	473
473	473	474
474	474	475
475	476	477
477	477	478
478	478	479
479	479	480
480	481	482
482	482	483
483	483	484
484	485	486
486	486	487
487	487	488
488	488	489
489	490	491
491	491	492
492	492	493
493	494	495

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
495	495	496
496	496	497
497	498	499
499	499	500
500	500	501
501	502	503
503	503	504
504	505	506
506	506	507
507	507	508
508	509	510
510	510	511
511	512	513
513	513	514
514	514	515
515	516	517
517	517	518
518	519	520
520	520	521
521	522	523
523	523	524
524	525	526
526	526	527
527	528	529
529	529	530
530	531	532
532	532	533
533	534	535
535	535	536
536	537	538
538	539	540
540	540	541
541	542	543
543	543	544
544	545	546
546	547	548

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
548	548	549
549	550	551
551	552	553
553	553	554
554	555	556
556	557	558
558	558	559
559	560	561
561	562	563
563	563	564
564	565	566
566	567	568
568	569	570
570	570	571
571	572	573
573	574	575
575	576	577
577	578	579
579	579	580
580	581	582
582	583	584
584	585	586
586	587	588
588	589	590
590	591	592
592	592	593
593	594	595
595	596	597
597	598	599
599	600	601
601	602	603
603	604	605
605	606	607
607	608	609
609	610	611
611	612	613

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
613	614	615
615	616	617
617	618	619
619	621	622
622	623	624
624	625	626
626	627	628
628	629	630
630	631	632
632	633	634
634	636	637
637	638	639
639	640	641
641	642	643
643	644	645
645	647	648
648	649	650
650	651	652
652	654	655
655	656	657
657	658	659
659	661	662
662	663	664
664	666	667
667	668	669
669	670	671
671	673	674
674	675	676
676	678	679
679	680	681
681	683	684
684	685	686
686	688	689
689	691	692
692	693	694
694	696	697

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
697	698	699
699	701	702
702	704	705
705	707	708
708	709	710
710	712	713
713	715	716
716	718	719
719	719	720
720	720	721
721	722	723
723	723	724
724	725	726
726	726	727
727	728	729
729	729	730
730	730	731
731	732	733
733	733	734
734	735	736
736	736	737
737	738	739
739	739	740
740	741	742
742	742	743
743	744	745
745	745	746
746	747	748
748	748	749
749	750	751
751	751	752
752	753	754
754	754	755
755	756	757
757	758	759
759	759	760

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
760	761	762
762	762	763
763	764	765
765	765	766
766	767	768
768	769	770
770	770	771
771	772	773
773	773	774
774	775	776
776	777	778
778	778	779
779	780	781
781	782	783
783	783	784
784	785	786
786	787	788
788	788	789
789	790	791
791	792	793
793	794	795
795	795	796
796	797	798
798	799	800
800	800	801
801	802	803
803	804	805
805	806	807
807	808	809
809	809	810
810	811	812
812	813	814
814	815	816
816	816	817
817	818	819
819	820	821

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
821	822	823
823	824	825
825	826	827
827	828	829
829	829	830
830	831	832
832	833	834
834	835	836
836	837	838
838	839	840
840	841	842
842	843	844
844	845	846
846	847	848
848	849	850
850	851	852
852	853	854
854	854	855
855	856	857
857	858	859
859	861	862
862	863	864
864	865	866
866	867	868
868	869	870
870	871	872
872	873	874
874	875	876
876	877	878
878	879	880
880	881	882
882	883	884
884	885	886
886	888	889
889	890	891
891	892	893

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
893	894	895
895	896	897
897	898	899
899	901	902
902	903	904
904	905	906
906	907	908
908	910	911
911	912	913
913	914	915
915	916	917
917	919	920
920	921	922
922	923	924
924	926	927
927	928	929
929	930	931
931	933	934
934	935	936
936	937	938
938	940	941
941	942	943
943	945	946
946	947	948
948	949	950
950	952	953
953	954	955
955	957	958
958	959	960
960	962	963
963	964	965
965	967	968
968	970	971
971	972	973
973	975	976
976	977	978

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
978	980	981
981	983	984
984	985	986
986	988	989
989	990	991
991	993	994
994	996	997
997	999	1000
1000	1001	1002
1002	1004	1005
1005	1007	1008
1008	1010	1011
1011	1012	1013
1013	1015	1016
1016	1018	1019
1019	1021	1022
1022	1024	1025
1025	1026	1027
1027	1029	1030
1030	1032	1033
1033	1035	1036
1036	1038	1039
1039	1041	1042
1042	1044	1045
1045	1047	1048
1048	1050	1051
1051	1053	1054
1054	1056	1057
1057	1059	1060
1060	1062	1063
1063	1065	1066
1066	1068	1069
1069	1071	1072
1072	1074	1075
1075	1078	1079
1079	1081	1082

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1082	1084	1085
1085	1087	1088
1088	1090	1091
1091	1094	1095
1095	1097	1098
1098	1100	1101
1101	1104	1105
1105	1107	1108
1108	1110	1111
1111	1114	1115
1115	1117	1118
1118	1120	1121
1121	1124	1125
1125	1127	1128
1128	1131	1132
1132	1134	1135
1135	1138	1139
1139	1141	1142
1142	1145	1146
1146	1148	1149
1149	1152	1153
1153	1156	1157
1157	1159	1160
1160	1163	1164
1164	1167	1168
1168	1170	1171
1171	1174	1175
1175	1178	1179
1179	1182	1183
1183	1185	1186
1186	1189	1190
1190	1193	1194
1194	1197	1198
1198	1201	1202
1202	1205	1206
1206	1209	1210

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1210	1213	1214
1214	1217	1218
1218	1221	1222
1222	1225	1226
1226	1229	1230
1230	1233	1234
1234	1237	1238
1238	1242	1243
1243	1246	1247
1247	1250	1251
1251	1254	1255
1255	1259	1260
1260	1263	1264
1264	1267	1268
1268	1272	1273
1273	1276	1277
1277	1281	1282
1282	1285	1286
1286	1289	1290
1290	1294	1295
1295	1299	1300
1300	1303	1304
1304	1308	1309
1309	1313	1314
1314	1317	1318
1318	1322	1323
1323	1327	1328
1328	1332	1333
1333	1336	1337
1337	1341	1342
1342	1346	1347
1347	1351	1352
1352	1356	1357
1357	1361	1362
1362	1366	1367
1367	1371	1372

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1372	1376	1377
1377	1382	1383
1383	1387	1388
1388	1392	1393
1393	1397	1398
1398	1403	1404
1404	1408	1409
1409	1414	1415
1415	1419	1420
1420	1424	1425
1425	1430	1431
1431	1436	1437
1437	1438	1439
1439	1441	1442
1442	1444	1445
1445	1447	1448
1448	1450	1451
1451	1453	1454
1454	1456	1457
1457	1458	1459
1459	1461	1462
1462	1464	1465
1465	1467	1468
1468	1470	1471
1471	1473	1474
1474	1476	1477
1477	1479	1480
1480	1482	1483
1483	1485	1486
1486	1488	1489
1489	1491	1492
1492	1494	1495
1495	1497	1498
1498	1500	1501
1501	1503	1504
1504	1506	1507

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1507	1509	1510
1510	1512	1513
1513	1516	1517
1517	1519	1520
1520	1522	1523
1523	1525	1526
1526	1528	1529
1529	1531	1532
1532	1535	1536
1536	1538	1539
1539	1541	1542
1542	1544	1545
1545	1547	1548
1548	1551	1552
1552	1554	1555
1555	1557	1558
1558	1561	1562
1562	1564	1565
1565	1567	1568
1568	1571	1572
1572	1574	1575
1575	1577	1578
1578	1581	1582
1582	1584	1585
1585	1588	1589
1589	1591	1592
1592	1594	1595
1595	1598	1599
1599	1601	1602
1602	1605	1606
1606	1608	1609
1609	1612	1613
1613	1616	1617
1617	1619	1620
1620	1623	1624
1624	1626	1627

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1627	1630	1631
1631	1633	1634
1634	1637	1638
1638	1641	1642
1642	1644	1645
1645	1648	1649
1649	1652	1653
1653	1656	1657
1657	1659	1660
1660	1663	1664
1664	1667	1668
1668	1671	1672
1672	1674	1675
1675	1678	1679
1679	1682	1683
1683	1686	1687
1687	1690	1691
1691	1694	1695
1695	1698	1699
1699	1702	1703
1703	1706	1707
1707	1709	1710
1710	1713	1714
1714	1717	1718
1718	1722	1723
1723	1726	1727
1727	1730	1731
1731	1734	1735
1735	1738	1739
1739	1742	1743
1743	1746	1747
1747	1750	1751
1751	1754	1755
1755	1759	1760
1760	1763	1764
1764	1767	1768

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1768	1771	1772
1772	1776	1777
1777	1780	1781
1781	1784	1785
1785	1789	1790
1790	1793	1794
1794	1797	1798
1798	1802	1803
1803	1806	1807
1807	1811	1812
1812	1815	1816
1816	1820	1821
1821	1824	1825
1825	1829	1830
1830	1833	1834
1834	1838	1839
1839	1842	1843
1843	1847	1848
1848	1852	1853
1853	1856	1857
1857	1861	1862
1862	1866	1867
1867	1870	1871
1871	1875	1876
1876	1880	1881
1881	1885	1886
1886	1890	1891
1891	1895	1896
1896	1899	1900
1900	1904	1905
1905	1909	1910
1910	1914	1915
1915	1919	1920
1920	1924	1925
1925	1929	1930
1930	1934	1935

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1935	1940	1941
1941	1945	1946
1946	1950	1951
1951	1955	1956
1956	1960	1961
1961	1966	1967
1967	1971	1972
1972	1976	1977
1977	1981	1982
1982	1987	1988
1988	1992	1993
1993	1998	1999
1999	2003	2004
2004	2009	2010
2010	2014	2015
2015	2020	2021
2021	2025	2026
2026	2031	2032
2032	2036	2037
2037	2042	2043
2043	2048	2049
2049	2053	2054
2054	2059	2060
2060	2065	2066
2066	2071	2072
2072	2077	2078
2078	2082	2083
2083	2088	2089
2089	2094	2095
2095	2100	2101
2101	2106	2107
2107	2112	2113
2113	2119	2120
2120	2125	2126
2126	2131	2132
2132	2137	2138

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
2138	2143	2144
2144	2149	2150
2150	2156	2157
2157	2162	2163
2163	2169	2170
2170	2175	2176
2176	2181	2182
2182	2188	2189
2189	2194	2195
2195	2201	2202
2202	2208	2209
2209	2214	2215
2215	2221	2222
2222	2228	2229
2229	2234	2235
2235	2241	2242
2242	2248	2249
2249	2255	2256
2256	2262	2263
2263	2269	2270
2270	2276	2277
2277	2283	2284
2284	2290	2291
2291	2297	2298
2298	2304	2305
2305	2312	2313
2313	2319	2320
2320	2326	2327
2327	2334	2335
2335	2341	2342
2342	2349	2350
2350	2356	2357
2357	2364	2365
2365	2371	2372
2372	2379	2380
2380	2387	2388

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
2388	2395	2396
2396	2402	2403
2403	2410	2411
2411	2418	2419
2419	2426	2427
2427	2434	2435
2435	2442	2443
2443	2450	2451
2451	2459	2460
2460	2467	2468
2468	2475	2476
2476	2484	2485
2485	2492	2493
2493	2501	2502
2502	2509	2510
2510	2518	2519
2519	2526	2527
2527	2535	2536
2536	2544	2545
2545	2553	2554
2554	2562	2563
2563	2570	2571
2571	2579	2580
2580	2589	2590
2590	2598	2599
2599	2607	2608
2608	2616	2617
2617	2626	2627
2627	2635	2636
2636	2644	2645
2645	2654	2655
2655	2664	2665
2665	2673	2674
2674	2683	2684
2684	2693	2694
2694	2703	2704

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
2704	2713	2714
2714	2723	2724
2724	2733	2734
2734	2743	2744
2744	2753	2754
2754	2764	2765
2765	2774	2775
2775	2785	2786
2786	2795	2796
2796	2806	2807
2807	2817	2818
2818	2828	2829
2829	2838	2839
2839	2849	2850
2850	2861	2862
2862	2872	2873
2873	2877	2878
2878	2883	2884
2884	2889	2890
2890	2894	2895
2895	2900	2901
2901	2906	2907
2907	2912	2913
2913	2917	2918
2918	2923	2924
2924	2929	2930
2930	2935	2936
2936	2941	2942
2942	2947	2948
2948	2952	2953
2953	2958	2959
2959	2964	2965
2965	2970	2971
2971	2976	2977
2977	2982	2983
2983	2989	2990

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
2990	2995	2996
2996	3001	3002
3002	3007	3008
3008	3013	3014
3014	3019	3020
3020	3025	3026
3026	3032	3033
3033	3038	3039
3039	3044	3045
3045	3051	3052
3052	3057	3058
3058	3063	3064
3064	3070	3071
3071	3076	3077
3077	3082	3083
3083	3089	3090
3090	3095	3096
3096	3102	3103
3103	3109	3110
3110	3115	3116
3116	3122	3123
3123	3128	3129
3129	3135	3136
3136	3142	3143
3143	3149	3150
3150	3155	3156
3156	3162	3163
3163	3169	3170
3170	3176	3177
3177	3183	3184
3184	3189	3190
3190	3196	3197
3197	3203	3204
3204	3210	3211
3211	3217	3218
3218	3224	3225

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
3225	3232	3233
3233	3239	3240
3240	3246	3247
3247	3253	3254
3254	3260	3261
3261	3267	3268
3268	3275	3276
3276	3282	3283
3283	3289	3290
3290	3297	3298
3298	3304	3305
3305	3312	3313
3313	3319	3320
3320	3327	3328
3328	3334	3335
3335	3342	3343
3343	3349	3350
3350	3357	3358
3358	3365	3366
3366	3372	3373
3373	3380	3381
3381	3388	3389
3389	3396	3397
3397	3404	3405
3405	3412	3413
3413	3419	3420
3420	3427	3428
3428	3435	3436
3436	3444	3445
3445	3452	3453
3453	3460	3461
3461	3468	3469
3469	3476	3477
3477	3484	3485
3485	3493	3494
3494	3501	3502

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
3502	3509	3510
3510	3518	3519
3519	3526	3527
3527	3535	3536
3536	3543	3544
3544	3552	3553
3553	3560	3561
3561	3569	3570
3570	3578	3579
3579	3586	3587
3587	3595	3596
3596	3604	3605
3605	3613	3614
3614	3622	3623
3623	3631	3632
3632	3640	3641
3641	3649	3650
3650	3658	3659
3659	3667	3668
3668	3676	3677
3677	3685	3686
3686	3694	3695
3695	3704	3705
3705	3713	3714
3714	3723	3724
3724	3732	3733
3733	3741	3742
3742	3751	3752
3752	3761	3762
3762	3770	3771
3771	3780	3781
3781	3790	3791
3791	3799	3800
3800	3809	3810
3810	3819	3820
3820	3829	3830

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
3830	3839	3840
3840	3849	3850
3850	3859	3860
3860	3869	3870
3870	3880	3881
3881	3890	3891
3891	3900	3901
3901	3911	3912
3912	3921	3922
3922	3932	3933
3933	3942	3943
3943	3953	3954
3954	3963	3964
3964	3974	3975
3975	3985	3986
3986	3996	3997
3997	4007	4008
4008	4018	4019
4019	4029	4030
4030	4040	4041
4041	4051	4052
4052	4062	4063
4063	4073	4074
4074	4084	4085
4085	4096	4097
4097	4107	4108
4108	4119	4120
4120	4130	4131
4131	4142	4143
4143	4154	4155
4155	4165	4166
4166	4177	4178
4178	4189	4190
4190	4201	4202
4202	4213	4214
4214	4225	4226

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
4226	4238	4239
4239	4250	4251
4251	4262	4263
4263	4274	4275
4275	4287	4288
4288	4299	4300
4300	4312	4313
4313	4325	4326
4326	4338	4339
4339	4350	4351
4351	4363	4364
4364	4376	4377
4377	4389	4390
4390	4402	4403
4403	4416	4417
4417	4429	4430
4430	4442	4443
4443	4456	4457
4457	4469	4470
4470	4483	4484
4484	4497	4498
4498	4511	4512
4512	4524	4525
4525	4538	4539
4539	4552	4553
4553	4567	4568
4568	4581	4582
4582	4595	4596
4596	4609	4610
4610	4624	4625
4625	4639	4640
4640	4653	4654
4654	4668	4669
4669	4683	4684
4684	4698	4699
4699	4713	4714

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
4714	4728	4729
4729	4743	4744
4744	4759	4760
4760	4774	4775
4775	4790	4791
4791	4805	4806
4806	4821	4822
4822	4837	4838
4838	4853	4854
4854	4869	4870
4870	4885	4886
4886	4901	4902
4902	4918	4919
4919	4934	4935
4935	4951	4952
4952	4968	4969
4969	4985	4986
4986	5002	5003
5003	5019	5020
5020	5036	5037
5037	5053	5054
5054	5070	5071
5071	5088	5089
5089	5106	5107
5107	5124	5125
5125	5141	5142
5142	5159	5160
5160	5178	5179
5179	5196	5197
5197	5214	5215
5215	5233	5234
5234	5252	5253
5253	5270	5271
5271	5289	5290
5290	5308	5309
5309	5328	5329

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
5329	5347	5348
5348	5367	5368
5368	5386	5387
5387	5406	5407
5407	5426	5427
5427	5446	5447
5447	5466	5467
5467	5487	5488
5488	5507	5508
5508	5528	5529
5529	5549	5550
5550	5570	5571
5571	5591	5592
5592	5612	5613
5613	5634	5635
5635	5656	5657
5657	5677	5678
5678	5699	5700
5700	5722	5723
5723	5744	5745
5745	5755	5756
5756	5767	5768
5768	5778	5779
5779	5789	5790
5790	5801	5802
5802	5812	5813
5813	5824	5825
5825	5835	5836
5836	5847	5848
5848	5858	5859
5859	5870	5871
5871	5882	5883
5883	5894	5895
5895	5905	5906
5906	5917	5918
5918	5929	5930

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
5930	5941	5942
5942	5953	5954
5954	5965	5966
5966	5978	5979
5979	5990	5991
5991	6002	6003
6003	6014	6015
6015	6027	6028
6028	6039	6040
6040	6051	6052
6052	6064	6065
6065	6076	6077
6077	6089	6090
6090	6102	6103
6103	6114	6115
6115	6127	6128
6128	6140	6141
6141	6153	6154
6154	6165	6166
6166	6178	6179
6179	6191	6192
6192	6205	6206
6206	6218	6219
6219	6231	6232
6232	6244	6245
6245	6257	6258
6258	6271	6272
6272	6284	6285
6285	6298	6299
6299	6311	6312
6312	6325	6326
6326	6338	6339
6339	6352	6353
6353	6366	6367
6367	6379	6380
6380	6393	6394

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
6394	6407	6408
6408	6421	6422
6422	6435	6436
6436	6449	6450
6450	6464	6465
6465	6478	6479
6479	6492	6493
6493	6507	6508
6508	6521	6522
6522	6535	6536
6536	6550	6551
6551	6565	6566
6566	6579	6580
6580	6594	6595
6595	6609	6610
6610	6624	6625
6625	6639	6640
6640	6654	6655
6655	6669	6670
6670	6684	6685
6685	6699	6700
6700	6715	6716
6716	6730	6731
6731	6745	6746
6746	6761	6762
6762	6776	6777
6777	6792	6793
6793	6808	6809
6809	6824	6825
6825	6839	6840
6840	6855	6856
6856	6871	6872
6872	6888	6889
6889	6904	6905
6905	6920	6921
6921	6936	6937

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
6937	6953	6954
6954	6969	6970
6970	6986	6987
6987	7002	7003
7003	7019	7020
7020	7036	7037
7037	7053	7054
7054	7070	7071
7071	7087	7088
7088	7104	7105
7105	7121	7122
7122	7138	7139
7139	7156	7157
7157	7173	7174
7174	7191	7192
7192	7208	7209
7209	7226	7227
7227	7244	7245
7245	7262	7263
7263	7280	7281
7281	7298	7299
7299	7316	7317
7317	7334	7335
7335	7352	7353
7353	7371	7372
7372	7389	7390
7390	7408	7409
7409	7427	7428
7428	7446	7447
7447	7464	7465
7465	7483	7484
7484	7503	7504
7504	7522	7523
7523	7541	7542
7542	7560	7561
7561	7580	7581

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
7581	7599	7600
7600	7619	7620
7620	7639	7640
7640	7659	7660
7660	7679	7680
7680	7699	7700
7700	7719	7720
7720	7739	7740
7740	7760	7761
7761	7780	7781
7781	7801	7802
7802	7822	7823
7823	7843	7844
7844	7864	7865
7865	7885	7886
7886	7906	7907
7907	7927	7928
7928	7949	7950
7950	7970	7971
7971	7992	7993
7993	8014	8015
8015	8036	8037
8037	8058	8059
8059	8080	8081
8081	8102	8103
8103	8124	8125
8125	8147	8148
8148	8169	8170
8170	8192	8193
8193	8215	8216
8216	8238	8239
8239	8261	8262
8262	8285	8286
8286	8308	8309
8309	8331	8332
8332	8355	8356

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
8356	8379	8380
8380	8403	8404
8404	8427	8428
8428	8451	8452
8452	8476	8477
8477	8500	8501
8501	8525	8526
8526	8549	8550
8550	8574	8575
8575	8599	8600
8600	8625	8626
8626	8650	8651
8651	8676	8677
8677	8701	8702
8702	8727	8728
8728	8753	8754
8754	8779	8780
8780	8805	8806
8806	8832	8833
8833	8858	8859
8859	8885	8886
8886	8912	8913
8913	8939	8940
8940	8967	8968
8968	8994	8995
8995	9022	9023
9023	9049	9050
9050	9077	9078
9078	9105	9106
9106	9134	9135
9135	9162	9163
9163	9191	9192
9192	9219	9220
9220	9248	9249
9249	9278	9279
9279	9307	9308

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
9308	9337	9338
9338	9366	9367
9367	9396	9397
9397	9426	9427
9427	9457	9458
9458	9487	9488
9488	9518	9519
9519	9549	9550
9550	9580	9581
9581	9611	9612
9612	9643	9644
9644	9674	9675
9675	9706	9707
9707	9738	9739
9739	9771	9772
9772	9803	9804
9804	9836	9837
9837	9869	9870
9870	9902	9903
9903	9936	9937
9937	9970	9971
9971	10004	10005
10005	10038	10039
10039	10072	10073
10073	10107	10108
10108	10141	10142
10142	10177	10178
10178	10212	10213
10213	10248	10249
10249	10283	10284
10284	10319	10320
10320	10356	10357
10357	10392	10393
10393	10429	10430
10430	10466	10467
10467	10504	10505

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
10505	10541	10542
10542	10579	10580
10580	10617	10618
10618	10656	10657
10657	10695	10696
10696	10734	10735
10735	10773	10774
10774	10813	10814
10814	10853	10854
10854	10893	10894
10894	10933	10934
10934	10974	10975
10975	11015	11016
11016	11057	11058
11058	11098	11099
11099	11140	11141
11141	11183	11184
11184	11225	11226
11226	11268	11269
11269	11312	11313
11313	11355	11356
11356	11399	11400
11400	11444	11445
11445	11488	11489
11489	11511	11512
11512	11534	11535
11535	11556	11557
11557	11579	11580
11580	11602	11603
11603	11625	11626
11626	11648	11649
11649	11671	11672
11672	11694	11695
11695	11717	11718
11718	11741	11742
11742	11764	11765

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
11765	11788	11789
11789	11811	11812
11812	11835	11836
11836	11859	11860
11860	11883	11884
11884	11907	11908
11908	11931	11932
11932	11956	11957
11957	11980	11981
11981	12004	12005
12005	12029	12030
12030	12054	12055
12055	12078	12079
12079	12103	12104
12104	12128	12129
12129	12153	12154
12154	12178	12179
12179	12204	12205
12205	12229	12230
12230	12254	12255
12255	12280	12281
12281	12306	12307
12307	12331	12332
12332	12357	12358
12358	12383	12384
12384	12410	12411
12411	12436	12437
12437	12462	12463
12463	12489	12490
12490	12515	12516
12516	12542	12543
12543	12569	12570
12570	12596	12597
12597	12623	12624
12624	12650	12651
12651	12677	12678

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
12678	12704	12705
12705	12732	12733
12733	12759	12760
12760	12787	12788
12788	12815	12816
12816	12843	12844
12844	12871	12872
12872	12899	12900
12900	12928	12929
12929	12956	12957
12957	12985	12986
12986	13014	13015
13015	13042	13043
13043	13071	13072
13072	13101	13102
13102	13130	13131
13131	13159	13160
13160	13189	13190
13190	13218	13219
13219	13248	13249
13249	13278	13279
13279	13308	13309
13309	13338	13339
13339	13368	13369
13369	13399	13400
13400	13430	13431
13431	13460	13461
13461	13491	13492
13492	13522	13523
13523	13553	13554
13554	13585	13586
13586	13616	13617
13617	13648	13649
13649	13679	13680
13680	13711	13712
13712	13743	13744

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
13744	13776	13777
13777	13808	13809
13809	13840	13841
13841	13873	13874
13874	13906	13907
13907	13939	13940
13940	13972	13973
13973	14005	14006
14006	14039	14040
14040	14072	14073
14073	14106	14107
14107	14140	14141
14141	14174	14175
14175	14208	14209
14209	14242	14243
14243	14277	14278
14278	14312	14313
14313	14347	14348
14348	14382	14383
14383	14417	14418
14418	14452	14453
14453	14488	14489
14489	14524	14525
14525	14560	14561
14561	14596	14597
14597	14632	14633
14633	14669	14670
14670	14705	14706
14706	14742	14743
14743	14779	14780
14780	14817	14818
14818	14854	14855
14855	14892	14893
14893	14929	14930
14930	14967	14968
14968	15006	15007

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
15007	15044	15045
15045	15082	15083
15083	15121	15122
15122	15160	15161
15161	15199	15200
15200	15239	15240
15240	15278	15279
15279	15318	15319
15319	15358	15359
15359	15398	15399
15399	15439	15440
15440	15479	15480
15480	15520	15521
15521	15561	15562
15562	15603	15604
15604	15644	15645
15645	15686	15687
15687	15728	15729
15729	15770	15771
15771	15812	15813
15813	15855	15856
15856	15898	15899
15899	15941	15942
15942	15984	15985
15985	16028	16029
16029	16072	16073
16073	16116	16117
16117	16160	16161
16161	16204	16205
16205	16249	16250
16250	16294	16295
16295	16339	16340
16340	16385	16386
16386	16431	16432
16432	16477	16478
16478	16523	16524

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
16524	16570	16571
16571	16616	16617
16617	16663	16664
16664	16711	16712
16712	16758	16759
16759	16806	16807
16807	16854	16855
16855	16903	16904
16904	16952	16953
16953	17001	17002
17002	17050	17051
17051	17099	17100
17100	17149	17150
17150	17199	17200
17200	17250	17251
17251	17301	17302
17302	17352	17353
17353	17403	17404
17404	17455	17456
17456	17507	17508
17508	17559	17560
17560	17611	17612
17612	17664	17665
17665	17717	17718
17718	17771	17772
17772	17825	17826
17826	17879	17880
17880	17934	17935
17935	17988	17989
17989	18044	18045
18045	18099	18100
18100	18155	18156
18156	18211	18212
18212	18268	18269
18269	18325	18326
18326	18382	18383

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
18383	18439	18440
18440	18497	18498
18498	18556	18557
18557	18615	18616
18616	18674	18675
18675	18733	18734
18734	18793	18794
18794	18853	18854
18854	18914	18915
18915	18975	18976
18976	19036	19037
19037	19098	19099
19099	19160	19161
19161	19223	19224
19224	19286	19287
19287	19349	19350
19350	19413	19414
19414	19477	19478
19478	19542	19543
19543	19607	19608
19608	19673	19674
19674	19739	19740
19740	19805	19806
19806	19872	19873
19873	19940	19941
19941	20008	20009
20009	20076	20077
20077	20145	20146
20146	20214	20215
20215	20283	20284
20284	20354	20355
20355	20424	20425
20425	20496	20497
20497	20567	20568
20568	20639	20640
20640	20712	20713

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
20713	20785	20786
20786	20859	20860
20860	20933	20934
20934	21008	21009
21009	21083	21084
21084	21159	21160
21160	21235	21236
21236	21312	21313
21313	21390	21391
21391	21468	21469
21469	21547	21548
21548	21626	21627
21627	21706	21707
21707	21786	21787
21787	21867	21868
21868	21949	21950
21950	22031	22032
22032	22114	22115
22115	22197	22198
22198	22281	22282
22282	22366	22367
22367	22451	22452
22452	22537	22538
22538	22624	22625
22625	22711	22712
22712	22799	22800
22800	22888	22889
22889	22977	22978
22978	23022	23023
23023	23068	23069
23069	23113	23114
23114	23158	23159
23159	23204	23205
23205	23250	23251
23251	23296	23297
23297	23342	23343

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
23343	23389	23390
23390	23435	23436
23436	23482	23483
23483	23529	23530
23530	23576	23577
23577	23623	23624
23624	23671	23672
23672	23719	23720
23720	23767	23768
23768	23815	23816
23816	23863	23864
23864	23912	23913
23913	23960	23961
23961	24009	24010
24010	24058	24059
24059	24108	24109
24109	24157	24158
24158	24207	24208
24208	24257	24258
24258	24307	24308
24308	24357	24358
24358	24408	24409
24409	24458	24459
24459	24509	24510
24510	24560	24561
24561	24612	24613
24613	24663	24664
24664	24715	24716
24716	24767	24768
24768	24820	24821
24821	24872	24873
24873	24925	24926
24926	24978	24979
24979	25031	25032
25032	25084	25085
25085	25138	25139

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
25139	25192	25193
25193	25246	25247
25247	25300	25301
25301	25354	25355
25355	25409	25410
25410	25464	25465
25465	25519	25520
25520	25575	25576
25576	25631	25632
25632	25687	25688
25688	25743	25744
25744	25799	25800
25800	25856	25857
25857	25913	25914
25914	25970	25971
25971	26028	26029
26029	26085	26086
26086	26143	26144
26144	26202	26203
26203	26260	26261
26261	26319	26320
26320	26378	26379
26379	26437	26438
26438	26497	26498
26498	26556	26557
26557	26616	26617
26617	26677	26678
26678	26737	26738
26738	26798	26799
26799	26860	26861
26861	26921	26922
26922	26983	26984
26984	27045	27046
27046	27107	27108
27108	27170	27171
27171	27233	27234

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
27234	27296	27297
27297	27359	27360
27360	27423	27424
27424	27487	27488
27488	27552	27553
27553	27616	27617
27617	27681	27682
27682	27746	27747
27747	27812	27813
27813	27878	27879
27879	27944	27945
27945	28011	28012
28012	28078	28079
28079	28145	28146
28146	28212	28213
28213	28280	28281
28281	28348	28349
28349	28417	28418
28418	28485	28486
28486	28555	28556
28556	28624	28625
28625	28694	28695
28695	28764	28765
28765	28835	28836
28836	28905	28906
28906	28977	28978
28978	29048	29049
29049	29120	29121
29121	29192	29193
29193	29265	29266
29266	29338	29339
29339	29411	29412
29412	29485	29486
29486	29559	29560
29560	29634	29635
29635	29708	29709

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
29709	29784	29785
29785	29859	29860
29860	29935	29936
29936	30012	30013
30013	30088	30089
30089	30165	30166
30166	30243	30244
30244	30321	30322
30322	30399	30400
30400	30478	30479
30479	30557	30558
30558	30637	30638
30638	30717	30718
30718	30797	30798
30798	30878	30879
30879	30959	30960
30960	31041	31042
31042	31123	31124
31124	31206	31207
31207	31289	31290
31290	31372	31373
31373	31456	31457
31457	31540	31541
31541	31625	31626
31626	31710	31711
31711	31796	31797
31797	31882	31883
31883	31969	31970
31970	32056	32057
32057	32144	32145
32145	32232	32233
32233	32320	32321
32321	32409	32410
32410	32499	32500
32500	32589	32590
32590	32679	32680

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
32680	32770	32771
32771	32862	32863
32863	32954	32955
32955	33046	33047
33047	33140	33141
33141	33233	33234
33234	33327	33328
33328	33422	33423
33423	33517	33518
33518	33613	33614
33614	33709	33710
33710	33806	33807
33807	33904	33905
33905	34002	34003
34003	34100	34101
34101	34199	34200
34200	34299	34300
34300	34399	34400
34400	34500	34501
34501	34602	34603
34603	34704	34705
34705	34806	34807
34807	34910	34911
34911	35014	35015
35015	35118	35119
35119	35223	35224
35224	35329	35330
35330	35435	35436
35436	35542	35543
35543	35650	35651
35651	35758	35759
35759	35868	35869
35869	35977	35978
35978	36088	36089
36089	36199	36200
36200	36310	36311

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
36311	36423	36424
36424	36536	36537
36537	36650	36651
36651	36764	36765
36765	36879	36880
36880	36995	36996
36996	37112	37113
37113	37230	37231
37231	37348	37349
37349	37467	37468
37468	37586	37587
37587	37707	37708
37708	37828	37829
37829	37950	37951
37951	38073	38074
38074	38197	38198
38198	38321	38322
38322	38446	38447
38447	38572	38573
38573	38699	38700
38700	38827	38828
38828	38955	38956
38956	39085	39086
39086	39215	39216
39216	39346	39347
39347	39478	39479
39479	39611	39612
39612	39745	39746
39746	39880	39881
39881	40016	40017
40017	40152	40153
40153	40290	40291
40291	40428	40429
40429	40567	40568
40568	40708	40709
40709	40849	40850

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
40850	40992	40993
40993	41135	41136
41136	41279	41280
41280	41425	41426
41426	41571	41572
41572	41718	41719
41719	41867	41868
41868	42016	42017
42017	42167	42168
42168	42319	42320
42320	42471	42472
42472	42625	42626
42626	42780	42781
42781	42936	42937
42937	43094	43095
43095	43252	43253
43253	43412	43413
43413	43572	43573
43573	43734	43735
43735	43898	43899
43899	44062	44063
44063	44228	44229
44229	44395	44396
44396	44563	44564
44564	44732	44733
44733	44903	44904
44904	45075	45076
45076	45248	45249
45249	45423	45424
45424	45599	45600
45600	45777	45778
45778	45955	45956
45956	46045	46046
46046	46136	46137
46137	46226	46227
46227	46317	46318

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
46318	46409	46410
46410	46500	46501
46501	46592	46593
46593	46685	46686
46686	46778	46779
46779	46871	46872
46872	46964	46965
46965	47058	47059
47059	47153	47154
47154	47247	47248
47248	47342	47343
47343	47438	47439
47439	47534	47535
47535	47630	47631
47631	47727	47728
47728	47824	47825
47825	47921	47922
47922	48019	48020
48020	48117	48118
48118	48216	48217
48217	48315	48316
48316	48414	48415
48415	48514	48515
48515	48614	48615
48615	48715	48716
48716	48816	48817
48817	48917	48918
48918	49019	49020
49020	49121	49122
49122	49224	49225
49225	49327	49328
49328	49431	49432
49432	49535	49536
49536	49640	49641
49641	49745	49746
49746	49850	49851

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
49851	49956	49957
49957	50062	50063
50063	50169	50170
50170	50276	50277
50277	50384	50385
50385	50492	50493
50493	50600	50601
50601	50709	50710
50710	50819	50820
50820	50929	50930
50930	51039	51040
51040	51150	51151
51151	51262	51263
51263	51374	51375
51375	51486	51487
51487	51599	51600
51600	51712	51713
51713	51826	51827
51827	51941	51942
51942	52056	52057
52057	52171	52172
52172	52287	52288
52288	52404	52405
52405	52521	52522
52522	52638	52639
52639	52756	52757
52757	52875	52876
52876	52994	52995
52995	53113	53114
53114	53233	53234
53234	53354	53355
53355	53475	53476
53476	53597	53598
53598	53720	53721
53721	53843	53844
53844	53966	53967

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
53967	54090	54091
54091	54215	54216
54216	54340	54341
54341	54466	54467
54467	54592	54593
54593	54719	54720
54720	54847	54848
54848	54975	54976
54976	55104	55105
55105	55233	55234
55234	55363	55364
55364	55493	55494
55494	55625	55626
55626	55756	55757
55757	55889	55890
55890	56022	56023
56023	56156	56157
56157	56290	56291
56291	56425	56426
56426	56561	56562
56562	56697	56698
56698	56834	56835
56835	56971	56972
56972	57110	57111
57111	57249	57250
57250	57388	57389
57389	57529	57530
57530	57670	57671
57671	57811	57812
57812	57954	57955
57955	58097	58098
58098	58241	58242
58242	58385	58386
58386	58530	58531
58531	58676	58677
58677	58823	58824

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
58824	58970	58971
58971	59119	59120
59120	59268	59269
59269	59417	59418
59418	59568	59569
59569	59719	59720
59720	59871	59872
59872	60024	60025
60025	60177	60178
60178	60331	60332
60332	60486	60487
60487	60642	60643
60643	60799	60800
60800	60957	60958
60958	61115	61116
61116	61274	61275
61275	61434	61435
61435	61595	61596
61596	61756	61757
61757	61919	61920
61920	62082	62083
62083	62247	62248
62248	62412	62413
62413	62578	62579
62579	62745	62746
62746	62912	62913
62913	63081	63082
63082	63251	63252
63252	63421	63422
63422	63593	63594
63594	63765	63766
63766	63938	63939
63939	64112	64113
64113	64288	64289
64289	64464	64465
64465	64641	64642

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
64642	64819	64820
64820	64998	64999
64999	65178	65179
65179	65359	65360
65360	65541	65542
65542	65724	65725
65725	65908	65909
65909	66093	66094
66094	66280	66281
66281	66467	66468
66468	66655	66656
66656	66844	66845
66845	67035	67036
67036	67226	67227
67227	67419	67420
67420	67613	67614
67614	67808	67809
67809	68004	68005
68005	68201	68202
68202	68399	68400
68400	68598	68599
68599	68799	68800
68800	69001	69002
69002	69204	69205
69205	69408	69409
69409	69613	69614
69614	69820	69821
69821	70028	70029
70029	70237	70238
70238	70447	70448
70448	70658	70659
70659	70871	70872
70872	71085	71086
71086	71301	71302
71302	71517	71518
71518	71736	71737

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
71737	71955	71956
71956	72176	72177
72177	72398	72399
72399	72621	72622
72622	72846	72847
72847	73072	73073
73073	73300	73301
73301	73529	73530
73530	73759	73760
73760	73991	73992
73992	74225	74226
74226	74460	74461
74461	74696	74697
74697	74934	74935
74935	75173	75174
75174	75414	75415
75415	75657	75658
75658	75901	75902
75902	76146	76147
76147	76394	76395
76395	76643	76644
76644	76893	76894
76894	77145	77146
77146	77399	77400
77400	77654	77655
77655	77911	77912
77912	78170	78171
78171	78431	78432
78432	78693	78694
78694	78957	78958
78958	79223	79224
79224	79491	79492
79492	79760	79761
79761	80032	80033
80033	80305	80306
80306	80580	80581

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
80581	80857	80858
80858	81135	81136
81136	81416	81417
81417	81699	81700
81700	81984	81985
81985	82270	82271
82271	82559	82560
82560	82850	82851
82851	83142	83143
83143	83437	83438
83438	83734	83735
83735	84033	84034
84034	84334	84335
84335	84638	84639
84639	84943	84944
84944	85251	85252
85252	85561	85562
85562	85873	85874
85874	86188	86189
86189	86505	86506
86506	86824	86825
86825	87145	87146
87146	87469	87470
87470	87796	87797
87797	88125	88126
88126	88456	88457
88457	88790	88791
88791	89126	89127
89127	89465	89466
89466	89806	89807
89807	90151	90152
90152	90497	90498
90498	90847	90848
90848	91199	91200
91200	91554	91555
91555	91911	91912

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
91912	92091	92092
92092	92272	92273
92273	92453	92454
92454	92635	92636
92636	92818	92819
92819	93001	93002
93002	93185	93186
93186	93370	93371
93371	93556	93557
93557	93742	93743
93743	93929	93930
93930	94117	94118
94118	94306	94307
94307	94495	94496
94496	94685	94686
94686	94876	94877
94877	95068	95069
95069	95260	95261
95261	95454	95455
95455	95648	95649
95649	95842	95843
95843	96038	96039
96039	96234	96235
96235	96432	96433
96433	96630	96631
96631	96828	96829
96829	97028	97029
97029	97228	97229
97229	97430	97431
97431	97632	97633
97633	97835	97836
97836	98039	98040
98040	98243	98244
98244	98449	98450
98450	98655	98656
98656	98863	98864

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
98864	99071	99072
99072	99280	99281
99281	99490	99491
99491	99700	99701
99701	99912	99913
99913	100125	100126
100126	100338	100339
100339	100553	100554
100554	100768	100769
100769	100984	100985
100985	101201	101202
101202	101419	101420
101420	101638	101639
101639	101858	101859
101859	102079	102080
102080	102301	102302
102302	102524	102525
102525	102748	102749
102749	102973	102974
102974	103199	103200
103200	103425	103426
103426	103653	103654
103654	103882	103883
103883	104112	104113
104113	104343	104344
104344	104575	104576
104576	104808	104809
104809	105042	105043
105043	105277	105278
105278	105513	105514
105514	105750	105751
105751	105988	105989
105989	106227	106228
106228	106467	106468
106468	106709	106710
106710	106951	106952

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
106952	107195	107196
107196	107440	107441
107441	107686	107687
107687	107933	107934
107934	108181	108182
108182	108430	108431
108431	108680	108681
108681	108932	108933
108933	109185	109186
109186	109439	109440
109440	109694	109695
109695	109950	109951
109951	110208	110209
110209	110466	110467
110467	110726	110727
110727	110987	110988
110988	111250	111251
111251	111513	111514
111514	111778	111779
111779	112044	112045
112045	112312	112313
112313	112580	112581
112581	112850	112851
112851	113122	113123
113123	113394	113395
113395	113668	113669
113669	113943	113944
113944	114220	114221
114221	114498	114499
114499	114777	114778
114778	115058	115059
115059	115340	115341
115341	115623	115624
115624	115908	115909
115909	116194	116195
116195	116482	116483

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
116483	116771	116772
116772	117061	117062
117062	117353	117354
117354	117647	117648
117648	117941	117942
117942	118238	118239
118239	118536	118537
118537	118835	118836
118836	119136	119137
119137	119438	119439
119439	119742	119743
119743	120048	120049
120049	120355	120356
120356	120663	120664
120664	120973	120974
120974	121285	121286
121286	121599	121600
121600	121914	121915
121915	122230	122231
122231	122549	122550
122550	122868	122869
122869	123190	123191
123191	123513	123514
123514	123839	123840
123840	124165	124166
124166	124494	124495
124495	124824	124825
124825	125156	125157
125157	125490	125491
125491	125825	125826
125826	126163	126164
126164	126502	126503
126503	126843	126844
126844	127186	127187
127187	127530	127531
127531	127877	127878

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
127878	128225	128226
128226	128576	128577
128577	128928	128929
128929	129282	129283
129283	129638	129639
129639	129996	129997
129997	130356	130357
130357	130718	130719
130719	131083	131084
131084	131449	131450
131450	131817	131818
131818	132187	132188
132188	132560	132561
132561	132934	132935
132935	133311	133312
133312	133689	133690
133690	134070	134071
134071	134453	134454
134454	134839	134840
134840	135226	135227
135227	135616	135617
135617	136008	136009
136009	136402	136403
136403	136798	136799
136799	137197	137198
137198	137598	137599
137599	138002	138003
138003	138408	138409
138409	138816	138817
138817	139227	139228
139228	139640	139641
139641	140056	140057
140057	140474	140475
140475	140894	140895
140895	141317	141318
141318	141743	141744

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
141744	142171	142172
142172	142602	142603
142603	143035	143036
143036	143472	143473
143473	143910	143911
143911	144352	144353
144353	144796	144797
144797	145243	145244
145244	145692	145693
145693	146145	146146
146146	146600	146601
146601	147058	147059
147059	147519	147520
147520	147983	147984
147984	148450	148451
148451	148920	148921
148921	149393	149394
149394	149868	149869
149869	150347	150348
150348	150829	150830
150830	151314	151315
151315	151802	151803
151803	152293	152294
152294	152788	152789
152789	153286	153287
153287	153787	153788
153788	154291	154292
154292	154798	154799
154799	155309	155310
155310	155823	155824
155824	156341	156342
156342	156862	156863
156863	157387	157388
157388	157915	157916
157916	158447	158448
158448	158982	158983

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
158983	159521	159522
159522	160064	160065
160065	160610	160611
160611	161160	161161
161161	161714	161715
161715	162271	162272
162272	162833	162834
162834	163398	163399
163399	163968	163969
163969	164541	164542
164542	165118	165119
165119	165700	165701
165701	166285	166286
166286	166875	166876
166876	167469	167470
167470	168067	168068
168068	168669	168670
168670	169276	169277
169277	169887	169888
169888	170502	170503
170503	171122	171123
171123	171747	171748
171748	172376	172377
172377	173010	173011
173011	173648	173649
173649	174291	174292
174292	174939	174940
174940	175592	175593
175593	176250	176251
176251	176912	176913
176913	177580	177581
177581	178253	178254
178254	178930	178931
178931	179613	179614
179614	180302	180303
180303	180995	180996

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
180996	181694	181695
181695	182398	182399
182399	183108	183109
183109	183823	183824
183824	184183	184184
184184	184544	184545
184545	184906	184907
184907	185270	185271
185271	185636	185637
185637	186003	186004
186004	186371	186372
186372	186741	186742
186742	187112	187113
187113	187485	187486
187486	187859	187860
187860	188235	188236
188236	188612	188613
188613	188991	188992
188992	189371	189372
189372	189753	189754
189754	190136	190137
190137	190521	190522
190522	190908	190909
190909	191296	191297
191297	191685	191686
191686	192076	192077
192077	192469	192470
192470	192864	192865
192865	193260	193261
193261	193657	193658
193658	194057	194058
194058	194457	194458
194458	194860	194861
194861	195264	195265
195265	195670	195671
195671	196078	196079

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
196079	196487	196488
196488	196898	196899
196899	197311	197312
197312	197726	197727
197727	198142	198143
198143	198560	198561
198561	198980	198981
198981	199401	199402
199402	199825	199826
199826	200250	200251
200251	200677	200678
200678	201106	201107
201107	201536	201537
201537	201969	201970
201970	202403	202404
202404	202839	202840
202840	203277	203278
203278	203717	203718
203718	204159	204160
204160	204603	204604
204604	205049	205050
205050	205497	205498
205498	205946	205947
205947	206398	206399
206399	206851	206852
206852	207307	207308
207308	207765	207766
207766	208224	208225
208225	208686	208687
208687	209150	209151
209151	209616	209617
209617	210084	210085
210085	210554	210555
210555	211026	211027
211027	211500	211501
211501	211976	211977

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
211977	212455	212456
212456	212935	212936
212936	213418	213419
213419	213903	213904
213904	214390	214391
214391	214880	214881
214881	215372	215373
215373	215866	215867
215867	216362	216363
216363	216860	216861
216861	217361	217362
217362	217864	217865
217865	218370	218371
218371	218878	218879
218879	219388	219389
219389	219901	219902
219902	220416	220417
220417	220933	220934
220934	221453	221454
221454	221975	221976
221976	222500	222501
222501	223027	223028
223028	223557	223558
223558	224089	224090
224090	224624	224625
224625	225161	225162
225162	225701	225702
225702	226244	226245
226245	226789	226790
226790	227337	227338
227338	227887	227888
227888	228440	228441
228441	228996	228997
228997	229555	229556
229556	230116	230117
230117	230680	230681

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
230681	231247	231248
231248	231816	231817
231817	232389	232390
232390	232964	232965
232965	233542	233543
233543	234123	234124
234124	234707	234708
234708	235294	235295
235295	235883	235884
235884	236476	236477
236477	237072	237073
237073	237670	237671
237671	238272	238273
238273	238877	238878
238878	239485	239486
239486	240096	240097
240097	240710	240711
240711	241327	241328
241328	241947	241948
241948	242571	242572
242572	243198	243199
243199	243828	243829
243829	244461	244462
244462	245098	245099
245099	245737	245738
245738	246381	246382
246382	247027	247028
247028	247678	247679
247679	248331	248332
248332	248988	248989
248989	249648	249649
249649	250312	250313
250313	250980	250981
250981	251651	251652
251652	252326	252327
252327	253004	253005

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
253005	253686	253687
253687	254372	254373
254373	255061	255062
255062	255754	255755
255755	256451	256452
256452	257152	257153
257153	257856	257857
257857	258564	258565
258565	259277	259278
259278	259993	259994
259994	260713	260714
260714	261437	261438
261438	262166	262167
262167	262898	262899
262899	263634	263635
263635	264375	264376
264376	265120	265121
265121	265869	265870
265870	266622	266623
266623	267379	267380
267380	268141	268142
268142	268907	268908
268908	269678	269679
269679	270453	270454
270454	271232	271233
271233	272016	272017
272017	272804	272805
272805	273597	273598
273598	274395	274396
274396	275197	275198
275198	276004	276005
276005	276816	276817
276817	277633	277634
277634	278454	278455
278455	279280	279281
279281	280112	280113

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
280113	280948	280949
280949	281789	281790
281790	282635	282636
282636	283486	283487
283487	284343	284344
284344	285204	285205
285205	286071	286072
286072	286944	286945
286945	287821	287822
287822	288704	288705
288705	289592	289593
289593	290486	290487
290487	291385	291386
291386	292290	292291
292291	293201	293202
293202	294117	294118
294118	295039	295040
295040	295967	295968
295968	296901	296902
296902	297840	297841
297841	298786	298787
298787	299737	299738
299738	300695	300696
300696	301659	301660
301660	302629	302630
302630	303605	303606
303606	304587	304588
304588	305576	305577
305577	306572	306573
306573	307574	307575
307575	308582	308583
308583	309597	309598
309598	310619	310620
310620	311647	311648
311648	312683	312684
312684	313725	313726

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
313726	314774	314775
314775	315831	315832
315832	316894	316895
316895	317965	317966
317966	319042	319043
319043	320128	320129
320129	321220	321221
321221	322320	322321
322321	323428	323429
323429	324543	324544
324544	325666	325667
325667	326797	326798
326798	327936	327937
327937	329082	329083
329083	330237	330238
330238	331400	331401
331401	332571	332572
332572	333750	333751
333751	334938	334939
334939	336134	336135
336135	337339	337340
337340	338552	338553
338553	339774	339775
339775	341005	341006
341006	342245	342246
342246	343495	343496
343496	344753	344754
344754	346020	346021
346021	347297	347298
347298	348583	348584
348584	349879	349880
349880	351185	351186
351186	352500	352501
352501	353825	353826
353826	355160	355161
355161	356506	356507

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
356507	357861	357862
357862	359227	359228
359228	360604	360605
360605	361990	361991
361991	363388	363389
363389	364797	364798
364798	366216	366217
366217	367647	367648
367648	368366	368367
368367	369088	369089
369089	369813	369814
369814	370541	370542
370542	371272	371273
371273	372006	372007
372007	372743	372744
372744	373482	373483
373483	374225	374226
374226	374970	374971
374971	375719	375720
375720	376470	376471
376471	377225	377226
377226	377982	377983
377983	378743	378744
378744	379506	379507
379507	380273	380274
380274	381043	381044
381044	381816	381817
381817	382592	382593
382593	383371	383372
383372	384153	384154
384154	384939	384940
384940	385728	385729
385729	386520	386521
386521	387315	387316
387316	388114	388115
388115	388915	388916

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
388916	389721	389722
389722	390529	390530
390530	391341	391342
391342	392156	392157
392157	392975	392976
392976	393797	393798
393798	394623	394624
394624	395452	395453
395453	396284	396285
396285	397120	397121
397121	397960	397961
397961	398803	398804
398804	399650	399651
399651	400500	400501
400501	401354	401355
401355	402212	402213
402213	403073	403074
403074	403938	403939
403939	404807	404808
404808	405679	405680
405680	406555	406556
406556	407435	407436
407436	408319	408320
408320	409207	409208
409208	410098	410099
410099	410994	410995
410995	411893	411894
411894	412796	412797
412797	413703	413704
413704	414615	414616
414616	415530	415531
415531	416449	416450
416450	417373	417374
417374	418300	418301
418301	419232	419233
419233	420168	420169

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
420169	421108	421109
421109	422052	422053
422053	423000	423001
423001	423953	423954
423954	424910	424911
424911	425871	425872
425872	426837	426838
426838	427807	427808
427808	428781	428782
428782	429760	429761
429761	430744	430745
430745	431732	431733
431733	432724	432725
432725	433721	433722
433722	434723	434724
434724	435729	435730
435730	436740	436741
436741	437756	437757
437757	438776	438777
438777	439802	439803
439803	440832	440833
440833	441866	441867
441867	442906	442907
442907	443951	443952
443952	445000	445001
445001	446055	446056
446056	447114	447115
447115	448179	448180
448180	449248	449249
449249	450323	450324
450324	451403	451404
451404	452488	452489
452489	453579	453580
453580	454674	454675
454675	455775	455776
455776	456881	456882

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
456882	457993	457994
457994	459110	459111
459111	460232	460233
460233	461361	461362
461362	462494	462495
462495	463633	463634
463634	464778	464779
464779	465928	465929
465929	467085	467086
467086	468247	468248
468248	469414	469415
469415	470588	470589
470589	471767	471768
471768	472953	472954
472954	474144	474145
474145	475341	475342
475342	476545	476546
476546	477754	477755
477755	478970	478971
478971	480192	480193
480193	481420	481421
481421	482654	482655
482655	483895	483896
483896	485142	485143
485143	486396	486397
486397	487656	487657
487657	488922	488923
488923	490196	490197
490197	491475	491476
491476	492762	492763
492763	494055	494056
494056	495356	495357
495357	496663	496664
496664	497976	497977
497977	499297	499298
499298	500625	500626

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
500626	501960	501961
501961	503302	503303
503303	504652	504653
504653	506008	506009
506009	507372	507373
507373	508744	508745
508745	510122	510123
510123	511508	511509
511509	512902	512903
512903	514304	514305
514305	515713	515714
515714	517129	517130
517130	518554	518555
518555	519987	519988
519988	521427	521428
521428	522875	522876
522876	524332	524333
524333	525796	525797
525797	527269	527270
527270	528750	528751
528751	530240	530241
530241	531738	531739
531739	533244	533245
533245	534759	534760
534760	536282	536283
536283	537815	537816
537816	539356	539357
539357	540906	540907
540907	542464	542465
542465	544032	544033
544033	545609	545610
545610	547195	547196
547196	548790	548791
548791	550395	550396
550396	552009	552010
552010	553633	553634

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
553634	555266	555267
555267	556909	556910
556910	558561	558562
558562	560224	560225
560225	561896	561897
561897	563578	563579
563579	565271	565272
565272	566973	566974
566974	568686	568687
568687	570409	570410
570410	572143	572144
572144	573888	573889
573889	575643	575644
575644	577408	577409
577409	579185	579186
579186	580973	580974
580974	582771	582772
582772	584581	584582
584582	586402	586403
586403	588235	588236
588236	590079	590080
590080	591934	591935
591935	593802	593803
593803	595681	595682
595682	597572	597573
597573	599475	599476
599476	601390	601391
601391	603318	603319
603319	605258	605259
605259	607210	607211
607211	609175	609176
609176	611153	611154
611154	613144	613145
613145	615148	615149
615149	617164	617165
617165	619195	619196

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
619196	621238	621239
621239	623295	623296
623296	625366	625367
625367	627450	627451
627451	629549	629550
629550	631662	631663
631663	633788	633789
633789	635930	635931
635931	638085	638086
638086	640256	640257
640257	642441	642442
642442	644641	644642
644642	646856	646857
646857	649087	649088
649088	651333	651334
651334	653594	653595
653595	655872	655873
655873	658165	658166
658166	660474	660475
660475	662800	662801
662801	665142	665143
665143	667501	667502
667502	669876	669877
669877	672268	672269
672269	674678	674679
674679	677105	677106
677106	679549	679550
679550	682011	682012
682012	684491	684492
684492	686990	686991
686991	689506	689507
689507	692041	692042
692042	694595	694596
694596	697167	697168
697168	699759	699760
699760	702370	702371

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
702371	705001	705002
705002	707651	707652
707652	710321	710322
710322	713012	713013
713013	715723	715724
715724	718455	718456
718456	721208	721209
721209	723981	723982
723982	726777	726778
726778	729594	729595
729595	732433	732434
732434	735294	735295
735295	736733	736734
736734	738177	738178
738178	739627	739628
739628	741083	741084
741084	742545	742546
742546	744013	744014
744014	745486	745487
745487	746965	746966
746966	748450	748451
748451	749941	749942
749942	751438	751439
751439	752941	752942
752942	754450	754451
754451	755965	755966
755966	757486	757487
757487	759013	759014
759014	760546	760547
760547	762086	762087
762087	763632	763633
763633	765184	765185
765185	766742	766743
766743	768307	768308
768308	769878	769879
769879	771456	771457

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
771457	773040	773041
773041	774630	774631
774631	776228	776229
776229	777831	777832
777832	779442	779443
779443	781059	781060
781060	782683	782684
782684	784313	784314
784314	785951	785952
785952	787595	787596
787596	789246	789247
789247	790904	790905
790905	792569	792570
792570	794241	794242
794242	795920	795921
795921	797607	797608
797608	799300	799301
799301	801001	801002
801002	802709	802710
802710	804424	804425
804425	806146	806147
806147	807876	807877
807877	809614	809615
809615	811359	811360
811360	813111	813112
813112	814871	814872
814872	816639	816640
816640	818414	818415
818415	820197	820198
820198	821988	821989
821989	823786	823787
823787	825593	825594
825594	827407	827408
827408	829230	829231
829231	831060	831061
831061	832899	832900

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
832900	834746	834747
834747	836601	836602
836602	838464	838465
838465	840336	840337
840337	842216	842217
842217	844104	844105
844105	846001	846002
846002	847906	847907
847907	849820	849821
849821	851743	851744
851744	853674	853675
853675	855614	855615
855615	857563	857564
857564	859521	859522
859522	861488	861489
861489	863464	863465
863465	865449	865450
865450	867443	867444
867444	869447	869448
869448	871459	871460
871460	873481	873482
873482	875512	875513
875513	877553	877554
877554	879604	879605
879605	881664	881665
881665	883733	883734
883734	885813	885814
885814	887902	887903
887903	890001	890002
890002	892110	892111
892111	894229	894230
894230	896358	896359
896359	898497	898498
898498	900647	900648
900648	902807	902808
902808	904977	904978

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
904978	907158	907159
907159	909349	909350
909350	911551	911552
911552	913763	913764
913764	915986	915987
915987	918220	918221
918221	920465	920466
920466	922722	922723
922723	924989	924990
924990	927267	927268
927268	929557	929558
929558	931857	931858
931858	934170	934171
934171	936494	936495
936495	938829	938830
938830	941176	941177
941177	943535	943536
943536	945906	945907
945907	948288	948289
948289	950683	950684
950684	953090	953091
953091	955509	955510
955510	957940	957941
957941	960384	960385
960385	962840	962841
962841	965309	965310
965310	967790	967791
967791	970285	970286
970286	972792	972793
972793	975312	975313
975313	977845	977846
977846	980392	980393
980393	982951	982952
982952	985525	985526
985526	988111	988112
988112	990712	990713

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
990713	993326	993327
993327	995953	995954
995954	998595	998596
998596	1001251	1001252
1001252	1003921	1003922
1003922	1006605	1006606
1006606	1009304	1009305
1009305	1012017	1012018
1012018	1014745	1014746
1014746	1017488	1017489
1017489	1020245	1020246
1020246	1023017	1023018
1023018	1025805	1025806
1025806	1028608	1028609
1028609	1031426	1031427
1031427	1034259	1034260
1034260	1037109	1037110
1037110	1039974	1039975
1039975	1042854	1042855
1042855	1045751	1045752
1045752	1048664	1048665
1048665	1051593	1051594
1051594	1054539	1054540
1054540	1057501	1057502
1057502	1060480	1060481
1060481	1063476	1063477
1063477	1066488	1066489
1066489	1069518	1069519
1069519	1072565	1072566
1072566	1075630	1075631
1075631	1078712	1078713
1078713	1081812	1081813
1081813	1084929	1084930
1084930	1088065	1088066
1088066	1091219	1091220
1091220	1094391	1094392

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1094392	1097581	1097582
1097582	1100791	1100792
1100792	1104019	1104020
1104020	1107266	1107267
1107267	1110532	1110533
1110533	1113818	1113819
1113819	1117123	1117124
1117124	1120448	1120449
1120449	1123792	1123793
1123793	1127157	1127158
1127158	1130542	1130543
1130543	1133947	1133948
1133948	1137373	1137374
1137374	1140819	1140820
1140820	1144287	1144288
1144288	1147776	1147777
1147777	1151286	1151287
1151287	1154817	1154818
1154818	1158371	1158372
1158372	1161946	1161947
1161947	1165543	1165544
1165544	1169163	1169164
1169164	1172805	1172806
1172806	1176470	1176471
1176471	1180158	1180159
1180159	1183869	1183870
1183870	1187604	1187605
1187605	1191362	1191363
1191363	1195144	1195145
1195145	1198950	1198951
1198951	1202781	1202782
1202782	1206636	1206637
1206637	1210516	1210517
1210517	1214421	1214422
1214422	1218351	1218352
1218352	1222307	1222308

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1222308	1226288	1226289
1226289	1230296	1230297
1230297	1234329	1234330
1234330	1238390	1238391
1238391	1242477	1242478
1242478	1246591	1246592
1246592	1250732	1250733
1250733	1254901	1254902
1254902	1259098	1259099
1259099	1263324	1263325
1263325	1267577	1267578
1267578	1271860	1271861
1271861	1276171	1276172
1276172	1280512	1280513
1280513	1284882	1284883
1284883	1289282	1289283
1289283	1293713	1293714
1293714	1298174	1298175
1298175	1302666	1302667
1302667	1307189	1307190
1307190	1311744	1311745
1311745	1316330	1316331
1316331	1320949	1320950
1320950	1325600	1325601
1325601	1330284	1330285
1330285	1335002	1335003
1335003	1339752	1339753
1339753	1344537	1344538
1344538	1349356	1349357
1349357	1354210	1354211
1354211	1359099	1359100
1359100	1364023	1364024
1364024	1368983	1368984
1368984	1373980	1373981
1373981	1379013	1379014
1379014	1384083	1384084

Table A-1 BXM-E Configured versus Actual Bandwidth (continued)

Minimum Bandwidth (cps)	Maximum Bandwidth (cps)	Actual Bandwidth (cps)
1384084	1389190	1389191
1389191	1394335	1394336
1394336	1399518	1399519
1399519	1404741	1404742
1404742	1410002	1410003
1410003	1412830	1415303