Introduction

This guide describes the Cisco Systems private, or local, Management Information Base (MIB) for Internetwork Operating System (IOS) Release 10.2. The Cisco MIB is provided with all Cisco software releases and with CiscoWorks router management software. The MIB file contains variables that can be set or read to provide information on network devices and interfaces.

The Cisco MIB is a set of variables that are private extensions to the Internet standard MIB II. The MIB II is documented in RFC 1213, Management Information Base for Network Management of TCP/IP-based Internets: MIB-II.

The Cisco MIB is described by a number of MIB files, which can be obtained by FTP from the Cisco server. The listing of Cisco MIB variables in those files is identical to the listing in this guide, except that unlike the MIB files, the Cisco MIB variables are presented alphabetically in this guide for quick reference.

You can obtain the files which describe the Cisco MIB by using the **ftp ftp.cisco.com** command. Log in with the username **anonymous** and enter your e-mail name when prompted for the password. Use the **cd pub/mibs** command to go to the directory that contains the MIB files, and then issue the **get README** command to display the *readme* file containing a list of available files. You can then use the **get filename** command to retrieve the desired MIB file (for example, use **get cisco-ping-mib.my** to retrieve the Cisco Ping MIB).

The Cisco MIB variables are accessible via the Simple Network Management Protocol (SNMP), which is an application-layer protocol designed to facilitate the exchange of management information between network devices. The SNMP system consists of three parts: SNMP manager, SNMP agent, and MIB.

Instead of defining a large set of commands, SNMP places all operations in a get-request, get-next-request, get-bulk-request, and set-request format. For example, an SNMP manager can get a value from an SNMP agent or store a value into that SNMP agent. The SNMP manager can be part of a network management system (NMS), and the SNMP agent can reside on a networking device such as a router. You can compile the

Cisco MIB with your network management software. If SNMP is configured on a router, the SNMP agent can respond to MIB-related queries being sent by the NMS.

An example of an NMS is the CiscoWorks network management software. CiscoWorks uses the Cisco MIB variables to set device variables and to poll devices on the internetwork for specific information. The results of a poll can be graphed and analyzed in order to troubleshoot internetwork problems, increase network performance, verify the configuration of devices, monitor traffic loads, and more.

As shown in Figure 1, the SNMP agent gathers data from the MIB, which is the repository for information about device parameters and network data. The agent also can send traps, or notification of certain events, to the manager. The Cisco trap file, *mib.traps*, which documents the format of the Cisco traps, is available on the Cisco host `ftp.cisco.com`.

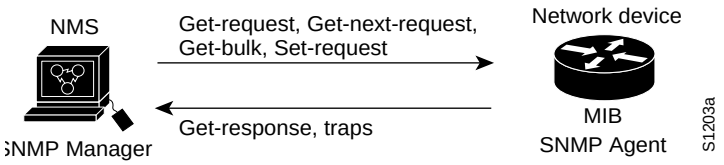


Figure 1 SNMP Network

The SNMP manager uses information in the MIB to perform the operations described in Table 1.

Table 1 SNMP Manager Operations

Operation	Description
get-request	Retrieve a value from a specific variable.
get-next-request	Retrieve a value from a variable within a table[1].
get-response	The reply to a get-request, get-next-request, and set-request sent by an NMS.
get-bulk-request	The agent's response to the get-bulk operator isn't unlike the concatenation of the agent's responses from up to max-repetition number of get-next interactions.
set-request	Store a value in a specific variable.
trap	An unsolicited message sent by an SNMP agent to an SNMP manager indicating that some event has occurred.

1. With this operation, an SNMP manager does not need to know the exact variable name. A sequential search is performed to find the needed variable from within a table.

Internet MIB Hierarchy

The MIB structure is logically represented by a tree hierarchy. (See Figure 2.) The *root* of the tree is unnamed and splits into three main branches: Consultative Committee for International Telegraph and Telephone (CCITT), International Organization for Standardization (ISO), and joint ISO/CCITT.

These branches and those that fall below each category have short text strings and integers to identify them. Text strings describe *object names*, while integers allow computer software to create compact, encoded representations of the names. For example, the Cisco MIB variable *authAddr* is an object name and is denoted by number 5, which is listed at the end of its object identifier number *1.3.6.1.4.1.9.2.1.5*.

The *object identifier* in the Internet MIB hierarchy is the sequence of numeric labels on the nodes along a path from the root to the object. The Internet standard MIB is represented by the object identifier *1.3.6.1.2.1*. It also can be expressed as *iso.org.dod.internet.mgmt.mib*. (See Figure 2.)

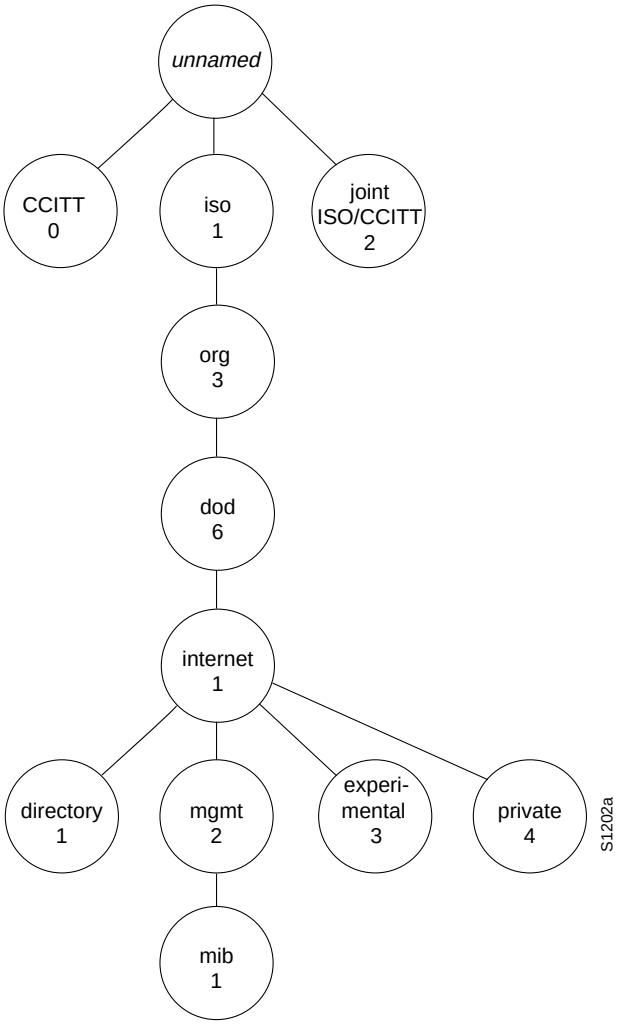


Figure 2 Internet MIB Hierarchy

Cisco MIB

The private Cisco MIB is represented by the object identifier 1.3.6.1.4.1.9, or *iso.org.dod.internet.private.enterprise.cisco*. The Cisco MIB includes the following subtrees: local (2), temporary (3), otherEnterprises (6), and ciscoMgmt(9).

The local subtree contains MIB objects defined prior to Software Release 10.2. MIB objects defined prior to Software Release 10.2 implemented the SNMPv1 Structure of Management Information (SMI). Beginning with IOS 10.2, however, Cisco MIBs are defined using the SNMPv2 SMI. MIBs defined using SNMPv2 are being placed in the ciscoMgmt tree. (See Figure 3.) MIBs currently defined in the local subtree are being deprecated by Cisco as an ongoing process, and being replaced with new objects defined in the ciscoMgmt subtree. For example, the TCP group that was in the local group has been deprecated and replaced with a new TCP group in the ciscoMgmt tree. The Ping group is one of the new objects in the ciscoMgmt tree. The otherEnterprises subtree contains MIBS defined by other entities that Cisco has incorporated into its MIB structure. The new IPX and RIPSAP groups are examples of MIBs in the otherEnterprises tree.

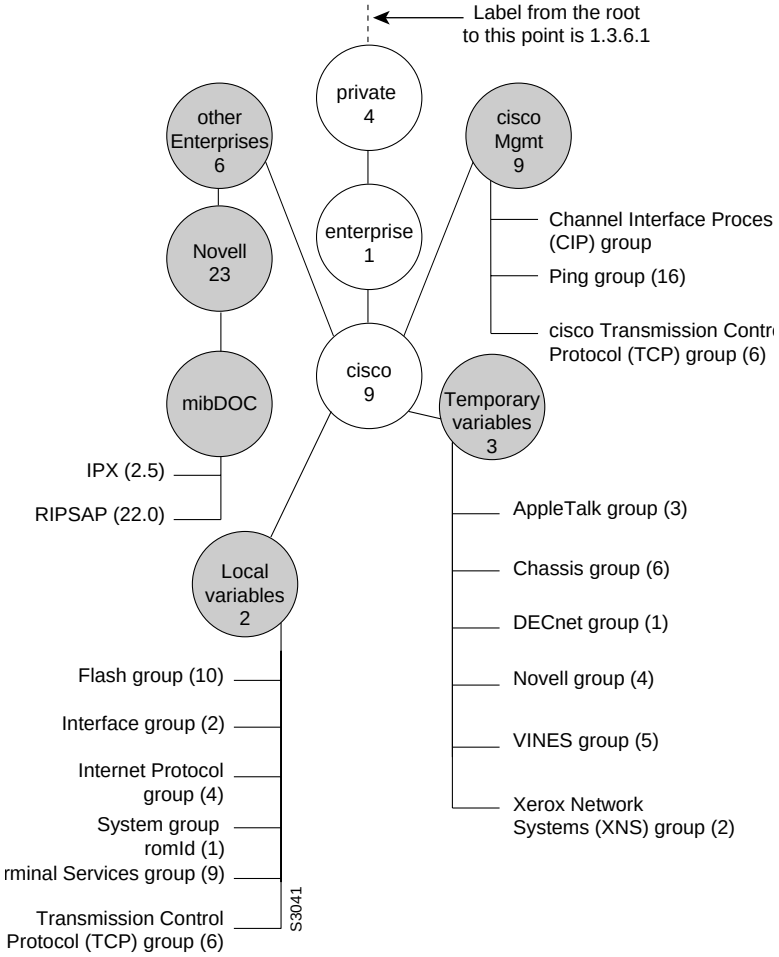


Figure 3 Cisco Private MIB Hierarchy

In Figure 3, the local variables group is identified by 2; its subgroup, called *lsystem*, is identified by 1; and the first variable is *romId* with a value of 1. Therefore, the variable *romId* has a value of 1.3.6.1.4.1.9.2.1.1.0. The appended 0 indicates that 1.3.6.1.4.1.9.2.1.1.0 is the one and only instance of *romId*.

Note Although variables are arranged as shown in Figure 3 and as described in the compilable Cisco MIB file, this quick reference guide organizes variable groups and variables within groups alphabetically, so that you can quickly look up descriptions of MIB variables.

Interpreting the Object Identifier

In this guide, each group of Cisco MIB variables is accompanied by an illustration that indicates the specific *object identifier* for each variable.

For example, in Figure 4 the object identifier 1.3.6.1.4.1.9.2.1 at the top of the illustration indicates the labeled nodes. The last value is the number of the Cisco MIB variable. For example, the MIB variable *hostConfigAddr* is indicated by the number 51. The object identifier for *hostConfigAddr* is *iso.org.dod.internet.private.enterprise.cisco.local variables.system group.hostConfigAddr* or *1.3.6.1.4.1.9.2.1.51*.

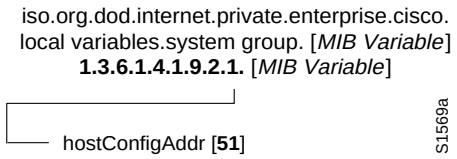


Figure 4 Object Identifier Example for a Cisco MIB Variable

Tables

When network management protocols use names of MIB variables in messages, each name has a suffix appended. For simple variables, the suffix 0 refers to the instance of the variable with that name. A MIB also can contain tables of related variables.

Following is an excerpt of the information on the IP Routing table (known as *lipRoutingTable*) from the associated mib file:

```
lipRoutingTable OBJECT-TYPE
   SYNTAX  SEQUENCE OF LIpRouteEntry
   ACCESS  not-accessible
   STATUS  mandatory
   DESCRIPTION
       "A list of IP routing entries."
::= { lip 2 }

lipRouteEntry OBJECT-TYPE
   SYNTAX LIpRouteEntry
   ACCESS  not-accessible
   STATUS  mandatory
   DESCRIPTION
       "A collection of additional objects in the
       cisco IP routing implementation."
   INDEX { ipRouteDest }
::= { lipRoutingTable 1 }

LIpRouteEntry ::=
   SEQUENCE {
     locRtMask
        IpAddress,
     locRtCount
        INTEGER,
}
```

The local IP Routing table, *lipRoutingTable*, is described in Table 7. The *lipRoutingTable* contains two variables: *locRtMask* and *locRtCount*. The index for this table is the destination address of the IP route, or *ipRouteDest.* If there are *n* number of routes available to a device, there will be *n* rows in the IP Routing table.

In Table 2, for the route with the destination IP address of 131.104.111.1, the IP Routing table network mask is 255.255.255.0. The number of parallel routes within the routing table is 3.

Table 2 IP Routing

ipRouteDest	locRtMask	locRtCount
131.104.111.1	255.255.255.0	3
133.45.244.245	255.255.255.0	1

Typically, an instance identifier might be a unique interface number or a 0, as described earlier with the *romId* example. An instance identifier can also be an (IP) address. For example, to find the network mask for the route with a destination address of *131.104.211.243*, use the variable *locRtMask* with an instance identifier of *131.104.211.243*. The format is *locRtMask.131.104.211.243*.

In this guide, when variables belong to a table, they are listed in the section describing the table. The following tag is used to indicate the end of a table:

End of Table

All variables before this tag are part of the table.

Local Variables

The local variables section pertains to all Cisco devices and contains the following groups.

Note This quick reference guide organizes variable groups and variables within groups alphabetically, so that you can quickly look up descriptions of MIB variables.

- Flash group

  Pertains to the Flash memory used to store, boot, and write system software images. Includes information such as Flash memory size and the contents of flash. Operations can be invoked by SETing MIB variables such as erasing Flash memory and transferring a Flash memory file to a Trivial File Transfer Protocol (TFTP) server.

- Interface group

  Provides information on Cisco device interfaces, such as traffic statistics, line status, average speed of input and output packets, and error checking.

- Internet Protocol (IP) group

  Provides information about devices running IP. Includes information such as how and from whom an interface obtained its address, Internet Control Message Protocol (ICMP) messages, and number of packets lost.

- System group

  Provides information on system-wide parameters for Cisco devices, such as software version, host name, domain name, buffer size, configuration files, and environmental statistics.

- Terminal Services group

  Provides information about terminal services, such as number of physical lines, line status, line type, line speed, type of flow control, and type of modem.

- Transmission Control Protocol (TCP) group

Provides statistics on the number of input and output bytes and packets for TCP connections. The “local” TCP group has been deprecated, and replaced with a new TCP group in the ciscoMgmt group which provides more functionality.

Temporary Variables

This section is equivalent to the experimental space defined by the Structure of Management Information (SMI). These variables are subject to change for each Cisco Systems software release.

Temporary variables consists of the following groups, which are presented in alphabetical order. (See Figure 3.)

- AppleTalk group

  Pertains to devices running the AppleTalk protocol. Includes information such as total number of input and output packets, number of packets with errors, and number of packets with Address Resolution Protocol (ARP) requests and replies.

- Chassis group

  Pertains to hardware information about Cisco devices. Includes information such as the types of cards used by the device, the hardware version of the cards, and the number of slots in the chassis.

- DECnet group

  Pertains to devices running the DECnet protocol. Includes information such as hop count, host name, total packets received and sent, and number of packets with header errors.

- IPX Accounting Variables

- IPX Checkpoint Accounting

- Novell group

  Pertains to devices running the Novell protocol. Includes information such as total number of input and output packets, number of packets with errors, and number of packets with service access point (SAP) requests and replies.

- Virtual Integrated Network System (VINES) group

Pertains to devices running the VINES protocol. Includes information such as total number of input and output packets, number of packets with errors, and number of packets with Internet Control Message Protocol (ICMP) requests and replies.

- Xerox Network Systems (XNS) group

  Pertains to devices running the XNS protocol. Includes information such as number of packets forwarded, total number of input packets, and total number of packets with errors.

ciscoMgmt Variables

The ciscoMgmt subtree consists of the following variables:

- Channel Interface Processor Group

  The CIP Group specifies the MIB module for objects used to manage the cisco channel interface processor card.

- Ping group

  Provides a user with the ability to initiate a ping (ICMP echo request) from the Cisco device to a specified destination address.

- Cisco Transmission Control Protocol

  Provides statistics on the number of input and output bytes and packets for TCP connections; ciscoTCP, however, provides more functionality over its counterpart in the Local Variables subtree.

otherEnterprises Variables

The otherEnterprises subtree consists of the following variables:

- Novell IPX System Group

  Contains general information about all instances of IPX on one system.

- Novell RIPSAP

  Defines the management information for the RIP and SAP protocols running in an IPX environment.

Terminology

This section presents the syntax and access type categories used to describe each variable. For details on syntax, refer to RFC 1155, and to RCF 1442 for SNMPv2.

Syntax

The syntax describes the format of the information, or value, that is returned upon monitoring or setting information in a device with a MIB variable.

Note Some MIBs are defined using the SNMPv1 SMI while others are defined using the SNMPv2 SMI, and so the two have slightly different syntaxes. For example, an SNMPv1 “Counter” is a “Counter32” in SNMPv2.

The syntax can be any one of the following categories:

- TruthValue

  An integer of 1 or 2, where 1 = true or 2 = false. TruthValue is defined in “Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2),” RFC 1443.

- Counter/Counter32

  A counter is a nonnegative integer that increases until it reaches some maximum value. After reaching the maximum value, it rolls back to zero. For example, the variable *locIfipInPkts* counts the number of IP protocol input packets on an interface.

- Display string

  A display string is a printable ASCII string. It is typically a name or description. For example, the variable *netConfigName* provides the name of the network configuration file for a device.

- Integer

  An integer is a numeric value. It can be an actual number, for example, the number of lost IP packets on an interface. It also can be a number that represents a nonnumeric value. For example, the variable *tsLineType* returns the type of terminal services line to the SNMP manager. A 2 indicates a console line; a 3 indicates a terminal line; and so on.

- Integer32

  An integer from -2^{32} to $2^{32}-1$.

- TimeStamp

  TimeStamp is defined in RFC 1443 as the value of the MIB-II sysUpTime object at which a specific event occurred.

- IP address

  The variable *hostConfigAddr* indicates the IP address of the host that provided the host configuration file for a device.

- Timeticks

  Timeticks is a nonnegative integer that counts the hundredths of a second since an event. For example, the variable *loctcpConnElapsed* provides the length of time that a TCP connection has been established.

Access

The access type, which applies to SNMPv1, describes whether a MIB variable can be used under one of the following circumstances:

- Read-only

  This variable can be used to monitor information only. For example, the *locIPUnreach* variable, whose access is read-only, indicates whether Internet Control Message Protocol (ICMP) packets concerning an unreachable address will be sent.

- Read-write

This variable can be used to monitor information and to set a new value for the variable. For example, the *tsMsgSend* variable, whose access is read-write, determines what action to take after a message has been sent.

The possible integer values for this variable follow:

1 = nothing
2 = reload
3 = message done
4 = abort

- Write-only

  This variable can be used to set a new value for the variable only. For example, the *writeMem* variable, whose access is write-only, writes the current (running) router configuration into nonvolatile memory where it can be stored and retained even if the router is reloaded. If the value is set to 0, the *writeMem* variable erases the configuration memory.

Max-Access

This variable, which applies to SNMPv2, can represent one of the following four states: read-create, read-write, read-only, and not-accessible.

- Not-Accessible

  You cannot read or write to this variable. Entry statements are typically among those variables that are not accessible.

- Read-Create

  This specifies a tabular object which can be read or created as a new row in a table.

- Read-Write

  You can read or modify this variable.

Internetwork Management

The International Organization for Standards (ISO) Network Management Forum defined five areas of network management: fault, configuration, security, performance, and accounting. Cisco MIB variables can be mapped to each of these areas (as described in this section) and used to manage your internetwork.

- Fault Management

  Fault management involves running diagnostic tests on the internetwork, analyzing the results, and isolating and resolving problems.

  Example:

  Several of the variables described in the section "Basic" provide resources for troubleshooting. For example, the variables *freeMem*, and *whyReload* provide information on why a router was reloaded, and indicate how much memory is currently available in a device.

  The variables described in the section "Environmental Monitor Card" provide feedback on the physical status of the AGS+ router or 7000 router.

  Statistics from variables in the section "Interface Table" record the number of packets dropped on particular interfaces so that they can be identified as potential trouble spots.

- Configuration Management

  Configuration management involves monitoring and controlling the configuration of devices on the internetwork.

  Example:

  The *locIPhow* and *locIPwho* variables described in the section "Internet Protocol (IP) Group" provide information on how a device received its IP address and the device that provided it with its address.

  The variables described in the sections "Host Configuration File" and "Network Configuration File" provide configuration file names and addresses of hosts supplying network configuration files.

  The variables described in the section "System Configuration" provide information such as the name of the host that supplied the system boot image for a device and the name of the boot image.

- Security Management

  Security management deals with controlling access to network resources through the use of authentication techniques and authorization policies.

  Example:

  The variable *authAddr* contains the address of the last SNMP manager that failed the authorization check. The *locIPSecurity* variable provides the IP security level assigned to an interface.

- Performance Management

  Performance management measures traffic flow across the internet, calculates the number of packets that are successfully transmitted against those that are dropped, and so on, in order to optimize efficiency.

  Example:

  The variables described in the section “CPU Utilization” provide feedback on CPU performance. The variables described in the section “Interface Group” provide statistics on time between packets sent, number of packets transmitted successfully, and so on.

- Accounting Management

  Accounting management involves collecting and processing data related to resource consumption on the internet.

  Example:

  The variables described in the section “IP Checkpoint Accounting Table,” found later in this guide, provide numerous statistics such as packets and bytes sent successfully or dropped.

Cisco-Supported MIBs

Cisco supports several MIBs, which are described in the following Requests for Comments (RFCs). Also listed are RFCs describing the Internet standards that Cisco Systems follows with regard to its MIB format and the SNMP protocol.

- RFC 1155, *Structure and Identification of Management Information for TCP/IP-based Internets*, May 1990

  Describes the common structures and identification scheme for the definition of management information for use with TCP/IP-based Internets. Formal descriptions of the structure are given using Abstract Syntax Notation One (ASN.1).

- RFC 1156, *Management Information Base for Network Management of TCP/IP-based Internets,* May 1990

  Describes the initial version of the standard Internet Management Information Base, MIB I. MIB I is superseded by MIB II, as described in RFC 1213.

- RFC 1157, *A Simple Network Management Protocol (SNMP),* May 1990

  Describes the SNMP architecture and supported operations.

- RFC 1212, *Concise MIB Definitions*, March 1991

  Describes the format for producing concise, yet descriptive, MIB modules.

- RFC 1213, *Management Information Base for Network Management of TCP/IP-based Internets: MIB-II,* March 1991

  Describes the Internet standard MIB II for use with network management protocols in TCP/IP-based internets.

  RFC 1213 obsoletes RFC 1158.

- RFC 1215, *A Convention for Defining Traps for use with the SNMP,* March 1991

  Describes the SNMP standardized traps and provides a means for defining enterprise-specific traps.

- RFC 1231, *IEEE 802.5 Token Ring MIB*, May 1991

  Describes the managed objects used for managing subnetworks that use the IEEE 802.5 Token Ring technology.

  Cisco implements the mandatory tables (Interface table and Statistics table), but not the optional table (Timer table) of this MIB.

  RFC 1239 contains information that updates RFC 1231.

- RFC 1243, *AppleTalk MIB*, July 1991

  Describes the managed objects for AppleTalk that use the SNMP protocol.

  Cisco Systems provides support for the AppleTalk Resolution Protocol (ARP), AppleTalk Port Group, AppleTalk Datagram Delivery Protocol (DDP), AppleTalk Routing Table Maintenance Protocol (RTMP), AppleTalk Zone Information Protocol (ZIP), AppleTalk Name Binding Protocol (NBP), and AppleTalk Echo Group

- RFC 1285, *FDDI Management Information Base*, January 1992

  Describes the managed objects for Fiber Distributed Data Interface (FDDI) devices that are accessible via the Simple Network Management Protocol (SNMP).

  Cisco Systems supports only some of the variables in the Station Management (SMT) and Media Access Control (MAC) groups of this MIB. Refer to the Cisco publication *FDDI MIB Variables in 9.0 Product Update Bulletin No. 181*.

- RFC 1398, *Ethernet-like Interface Types*, January 1993

  Specifies an IAB (Internet Activities Board) standards track protocol for the Internet community and defines objects for managing Ethernet-like objects.

- RFC 1442, *Structure of Management Information for version 2 of the Simple Network Management Protocol (SNMPv2)*.

  This document outlines the subset of OSI's Abstract Syntax Notation One (ASN.1) used to define the Management Information Base (MIB) for version 2 of the Simple Network Management Protocol (SNMPv2).

- RFC 1443, *Textual Conventions for version 2 of the Simple Network Management Protocol (SNMPv2)*.

  This document defines the initial set of extensions (textual conventions) to the basic types defined in the SMI (RFC1442) which are available to all MIB modules.

- RFC 1447 SNMPv2 Party MIB, April 1993

  Describes the managed objects which correspond to the properties associated with SNMPv2 parties, SNMPv2 contexts, and access control policies, as defined by the SNMPv2 Administrative Model.

  Cisco supports the MIB variables as required by the Conformance clauses specified in these MIBs.

- RFC 1450 SNMPv2 MIB, April 1993

  Describes the managed objects that cause the behavior of an SNMPv2 implementation.

  Cisco supports the MIB variables as required by the Conformance clauses specified in these MIBs.

- RFC 1493, *Definitions of Managed Objects for Bridges*, July 1993

  RFC 1493 obsoletes half of RFC 1286.

- RFC 1525, *Definitions of Managed Objects for Source Routing Bridges*

  RFC 1525 obsoletes half of RFC 1286.

  Cisco supports all of the groups described in this MIB, including the following groups: dotldBase, dotldSr, dot1dStp, and dotIdTp.

- RFC 1406, *Definitions of Managed Objects for DS1 and E1 Interface Types*, January 1993

  RFC 1406 obsoletes RFC 1232.

- RFC 1315, *Management Information Base for Frame Relay DTEs*, April 1992

  Cisco supports the following tables in this MIB:

  — Data Link Connection Management Interface

  — Circuit

— Frame Relay Globals

— Data Link Connection Management Interface Related Traps

The Error Table is not supported in this MIB.

- RFC 1381, *SNMP MIB Extension for X.25 LAPB*, November 1992

  Cisco supports the following tables in this MIB:

  — LAPB Admn (read-only)

  — LAPB Operating Parameters

  — LAPB Flow

  The LAPB XID table is not supported in this MIB.

- RFC 1382, *SNMP MIB Extension for the X.25 Packet Layer*, November 1992

  The X.25 packet layer MIB is available under the ifType node rfc887-x25 (5) registered under the MIB-II transmission Object Identifier. This condition applies to all X.25 interfaces, including any DDN-X.25 encapsulation interfaces. Cisco supports the following tables in this MIB:

  — X.25 Administration (read-only)

  — X.25 Operational

  — X.25 Statistics

  — X.25 Channel (read-only)

  — X.25 Circuits Information (read-only)

  — X.25 Traps (both must be configured)

  The following tables are not supported in this MIB:

  — X.25 Cleared Circuit Table

  — X.25 Call Parameter Table

- RFC 1269, Management Information Base for Border Gateway Protocol (BGP)

  Provides some support for RFC 1269 and replacement draft IETF-BGP-MIBC4-OS.Txt. Cisco supports the following tables in this MIB:

- BGP Version
- BGP LocalAs
- BGP Identifier
- BGP PeerTable

- RFC 1659 for asynchronous interfaces

  The RS-232-like Hardware Device MIB applies to interface ports that might logically support the Interface MIB, a Transmission MIB, or the Character MIB. The most common example is an RS-232 port with modem signals.

  The RS-232-like Hardware Device MIB is mandatory for all systems that have such a hardware port supporting services managed through some other MIB.

  The MIB includes many similar types of hardware, and as a result contains objects not applicable to all of those hardware types. The compliance definitions have a general group for all implementations, and separate groups for the different types of ports, such as asynchronous and synchronous.

  The RS-232-like Hardware Port MIB includes RS-232, RS-422, RS-423, V.35, and serial physical links (other asynchronous or synchronous) with a similar set of control signals.

  The MIB contains objects that relate to physical layer connections. Such connections may provide hardware signals (other than for basic data transfer), such as RNG and DCD. Hardware ports also have such attributes as speed and bits per character.

To obtain copies of RFCs, use the **ftp nic.ddn.mil** command. Log in as **anonymous** and enter your e-mail name when prompted for the password. Enter the **cd rfc** command to change to the correct directory.

Use the **get rfc-index.txt** command to retrieve a list of all available RFCs. To obtain a copy of any specific RFC, enter **get rfcnnnn.txt**, where *nnnn* is the RFC number.

Related Cisco Publications

For detailed information on configuration and troubleshooting commands, refer to the following Cisco publications:

- *Router Products Configuration Guide*
- *Router Products Command Reference*
- *Access and Communication Servers Configuration Guide*
- *Access and Communication Servers Command Reference*

Users of the CiscoWorks router management software can refer to the *CiscoWorks User Guide* for information on CiscoWorks router management software features and its use of MIB variables for the purposes of graphing and analyzing network performance, ensuring configuration consistency, troubleshooting, and more.

Suggested Reading

Following are suggested reading materials:

- Leinwand, A. and K. Fang. *Network Management: A Practical Perspective.* Reading, Massachusetts: Addison-Wesley Publishing Company, Inc.; 1993.
- Rose, M. T. *The Simple Book: An Introduction to Management of TCP/IP-based Internets*. Englewood Cliffs, New Jersey: Prentice-Hall; 1991.
- Rose, M. T. *The Simple Book: An Introduction to Internet Management,* 2nd edition. Englewood Cliffs, New Jersey: Prentice-Hall; 1993.
- Stallings, W. *SNMP, SNMPv2, and CMIP: The Practical Guide to Network Management Standards*. Reading, Massachusetts: Addison-Wesley Publishing Company, Inc.; 1993.

Object Identifier Numbers for Variables

The figures in this section provide a visual overview of the Cisco MIB variables along with the object identifier numbers for each MIB variable. The MIB variables are arranged alphabetically within each figure (in the same order in which they appear in the sections of this guide).

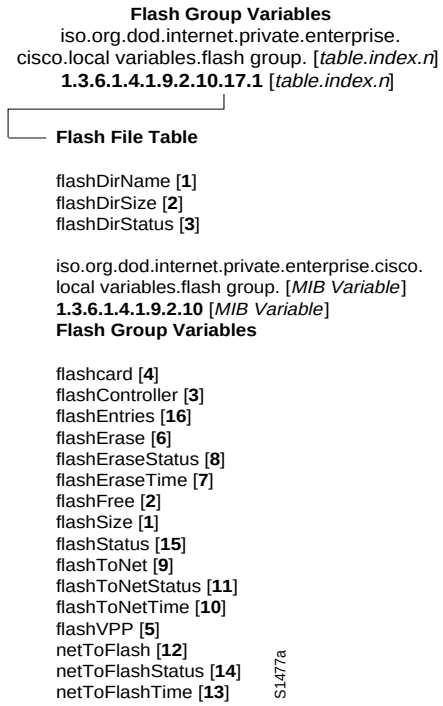


Figure 5 Local Variables: Flash File Table and Flash Group

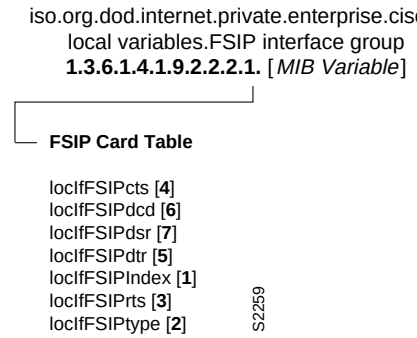


Figure 6 FSIP Group Variables

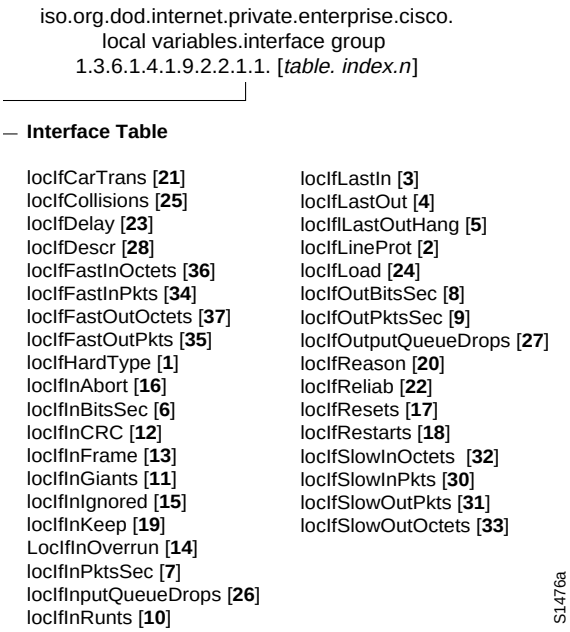


Figure 7 Local Variables: Interface Group Table

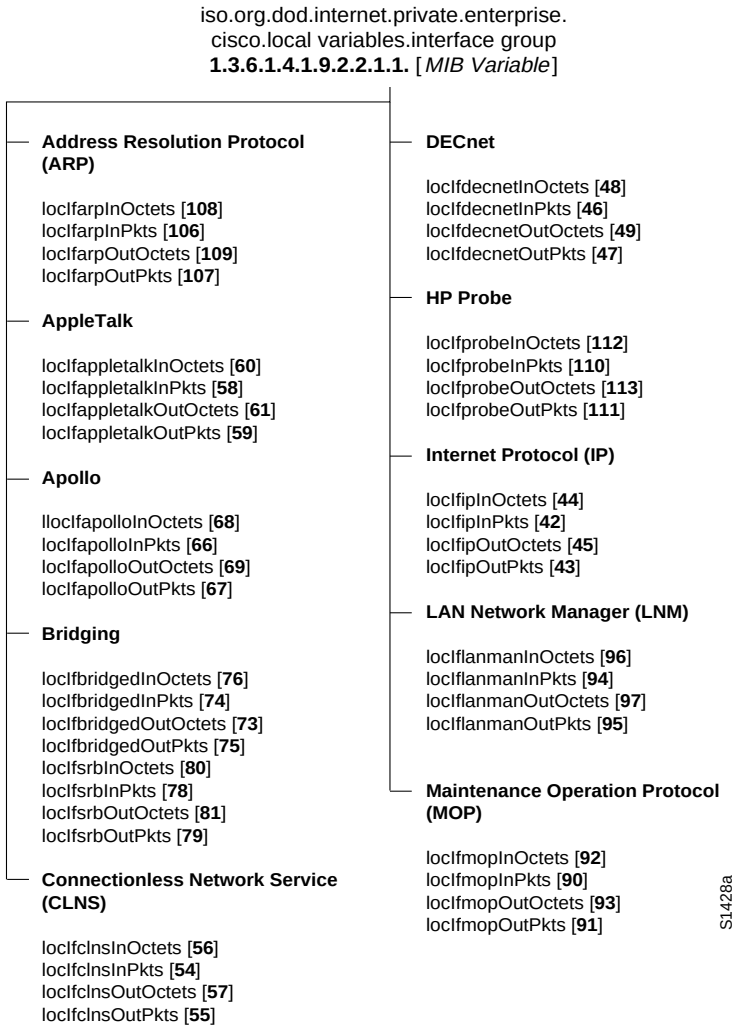


Figure 8 Local Variables: Interface Group—ARP, AppleTalk, Apollo, Bridging, CLNS, DECnet, HP Probe, IP, LNM, and MOP

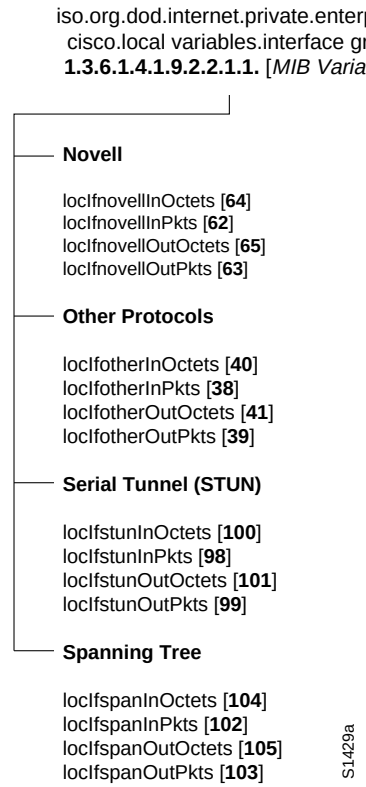


Figure 9 Local Variables: Interface Group—Novell, Other Protocols, STUN, SpanningTree

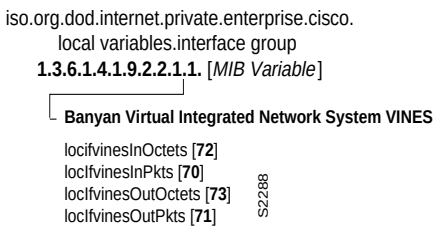


Figure 10 Local Variables: Interface Group—Vines

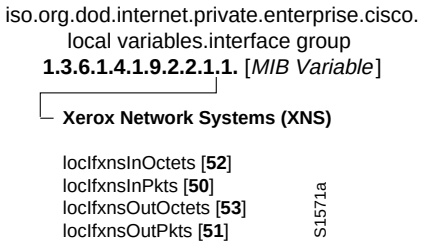


Figure 11 Local Variables: Interface Group—XNS

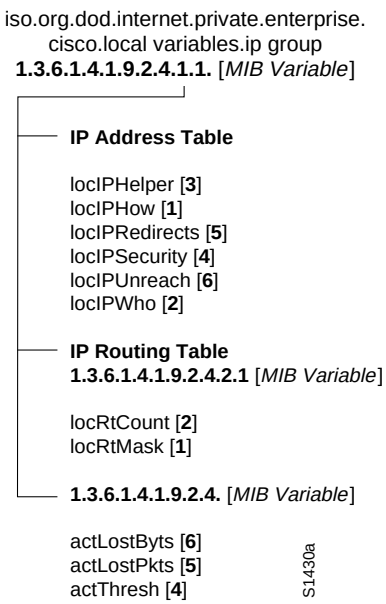


Figure 12 Local Variables: Internet Protocol (IP) Group

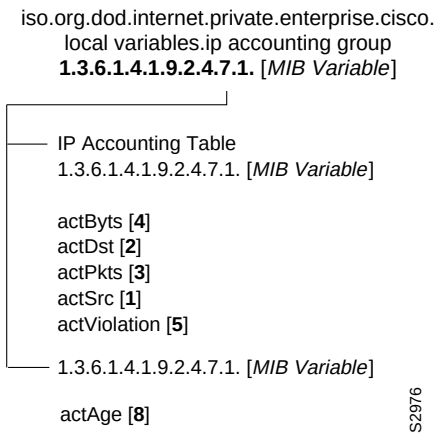


Figure 13 Local Variables: IP Accounting Table

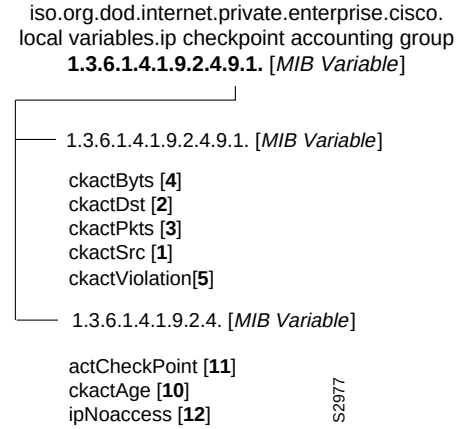


Figure 14 Local Variables: IP Checkpoint Accounting Table

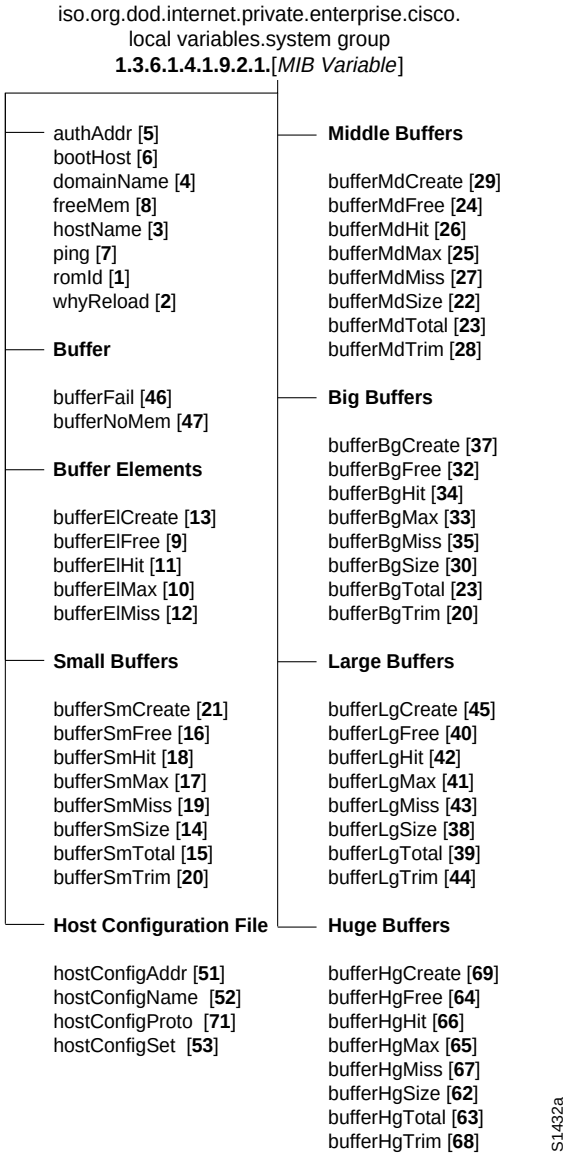


Figure 15 Local Variables: System Group—Buffers

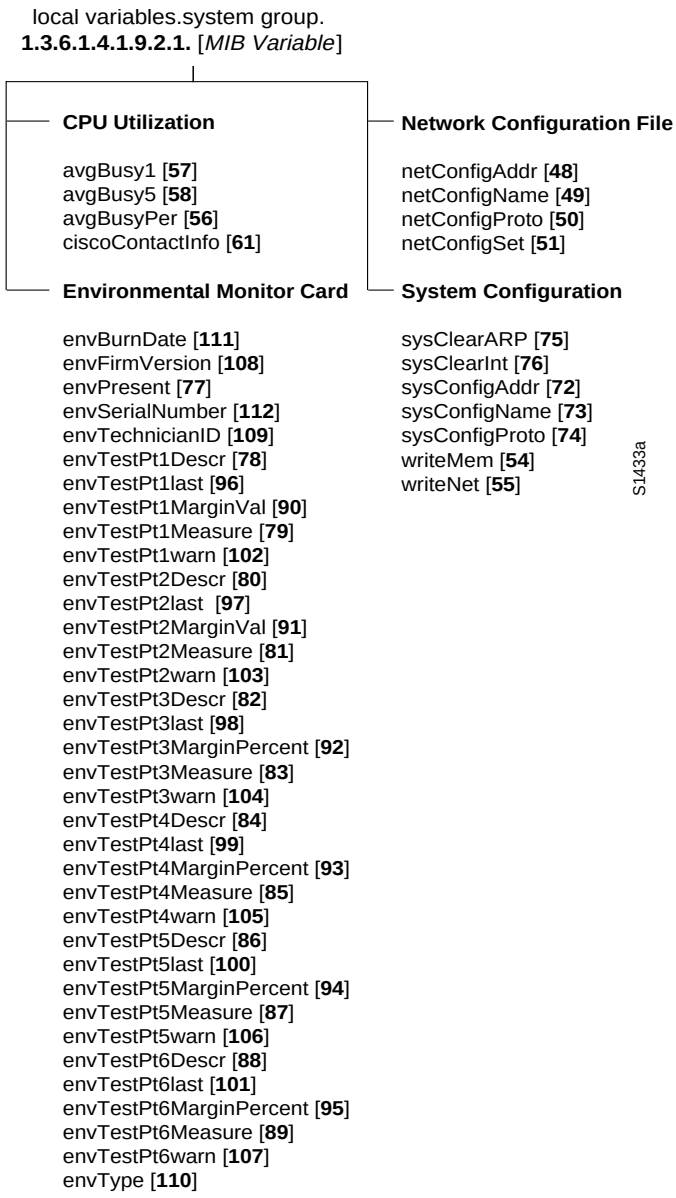


Figure 16 Local Variables: System Group—CPU Utilization and Environmental Monitor Card

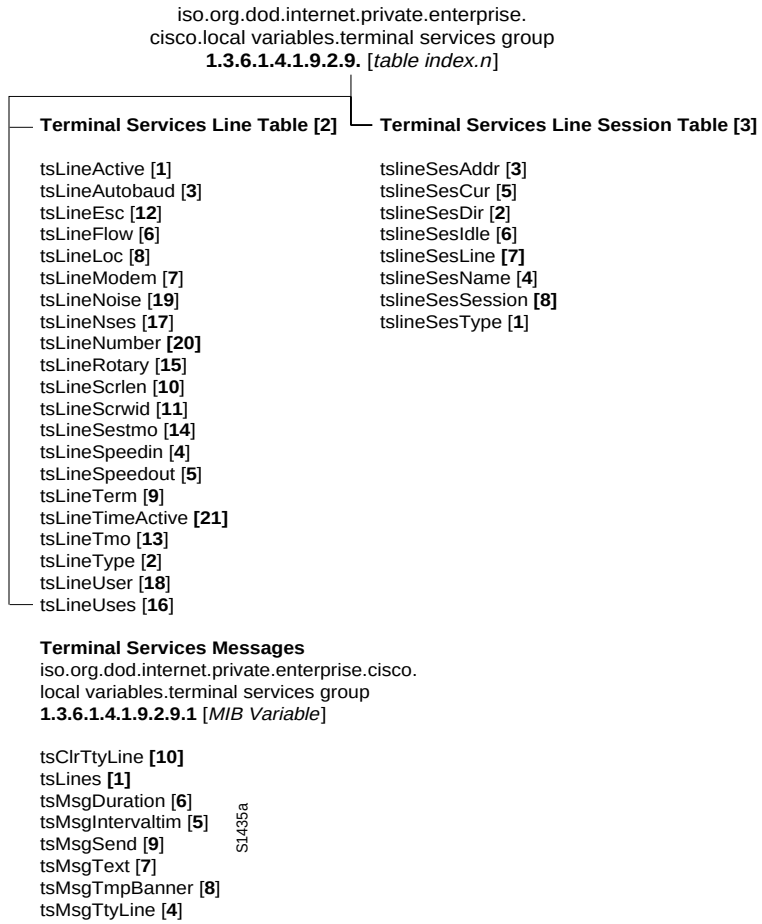


Figure 17 Local Variables: Terminal Services Group

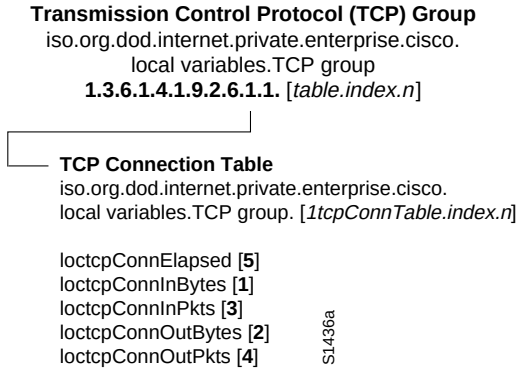


Figure 18 Local Variables: Transmission Control Protocol (TCP) Connection Table

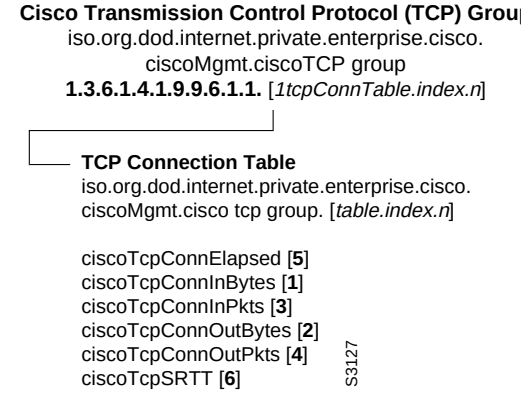


Figure 19 ciscoMgmt Variables: Cisco Transmission Control Protocol (TCP) Connection Table

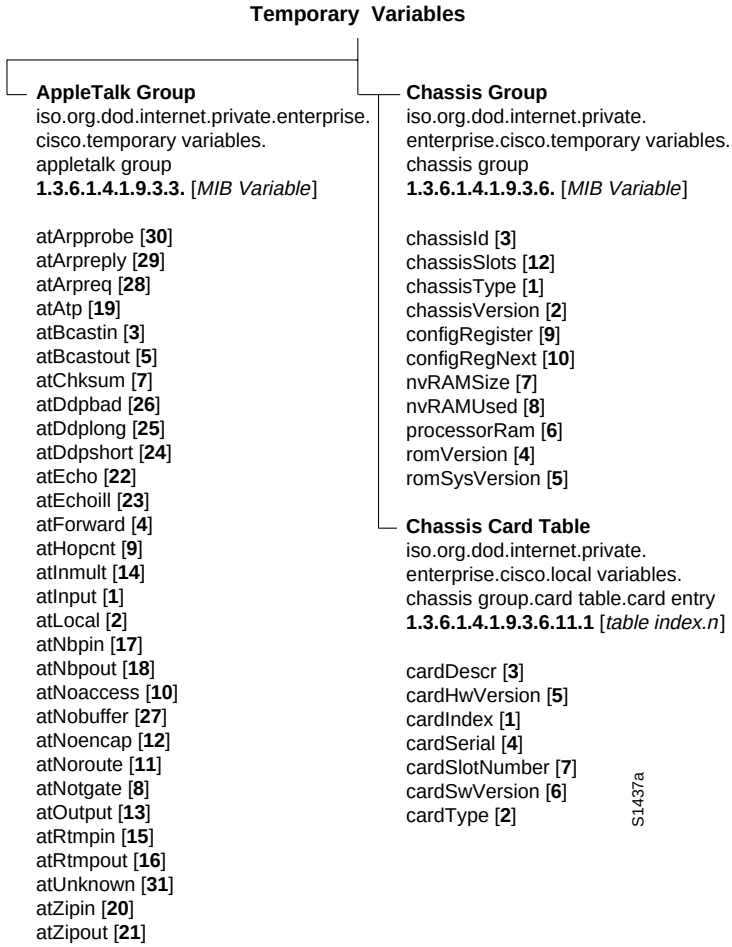


Figure 20 Temporary Variables: AppleTalk and Chassis

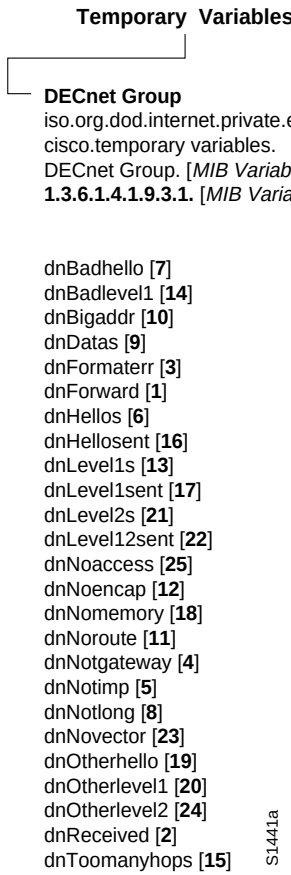


Figure 21 Temporary Variables: DECnet

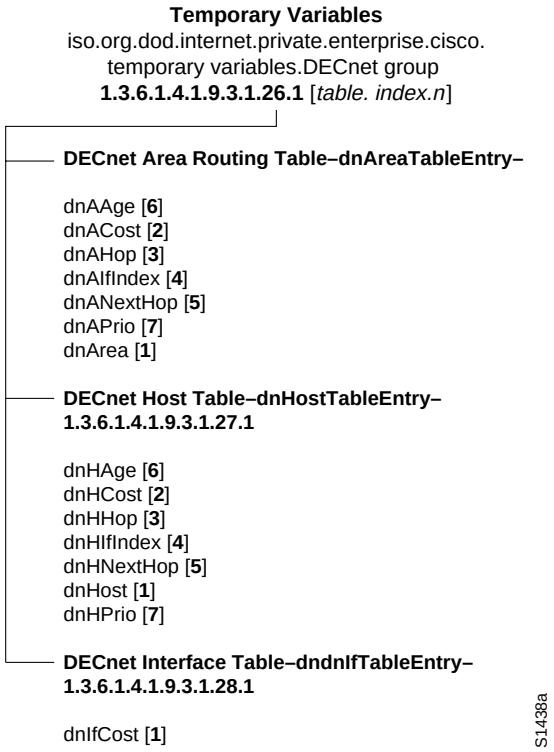


Figure 22 Temporary Variables: DECnet Tables

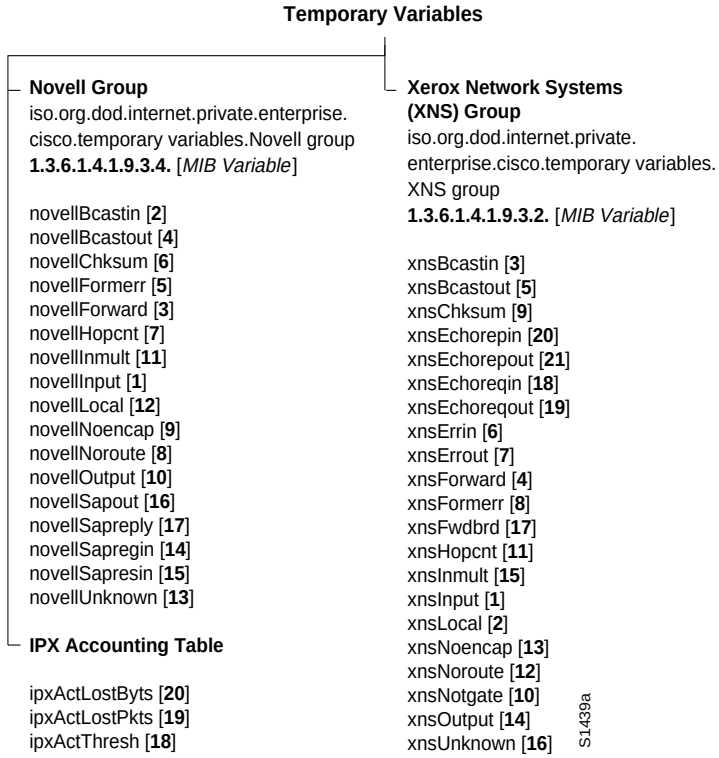


Figure 23 Temporary Variables: Novell and Xerox Network Systems (XNS)

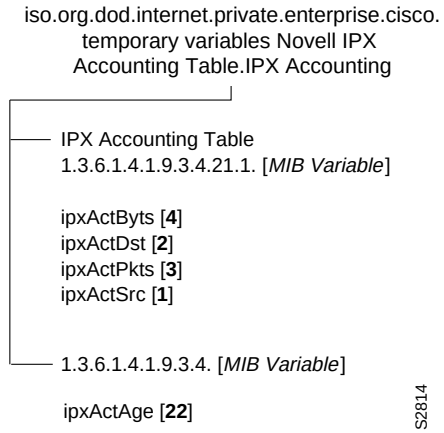


Figure 24 Temporary Variables: IPX Accounting Table I

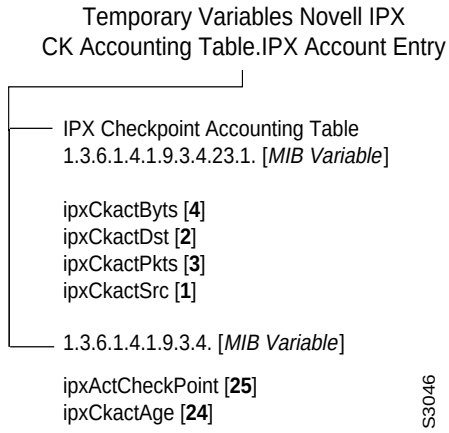


Figure 25 Temporary Variables: IPX Checkpoint Accounting Table

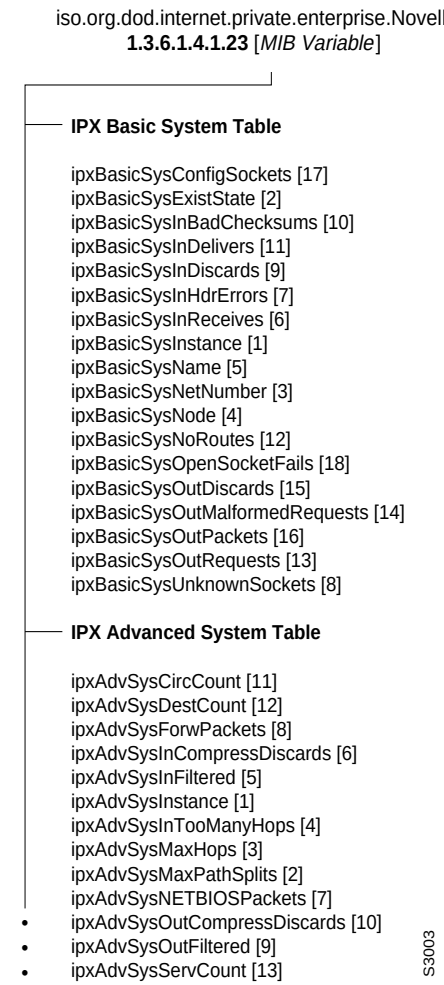


Figure 26 otherEnterprises:Novell MIB Variables: IPX Tables

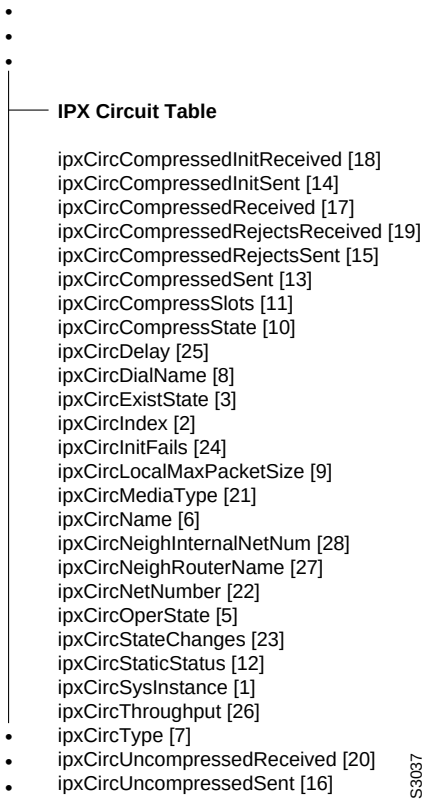


Figure 27 otherEnterprises: Novell MIB: IPX Circuit Table

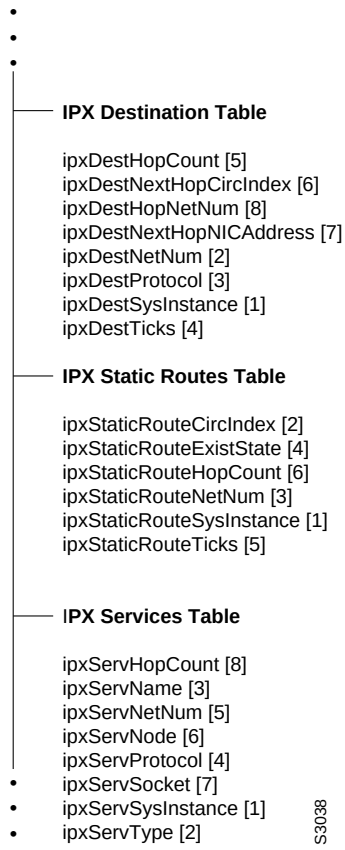


Figure 28 otherEnterprises: Novell MIB: IPX Destination, Static Routes, and Services Tables

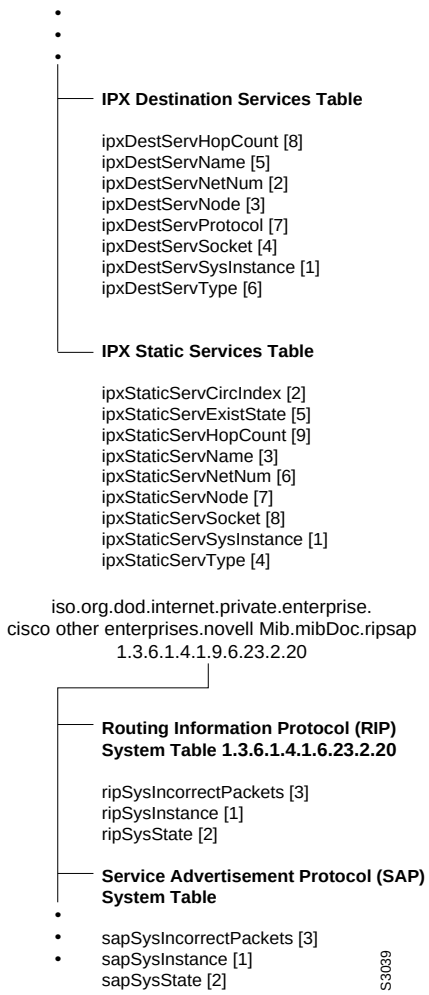


Figure 29 otherEnterprises: Novell MIB: IPX Destination Services, Static Services, Routing Information Protocol System, Service Advertisement Protocol System Tables

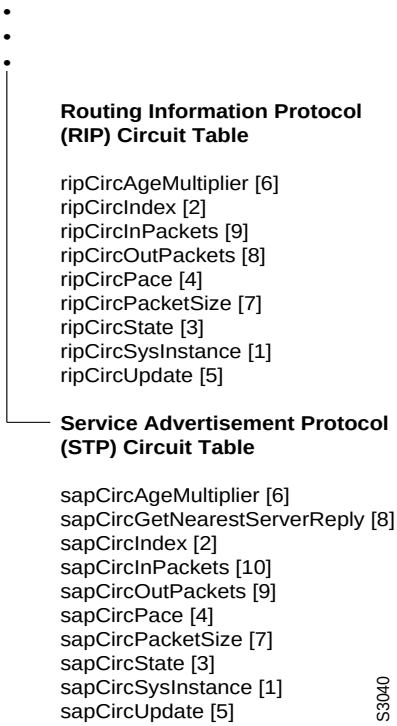


Figure 30 otherEnterprises: Novell MIB: Routing Information and Service Advertisement Protocol Circuit Table

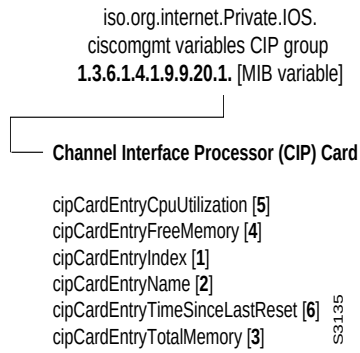


Figure 31 ciscoMgmt: Channel Interface Processor Card Table

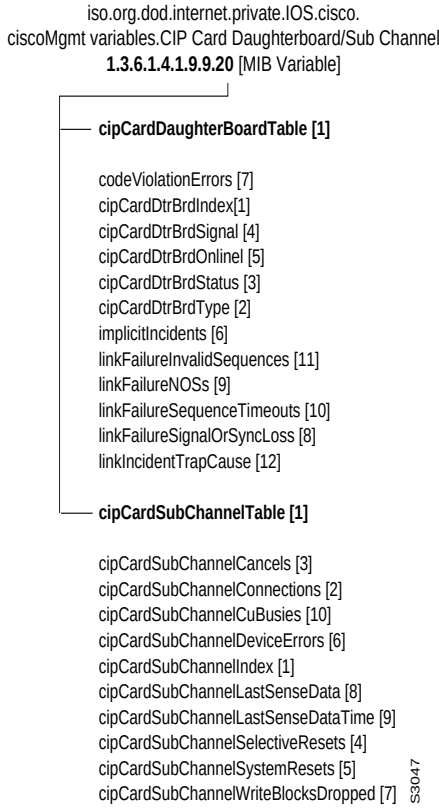


Figure 32 ciscoMgmt: Channel Interface Processor Card Daughter Board and SubChannel Tables

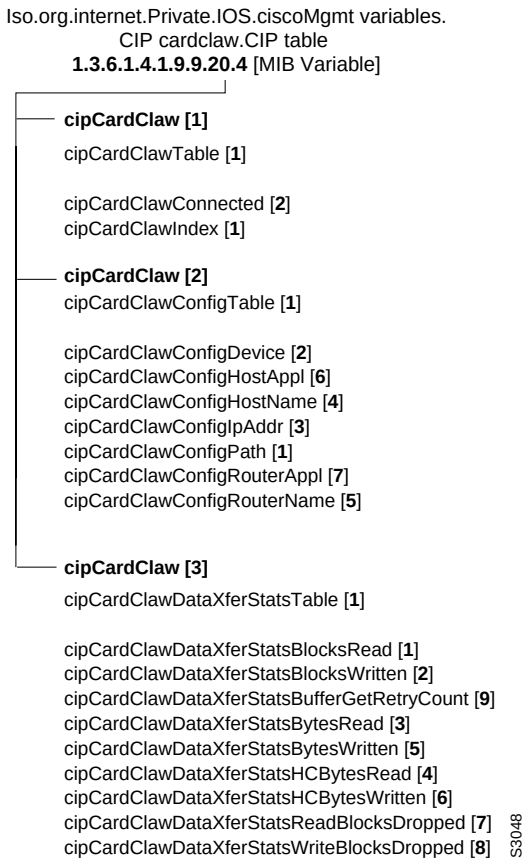


Figure 33 ciscoMgmt: Channel Interface Processor Group CardClaw

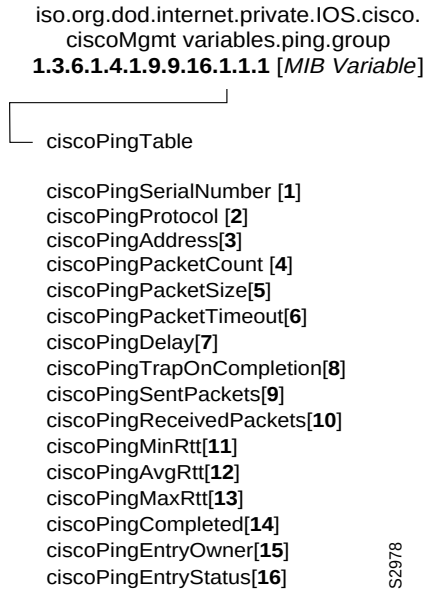


Figure 34 ciscoMgmt: PING group

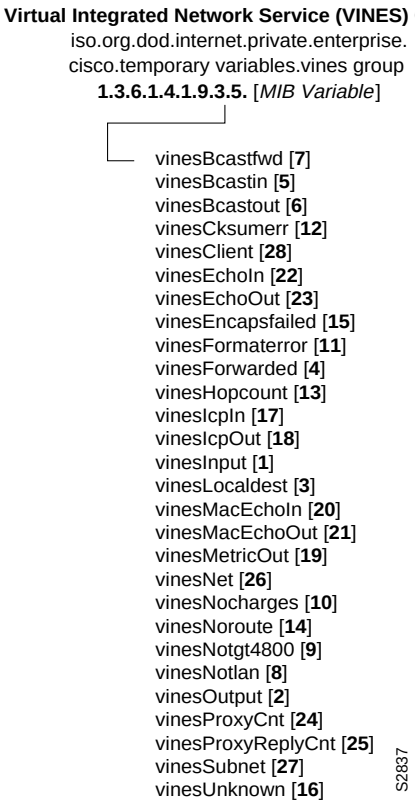
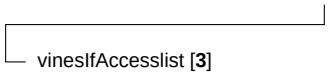


Figure 35 Temporary Variables: Virtual Integrated Network System VINES I

Virtual Integrated Network Service (VINES) Interface Table

iso.org.dod.internet.private.enterprise.
cisco.temporary variables.Vines group
1.3.6.1.4.1.9.3.5.29. [*If*].[*Variable*]



vinesIfAccesslist [**3**]
vinesIfArpEnabled [**5**]
vinesIfEnctype [**2**]
vinesIfFastOkay [**11**]
vinesIfInputNetworkFilter [**82**]
vinesIfInputRouterFilter [**81**]
vinesIfLineup [**10**]
vinesIfMetric [**1**]
vinesIfOutputNetworkFilter [**83**]
vinesIfPropagate [**4**]
vinesIfRedirectInterval [**8**]
vinesIfRouteCache [**12**]
vinesIfRxArp0Cnt [**25**]
vinesIfRxArp1Cnt [**26**]
vinesIfRxArp2Cnt [**27**]
vinesIfRxArp3Cnt [**28**]
vinesIfRxArpIllegalCnt [**29**]
vinesIfRxBcastDuplicateCnt [**47**]
vinesIfRxBcastForwardedCnt [**46**]
vinesIfRxBcastHelperedCnt [**45**]
vinesIfRxBcastinCnt [**20**]
vinesIfRxChecksumErrorCnt [**24**]
vinesIfRxEchoCnt [**48**]
vinesIfRxFormatErrorCnt [**18**]
vinesIfRxForwardedCnt [**21**]
vinesIfRxIcpErrorCnt [**30**]
vinesIfRxIcpIllegalCnt [**32**]
vinesIfRxIcpMetricCnt [**31**]
vinesIfRxIpcCnt [**33**]
vinesIfRxLocalDestCnt [**19**]
vinesIfRxMacEchoCnt [**49**]
vinesIfRxNoRouteCnt [**22**]
vinesIfRxNotEnabledCnt [**17**]
vinesIfRxProxyReplyCnt [**50**]
vinesIfRxRtp0Cnt [**34**]
vinesIfRxRtp1Cnt [**35**]
vinesIfRxRtp2Cnt [**36**]
vinesIfRxRtp3Cnt [**37**]
vinesIfRxRtp4Cnt [**38**]
vinesIfRxRtp5Cnt [**39**]
vinesIfRxRtp6Cnt [**40**]
vinesIfRxRtpIllegalCnt [**41**]
vinesIfRxIpUnknownCnt [**43**]
vinesIfRxIpcUnknownCnt [**44**]
vinesIfRxSppCnt [**42**]
vinesIfRxZeroHopCountCnt [**23**]
vinesIfServerless [**6**]
vinesIfServerlessBcast [**7**]
vinesIfSplitDisabled [**9**]
vinesIfTxArp0Cnt [**63**]
vinesIfTxArp1Cnt [**64**]
vinesIfTxArp2 Cnt [**65**]
vinesIfTxArp3Cnt [**66**]
vinesIfTxBcastCnt [**52**]
vinesIfTxBcastForwardedCnt [**61**]
vinesIfTxBcastHelperedCnt [**62**]
vinesIfTxEchoCnt [**78**]
vinesIfTxFailedAccessCnt [**55**]
vinesIfTxFailedDownCnt [**56**]
vinesIfTxFailedEncapsCnt [**54**]
vinesIfTxForwardedCnt [**53]**
vinesIfTxIcpErrorCnt [**67**]
vinesIfTxIcpMetricCnt [**68**]
vinesIfTxIpcCnt [**69**]
vinesIfTxMacEchoCnt [**79**]
vinesIfTxNotBcastNotgt4800Cnt [**59**]
vinesIfTxNotBcastNotlanCnt [**58**]
vinesIfTxNotBcastPpchargeCnt [**60**]
vinesIfTxNotBcastToSourceCnt [**57**]
vinesIfTxProxyCnt [**80**]
vinesIfTxRtp0 Cnt [**70**]
vinesIfTxRtp1Cnt [**71**]
vinesIfTxRtp2Cnt [**72**]
vinesIfTxRtp3Cnt [**73**]
vinesIfTxRtp4Cnt [**74**]
vinesIfTxRtp5Cnt [**75**]
vinesIfTxRtp6Cnt [**76**]
vinesIfTxSppCnt [**77**]
vinesIfTxUnicastCnt [**51**]

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Figure 36 Temporary Variables: VINES II

Local Variables

This section describes the MIB variables within the Cisco product line. Certain groups of variables may or may not be present, depending upon the software options and configuration in the managed device.

- Flash
  - Flash File Table
- Interfaces
  - Interface Table
  - Across All Interfaces
  - Address Resolution Protocol (ARP)
  - AppleTalk
  - Apollo
  - Bridging
  - Connectionless Network Service (CLNS)
  - DECnet
  - Fast Serial Interface Processor (FSIP)
  - HP Probe
  - Internet Protocol (IP)
  - LAN Network Manager (LNM)
  - Maintenance Operation Protocol (MOP)
  - Novell
  - Other Protocols
  - Serial Tunnel (STUN)
  - Spanning Tree
  - Banyan Virtual Integrated Network Service (VINES)
  - Xerox Network Systems (XNS)
- Internet Protocol (IP)
  - IP Address Table

- IP Routing Table

- System
  - Basic
  - Buffer
  - CPU Utilization
  - Environmental Monitor Card
  - Host Configuration File
  - Network Configuration File
  - System Configuration
- Terminal Services
  - Terminal Services Line Table
  - Terminal Services Line Session Table
  - Terminal Services Messages
- Transmission Control Protocol (TCP)

  This has been deprecated and replaced with a version in the ciscoMgmt group.
  - TCP Connection Table

Flash Group

The Flash memory card is an add-in card of Flash EPROM (erasable programmable read-only memory) storage onto which system software images can be stored, booted, and rewritten.

Flash File Table

The local Flash File table, *lflashFileDirTable*, contains information on a per file basis and includes the following three variables: *flashDirName*, *flashDirSize*, and *flashDirStatus.* The index to this table is *flashEntries*, or the number of Flash files. If the device has *n* number of Flash files, the table will contain *n* number of rows.

For example, in Table 3, the *flash1* file has a directory size of 50 octets, and its status is valid, represented by the integer 1.

Table 3 Flash File Table

flashEntries	flashDirName	flashDirSize	flashDirStatus
1	flash1	50	1
2	flash2	100	1
3	flash3	200	2

flashDirName

Provides the name associated with a Flash directory entry.

Syntax: Display string

Access: Read-only

flashDirSize

Provides the size (in octets) of a Flash directory entry.

Syntax: Integer

Access: Read-only

flashDirStatus

Indicates the status of the Flash directory entry.

Syntax: Integer (1 = valid, 2 = deleted)

Access: Read-only

End of Table

flashcard

Provides the type of card connected to the Flash card installed in the router. For example, the type of card connected to the Flash card could be either CSC-MS or CSC-MC+.

Syntax: Display string

Access: Read-only

flashController

Provides the type of Flash controller (either CCTL or CCTL2) installed in the router.

Syntax: Display string

Access: Read-only

flashEntries

Provides the number of directory entries, or files, that exist in the Flash memory directory.

Syntax: Integer

Access: Read-only

flashErase

This variable sets a request to erase Flash memory, freeing up all available memory space. All of the Flash memory is erased out. Individual files cannot be erased from Flash memory.

Syntax: Integer

Access: Write-only

flashEraseStatus

Indicates the status of current or last erasing of Flash memory.

Syntax: Integer

Access: Read-only

flashEraseTime

Indicates the value of sysUpTime the last time the Flash memory was erased.

Syntax: Timeticks

Access: Read-only

flashFree

Provides the amount of available Flash memory in octets.

Syntax: Integer

Access: Read-only

flashSize

Provides the amount of total Flash memory in octets.

Syntax: Integer

Access: Read-only

flashStatus

Indicates the status of the availability of Flash memory.

Syntax: Integer

Access: Read-only

flashToNet

Requests to write the Flash memory to a Trivial File Transfer Protocol (TFTP) server. The value (display string) is the name of the Flash file being sent, or written, to the server. The instance ID is the IP address of the TFTP host.

This copy of the system image can serve as a backup copy and can also be used to verify that the copy in the Flash memory is the same as the original file.

The Flash memory card can be used as a TFTP file server for other routers on the network. This feature allows you to boot a remote router with an image that resides in the Flash server memory.

Syntax: Display string

Access: Write-only

flashToNetStatus

Indicates the status of the current or last flash to net transfer.

Syntax: Integer

Access: Read-only

flashToNetTime

Indicates the value of sysUpTime the last time a file was copied from the Flash memory in the router to the TFTP host.

Syntax: Timeticks

Access: Read-only

flashVPP

Provides the status of the VPP DIP jumper on the Flash memory card. Files can be written to the Flash memory card only if the VPP DIP jumper is turned on.

Syntax: Integer (1 = VPP enabled/Flash write enabled, 2 = VPP disabled/Flash write disabled)

Access: Read-only

netToFlash

Copies a software image from Trivial File Transfer Protocol (TFTP) server to the Flash memory on the router. The value (display string) is the name of the file being sent, or written, to the Flash memory. The instance ID is the IP address of the TFTP host.

The TFTP image copied to the Flash memory must be at least System Software Release 9.0 or later. If earlier system software is copied into the Flash memory, the host processor card will not recognize the CSC-MC+ card upon the next reboot.

If free Flash memory space is unavailable, or if the Flash memory has never been written to, the erase routine is required before new files can be copied.

Syntax: Display string

Access: Write-only

netToFlashStatus

Indicates the status of the current or next-to-last flash transfer.

Syntax: Integer

Access: Read-only

netToFlashTime

Indicates the value of sysUpTime the last time a file was copied from a Trivial File Transfer Protocol (TFTP) server to the Flash memory on the router.

Syntax: Timeticks

Access: Read-only

Fast Serial Interface Processor (FSIP) Group

The local FSIP Card table, *lfsipTable*, contains information about FSIP cards used by the Cisco 7000 and includes the following six variables that provide information about the processor: *locIfFSIPtype*, *locIfFSIPrts*, *locIfFSIPcts*, *locIfFSIPdtr*, *locIfFSIPdcd*, and *locIfFSIPdsr*. The index to this table is *locIfSIPIndex*, which indicates the interface index of the card corresponding to its *IfIndex*.

Table 4 FSIP Card Table

locIfFSIPIndex	locIfFSIPtype	locIfFSIPrts	locIfFSIPcts	and so on
1	DCE	1	2	
2	DTE	1	3	
and so on				

locIfFSIPcts

Indicates whether the CTS (clear to send) signal is up or down.

Syntax: Integer (1 = not available, 1 = up, 2 = down)

Access: Read-only

locIfFSIPdcd

Indicates whether the DCD (data carrier detect) signal is up or down.

Syntax: Integer (1 = not available, 2 = up, 3 = down)

Access: Read-only

locIfFSIPdsr

Indicates whether the DSR (data set ready) signal is up or down.

Syntax: Integer (1 = not available, 2 = up, 3 = down)

Access: Read-only

locIfFSIPdtr

Indicates whether the DTR (data terminal ready) signal is up or down.

Syntax: Integer (1 = not available, 2 = up, 3 = down)

Access: Read-only

locIfFSIPIndex

Indicates the index interface port of the corresponding *ifIndex.* (RFC 1213)

Syntax: Integer

Access: Read-only

locIfFSIPrts

Indicates whether the RTS (request to send) signal is up or down.

Syntax: Integer (1 = not available, 2 = up, 3 = down)

Access: Read-only

locIfFSIPtype

Indicates whether the FSIP line uses DCE (data communications equipment) or DTE (data terminal equipment).

Syntax: Integer (1 = not available, 2 = DTE, 3 = DCE)

Access: Read-only

Interface Group

The following variables apply to interfaces attached to Cisco devices. These variables can be used to monitor the performance of the network in terms of the number of packets dropped, time allocations for input and output packets, and so on. These variables also can be used for fault management. For example, variable values indicate which interfaces are dropping packets or have had to be restarted several times.

Interface Table

The Interface table, *lifTable*, contains all of the variables in the Interface group. The index to the table is *ifIndex,* which indicates the number of the interface. If the device has *n* number of interfaces, the Interface table will contain *n* rows.

In the Interface table shown in Table 5, the first column indicates the number of interfaces on the device. Each of the variables in the interface table occupies one column; for example, *locIfHardType* is shown in a column, followed by *locIfLineProt* in the next column, and so on.

Table 5 Interface Table

Interface Numer	locIfHardType	locIfLineProt	and so on
1	Ethernet	1	
2	TokenRing	0	
3	FDDI	1	
and so on			

Across All Interfaces

This section contains basic interface variables that apply to all interfaces and are not protocol-specific.

locIfCarTrans

Provides the number of times the serial interface received the Carrier Detect (CD) signal. If the carrier detect line is changing state often, it might indicate modem or line problems.

Syntax: Integer

Access: Read-only

locIfCollisions

Provides the number of output collisions detected on this interface.

Syntax: Integer

Access: Read-only

locIfDelay

Provides the media-dependent delay in transferring a packet to another interface on the media. The delay is indicated in microseconds. Used by Interior Gateway Routing Protocol (IGRP).

Syntax: Integer

Access: Read-only

locIfDescr

Provides a description of the interface (such as Ethernet, serial, and so on) that corresponds to the user-configurable interface description commands

Syntax: Display string

Access: Read-write

locIfFastInOctets

Provides the octet count for inbound traffic routed with fast and autonomous switching.

Syntax: Counter

Access: Read-only

locIfFastInPkts

Provides the packet count for inbound traffic routed with fast and autonomous switching.

Syntax: Counter

Access: Read-only

locIfFastOutOctets

Provides the octet count for outbound traffic routed with fast and autonomous switching.

Syntax: Counter

Access: Read-only

locIfFastOutPkts

Provides the packet count for outbound traffic routed with fast and autonomous switching.

Syntax: Counter

Access: Read-only

locIfHardType

Provides the type of interface (such as Ethernet, serial, FDDI, and so on).

Syntax: Display string

Access: Read-only

locIfInAbort

Provides the number of input packets that were aborted. Aborted input packets usually indicate a clocking problem between the serial interface and the data-link equipment.

Syntax: Integer

Access: Read-only

locIfInBitsSec

Provides a 5-minute exponentially delayed average of CPU input bits per second.

Syntax: Integer

Access: Read-only

locIfInCRC

Provides the number of input packets that had cyclic redundancy checksum (CRC) errors. The CRC generated by the originating station or far-end device does not match the checksum calculated from the data received. On a serial link, CRCs usually indicate noise, gain hits, or other transmission problems on the data link.

Syntax: Integer

Access: Read-only

locIfInFrame

Provides the number of input packets that were received incorrectly with framing errors. On a serial line, this is usually the result of noise or other transmission problems.

Syntax: Integer

Access: Read-only

locIfInGiants

Provides the number of input packets that were discarded because they exceeded the maximum packet size allowed by the physical media.

Syntax: Integer

Access: Read-only

locIfInIgnored

Provides the number of input packets that were ignored by this interface because the interface hardware ran low on internal buffers. Broadcast storms and bursts of noise can cause the ignored count to be increased.

Syntax: Integer

Access: Read-only

locIfInKeep

Indicates whether keepalives are enabled on this interface.

Syntax: Integer (1 = enabled, 2 = disabled)

Access: Read-only

locIfInOverrun

Provides the number of times the serial receiver hardware was unable to send data to a hardware buffer because the input rate exceeded the ability of the receiver to handle the data.

Syntax: Integer

Access: Read-only

locIfInPktsSec

Provides a weighted average of input bits and packets transmitted per second in the last 5 minutes.

Syntax: Integer

Access: Read-only

locIfInputQueueDrops

Provides the number of packets dropped because the input queue was full.

Syntax: Integer

Access: Read-only

locIfInRunts

Provides the number of input packets that were discarded because they were smaller than the minimum packet size allowed by the physical media.

Syntax: Integer

Access: Read-only

locIfLastIn

Provides the elapsed time in milliseconds since the last line protocol input packet was successfully received by an interface. Useful for knowing when a dead interface failed.

Syntax: Integer

Access: Read-only

locIfLastOut

Provides the elapsed time in milliseconds since the last line protocol output packet was successfully transmitted by an interface. Useful for knowing when a dead interface failed.

Syntax: Integer

Access: Read-only

locIfLastOutHang

Provides the elapsed time in milliseconds since the last line protocol output packet could not be successfully transmitted.

OR

Provides the elapsed time (in milliseconds) since the interface was last reset because of a transmission that took too long.

Syntax: Integer

Access: Read-only

locIfLineProt

Indicates whether the interface is up or down.

Syntax: Integer (1 = up, 2 = down)

Access: Read-only

locIfLoad

Provides the loading factor of the interface. The load on the interface is calculated as an exponential average over 5 minutes and expressed as a fraction of 255 (255/255 is completely saturated). Used by Interior Gateway Routing Protocol (IGRP).

Syntax: Integer

Access: Read-only

locIfOutBitsSec

Provides a 5-minute weighted average of output bits per second for the specific protocol.

Syntax: Integer

Access: Read-only

locIfOutPktsSec

Provides a 5-minute weighted average of output packets per second for the specific protocol.

Syntax: Integer

Access: Read-only

locIfOutputQueueDrops

Provides the number of packets dropped because the output queue was full.

Syntax: Integer

Access: Read-only

locIfReason

Provides the reason for the most recent status change of the interface.

Syntax: Display string

Access: Read-only

locIfReliab

Provides the level of reliability for the interface. The reliability of the interface is calculated as an exponential average over 5 minutes and expressed as a fraction of 255 (255/255 is 100 percent). Used by Interior Gateway Routing Protocol (IGRP).

Syntax: Integer

Access: Read-only

locIfResets

Provides the number of times the interface was reset internally. An interface can be reset if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets also can occur when an interface is looped back or shut down.

Syntax: Integer

Access: Read-only

locIfRestarts

Provides the number of times the interface needed to be completely restarted because of errors.

Syntax: Integer

Access: Read-only

locIfSlowInOctets

Provides the octet count for inbound traffic routed with process switching.

Syntax: Counter

Access: Read-only

locIfSlowInPkts

Provides the packet count for inbound traffic routed with process switching.

Syntax: Counter

Access: Read-only

locIfSlowOutPkts

Provides the packet count for outbound traffic routed with process switching.

Syntax: Counter

Access: Read-only

locIfSlowOutOctets

Provides the octet count for outbound traffic routed with process switching.

Syntax: Counter

Access: Read-only

End of Table

Address Resolution Protocol (ARP)

The following variables in the Interface group apply to interfaces running the Address Resolution Protocol (ARP). ARP provides dynamic addressing between 32-bit IP addresses and Ethernet addresses. For detailed information on ARP, refer to the *Router Products Configuration and Reference* publication.

locIfarpInOctets

Provides the ARP input octet count.

Syntax: Counter

Access: Read-only

locIfarpInPkts

Provides the ARP input packet count. It indicates the number of ARP Reply packets received by this router on this interface from other hosts.

Syntax: Counter

Access: Read-only

locIfarpOutOctets

Provides the ARP output octet count.

Syntax: Counter

Access: Read-only

locIfarpOutPkts

Provides the ARP output packet count. It indicates the number of ARP Request packets sent by this router on this interface to other hosts on the network.

Syntax: Counter

Access: Read-only

AppleTalk

The following variables in the Interface group apply to interfaces running AppleTalk:

locIfappletalkInOctets

Provides the AppleTalk protocol input octet count.

Syntax: Counter

Access: Read-only

locIfappletalkInPkts

Provides the AppleTalk protocol input packet count.

Syntax: Counter

Access: Read-only

locIfappletalkOutOctets

Provides the AppleTalk protocol output octet count.

Syntax: Counter

Access: Read-only

locIfappletalkOutPkts

Provides the AppleTalk protocol output packet count.

Syntax: Counter

Access: Read-only

Apollo

The following variables in the Interface group apply to interfaces running Apollo:

locIfapolloInOctets

Provides the Apollo protocol input octet count.

Syntax: Counter

Access: Read-only

locIfapolloInPkts

Provides the Apollo protocol input packet count.

Syntax: Counter

Access: Read-only

locIfapolloOutOctets

Provides the Apollo protocol output octet count.

Syntax: Counter

Access: Read-only

locIfapolloOutPkts

Provides the Apollo protocol output packet count.

Syntax: Counter

Access: Read-only

Bridging

The following variables in the Interface group apply to interfaces running bridging protocols:

locIfbridgedInOctets

Provides the bridged protocol input octet count.

Syntax: Counter

Access: Read-only

locIfbridgedInPkts

Provides the bridged protocol input packet count.

Syntax: Counter

Access: Read-only

locIfbridgedOutOctets

Provides the bridged protocol output octet count.

Syntax: Counter

Access: Read-only

locIfbridgedOutPkts

Provides the bridged protocol output packet count.

Syntax: Counter

Access: Read-only

locIfsrbInOctets

Provides the Source-Route Bridging (SRB) protocol input octet count.

Syntax: Counter

Access: Read-only

locIfsrbInPkts

Provides the SRB protocol input packet count.

Syntax: Counter

Access: Read-only

locIfsrbOutOctets

Provides the SRB protocol output octet count.

Syntax: Counter

Access: Read-only

locIfsrbOutPkts

Provides the SRB protocol output packet count.

Syntax: Counter

Access: Read-only

Connectionless Network Service (CLNS)

The following variables in the Interface group apply to interfaces running Connectionless Network Service (CLNS):

locIfclnsInOctets

Provides the CLNS protocol input byte count.

Syntax: Counter

Access: Read-only

locIfclnsInPkts

Provides the CLNS protocol input packet count.

Syntax: Counter

Access: Read-only

locIfclnsOutOctets

Provides the CLNS protocol output byte count.

Syntax: Counter

Access: Read-only

locIfclnsOutPkts

Provides the CLNS protocol output packet count.

Syntax: Counter

Access: Read-only

DECnet

The following variables in the Interface group apply to interfaces running DECnet:

locIfdecnetInOctets

Provides the DECnet protocol input octet count.

Syntax: Counter

Access: Read-only

locIfdecnetInPkts

Provides the DECnet protocol input packet count.

Syntax: Counter

Access: Read-only

locIfdecnetOutOctets

Provides the DECnet protocol output octet count.

Syntax: Counter

Access: Read-only

locIfdecnetOutPkts

Provides the DECnet protocol output packet count.

Syntax: Counter

Access: Read-only

HP Probe

The following variables in the Interface group apply to interfaces running HP Probe, an address resolution protocol developed by Hewlett-Packard:

locIfprobeInOctets

Provides the HP Probe protocol input octet count.

Syntax: Counter

Access: Read-only

locIfprobeInPkts

Provides the HP Probe protocol input packet count.

Syntax: Counter

Access: Read-only

locIfprobeOutOctets

Provides the HP Probe protocol output octet count.

Syntax: Counter

Access: Read-only

locIfprobeOutPkts

Provides the HP Probe protocol output packet count.

Syntax: Counter

Access: Read-only

Internet Protocol (IP)

The following variables in the Interface group apply to interfaces running the Internet Protocol (IP):

locIfipInOctets

Provides the IP input octet count.

Syntax: Counter

Access: Read-only

locIfipInPkts

Provides the IP input packet count.

Syntax: Counter

Access: Read-only

locIfipOutOctets

Provides the IP output octet count.

Syntax: Counter

Access: Read-only

locIfipOutPkts

Provides the IP output packet count.

Syntax: Counter

Access: Read-only

LAN Network Manager (LNM)

The following variables in the Interface group apply to interfaces running the LAN Network Manager (LNM) protocol. This protocol manages source-route bridging (SRB) networks.

locIflanmanInOctets

Provides the LAN Network Manager protocol input octet count.

Syntax: Counter

Access: Read-only

locIflanmanInPkts

Provides the LAN Network Manager protocol input packet count.

Syntax: Counter

Access: Read-only

locIflanmanOutOctets

Provides the LAN Network Manager protocol output octet count.

Syntax: Counter

Access: Read-only

locIflanmanOutPkts

Provides the LAN Network Manager protocol output packet count.

Syntax: Counter

Access: Read-only

Maintenance Operation Protocol (MOP)

The following variables in the Interface group apply to interfaces running the Maintenance Operation Protocol (MOP):

locIfmopInOctets

Provides the MOP input octet count.

Syntax: Counter

Access: Read-only

locIfmopInPkts

Provides the MOP input packet count.

Syntax: Counter

Access: Read-only

locIfmopOutOctets

Provides the MOP output octet count.

Syntax: Counter

Access: Read-only

locIfmopOutPkts

Provides the MOP output packet count.

Syntax: Counter

Access: Read-only

Novell

The following variables in the Interface group apply to interfaces running Novell:

locIfnovellInOctets

Provides the Novell protocol input octet count.

Syntax: Counter

Access: Read-only

locIfnovellInPkts

Provides the Novell protocol input packet count.

Syntax: Counter

Access: Read-only

locIfnovellOutOctets

Provides the Novell protocol output octet count.

Syntax: Counter

Access: Read-only

locIfnovellOutPkts

Provides the Novell protocol output packet count.

Syntax: Counter

Access: Read-only

Other Protocols

The following variables in the Interface group record the number of input and output packets and octets for interfaces running protocols other than those listed in the Interface group:

locIfotherInOctets

Provides the input octet count for protocols other than those listed in the Interface group.

Syntax: Counter

Access: Read-only

locIfotherInPkts

Provides the input packet count for protocols other than those listed in the Interface group.

Syntax: Counter

Access: Read-only

locIfotherOutOctets

Provides the output octet count for protocols other than those listed in the Interface group.

Syntax: Counter

Access: Read-only

locIfotherOutPkts

Provides the output packet count for protocols other than those listed in the Interface group.

Syntax: Counter

Access: Read-only

Serial Tunnel (STUN)

The following variables in the Interface group apply to interfaces using the Serial Tunnel (STUN) protocol. STUN allows devices that use Synchronous Data Link Control (SDLC) or High-Level Data Link Control (HDLC) to be connected through one or more Cisco routers across different network topologies.

locIfstunInOctets

Provides the STUN protocol input octet count.

Syntax: Counter

Access: Read-only

locIfstunInPkts

Provides the STUN protocol input packet count.

Syntax: Counter

Access: Read-only

locIfstunOutOctets

Provides the STUN protocol output octet count.

Syntax: Counter

Access: Read-only

locIfstunOutPkts

Provides the STUN protocol output packet count.

Syntax: Counter

Access: Read-only

Spanning Tree

The following variables in the Interface group apply to interfaces running the Spanning Tree protocol. Used in bridging, spanning trees provide root and designated bridges to notify all other bridges in the network when an address change has occurred, thereby eliminating loops.

locIfspanInOctets

Provides the spanning-tree input octet packet count.

Syntax: Counter

Access: Read-only

locIfspanInPkts

Provides the spanning-tree input protocol packet count.

Syntax: Counter

Access: Read-only

locIfspanOutOctets

Provides the spanning-tree output octet packet count.

Syntax: Counter

Access: Read-only

locIfspanOutPkts

Provides the spanning-tree output protocol packet count.

Syntax: Counter

Access: Read-only

Banyan Virtual Integrated Network Service (VINES)

The following variables in the Interface group apply to interfaces running the Banyan Virtual Integrated Network Service (VINES) protocol. This proprietary protocol is derived from the Xerox Network Systems (XNS) protocol. The VINES variables provide the number of input and output packets and octets on a per interface basis.

locIfvinesInOctets

Provides the VINES protocol input octet count.

Syntax: Counter

Access: Read-only

locIfvinesInPkts

Provides the VINES protocol input packet count.

Syntax: Counter

Access: Read-only

locIfvinesOutOctets

Provides the VINES protocol output octet count.

Syntax: Counter

Access: Read-only

locIfvinesOutPkts

Provides the VINES protocol output packet count.

Syntax: Counter

Access: Read-only

Xerox Network Systems (XNS)

The following variables in the Interface group apply to interfaces running Xerox Network Systems (XNS).

locIfxnsInOctets

Provides the XNS protocol input octet count.

Syntax: Counter

Access: Read-only

locIfxnsInPkts

Provides the XNS input packet count.

Syntax: Counter

Access: Read-only

locIfxnsOutOctets

Provides the XNS protocol output octet count.

Syntax: Counter

Access: Read-only

locIfxnsOutPkts

Provides the XNS protocol output packet count.

Syntax: Counter

Access: Read-only

Internet Protocol (IP) Group

The Internet Protocol (IP) group provides variables pertaining to the IP, such as the determination of how an interface obtained its IP address, who supplied the address, and Internet Control Message Protocol (ICMP) messages about IP packet processing.

IP Address Table

The Cisco IP Address table, *lipAddrTable*, contains the following six variable entries, or rows: *locIPHelper, locIPHow, locIPRedirects, locIPSecurity, locIPUnreach,* and *locIPWho.* The index to this table is the IP address of the device, or *ipAdEntAddr.* If a device has *n* number of IP addresses, there will be *n* rows in the table.

For simplification, Table 6 shows only the *locIpHow* and *locIPWho* variables. The *locIPHow* variable value shows that the device at 131.108.201.245 obtained its address through nonvolatile memory. The *locIPWho* variable value indicates the device was assigned its current address by the device at 131.101.200.248.

Table 6 IP Address

IP Address	locIPHow	locIPWho	and so on
131.108.201.245	nonvolatile	131.101.200.248	
142.111.202.244	nonvolatile	131.56.70.249	
and so on			

locIPHelper

Provides the IP address for broadcast forwarding support. Provides the destination broadcast or IP address that the router should use when forwarding User Datagram Protocol (UDP) broadcast datagrams, including BootP, received on the interface.

Syntax: IpAddress

Access: Read-only

locIPHow

Describes how this interface obtained its IP address. Typically, the address is determined by nonvolatile memory.

Syntax: Display string

Access: Read-only

locIPRedirects

Indicates whether Internet Control Message Protocol (ICMP) redirects will be sent. A router sends an ICMP Redirect message to the originator of any datagram that it is forced to resend through the same interface on which it was received. It does so because the originating host presumably could have sent that datagram to the ultimate destination without involving the router at all. ICMP Redirect messages are sent only if the router is configured with the **ip redirects** command.

Syntax: Integer (1 = sent, 2 = not sent)

Access: Read-only

locIPSecurity

Indicates whether IP security is enabled on the interface. For details on IP security levels, see RFC 1108, *U.S. Department of Defense Security Options for the Internet Protocol*.

Syntax: Integer (0 = false, 1 = true)

Access: Read-only

locIPUnreach

Indicates whether Internet Control Message Protocol (ICMP) packets indicating unreachable addresses will be sent for a specific route.

If this variable is set, and the router receives a datagram that it cannot deliver to its ultimate datagram (because it knows of no route to the destination address), it replies to the originator of that datagram with an ICMP Host Unreachable message.

Syntax: Integer (0 = false, 1 = true)

Access: Read-only

locIPWho

Provides the IP address of the device from which this interface received its IP address. If the interface does not use an IP address from another device, a value of 0.0.0.0 displays.

Syntax: IpAddress

Access: Read-only

End of Table

IP Routing Table

The local IP routing table, *lipRoutingTable*, contains two variables: *locRtCount* and *locRtMask*. The index for this table is the destination address of the IP route, or *ipRouteDest*. If there are *n* number of routes available to a device, there will be *n* rows in the IP routing table.

In Table 7, for the route with the destination IP address of 131.104.111.1, the routing table network mask is 255.255.255.0. The number of parallel routes within the routing table is 3, and the route was used in a forwarding operation two times.

Table 7 IP Routing Table

ipRouteDest	locRtMask	locRtCount
131.104.111.1	255.255.255.0	3
133.45.244.245	255.255.255.0	1

locRtCount

Provides the number of parallel routes within the IP Routing table.

Syntax: Integer

Access: Read-only

locRtMask

Provides the IP Routing table network mask. For example, 255.255.255.0.

Syntax: IpAddress

Access: Read-only

End of Table

actLostByts

Provides the total number of bytes of lost IP packets as a result of accounting failure.

Syntax: Integer

Access: Read-only

actLostPkts

Provides the number of IP packets that were lost due to memory limitations and accounting failure.

Syntax: Integer

Access: Read-only

actThresh

Provides the threshold of IP accounting records in use before IP traffic will be discarded.

Syntax: Integer

Access: Read-only

IP Accounting Group

Cisco routers maintain two accounting databases: an active database and a checkpoint database. The router takes a snapshot of the running, or active database, and copies it into the checkpoint database. For detailed information on active and checkpoint databases, refer to the *Router Products Configuration and Reference* and *Router Products Command Reference* publications.

This group provides access to the active database that is created and maintained if IP accounting is enabled on a router. The active database contains information about the number of bytes and packets switched through a system on a source and destination IP address basis. Only transit IP traffic is measured and only on an outbound basis; traffic

generated by the router or terminating in the router is not included in the accounting statistics. Internetwork statistics obtained through these variables can be analyzed to improve network performance.

IP Accounting Table

The local IP accounting table, *lipAccountingTable*, includes four related variables: *actByts*, *actDst*, *actPkts*, and *actSrc*. The index for this table is *actSrc* and *actDst*. For example, in the first row in Table 8, the source host address is 131.24.35.248, and the destination host address is 138.32.28.245. Fifty IP packets and 400 bytes of data have been sent between the source and destination address.

Table 8 Local IP Accounting Table

actByts	actDst	actPkts	actSrc
400	138.32.28.245	50	131.24.35.248
1259	128.52.33.101	110	128.52.33.96

actByts

Provides the total number of bytes in IP packets from the source to destination host.

Syntax: Integer

Access: Read-only

actDst

Provides the IP destination address for the host traffic matrix.

Syntax: Ip Address

Access: Read-only

actPkts

Provides the number of IP packets sent from the source to destination host.

Syntax: Integer

Access: Read-only

actSrc

Provides the IP address for the host traffic matrix.

Syntax: IpAddress

Access: Read-only

actViolation

Specifies the access list number violated by packets from this source to this destination. A zero value indicates that no access list was violated.

Syntax: Integer

Access: Read-only

End of Table

actAge

Provides the age of the accounting data in the current data matrix of the active database.

Syntax: Timeticks

Access: Read-only

IP Checkpoint Accounting Group

The Cisco router maintains two accounting databases: an active database and a checkpoint database. For detailed information on active and checkpoint databases, refer to the *Router Products Configuration and Reference* publication.

The running, or active database, is copied into the checkpoint database. If the checkpoint database already has data obtained previously from the active database, the router appends the latest copy of the active database to the existing data in the checkpoint database. The checkpoint database stores data retrieved from the active database until actCheckPoint is set or you delete the contents of this database by using the **clear ip accounting** [**checkpoint**] command.

A network management system (NMS) can use checkpoint MIB variables to analyze stable data in the checkpoint database.

IP Checkpoint Accounting Table

The local IP Checkpoint Accounting table, *lipCkAccountingTable*, includes four related variables: *ckactByts*, *ckactDst*, *ckactPkts*, and *ckactSrc*. The index for this table is *ckacSrc* and *ckactDst*. For example, in Table 9, the source host address is 131.24.35.248. The destination host address is 138.32.28.245. Fifty IP packets and 400 bytes of data have been sent between the source and destination address.

Table 9 IP Checkpoint Accounting

ckactByts	ckactDst	ckactPkts	ckacSrc
400	138.32.28.245	50	131.24.35.248
480	124.45.222.246	60	123.34.216.244

ckactByts

Provides the total number of bytes in IP packets from source to destination in the checkpoint matrix.

Syntax: Integer

Access: Read-only

ckactDst

Provides the IP destination address of the host receiving the IP packets. The address is listed in the checkpoint traffic matrix.

Syntax: IpAddress

Access: Read-only

ckactPkts

Provides the number of IP packets sent from the source to the destination address in the checkpoint matrix.

Syntax: Integer

Access: Read-only

ckactSrc

Provides the IP source address of the host sending the IP packets. The address is listed in the checkpoint traffic matrix.

Syntax: IP address

Access: Read-only

ckactViolation

Provides the access list number violated by packets from source to destination in the checkpoint matrix.

Syntax: Integer

Access: Read-only

End of Table

actCheckPoint

Activates a checkpoint database. This variable must be read and then set to the same value that was read. The value read and then set will be incremented after a successful set request.

For detailed information on active and checkpoint databases, refer to the *Router Products Command Reference* and *Router Products Configuration and Reference* publications.

Syntax: Integer

Access: Read-write

ckactAge

Provides information on how long ago the data was first stored in the checkpoint matrix.

Syntax: Timeticks

Access: Read-only

ipNoaccess

Provides the total number of packets dropped due to access control failure.

Syntax: Counter

Access: Read-only

IPX Accounting

The IPX Accounting table allows a related set of IPX accounting variables to be applied across several devices or interfaces.

ipxactLostByts

Provides the total bytes of lost IPX packets.

Syntax: Counter

Access: Read-Only

ipxactLostPkts

Provides the lost IPX packets due to memory limitations.

Syntax: Counter

Access: Read-Only

ipxactThresh

Provides the threshold of IPX accounting records in use before IPX traffic will be unaccounted.

Syntax: Integer

Access: Read-Only

Local IPX Accounting Table

The local IPX accounting table (see Table 10), *lipxAccountingTable*, provides access to the Cisco IPX accounting support. The Local IPX Accounting Table (see Table 11) includes the following variables: *ipxActSrc*, *ipxActDst*, *ipxActPkts*, and *ipxActByts.*

Table 10 Local IPX Accounting Table

ipxActByts	ipxActDst	ipxActPkts	ipxActSrc
10,000	1.000.0230.0110	40	BADDAD.0110.0220.0333

ipxActByts

Provides the total number of bytes in IPX packets from source to destination.

Syntax: Counter

Access: Read-Only

ipxActDst

Provides the IPX Destination address for host traffic matrix.

Syntax: Octet String

Access: Read-Only

ipxActPkts

Provides the number of IPX packets sent from source to destination.

Syntax: Counter

Access: Read-Only

ipxActSrc

Provides the IPX source address for host traffic matrix.

Syntax: Octet String

Access: Read-Only

End of Table

ipxActAge

Provides the age of the data in the current IPX data matrix.

Syntax: TimeTicks

Access: Read-Only

Local IPX Checkpoint Accounting Table

The Local IPX Checkpoint Accounting table, *ipxCkAccountingTable*, includes four related variables: *ipxckActByts*, *ipxckActDst*, *ipxckActPkts*, and *ipxckActSrc*. The index for this table is ckActSrc and ckActDst.

Table 11 IPX Checkpoint Accounting

ipxckActByts	ipxckActDst	ipxckActPkts	ipxckActSrc
10,000	1.000.0230.0110	40	BADDAD.0110.0220.0333

ipxckActDst

Provides the IPX destination address for host in checkpoint traffic matrix.

Syntax: Octet String

Access: Read-Only

ipxckActPkts

Provides the number of IPX packets sent from source to destination in checkpoint matrix.

Syntax: Counter

Access: Read-Only

ipxckActSrc

Provides the IPX source address for host in checkpoint traffic matrix.

Syntax: Octet String

Access: Read-Only

End of Table

ipxckActAge

Provides the age of data in the IPX checkpoint matrix.

Syntax: TimeTicks

Access: Read-Only

ipxckActCheckPoint

Provides a checkpoint to the IPX accounting database. This MIB variable must be read and then set with the same value for the checkpoint to succeed. The value read and then set will be incremented after a successful set request

Syntax: Integer

Access: Read-Write

otherEnterprises

The otherEnterprises subtree contains the Novell MIB (IPX) group and the RIPSAP group.

IPX System Group

This group contains general information about all instances of IPX on one system. The IPX variables are located in the other Enterprises group.

Basic System Table

This table contains one entry for each instance of IPX running on the system. It contains the management information that should be made available by all implementations of the IPX protocol.

ipxBasicSysTable

Provides basic information for the IPX System table.

Syntax: Sequence of IPXBasicSysEntry

Access: Not-accessible

ipxBasicSysEntry

Specifies that each entry corresponds to one instance of IPX running on the system.

Syntax: IPXBasicSysEntry

Access: not-accessible

ipxBasicSysInstance

The unique identifier of the instance of IPX to which this row corresponds. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read

ipxBasicSysExistState

The validity of this entry in the IPX system table. Setting this field to off indicates that this entry may be deleted from the system table at the IPX implementation's discretion.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

ipxBasicSysNetNumber

The network number portion of the IPX address of this system.

Syntax: NetNumber

Access: Read-write

ipxBasicSysNode

The node number portion of the IPX address of this system.

Syntax: Octet String (size = 6)

Access: Read-write

ipxBasicSysName

The readable name for this system.

Syntax: Octet string (size (0..48))

Access: Read-write

ipxBasicSysInReceives

The total number of IPX packets received, including those received in error.

Syntax: Counter

Access: Read-only

ipxBasicSysInHdrErrors

The number of IPX packets discarded due to errors in their headers, including any IPX packet with a size less than the minimum of 30 bytes.

Syntax: Counter

Access: Read-only

ipxBasicSysInUnknownSockets

The number of IPX packets discarded because the destination socket was not open.

Syntax: Counter

Access: Read-only

ipxBasicSysInDiscards

The number of IPX packets received but discarded due to reasons other than those accounted for by ipxBasicSysInHdrErrors, ipxBasicSysInUnknownSockets, ipxAdvSysInDiscards, and ipxAdvSysInCompressDiscards.

Syntax: Counter

Access: Read-only

ipxBasicSysInBadChecksums

The number of IPX packets received with incorrect checksums.

Syntax: Counter

Access: Read-only

ipxBasicSysInDelivers

The total number of IPX packets delivered locally, including packets from local applications.

Syntax: Counter

Access: Read-only

ipxBasicSysNoRoutes

The number of times no route to a destination was found.

Syntax: Counter

Access: Read-only

ipxBasicSysOutRequests

The number of IPX packets supplied locally for transmission, not including any packets counted in ipxAdvForwPackets.

Syntax: Counter

Access: Read-only

ipxBasicSysOutMalformedRequests

The number of IPX packets supplied locally that contained errors in their structure.

Syntax: Counter

Access: Read-only

ipxBasicSysOutDiscards

The number of outgoing IPX packets discarded due to reasons other than those accounted for in ipxBasicSysOutMalformedRequests, ipxAdvSysOutFiltered, and ipxAdvSysOutCompressDiscards.

Syntax: Counter

Access: Read-only

ipxBasicSysOutPackets

The total number of IPX packets transmitted.

Syntax: Counter

Access: Read-only

ipxBasicSysConfigSockets

The configured maximum number of IPX sockets that may be open at one time.

Syntax: Integer

Access: Read-only

ipxBasicSysOpenSocketFails

The number of IPX socket open calls which failed.

Syntax: Counter

Access: Read-only

Advanced System Table

This table contains one entry for each instance of IPX running on the system. It contains the advanced management information that may not be available from all implementations of the IPX protocol.

ipxAdvSysTable

Specifies the IPX System table - advanced information.

Syntax: Sequence of IPXAdvSysEntry

Access: Not-accessible

ipxAdvSysEntry

Each entry corresponds to one instance of IPX running on the system.

Syntax: IPXAdvSysEntry

Access: not-accessible

ipxAdvSysInstance

The unique identifier of the instance of IPX to which this row corresponds. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

ipxAdvSysMaxPathSplits

The maximum number of paths with equal routing metric value which this instance of the IPX may split between when forwarding packets.

Syntax: Integer (1..32)

Access: Read-write

ipxAdvSysMaxHops

The maximum number of hops a packet may take.

Syntax: Integer

Access: Read-write

ipxAdvSysInTooManyHops

The number of IPX packets discarded due to exceeding the maximum hop count.

Syntax: Counter

Access: read-only

ipxAdvSysInFiltered

The number of incoming IPX packets discarded due to filtering.

Syntax: Counter

Access: Read-only

ipxAdvSysInCompressDiscards

The number of incoming IPX packets discarded due to decompression errors.

Syntax: Counter

Access: Read-only

ipxAdvSysNETBIOSPackets

The number of NETBIOS packets received.

Syntax: Counter

Access: Read-only

ipxAdvSysForwPackets

The number of IPX packets forwarded.

Syntax: Counter

Access: Read-only

ipxAdvSysOutFiltered

The number of outgoing IPX packets discarded due to filtering.

Syntax: Counter

Access: Read-only

ipxAdvSysOutCompressDiscards

The number of outgoing IPX packets discarded due to compression errors.

Syntax: Counter

Access: Read-only

ipxAdvSysCircCount

The number of circuits known to this instance of IPX.

Syntax: Integer

Access: Read-only

ipxAdvSysDestCount

The number of currently reachable destinations known to this instance of IPX.

Syntax: Integer

Access: Read-only

ipxAdvSysServCount

The number of services known to this instance of IPX.

Syntax: Integer

Access: Read-only

IPX Circuit Group

This group contains information about all circuits used by IPX on the system.

Circuit Table

The Circuit Table contains management information for each circuit known to this system.

ipxCircTable

Specifies the Circuit table.

Syntax: Sequence of IPXCircEntry

Access: Not-accessible

ipxCircEntry

Each entry corresponds to one circuit known to the system.

Syntax: IPXCircEntry

Access: Not-accessible

ipxCircSysInstance

The unique identifier of the instance of IPX to which this entry corresponds. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

ipxCircIndex

The identifier of this circuit, unique within the instance of IPX. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

ipxCircExistState

The validity of this circuit entry. A circuit with this value set to off may be deleted from the table at the IPX implementation's discretion.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

ipxCircOperState

The value of ifIndex for the interface used by this circuit. This value may be written only when creating a new entry in the table

Syntax: Integer 1 = down, 2 = up, 3 = sleeping

Access: Read-write

ipxCircName

Specifies the readable name for the circuit.

Syntax: Octet string (size (0..48)

Access: Read-write

ipxCircType

Specifies the type of the circuit.

Syntax: Integer 1 = other, 2 = broadcast, 3 = ptToPt, 4 = wanRIP, 5 = unnumberedRIP, 6 = dynamic, 7 = wanWS

Access: Read-write

ipxCircDialName

The symbolic name used to reference the dialing information used to create this circuit. This value may be written only when creating a new entry in the table.

Syntax: Octet string (size (0..48))

Access: Read-write

ipxCircLocalMaxPacketSize

Specifies the maximum size (including header), in bytes, that the system supports locally on this circuit.

Syntax: Integer

Access: Read-write

ipxCircCompressState

The compression state on this circuit. This value may be written only when creating a new entry in the table.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

ipxCircCompressSlots

The number of compression slots available on this circuit. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

ipxCircStaticStatus

Indicates whether the information about static routes and services reached via this circuit matches that saved in permanent storage (current). Setting the value to write when it had the value changed will write the currently in use information to permanent storage, if supported. Setting the value to read when it had the value changed will replace any routes and services currently defined for the circuit with those read from permanent storage, if supported.

Syntax: Integer 1 = unknown, 2 = current, 3 = changed, 4 = read, 5 = reading, 6 = write, 7 = writing

Access: Read-write

ipxCircCompressedSent

Specifies the number of compressed packets sent.

Syntax: Counter

Access: Read-only

ipxCircCompressedInitSent

Specifies the number of compression initialization packets sent.

Syntax: Counter

Access: Read-only

ipxCircCompressedRejectsSent

The number of compressed packet rejected packets sent.

Syntax: Counter

Access: Read-only

ipxCircUncompressedSent

The number of packets sent without being compressed even though compression was turned on for this circuit.

Syntax: Counter

Access: Read-only

ipxCircCompressedReceived

The number of compressed packets received.

Syntax: Counter

Access: Read-only

ipxCircCompressedInitReceived

The number of compression initialization packets received.

Syntax: Counter

Access: Read-only

ipxCircCompressedRejectsReceived

The number of compressed packet rejected packets received.

Syntax: Counter

Access: Read-only

ipxCircUncompressedReceived

The number of packets received without having been compressed even though compression was turned on for this circuit.

Syntax: Counter

Access: Read-only

ipxCircMediaType

Specifies the media type used on this circuit

Syntax: Octet string (size = 2)

Access: Read-only

ipxCircNetNumber

Specifies the IPX network number of this circuit.

Syntax: NetNumber

Access: Read-only

ipxCircStateChanges

The number of times the circuit has changed state.

Syntax: Counter

Access: Read-only

ipxCircInitFails

Specifies the number of times that initialization of this circuit has failed.

Syntax: Counter

Access: Read-only

ipxCircDelay

The period of time, in milliseconds, that it takes to transmit one byte of data, excluding protocol headers, to a destination on the other end of the circuit, if the circuit is free of other traffic.

Syntax: Integer

Access: Read-only

ipxCircThroughput

The amount of data, in bits per second, that may flow through the circuit if there is no other traffic.

Syntax: Integer

Access: Read-only

ipxCircNeighRouterName

The name of the neighboring router on a WAN circuit.

Syntax: Octet string (size = 0..48)

Access: Read-only

ipxCircNeighInternalNetNum

The internal network number of the neighboring router on a WAN circuit.

Syntax: NetNumber

Access: Read-only

IPX Forwarding Group

This group provides a representation of the forwarding database used by all instances of IPX on the system. This group contains generic routing information that must be provided by any IPX routing protocol.

Destination Table

The Destination table contains information about all known destinations. The routing information shown in this table represents the path currently being used to reach the destination.

ipxDestTable

The Destination table contains information about all known destinations.

Syntax: Sequence of IPXDestEntry

Access: Not accessible

ipxDestEntry

Each entry corresponds to one destination

Syntax: IPXDestEntry

Access: Not accessible

ipxDestSysInstance

The unique identifier of the instance of IPX to which this row corresponds.

Syntax: Integer

Access: Read-only

ipxDestNetNum

The IPX network number of the destination.

Syntax: NetNumber

Access: Read-only

ipxDestProtocol

The routing protocol from which knowledge of this destination was obtained.

Syntax: Integer 1 = other, 2 = local, 3 = rip, 4 = nlsp, 5 = static

Access: Read-only

ipxDestTicks

Specifies the delay in ticks to reach this destination.

Syntax: Integer

Access: Read-only

ipxDestHopCount

Specifies the number of hops necessary to reach the destination.

Syntax: Integer

Access: Read-only

ipxDestNextHopCircIndex

Specifies the unique identifier of the circuit used to reach the next hop.

Syntax: PhysAddress

Access: Read-only

ipxDestNextHopNICAddress

Specifies the NIC address of the next hop.

Syntax: PhysAddress

Access: Read-only

ipxDestNextHopNetNum

Specifies the IPX network number of the next hop.

Syntax: NetNumbr

Access: Read-only

Static Routes Table

This table contains the information about all the static routes defined. There may be more than one static route to any given destination. Only the route currently being used will also be present in the Destination Table defined earlier.

ipxStaticRouteTable

The Static Routes table contains information about all destinations reached via statically configured routes.

Syntax: Sequence of IPXStaticRouteEntry

Access: Not-accessible

ipxStaticRouteEntry

Specifies that each entry corresponds to one static route.

Syntax: IPXStaticRouteEntry

Access: Not-accessible

ipxStaticRouteSysInstance

The unique identifier of the instance of IPX to which this row corresponds.

Syntax: Integer

Access: Read-write

ipxStaticRouteCircIndex

Specifies the unique identifier of the circuit used to reach the first hop in the static route.

Syntax: Integer

Access: Read-write

ipxStaticRouteNetNum

Specifies the IPX network number of the route's destination.

Syntax: NetNumber

Access: Read-write

ipxStaticRouteExistState

Specifies the validity of this static route. Entries with the value set to off may be deleted from the table at the implementation's discretion.

Syntax: Integer 1 = off, 2 = on

Access: Read-write

ipxStaticRouteTicks

Specifies the delay, in ticks, to reach the route's destination.

Syntax: Integer

Access: Read-write

ipxStaticRouteHopCount

Specifies the number of hops necessary to reach the destination.

Syntax: Integer

Access: Read-only

IPX Services Group

This group contains management information about all known services.

Services Table

This table contains the services information indexed by service name and type.

ipxServTable

Specifies the table of services, indexed by name and type.

Syntax: Sequence of IPXServEntry

Access: Not-accessible

ipxServEntry

Specifies that each entry corresponds to one service.

Syntax: IPXServEntry

Access: Not-accessible

ipxServSysInstance

The unique identifier of the instance of IPX to which this entry corresponds.

Syntax: Integer

Access: Read-only

ipxServType

Specifies the service type

Syntax: Octet string (size=2)

Access: read-only

ipxServName

Specifies the service name.

Syntax: Octet string (size=1..48)

Access: read-only

ipxServProtocol

Specifies the protocol from which knowledge of this service was obtained.

Syntax: Integer 1=other, 2=local, 4=nlsp, 5=static, 6=sap

Access: Read-only

ipxServNetNum

Specifies the IPX network number portion of the IPX address of the service.

Syntax: NetNumber

Access: Read-only

ipxServNode

Specifies the node portion of the IPX address of the service.

Syntax: Octet string (Size=6)

Access: Read-only

ipxServSocket

Specifies the socket portion of the IPX address of the service.

Syntax: Octet string (Size=2)

Access: read-only

ipxServHopCount

Specifies the number of hops to the service.

Syntax: Integer

Access: Read-only

Destination Services Table

This table contains the services information indexed by address, name, and type.

ipxDestServTable

Specifies the table of services, indexed by address, name, and type.

Syntax: IPXDestServEntry

Access: not-accessible

ipxDestServEntry

Confirms that each entry corresponds to one service.

Syntax: IPXDestServEntry

Access: not-accessible

ipxDestServSysInstance

Specifies the unique identifier of the instance of IPX to which this entry corresponds.

Syntax: Integer

Access: Read-only

ipxDestServNetNum

Specifies the IPX network number portion of the IPX address of the service.

Syntax: NetNumber

Access: Read-only

ipxDestServSocket

Specifies the socket portion of the IPX address of the service.

Syntax: Octet string (Size=2)

Access: Read-only

ipxDestServName

Specifies the name of the service

Syntax: Octet string (Size=1..48)

Access: Read-only

ipxDestServType

Specifies the type of service

Syntax: Octet string (Size=2)

Access: Read-only

ipxDestServProtocol

The protocol from which knowledge of this service was obtained.

Syntax: Integer 1=other, 2=local, 4=nlsp, 5=static, 6=sap)

Access: Read-only

ipxDestServHopCount

Identifies the number of hops to the service.

Syntax: Integer

Access: Read-only

Static Services Table

This table contains information for all services reached via a static route.

ipxStaticServTable

The Static Services table contains information about all services reached via statically configured routes.

Syntax: Sequence of IPXStaticServEntry

Access: Not-accessible

ipxStaticServEntry

Specifies that each entry corresponds to one service.

Syntax: IPXStaticServEntry

Access: Not-accessible

ipxStaticServSysInstance

The unique identifier of the instance of IPX to which this entry corresponds.

Syntax: Integer

Access: Read-write

ipxStaticServCircIndex

Specifies the circuit used to reach this service.

Syntax: Integer

Access: Read-write

ipxStaticServName

Specifies the name of the service.

Syntax: Octet string (Size=1..48)

Access: Read-write

ipxStaticServType

Specifies the type of service.

Syntax: Octet string (Size=2)

Access: Read-write

ipxStaticServExistState

The validity of this static service. Entries with the value set to off may be deleted from the table at the implementation's discretion.

Syntax: Integer 1=off, 2=on

Access: Read-write

ipxStaticServNetNum

The IPX network number portion of the IPX address of the service.

Syntax: NetNumber

Access: Read-write

ipxStaticServNode

Specifies the node portion of the IPX address of the service.

Syntax: Octet string (Size=6)

Access: Read-write

ipxStaticServSocket

Specifies the socket portion of the IPX address of the service.

Syntax: Octet String (Size=2)

Access: Read-write

ipxStaticServHopCount

Specifies the number of hops to the service.

Syntax: Integer

Access: Read-write

RIPSAP Group

This MIB defines the management information for the RIP and SAP protocols running in an IPX environment. It provides information in addition to that contained in the IPX MIB itself. All tables in this MIB are linked to an instance of IPX via the system instance identifier as defined in the IPX MIB.

System Group

This group contains global information about each instance of RIP/SAP running on one system.

RIP System Table

This table contains an entry for each instance of RIP running on the system.

ripSysTable

Specifies the RIP system table.

Syntax: Sequence of RIPSysEntry

Access: Not-accessible

ripSysEntry

Specifies that each entry corresponds to one instance of RIP running on the system.

Syntax: RIPSysEntry

Access: Not-accessible

ripSysInstance

The unique identifier of the instance of RIP to which this row corresponds. This value links the instance of RIP to an instance of IPX running on the system (in other words, the value of ripSysInstance should be the same as a value of ipxSysInstance). This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: read-write

ripSysState

Indicates the operational state of this instance of RIP.

Syntax: Integer 1=off, 2=on

Access: Read-write

ripSysIncorrectPackets

Specifies the number of times that an incorrectly formatted RIP packet was received.

Syntax: Counter

Access: Read-only

SAP System Table

This table contains an entry for each instance of SAP running on the system.

sapSysTable

Identifies the SAP system table.

Syntax: Sequence of SAPSysEntry

Access: Not-accessible

sapSysEntry

Specifies that each entry corresponds to one instance of SAP running on the system.

Syntax: SAPSysEntry

Access: Not-accessible

sapSysInstance

The unique identifier of the instance of SAP to which this row corresponds. This value links the instance of SAP to an instance of IPX running on the system (in other words, the value of SApSysInstance should be the same as a value of ipxSysInstance). This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

sapSysState

Indicates the operational state of this instance of SAP.

Syntax: Integer 1=off, 2=on

Access: Read-write

sapSysIncorrectPackets

Specifies the number of times that an incorrectly formatted SAP packet was received.

Syntax: Counter

Access: Read-only

Circuit Group

This group contains RIP and SAP management information for each circuit known to this system.

RIP Circuit Table

The RIP Circuit table contains an entry for the RIP information for each circuit known to the system.

ripCircTable

Specifies the RIP Circuit table.

Syntax: Sequence of RIPCircEntry

Access: Not-accessible

ripCircEntry

Specifies that each entry corresponds to one circuit known to the system.

Syntax: RIPCircEntry

Access: Not-accessible

ripCircSysInstance

The unique identifier of the instance of RIP and IPX (by means of ipxSysInstance) to which this entry corresponds. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

ripCircIndex

Specifies the identifier of this circuit, unique within the instance of RIP. This value corresponds to the circuit identifier found in ipxCircIndex. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

ripCircState

Indicates whether RIP information may be sent/received over this circuit.

Syntax: Integer 1=off, 2=on, 3=auto-on, 5=auto-off

Access: Read-write

ripCircPace

Specifies the maximum pace, in packets per second, at which RIP packets may be sent on this circuit.

Syntax: Integer

Access: Read-write

ripCircUpdate

Specifies the RIP periodic update interval, in seconds.

Syntax: Integer

Access: Read-write

ripCircAgeMultiplier

Specifies the holding multiplier for information received in RIP periodic updates.

Syntax: Integer

Access: Read-write

ripCircPacketSize

Specifies the RIP packet size used on this circuit.

Syntax: Integer

Access: Read-write

ripCircOutPackets

Specifies the number of RIP packets sent on this circuit.

Syntax: Counter

Access: Read-only

ripCircInPackets

Specifies the number of RIP packets received on this circuit.

Syntax: Counter

Access: Read-only

SAP Circuit Table

The SAP Circuit table contains an entry for the SAP information for each circuit known to the system.

sapCircTable

Identifies the SAP Circuit table.

Syntax: Sequence of SAPCircEntry

Access: not-accessible

sapCircEntry

Specifies that each entry corresponds to one circuit known to the system.

Syntax: SAPCircEntry

Access: Not-accessible

sapCircSysInstance

The unique identifier of the instance of SAP and IPX (by means of ipxSysInstance) to which this entry corresponds. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

sapCircIndex

Specifies the identifier of this circuit, unique within the instance of SAP. This value corresponds to the circuit identifier found in ipxCircIndex. This value may be written only when creating a new entry in the table.

Syntax: Integer

Access: Read-write

sapCircState

Indicates whether SAP information may be sent/received over this circuit.

Syntax: Integer 1=off, 2=on, 3=auto-on, 4=auto-off

Access: Read-write

sapCircPace

Specifies the maximum pace, in packets per second, at which SAP packets may be sent on this circuit.

Syntax: Integer

Access: Read-write

sapCircUpdate

Specifies the SAP periodic update interval, in seconds.

Syntax: Integer

Access: Read-write

sapCircAgeMultiplier

Specifies the holding multiplier for information received in SAP periodic updates.

Syntax: Integer

Access: Read-write

sapCircPacketSize

Specifies the SAP packet size used on this circuit.

Syntax: Integer

Access: Read-write

sapCircGetNearestServerReply

Indicates whether to respond to SAP to get the nearest server requests received on this circuit.

Syntax: Integer 1=no, 2=yes

Access: Read-write

sapCircOutPackets

Indicates the number of SAP packets sent on this circuit.

Syntax: Counter

Access: Read-only

sapCircInPackets

Specifies the number of SAP packets received on this circuit.

Syntax: Counter

Access: Read-only

CiscoMgmt Group

This section describes the group of MIB variables managed by Cisco Systems.

Channel Interface Processor (CIP) Group

The CIP Group specifies the MIB module for objects used to manage the cisco channel interface processor card.

cipCardTable

The cipCardTable contains a list of values for the CIP card which can be obtained on a per cip-card basis and include the following variables: *cipCardEntryIndex*, *cipCardEntryName*, *cipCardEntryTotalMemory*, *cipCardEntryFreeMemory*, *cipCardEntryCpuUtilization*, and *cipCardEntryTimeSinceLastReset*. This table extends CardTable in the cisco.mib.

Syntax: Sequence of CipCardEntry

Max-Access: not-accessible

cipCardEntryIndex

Specifies the index into cardTable (not physical chassis slot number, matches cisco chassis MIB cardindex)

Syntax: UInteger32

Max-Access: not-accessible

cipCardEntryName

Specifies the configured name for the CIP.

Syntax: DisplayString

Max-Access: Read-only

cipCardEntryTotalMemory

Specifies total memory on the card in kilobytes.

Syntax: UInteger32

Max-Access: Read-only

cipCardEntryFreeMemory

Specifies the total free memory on the card, that is the amount of memory in kilobytes not in use.

Syntax: UInteger32

Max-Access: read-only

cipCardEntryCpuUtilization

The average percentage of time, over the last minute, that this processor was not idle.

Syntax: Integer (0..100)

Max-Access: read-only

cipCardEntryTimeSinceLastReset

Specifies the number of seconds the CIP has been running.

Syntax: Counter32

Max-Access: read-only

End of Table

cipCardDaughterBoardTable

This table contains a list of objects pertaining to the daughter board on the CIP card.

cipCardDtrBrdIndex

Specifies which daughter board is being referenced for a particular CIP card.

Syntax: UInteger32

Max-Access: read-only

cipCardDtrBrdType

Indicates the channel path interface type.

Syntax: Integer

Max-Access: read-only

cipCardDtrBrdStatus

Specifies that the microcode for the daughter board has been successfully loaded and is executing.

Syntax: TruthValue

Max-Access: read-only

cipCardDtrBrdSignal

For ESCON, specifies that the LED has been seen and synchronization has been established. ESCON is the fiber optic connection from the IBM mainframe to the peripheral.This is layer 1 of the channel. Older technology (still in use) is called BUS and TAB and consists of 2 bulky copper cables. For Parallel Channel Adapter (PCA), specifies that the operational out has been sensed.

Syntax: TruthValue

Max-Access: read-only

cipCardDtrBrdOnline

For ESCON, specifies that a path has been established with at least one channel. For PCA, specifies that the PCA is online to the channel. It will respond to at least one device address.

Syntax: TruthValue

Max-Access: read-only

implicitIncidents

Counts the number of times the ESCON Processor recovers from an internal error.

Syntax: Counter32

Max-Access: read-only

codeViolationErrors

Specifies the number of recognized code-violation errors. A trap is issued when this number exceeds the bit error rate threshold for ESCON. The bit error rate threshold is set at 15 error burst within a 5 minute period. An error burst is the time period of 1.5 seconds plus or minus 0.05 seconds during which one or more code violations errors occur.

Syntax: Counter32

Max-Access: read-only

linkFailureSignalOrSyncLoss

Specifies the number of link failures recognized as a result of a loss of signal or loss of synchronization that persisted longer than the link interval duration. The link interval duration is one second with a tolerance of +1.5 seconds and -0 seconds.

Syntax: Counter32

Max-Access: read-only

linkFailureNOSs

Specifies the number of link failures recognized as a result of the not-operational sequence (NOS).

Syntax: Counter32

Max-Access: read-only

linkFailureSequenceTimeouts

Specifies the number of link failures recognized as a result of a connection recovery timeout or response timeout occurring while in transmit OLS state.

Syntax: Counter32

Max-Access: read-only

linkFailureInvalidSequences

Specifies the number of link failures recognized as a result of an invalid sequence for Link-Level-Facility State. Either a UD or UDR sequence was recognized while in wait-for-offline-sequence state.

Syntax: Counter32

Max-Access: read-only

linkIncidentTrapCause

Indicates the condition which caused the last SNMP trap.

Syntax: Integer
1=reason other than what is defined in conditions 2–7.
2=indicates that the daughter board status has changed.
3=indicates that a condition, which may cause the recognition of a link incident in the attached node, has occurred.
4=indicates that the code violation error rate exceeded the threshold.
5=indicates a loss of signal or loss of synchronization that persisted longer than the link interval duration.
6=indicates the recognition of not-operational sequence, usually due to the operator taking the channel offline.
7=indicates a connection recovery timeout or response timeout occurring while in transmit OLS state.
8=indicates a UD or UDR sequence was recognized while in wait-for-offline-sequence state.

Max-Access: read-only

cipCardSubChannelIndex

Indicates which subchannel is being referenced for a particular daughter board on a CIP card.

Syntax: UInteger32

Max-Access: read-only

cipCardSubChannelConnections

Indicates the number of times a device was connected to the subchannel. For some devices, this correlates with the number of start subchannels.

Syntax: Counter32

Max-Access: read-only

cipCardSubChannelCancels

Specifies the number of halt subchannels.

Syntax: Counter32

Max-Access: read-only

cipCardSubChannelSelectiveResets

Specifies the number of selective resets.

Syntax: Counter32

Max-Access: read-only

cipCardSubChannelSystemResets

Specifies the number of system resets.

Syntax: Counter32

Max-Access: read-only

cipCardSubChannelDeviceErrors

Specifies the number of device level errors.

Syntax: Counter32

Max-Access: read-only

cipCardSubChannelWriteBlocksDropped

Specifies the number of times a block was received by the channel and a router buffer was not available so the block was discarded.

Syntax: Counter32

Max-Access: read-only

cipCardSubChannelLastSenseData

Specifies the last sense data sent to the channel by this device.

Syntax: OCTET STRING (SIZE (2))

Access: read-only

cipCardSubChannelLastSenseDataTime

Specifies the time when the last sense data was sent to the channel by this device.

Syntax: TimeStamp

Max-Access: read-only

cipCardSubChannelCuBusies

Specifies the number of control unit busies sent to the channel when this device was requested.

Syntax: Counter32

Max-Access: read-only

cipCardClawTable

This table contains status and other information not covered in the following tables for the Common Link Access to Workstation (CLAW) protocol.

Syntax: Sequence of CipCardClawEntry

Max-Access: not-accessible

cipCardClawIndex

Specifies which CLAW link is being referenced for a particular subchannel on a daughter board on a CIP card.

Syntax: UInteger32

Max-Access: read-only

cipCardClawConnected

Specifies the CLAW connection status.

Syntax: TruthValue

Max-Access: read-only

cipCardClawConfigTable

Contains configuration information for the Common Link Access to Workstation (CLAW) protocol.

Syntax: Sequence of CipCardClawConfigEntry

Max-Access: not-accessible

cipCardClawConfigEntry

Specifies a list of CLAW configuration values.

Syntax: CipCardClawConfigEntry

Max-Access: not-accessible

cipCardClawConfigPath

Specifies the Hex path identifier for the switch port containing the fiber from the channel on the host to which this task connects. This is a concatenation of the switch port number, the channel logical address, and the control unit logical address. For a directly connected channel, the switch port number is usually 01.

Syntax: OCTET STRING (SIZE (2))

Max-Access: read-write

cipCardClawConfigDevice

Specifies Device address for the device the host will use to communicate with this task.

Syntax: OCTET STRING (SIZE(2))

Max-Access: read-write

cipCardClawConfigIpAddr

Specifies the IP address of the host application for this task.

Syntax: IpAddress

Max-Access: read-write

cipCardClawConfigHostName

Specifies the CLAW host name for this CLAW device.

Syntax: DisplayString

Max-Access: read-write

cipCardClawConfigRouterName

Specifies the CLAW router name for this CLAW device.

Syntax: DisplayString

Max-Access: read-write

cipCardClawConfigHostAppl

Specifies the CLAW host application name for this CLAW connection.

Syntax: DisplayString

Max-Access: read-write

cipCardClawConfigRouterAppl

Specifies the CLAW router application name for this CLAW connection.

Syntax: DisplayString

Max-Access: read-write

cipCardClawDataXferStatsTable

This table specifies a list of objects pertaining to data transfer statistics per CLAW Logical Link.

Syntax: Sequence of CipCardClawDataXferStatsEntry

Max-Access: not-accessible

cipCardClawDataXferStatsEntry

Specifies a list of daughter board statistics.

Syntax: CipCardClawDataXferStatsEntry

Max-Access: not-accessible

cipCardClawDataXferStatsBlocksRead

Specifies the number of read data transfer channel command words (CCWs) from the channel perspective.

Syntax: Counter32

Max-Access: read-only

cipCardClawDataXferStatsBlocksWritten

Specifies the number of successful write data transfer CCWs from the channel perspective.

Syntax: Counter32

Max-Access: read-only

cipCardClawDataXferStatsBytesRead

Specifies the number of bytes successfully read from the channel perspective.

Syntax: Counter32

Max-Access: read-only

clawDataXferStatsBytesWritten

Specifies the number of bytes successfully written from the channel perspective.

Syntax: Counter32

Max-Access: read-only

cipCardClawDataXferStatsHCBytesRead

Specifies the number of bytes successfully read from the channel perspective. The HC (High Capacity) objects are the 64-bit equivalent of their 32-bit counterparts modeled after RFC 1573.

Syntax: Counter64

Max-Access: read-only

cipCardClawDataXferStatsHCBytesWritten

Specifies the number of bytes successfully written from the channel perspective. The HC (High Capacity) objects are the 64-bit equivalent of their 32-bit counterparts modeled after RFC 1573.

Syntax: Counter64

Max-Access: read-only

cipCardClawDataXferStatsReadBlocksDropped

Specifies the number of bytes written.

Syntax: Counter32

Max-Access: read-only

cipCardClawDataXferStatsWriteBlocksDropped

Specifies the number of read blocks dropped.

Syntax: Counter32

Max-Access: read-only

cipCardClawDataXferStatsBufferGetRetryCount

Specifies the number of times a buffer was requested and none was available.

Syntax: Counter32

Max-Access: read-only

Ping Group

The variables described in this section apply to the Cisco Ping MIB Definitions.

ciscoPingTable

Provides a table of ping request entries. The Ping group consists of a single table, the ciscoPingTable, and includes the ciscoPing entries described in this subsection.

Syntax: Sequence of CiscoPingEntry

Access: current

ciscoPingAddress

The address of the device to be pinged. An instance of this object cannot be created until the associated instance of ciscoPingProtocol is created. Once an instance of this object is created, its value cannot be changed.

Syntax: CiscoNetworkAddress

Access: Read-Write

ciscoPingEntry

Provides a ping request entry. A management station choosing to create an entry should first generate a pseudo-random serial number to be used as the index to this sparse table. The station should then create the associated instance of the row status and row owner objects. It must also, either in the same or in successive PDUs, create the associated instance of the protocol and address objects. It should also modify the default values for the other configuration objects if the defaults are not appropriate.

Once the appropriate instance of all the configuration objects has been created, either by an explicit SNMP set request or by default, the row status should be set to active to initiate the request. Note that this entire procedure may be initiated by means of a single set request which specifies a row status of *createAndGo* as well as specifies values for the non-defaulted configuration objects.

Once the ping sequence has been activated, it cannot be stopped; it will run until the configured number of packets have been sent.

Once the sequence completes, the management station should retrieve the values of the status objects of interest, and should then delete the entry. In order to prevent old entries from clogging the table, entries will be aged out, but an entry will never be deleted within 5 minutes of completing.

Syntax: CiscoPingEntry

Access: not-accessible

ciscoPingProtocol

Specifies the protocol stack over which the ping packet is being sent. For IOS 10.2, Cisco supports the SNMP ping over IP, IPX, AppleTalk, CLNS, DECnet, and Vines.

Syntax: Cisco Network Protocol

Max-Access: Read-Create

ciscoPingSerialNumber

Specifies a unique entry in the ciscoPingTable. A management station choosing to initiate a ping operation should use a pseudo-random value for this object when creating or modifying an instance of a ciscoPingEntry. The RowStatus semantics of the ciscoPingEntryStatus object will prevent access conflicts.

Syntax: Integer32

Max-Access: not-accessible

ciscoPingPacketCount

Specifies the number of ping packets to send to the target in this sequence.

Syntax: Integer32

Max-Access: Read-create

ciscoPingPacketSize

Specifies the size of ping packets to send to the target in this sequence. The lower and upper boundaries of this object are protocol-dependent. An instance of this object cannot be modified unless the associated instance of ciscoPingProtocol has been created (so as to allow protocol-specific range checking on the new value).

Syntax: Integer32

Max-Access: Read-create

ciscoPingPacketTimeout

Specifies the amount of time to wait for a response to a transmitted packet before declaring the packet dropped.

Syntax: Integer32

Max-Access: Read-create

ciscoPingDelay

Specifies the minimum amount of time to wait before sending the next packet in a sequence after receiving a response or declaring a timeout for a previous packet. The actual delay may be greater due to internal task scheduling.

Syntax: Integer32

Max-Access: Read-create

ciscoPingTrapOnCompletion

Specifies whether a ciscoPingCompletion trap should be issued on completion of the sequence of pings. If such a trap is sought, it is the responsibility of the management entity to ensure that the SNMP administrative model is configured in such a way as to allow the trap to be delivered.

Syntax: TruthValue

Max-Access: Read-create

ciscoPingSentPackets

The number of ping packets that have been sent to the target in this sequence.

Syntax: Counter32

Max-Access: Read-only

ciscoPingReceivedPackets

The number of ping packets that have been received from the target in this sequence.

Syntax: Counter32

Max-Access: Read-only

ciscoPingMinRtt

The minimum round trip time of all the packets that have been sent in this sequence. This object will not be created until the first ping response in a sequence is received.

Syntax: Integer

Access: Read-only

ciscoPingAvgRtt

The average round trip time of all the packets that have been sent in this sequence. This object will not be created until the first ping response in a sequence is received.

Syntax: Integer

Access: Read-only

ciscoPingMaxRtt

The maximum round trip time of all the packets that have been sent in this sequence. This object will not be created until the first ping response in a sequence is received.

Syntax: Integer

Access: Read-only

ciscoPingCompleted

Specifies a setting of true when all the packets in this sequence have been answered or have timed out.

Syntax: TruthValue

Access: Read-only

ciscoPingEntryOwner

Specifies the entity that configured this device.

Syntax: OwnerString

Access: Read-create

ciscoPingEntryStatus

Specifies the status of this table entry. Once the entry status is set to active, the associate entry cannot be modified until the sequence is completed (in other words, ciscoPingCompleted is true).

Syntax: RowStatus

Access: Read-create

System Group

The variables described in this section are system-wide and apply to all Cisco Systems products.

Basic

The following variables pertain to basic information such as system software description and version number, host and domain names, and number of bytes of free memory in the managed device:

authAddr

Provides the IP address of the device causing the last SNMP authorization failure. The device did not use a configured community string or tried a SET with a read-only community string.

Syntax: IP address

Access: Read-only

bootHost

Provides the IP address of the host that supplied the software currently running on the managed device.

Syntax: IP address

Access: Read-only

domainName

Provides the domain portion of the domain name of the host.

Syntax: Display string

Access: Read-only

freeMem

Provides the number of bytes of free memory available in the managed device.

Syntax: Integer

Access: Read-only

hostName

Represents the name of the host in printable ASCII characters.

Syntax: Display string

Access: Read-only

romId

Contains a printable octet string that contains the system bootstrap description and version identification.

Syntax: Display string

Access: Read-only

whyReload

Contains a printable octet string that contains the reason why the system was last restarted.

Syntax: Display string

Access: Read-only

Buffer

The following variables are used to monitor the amount and type of buffer space available within a managed device. *Buffers* are blocks of memory used to hold network packets. There are five types of buffers based on size: *small*, *middle*, *big*, *large*, and *huge*. There are several pools

of different-sized buffers. These pools grow and shrink based upon demand. Some buffers are temporary and are created and destroyed as warranted. Others are permanently allocated.

bufferFail

Contains the total number of allocation requests that have failed due to lack of any free buffers.

Syntax: Integer

Access: Read-only

bufferNoMem

Counts the number of failures caused by insufficient memory to create a new buffer.

Syntax: Integer

Access: Read-only

Buffer Elements

Buffer elements are blocks of memory used in internal operating system queues.

bufferElCreate

Contains the number of new buffer elements created for the managed device.

Syntax: Integer

Access: Read-only

bufferElFree

Contains the number of buffer elements that are not currently allocated and are available for use in the managed device.

Syntax: Integer

Access: Read-only

bufferElHit

Contains the number of successful attempts to allocate a buffer element when needed.

Syntax: Integer

Access: Read-only

bufferElMax

Contains the maximum number of buffer elements the managed device can have.

Syntax: Integer

Access: Read-only

bufferElMiss

Contains the number of allocation attempts that failed because there were no buffer elements available.

Syntax: Integer

Access: Read-only

Small Buffers

Small buffer sizes are configurable.

bufferSmCreate

Contains the number of small buffers created in the managed device.

Syntax: Integer

Access: Read-only

bufferSmFree

Contains the number of small buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

bufferSmHit

Contains the number of successful attempts to allocate a small buffer when needed.

Syntax: Integer

Access: Read-only

bufferSmMax

Contains the maximum number of small buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferSmMiss

Contains the number of allocation attempts that failed because there were no small buffers available.

Syntax: Integer

Access: Read-only

bufferSmSize

Provides the size (in bytes) of small buffers.

Syntax: Integer

Access: Read-only

bufferSmTotal

Provides the total number of small buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferSmTrim

Contains the small buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

Middle Buffers

Middle buffer sizes are configurable.

bufferMdCreate

Contains the number of middle buffers created in the managed device.

Syntax: Integer

Access: Read-only

bufferMdFree

Contains the number of middle buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

bufferMdHit

Contains the number of successful attempts to allocate a middle buffer when needed.

Syntax: Integer

Access: Read-only

bufferMdMax

Contains the maximum number of middle buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferMdMiss

Contains the number of allocation attempts that failed because there were no middle buffers available.

Syntax: Integer

Access: Read-only

bufferMdSize

Provides the size (in bytes) of middle buffers.

Syntax: Integer

Access: Read-only

bufferMdTotal

Provides the total number of middle buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferMdTrim

Contains the middle buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

Big Buffers

Big buffer sizes are configurable.

bufferBgCreate

Contains the number of big buffers created in the managed device.

Syntax: Integer

Access: Read-only

bufferBgFree

Contains the number of big buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

bufferBgHit

Contains the number of successful attempts to allocate a big buffer when needed.

Syntax: Integer

Access: Read-only

bufferBgMax

Contains the maximum number of big buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferBgMiss

Contains the number of allocation attempts that failed because there were no big buffers available.

Syntax: Integer

Access: Read-only

bufferBgSize

Provides the size (in bytes) of big buffers.

Syntax: Integer

Access: Read-only

bufferBgTotal

Provides the total number of big buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferBgTrim

Contains the big buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

Large Buffers

Large buffer sizes are configurable.

bufferLgCreate

Contains the number of large buffers created in the managed device.

Syntax: Integer

Access: Read-only

bufferLgFree

Contains the number of large buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

bufferLgHit

Contains the number of successful attempts to allocate a large buffer when needed.

Syntax: Integer

Access: Read-only

bufferLgMax

Contains the maximum number of large buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferLgMiss

Contains the number of allocation attempts that failed because there were no large buffers available.

Syntax: Integer

Access: Read-only

bufferLgSize

Provides the size (in bytes) of large buffers.

Syntax: Integer

Access: Read-only

bufferLgTotal

Provides the total number of large buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferLgTrim

Contains the large buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

Huge Buffers

Huge buffer sizes are configurable.

bufferHgCreate

Contains the number of huge buffers created in the managed device.

Syntax: Integer

Access: Read-only

bufferHgFree

Contains the number of huge buffers that are currently available to the managed device.

Syntax: Integer

Access: Read-only

bufferHgHit

Contains the number of successful attempts to allocate a huge buffer when needed.

Syntax: Integer

Access: Read-only

bufferHgMax

Contains the maximum number of huge buffers that can be allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferHgMiss

Contains the number of allocation attempts that failed because there were no huge buffers available.

Syntax: Integer

Access: Read-only

bufferHgSize

Provides the size (in bytes) of huge buffers.

Syntax: Integer

Access: Read-only

bufferHgTotal

Provides the total number of huge buffers allocated to the managed device.

Syntax: Integer

Access: Read-only

bufferHgTrim

Contains the huge buffers that have been destroyed in the managed device.

Syntax: Integer

Access: Read-only

CPU Utilization

The following variables provide statistics on the CPU utilization of a device:

avgBusy1

Provides a cumulative average of the CPU usage percentage over a 1-minute period. This variable, called by the scheduler every 5 seconds, computes the busy time in the last 5-second period, and the 5-minute, exponentially decayed busy time. The following equation shows the average sampling time:

average = ((average - interval) * exp (-t/C)) + interval

where t is five seconds and C is 1 minute, exp(-5/60) == .920 ~= 942/1024

Syntax: Integer

Access: Read-only

avgBusy5

Provides a cumulative average of the CPU usage percentage over a 5-minute period. This variable, called by the scheduler every 5 seconds, computes the busy time in the last 5-second period, and the 5-minute, exponentially decayed busy time. The following equation shows the average sampling time:

average = ((average - interval) * exp (-t/C)) + interval

where t is five seconds and C is five minutes, exp(-5/60*5)) == .983 ~= 1007/1024

Syntax: Integer

Access: Read-only

avgBusyPer

Provides the percentage of CPU usage over the first 5-second period in the scheduler. The scheduler determines which process or task takes priority over another and triggers them accordingly.

Syntax: Integer

Access: Read-only

ciscoContactInfo

Provides the Cisco name and address for reference purposes. This MIB variable applies only to router products that were purchased from Cisco.

Syntax: Display string

Access: Read-only

Environmental Monitor Card

The environmental monitor card is provided only with the Cisco AGS+ router. This card checks input air temperature and air flow through the system card cage and card cage backplane power supplies. It also provides nonvolatile and system bus memory for the system. The

Cisco 7000 has built-in environmental monitoring functionality, and so does not use the card. The Cisco 7000 router provides environmental monitoring, reporting, and if necessary, system shutdown.

All MIB variables in this group apply to the Cisco AGS+. A subset of those variables apply to the Cisco 7000. The following variables are used to poll and display power supply voltage and air temperature (in Celsius) in an AGS+ to help prevent system problems.

envBurnDate

Provides the date of the calibration of the environmental monitor card. (AGS+ only)

For example:

```
calibrated on 2-14-93.
```

Syntax: Display string

Access: Read-only

envFirmVersion

Provides the firmware level of the environmental monitor card. (AGS+ only)

For example:

```
Environmental controller firmware version 2.0
```

Syntax: Display string

Access: Read-only

envPresent

Indicates whether there is an environmental monitor card in a router.

Syntax: Integer (0 = no, 1 = yes, but unavailable to SNMP; 2 = yes and available to SNMP for AGS+ routers; 3 = yes and available to SNMP for Cisco 7000 routers)

Access: Read-only

envSerialNumber

Provides the serial number of the environmental monitor card. (AGS+ only)

Following is an example of a serial number:

```
00220846
```

Syntax: Display string

Access: Read-only

envTechnicianID

Provides the technician ID for the environmental monitor card. (AGS+ only)

Following is an example of a technician ID:

```
rma
```

Syntax: Display string

Access: Read-only

envTestPt1Descr

Test point 1 is the temperature of air entering the router. (AGS+ and Cisco 7000)

Syntax: Display string

Access: Read-only

envTestPt1last

Provides the temperature of air entering the AGS+ and the Cisco 7000 router when the last shutdown occurred. If the input air temperature exceeds 109°F (43°C) in an AGS+, an error is detected, and the CSC-ENVM card shuts down the power supply.

Syntax: Integer

Access: Read-only

envTestPt1MarginVal

Provides warning and fatal threshold values of the internal intake air for the AGS+ router and Cisco 7000.

Syntax: Integer

Access: Read-only

envTestPt1Measure

Provides the current temperature of air entering the router. (AGS+ and Cisco 7000)

Syntax: Display string

Access: Read-only

envTestPt1warn

Indicates whether the air temperature entering the router is at warning level. (AGS+ and Cisco 7000)

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

envTestPt2Descr

Provides the temperature of air leaving the router. (AGS+ and Cisco 7000)

Syntax: Display string

Access: Read-only

envTestPt2last

Provides the temperature of air leaving the router when the last shutdown occurred. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

envTestPt2MarginVal

Provides the fatal threshold value for the exhaust air flow of the router. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

envTestPt2Measure

Provides the temperature of the exhaust air flow of the router. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

envTestPt2warn

Indicates whether the temperature of air flow leaving the router is at a warning level. (AGS+ and Cisco 7000)

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

envTestPt3Descr

Test point 3 is the +5-volt (V) line on the router.

Syntax: Display string

Access: Read-only

envTestPt3last

Provides the value of the +5V line when the last shutdown occurred. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

envTestPt3MarginPercent

Provides the warning and fatal thresholds for the +5V line to the power supply on the AGS+ router. The warning threshold is 5 percent above or below +5V. The fatal threshold at which the router shuts down is 10 percent above or below +5V. (AGS+ only)

Syntax: Integer

Access: Read-only

envTestPt3Measure

Provides the current value for the +5V line to the power supply on the router. The value is expressed in millivolts. (AGS+ and Cisco 7000)

Syntax: Integer

Access: Read-only

envTestPt3warn

Indicates whether the +5V line to the power supply is at warning level. The warning threshold is 5 percent above or below +5V. (AGS+ and Cisco 7000)

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

envTestPt4Descr

Test point 4 is the +12V line to the power supply of the router.

Syntax: Display string

Access: Read-only

envTestPt4last

Provides the value of the +12V line when the last shutdown occurred.

Syntax: Integer

Access: Read-only

envTestPt4MarginPercent

Provides the warning and fatal thresholds for the +12V line to the power supply on the AGS+ router. The warning threshold is 10 percent above or below +12V. The fatal threshold at which the router shuts down is 15 percent above or below +12V. (AGS+ only)

Syntax: Integer

Access: Read-only

envTestPt4Measure

Provides the current value (in millivolts) of the +12V line to the power supply of the router.

Syntax: Integer

Access: Read-only

envTestPt4warn

Indicates whether the +12V line to the power supply is at warning level. The warning threshold is 10 percent above or below +12V.

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

envTestPt5Descr

Test point 5 is the –12V line to the power supply of the router.

Syntax: Display string

Access: Read-only

envTestPt5last

Provides the value of the –12V line when the last shutdown occurred.

Syntax: Integer

Access: Read-only

envTestPt5MarginPercent

Provides the warning and fatal thresholds for the –12V line to the power supply on the router. The warning threshold is 10 percent above or below –12V. The fatal threshold at which the router shuts down is 15 percent above or below –12V. (AGS+ only)

Syntax: Integer

Access: Read-only

envTestPt5Measure

Provides the current value (in millivolts) of the –12V line to the power supply of the router.

Syntax: Integer

Access: Read-only

envTestPt5warn

Indicates whether the –12V line to the power supply on the router is at the warning level. The warning threshold is 10 percent above or below –12V. (AGS+ only)

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

envTestPt6Descr

Test point 6 is the –5V line to the power supply of the AGS+ router and +24V line to the power supply of the Cisco 7000 router.

Syntax: Display string

Access: Read-only

envTestPt6last

Provides the value of the –5V line to the power supply of the AGS+ router and +24V line to the power supply of the Cisco 7000 router when the last shutdown occurred.

Syntax: Integer

Access: Read-only

envTestPt6MarginPercent

Provides the warning and fatal thresholds for the –12V line to the power supply on the AGS+ router. The warning threshold is 5 percent above or below –5V. The fatal threshold at which the router shuts down is 10 percent above or below –5V. (AGS+ only)

Syntax: Integer

Access: Read-only

envTestPt6Measure

Provides the current value (in millivolts) of the –5V line to the power supply of the AGS+ router and +24V line to the power supply of the Cisco 7000 router.

Syntax: Integer

Access: Read-only

For the Cisco 7000, this variable indicates whether the +P24V line to the power supply is at the warning level.

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

envTestPt6warn

Indicates whether the –5V line to the power supply of the AGS+ router or +24V line to the power supply of the Cisco 7000 router is at the warning level. The warning threshold is 10 percent above or below –5V (AGS+ router) or +24V (Cisco 7000 router).

Syntax: Integer (1 = warning, 2 = no warning)

Access: Read-only

envType

Provides the type of environmental card (for example, CSC-ENVM).

Syntax: Display string

Access: Read-only

Host Configuration File

The following variables are used to monitor and set host configuration file information:

hostConfigAddr

Provides the address of the host that provided the host configuration file for the managed device. The *host configuration file* contains commands that apply to one network server in particular.

Syntax: IpAddress

Access: Read-only

hostConfigName

Provides the name of the last host configuration file used by the device.

Syntax: Display string

Access: Read-only

hostConfigProto

Provides the protocol that supplied the host configuration file.

Syntax: Integer (1 = IP, 2 = MOP, 3 = not applicable)

Access: Read-only

hostConfigSet

Allows the network management system (NMS) to load a new host configuration file via Trivial File Transfer Protocol (TFTP) onto the managed device and indicate the name of this configuration file. The instance ID is the IP address of the TFTP host. The display string indicates the name of the configuration file.

Syntax: Display string

Access: Write-only

Network Configuration File

The following variables are used to monitor and remotely set network configuration file information for the device:

netConfigAddr

Provides the address of the host that supplied the network configuration file for the managed device. The *network configuration file* contains commands that apply to all network servers and terminal services on a network.

Syntax: IpAddress

Access: Read-only

netConfigName

Provides the name of the network configuration file that resides on the managed device.

Syntax: Display string

Access: Read-only

netConfigProto

Provides the protocol that supplied the network configuration file.

Syntax: Integer

Access: Read-only

netConfigSet

Loads a new network configuration file via Trivial File Transfer Protocol (TFTP) onto the managed device and indicates the name of this configuration file. The instance ID is the IP address of the TFTP host. The display string indicates the name of the configuration file.

Syntax: Display string

Access: Write-only

System Configuration

The following variables are used to monitor and set system-wide parameters:

sysClearARP

Performs a clearing of the entire Address Resolution Protocol (ARP) cache and Internet Protocol (IP) route cache. The ARP provides dynamic mapping between IP addresses and Ethernet addresses. The ARP Cache table, which keeps a record of these mappings, can be cleared for maintenance purposes.

The IP route cache controls the use of a high-speed switching cache for IP routing. The route cache is enabled by default and allows outgoing packets to be load balanced on a per-destination basis. The *sysClearARP* variable helps clear the IP route cache for maintenance purposes.

Syntax: Integer

Access: Write-only

sysClearInt

Clears an interface that is given *IfIndex* as a value. To clear an interface, take the *ifIndex* for the interface (for example, a value of 4) and set the *sysClearInt* variable to the *ifIndex* value of 4.

Syntax: Integer

Access: Write-only

sysConfigAddr

Provides the address of the host that supplied the system boot image for the managed device. New versions of software can be downloaded over the network with boot image files. The new file takes effect the next time the managed device is reloaded.

Syntax: IpAddress

Access: Read-only

sysConfigName

Provides the name of the system boot image file. New versions of software can be downloaded over the network with boot image files. The new file takes effect the next time the managed device is reloaded.

Syntax: Display string

Access: Read-only

sysConfigProto

Provides the protocol type that supplied the system boot image.

Syntax: Integer

Access: Read-only

writeMem

Writes the current (running) router configuration into nonvolatile memory where it can be stored and retained even if the router is reloaded. Write configuration memory if 1. Erase configuration memory if 0.

Syntax: Integer

Access: Write-only

writeNet

Sends a copy of the current configuration via Trivial File Transfer Protocol (TFTP) to a remote host. When it is stored on the host, the configuration file can be edited and retrieved by other network entities.

Syntax: Display string

Access: Write-only

Terminal Services Group

Following are variables that can be applied to terminal services. This group of variables contains terminal service information on a per-line basis, such as line status, line type, line speed, type of flow control, and type of modem.

tsLine

Provides the number of physical lines on the device.

Syntax: Integer

Access: Read-only

Terminal Services Line Table

The local terminal services line table, *ltsLineTable*, contains all of the variables described in this section. The index to this table is the number of the terminal services line. If there are *n* number of terminal lines associated with the device, there will be *n* rows in the table.

Table 12 Terminal Services Line

Line Number	tsLineActive	tsLineAutobaud	and so on
1	Contains all of the variables described in this section.		
2			
and so on			

tsLineActive

Indicates whether this line is active.

Syntax: Integer (1 = active, 2 = not active)

Access: Read-only

tsLineAutobaud

Indicates whether the line is set to autobaud detection so that it can adapt to the rate at which data is being sent to it.

Syntax: Integer (1 = autobaud, 2 = not autobaud)

Access: Read-only

tsLineEsc

Indicates what is used to represent the escape (Esc) character. The escape character allows a user to break out of active sessions.

Syntax: Display string

Access: Read-only

tsLineFlow

Indicates the type of flow control the line is using. The flow can be controlled from software or hardware. Input indicates that the flow control is coming from the device to the terminal service. Output indicates flow control is provided by the terminal service.

The possible integer values follow:

1 = unknown
2 = none
3 = software-input
4 = software-output
5 = software-both
6 = hardware-input
7 = hardware-output
8 = hardware-both

Syntax: Integer

Access: Read-only

tsLineLoc

Describes the physical location of the line. The integer values 1–3 represent commands that can be defined by the user.

Syntax: Display string

Access: Read-only

tsLineModem

Describes the type of modem control the line is using.

The possible integer values follow:

1 = unknown
2 = none
3 = call-in
4 = call-out
5 = cts-required
6 = ri-is-cd
7 = modem inout

Descriptions of the integer values follow:

Call-in indicates dial-in modems that use the status of Data Terminal Ready (DTR) to determine whether to answer an incoming call.

Call-out indicates modems that raise data terminal ready (DTR) to see if Clear To Send (CTS) becomes high as an indication that the host has noticed its signal.

Cts-required indicates the form of modem control that requires CTS to be high throughout the use of the line.

ri-is-cd is used for lines with high-speed modems. The modem answers the call if DTR is high, uses its Carrier Detect (CD) signal to reflect the carrier presence, and has its CD signal wired to the ring input of the terminal service.

modem inout is used to configure a line for both incoming and outgoing calls. The command enables a line to be used for both incoming and outgoing calls on dial-in/dial-out modems.

Syntax: Integer

Access: Read-only

tsLineNoise

Provides the number of garbage characters received while the line is inactive.

Syntax: Integer

Access: Read-only

tsLineNses

Indicates the number of current sessions on the line.

Syntax: Integer

Access: Read-only

tsLineRotary

Specifies the number of the rotary group to which the line belongs. If the first line in a rotary group is busy, a connection can be made to the next free line.

Syntax: Integer

Access: Read-only

tsLineScrlen

Provides the length (in lines) of the screen of the terminal attached to the line.

Syntax: Integer

Access: Read-only

tsLineScrwid

Provides the width (in characters) of the screen of the terminal attached to the line.

Syntax: Integer

Access: Read-only

tsLineSestmo

Specifies the interval (in seconds) for closing the connection when there is no input or output traffic during a session.

Syntax: Integer

Access: Read-only

tsLineSpeedin

Indicates the input speed at which the line is running.

Syntax: Integer

Access: Read-only

tsLineSpeedout

Indicates the output speed at which the line is running.

Syntax: Integer

Access: Read-only

tsLineTerm

Describes the terminal type of the line.

Syntax: Display string

Access: Read-only

tsLineTmo

Specifies the interval (in seconds) for closing the connection when there is no input or output traffic on the line.

Syntax: Integer

Access: Read-only

tsLineType

Describes the terminal line type.

The possible integer values follow:

1 = unknown
2 = console
3 = terminal
4 = line-printer
5 = virtual-terminal
6 = auxiliary

Syntax: Integer

Access: Read-only

tsLineUser

Provides the Terminal Access Controller Access System (TACACS) username and indicates whether TACACS is enabled on this line. TACACS servers provide security for accessing terminals remotely.

Syntax: Display string

Access: Read-only

tsLineUses

Indicates the number of times a connection has been made to or from this line.

Syntax: Integer

Access: Read-only

End of Table

Terminal Services Line Session Table

The Terminal Services Line Session table, *ltsLineSessionTable*, contains six variables: *tslineSesAddr, tslineSesCur, tslineSesDir, tslineSesIdle, tslineSesName,* and *tslineSesType.*

For simplification, Table 13 shows values for three of the variables contained in the Terminal Services Line Session table. The index to the table is the session number and line number. Line 1 in the first session illustrates a Telnet connection. The session was started by the terminal. The remote host for this session is located at the IP address of 131.38.141.244.

Table 13 Terminal Services Line Session

Session no. Line no.	tslineSesAddr	tslineSesDir	tslineSesType
1, 1	131.38.141.244	3	5
2, 4	138.121.128.243	2	3

tslineSesAddr

Provides the address of the remote host for this session.

Syntax: Network address

Access: Read-only

tslineSesCur

Indicates whether this session is currently active.

Syntax: Integer (1 = active, 2 = not active)

Access: Read-only

tslineSesDir

Indicates whether this session was started by another device (incoming) or by the terminal (outgoing).

The possible integer values follow:

1 = unknown
2 = incoming
3 = outgoing

Syntax: Integer

Access: Read-only

tslineSesIdle

Indicates the amount of time (in seconds) that this session has been idle.

Syntax: Integer

Access: Read-only

tslineSesName

Provides the name of the remote host for this session.

Syntax: Display string

Access: Read-only

tslineSesType

Describes the type of session that is currently active.

The possible integer values follow:

1 = unknown
2 = X.3 Packet Assembler/Disassembler (PAD)
3 = stream (enables a raw TCP (Transmission Control Protocol) stream with no Telnet-control sequences)
4 = rlogin (for making remote connection to a host—part of TCP/IP)
5 = telnet (for making remote connection to a host—UNIX protocol)
6 = Transmission Control Protocol (TCP)
7 = local-area transport (LAT)
8 = Maintenance Operation Protocol (MOP)
9 = Serial Line Internet Protocol (SLIP)
10 = XRemote (provides support for X Windows over a serial line)

Syntax: Integer

Access: Read-only

End of Table

Terminal Services Messages

The following variables pertain to the parameters of terminal services messages:

tsMsgDuration

Sets the length of time (in milliseconds) allocated to reissue a message. The minimum nonzero setting is 10000.0. A setting of 0 will not repeat the message.

Syntax: Integer

Access: Read-write

tsMsgIntervaltim

Sets the interval (in milliseconds) that occurs between reissues of the same message. The minimum (nonzero) setting for this interval is 10,000 milliseconds. If set to 0, the intervals will become more frequent as the message duration gets close to expiring. For example, 2 hours, 1 hour, 30 minutes, 5 minutes, and 1 minute.

Syntax: Integer

Access: Read-write

tsMsgSend

Determines what action to take after the message has been sent.

The possible integer values follow:

1 = nothing
2 = reload
3 = message done
4 = abort

Syntax: Integer

Access: Read-write

tsMsgText

Sets the text of the message. Up to 256 characters can be included in the message.

Syntax: Display string

Access: Read-write

tsMsgTmpBanner

Determines whether to use the message text as a temporary banner.

Syntax: Integer (1 = no, 2 = yes, in addition to the regular banner)

Access: Read-write

tsMsgTtyLine

Selects the TTY line to which you want the message sent. Setting this variable to –1 will send the message to all TTY lines.

Syntax: Integer

Access: Read-write

Transmission Control Protocol (TCP) Group

These variables can be applied to Cisco products running the Transmission Control Protocol (TCP). These variables provide statistics on the number of input and output bytes and packets for TCP connections.

TCP Connection Table

The TCP connection table, *ltcpConnTable*, contains five variables: *loctcpConnElapsed*, *loctcpConnInBytes*, *loctcpConnInPkts*, *loctcpConnOutBytes*, and *loctcpConnOutPkts*.

The index to this table includes the local host address and port number and the remote host address and port number for each TCP connection that is active for the device. These values are represented by *tcpConnLocalAddress*, *tcpConnLocalPort*, *tcpConnRemAddress*, and *tcpConRemPort*.

For *n* number of TCP connections, there are *n* rows in the table. The value *n* can change at any time if another TCP connection opens or if an existing TCP connection closes.

In Table 14, TCP A represents the first TCP connection in the table. The TCP A connection shows 100 input bytes, 100 output bytes, 85 input packets, and 85 output packets for the connection. The connection has been established for 60 seconds, or 6000 timeticks.

Table 14 TCP Connection Table

ltcpConnTable	Elapsed	InBytes	InPkts	OutBytes	OutPkts
TCP A	6000	100	85	100	85
TCP B	4500	200	90	130	100
TCP C	9000	300	100	250	95

loctcpConnElapsed

Provides the length of time that the TCP connection has been established.

Syntax: Timeticks

Access: Read-only

loctcpConnInBytes

Provides the number of input bytes for the TCP connection.

Syntax: Counter

Access: Read-only

loctcpConnInPkts

Provides the number of input packets for the TCP connection.

Syntax: Counter

Access: Read-only

loctcpConnOutBytes

Provides the number of output bytes for the TCP connection.

Syntax: Counter

Access: Read-only

loctcpConnOutPkts

Provides the number of output packets for the TCP connection.

Syntax: Counter

Access: Read-only

End of Table

Temporary Variables

This section is equivalent to the experimental space defined by the Structure of Management Information (SMI). It contains variables that are useful to have, but are beyond the ability of Cisco to control and maintain. Support for these variables can change with each Cisco Systems software release.

Note Unlike the compilable mib files, this quick reference guide organizes variable groups and variables within groups alphabetically so that you can quickly look up descriptions of MIB variables.

The temporary variables section includes the following groups of variables:

- AppleTalk
- Chassis
  - Chassis Card Table
  - Chassis Interface Table
- DECnet
  - DECnet Area Routing Table
  - DECnet Host Table
  - DECnet Interface Table
- Novell
- Virtual Integrated Network Service (VINES)
  - Banyan Vines Interface Table
- Xerox Network Systems (XNS)

AppleTalk Group

Variables in this group can be used with all Cisco products running the AppleTalk protocol. These variables provide such information as total number of input and output packets, number of packets with errors, and number of packets with Address Resolution Protocol (ARP) requests and replies.

atArpprobe

Indicates the total number of input ARP probe packets.

Syntax: Integer

Access: Read-only

atArpreply

Indicates the total number of AppleTalk ARP reply packets output.

Syntax: Integer

Access: Read-only

atArpreq

Indicates the total number of input AppleTalk ARP request packets.

Syntax: Integer

Access: Read-only

atAtp

Indicates the total number of AppleTalk ATP packets received.

Syntax: Integer

Access: Read-only

atBcastin

Indicates the total number of AppleTalk input broadcast packets.

Syntax: Integer

Access: Read-only

atBcastout

Indicates the total number of AppleTalk output broadcast packets.

Syntax: Integer

Access: Read-only

atChksum

Indicates the total number of AppleTalk input packets with checksum errors.

Syntax: Integer

Access: Read-only

atDdpbad

Indicates the total number of illegal-sized AppleTalk Datagram Delivery Protocol (DDP) packets received.

Syntax: Integer

Access: Read-only

atDdplong

Indicates the total number of long DDP packets received.

Syntax: Integer

Access: Read-only

atDdpshort

Indicates the total number of short DDP packets received.

Syntax: Integer

Access: Read-only

atEcho

Indicates the total number of AppleTalk echo packets received.

Syntax: Integer

Access: Read-only

atEchoill

Indicates the total number of illegal AppleTalk echo packets received.

Syntax: Integer

Access: Read-only

atForward

Indicates the total number of AppleTalk packets forwarded.

Syntax: Integer

Access: Read-only

atHopcnt

Indicates the total number of AppleTalk input packets that have exceeded the maximum hop count.

Syntax: Integer

Access: Read-only

atInmult

Indicates the total number of AppleTalk input packets with multicast addresses.

Syntax: Integer

Access: Read-only

atInput

Indicates the total number of input AppleTalk packets.

Syntax: Integer

Access: Read-only

atLocal

Indicates the total number of AppleTalk input packets for this host.

Syntax: Integer

Access: Read-only

atNbpin

Indicates the total number of AppleTalk Name Binding Protocol (NBP) packets received.

Syntax: Integer

Access: Read-only

atNbpout

Indicates the total number of NBP packets sent.

Syntax: Integer

Access: Read-only

atNoaccess

Indicates the total number of AppleTalk packets dropped due to access control.

Syntax: Integer

Access: Read-only

atNobuffer

Indicates the total number of AppleTalk packets lost due to no memory.

Syntax: Integer

Access: Read-only

atNoencap

Indicates the total number of AppleTalk packets that were dropped because they could not be encapsulated.

Syntax: Integer

Access: Read-only

atNoroute

Indicates the total number of number of AppleTalk packets dropped because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

atNotgate

Indicates the total number of AppleTalk input packets received while AppleTalk routing was not enabled.

Syntax: Integer

Access: Read-only

atOutput

Indicates the total number of AppleTalk output packets.

Syntax: Integer

Access: Read-only

atRtmpin

Indicates the total number of AppleTalk Routing Table Maintenance Protocol (RTMP) packets received.

Syntax: Integer

Access: Read-only

atRtmpout

Indicates the total number of RTMP packets sent.

Syntax: Integer

Access: Read-only

atUnknown

Indicates the total number of unknown AppleTalk input packets.

Syntax: Integer

Access: Read-only

atZipin

Indicates the total number of AppleTalk Zone Information Protocol (ZIP) packets received.

Syntax: Integer

Access: Read-only

atZipout

Indicates the total number of ZIP packets sent.

Syntax: Integer

Access: Read-only

Chassis Group

Variables in this group apply to the Cisco chassis and provide information about the hardware within the chassis such as the system software version of the read-only memory (ROM) and the type of chassis (Cisco 2000, Cisco 3000, and so on).

The Chassis Card table, *cardTableEntry*, contains information on a per-chassis basis and includes the following variables: *cardDescr, cardHwVersion, cardIndex*, *cardSerial*, *cardSlotNumber, cardSwVersion*, and *cardType*. The index to this table is *cardIndex*. If the device has *n* number of cards, the table will contain *n* number of rows.

chassisId

Provides the unique ID number for the chassis. This number contains the value of the CPU serial number or ID number (if available); otherwise, it will be empty. This number also can be set with *snmp-server chassis-id*. An example of a value for a CPU serial number is 00160917.

Syntax: Display string

Access: Read-write

chassisSlots

Provides the number of slots in this chassis, or –1 if no slots exist or the number of slots cannot be determined.

Syntax: Integer

Access: read-only

chassisType

Indicates the type of chassis for the product. For example, c4000 indicates a Cisco 4000 router.

The following are integer values for this variable:

1 = Unknown

2 = Multibus (for example, CGS or ASM)

3 = AGS+

4 = IGS

5 = Cisco 2000

6 = Cisco 3000

7 = Cisco 4000

8 = Cisco 7000

9 = Communication server 500

10 = Cisco 7010

11 = Cisco 2500

12 = Cisco 4500

Syntax: Integer

Access: Read-only

chassisVersion

Provides the chassis hardware revision level, or an empty string if the information is unavailable. Examples of the types of chassis versions are D or AO.

Syntax: Display string

Access: Read-only

configRegister

Indicates the value of the configuration register.

Syntax: Integer

Access: Read-only

configRegNext

Indicates the value of the configuration register at next reload.

Syntax: Integer

Access: Read-only

nvRAMSize

Provides the nonvolatile configuration memory in bytes.

Syntax: Integer

Access: Read-only

nvRAMUsed

Provides the number of bytes of nonvolatile configuration memory in use.

Syntax: Integer

Access: Read-only

processorRam

Provides the bytes of RAM available to the CPU of the device.

Syntax: Integer

Access: Read-only

romVersion

Provides the ROM system software version, or an empty string if unavailable. Following is an example of the type of information provided by the *romVersion* variable:

```
System Bootstrap, Version 4.5(3), SOFTWARE [fc1]
Copyright (c) 1986-1992 by cisco Systems
```

Syntax: Display string

Access: Read-only

romSysVersion

Provides the software version of the system software in ROM, or an empty string if the information is unavailable. Following is an example of the type of information provided by the *romSysVersion* variable:

```
GS Software (GS3), Version 10.2(3127) [jdoe 106]
Copyright (c) 1986-1993 by cisco Systems, Inc.
Compiled Thu 08-Apr-93 09:55
```

Syntax: Display string

Access: Read-only

Chassis Interface Card Table

The Chassis Interface Card Table, *cardTabl*e, contains the *cardTableEntry* variable. The Cisco Card table, *cardTableEntry*, contains seven entries, or rows: *cardDescr, cardHwVersion, cardIndex, cardSerial, cardSwVersion*, *cardSlotNumber*, and *cardType*. The index to this table is *cardIndex*. If there are *n* number of cards associated with the device, there will be *n* rows in the table.

For example, in Table 15, there are 4 rows.

Table 15 Chassis Card Table

cardType	cardDescr	cardHwVersion	cardSerial	and so on
70	MCI interface	1.1	0	
70	MCI interface	1.1	0	
5	25 MHz 68040		0	
24	Environmental Monitor	4	00196849	
and so on				

cardDescr

Provides a description of the card used by the router. Examples of the descriptions are *MEC Ethernet* for an MEC board, *25MHz 68040* for the CSC/4, and *CTR Token Ring* for a CTR board.

Syntax: Display string

Access: Read-only

cardHwVersion

Provides the hardware revision level of this card, or an empty string if unavailable.

Syntax: Display string

Access: Read-only

cardIndex

Index into card table (not physical chassis slot number).

Syntax: Integer

Access: Read-only

cardSerial

Provides the serial number of this card, or zero if unavailable.

Syntax: Integer

Access: Read-only

cardSlotNumber

Provides the chassis slot number. A value of –1 is provided if it is not applicable or cannot be determined.

Syntax: Integer

Access: Read-only

cardSwVersion

Provides the version of the firmware or microcode installed on this card, or an empty string if unavailable. For example, *1.8* indicates MCI microcode 1.8, and *3.0 MADGE 1.01/4.02, TI 000000* indicates CSC-R16M.

Syntax: Display string

Access: Read-only

cardType

Provides information that identifies the functional type of card.

The possible integer values follow:

1 = unknown

2 = csc1

3 = csc2

4 = csc3

5 = csc4

6 = rp

20 = csc-m

21 = csc-mt

22 = csc-mc

23 = csc-mcplus

24 = csc-envm

40 = csc-16

41 = csc-p

50 = csc-a

51 = csc-e1

52 = csc-e2

53 = csc-y

54 = csc-s

55 = csc-t

56 = sci4s

57 = sci2s2t

58 = sci4t

59 = mci1t

60 = mci2t

61 = mci1s

62 = mci1s1t

63 = mci2s

64 = mci1e

65 = mci1e1t

66 = mci1e2t

67 = mci1e1s

68 = mci1e1s1t

69 = mci1e2s

70 = mci2e

71 = mci2e1t

72 = mci2e2t

73 = mci2e1s

74 = mci2e1s1t

75 = mci2e2s

80 = csc-r

81 = csc-r16

82 = csc-r16m

83 = csc-1r

84 = csc-2r

100 = csc-cctl1

101 = csc-cctl2

110 = csc-mec2

111 = csc-mec4

112 = csc-mec6

113 = csc-fci

114 = csc-fcit

115 = csc-hsci

116 = csc-ctr

150 = sp

151 = eip

152 = fip

153 = hip

154 = sip

155 = trip

156 = fsip

157 = aip

158 = mip

159 = ssp

200 = npm-4000-fddi-sas

201 = npm-4000-fddi-das

202 = npm-4000-1e

203 = npm-4000-1r

204 = npm-4000-2s

206 = npm-4000-2e

Syntax: Integer

Access: Read-only

chassisSlots

Provides the number of slots in this chassis. A value of –1 is provided if the number is not applicable or cannot be determined.

Syntax: Integer

Access: Read-only

DECnet Group

This section describes the Cisco MIB variables pertaining to monitoring and managing a device running the DECnet protocol. These variables gather information, such as hop count, host name, total packets received and sent, and number of packets with header errors.

Note The terms *Level 1* and *Level 2* are used often with these variables. Level 1 routers can communicate with end nodes and with other Level 1 routers in an area. Level 2 routers can communicate with Level 1 routers in the same area and with Level 2 routers in different areas. The term *hellos* is also used. Hosts acknowledge the addresses of other hosts by listening to host hello messages. Hosts learn about nearby routers by listening to router hello messages.

dnBadhello

Provides the total number of received bad hello messages.

Syntax: Integer

Access: Read-only

dnBadlevel1

Provides the total number of bad Level 1 routing packets that have been received.

Syntax: Integer

Access: Read-only

dnBigaddr

Provides the total number of addresses that are too large.

Syntax: Integer

Access: Read-only

dnDatas

Provides the total number of received data packets.

Syntax: Integer

Access: Read-only

dnFormaterr

Provides the total number of DECnet packets received with header errors.

Syntax: Integer

Access: Read-only

dnForward

Provides the total number of DECnet packets forwarded.

Syntax: Integer

Access: Read-only

dnHellos

Provides the total number of hello messages received.

Syntax: Integer

Access: Read-only

dnHellosent

Provides the total number of output hello messages.

Syntax: Integer

Access: Read-only

dnLevel1s

Provides the total number of Level 1 routing packets received.

Syntax: Integer

Access: Read-only

dnLevel1sent

Provides the total number of Level 1 routing packets sent.

Syntax: Integer

Access: Read-only

dnLevel2s

Provides the total number of Level 2 routing packets received.

Syntax: Integer

Access: Read-only

dnLevel2sent

Provides the total number of Level 2 routing packets sent.

Syntax: Integer

Access: Read-only

dnNoaccess

Provides the total number of packets dropped due to access control failure.

Syntax: Integer

Access: Read-only

dnNoencap

Provides the total number of packets that were dropped because they could not be encapsulated.

Syntax: Integer

Access: Read-only

dnNomemory

Provides the total number of transactions denied due to lack of memory.

Syntax: Integer

Access: Read-only

dnNoroute

Provides the total number of packets that were dropped because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

dnNotgateway

Provides the total number of packets that were received while not routing DECnet.

Syntax: Integer

Access: Read-only

dnNotimp

Provides the total number of unknown control packets received.

Syntax: Integer

Access: Read-only

dnNotlong

Provides the total number of received packets not in the long DECnet format. This number should always be zero.

Syntax: Integer

Access: Read-only

dnNovector

Provides the total number of missing routing vectors. Occurs when a packet is received for which there is no entry in the Routing table.

Syntax: Integer

Access: Read-only

dnOtherhello

Provides the total number of hello messages received from another area by a Level 1 router.

Syntax: Integer

Access: Read-only

dnOtherlevel1

Provides the total number of Level 1 routing packets received from another area.

Syntax: Integer

Access: Read-only

dnOtherlevel2

Provides the total number of Level 2 routing packets received from another area.

Syntax: Integer

Access: Read-only

dnReceived

Provides the number of total DECnet packets received.

Syntax: Integer

Access: Read-only

dnToomanyhops

Provides the total number of packets received that exceeded the maximum hop count set for this device and have been discarded.

Syntax: Integer

Access: Read-only

DECnet Area Routing Table

The DECnet Area Routing table, *dnAreaTable*, includes seven variables: *dnAAge, dnACost, dnAHop, dnAIfIndex, dnANextHop, dnAPrio,* and *dnArea.* The index for this table is the DECnet area, or *dnArea.* If there are *n* number of areas for the device, there will be *n* rows in the table.

For example, in Table 16, the DECnet area is 44; the cost is 3; and the maximum number of hops allowed is 2. The interface used to get to area 44 is number 1; the address for the next hop is 46.5; the Routing table was updated 30 seconds ago; and the next hop area is prioritized as 1.

Table 16 DECnet Area Routing

dn Area	dnACost	dnAHop	dnA IfIndex	dnA Next Hop	dnAAge	dnA Prio
44	3	2	1	46.5	30	1
24	60	4	2	24.7	12	2
6	17	2	3	6.4	60	3

dnAAge

Provides the age (in seconds) of an area route. When a route is used or has been verified as functional, its age is reset to 0. If a route is not used, its age will gradually grow. Eventually, routes with large ages are cleared out.

Syntax: Integer

Access: Read-only

dnACost

Provides the cost of the router area. The cost value can be an integer from 1 through 63. The cost signifies routing preference. The lower the cost, the better the path.

Syntax: Integer

Access: Read-only

dnAHop

Provides the maximum number of hops for a route to a distant area that the router will accept.

Syntax: Integer

Access: Read-only

dnAIfIndex

Provides the instance ID of the interface providing the next hop address to the area. A zero denotes self. The DECnet table is indexed by *dnArea*. For example, *dnAIfIndex.5* is the *ifIndex* for the next hop to *DECnet area 5*; *dnAifIndex 7* is the *ifIndex* for the next hop to DECnet area 7; and so on.

If *dnAIfIndex.5* is set to the value of 4, to get to the next hop for DECnet area 5, the router sends the packet via the interface that has an *ifIndex* of 4.

Syntax: Integer

Access: Read-only

dnANextHop

Provides the DECnet address for the next hop.

Syntax: Octet string

Access: Read-only

dnAPrio

Provides the priority of the next hop router for an area route.

Syntax: Integer

Access: Read-only

dnArea

Indicates the DECnet area for the device.

Syntax: Integer

Access: Read-only

End of Table

DECnet Host Table

The DECnet host table, *dnHostTable*, contains seven variables: *dnHAge*, *dnHCost*, *dnHHop*, *dnHIfIndex*, *dnHNextHop*, *dnHost*, and *dnHPrio*.

In Table 17, the first DECnet host address in the table is 44.5. Its cost is 3; the number of hops to the host is 4; and the interface number 1 provides the next hop to address 55.6. The route was updated 30 seconds ago, and the priority for the next hop is set to 4.

Table 17 DECnet Host

dnHost	dnH Cost	dnH Hop	dnHIfIndex	dnH Next Hop	dnH Age	dnH Prio
44.5	3	4	1	55.6	30	4
54.6	1	3	2	33.2	20	3
23.2	2	1	3	25.1	60	2

dnHAge

Provides the age (in seconds) of the route to the host.When a route is used or has been verified as functional, its age is reset to 0. If a route is not used, the age of the route will gradually grow. Eventually, routes with large ages are cleared out.

Syntax: Integer

Access: Read-only

dnHCost

Provides the cost of the path to this device.

Syntax: Integer

Access: Read-only

dnHHop

Provides the number of hops to this device.

Syntax: Integer

Access: Read-only

dnHIfIndex

Provides the index of the interface to the next hop address to the node. 0 denotes self.

Syntax: Integer

Access: Read-only

dnHNextHop

Provides the DECnet address of the next hop destination.

Syntax: Octet string

Access: Read-only

dnHost

Provides the DECnet node address.

Syntax: Integer

Access: Read-only

dnHPrio

Provides the priority of the next hop router for the node.

Syntax: Integer

Access: Read-only

End of Table

DECnet Interface Table

The DECnet Interface table, *dnIfTabl*e, contains the *dnIfCost* variable. The index to this table is *ifIndex*, or the interface number. If there are *n* number of interfaces associated with the device, there will be *n* rows in the table.

For example, in Table 18, interface 1 has a cost of 20; interface 2 has a cost of 31; and so on.

Table 18 DECnet Interface

Interface Number	dnIfCost
1	20
2	31
3	12

dnIfCost

Indicates the cost of this interface.

Syntax: Integer

Access: Read-only

End of Table

Novell Group

The variables in this group can be used with all Cisco products running the Novell protocol. These variables provide such information as total number of input and output packets, number of packets with errors, and number of packets with service access point (SAP) requests and replies.

novellBcastin

Indicates the total number of Novell input broadcast packets.

Syntax: Integer

Access: Read-only

novellBcastout

Indicates the total number of Novell output broadcast packets.

Syntax: Integer

Access: Read-only

novellChksum

Indicates the total number of Novell input packets with checksum errors.

Syntax: Integer

Access: Read-only

novellFormerr

Indicates the total number of Novell input packets with header errors.

Syntax: Integer

Access: Read-only

novellForward

Indicates the total number of Novell packets forwarded.

Syntax: Integer

Access: Read-only

novellHopcnt

Indicates the total number of Novell input packets that exceeded the maximum hop count.

Syntax: Integer

Access: Read-only

novellInmult

Indicates the total number of Novell input multicast packets.

Syntax: Integer

Access: Read-only

novellInput

Indicates the total number of Novell input packets.

Syntax: Integer

Access: Read-only

novellLocal

Indicates the total number of Novell input packets for this host.

Syntax: Integer

Access: Read-only

novellNoencap

Indicates the total number of Novell packets dropped due to output encapsulation failure.

Syntax: Integer

Access: Read-only

novellNoroute

Indicates the total number of Novell packets dropped because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

novellOutput

Indicates the total number of Novell output packets.

Syntax: Integer

Access: Read-only

novellSapout

Indicates the total number of Novell service access point (SAP) request packets sent.

Syntax: Integer

Access: Read-only

novellSapreply

Indicates the total number of Novell SAP reply packets sent.

Syntax: Integer

Access: Read-only

novellSapreqin

Indicates the total number of Novell SAP request packets received.

Syntax: Integer

Access: Read-only

novellSapresin

Indicates the total number of Novell SAP response packets received.

Syntax: Integer

Access: Read-only

novellUnknown

Indicates the total number of unknown Novell input packets.

Syntax: Integer

Access: Read-only

Virtual Integrated Network Service (VINES) Group

The variables in this group can be used with all Cisco products running the Banyan Virtual Integrated Network Service (VINES) protocol. This protocol is derived from the Xerox Network Systems (XNS) protocol. These variables provide information such as total number of input and output packets, number of packets with errors, and number of packets with Internet Control Protocol(ICP) requests and replies.

vinesBcastfwd

Indicates the total number of VINES broadcast packets forwarded.

Syntax: Integer

Access: Read-only

vinesBcastin

Indicates the total number of VINES input broadcast packets.

Syntax: Integer

Access: Read-only

vinesBcastout

Indicates the total number of VINES output broadcast packets.

Syntax: Integer

Access: Read-only

vinesCksumerr

Indicates the total number of VINES input packets with checksum errors.

Syntax: Integer

Access: Read-only

vinesClient

Indicates the next VINES subnetwork number that this router will assign to a client.

Syntax: Integer

Access: Read-only

vinesEchoIn

Indicates the total number of VINES echo packets received.

Syntax: Integer

Access: Read-only

vinesEchoOut

Indicates the total number of VINES echo packets generated.

Syntax: Integer

Access: Read-only

vinesEncapsfailed

Indicates the total number of VINES packets dropped because they could not be encapsulated.

Syntax: Integer

Access: Read-only

vinesFormaterror

Indicates the total number of VINES input packets with header errors.

Syntax: Integer

Access: Read-only

vinesForwarded

Indicates the total number of VINES packets forwarded.

Syntax: Integer

Access: Read-only

vinesHopcount

Indicates the total number of VINES input packets that have exceeded the maximum hop count.

Syntax: Integer

Access: Read-only

vinesIcpIn

Indicates the total number of VINES Internet Control Protocol (ICP) packets received.

Syntax: Integer

Access: Read-only

vinesIcpOut

Indicates the total number of VINES ICP packets generated.

Syntax: Integer

Access: Read-only

vinesInput

Indicates the total number of VINES input packets.

Syntax: Integer

Access: Read-only

vinesLocalDest

Indicates the total number of VINES input packets for this host.

Syntax: Integer

Access: Read-only

vinesMacEchoIn

Indicates the total number of VINES MAC level echo packets received.

Syntax: Integer

Access: Read-only

vinesMacEchoOut

Indicates the total number of VINES Media Access Control (MAC) level echo packets generated.

Syntax: Integer

Access: Read-only

vinesMetricOut

Indicates the total number of VINES ICP metric notification packets generated.

Syntax: Integer

Access: Read-only

vinesNet

Indicates the VINES network number of this router.

Syntax: Integer

Access: Read-only

vinesNoCharges

Indicates the total number of VINES broadcast packets not forwarded to all interfaces because the *no charges only* bit in the packet was set to *on*.

Syntax: Integer

Access: Read-only

vinesNoRoute

Indicates the total number of VINES packets dropped because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

vinesNotGt4800

Indicates the total number of VINES broadcast packets not forwarded to all interfaces because the *over 4800 bps* bit in the packet was set to *on*.

Syntax: Integer

Access: Read-only

vinesNotLan

Indicates the total number of VINES broadcast packets not forwarded to all interfaces because the *lan only* bit in the packet was set to *on*.

Syntax: Integer

Access: Read-only

vinesOutput

Indicates the total number of VINES output packets.

Syntax: Integer

Access: Read-only

vinesProxyCnt

Indicates the total number of VINES packets that were sent to an actual Banyan server as a proxy for a client.

Syntax: Counter

Access: Read-only

vinesProxyReplyCnt

Indicates the total number of received VINES packets that were responses to proxy packets sent by the router.

Syntax: Counter

Access: Read-only

vinesSubnet

Indicates the VINES subnet number of this router.

Syntax: Integer

Access: Read-only

vinesUnknown

Indicates the total number of unknown VINES input packets.

Syntax: Integer

Access: Read-only

Banyan VINES Interface Table

The Banyan VINES Interface table, *vinesIfTableEntry*, contains all the variables described in the Banyan VINES group. The index to the table is *ifIndex*. *ifIndex* indicates the number of the interface. If the device has *n* number of interfaces, the VINES Interface table will contain *n* rows.

In Table 19, the first column indicates the number of interfaces on the devices. Each of the variables in the VINES Interface table occupies one column; for example, *vinesIfMetri*c is shown in a column, followed by *vinesIfEnctype* in the next column, and so on.

Table 19 Banyan VINES Interface Table

Interface Number	vinesIfMetric	vinesIfEnctype	and so on
1	3	1	
2	5	3	
and so on			

vinesIfAccesslist

Provides the outgoing access list number for the VINES protocol.

Syntax: Integer

Access: Read-only

vinesIfArpEnabled

Indicates how the router responds to the VINES protocol ARP.

Syntax: Integer (0 = never respond to ARP packets, 1 = always respond to ARP packets, 2 = respond to ARP packets only if servers are not present on the network)

Access: Read-only

vinesIfEnctype

Indicates the type of data link encapsulation that will be used on broadcasts sent by the router.

Syntax: Integer (1 = ARPA, 3 = SNAP, 5 = HDLC, 12 = X.25, 13 = X.25, 25 = VINES TR, 27 = Frame Relay, 28 = SMDS, 30 = PPP)

Access: Read-only

vinesIfFastOkay

Indicates whether fast switching is supported for the VINES protocol.

Syntax: Integer (0 = fast switching not requested or not supported, 1 = fast switching requested and supported)

Access: Read-only

vinesIfInputNetworkFilter

Provides the access list number for filtering the content of received VINES routing information.

Syntax: Integer

Access: Read-only

vinesIfInputRouterFilter

Provides the access list number for filtering on the source of received VINES routing information.

Syntax: Integer

Access: Read-only

vinesIfLineup

Indicates whether the VINES protocol line is up or down.

Syntax: Integer (0 = down, 1 = up)

Access: Read-only

vinesIfMetric

Provides the metric value for the VINES protocol. Banyan servers use delay metrics to compute timeouts when communicating with other hosts. The metric value is either manually assigned to the interface by using the **vines metric** command or is automatically assigned by the system. This number is returned in the format defined in the VINES Protocol Definition.

Syntax: Integer

Access: Read-only

vinesIfOutputNetworkFilter

Provides the access list number for filtering the content of transmitted VINES routing information.

Syntax: Integer

Access: Read-only

vinesIfPropagate

Indicates whether the VINES protocol “propagate” is enabled.

Syntax: Integer (0 = never enabled, 1 = always enabled, 2 = enabled only if there are no local servers on any interface)

Access: Read-only

vinesIfRedirectInterval

Provides the redirect interval for the VINES protocol.

Syntax: Integer

Access: Read-only

vinesIfRouteCache

Indicates whether fast switching is supported for the VINES protocol.

Syntax: Integer

Access: Read-only

vinesIfRxArp0Cnt

Provides the number of input ARP query request messages for the VINES protocol. The four types of ARP messages following apply to *vinesIfRxArp0–vinesIfRxArp3*:

- Service request (type 0)—Query to find servers
- Service response (type 1)—Server indicating its presence
- Assignment request (type 2)—Client asking to be assigned a VINES IP address
- Assignment response (type 3)—Server assigning a VINES IP address to a client

Syntax: Counter

Access: Read-only

vinesIfRxArp1Cnt

Provides the number of input ARP query response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxArp2Cnt

Provides the number of input ARP assignment request messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxArp3Cnt

Provides the number of input ARP assignment response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxArpIllegalCnt

Provides the number of input illegal ARP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxBcastDuplicateCnt

Provides the input duplicate broadcast count for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxBcastForwardedCnt

Provides the VINES protocol number of input packets forwarded to another interface.

Syntax: Counter

Access: Read-only

vinesIfRxBcastHelperedCnt

Provides the VINES protocol number of input packets helpered to another server. Helpered packets are broadcasts received from a serverless network that should be thrown away according to the fields in the VINES IP header. Instead of being thrown away, they are resent on another interface, so that they will be received by a VINES server.

Syntax: Counter

Access: Read-only

vinesIfRxBcastinCnt

Provides the input broadcast count for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxChecksumErrorCnt

Provides the number of input packets with checksum errors for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxEchoCnt

Provides the number of input IPC echo messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxFormatErrorCnt

Provides the number of input packets with format errors for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxForwardedCnt

Provides the VINES protocol number of input packets forwarded to another interface.

Syntax: Counter

Access: Read-only

vinesIfRxIcpErrorCnt

Provides the number of input interprocess communications (ICP) error messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxIcpIllegalCnt

Provides the number of input illegal ICP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxIcpMetricCnt

Provides the number of input ICP metric messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxIpcCnt

Provides the number of input IPC messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxLocalDestCnt

Provides the VINES protocol number of input packets destined for this router.

Syntax: Counter

Access: Read-only

vinesIfRxMacEchoCnt

Provides the number of input MAC layer echo frames for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxNoRouteCnt

Provides the VINES protocol number of input packets that were dropped because there was no route to the destination.

Syntax: Counter

Access: Read-only

vinesIfRxNotEnabledCnt

Provides the VINES protocol number of input packets that were discarded because the interface was not configured.

Syntax: Counter

Access: Read-only

vinesIfRxProxyReplyCnt

Provides the VINES protocol number of responses to proxy packets.

Syntax: Counter

Access: Read-only

vinesIfRxRtp0Cnt

Provides the number of illegal input Routing Table Protocol (RTP) type 0 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxRtp1Cnt

Provides the number of input RTP type 1 (request for information) messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxRtp2Cnt

Provides the number of illegal input RTP type 2 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxRtp3Cnt

Provides the number of illegal input RTP type 3 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxRtp4Cnt

Provides the number of input RTP type 4 update messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxRtp5Cnt

Provides the number of input RTP type 5 response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxRtp6Cnt

Provides the number of input RTP type 6 redirect messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxRtpIllegalCnt

Provides the number of all other illegal input RTP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxIpUnknownCnt

Provides the number of input messages from unknown VINES protocols.

Syntax: Counter

Access: Read-only

vinesIfRxlpcUnknownCnt

Provides the number of input messages from unknown VINES IPC ports.

Syntax: Counter

Access: Read-only

vinesIfRxSppCnt

Provides the number of input SPP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfRxZeroHopCountCnt

Provides VINES protocol number of input packets dropped due to a zero hop count.

Syntax: Counter

Access: Read-only

vinesIfServerless

Indicates whether the VINES protocol serverless support is enabled.

Syntax: Integer (0 = never enabled, 1 = enabled only if servers are not present on the network, 2 = always enabled, 3 = always enabled to flood broadcasts)

Access: Read-only

vinesIfServerlessBcast

Indicates whether VINES protocol serverless broadcasting support is enabled.

Syntax: Counter (0 = not enabled, 1 = enabled)

Access: Read-only

vinesIfSplitDisabled

Indicates whether the VINES protocol split horizon is enabled.

Syntax: Integer (0 = enabled, 1 = disabled)

Access: Read-only

vinesIfTxArp0Cnt

Provides the number of output ARP query request messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxArp1Cnt

Provides the number of output ARP query response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxArp2Cnt

Provides the number of output ARP assignment request messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxArp3Cnt

Provides the number of input ARP assignment response messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxBcastCnt

Provides broadcast packets that were generated by the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxBcastForwardedCnt

Provides the VINES protocol output broadcast forwarded from another interface.

Syntax: Counter

Access: Read-only

vinesIfTxBcastHelperedCnt

Provides the VINES protocol output broadcast helpered to a Banyan server.

Syntax: Counter

Access: Read-only

vinesIfTxEchoCnt

Provides the number of output IPC echo messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxFailedAccessCnt

Provides the number of packets to be output that failed on access list for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxFailedDownCnt

Provides the number of VINES packets that could not be output because the interface was down.

Syntax: Counter

Access: Read-only

vinesIfTxFailedEncapsCnt

Provides VINES packets to be output that could not be encapsulated.

Syntax: Counter

Access: Read-only

vinesIfTxForwardedCnt

Provides the number of forwarded packets for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxIcpErrorCnt

Provides the number of output IPC error messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxIcpMetricCnt

Provides the number of output IPC metric messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxIpcCnt

Provides the number of output ICP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxMacEchoCnt

Provides the number of output IPC MAC-layer echo frames for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxNotBcastNotgt4800Cnt

Provides the VINES protocol output broadcast not sent due to high-speed class. This occurs if a received packet is marked to be sent only on network interfaces with a speed of 4800 bps or greater. The counter is incremented on interfaces with a speed of less than 4800 whenever this type of packet should have been transmitted.

Syntax: Counter

Access: Read-only

vinesIfTxNotBcastNotLanCnt

Provides the VINES protocol output broadcast not sent due to *LanOnly* class. This occurs if a received packet is marked to be sent only if the network interface type is *LanOnly.* The counter is incremented on interfaces other than type *LanOnly* whenever this type of packet should have been transmitted.

Syntax: Counter

Access: Read-only

vinesIfTxNotBcastPpchargeCnt

Provides VINES protocol output broadcast not sent due to *No Charges* class. This occurs if a received packet is marked to be sent only if the sender's transmission is free of charge. The counter is incremented on interfaces carrying per-packet charges whenever this type of packet should have been transmitted.

Syntax: Counter

Access: Read-only

vinesIfTxNotBcastToSourceCnt

Provides the VINES protocol output broadcast packets that were not sent due to the interface leading back to the source.

Syntax: Counter

Access: Read-only

vinesIfTxProxyCnt

Provides the number of proxy packets sent by the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxRtp0Cnt

Provides the number of illegal output RTP type 0 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxRtp1Cnt

Provides the number of output RTP type 1 (request messages) for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxRtp2Cnt

Provides the number of illegal output RTP type 2 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxRtp3Cnt

Provides the number of illegal output RTP type 3 messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxRtp4Cnt

Provides the number of output RTP type 4 (update messages) for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxRtp5Cnt

Provides the number of output RTP type 5 (response messages) for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxRtp6Cnt

Provides the number of output RTP type 6 (redirect messages) for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxSppCnt

Provides the number of output SPP messages for the VINES protocol.

Syntax: Counter

Access: Read-only

vinesIfTxUnicastCnt

Provides the unicast packets that were generated for the VINES protocol.

Syntax: Counter

Access: Read-only

Xerox Network Systems (XNS) Group

This group is present in all router-based products running the Xerox Network Systems (XNS) protocol. These variables provide such information as the number of packets forwarded, total number of input packets, and total number of packets transmitted with errors.

xnsBcastin

Indicates the total number of XNS input broadcast packets.

Syntax: Integer

Access: Read-only

xnsBcastout

Indicates the total number of XNS output broadcast packets.

Syntax: Integer

Access: Read-only

xnsChksum

Indicates the total number of XNS input packets with checksum errors.

Syntax: Integer

Syntax: Read-only

xnsEchorepin

Indicates the total number of XNS echo reply packets received.

Syntax: Integer

Access: Read-only

xnsEchorepout

Indicates the total number of XNS echo reply packets sent.

Syntax: Integer

Access: Read-only

xnsEchoreqin

Indicates the total number of XNS echo request packets received.

Syntax: Integer

Access: Read-only

xnsEchoreqout

Indicates the total number of XNS echo request packets sent.

Syntax: Integer

Access: Read-only

xnsErrin

Indicates the total number of XNS error input packets.

Syntax: Integer

Access: Read-only

xnsErrout

Indicates the total number of XNS error output packets.

Syntax: Integer

Access: Read-only

xnsForward

Indicates the total number of XNS packets forwarded.

Syntax: Integer

Access: Read-only

xnsFormerr

Indicates the total number of XNS input packets with header errors.

Syntax: Integer

Access: Read-only

xnsFwdbrd

Indicates the total number of XNS broadcast packets forwarded.

Syntax: Integer

Access: Read-only

xnsHopcnt

Indicates the total number of XNS input packets that exceeded the maximum hop count.

Syntax: Integer

Access: Read-only

xnsInmult

Indicates the total number of XNS input packets received with multicast addresses.

Syntax: Integer

Access: Read-only

xnsInput

Indicates the total number of input XNS packets.

Syntax: Integer

Access: Read-only

xnsLocal

Indicates the total number of XNS input packets for this host.

Syntax: Integer

Access: Read-only

xnsNoencap

Provides the total number of XNS packets dropped because they could not be encapsulated.

Syntax: Integer

Access: Read-only

xnsNoroute

Indicates the total number of XNS packets that were discarded because the router did not know where to forward them.

Syntax: Integer

Access: Read-only

xnsNotgate

Indicates the total number of XNS input packets received while XNS routing was not enabled.

Syntax: Integer

Access: Read-only

xnsOutput

Indicates the total number of XNS output packets.

Syntax: Integer

Access: Read-only

xnsUnknown

Indicates the total number of unknown XNS input packets.

Syntax: Integer

Access: Read-only

Public SNMP Traps Supported by Cisco

SNMP traps are set up on specific devices to obtain useful information such as the change in a device configuration or the absence of proper user authentication with a request. When the SNMP agent on the device detects a change, it immediately sends an SNMP trap to the NMS system.

Cisco products, including the routers, access servers and communication servers, and protocol translators, support the SNMP traps specified in RFC 1213, *Management Information Base for Network Management of TCP/IP-based Internets: MIB-II*. The *warmStart* trap in MIB II is not supported by Cisco.

Following are the standard SNMP traps supported by Cisco:

authenticationFailure

This trap is sent to the NMS system if the SNMP agent detects that proper user authentication was not provided with a request. User authentication enhances the security of the devices by ensuring that only privileged users with valid community strings are allowed to access the system.

coldStart

The SNMP agent sends a *coldStart* trap when its device has reinitialized itself.

egpNeighborloss

An *egpNeighborLoss* trap indicates that an EGP (Exterior Gateway Protocol) neighbor is down. Neighboring routers are two routers that have interfaces to a common network and exchange routing information. An exterior router uses EGP to advertise its knowledge of routes to networks within its autonomous system. It sends these advertisements to the core routers, which then readvertise their collected routing information to the exterior router. A neighbor or peer router is any router with which the router communicates using EGP.

linkDown

A *linkDown* trap is sent by the SNMP agent to the NMS system if a link in a configuration of a device has been shutdown. For example, the link could be a serial line connecting two devices or an Ethernet link between two networks.

linkUp

A *linkUp* trap indicates the recognition of an SNMP agent that a link in a configuration of a device has become active.

SNMP Traps Defined by Cisco

Following are the Cisco private SNMP traps that are implemented in Cisco products including the router, access server and communication server, and protocol translator.

ipxTrapCircuitUp

This trap signifies that the specified circuit has come up.

ipxTrapCircuitDown

This trap signifies that the specified circuit has gone down.

ciscoPingCompletionTrap

A ciscoPingCompleted trap is sent at the completion of a sequence of pings if such a trap was requested when the sequence was initiated.

reload

This trap is sent after a reload command is issued.

tcpConnectionClose

The *tty* trap indicates that a TCP connection, which existed previously for a tty session, has been terminated.

Variables Supported in RFC 1285

The following variables in RFC 1285 are supported in Software Release 9.0 and later:

snmpFddiSMTNumber

snmpFddiSMTIndex

snmpFddiSMTStationId

snmpFddiSMTOpVersionId

snmpFddiSMTHiVersionId

snmpFddiSMTLoVersionId

snmpFddiSMTCFState

snmpFddiMACNumber

snmpFddiMACSMTIndex

snmpFddiMACIndex

snmpFddiMACTReq

snmpFddiMACTNegj

snmpFddiMACTMax

snmpFddiMACTvxValue

snmpFddiMACMin

snmpFddiMACFrameCts

snmpFddiMACErrorCts

snmpFddiMACLostCts

snmpFddiMACChipSet

MIBs Supported by Cisco Software Releases

This section lists the Cisco private MIB variables that have been introduced after Software Release 8.0.

Software Release 8.2

The following list describes the MIB variables introduced with Software Release 8.2:

writeMem

writeNet

busyPer

avgBusy1

avgBusy5

idleCount

idleWired

locIfCarTrans

locIfReliab

locIfDelay

locIfLoad

locIfCollisions

tsLineNoise

dnAreaTable

dnACost

dnAHop

dnAifIndex

dnANextHop

dnAAge

dnAPrio

vinesInput

vinesOutput

vinesLocaldest

vinesForwarded

vinesBcastin

vinesBcastout

vinesBcastfwd

vinesNotlan

vinesNotgt4800

vinesNocharges

vinesFormaterror

vinesCksumerr

vinesHopcout

vinesNoroute

vinesEncapsfailed

vinesUnknown

vinesIcpIn

vinesIcpOut

vinesMetricOut

vinesMacEchoIn

vinesMacEchoOut

vinesEchoIn

vinesEchoOut

Software Release 8.3

The following list describes the MIB variables introduced with Software Release 8.3:

bufferHgsize

bufferHgTotal

bufferHgFree

bufferHgMax

bufferHgHit

bufferHgMiss

bufferHgTrim

bufferHgCreate

locIfInputQueueDrops

locIfOutputQueueDrops

ipNoaccess

actCheckPoint

tsMsgTtyLine

tsMsgIntervaltim

tsMsgDuration

tsMsgTest

tsMsgTmpBanner

tsMsgSend

dnIfTable

dnIfCost

Software Release 9.0

The following list provides the MIB variables introduced with Software Release 9.0:

netConfigProto

hostConfigProto

sysConfigAddr

sysConfigName

sysConfigProto

sysClearARP

sysClearInt

envPresent

envTestPt1Descr

envTestPt1Measure

envTestPt2Descr

envTestPt2Measure

envTestPt3Descr

envTestPt3Measure

envTestPt4Descr

envTestPt4Measure

envTestPt5Descr

envTestPt5Measure

envTestPt6Descr

envTestPt6Measure

locIfDescr

locIfPakmon

Software Release 9.1

The following list provides the MIB variables introduced with Software Release 9.1:

envTestPt4MarginPercent

envTestPt5MarginPercent

envTestPt6MarginPercent

envTestPt1last

envTestPt2last

envTestPt3last

envTestPt4last

envTestPt5last

envTestPt6last

envTestPt1MarginVal

envTestPt2MarginVal

envTestPt3MarginVal

envTestPt4MarginVal

envTestPt5MarginVal

envTestPt6MarginVal

envTestPt1warn

envTestPt2warn

envTestPt3warn

envTestPt4warn

envTestPt5warn

envTestPt6warn

envFirmVersion

envTechnicianID

envType

envBurnDate

envSerialNumber

locIfSlowInPkts

locIfSlowOutPkts

locIfSlowInOctets

locIfSlowOutOctets

locIfFastInPkts

locIfFastOutPkts

locIfFastInOctets

locIfFastOutOctets

locIfotherInPkts

locIfotherOutPkts

locIfotherInOctets

locIfotherOutOctets

locIfipInPkts

locIfipOutPkts

locIfipInOctets

locIfipOutOctets

locIfdecnetInPkts

locIfdecnetOutPkts

locIfdecnetInOctets

locIfdecnetOutOctets

locIfxnsInPkts

locIfxnsOutPkts

locIfxnsInOctets

locIfxnsOutOctets

locIfclnsInPkts

locIfclnsOutPkts

locIfclnsInOctets

locIfclnsOutOctets

locIfappletalkInPkts

locIfappletalkOutPkts

locIfappletalkInOctets

locIfappletalkOutOctets

locIfnovellInPkts

locIfnovellOutPkts

locIfnovellInOctets

locIfnovellOutOctets

locIfapolloInPkts

locIfapolloOutPkts

locIfapolloInOctets

locIfapolloOutOctets

locIfvinesInPkts

locIfvinesOutPkts

locIfvinesInOctets

locIfvinesOutOctets

locIfbridgedInPkts

locIfbridgedOutPkts

locIfbridgedInOctets

locIfbridgedOutOctets

locIfsrbInPkts

locIfsrbOutPkts

locIfsrbInOctets

locIfsrbOutOctets

locIfchaosInPkts

locIfchaosOutPkts

locIfchaosInOctets

locIfchaosOutOctets

locIfpupInPkts

locIfpupOutPkts

locIfpupInOctets

locIfpupOutOctets

locIfmopInPkts

locIfmopOutPkts

locIfmopInOctets

locIfmopOutOctets

locIflanmanInPkts

locIflanmanOutPkts

locIflanmanInOctets

locIflanmanOutOctets

locIfstunInPkts

locIfstunOutPkts

locIfstunInOctets

locIfstunOutOctets

locIfspanInPkts

locIfspanOutPkts

locIfspanInOctets

locIfspanOutOctets

locIfarpInPkts

locIfarpOutPkts

locIfarpInOctets

locIfarpOutOctets

locIfprobeInPkts

locIfprobeOutPkts

locIfprobeInOctets

locIfprobeOutOctets

flashSize

flashFree

flashcontoller

flashcard

flashVPP

flashErase

flashEraseTime

flashEraseStatus

flashToNet

flashToNetTime

flashToNetStatus

netToFlash

netToFlashTime

netToFlashStatus

flashStatus

flashEntries

flashDirName

flashDirSize

flashDirStatus

Software Release 9.21

The following list provides the MIB variables introduced with Software Release 9.21:

locIfDribbleInputs

vinesProxy

vinesProxyReply

vinesNet

vinesSubNet

vinesClient

vinesIfMetric

vinesIfEnctype

vinesIfAccesslist

vinesIfInputNetworkFilter

vinesIfInputRouterFilter

vinesIfOutputNetworkFilter

vinesIfPropagate

vinesIfArpEnabled

vinesIfServerless

vinesIfServerlessBcast

vinesIfRedirectInterval

vinesIfSplitDisabled

vinesIfLineup

vinesIfFastokay

vinesIfRouteCache

vinesIfIn

vinesIfOut

vinesIfInBytes

vinesIfOutBytes

vinesIfRxNotEnabled

vinesIfRxFormatError

vinesIfRxLocalDest

vinesIfRxBcastin

vinesIfRxForwarded

vinesIfRxNoRoute

vinesIfRxZeroHopCount

vinesIfRxChecksumError

vinesIfRxArp0

vinesIfRxArp1

vinesIfRxArp2

vinesIfRxArp3

vinesIfRxArpIllegal

vinesIfRxIcpError

vinesIfRxIcpMetric

vinesIfRxIcpIllegal

vinesIfRxIpc

vinesIfRxRtp0

vinesIfRxRtp1

vinesIfRxRtp2

vinesIfRxRtp3

vinesIfRxRtp4

vinesIfRxRtp5

vinesIfRxRtp6

vinesIfRxRtpIllegal

vinesIfRxSpp

vinesIfRxBcastHelpered

vinesIfRxBcastForwarded

vinesIfRxBcastDuplicate

vinesIfRxEcho

vinesIfRxMacEcho

vinesIfRxProxyReply

vinesIfTxUnicast

vinesIfTxBcast

vinesIfTxForwarded

vinesIfTxFailedEncaps

vinesIfTxFailedAccess

vinesIfTxFailedDown

vinesIfTxNotBcastToSource

vinesIfTxNotBcastNotlan

vinesIfTxNotBcastNotgt4800

vinesIfTxNotBcastPpcharge

vinesIfTxBcastForwarded

vinesIfTxBcastHelpered

vinesIfTxArp0

vinesIfTxArp1

vinesIfTxArp2

vinesIfTxArp3

vinesIfTxIcpError

vinesIfTxIcpMetric

vinesIfTxIpc

vinesIfTxRtp0

vinesIfTxRtp1

vinesIfTxRtp2

vinesIfTxRtp3

vinesIfTxRtp4

vinesIfTxRtp5

vinesIfTxRtp6

vinesIfTxSpp

vinesIfTxEcho

vinesIfTxMacEcho

vinesIfTxProxy

chassisType

chassisVersion

chassisId

romVersion

romSysVersion

processorRam

nvRAMSize

nvRAMUsed

configRegister

configRegNext

cardTable

cardTableEntry

cardIndex

cardType

cardDescr

cardSerial

cardHwVersion

cardSwVersion

cardSlotNumber

chassisSlots

Internetwork Operating System (IOS) Release 10.0

The following list provides the MIB variables introduced with IOS Release 10.0:

ipxThresh

ipxactLostPkts

ipxactLostByts

ipxactSrc

ipxactDst

ipxactPkts

ipxactByts

ipxactAge

ipxckactSrc

ipxckactDst

ipxckactPkts

ipckactByts

ipxckactAge

ipxactCheckPoint

vinesIfInputNetworkFilter

vinesIfInputRouterFilter

vinesIfOutputNetworkFilter

Internetwork Operating System (IOS) Release 10.2

The following list provides the MIB variables introduced with IOS Release 10.2:

cipCardClawEntry

cipCardClawIndex

cipCardClawConnected

cipCardClawConfigTable

cipCardClawConfigEntry

cipCardClawConfigPath

cipCardClawConfigDevice

cipCardClawConfigIpAddr

cipCardClawConfigHostName

cipCardClawConfigRouterName

cipCardClawConfigHostAppl

cipCardClawConfigRouterAppl

cipCardClawDataXferStatsTable

cipCardClawDataXferStatsEntry

cipCardClawDataXferStatsBlocksRead

cipCardClawDataXferStatsBlocksWritten

cipCardClawDataXferStatsBytesRead

cipCardClawDataXferStatsBytesWritten

cipCardClawDataXferStatsHCBytesRead

cipCardClawDataXferStatsHCBytesWritten

cipCardClawDataXferStatsReadBlocksDropped

cipCardClawDataXferStatsWriteBlocksDropped

cipCardClawDataXferStatsBufferGetRetryCount

cipCardDtrBrdIndex

cipCardDtrBrdType

cipCardDtrBrdStatus

cipCardDtrBrdSignal

cipCardDtrBrdOnline

implicitIncidents

codeViolationErrors

linkFailureSignalOrSyncLoss

linkFailureNOSs

linkFailureSequenceTimeouts

linkFailureInvalidSequences

linkIncidentTrapCause

cipCardsubChannelIndex

cipCardsubChannelConnections

cipCardsubChannelCancels

cipCardsubChannelSelectiveResets

cipCardsubChannelSystemResets

cipCardsubChannelDeviceErrors

cipCardsubChannelWriteBlocksDropped

cipCardsubChannelLastSenseData

cipCardSubchannelLastSenseDataTime

cipCardSubChannelCuBusies

cipCardEntryIndex

cipCardEntryName

cipCardEntryTotalMemory

cipCardEntryFreeMemory

cipCardEntryCpuUtilization

cipCardEntryTimeSinceLastReset

ciscoPingAddress

ciscoPingTable

ciscoPingEntry

ciscoPingProtocol

ciscoPingSerialNumber

ciscoPingPacketCount

ciscoPingPacketSize

ciscoPingPacketTimeout

ciscoPingDelay

ciscoPingTrapOnCompletion

ciscoPingSentPackets

ciscoPingReceivedPackets

ciscoPingMinRtt

ciscoPingAvgRtt

ciscoPingMaxRtt

ciscoPingCompleted

ciscoPingEntryOwner

ciscoPingEntryStatus

ipxBasicSysInstance

ipxBasicSysExistState

ipxBasicSysNetNumber

ipxBasicSysNode

ipxBasicSysName

ipxBasicSysInReceives

ipxBasicSysInHdrErrors

ipxBasicSysInUnknownSockets

ipxBasicSysInDiscards

ipxBasicSysInBadChecksums

ipxBasicSysInDelivers

ipxBasicSysNoRoutes

ipxBasicSysOutRequests

ipxBasicSysOutMalformedRequests

ipxBasicSysOutDiscards

ipxBasicSysOutPackets

ipxBasicSysConfigSockets

ipxBasicSysOpenSocketFails

ipxAdvSysInstance

ipxAdvSysMaxPathSplits

ipxAdvSysMaxHops

ipxAdvSysInTooManyHops

ipxAdvSysInFiltered

ipxAdvSysInCompressDiscards

ipxAdvSysNETBIOSPackets

ipxAdvSysForwPackets

ipxAdvSysOutFiltered

ipxAdvSysOutCompressDiscards

ipxAdvSysCircCount

ipxAdvSysDestCount

ipxAdvSysServCount

ipxCircSysInstance

ipxCircIndex

ipxCircExistState

ipxCircOperState

ipxCircName

ipxCircType

ipxCircDialName

ipxCircLocalMaxPacketSize

ipxCircCompressState

ipxCircCompressSlots

ipxCircStaticStatus

ipxCircCompressedSent

ipxCircCompressedInitSent

ipxCircCompressedRejectsSent

ipxCircUncompressedSent

ipxCircCompressedReceived

ipxCircCompressedInitReceived

ipxCircCompressedRejectsReceived

ipxCircUncompressedReceived

ipxCircMediaType

ipxCircNetNumber

ipxCircStateChanges

ipxCircInitFails

ipxCircDelay

ipxCircThroughput

ipxCircNeighRouterName

ipxCircNeighInternalNetNum

ipxDestSysInstance

ipxDestNetNum

ipxDestProtocol

ipxDestTicks

ipxDestHopCount

ipxDestNextHopCircIndex

ipxDestNextHopNICAddress

ipxDestNextHopNetNum

ipxStaticRouteSysInstance

ipxStaticRouteCircIndex

ipxStaticRouteNetNum

ipxStaticRouteExistState

ipxStaticRouteTicks

ipxStaticRouteHopCount

ipxServSysInstance

ipxServType

ipxServName

ipxServProtocol

ipxServNetNum

ipxServNode

ipxServSocket

ipxServHopCount

ipxDestServSysInstance

ipxDestServNetNum

ipxDestServSocket

ipxDestServName

ipxDestServType

ipxDestServProtocol

ipxDestServHopCount

ipxStaticServSysInstance

ipxStaticServCircIndex

ipxStaticServName

ipxStaticServType

ipxStaticServExistState

ipxStaticServNetNum

ipxStaticServNode

ipxStaticServSocket

ipxStaticServHopCount

ripSysInstance

ripSysState

ripSysIncorrectPackets

sapSysInstance

sapSysState

sapSysIncorrectPackets

ripCircSysInstance

ripCircIndex

ripCircState

ripCircPace

ripCircUpdate

ripCircAgeMultiplier

ripCircPacketSize

ripCircOutPackets

ripCircInPackets

sapCircSysInstance

sapCircIndex

sapCircState

sapCircPace

sapCircUpdate

sapCircAgeMultiplier

sapCircPacketSize

sapCircGetNearestServerReply

sapCircOutPackets

sapCircInPackets

Deprecated in IOS 10.2

The loctcp table has been replaced by the ciscoloctcp table.

Obsoleted in IOS 10.2

The IOS 10.1 Ping object was replaced by the IOS 10.2 ciscoPing table.

The loctcp table has been replaced by the ciscoloctcp table.