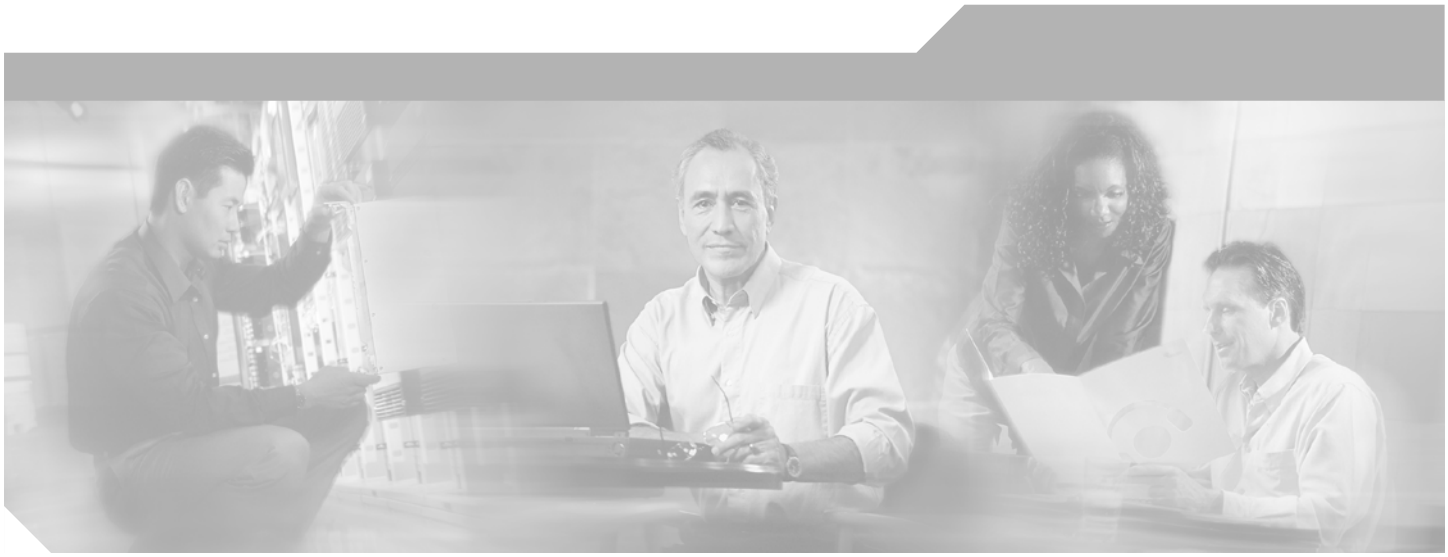

Cisco SS7 Interconnect for Voice Gateways Version 1.3 Solution Provisioning Guide

July 9, 2002

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Preface

Document Objectives

This guide describes how to provision the Cisco SS7 Interconnect for Voice Gateways Solution by using the provisioning tools provided with the Cisco Media Gateway Controller (MGC) software. The tools include:

- Cisco Media Gateway Controller Manager (CMM) for Cisco MGC software Release 7.3(x) and 7.4(x).
- Release 1.6 of the Cisco Voice Services Provisioning Tool (VSPT) for Cisco MGC software Release 7.4(x)
- Man-Machine Language (MML) for Cisco MGC software Release 7.3(x) and 7.4(x)

Audience

The primary audience for this document is network operators and administrators who have experience in the following areas:

- Telecommunications network operations
- Data network operations
- SS7 protocols, switching, and routing
- Telecommunications hardware
- Data network hardware

In addition, the following audiences may find this document useful:

- Software and hardware installers
- Network designers

Document Organization

This document contains the following chapters listed in Table 1:

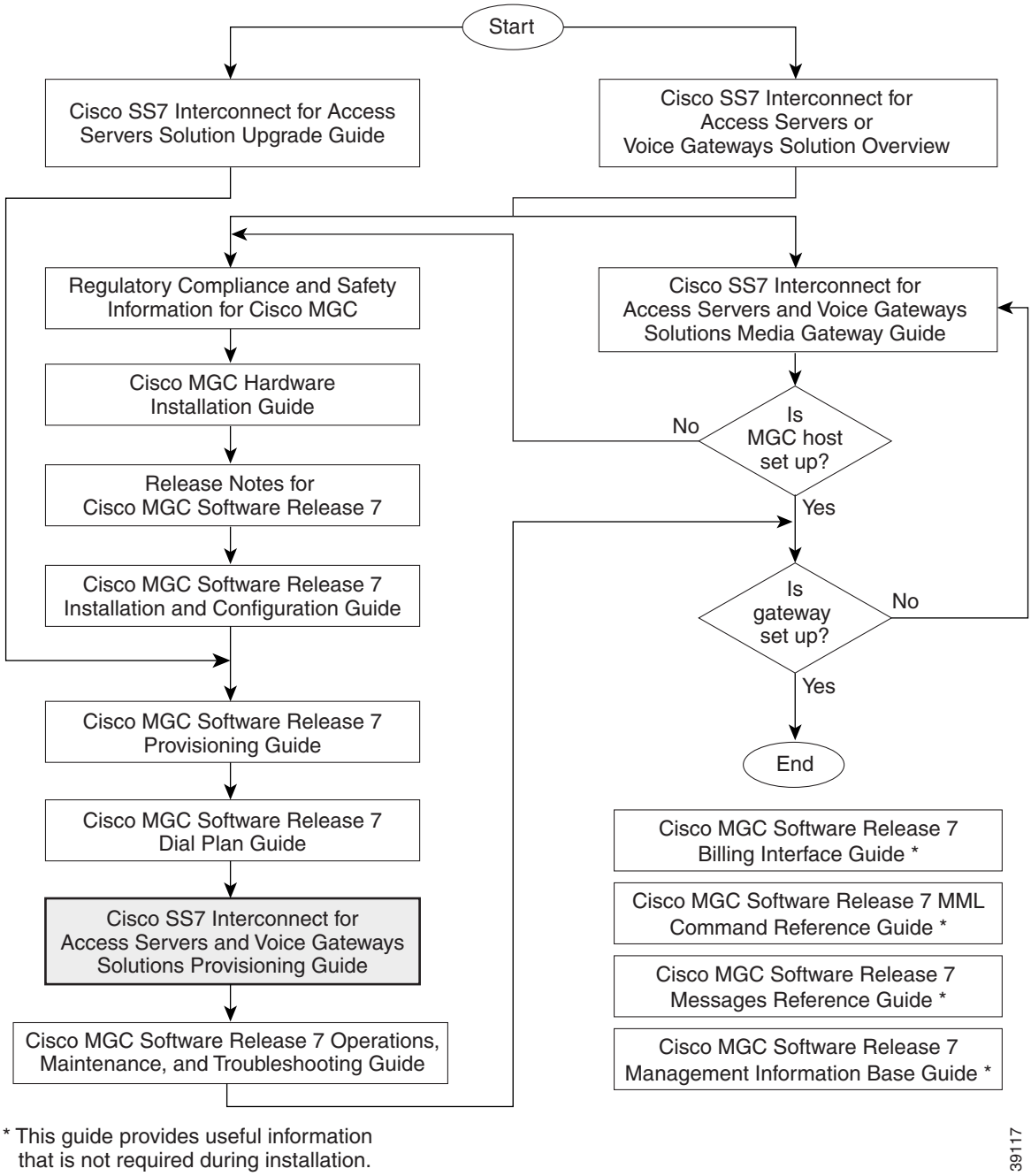
Table 1 Document Contents

Chapter	Title	Content
1	Introduction	Provides an overview of the Cisco SS7 Interconnect for Voice Gateways Solution. Contains a brief review of provisioning tools used in this guide.
2	Provisioning the Cisco SS7 Interconnect for Voice Gateways Solution by Using CMM	Describes how to provision a sample Cisco SS7 Interconnect for Voice Gateways Solution using the CMM.
3	Provisioning the Cisco SS7 Interconnect for Voice Gateways Solution by Using VSPT	Describes how to provision a sample Cisco SS7 Interconnect for Voice Gateways Solution using the VSPT.
4	Provisioning the Cisco SS7 Interconnect for Voice Gateways Solution by Using MML	Describes how to provision a sample Cisco SS7 Interconnect for Voice Gateways Solution using MML.

Documentation Map

Use the following documentation maps to navigate through the Cisco SS7 Interconnect for Voice Gateways Solution documentation suite.

Figure 1 Documentation Map



Documentation Suite

Refer to the documentation listed in the following sections for information about the Cisco MGC software and the solutions it supports.

Platform Documentation

- *Regulatory Compliance and Safety Information for Cisco Media Gateway Controller Hardware*
- *Cisco Media Gateway Controller Hardware Installation Guide*
- *Release Notes for Cisco Media Gateway Controller Software Release 7*
- *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide*
- *Cisco Media Gateway Controller Software Release 7 Provisioning Guide*
- *Cisco Media Gateway Controller Software Release 7 Dial Plan Guide*
- *Cisco Media Gateway Controller Software Release 7 MML Command Reference Guide*
- *Cisco Media Gateway Controller Software Release 7 Messages Reference Guide*
- *Cisco Media Gateway Controller Software Release 7 Billing Interface Guide*
- *Cisco Media Gateway Controller Software Release 7 Management Information Base Guide*
- *Cisco Media Gateway Controller Software Release 7 Operations, Maintenance, and Troubleshooting Guide*

Cisco SS7 Interconnect for Voice Gateways Solution Documentation

- *Cisco SS7 Interconnect for Voice Gateways Solution Overview*
- *Cisco SS7 Interconnect for Access Servers and Voice Gateways Solutions Media Gateway Guide*

Document Conventions

Command descriptions use the following conventions:

boldface font	Commands and keywords are in **boldface**.
italic font	Arguments for which you supply values are in *italics*.
[ ]	Elements in square brackets are optional.
{ x | y | z }	Alternative keywords are grouped in braces and separated by vertical bars.
[x | y | z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string, or the string will include the quotation marks.

Screen examples use the following conventions:

`screen` font	Terminal sessions and information the system displays are in `screen` font.
`boldface screen` font	Information you must enter is in **`boldface screen`** font.
italic screen font	Arguments for which you supply values are in *italic screen* font.
^	The symbol ^ represents the key labeled Control. For example, the key combination ^D in a screen display means hold down the Control key while you press the D key.
< >	Nonprinting characters, such as passwords, are in angle brackets.
[ ]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the publication.

Timesaver Means the *described action saves time*. You can save time by performing the action described in the paragraph.

Tip Means *the following information might help you solve a problem.* The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

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

Obtaining Documentation

These sections explain how to obtain documentation from Cisco Systems.

World Wide Web

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

http://www.cisco.com

Translated documentation is available at this URL:

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

Documentation CD-ROM

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

Ordering Documentation

You can order Cisco documentation in these ways:

- Registered Cisco.com users (Cisco direct customers) can order Cisco product documentation from the Networking Products MarketPlace:

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

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

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

- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco Systems Corporate Headquarters (California, U.S.A.) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

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You can submit comments electronically on Cisco.com. In the Cisco Documentation home page, click the **Fax** or **Email** option in the "Leave Feedback" section at the bottom of the page.

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You can submit your comments by mail by using the response card behind the front cover of your document or by writing to the following address:

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

We appreciate your comments.

Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain online documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you with these tasks:

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

If you want to obtain customized information and service, you can self-register on Cisco.com. To access Cisco.com, go to this URL:

http://www.cisco.com

Technical Assistance Center

The Cisco Technical Assistance Center (TAC) is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two levels of support are available: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Cisco TAC inquiries are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

The Cisco TAC resource that you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

Cisco TAC Web Site

You can use the Cisco TAC Web Site to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to this URL:

http://www.cisco.com/tac

All customers, partners, and resellers who have a valid Cisco service contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to this URL to register:

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

If you are a Cisco.com registered user, and you cannot resolve your technical issues by using the Cisco TAC Web Site, you can open a case online by using the TAC Case Open tool at this URL:

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

If you have Internet access, we recommend that you open P3 and P4 cases through the Cisco TAC Web Site.

Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses priority level 1 or priority level 2 issues. These classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer automatically opens a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to this URL:

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

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled: for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). When you call the center, please have available your service agreement number and your product serial number.

Introduction

Cisco Media Gateway Controller Software Overview

The Cisco Media Gateway Controller (MGC) Software Release 7 is part of solutions that enable the routing of time division multiplexing (TDM) traffic to or through an IP network. These solutions include:

- Cisco SS7 Interconnect for Access Servers Solution—Provides a gateway that allows dial-in users to dial in through a TDM network to access traditional data services on an IP network. This solution supports SS7 signaling through use of Cisco Signaling Link Terminals (SLTs).
- Cisco SS7 Interconnect for Voice Gateways Solution—Enables voice calls between the traditional TDM network and telephony services on an IP network. This solution also hosts voice calls between two TDM networks, but it uses two types of call routing: gatekeeper call routing and MGC call routing.

In both of these solutions, the Cisco MGC software is combined with one or two Sun hosts, Cisco SLTs, and network interface cards in the Sun hosts. This combination of hardware and software is known as the Cisco SC2200 product.

Terminology

The following terms are used in this document:

- Cisco SC host—A Sun host server running Cisco MGC software.
- Cisco SC node—The combination of the Cisco SC2200 product and the control signaling network. The SC node consists of all solution components except the media gateway.
- Simplex SC node—A node that uses a single SC host. Typically, this type of node is used for solution evaluation tests or for small installations. In a simplex configuration, any loss of service in the Cisco SC host disrupts all call traffic.
- Continuous-service SC node—A node that uses two SC hosts to prevent system down time caused by failure of a single SC host. Calls in progress are maintained when one SC host fails. Continuous-service nodes use SLTs to preprocess SS7 signaling and distribute signaling to both SC hosts. If a failover occurs, all stable calls are maintained.

Provisioning Tools

Three provisioning tools are distributed with the Cisco MGC software:

- Cisco Media Gateway Controller Manager (CMM), distributed with software Release 7.3(x) and 7.4(x)
- Release 1.6 of the Cisco Voice Services Provisioning Tool (VSPT), used with software Release 7.4(x)
- Man-Machine Language (MML), distributed with software Release 7.3(x) and 7.4(x)

Tip Notes are used in this chapter to identify the procedures and other elements that differ in the CMM (used with Cisco MGC software Release 7.3[x] and 7.4[x]) and the VSPT (used with software Release 7.4[x]). However, most procedures are the same for both tools. See Table 1-1 on page 1-2.

The CMM/VSPT can be used alone or in conjunction with MML commands to provision your system. Table 1-1 shows the differences between provisioning methods.

Table 1-1 CMM/VSPT and MML Specifications/Features

Specification/Feature	CMM/VSPT	MML
System basics	X Window System GUI[1] front end, SNMP back end. **Note** Any client software supporting X, such as Reflection for remote management, can be used.	CLI[2] that interacts directly with the SC host.
System hardware/software requirements	Sun Sparc station running Solaris 2.6. **Note** Running the CMM/VSPT on the same host as the Cisco MGC can adversely impact performance. We recommend using a separate server.	Runs on the SC host.
Batch file support	CMM:No VSPT: Yes.	Yes.
Level of network/telephony experience required	Little experience required; very easy to use.	Requires a high level of experience with MML and the Cisco MGC software.
Best used for	• Setting up a single configuration or few configurations on individual machines. • Modifying an existing configuration.	• Creating batch files to provision many Cisco SC nodes or retrieve measurements. • Modifying configurations (experienced users).

1. GUI = graphical user interface.

2. CLI = command line interface.

See *Cisco Media Gateway Controller Software Release 7 Provisioning Guide* for basic information on provisioning your system, including:

- Using the CMM/VSPT and MML tools
- Provisioning solution components
- Creating worksheets to use during provisioning

CMM/VSPT Overview

The CMM/VSPT is an X Window System GUI that accesses Cisco SC node information by using SNMP. You use the CMM/VSPT to perform the following tasks:

- Setting up your initial system configuration
- Adding or deleting system components (for example, point codes, gateways, switches, and other nodes)
- Setting up links and signaling services between components
- Provisioning component properties
- Setting up number analysis and routing
- Saving or changing subsequent provisioning sessions

See *Cisco Media Gateway Controller Software Release 7 Provisioning Guide* and the *Cisco Media Gateway Controller Software Release 7 Dial Plan Guide* for more information.

MML Overview

MML is a CLI that is used to directly interface with the Cisco SC host through a terminal. You can access MML through a console attached to the Cisco SC host, or through a Telnet session to the Cisco SC host.

See *Cisco Media Gateway Controller Software Release 7 Provisioning Guide* and the *Cisco Media Gateway Controller Software Release 7 Dial Plan Guide* for more information on provisioning with MML. Refer to the *Cisco Media Gateway Controller Software Release 7 MML Command Reference Guide* for more information on MML commands.

Before You Start

The following task checklist presents the steps you should have performed before using this guide.

	Task	Documentation
Step 1	Become familiar with the Cisco SS7 Interconnect for Voice Gateways Solution. You should have a general idea of what components each solution contains.	• *Cisco SS7 Interconnect for Voice Gateways Solution Overview*
Step 2	Know how to install and configure the gateways used in these solutions.	• *Cisco SS7 Interconnect for Access Servers and Voice Gateways Solutions Media Gateway Guide*
Step 3	Briefly review general Cisco MGC software information, such as software installation procedures, operating procedures, and release notes.	• *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* • *Cisco Media Gateway Controller Software Release 7 Operations, Maintenance, and Troubleshooting Guide* • *Cisco Media Gateway Controller Software Release 7 MML Command Reference Guide* • *Cisco Media Gateway Controller Software Release 7 Messages Reference Guide* • *Cisco Media Gateway Controller Software Release 7 Billing Interface Guide* • *Cisco Media Gateway Controller Software Release 7 Management Information Base Guide* • *Release Notes for Cisco Media Gateway Controller Software Release 7*
Step 4	Read the general provisioning guide to obtain an overview of the provisioning process, install the provisioning tools, know how to use the provisioning tools, and know how to provision components by using the CMM/VSPT and MML.	• *Cisco Media Gateway Controller Software Release 7 Provisioning Guide* • *Cisco Media Gateway Controller Software Release 7 Dial Plan Guide*

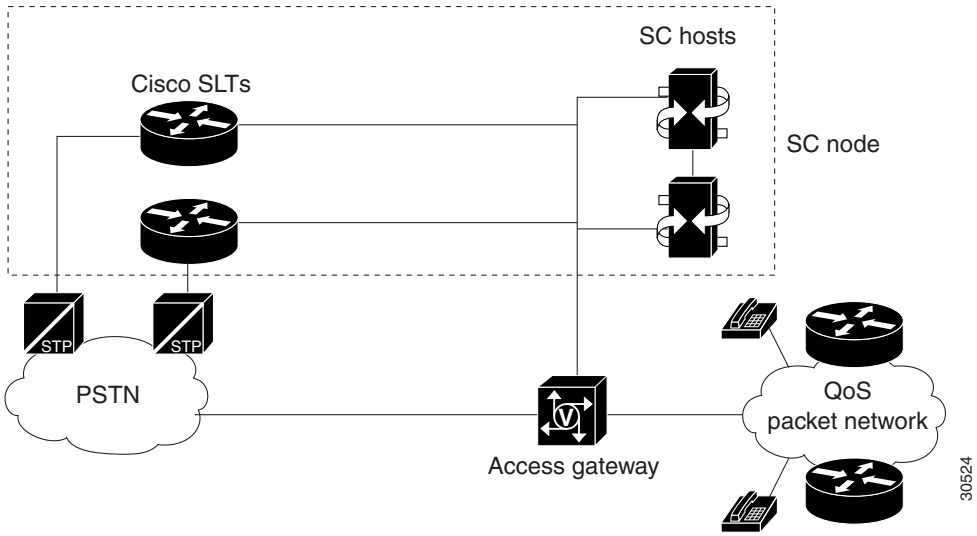
CHAPTER 2

Provisioning the Cisco SS7 Interconnect for Voice Gateways Solution by Using CMM

This chapter describes how to provision a sample Cisco SS7 Interconnect for Voice Gateways Solution (see Figure 2-1). The chapter describes a sample configuration for illustration purposes only. Your configuration will vary and depend on your own network configuration.

The Cisco Media Gateway Controller Manager (CMM) tool is used with Cisco MGC software Release 7.3(x) and Release 7.4(x). You can also use the Cisco Voice Services Provisioning Tool (VSPT) to provision Cisco MGC software Release 7.4(x). Refer to the "Provisioning the Cisco SS7 Interconnect for Voice Gateways Solution by Using VSPT" chapter for more information on the Cisco VSPT.

Figure 2-1 Sample Cisco SS7 Interconnect for Voice Gateways Solution



Caution Do *not* use the sample values in this chapter to provision your system. You must research your network and obtain your own values for the network addresses, point codes, and other parameters used in your solution. If you use the sample values presented here, your configuration *will not* work.

Provisioning Outline

Perform the following steps to provision the sample Cisco SS7 Interconnect for Voice Gateways Solution.

	Step	Section and Page
Provision SS7 signaling routes		
Step 1	Add the OPC[1] in your network.	Adding the Origination Point Code, page 2-9
Step 2	Add the DPC[2] to identify the destination switch.	Adding the Destination Point Code, page 2-10
Step 3	Add the APCs[3] to identify the STPs[4] with which the signaling controller communicates signaling information.	Adding the Adjacent Point Codes, page 2-10
Step 4	Add linksets to connect the Cisco SLT[5] to the signal transfer points.	Adding Linksets, page 2-11
Step 5	Add the SS7 subsystem to identify the mated STPs.	Adding the SS7 Subsystem, page 2-11
Step 6	Add the SS7 routes for each signaling path from the signaling controller to the destination switch.	Adding SS7 Routes, page 2-12
Step 7	Add the SS7 signaling service from the signaling controller to the destination switch.	Adding SS7 Signaling Services, page 2-13
Provision signaling links		
Step 1	Add the Ethernet adapters (cards) in the SC host that carry signaling to and from the Cisco SLTs.	Adding Adapters (Cards), page 2-14
Step 2	Add Ethernet interfaces for the cards in the host.	Adding Ethernet Interfaces, page 2-14
Step 3	Add C7 IP links for each SS7 link from the signaling controller to the SS7 network (through the Cisco SLT).	Adding C7 IP Links to Cisco SLTs, page 2-15
Provision NAS[6] links		
Step 1	Add external nodes for the NASs in your network.	Adding NAS External Nodes, page 2-20
Step 2	Add NAS signaling services for each NAS.	Adding NAS Signaling Services, page 2-20
Step 3	Add IP links for each NAS to each Ethernet card in the SC host.	Adding IP Links, page 2-21
Provision trunks		
Step 1	Create the trunk file.	Creating the Trunk File, page 2-22
Step 2	Add individual trunks from each NAS to the signaling controller.	Adding Individual Trunks, page 2-23
Step 3	Process the trunk file.	Processing the Trunk File, page 2-26
Provision screening:		
Step 1	Provision white list screening.	Provisioning White and Black List Screening, page 2-27

Deploy the session.

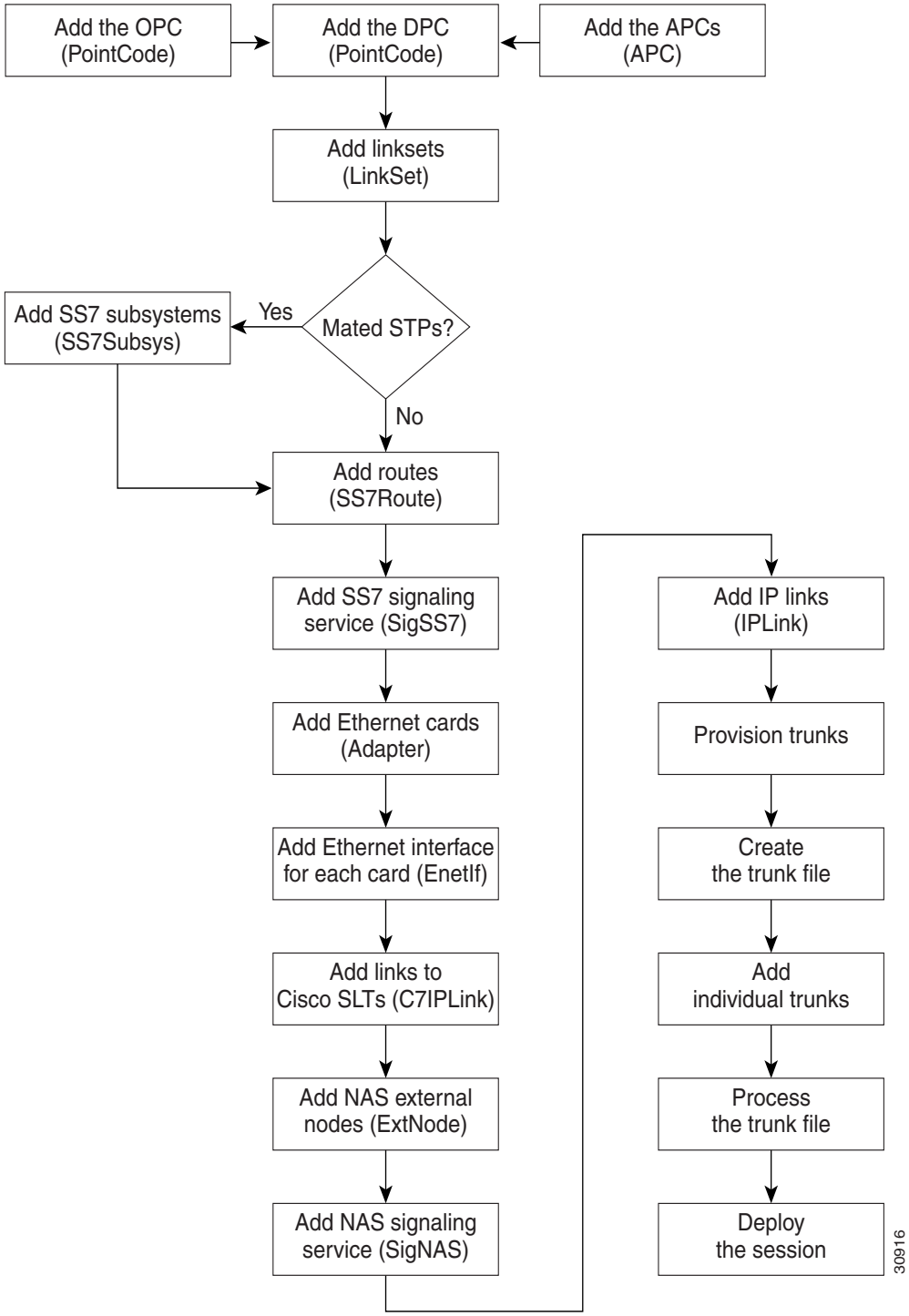
1. OPC = origination point code

2. DPC = destination point code
3. APCs = adjacent point codes
4. STPs = signal transfer points
5. Cisco SLT = Cisco Signaling Link Terminal
6. NAS = network access server

Note Trunk groups and trunk routing are not used in the Cisco SS7 Interconnect for Voice Gateways Solution. This solution uses nailed trunks between the voice gateways and the PSTN switch. The signaling controller does not perform trunk group selection in this solution.

Figure 2-2 shows a flow chart of the provisioning steps discussed in this chapter. After the component, the CMM name of the component is shown in parenthesis.

Figure 2-2 Provisioning Steps



Provisioning Worksheet

Table 2-1 shows a provisioning worksheet for the sample configuration shown in this chapter.

Table 2-1 Provisioning Worksheet

Component	Parent Component	MML Name	Description	Parameters
OPC	None	opc	Origination point code	• Network address: 171.1.4 • Network indicator: National Network
DPC	None	dpc1	DPC of PSTN Switch A	• Network address: 171.1.3 • Network indicator: National Network
APC	None	apc1	APC for STP A	• Network address: 171.16.1 • Network indicator: National Network
APC	None	apc2	APC for STP B	• Network address: 171.16.2 • Network indicator: National Network
Linkset	apc1	ls01	Linkset from signaling controller to STP A	• Protocol family: SS7-ANSI • Transport type: IP
Linkset	apc2	ls02	Linkset from signaling controller to STP B	• Protocol family: SS7-ANSI • Transport type: IP
SS7 subsystem	• apc1 • apc2	subsys1	Route Between STP A and STP B	• Adjacent point code: apc1 • Mated adjacent point code: apc2 • Protocol Family: SS7-ANSI • Priority: 3 • Subsystem Number: 0 • STP-SCP index: 0 • Transport protocol: SCCP
SS7 route	• dpc1 • ls01 • opc	ss7route1	Route 1 to PSTN Switch A through LS1	• Signal Destination Point: dpc1 • Linkset: ls01 • Originating point code: opc • Priority: 1
SS7 route	• dpc1 • ls02 • opc	ss7route2	Route 2 to PSTN Switch A through LS2	• Signal Destination Point: dpc1 • Linkset: ls02 • Originating point code: opc • Priority: 1

Table 2-1 Provisioning Worksheet (continued)

Component	Parent Component	MML Name	Description	Parameters
SS7 signaling service	dpc1	ss7sigsvc	SS7 Service to PSTN Switch A	• MDO File Name: ANSISS7_STANDARD • Customer Group ID: D123 • Customer Group Table: 0101 • Side: Network • ASP Part: N
Adapter (card)	None	encard1	Ethernet card 1	Card slot: 0
Adapter (card)	None	encard2	Ethernet card 2	Card slot: 1
Ethernet interface	encard1	enetif1	Ethernet interface for encard1	None
Ethernet interface	encard2	enetif2	Ethernet interface for encard2	None
C7 IP link	ls01	c7iplnk1	Link 1 in Linkset 1	• Enet Line Interface: enetif1 • Port: 5000 • Priority: 1 • Peer address: 175.30.241.27 • Peer port: 5000 • IP address: IPAddr1 • Time slot: 0 • Link code: 0
C7 IP link	ls01	c7iplnk2	Link 2 in Linkset 1	• Enet Line Interface: enetif1 • Port: 5000 • Priority: 1 • Peer address: 175.30.238.28 • Peer port: 5000 • IP address: IPAddr2 • Time slot: 0 • Link code: 1
C7 IP link	ls02	c7iplnk3	Link 1 in Linkset 2	• Enet Line Interface: enetif2 • Port: 5000 • Priority: 1 • Peer address: 175.30.241.27 • Peer port: 7000 • IP address: IPAddr1 • Time slot: 0 • Link code: 0

Table 2-1 Provisioning Worksheet (continued)

Component	Parent Component	MML Name	Description	Parameters
C7 IP link	ls02	c7iplnk4	Link 2 in Linkset 2	• Enet Line Interface: enetif2 • Port: 5000 • Priority: 1 • Peer address: 175.30.238.28 • Peer port: 5000 • IP address: IPAddr2 • Time slot: 0 • Link code: 1
NAS external node	None	nas1	NAS 1	None
NAS external node	None	nas2	NAS 2	None
NAS external node	None	nas3	NAS 3	None
NAS signaling service	nas1	signas1	Signaling service for NAS 1	MDO file name: BELL_1268_C3
NAS signaling service	nas2	signas2	Signaling service for NAS 2	MDO file name: BELL_1268_C3
NAS signaling service	nas3	signas3	Signaling service for NAS 3	MDO file name: BELL_1268_C3
IP link	signas1	iplink1	IP link for NAS 1 to Ethernet IF 1	Enet line interface: enetif1 Port: 3001 Priority: 1 Peer address: 175.30.241.2 Peer port: 3001 IP address: IPAddr1 Signal slot: 0 Signal port: 0
IP link	signas1	iplink2	IP link for NAS 1 to Ethernet IF 2	Enet line interface: enetif2 Port: 3001 Priority: 1 Peer address: 175.30.238.2 Peer port: 3001 IP address: IPAddr2 Signal slot: 0 Signal port: 0

Table 2-1 Provisioning Worksheet (continued)

Component	Parent Component	MML Name	Description	Parameters
IP link	signas2	iplink3	IP link for NAS 2 to Ethernet IF 1	Enet line interface: enetif1 Port: 3001 Priority: 1 Peer address: 175.30.241.3 Peer port: 3001 IP address: IPAddr1 Signal slot: 0 Signal port: 0
IP link	signas2	iplink4	IP link for NAS 2 to Ethernet IF 2	Enet line interface: enetif2 Port: 3001 Priority: 1 Peer address: 175.30.238.3 Peer port: 3001 IP address: IPAddr2 Signal slot: 0 Signal port: 0
IP link	signas3	iplink5	IP link for NAS 3 to Ethernet IF 1	Enet line interface: enetif1 Port: 3001 Priority: 1 Peer address: 175.30.241.4 Peer port: 3001 IP address: IPAddr1 Signal slot: 0 Signal port: 0
IP link	signas3	iplink6	IP link for NAS 3 to Ethernet IF 2	Enet line interface: enetif2 Port: 3001 Priority: 1 Peer address: 175.30.238.4 Peer port: 3001 IP address: IPAddr2 Signal slot: 0 Signal port: 0

Before You Begin

Log in to the signaling controller and start the CMM as described in *Cisco Media Gateway Controller Software Release 7 Provisioning Guide*.

Note Many procedures in this chapter refer to sections in *Cisco Media Gateway Controller Software Release 7 Provisioning Guide* or the *Cisco Media Gateway Controller Software Release 7 Dial Plan Guide*. Keep these books handy when performing the procedures in this chapter.

Provisioning SS7 Signaling Routes

The SS7 signaling route is the path from the Cisco SC host to a service switching point (SSP) through the Cisco SLTs and signal transfer points (STPs). In the sample configuration in this chapter, the SSP is the PSTN switch. When you provision the SS7 signaling routes, you add the following components:

- OPC—Origination point code or the point code of the signaling controller in your network
- DPC—Destination point code or the point code of the PSTN switch A to which you are connecting
- APCs—Adjacent point codes or the point codes of the adjacent STPs
- Linksets
- SS7 subsystems (to identify mated STPs)
- SS7 routes
- SS7 signaling services

For more information on configuring SS7 signaling routes, see *Cisco Media Gateway Controller Software Release 7 Provisioning Guide.*

Adding the Origination Point Code

A point code is an SS7 network address that identifies an SS7 network node, such as a switch, STP, or SSP.

Note ITU point codes contain 14 bits, and North American point codes contain 24 bits.

The following procedure shows how to add the point code for the SC host.

Step 1 In the Media Gateway Controller Tab, click **PointCode**.

Step 2 Enter MML name **opc**.

Step 3 Enter description **Origination point code**.

Step 4 Enter network address **171.1.4**.

Step 5 Click **Network Indicator** and choose **National Network**.

Step 6 Click **Create**.

Step 7 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Adding the Destination Point Code

The following procedure shows how to add the point code for the PSTN switch.

Step 1 Click **PointCode**.

Step 2 Enter MML name **dpc1**.

Step 3 Enter description **DPC of PSTN Switch A**.

Step 4 Enter network address **171.1.3**.

Step 5 Click **Network Indicator** and choose **National Network**.

Step 6 Click **Create**.

Step 7 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Adding the Adjacent Point Codes

The following procedure shows how to add the adjacent point codes for the STPs.

Note The sample configuration in this chapter uses A-links from the STPs for signaling to the Cisco SLTs. If you have a configuration where F-links come directly from the SSP to the Cisco SLTs, you do not need to add APCs.

Step 1 Click **APC**.

Step 2 Enter MML name **apc1**.

Step 3 Enter description **APC for STP A**.

Step 4 Enter network address **171.16.1**.

Step 5 Click **Network Indicator** and choose **National Network**.

Step 6 Click **Create**.

Step 7 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Step 8 Repeat for apc2, entering **APC for STP B** for the description and **171.16.2** for the network address.

Adding Linksets

A linkset is a logical set of one or more links originating from an SS7 node (STP) and connecting to an adjacent node. In this example, the linkset contains communication links that join the signaling controller to an adjacent STP.

You must provision one linkset for each connection through the STP to the signaling controller.

Step 1 Click **Link Set**.

Step 2 Click **Adjacent Point Code** and select the apc1 component you provisioned in the "Adding the Adjacent Point Codes" section on page 2-10.

Step 3 Enter the MML name **ls01**.

Step 4 Enter the description **Linkset from signaling controller to STP A**.

Step 5 Click **Protocol Family** and choose **SS7-ANSI**.

Step 6 Click the **IP** transport type.

Step 7 Click **Create**.

Step 8 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Step 9 Repeat to add a linkset from the signaling controller to STPB, choosing the apc2 component and changing the MML name and description accordingly.

Note After creating the linksets, you must create the C7 IP links for each linkset. See "Adding C7 IP Links to Cisco SLTs" section on page 2-15.

Adding the SS7 Subsystem

You must add an SS7 subsystem that identifies each pair of mated STPs. This allows the signaling controller to route traffic over the C-links in case of a failure between one of the STPs and an endpoint.

Step 1 Click **SS7SubSys**.

Step 2 Enter the MML name **subsys1**.

Step 3 Enter the description **Route Between STP A and STP B**.

Step 4 Click **Adjacent Point Code** to choose **apc1** (the component you created for the STP A in the "Adding the Adjacent Point Codes" section on page 2-10).

Step 5 Click **Mated Adjacent Point Code** to choose the **apc2** component you created for STP B.

Step 6 Click **Protocol Family** to choose **SS7-ANSI**.

Step 7 Click **3** for Priority.

Tip The priority for the SS7 subsystem should always be lower than the priority for the C7 IP links between the signaling controller and the STPs (which you provision in the "Adding C7 IP Links to Cisco SLTs" section on page 2-15). You do not want signaling traffic on the C-links, because they are used only if the F-links go down. If the priority for the C-links (SS7 subsystem) is higher than or equal to the priority for the C7 IP links, the signaling controller routes signaling traffic over those links. If you set the SS7 subsystem priority lower than the priority for the C7 IP links, the signaling controller routes traffic over the C-links between the STPs only if the links with a higher priority are not available.

Step 8 Enter **0** in the Sub System Number field. This value is not used when you are identifying mated STPs.

Step 9 Enter **0** in the STP-SCP index field. This value is not used when you are identifying mated STPs.

Step 10 Click **SCCP** for transport protocol.

Step 11 Click **Create**.

Step 12 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Adding SS7 Routes

An SS7 route is a path through a linkset between the signaling controller and another signaling controller or TDM switch. In this example, the SS7 routes indicate the linksets that carry SS7 signals between the signaling controller and the PSTN switch A.

You must add an SS7 route for each signaling path from the signaling controller to the PSTN switch A. You provision a route for each linkset.

Step 1 Click **SS7Route**.

Step 2 Enter the MML name **ss7route1**.

Step 3 Enter the description **Route 1 to PSTN Switch A through LS1**.

Step 4 Click **Signal Destination Point Code** and choose **dpc1** (the DPC for PSTN Switch A that you provisioned in the "Adding the Destination Point Code" section on page 2-10).

Step 5 Click **Link Set** to choose **ls01** as the linkset for this route.

Step 6 Click **Originating Point Code** to choose **opc** as the origination point code for this route (the OPC for the signaling controller that you added in the "Adding the Origination Point Code" section on page 2-9).

Step 7 Choose **1** for priority.

Note Routes can share signaling traffic. You can set loadsharing by making the priorities the same for all routes.

Step 8 Click **Create**.

Step 9 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Step 10 Repeat Step 1 through Step 9 to add another route using Linkset 2, changing the MML name and description, and selecting **ls02** as the linkset.

Adding SS7 Signaling Services

The SS7 signaling service specifies the path and the protocol variant that the signaling controller uses to communicate with a remote switch (SSP) that is sending bearer traffic to the NASs. You must add an SS7 signaling service from the signaling controller to the PSTN switch.

Step 1 Click **SigSS7**.

Step 2 Click **Point Code** to select the **dpc1** point code for this signaling service. (You provisioned dpc1 as your destination point code for the PSTN switch in the "Adding the Destination Point Code" section on page 2-10.)

Enter MML name **ss7sigsvc**.

Step 3 Enter description **SS7 Service to PSTN Switch A**.

Step 4 Click **MDO File Name** and choose **ANSISS7_STANDARD** as the protocol for this signaling service.

Step 5 Enter D123 for the Customer Group ID. This is the name of the dial plan file you use for screening. See "Provisioning White and Black List Screening" section on page 2-27.

Note We recommend that you go ahead and provision a customer group ID for your SS7 signaling service, even if you are not planning on currently using the screening tools. This is because once the SS7 signaling service is placed in service, you would have to take it out-of-service to add a customer group ID.

Step 6 Click **network** for Side.

Step 7 Click **N** for ASP Part. This is used for DPNSS feature transparency.

Note The ASP Part field does not appear in software Release 7.4(x).

Step 8 Click **Create**.

Step 9 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Step 10 After you create the signaling service, click **Properties** and enter values for the following properties:

- BOrigStartIndex: **1**
- BTermStartIndex: **2**

These values are used in the screening process.

Step 11 Click **Set**.

Provisioning Signaling Links

You must provision links for all physical connections bearing signals that enter and exit the signaling controller. This includes SS7 signals from the SSP (PSTN Switch A) and signals to the NASs. You must add the following components:

- Ethernet cards in the signaling controller that provide an interface from the Cisco SLT
- Ethernet interfaces for the cards you provision
- C7 IP links to the Cisco SLTs

Adding Adapters (Cards)

You must add a card component for each card in the signaling controller. For the example in this chapter, you add one Ethernet card for each connection to the IP network—one card for the 10-Mb signaling network and one for the 100-Mb signaling network. These cards permit SS7 signaling between the signaling controller and the Cisco SLTs.

Note You provision only one set of cards for one signaling controller (the primary), even though both signaling controllers are highlighted.

Step 1 Click **Adapter**.

Step 2 Enter MML name **encard1**.

Step 3 Click **Type** and choose **EN** (Ethernet).

Step 4 Enter description **Ethernet card 1**.

Step 5 Enter **0** for the card slot.

Step 6 Click **Create**.

Step 7 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Step 8 Repeat Step 1 through Step 7 for the second Ethernet card connected to the second signaling network, changing the MML name, description, and slot accordingly.

Note You must provision the card before provisioning the card interfaces.

Adding Ethernet Interfaces

The Ethernet interface provides the physical line interface between the signaling controller's Ethernet card and the physical Ethernet network. You must add an Ethernet interface if you have added an Ethernet card. To add the interface for your first Ethernet card (encard1):

Step 1 Click **EnetIf**.

Step 2 Click **Ethernet Adapter** to choose the Ethernet card for this interface. Choose **encard1**.

Step 3 Enter MML name **enetif1**.

Step 4 Enter description **Ethernet interface for Card 1**.

Step 5 Click **Create**.

Step 6 Click **OK**. A message appears in the lower left corner of the main CMM window telling you what action was performed.

Step 7 Repeat Step 1 through Step 6 to add the interface for your second Ethernet card (encard2).

Adding C7 IP Links to Cisco SLTs

A C7 IP link component identifies a link between a Cisco SLT's IP address and port and the SS7 network (SSP or STP). The C7 IP link component identifies one of the links within a linkset.

Note Use C7 IP links only when your configuration has Cisco SLTs that carry SS7 signaling to the signaling controller over IP. If your configuration does not include Cisco SLTs and your links from the STPs terminate directly into ITK cards in the signaling controller, you must provision TDM links for the ITK cards. For example, the Cisco SS7 Dial Access Solution Release 2.0 uses ITK cards and TDM links.

You must add a C7 IP link for each physical SS7 link that is connected to the SS7 network through the Cisco SLT. These links correspond to the linksets you created in the "Adding Linksets" section on page 2-11.

Adding Links for Linkset 1

Adding the First Link

You must add two links for linkset 1. To add the first link:

Step 1 Click **C7IPLink**.

Step 2 Click **Link Set** and choose **ls01** as the linkset for this link.

Step 3 Enter the MML name **c7iplink1**.

Step 4 Enter the description **Link 1 in Linkset 1**.

Step 5 Click **Enet Line Interface** to choose the **enetif1** Ethernet interface for this link. (You provisioned the Ethernet interfaces for each Ethernet card in the "Adding Ethernet Interfaces" section on page 2-14.)

Step 6 Enter **5000** in the Port field. This is the UDP port on the signaling controller. You can use any unused UDP port number, but do not use 1 through 1024 (these are reserved for other applications).

Step 7 Click **1** for priority.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 8 Enter **175.30.241.27** in the peer address field. This is the IP address of SLT A.

Step 9 Enter **5000** in the peer port field. This is a placeholder value and is not used by the software.

Note The actual peer port value is found in the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 10 Click **IPAddr1**. This is the IP address of the signaling controller.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 11 Enter **0** in the time slot field. The time slot field is the physical port on the Cisco SLT.

Note The time slot number must be unique for a given link on a particular Cisco SLT. For example, if you have a 2T WAN interface card (WIC) in slot 0 of the Cisco SLT, you can use time slot value 0 or 1 for the first link you provision. The second link on that WIC uses the remaining value.

Step 12 Enter **0** in the link code field. This is the signaling link code for the line between the Cisco SLT and the STP.

Step 13 Click **Create**.

Step 14 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

Adding the Second Link

To add the second link:

Step 1 Click **C7IPLink** again.

Step 2 Click **Link Set** and choose **ls01** as the linkset for this link.

Step 3 Enter the MML name **c7iplink2**.

Step 4 Enter the description **Link 2 in Linkset 1**.

Step 5 Click **Enet Line Interface** to choose the **enetif1** Ethernet interface for this link. (You provisioned the Ethernet interfaces for each Ethernet card in the "Adding Ethernet Interfaces" section on page 2-14.)

Step 6 Enter **5000** in the Port field. This is the UDP port on the signaling controller. You can use any unused UDP port number, but do not use 1 through 1024 (these are reserved for other applications).

Step 7 Click **1** for priority.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 8 Enter **175.30.238.28** in the peer address field. This is the IP address of SLT B.

Step 9 Enter **5000** in the peer port field. This field is a placeholder value and is not used by the software.

Note The actual peer port value is found in the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 10 Click **IPAddr2**. This is the IP address of the signaling controller.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 11 Enter **0** in the time slot field. This field is the physical port on the Cisco SLT. (You used port 0 when you created the first link.)

Step 12 Enter **1** in the link code field. This is the signaling link code for the line between the Cisco SLT and the STP.

Step 13 Click **Create**.

Step 14 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

Adding Links for Linkset 2

Adding the First Link

You must add two links for linkset 2. To add the first link:

Step 1 Click **C7IPLink**.

Step 2 Click **Link Set** and choose **ls02** as the linkset for this link.

Step 3 Enter the MML name **c7iplink3**.

Step 4 Enter the description **Link 1 in Linkset 2**.

Step 5 Click **Enet Line Interface** to choose the **enetif2** Ethernet interface for this link. (You provisioned the Ethernet interfaces for each Ethernet card in the "Adding Ethernet Interfaces" section on page 2-14.)

Step 6 Enter **5000** in the Port field. This is the UDP port on the signaling controller. You can use any unused UDP port number, but do not use 1 through 1024 (these are reserved for other applications).

Step 7 Click **1** for priority.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 8 Enter **175.30.241.27** in the peer address field. This is the IP address of SLT A.

Step 9 Enter **32767** in the peer port field. This field is a placeholder value and is not used by the software.

Note The actual peer port value is found in the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 10 Click **IPAddr1**. This is the IP address of the signaling controller.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 11 Enter **0** in the time slot field. This field is the physical port on the Cisco SLT.

Step 12 Enter **0** in the link code field.

Step 13 Click **Create**.

Step 14 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

Adding the Second Link

To add the second link:

Step 1 Click **C7IPLink**.

Step 2 Click **Link Set** and choose **ls02** as the linkset for this link.

Step 3 Enter the MML name **c7iplink4**.

Step 4 Enter the description **Link 2 in Linkset 2**.

Step 5 Click **Enet Line Interface** to choose the **enetif2** Ethernet interface for this link. (You provisioned the Ethernet interfaces for each Ethernet card in the "Adding Ethernet Interfaces" section on page 2-14.)

Step 6 Enter **5000** in the Port field. This is the UDP port on the signaling controller. You can use any unused UDP port number, but do not use 1 through 1024 (these are reserved for other applications).

Step 7 Click **1** for priority.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 8 Enter **175.30.238.28** in the peer address field. This is the IP address of SLT B.

Step 9 Enter **32767** in the peer port field. This is a placeholder value and is not used by the software.

Note The actual peer port value is found in the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 10 Click **IPAddr2**. This is the IP address of the signaling controller.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 11 Enter **0** in the time slot field. This is the physical port on the Cisco SLT.

Step 12 Enter **1** in the link code field.

Step 13 Click **Create**.

Step 14 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

Provisioning NAS Links

NAS links indicate the communication path the signaling controller uses to control the bearer traffic that passes through each NAS.

To add links to the NASs in your network, you must add the following components:

- NAS external node
- NAS signaling service
- IP links

Adding NAS External Nodes

You must add a NAS external node for each NAS in your network.

Step 1 Click **ExtNode**.

Step 2 Enter MML name **nas1**.

Step 3 Enter description **NAS 1**.

Step 4 Click **Type** and choose the type of NAS (for this example, choose **AS5300**).

Step 5 Click **Create**.

Step 6 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

Step 7 Repeat Step 1 through Step 5 for nas2 and nas3.

Adding NAS Signaling Services

You must add a NAS signaling service for each NAS you created in the "Adding NAS External Nodes" section on page 2-20. The NAS signaling service indicates the Q.931 protocol path between the signaling controller and the NASs.

Step 1 Click **SigNAS**.

Step 2 Click **External Node** to choose the access server **nas1** for this signaling service.

Step 3 Enter the MML name **signas1**.

Step 4 Enter the description **Signaling service for NAS1**.

Step 5 Click **MDO File Name** to choose the **BELL_1268_C3** protocol for this signaling service.

Step 6 Click **Create**.

Step 7 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

Step 8 Repeat Step 1 through Step 8 for each NAS, changing the MML names and descriptions accordingly.

Adding IP Links

You must add an IP link from each NAS to each Ethernet card and interface in the signaling controller. In this example, you provision the following IP links:

- NAS 1 to enetif1
- NAS 1 to enetif2
- NAS 2 to enetif1
- NAS 2 to enetif2
- NAS 3 to enetif1
- NAS 3 to enetif 2

Note If you are provisioning two links from the signaling controller to the same NAS, you need two different Ethernet IP addresses on both the signaling controller and the NAS.

Step 1 Click **IPLink**.

Step 2 Click **IP Signaling Services** and choose **signas1** as the signaling service for this link. (You provisioned the NAS signaling services in the "Adding NAS Signaling Services" section on page 2-20.)

Step 3 Enter the MML name **iplink1**.

Step 4 Enter the description **IP link for NAS1 to Ethernet IF 1**.

Step 5 Click **Enet Line Interface** to choose the **enetif1** Ethernet interface for this link. (You provisioned the Ethernet interfaces for each Ethernet card in the "Adding Ethernet Interfaces" section on page 2-14.)

Step 6 Enter **3001** in the Port field. This is the UDP port on the signaling controller. You can use any unused UDP port number, but do not use 1 through 1024 (these are reserved for other applications).

Step 7 Click **1** for priority.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 8 Enter **175.30.241.2** in the peer address field. This is the IP address of NAS1.

Step 9 Enter **3001** in the peer port field. This is the port on the signaling controller.

Step 10 Click **IPAddr1**. This is the IP address of the signaling controller.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 11 Enter **0** in the signal slot/port fields.

Step 12 Click **Create**.

Step 13 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

Step 14 Repeat the procedures to add the second IP link from NAS 1 to enetif2, changing the MML name, Ethernet interface, and peer address accordingly.

Step 15 Repeat the steps 1 through 14 to add two links from each remaining NAS to the signaling controller, selecting the appropriate IP signaling service and changing the MML name, description, and peer address accordingly.

Note The provisioning example in this section creates two redundant link manager (RLM) links (forming an RLM group) for each NAS. As of Release 7.4(12) of the Cisco MGC software, you can create multiple RLM groups for each NAS. To create multiple RLM groups for each NAS, repeat steps 1 through 14 for each link in each RLM group. Ensure that the IP links in any multiple RLM groups use the following values defined in the associated NAS: the IP address of the loopback interfaces as the peer address value and the port number of the loopback interfaces as the peer port value.

Provisioning Trunks

You must add trunks for each connection between the NAS and the PSTN switch. NAS 1 has four T1 lines, NAS 2 has four T1 lines, and NAS 3 has three T1 lines. Each T1 contains 24 trunks, or DS0s. For the examples in this section, you must provision 264 trunks (96 for NAS1, 96 for NAS2, and 72 for NAS3).

Note If you have already provisioned the spans on the NAS to be associated with these trunks, you must remove these spans from service on the NAS using the **shutdown** command, before you provision the trunks on the Cisco SC2200.

Creating the Trunk File

To add trunks using the Traffic tab in the CMM, first create the trunk file that will be populated with your data.

Step 1 Click the **Traffic** tab.

Step 2 Click **Trunks**.

Step 3 Choose **Nailed** from the trunk type menu.

Step 4 Enter **trunks.txt** as the filename and click **Set**.

Note For the trunk file name, you can use any extension except .old (reserved for use by the CMM software). In this example, .txt is used.

Step 5 Click **OK.** A message appears in the lower left corner of the main CMM window that tells you what action was performed.

Step 6 After you set the filename, the trunk.txt and BCFile components appear. Click the **+** sign next to the trunks.txt filename to see the Nailed component. In the next section, you click on the Nailed component to add individual trunks.

Adding Individual Trunks

Note The values used for the destination span ID in the following examples are sample values. The real values for this parameter would match whichever PRI port the T1 is connected to on the NAS. Valid values are 0 through 3.

To add the individual trunks, use this procedure:

Step 1 Click **Nailed**. The Nailed Bearer List appears and is empty.

Step 2 Click **New**.

Step 3 Enter **100** for the trunk ID.

Step 4 Click **Source Signaling Service** and select **ss7sigsvc.** (You created this signaling service in the "Adding SS7 Signaling Services" section on page 2-13.)

Step 5 Select **Fixed** for the Source Span.

Step 6 Enter **ffff** for the Source Span ID.

Step 7 Enter **1** for the Source Time Slot/CIC. This identifies the time slot on the T1 at the destination (PSTN switch).

Step 8 Click **Destination Signaling Service** and choose **signas1**. (You created this service in the "Adding NAS Signaling Services" section on page 2-20.)

Step 9 Select **Fixed** for the Destination Span. (This is the destination span type.)

Step 10 Enter **1** for the Destination Span ID. This sample value identifies the appropriate T1 line and T1 controller on the NAS. This value matches the nfas_int value that is set in IOS on the NAS.

Step 11 Enter **1** in the Destination Time Slot/CIC field. This identifies the time slot on the T1 that terminates at the NAS.

Step 12 Select **T1** as the line type.

Step 13 Enter **24** in the multiple trunks field.

Step 14 Click **Set**.

Step 15 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

The system creates 24 trunks for this T1, automatically incrementing the Trunk ID each time, so that you have created trunk IDs 100 through 123.

The system automatically shows the Nailed Bearer List after successfully creating the trunks. The number of trunks shown depends on your value in the View Next menu. To see a different number of trunks, click the View Next menu and enter the desired value. To scroll through the Nailed Bearer List, click Next 10 and Previous 10.

After creating the trunks for the first T1, you must repeat the process to add trunks for the second, third, and fourth T1 that are connected to NAS1:

Step 1 From the Nailed Bearer List, click **New**.

Step 2 Enter **124** for the trunk ID.

Step 3 Click **Source Signaling Service** and select **ss7sigsvc.** (You created this signaling service in the "Adding SS7 Signaling Services" section on page 2-13.)

Step 4 Select **Fixed** for the Source Span.

Step 5 Enter **ffff** for the Source Span ID.

Step 6 Enter **25** for the Source Time Slot/CIC. This identifies the time slot on the T1 at the destination (PSTN switch).

Step 7 Click **Destination Signaling Service** and choose **signas1**. (You created this service in the "Adding NAS Signaling Services" section on page 2-20.)

Step 8 Select **Fixed** for the Destination Span. (This is the destination span type.)

Step 9 Enter **2** for the Destination Span ID. This sample value identifies the appropriate T1 line and T1 controller on the NAS. This value matches the nfas_int value that is set in IOS on the NAS.

Step 10 Enter **25** in the Destination Time Slot/CIC field. This identifies the time slot on the T1 that terminates at the NAS.

Step 11 Select **T1** as the line type.

Step 12 Enter **24** in the multiple trunks field.

Step 13 Click **Set**.

Step 14 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

The system creates 24 trunks for this T1, automatically incrementing the Trunk ID each time, so that you have created trunk IDs 124 through 147.

Add the trunks for the third T1:

Step 1 From the Nailed Bearer List, click **New**.

Step 2 Enter **148** for the trunk ID.

Step 3 Click **Source Signaling Service** and select **ss7sigsvc.** (You created this signaling service in the "Adding SS7 Signaling Services" section on page 2-13.)

Step 4 Select **Fixed** for the Source Span.

Step 5 Enter **ffff** for the Source Span ID.

Step 6 Enter **49** for the Source Time Slot/CIC. This identifies the time slot on the T1 at the destination (PSTN switch).

Step 7 Click **Destination Signaling Service** and choose **signas1**. (You created this service in the "Adding NAS Signaling Services" section on page 2-20.)

Step 8 Select **Fixed** for the Destination Span. (This is the destination span type.)

Step 9 Enter **3** for the Destination Span ID. This sample value identifies the appropriate T1 line and T1 controller on the NAS. This value matches the nfas_int value that is set in IOS on the NAS.

Step 10 Enter **49** in the Destination Time Slot/CIC field. This identifies the time slot on the T1 that terminates at the NAS.

Step 11 Select **T1** as the line type.

Step 12 Enter **24** in the multiple trunks field.

Step 13 Click **Set**.

Step 14 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

The system creates 24 trunks for this T1, automatically incrementing the Trunk ID each time, so that you have created trunk IDs 148 through 171.

Add the trunks for the fourth T1:

Step 1 From the Nailed Bearer List, click **New**.

Step 2 Enter **172** for the trunk ID.

Step 3 Click **Source Signaling Service** and select **ss7sigsvc.** (You created this signaling service in the "Adding SS7 Signaling Services" section on page 2-13.)

Step 4 Select **Fixed** for the Source Span.

Step 5 Enter **ffff** for the Source Span ID.

Step 6 Enter **73** for the Source Time Slot/CIC. This identifies the time slot on the T1 at the destination (PSTN switch).

Step 7 Click **Destination Signaling Service** and choose **signas1**. (You created this service in the "Adding NAS Signaling Services" section on page 2-20.)

Step 8 Select **Fixed** for the Destination Span. (This is the destination span type.)

Step 9 Enter **2** for the Destination Span ID. This value identifies the appropriate T1 line and T1 controller on the NAS. It is the nfas_int value that is set in IOS on the NAS.

Step 10 Enter **73** in the Destination Time Slot/CIC field. This identifies the time slot on the T1 that terminates at the NAS.

Step 11 Select **T1** as the line type.

Step 12 Enter **24** in the multiple trunks field.

Step 13 Click **Set**.

Step 14 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

The system creates 24 trunks for this T1, automatically incrementing the Trunk ID, so that you have created trunk IDs 172 through 195.

After you have created trunks for the four T1s that terminate at NAS1, you must add trunks for the four T1s that terminate at NAS2 and the three T1s that terminate at NAS3. Follow the previous instructions but make the changes outlined in Table 2-2 and Table 2-3.

Table 2-2 NAS2 Trunks

Field	Trunk 1 Value	Trunk 2 Value	Trunk 3 Value	Trunk 4 Value
Trunk ID	196	220	244	268
Source Time Slot/CIC	97	121	145	169
Mated Signaling Service	NAS2	NAS2	NAS2	NAS2
Mated Span ID	3	3	3	3
Mated Time Slot/CIC	97	121	145	169

Table 2-3 NAS3 Trunks

Field	Trunk 1 Value	Trunk 2 Value	Trunk 3 Value
Trunk ID	292	316	340
Source Time Slot/CIC	193	217	241
Mated Signaling Service	NAS3	NAS3	NAS3
Mated Span ID	4	4	4
Mated Time Slot/CIC	193	217	241

Processing the Trunk File

After you add the trunks, you must process the trunk file. To process the file, perform the following steps:

Step 1 Under trunks.txt, click **BCFile**.

Step 2 Enter **trunks.txt** in the filename field.

Step 3 Enter your user ID and password. Only this user is allowed to modify the file.

Step 4 Click **Set**.

Step 5 Click **OK**. A message appears in the lower left corner of the main CMM window that tells you what action was performed.

The system opens a File Transfer Protocol (FTP) session to the signaling controller host and copies the file. In addition, Simple Network Management Protocol (SNMP) sets the filename in the Management Information Base (MIB) and the file is post-processed.

Note Only one filename can be set in the MIB. If a new filename is set through use of SNMP, the old name is overwritten.

Tip If you receive an error message indicating that the file cannot be processed, your SNMP session might not be running. The SNMP session times out after 30 minutes of inactivity. Exit the CMM and restart it before trying to process the file.

Note If you have already provisioned the spans on the NAS to be associated with these trunks, you can now return those spans to service on the NAS using the **no shutdown** command.

Provisioning the Dial Plan/Number Analysis

The signaling controller provides the ability to create a dial plan to perform number analysis on both the A (calling) number and B (called) number. You can set up dial plans to perform routing, send calls to announcement servers, modify dialed digits, and perform other results.

You do not use the advanced features in the dial plan for the Cisco SS7 Interconnect for Access Servers Solution and the Cisco SS7 Interconnect for Voice Gateways Solution. In these solutions, the signaling controller routes calls directly over the IP network and does not perform routing or switching to trunk groups.

Provisioning White and Black List Screening

In the Cisco SS7 Interconnect for Access Servers Solution, you might want to perform white and black list screening to include or exclude calls from certain numbers. You can provision white lists that specify allowed A-numbers (calling numbers) or B-numbers (called numbers). Black lists block specified A-numbers (calling numbers) or B-numbers (called numbers).

The CMM allows you to enter numbers that are collected in a batch file. When you set the white or black list file and the file is post-processed, the commands in the file are applied to the black and white list databases. For example, if you added numbers to the white list, the numbers are inserted into the database when the file is post-processed.

Note Because the CMM white and black list provisioning is done by batch file, adding or removing a row during the provisioning session does not mean the row has been added to or removed from the database.

Sample Scenario

This section provides procedures for provisioning a sample B white list. In this scenario, assume that a company offering dialup service has two telephone numbers: one for regular customers and one for reduced-rate customers. Regular customers call (703) 484-3000 for dialup service. Reduced-rate customers call (703) 484-6000 and receive discount rates; for example, they could pay a monthly fee in exchange for cheaper per-minute charges. So the company wants to analyze calls made to (703) 484-6000 and route calls to the IP network only if they are from reduced-rate customers, or those customers on the white list. The SC host uses a dial plan result of screening to screen the A-number to see if the call is permitted.

Configuring the B White List

To configure a B whit e list, perform the steps in the following sections:

- “Setting Number Analysis Properties” section on page 2-28

- "Creating the Dial Plan File" section on page 2-28
- "Setting the Service Name" section on page 2-29
- "Adding the Screening Result Set and Result" section on page 2-29
- "Adding Numbers to the White List" section on page 2-29
- "Processing the Dial Plan File" section on page 2-30
- "Processing the White List File" section on page 2-30

These events occur during the screening:

1. Calls are made to (703) 484-6000.
2. The SC host receives a call and performs analysis based on the called number.
3. As a result of analysis, the SC host sees that calls directed to that number must be screened for the calling party number (A-number).
4. The SC host checks the A-number against the B white list to see if the calling party is authorized.
5. If the calling party does appear in the B white list database, the call is put through.
6. If the calling party does not appear in the B white list database, the call is disconnected.

Setting Number Analysis Properties

Before you set up the screening, make sure you have set number analysis properties for your NAS signaling services. You set these properties in "Adding SS7 Signaling Services" section on page 2-13. These values are:

- BOrigStartIndex: **1**
- BTermStartIndex: **2**

Creating the Dial Plan File

Perform the following steps to create the dial plan file:

Step 1 Click the **Number Analysis** tab.

Step 2 Click **Number Analysis**.

Step 3 Enter **D123** for the Customer Group ID.

Step 4 Click **Create New**.

Step 5 In the Number Analysis File Types window, click **File Type** and choose **DialPlan**.

Step 6 Click **Create File**. The file type you created appears in the directory under the customer group ID.

Creating the White List File

Perform the following steps to create the white list file:

Step 1 Click the **D123** component.

Step 2 In the Number Analysis File Types window, click **File Type** and choose **BWhiteList**.

Step 3 Click **Create File**. The file type you created appears in the directory under the customer group ID.

Setting the Service Name

To set up the service name, perform the following steps:

Step 1 Under the D123 component, click the **+** next to DialPlan.

Step 2 Click **Service_Name** to set up a service name (the name of the screening database) to link to the result.

Step 3 Click **New**. Enter **onerate** as the Service Name and click **Set**.

Adding the Screening Result Set and Result

Perform the following steps to add a result set and result of screening:

Step 1 Click **Results**.

Step 2 Click **New Result Set**. Enter **1ratescreen** as the result set name and click **Set**.

Step 3 Click **Add Result Type** and choose **Screening**.

Step 4 Enter **bwhite** for Result Name and **1** for Screen Type. The value of 1 indicates that the screen type is a white list—if the presented A-number is not found in the database, then the screening is considered to have failed and the call is released.

Step 5 Enter **onerate** as the Service Name and click **Set**.

Step 6 Click the **+** next to B_Digit_Tree. Click **Originating**.

Note Because this is a small example, you can leave the filter field blank and display all numbers.

Step 7 Click **Add String** and enter **7034846000** in the string field.

Step 8 Click **Result Set Name**, choose **1ratescreen**, and click **Select**.

Adding Numbers to the White List

Perform the following steps to add numbers to the white list:

Step 1 Under D124, click the **+** sign next to BWhiteList to expand the tree. Click **Screening**.

Step 2 Click **New Row**.

Step 3 Click **Action** and choose **Insert**.

Step 4 Enter **onerate** for the Service Name.

Step 5 Enter **7035552222** for the Calling Party Number. This is the number of a reduced-rate customer authorized to use the (703) 484-6000 number.

Step 6 Repeat to add a few sample numbers.

Processing the Dial Plan File

To process the dial plan file:

Step 1 Under DialPlan, click **NumAnFile**.

Step 2 Enter your user ID and password and click **Set**.

The system opens an FTP session to the Cisco SC host and copies the file. In addition, SNMP sets the filename in the MIB and the file is post-processed. At this time, the insertions and deletions are made in the white and black list databases.

Note Only one filename can be set in the MIB. If a new filename is set through use of SNMP, the old name is overwritten.

Tip If you receive an error message indicating that the file cannot be processed, your SNMP session might not be running. The SNMP session times out after 30 minutes of inactivity. Exit the CMM and restart it before trying to process the file.

Processing the White List File

To process the white list file:

Step 1 Under BWhiteList, click **BWhiteFile**.

Step 2 Enter your user ID and password and click **Set**.

The system opens an FTP session to the Cisco SC host and copies the file. In addition, SNMP sets the filename in the MIB and the file is post-processed. At this time, the insertions and deletions are made in the white and black list databases.

Note Only one filename can be set in the MIB. If a new filename is set through use of SNMP, the old name is overwritten.

Tip If you receive an error message that the file cannot be processed, your SNMP session might not be running. The SNMP session times out after 30 minutes of inactivity. Exit the CMM and restart it before trying to process the file.

Deploying the Session

The example used in this chapter features a continuous-service SC node. You must deploy the session to save it to the machine you are provisioning. The system then copies the files to the standby SC node.

To deploy the session:

Step 1 Use the TCM/CMM to build your configuration by following the steps in this chapter.

Step 2 Choose **Deploy** from the Session menu to save the current configuration as active and copy the configuration to the second host server.

Tip If you receive an error while trying to deploy the session, your connection between the active and standby SC nodes might be configured improperly. The communication between the active and standby SC nodes is configured in the XECfgParm.dat file on each machine. See the "Configuring the Execution Environment" section in Chapter 2 of *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

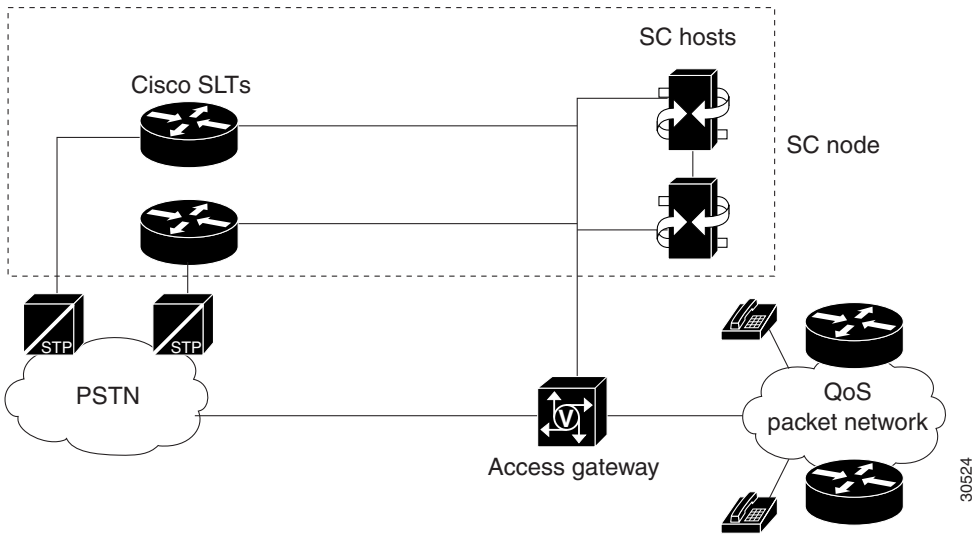
Step 3 Restart the standby server after reconfiguration to apply changes.

Provisioning the Cisco SS7 Interconnect for Voice Gateways Solution by Using VSPT

This chapter describes how to provision a sample Cisco SS7 Interconnect for Voice Gateways Solution (see Figure 3-1) using Release 1.6 of the Cisco Voice Services Provisioning Tool (VSPT). The chapter describes a sample configuration for illustration purposes only. Your configuration will vary and depend on your own network configuration.

Release 1.6 of the Cisco VSPT is used with Cisco MGC software Release 7.4(x). You can also use the Cisco Media Gateway Controller Manager (CMM) to provision Cisco MGC software Release 7.3(x) and Release 7.4(x). Refer to the "Provisioning the Cisco SS7 Interconnect for Voice Gateways Solution by Using CMM" chapter for more information on the CMM.

Figure 3-1 Sample Cisco SS7 Interconnect for Voice Gateways Solution



Caution Do *not* use the sample values in this chapter to provision your system. You must research your network and obtain your own values for the network addresses, point codes, and other parameters used in your solution. If you use the sample values presented here, your configuration *will not* work.

Provisioning Outline

Perform the following steps to provision the sample Cisco SS7 Interconnect for Voice Gateways Solution.

	Step	Section and Page
Provision Ethernet cards and interfaces		
Step 1	Add the Ethernet cards in the SC host that carry signaling to and from the Cisco SLTs, and add the Ethernet interfaces for the cards in the host.	From the main window, click Interfaces on the left-hand side of the window to expand the hierarchical tree., page 3-10
Provision SS7 signaling routes		
Step 1	Add the OPC[1] in your network.	Adding the Origination Point Code, page 3-12
Step 2	Add the DPC[2] to identify the destination switch.	Adding the Destination Point Code, page 3-12
Step 3	Add the APCs[3] to identify the STPs[4] with which the signaling controller communicates signaling information.	Adding the Adjacent Point Codes, page 3-12
Step 4	Add linksets to connect the Cisco SLT[5] to the signal transfer points.	Adding Linksets, page 3-13
Step 5	Add C7 IP links for each SS7 link from the signaling controller to the SS7 network (through the Cisco SLT).	Adding C7 IP Links to Cisco SLTs, page 3-13
Step 6	Add the SS7 subsystem to identify the mated STPs.	Adding the SS7 Subsystem, page 3-17
Step 7	Add the SS7 signaling service from the signaling controller to the destination switch.	Adding SS7 Signaling Services, page 3-18
Step 8	Add the SS7 routes for each signaling path from the signaling controller to the destination switch.	Adding SS7 Routes, page 3-19
Provision NAS[6] links		
Step 1	Add external nodes for the NASs in your network.	Adding NAS External Nodes, page 3-21
Step 2	Add NAS signaling services for each NAS.	Adding NAS Signaling Services, page 3-22
Step 3	Add IP links for each NAS to each Ethernet card in the SC host.	Adding IP Links, page 3-22
Provision trunks		

	Step	Section and Page
Step 1	Start a trunk provisioning session and add individual trunks from each NAS to the signaling controller.	Adding Trunks, page 3-25
Provision screening:		
Step 1	Provision white list screening.	Provisioning White and Black List Screening, page 3-28

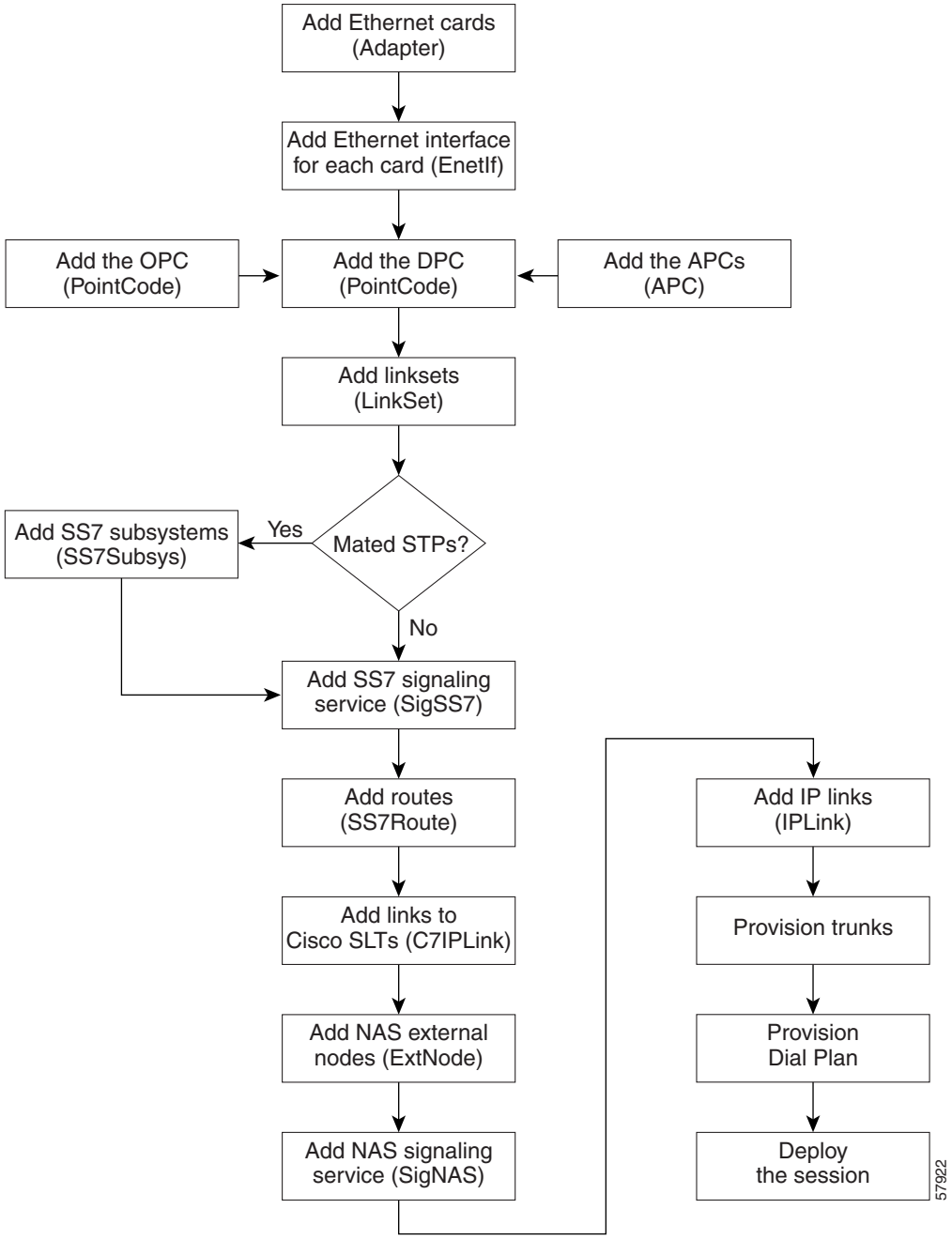
Deploy the session.

1. OPC = origination point code
2. DPC = destination point code
3. APCs = adjacent point codes
4. STPs = signal transfer points
5. Cisco SLT = Cisco Signaling Link Terminal
6. NAS = network access server

Note Trunk groups and trunk routing are not used in the Cisco SS7 Interconnect for Voice Gateways Solution. This solution uses nailed trunks between the voice gateways and the PSTN switch. The signaling controller does not perform trunk group selection in this solution.

Figure 3-2 shows a flow chart of the provisioning steps discussed in this chapter. After the component, the VSPT name of the component is shown in parenthesis.

Figure 3-2 Provisioning Steps



Provisioning Worksheet

Table 3-1 shows a provisioning worksheet for the sample configuration shown in this chapter.

Note For more information on the individual fields, refer to the *Cisco Media Gateway Controller Software Release 7 MML Command Reference Guide*.

Table 3-1 Provisioning Worksheet

Component	Parent Component	MML Name	Description	Parameters
Ethernet card	None	encard1	Ethernet card 1	Card slot: 0
Ethernet card	None	encard2	Ethernet card 2	Card slot: 1
Ethernet interface	encard1	enetif1	Ethernet interface for encard1	None
Ethernet interface	encard2	enetif2	Ethernet interface for encard2	None
OPC	None	opc	Origination point code	• Network address: 171.1.4 • Network indicator: National Network
DPC	None	dpc1	DPC of PSTN Switch A	• Network address: 171.1.3 • Network indicator: National Network
APC	None	apc1	APC for STP A	• Network address: 171.16.1 • Network indicator: National Network
APC	None	apc2	APC for STP B	• Network address: 171.16.2 • Network indicator: National Network
Linkset	apc1	ls01	Linkset from signaling controller to STP A	• Protocol family: SS7-ANSI • Transport type: IP
Linkset	apc2	ls02	Linkset from signaling controller to STP B	• Protocol family: SS7-ANSI • Transport type: IP
C7 IP link	ls01	c7iplnk1	Link 1 in Linkset 1	• Enet Line Interface: enetif1 • Port: 5000 • Priority: 1 • Peer address: 175.30.241.27 • IP address: IPAddr1 • SLT slot: 0 • SLC: 0

Table 3-1 Provisioning Worksheet (continued)

Component	Parent Component	MML Name	Description	Parameters
C7 IP link	ls01	c7iplnk2	Link 2 in Linkset 1	• Enet Line Interface: enetif1 • Port: 5000 • Priority: 1 • Peer address: 175.30.238.28 • IP address: IPAddr2 • SLT slot: 0 • SLC: 1
C7 IP link	ls02	c7iplnk3	Link 1 in Linkset 2	• Enet Line Interface: enetif2 • Port: 5000 • Priority: 1 • Peer address: 175.30.241.27 • IP address: IPAddr1 • SLT slot: 0 • SLC: 0
C7 IP link	ls02	c7iplnk4	Link 2 in Linkset 2	• Enet Line Interface: enetif2 • Port: 5000 • Priority: 1 • Peer address: 175.30.238.28 • IP address: IPAddr2 • SLT slot: 0 • SLC: 1
SS7 subsystem	• apc1 • apc2	subsys1	Route Between STP A and STP B	• Adjacent point code: apc1 • Mated adjacent point code: apc2 • Protocol Family: SS7-ANSI • STP-SCP index: 0 • Transport protocol: SCCP
SS7 signaling service	dpc1	ss7sigsvc	SS7 Service to PSTN Switch A	• MDO File Name: ANSISS7_STANDARD • Customer Group ID: D123 • Customer Group Table: 0101 • Side: Network
SS7 route	• dpc1 • ls01 • opc	ss7route1	Route 1 to PSTN Switch A through LS1	• Destination PC: dpc1 • Linkset: ls01 • Originating PC: opc • Priority: 1

Table 3-1 Provisioning Worksheet (continued)

Component	Parent Component	MML Name	Description	Parameters
SS7 route	• dpc1 • ls02 • opc	ss7route2	Route 2 to PSTN Switch A through LS2	• Destination PC: dpc1 • Linkset: ls02 • Originating PC: opc • Priority: 1
NAS external node	None	nas1	NAS 1	MGCP Domain: nas1 DS1 Type: T1 IP Addr1: 175.30.241.2
NAS external node	None	nas2	NAS 2	MGCP Domain: nas2 DS1 Type: T1 IP Addr1: 175.30.241.3
NAS external node	None	nas3	NAS 3	MGCP Domain: nas3 DS1 Type: T1 IP Addr1: 175.30.241.4
NAS signaling service	nas1	signas1	Signaling service for NAS 1	MDO file name: BELL_1268_C3
NAS signaling service	nas2	signas2	Signaling service for NAS 2	MDO file name: BELL_1268_C3
NAS signaling service	nas3	signas3	Signaling service for NAS 3	MDO file name: BELL_1268_C3
	Note The IP links are used for the Redundant Link Manager (RLM), not for carrying call data.			
IP link	signas1	signas1-1	IP link for NAS 1 to Ethernet IF 1	Enet line interface: enetif1 Port: 3001 Priority: 1 Peer address: 175.30.241.2 Peer port: 3001 IP address: IPAddr1 Signal slot: 0 Signal port: 0

Table 3-1 Provisioning Worksheet (continued)

Component	Parent Component	MML Name	Description	Parameters
IP link	signas1	signas1-2	IP link for NAS 1 to Ethernet IF 2	Enet line interface: enetif2 Port: 3001 Priority: 1 Peer address: 175.30.238.2 Peer port: 3001 IP address: IPAddr2 Signal slot: 0 Signal port: 0
IP link	signas2	signas2-1	IP link for NAS 2 to Ethernet IF 1	Enet line interface: enetif1 Port: 3001 Priority: 1 Peer address: 175.30.241.3 Peer port: 3001 IP address: IPAddr1 Signal slot: 0 Signal port: 0
IP link	signas2	signas2-2	IP link for NAS 2 to Ethernet IF 2	Enet line interface: enetif2 Port: 3001 Priority: 1 Peer address: 175.30.238.3 Peer port: 3001 IP address: IPAddr2 Signal slot: 0 Signal port: 0

Table 3-1 Provisioning Worksheet (continued)

Component	Parent Component	MML Name	Description	Parameters
IP link	signas3	signas3-1	IP link for NAS 3 to Ethernet IF 1	Enet line interface: enetif1 Port: 3001 Priority: 1 Peer address: 175.30.241.4 Peer port: 3001 IP address: IPAddr1 Signal slot: 0 Signal port: 0
IP link	signas3	signas3-2	IP link for NAS 3 to Ethernet IF 2	Enet line interface: enetif2 Port: 3001 Priority: 1 Peer address: 175.30.238.4 Peer port: 3001 IP address: IPAddr2 Signal slot: 0 Signal port: 0

Before You Begin

Log in to the signaling controller and start the VSPT as described in *Cisco Media Gateway Controller Software Release 7 Provisioning Guide*.

Note Many procedures in this chapter refer to sections in *Cisco Media Gateway Controller Software Release 7 Provisioning Guide* or the *Cisco Media Gateway Controller Software Release 7 Dial Plan Guide*. Keep these books handy when performing the procedures in this chapter.

Adding Ethernet Cards and Interfaces

You must add a card component for each card in the signaling controller. For the example in this chapter, you add one Ethernet card for each connection to the IP network—one card for the 10-Mb signaling network and one for the 100-Mb signaling network. These cards permit SS7 signaling between the signaling controller and the Cisco SLTs.

The Ethernet interface provides the physical line interface between the signaling controller's Ethernet card and the physical Ethernet network. You must add an Ethernet interface if you have added an Ethernet card.

Note You must provision the card before provisioning the card interfaces.

Note You provision only one set of cards for one signaling controller (the primary), even though both signaling controllers are highlighted.

To add Ethernet cards and interfaces, perform the following steps:

Step 1 From the main window, click **Interfaces** on the left-hand side of the window to expand the hierarchical tree.

Step 2 Enter the MML name for the card, *encard1*, in the **Name** field.

Step 3 Enter the interface name, *enetif1*, in the **Interface Name** field.

Step 4 Select the card slot, *0*, from the **Card Slot** pull-down menu.

Step 5 Click **Add**. The hierarchical tree on the left of the screen changes to reflect the card you added.

Step 6 Click the name of the interface, *enetif1*, that is associated with the card you just added.

Step 7 Enter the MML name for the Ethernet interface, *enetif1*, in the **Name** field.

Step 8 Enter the description, *Ethernet interface for Card 1*, in the **Description** field.

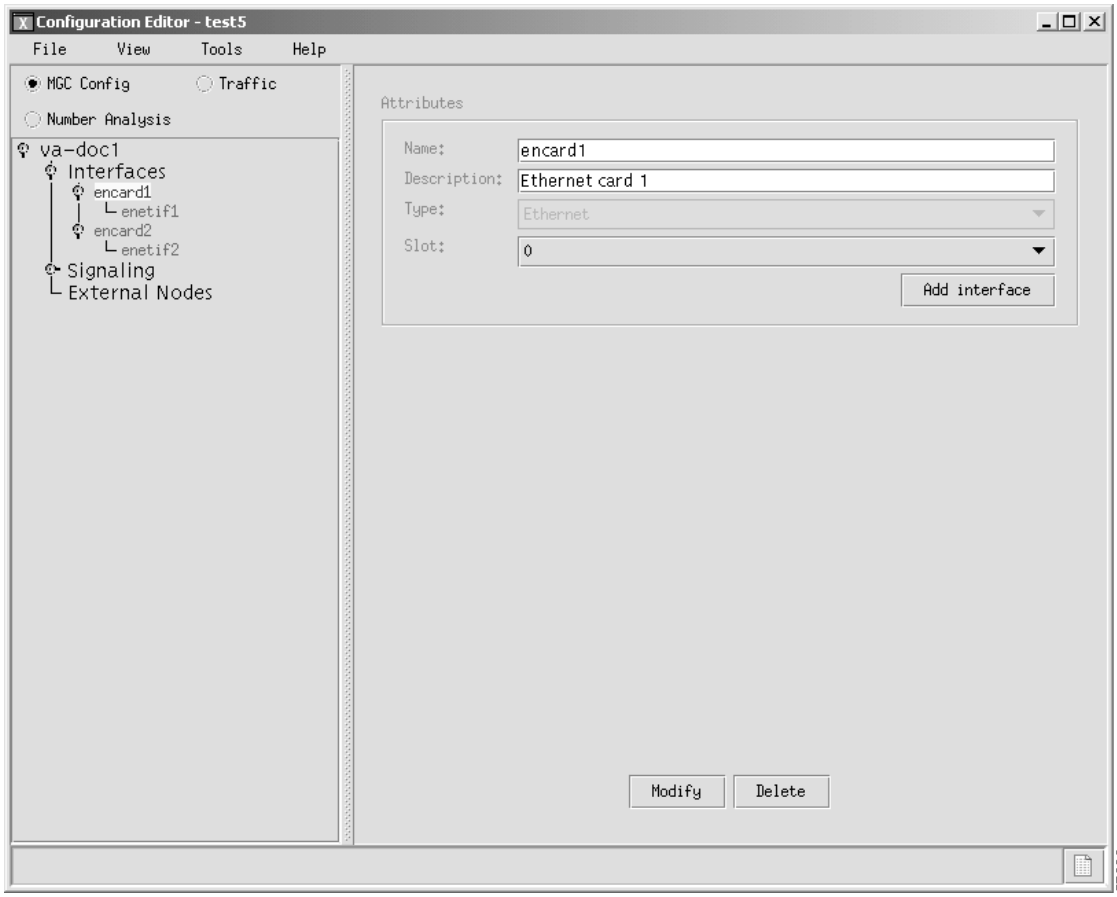
Step 9 Select *encard1* from the **Card** pull-down menu.

Step 10 Click **Add**.

Step 11 Repeat steps 1 through 10 to add the card and interface for your second Ethernet card (encard2).

Figure 3-3 gives an example of what the VSPT window looks like after you configure the Ethernet cards and interfaces.

Figure 3-3 Ethernet Cards and Interfaces



Provisioning SS7 Signaling Routes

The SS7 signaling route is the path from the Cisco SC host to a service switching point (SSP) through the Cisco SLTs and signal transfer points (STPs). In the sample configuration in this chapter, the SSP is the PSTN switch. When you provision the SS7 signaling routes, you add the following components:

- OPC—Origination point code or the point code of the signaling controller in your network
- DPC—Destination point code or the point code of the PSTN switch A to which you are connecting
- APCs—Adjacent point codes or the point codes of the adjacent STPs
- Linksets
- SS7 subsystems (to identify mated STPs)
- SS7 routes
- SS7 signaling services

For more information on configuring SS7 signaling routes, see *Cisco Media Gateway Controller Software Release 7 Provisioning Guide*.

Adding the Origination Point Code

A point code is an SS7 network address that identifies an SS7 network node, such as a switch, STP, or SSP.

Note ITU point codes contain 14 bits, and North American point codes contain 24 bits.

Step 1 From the main window, click **Signaling** on the left-hand side of the window to expand the hierarchical tree.

Step 2 Click **Point Codes** in the hierarchical tree.

Step 3 Enter the MML name, *opc*, in the **Name** field

Step 4 Enter the description, *Origination Point Code*, in the **Description** field.

Step 5 Enter the network address, *171.1.4***,** in the **NetAddr** field.

Step 6 Select the network indicator, *National Network***,** from the **NetIndicator** pull-down menu.

Step 7 Click the **Add** button. The hierarchical tree on the left of the window changes to reflect the originating point code you added.

Adding the Destination Point Code

The following procedure shows how to add the point code for the PSTN switch.

Step 1 Click **Point Codes** in the hierarchical tree.

Step 2 Enter the MML name, *dpc1*, in the **Name** field

Step 3 Enter the description, *DPC of PSTN Switch A*, in the **Description** field.

Step 4 Enter the network address, *171.1.3***,** in the **NetAddr** field.

Step 5 Select network indicator, *National Network***,** from the **NetIndicator** pull-down menu.

Step 6 Click the **Add** button. The hierarchical tree on the left of the window changes to reflect the destination point code you added.

Adding the Adjacent Point Codes

The following procedure shows how to add the adjacent point codes for the STPs.

Note The sample configuration in this chapter uses A-links from the STPs for signaling to the Cisco SLTs. If you have a configuration where F-links come directly from the SSP to the Cisco SLTs, you do not need to add APCs.

Step 1 Click **APCs** in the hierarchical tree.

Step 2 Enter the MML name, *apc1*, in the **Name** field

Step 3 Enter the description, *APC for STP A*, in the **Description** field.

Step 4 Enter the network address, *171.16.1***,** in the **NetAddr** field.

Step 5 Select the network indicator, *National Network***,** from the **NetIndicator** pull-down menu.

Step 6 Click **Add**. The hierarchical tree on the left of the window changes to reflect the APC you added.

Step 7 Repeat steps 1 though 6 to add a second APC, entering *apc2* for the name, *APC for STP B* for the description, and *171.16.2* for the network address.

Adding Linksets

A linkset is a logical set of one or more links originating from an SS7 node (STP) and connecting to an adjacent node. In this example, the linkset contains communication links that join the signaling controller to an adjacent STP.

You must provision one linkset for each connection through the STP to the signaling controller.

Step 1 Click **Linksets** in the hierarchical tree.

Step 2 Enter the MML name, *ls01*, in the **Name** field.

Step 3 Enter the description, *Linkset from signaling controller to STP A*, in the **Description** field.

Step 4 Select the *apc1* component you provisioned in the "Adding the Adjacent Point Codes" section on page 3-12 in the **APC** pull-down menu.

Step 5 Select *SS7-ANSI* from the **Protocol** pull-down menu.

Step 6 Select *IP* from the **Type** pull-down menu.

Step 7 Click **Add**. The hierarchical tree on the left of the window changes to reflect the linkset you added.

Step 8 Repeat steps 1 through 7 to add a linkset from the signaling controller to STPB, choosing the *apc2* component and changing the MML name and description accordingly.

Note After creating the linksets, you must create the C7 IP links for each linkset. See "Adding C7 IP Links to Cisco SLTs" section on page 3-13.

Adding C7 IP Links to Cisco SLTs

A C7 IP link component identifies a link between a Cisco SLT's IP address and port and the SS7 network (SSP or STP). The C7 IP link component identifies one of the links within a linkset.

Note Use C7 IP links only when your configuration has Cisco SLTs that carry SS7 signaling to the signaling controller over IP. If your configuration does not include Cisco SLTs and your links from the STPs terminate directly into ITK cards in the signaling controller, you must provision TDM links for the ITK cards. For example, the Cisco SS7 Dial Access Solution Release 2.0 uses ITK cards and TDM links.

You must add a C7 IP link for each physical SS7 link that is connected to the SS7 network through the Cisco SLT. These links correspond to the linksets you created in the "Adding Linksets" section on page 3-13.

Adding Links for Linkset 1

Adding the First Link

You must add two links for linkset 1. To add the first link:

Step 1 Click **Signaling**, then **Linksets**. Under Linksets, click **Links** under the listing for *ls01* (a linkset you created in the "Adding Linksets" section on page 3-13).

Step 2 Enter the MML name of the link, *c7iplink1*, in the **Name** field.

Step 3 Enter the description, *Link 1 in Linkset 1*, in the **Description** field.

Step 4 Select the Ethernet interface, *enetif1*, from the **Interface** pull-down menu. (You provisioned the Ethernet interfaces for each Ethernet card in the "From the main window, click Interfaces on the left-hand side of the window to expand the hierarchical tree." section on page 3-10.)

Step 5 Select *IP_Addr1* from the **IP Addr** pull-down menu.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 6 Enter the port number, *5000***,** in the **Port** field. This is the UDP port on the signaling controller. You can use any unused UDP port number, but do not use 1 through 1024 (these are reserved for other applications).

Step 7 Select the priority, *1*, from the **Priority** field.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 8 Enter the IP address of SLT A, *175.30.241.27*, in the **Peer Address** field.

Note You do not need to enter a peer port value because the actual peer port value is found in the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 9 Select the signaling link code (SLC), *0*, from the **SLC** pull-down menu. This is the SLC for the line between the Cisco SLT and the STP.

Step 10 Select the physical port on the Cisco SLT, *0,* in the **Time Slot** pull-down menu.

Note The time slot number must be unique for a given link on a particular Cisco SLT. For example, if you have a 2T WAN interface card (WIC) in slot 0 of the Cisco SLT, you can use time slot value 0 or 1 for the first link you provision. The second link on that WIC uses the remaining value.

Step 11 Click **Add**. The hierarchical tree on the left of the window changes to reflect the C7 IP link you added.

Adding the Second Link

To add the second link:

Step 1 Click **Links** under the listing for *ls01* (a linkset you created in the "Adding Linksets" section on page 3-13).

Step 2 Enter the MML name of the link, *c7iplink2*, in the **Name** field.

Step 3 Enter the description, *Link 2 in Linkset 1*, in the **Description** field.

Step 4 Select the Ethernet interface, *enetif1*, from the **Interface** pull-down menu. (You provisioned the Ethernet interfaces for each Ethernet card in the "From the main window, click Interfaces on the left-hand side of the window to expand the hierarchical tree." section on page 3-10.)

Step 5 Select *IP_Addr2* from the **IP Addr** pull-down menu.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 6 Select the priority, *1*, from the **Priority** field.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 7 Enter the IP address of SLT B, *175.30.238.28*, in the **Peer Address** field.

Note You do not need to enter a peer port value because the actual peer port value is found in the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 8 Select the signaling link code (SLC), *1*, from the **SLC** pull-down menu. This is the SLC for the line between the Cisco SLT and the STP.

Step 9 Select the physical port on the Cisco SLT, *0,* in the **Time Slot** pull-down menu.

Note The time slot number must be unique for a given link on a particular Cisco SLT. For example, if you have a 2T WAN interface card (WIC) in slot 0 of the Cisco SLT, you can use time slot value 0 or 1 for the first link you provision. The second link on that WIC uses the remaining value.

Step 10 Click **Add**. The hierarchical tree on the left of the window changes to reflect the C7 IP link you added.

Adding Links for Linkset 2

Adding the First Link

You must add two links for linkset 2. To add the first link:

Step 1 Click **Links** under the listing for *ls02* (a linkset you created in the "Adding Linksets" section on page 3-13).

Step 2 Enter the MML name of the link, *c7iplink3*, in the **Name** field.

Step 3 Enter the description, *Link 1 in Linkset 2*, in the **Description** field.

Step 4 Select the Ethernet interface, *enetif2*, from the **Interface** pull-down menu. (You provisioned the Ethernet interfaces for each Ethernet card in the "From the main window, click Interfaces on the left-hand side of the window to expand the hierarchical tree." section on page 3-10.)

Step 5 Select *IP_Addr1* from the **IP Addr** pull-down menu.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 6 Select the priority, *1*, from the **Priority** field.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 7 Enter the IP address of SLT A, *175.30.241.27*, in the **Peer Address** field.

Note You do not need to enter a peer port value because the actual peer port value is found in the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 8 Select the signaling link code (SLC), *0*, from the **SLC** pull-down menu. This is the SLC for the line between the Cisco SLT and the STP.

Step 9 Select the physical port on the Cisco SLT, *0,* in the **Time Slot** pull-down menu.

Note The time slot number must be unique for a given link on a particular Cisco SLT. For example, if you have a 2T WAN interface card (WIC) in slot 0 of the Cisco SLT, you can use time slot value 0 or 1 for the first link you provision. The second link on that WIC uses the remaining value.

Step 10 Click **Add**. The hierarchical tree on the left of the window changes to reflect the C7 IP link you added.

Adding the Second Link

To add the second link:

Step 1 Click **Links** under the listing for *ls02* (a linkset you created in the "Adding Linksets" section on page 3-13).

Step 2 Enter the MML name of the link, *c7iplink4*, in the **Name** field.

Step 3 Enter the description, *Link 2 in Linkset 2*, in the **Description** field.

Step 4 Select the Ethernet interface, *enetif2*, from the **Interface** pull-down menu. (You provisioned the Ethernet interfaces for each Ethernet card in the "From the main window, click Interfaces on the left-hand side of the window to expand the hierarchical tree." section on page 3-10.)

Step 5 Select *IP_Addr2* from the **IP Addr** pull-down menu.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 6 Select the priority, *1*, from the **Priority** field.

Note To enable loadsharing, use the same priority (1) for each C7 IP link. Traffic is routed equally over the links in case of failure.

Step 7 Enter the IP address of SLT B, *175.30.238.28*, in the **Peer Address** field.

Note You do not need to enter a peer port value because the actual peer port value is found in the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 8 Select the signaling link code (SLC), *1*, from the **SLC** pull-down menu. This is the SLC for the line between the Cisco SLT and the STP.

Step 9 Select the physical port on the Cisco SLT, *0,* in the **Time Slot** pull-down menu.

Note The time slot number must be unique for a given link on a particular Cisco SLT. For example, if you have a 2T WAN interface card (WIC) in slot 0 of the Cisco SLT, you can use time slot value 0 or 1 for the first link you provision. The second link on that WIC uses the remaining value.

Step 10 Click **Add**. The hierarchical tree on the left of the window changes to reflect the C7 IP link you added.

Adding the SS7 Subsystem

You must add an SS7 subsystem that identifies each pair of mated STPs. This allows the signaling controller to route traffic over the C-links in case of a failure between one of the STPs and an endpoint.

Note Adding an SS7 subsystem is optional. The SS7 subsystem is added in this instance because the associated PSTN switch in the example uses a mated pair of STPs.

Step 1 Click **Mated Pairs** in the hierarchical tree.

Step 2 Enter the MML name, *subsys1*, in the **Name** field.

Step 3 Enter the description, *Route Between STP A and STP B*, in the **Description** field.

Step 4 Select the *apc1* component you provisioned in the "Adding the Adjacent Point Codes" section on page 3-12 in the **APC** pull-down menu.

Step 5 Select the *apc2* component you provisioned in the "Adding the Adjacent Point Codes" section on page 3-12 in the **Mated APC** pull-down menu.

Step 6 Select the priority for the mated pair, *3***,** from the **Priority** pull-down menu.

Tip The priority for the SS7 subsystem should always be lower than the priority for the C7 IP links between the signaling controller and the STPs (which you provision in the "Adding C7 IP Links to Cisco SLTs" section on page 3-13). You do not want signaling traffic on the C-links, because they are used only if the F-links go down. If the priority for the C-links (SS7 subsystem) is higher than or equal to the priority for the C7 IP links, the signaling controller routes signaling traffic over those links. If you set the SS7 subsystem priority lower than the priority for the C7 IP links, the signaling controller routes traffic over the C-links between the STPs only if the links with a higher priority are not available.

Step 7 Enter the subsystem number, *0*, in the **Subsystem Number** field. This value is not used when you are identifying mated STPs.

Step 8 Enter *0* in the **STP/SCP Index** field. This value is not used when you are identifying mated STPs.

Step 9 Select *SCCP* from the **Transport Protocol** pull-down menu.

Step 10 Select *SS7-ANSI* from the **Protocol Family** pull-down menu.

Step 11 Click **Add**. The hierarchical tree on the left of the screen changes to reflect the mated pair you added.

Adding SS7 Signaling Services

The SS7 signaling service specifies the path and the protocol variant that the signaling controller uses to communicate with a remote switch (SSP) that is sending bearer traffic to the NASs.

You must add an SS7 signaling service from the signaling controller to the PSTN switch.

Step 1 Click **SS7 Paths** in the hierarchical tree.

Step 2 Enter the MML name, *ss7sigsvc*, in the **Name** field.

Step 3 Enter the description, *SS7 Service to PSTN Switch A*, in the **Description** field.

Step 4 Select the DPC, *dpc1*, (you provisioned dpc1 as your destination point code for the PSTN switch in the "Adding the Destination Point Code" section on page 3-12) from the **Pointcode** pull-down menu.

Step 5 Select the side, *network,* from the **Side** pull-down menu.

Step 6 Select *ANSISS7_STANDARD* as the protocol for this signaling service from the **MDO** pull-down menu.

Step 7 Enter the customer group ID, *D123,* in the **Customer Group ID** field. This is the name of the dial plan file you use for screening. See "Provisioning White and Black List Screening" section on page 3-28.

Note We recommend that you go ahead and provision a customer group ID for your SS7 signaling service, even if you are not planning on currently using the screening tools. This is because once the SS7 signaling service is placed in service, you would have to take it out-of-service to add a customer group ID.

Step 8 Enter the customer group table, *0101,* in the **Customer Group Table** field. This is the name of the dial plan table you use for screening. See "Provisioning White and Black List Screening" section on page 3-28.

Step 9 Click the **Add** button. The hierarchical tree on the left of the screen changes to reflect the SS7 path you have added.

Step 10 After you create the signaling service, click the **Properties** button to modify SS7 signaling service properties that are required for the screening process.

Step 11 Select *ReleaseMode* from the **Name** pull-down menu.

Step 12 Enter *Sync* in the **Value** field.

Step 13 If you are going to provision a dial plan, proceed to Step 14. Otherwise, proceed to Step 20.

Step 14 Select *BOrigStartIndex* from the **Name** pull-down menu.

Step 15 Enter *1* in the **Value** field.

Step 16 Click **Modify** to modify the value of the property.

Step 17 Select *BTermStartIndex* from the **Name** pull-down menu.

Step 18 Enter *2* in the **Value** field.

Step 19 Click **Modify** to modify the value of the property.

Step 20 Click **OK** to save the modified property values.

Adding SS7 Routes

An SS7 route is a path through a linkset between the signaling controller and another signaling controller or TDM switch. In this example, the SS7 routes indicate the linksets that carry SS7 signals between the signaling controller and the PSTN switch A.

You must add an SS7 route for each signaling path from the signaling controller to the PSTN switch A. You provision a route for each linkset.

Step 1 Click **SS7 Routes** in the hierarchical tree.

Step 2 Enter the MML name, *ss7route1*, in the **Name** field.

Step 3 Enter the description, *Route 1 to PSTN Switch A through LS1*, in the **Description** field.

Step 4 Select *opc* (the OPC for the signaling controller that you added in the "Adding the Origination Point Code" section on page 3-12) from the **Originating PC** pull-down menu.

Step 5 Select *dpc1* (the DPC for PSTN Switch A that you provisioned in the "Adding the Destination Point Code" section on page 3-12) from the **Destination PC** pull-down menu.

Step 6 Select *ls01* from the **Linkset** pull-down menu.

Step 7 Enter the priority for this route, *1*, in the **Priority** field.

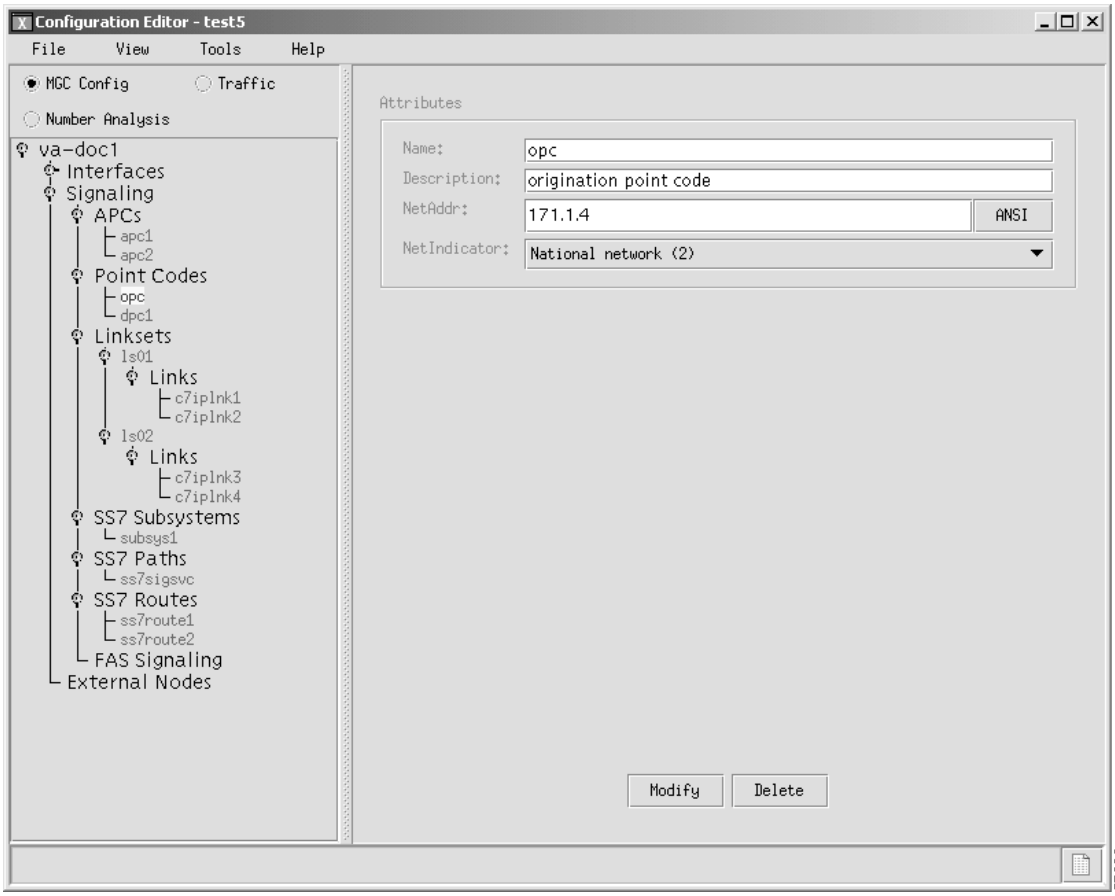
Note Routes can share signaling traffic. You can set loadsharing by making the priorities the same for all routes.

Step 8 Click the **Add** button. The hierarchical tree on the left of the window changes to reflect the SS7 route you added.

Step 9 Repeat steps 1 through 8 to add another route using linkset 2, changing the MML name and description, and selecting *ls02* as the linkset.

Figure 3-4 provides an example of the VSPT window after you have provisioned SS7 signaling route data.

Figure 3-4 SS7 Signaling Route Data



Provisioning NAS Links

NAS links indicate the communication path the signaling controller uses to control the bearer traffic that passes through each NAS.

To add links to the NASs in your network, you must add the following components:

- NAS external node
- NAS signaling service
- IP links

Adding NAS External Nodes

You must add a NAS external node for each voice gateway in your network.

Step 1 From the left-hand side of the main window, click **External Nodes**.

Step 2 Enter the MML name of the NAS, *nas1*, in the **Name** field.

Step 3 Enter the description, *NAS 1*, in the **Description** field.

Step 4 Select the type of NAS, *AS5300*, from the **Type** pull-down menu.

Step 5 Click **Add**.

Step 6 Repeat steps 1 through 5 for *nas2* and *nas3*.

Step 7 Click *nas1* to view the attributes for this NAS on the right side of the window. The hierarchical tree on the left-hand side of the window changes to reflect the addition of an external node (that is, *nas1*).

Step 8 Verify that *nas1* is present in the **Name** field.

Step 9 Verify that *NAS 1* is present in the **Description** field.

Step 10 Verify that *AS5300* is present in the **Type** field.

Step 11 Verify that *nas1* appears in the **MGCP Domain** field. This value should always match the value in the **Name** field.

Step 12 Select *T1* from the **DS1 Type** pull-down menu.

Step 13 Enter *175.30.241.2* in the **IP Addr1** field and *255.255.255.0* in the **IP Subnet Mask1** field. These addresses/subnet mask values must match the values configured on the NAS. It represents the interface used for primary IP connectivity.

Note If used, the IP Addr2 addresses/subnet mask fields must match the secondary IP address values configured on the NAS.

Note The other fields in this window are not used for NASs.

Step 14 Click **Modify** to save the changes.

Step 15 Repeat steps 7 through 14 for each NAS, using *175.30.241.3* as the IP address for *nas2* and *175.30.241.4* as the IP address for *nas3*.

Adding NAS Signaling Services

The procedure in this section shows you how to add a NAS signaling service for each NAS you created in the "Adding NAS External Nodes" section on page 3-21. The NAS signaling service indicates the Q.931 protocol path between the signaling controller and the NASs.

Note It is possible for more than one NAS to use a single NAS signaling service, as long as each NAS is associated with the same DPC.

Step 1 Click on **NAS**, below the *nas1* component. The window displays the NAS signaling service fields.

Step 2 Enter the MML name for the NAS signaling service, *signas1*, in the **Name** field.

Step 3 Enter the description, *Signaling service for NAS1*, in the Description field.

Step 4 Select the protocol, **BELL_1268_C3** from the **MDO** pull-down menu.

Step 5 Click **Add** to add this NAS signaling service.

Step 6 Repeat steps 1 through 5 for each NAS, changing the MML names and descriptions accordingly.

Adding IP Links

You must add an IP link from each NAS to each Ethernet card and interface in the signaling controller. In this example, you provision the following IP links:

- NAS 1 to enetif1
- NAS 1 to enetif2
- NAS 2 to enetif1
- NAS 2 to enetif2
- NAS 3 to enetif1
- NAS 3 to enetif 2

Note If you are provisioning two links from the signaling controller to the same NAS, you need two different Ethernet IP addresses on both the signaling controller and the NAS.

Step 1 Click **Links** below the *signas1* component. You can see that VSPT has already added a link, *signas1-1*, the individual IP link created for this signaling service.

Step 2 Click *signas1-1*. The window displays the fields associated with this IP link.

Step 3 Enter the description, *IP link for NAS1 to Ethernet IF 1*, in the **Description** field.

Step 4 Select the Ethernet interface, enetif1, from the **Interface** pull-down menu. (You provisioned the Ethernet interfaces for each Ethernet card in the "From the main window, click Interfaces on the left-hand side of the window to expand the hierarchical tree." section on page 3-10.)

Step 5 Select *IPAddr1* from the **IP Addr** pull-down menu.

Note The numbered address for this value is found in the XECfgParm.dat file you set up during your initial system configuration. See *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Step 6 Enter the port number, *3001*, in the **Port** field. This is the UDP port on the signaling controller. You can use any unused UDP port number, but do not use 1 through 1024 (these are reserved for other applications).

Step 7 Select the priority, *1*, from the **Priority** pull-down menu.

Note To enable loadsharing, use the same priority (1) for each IP link. Traffic is routed equally over the links in case of failure.

Step 8 Enter the IP address of nas1, *175.30.241.2*, in the **Peer Address** field.

Step 9 Enter the port number, *3001*, in the **Peer Port** field. This is the port on the signaling controller.

Step 10 Click **Add**.

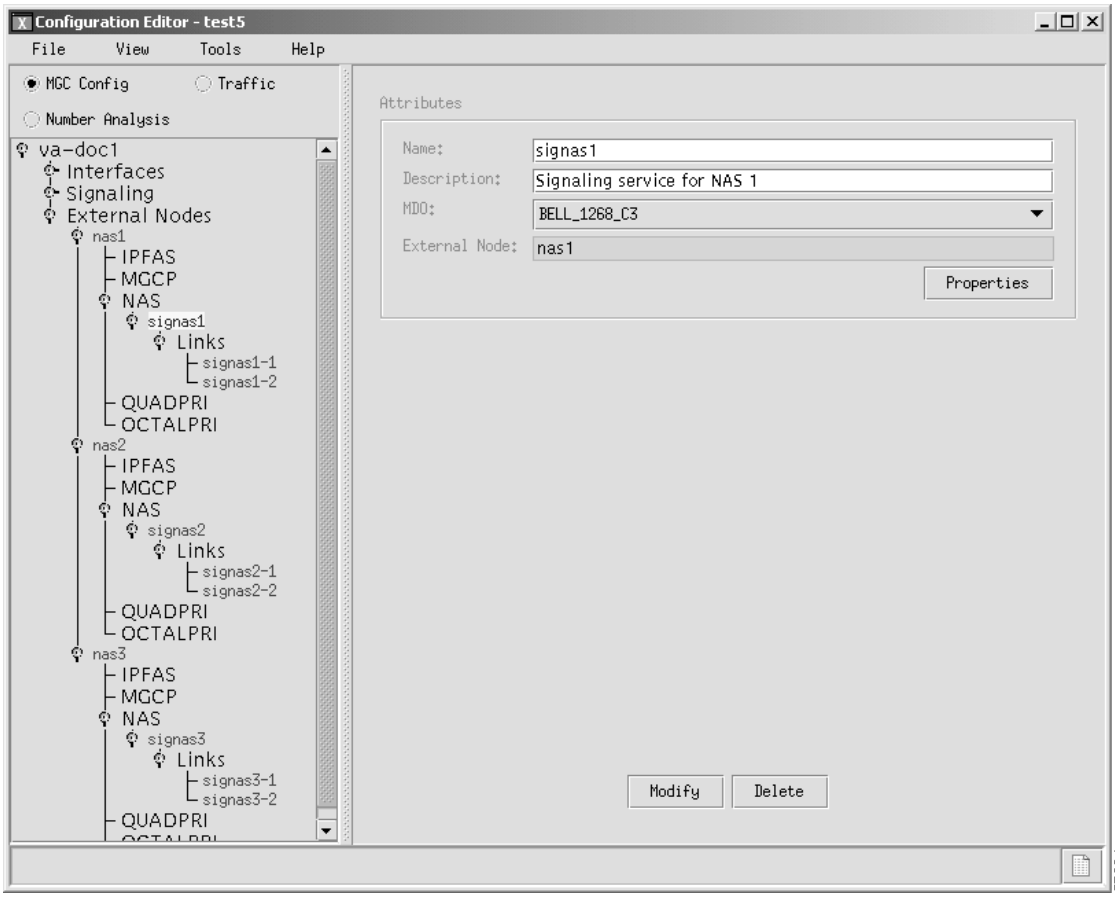
Step 11 Repeat steps 1 through 10 to add the second IP link from NAS 1 to enetif2, changing the MML name, Ethernet interface, and peer address accordingly.

Step 12 Repeat the steps 1 through 11 to add two links from each remaining NAS to the signaling controller, selecting the appropriate IP signaling service and changing the MML name, description, and peer address accordingly.

Note The provisioning example in this section creates two redundant link manager (RLM) links (forming an RLM group) for each NAS. As of Release 7.4(12) of the Cisco MGC software, you can create multiple RLM groups for each NAS. To create multiple RLM groups for each NAS, repeat steps 1 through 11 for each link in each RLM group. Ensure that the IP links in any multiple RLM groups use the following values defined in the associated NAS: the IP address of the loopback interfaces as the peer address value and the port number of the loopback interfaces as the peer port value.

Figure 3-5 illustrates the appearance of the VSPT window after you have provisioned external nodes.

Figure 3-5 NAS Links Provisioned



Provisioning Trunks

You must add trunks for each connection between the NAS and the PSTN switch. NAS 1 has four T1 lines, NAS 2 has four T1 lines, and NAS 3 has three T1 lines. Each T1 contains 24 trunks, or DS0s. For the examples in this section, you must provision 264 trunks (96 for NAS1, 96 for NAS2, and 72 for NAS3).

Note If you have already provisioned the spans on the NAS to be associated with these trunks, you must remove these spans from service on the NAS using the **shutdown** command, before you provision the trunks on the Cisco SC2200.

Adding Trunks

Note The values used for the destination span ID in the following examples are sample values. The real values for this parameter would match whichever PRI port the T1 is connected to on the NAS. Valid values are 0 through 3.

To add trunks, perform the following steps:

Step 1 Click the **Traffic** radio button the top of the left panel, click the **Trunks** component and then highlight the **Traffic** component type. The DAS Confirm dialog box opens, which asks you if this configuration is for a Dial Access Solution.

Step 2 Click **Yes** in the DAS Confirm dialog box. The Trunk Groups and Routing component types are removed from the left Traffic panel. Only Trunks remain.

Step 3 Highlight **Trunks** in the left panel. A corresponding properties panel appears on the right side of the window.

Step 4 Click **Add** to add trunks. The right panel displays fields associated with trunks.

Step 5 Select the signaling service, *ss7sigsvc*, from the **Source Signaling Service** pull-down menu**.** (You created this signaling service in the "Adding SS7 Signaling Services" section on page 3-18.)

Step 6 Select the NAS signaling service, signas1, from the **Destination Signaling Service** pull-down menu. (You created this service in the "Adding NAS Signaling Services" section on page 3-22.)

Step 7 Select *T1* from the **DS1 Type** pull-down menu. This indicates you are using the North American T1 facility.

Step 8 Enter a trunk ID, *1*, in the **First Trunk ID** field.

Note Each trunk ID must be a unique number. This number is used by the Cisco MGC for tracking.

Step 9 Enter the first CIC number for this trunk, *1*, in the **First Source CIC** field.

Note This value must match the number of the CIC you are connecting to on the far-end.

Step 10 Enter the first destination span for this trunk, *0*, in the **First Destination Span** field.

Note This value is the controller on the media gateway that are used by these trunks.

Step 11 Enter the first timeslot for this trunk, *1*, in the **First Timeslot** field.

Step 12 Enter the number of trunks you want to add, *24*, in the **Number of Trunks to Add** field.

Step 13 Click **Finish** to add the trunks. The properties panel updates to display a table of the 24 trunks you just created on Span 0.

After creating the trunks for the first T1, you must repeat the process to add trunks for the second, third, and fourth T1 that are connected to NAS1:

Step 1 To add 24 more trunks for the span 1 going to nas1, click on **Add**. The properties panel now displays the previous properties where you can indicate the Source and Destination signaling services.

Step 2 Enter a trunk ID, *25*, in the **First Trunk ID** field.

Step 3 Enter the first CIC number for this trunk, *25*, in the **First Source CIC** field.

Step 4 Enter the number of trunks you want to add, *24*, in the **Number of Trunks to Add** field.

Step 5 Click **Finish** to add the trunks. The properties panel updates to display a table of the 24 trunks you just created on Span 1.

The system creates 24 trunks for this T1, automatically incrementing the Trunk ID each time.

Add the trunks for the third T1:

Step 1 To add 24 more trunks for the span 2 going to nas1, click on **Add**. The properties panel now displays the previous properties where you can indicate the Source and Destination signaling services.

Step 2 Enter a trunk ID, *49*, in the **First Trunk ID** field.

Step 3 Enter the first CIC number for this trunk, *49*, in the **First Source CIC** field.

Step 4 Enter the number of trunks you want to add, *24*, in the **Number of Trunks to Add** field.

Step 5 Click **Finish** to add the trunks. The properties panel updates to display a table of the 24 trunks you just created on Span 2.

The system creates 24 trunks for this T1, automatically incrementing the Trunk ID each time.

Add the trunks for the fourth T1:

Step 1 To add 24 more trunks for the span 3 going to nas1, click on **Add**. The properties panel now displays the previous properties where you can indicate the Source and Destination signaling services.

Step 2 Enter a trunk ID, *73*, in the **First Trunk ID** field.

Step 3 Enter the first CIC number for this trunk, *73*, in the **First Source CIC** field.

Step 4 Enter the number of trunks you want to add, *24*, in the **Number of Trunks to Add** field.

Step 5 Click **Finish** to add the trunks. The properties panel updates to display a table of the 24 trunks you just created on Span 3.

The system creates 24 trunks for this T1, automatically incrementing the Trunk ID.

After you have created trunks for the four T1s that terminate at NAS1, you must add trunks for the four T1s that terminate at NAS2 and the three T1s that terminate at NAS3. Follow the previous instructions but make the changes outlined in Table 3-2 and Table 3-3.

Table 3-2 NAS2 Trunks

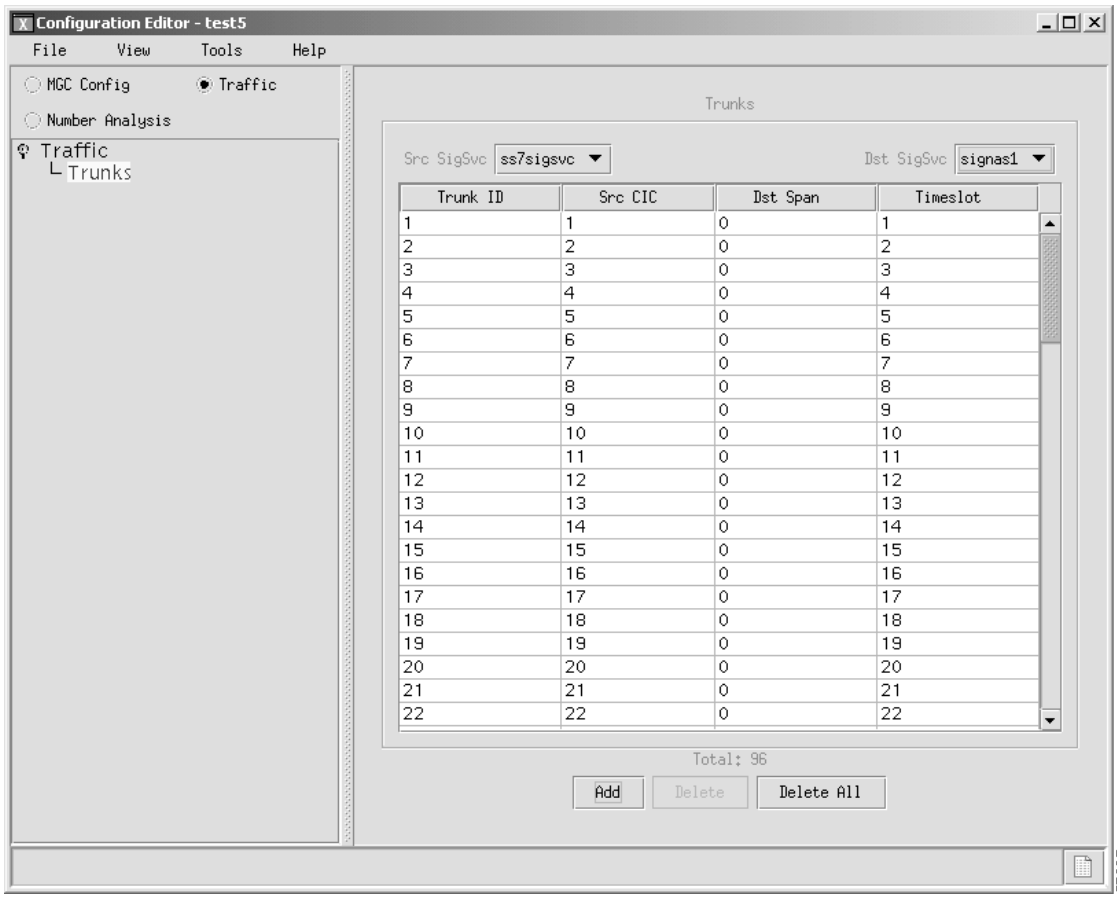
Field	Span 1 Value	Span 2 Value	Span 3 Value	Span 4 Value
First Trunk ID	97	121	145	169
Source CIC	97	121	145	169

Table 3-3 NAS3 Trunks

Field	Span 1 Value	Span 2 Value	Span 3 Value
Trunk ID	193	217	241
Source Time Slot/CIC	193	217	241

Figure 3-6 provides an example of the VSPT window after trunks are provisioned.

Figure 3-6 Trunk Data



Note If you have already provisioned the spans on the NAS to be associated with these trunks, you can now return those spans to service on the NAS using the **no shutdown** command.

Provisioning the Dial Plan/Number Analysis

The signaling controller provides the ability to create a dial plan to perform number analysis on both the A (calling) number and B (called) number. You can set up dial plans to perform routing, send calls to announcement servers, modify dialed digits, and perform other results.

You do not use the advanced features in the dial plan for the Cisco SS7 Interconnect for Access Servers Solution and the Cisco SS7 Interconnect for Voice Gateways Solution. In these solutions, the signaling controller routes calls directly over the IP network and does not perform routing or switching to trunk groups.

Provisioning White and Black List Screening

In the Cisco SS7 Interconnect for Access Servers Solution, you might want to perform white and black list screening to include or exclude calls from certain numbers. You can provision white lists that specify allowed A-numbers (calling numbers) or B-numbers (called numbers). Black lists block specified A-numbers (calling numbers) or B-numbers (called numbers).

The VSPT allows you to enter numbers that are collected in a batch file. When you set the white or black list file and the file is post-processed, the commands in the file are applied to the black and white list databases. For example, if you added numbers to the white list, the numbers are inserted into the database when the file is post-processed.

Note Because the VSPT white and black list provisioning is done by batch file, adding or removing a row during the provisioning session does not mean the row has been added to or removed from the database.

Sample Scenario

This section provides procedures for provisioning a sample B white list. In this scenario, assume that a company offering dialup service has two telephone numbers: one for regular customers and one for reduced-rate customers. Regular customers call (703) 484-3000 for dialup service. Reduced-rate customers call (703) 484-6000 and receive discount rates; for example, they could pay a monthly fee in exchange for cheaper per-minute charges. So the company wants to analyze calls made to (703) 484-6000 and route calls to the IP network only if they are from reduced-rate customers, or those customers on the white list. The SC host uses a dial plan result of screening to screen the A-number to see if the call is permitted.

Configuring the B White List

To configure a B white list, perform the steps in the following sections:

- “Setting Number Analysis Properties” section on page 3-29
- “Creating the Dial Plan File” section on page 3-29
- “Setting the Screening Data” section on page 3-29
- “Adding Calling Numbers to the B-Number White List File” section on page 3-29
- “Setting the Service Name” section on page 3-30
- “Adding the Screening Result Set and Result” section on page 3-31
- “Adding the Called Number” section on page 3-31

These events occur during the screening:

1. Calls are made to (703) 484-6000.
2. The SC host receives a call and performs analysis based on the called number.

3. As a result of analysis, the SC host sees that calls directed to that number must be screened for the calling party number (A-number).
4. The SC host checks the A-number against the B white list to see if the calling party is authorized.
5. If the calling party does appear in the B white list database, the call is put through.
6. If the calling party does not appear in the B white list database, the call is disconnected.

Setting Number Analysis Properties

Before you set up the screening, make sure you have set number analysis properties for your SS7 signaling services. You set these properties in "Adding SS7 Signaling Services" section on page 3-18. These values are:

- BOrigStartIndex: **1**
- BTermStartIndex: **2**
- CustomerGroupID: **D123**

Creating the Dial Plan File

Perform the following steps to create the dial plan file:

Step 1 From the main provisioning window, click the **Number Analysis** button.

Step 2 In the left-hand pane of the main provisioning window, click **Number Analysis**.

Step 3 Enter the customer group ID, *D123*, in the **Customer Group ID** field.

Step 4 Click the **Add** button. The customer group ID you entered appears underneath the **Number Analysis** component.

Setting the Screening Data

Perform the following steps to create the white list file:

Step 1 To display the call screening window, click the **D123**, **Results**, and **Screening** components on the left-hand side of the window.

Step 2 Select *BWHITE* from the **File Type** pull-down menu.

Step 3 Enter the file name, *D123.bwhite*, in the **File name** field.

Step 4 Click the **Add** button. The Screening file is added to the hierarchical tree on the left-hand side of the window.

Adding Calling Numbers to the B-Number White List File

Perform the following steps to add A-numbers to the B-number white list:

Step 1 Click the **BWHITE** component below the Screening component on the left-hand side of the window.

Step 2 Click the **Edit File** button to edit the *D123.bwhite* file. A dialog box opens asking you if want to create the D123.bwhite file.

Step 3 Click **Yes** and a text file editor window displays.

Step 4 Click on the **Edit** menu and select **Add new numbers** to add calling numbers to the text file. A dialog box is displayed.

Step 5 Enter calling numbers into the New Numbers field. Each number is separated by a comma, without a space.

For example, three calling numbers would be entered in the following format:

The first line of your file should entered as follows:

```
7035552222,7035551245,7035554567
```

Step 6 Enter the service name, *onerate*, in the **Service Name** field.

Step 7 Click **OK** once you have finished entering data for the calling numbers. The data for the calling numbers is added to the file.

Step 8 Save and exit from the text file editor.

Setting the Service Name

To set up the service name, perform the following steps:

Step 1 To display the service name window, click the **Service** component underneath the **Results** component on the left-hand side of the window.

Step 2 Click the **Add** button. A dialog box is displayed.

Step 3 Enter the service name, *onerate*, in the **Service Name** field.

Step 4 Click **OK** to save the service name.

Adding the Screening Result Set and Result

Perform the following steps to add a result set and result of screening:

Step 1 To display the result set window, click the **Resultset** component underneath the **Results** component on the left-hand side of the window.

Step 2 Click the **Add** button. The Add Result Set dialog box is displayed.

Step 3 Enter *1ratescreen* in the **Result Set Name** field and click **OK**. The result name is added to the window.

Step 4 To define the result type that you want the dialed digits to produce during number analysis, select the *1ratescreen* result set you just added and click the **Add** button at the bottom of the window. A dialog box is displayed.

Step 5 Enter the name of the result, *1ratescreen*, in the **Result Name** field.

Step 6 Select the result type, *SCREENING*, from the **Result Type** pull-down menu. The fields at the bottom of the window change to reflect the data necessary for screening.

Step 7 Ensure that the value in the **Screen type** pull-down menu is *1* (for white list screening).

Step 8 Select the service name, *onerate*, from the **Service name** pull-down menu.

Step 9 Click **OK**. The dialog box closes.

Adding the Called Number

Perform the following steps to add the called number to the database:

Step 1 Click the **Triggers** and the **Bdigtree** components on the left-hand side of the window to display the B digit tree window.

Step 2 Click the **Add** button. The Add Bdigtree dialog box is displayed.

Step 3 Enter *7034846000* in the **Digit String** field.

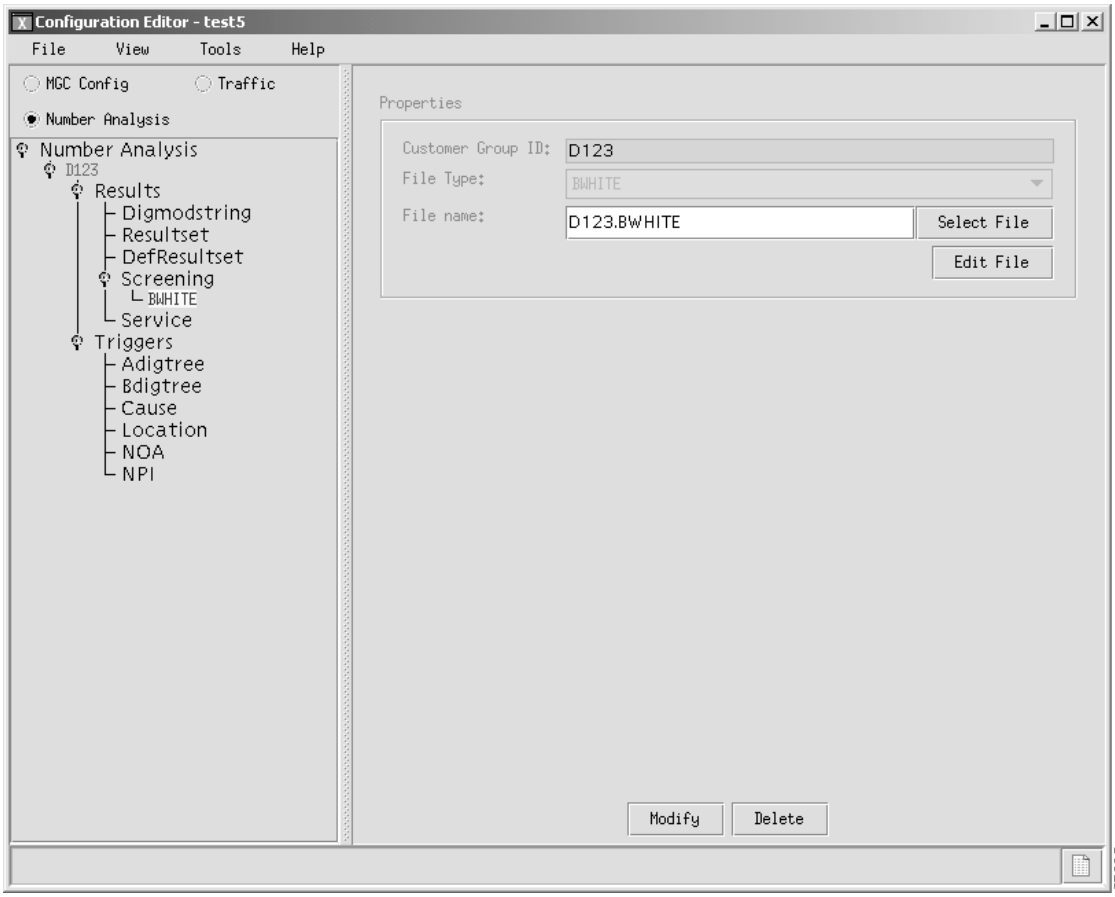
Step 4 Ensure that the **Call side** pull-down menu is set to *originating*.

Step 5 Select *1ratescreen* in the **Result Set** pull-down menu.

Step 6 Click **OK**. The dialog box closes and the information for the called number is added to the window.

Figure 3-7 provides an example of the VSPT window after a dial plan has been provisioned.

Figure 3-7 Dial Plan Data



Deploying the Session

The example used in this chapter features a continuous-service SC node. You must deploy the session to save it to the machine you are provisioning. The system then copies the files to the standby SC node.

To deploy the session:

Step 1 From the **Tools** menu, select **Deploy**. A dialog box is displayed.

Step 2 Enter the configuration name on the destination Cisco MGC.

You can click **VSC View** to browse the target Cisco MGC. This lets you avoid duplicating a configuration name that already exists on your Cisco MGC.

Step 3 Indicate how you want to deploy the configuration:

- If you want to send the configuration to the Cisco MGC but not activate it, click the button next to **Send Configuration to VSC Only**.
- If you want to send the configuration to the Cisco MGC and activate it, click the button next to **Send and Activate Configuration**.

- If you have a continuous-service configuration with two Cisco MGC hosts, click the button next to **Send, Activate and Synchronize failover**. The configuration is saved on the active host and copied to the standby host. You must restart the standby server after deployment to apply changes.

Note Do not select the **Do not deploy to VSC** box. This option is not used in Cisco SS7 Interconnect to Access Servers or Voice Gateways solutions.

Step 4 Click **OK**.

Note Even though the Cisco MGC supports only one provisioning session at one time, multiple user provisioning is supported in VSPT version 1.6. If more than one user is provisioning, and a deploy is attempted, the deploy is placed on hold for a 45 second timeout interval. Up to three retries can be attempted before the deploy attempt fails.

Provisioning the Cisco SS7 Interconnect for Voice Gateways Solution by Using MML

This chapter describes how to provision a sample Cisco SS7 Interconnect for Voice Gateways Solution (shown in Figure 4-1). The chapter describes a sample configuration for the illustration purpose only. Your configuration will vary and depend on your own network configuration.

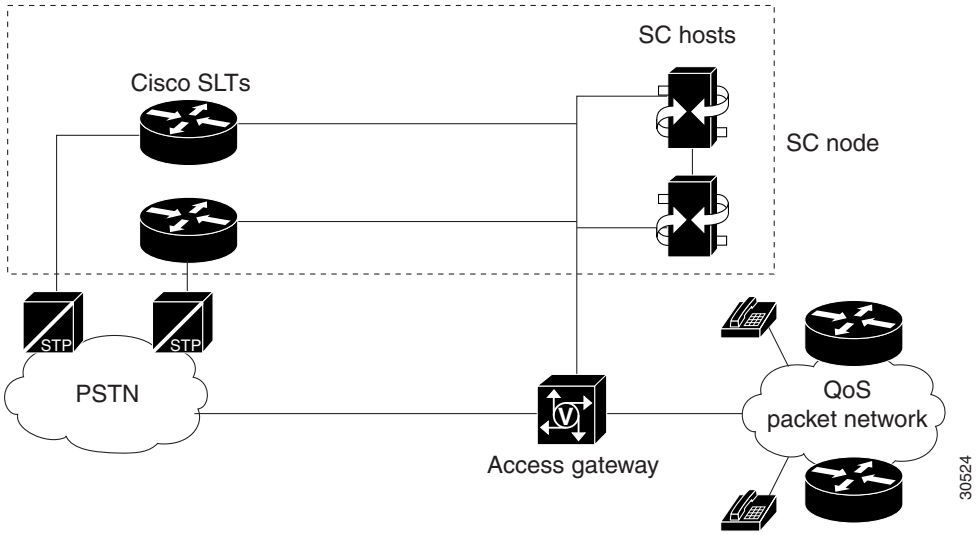
Tip Notes are used in this chapter to identify the procedures and other elements that differ in the Cisco Media Gateway Controller (MGC) software Release 7.3(x) and the Cisco MGC software Release 7.4(x). However, most procedures are the same for both software releases.

This chapter presents two ways of provisioning with MML:

- Using MML commands individually to provision your system. (This can be time consuming if you have a large configuration.)
- Creating a simple MML batch file in ASCII format and processing it with MML.

To skip directly to the MML batch file used to provision the sample configuration, see "Creating and Processing an MML Batch File for Provisioning" section on page 4-38.

Figure 4-1 Sample Cisco SS7 Interconnect for Voice Gateways Solution



Caution Do *not* use the sample values in this chapter to provision your system. You must research your network and obtain your own values for the network addresses, point codes, and other parameters used in your solution. If you use the sample values presented here, your configuration *will not* work.

Provisioning Outline

Perform the following steps to provision the sample Cisco SS7 Interconnect for Voice Gateways Solution.

	Step	Section and Page
Provision SS7 signaling routes		
Step 1	Add the OPC[1] in your network.	Adding the OPC, page 4-10
Step 2	Add the DPC[2] to identify the destination switch.	Adding the DPC, page 4-11
Step 3	Add the APCs[3] to identify the STPs[4] with which the signaling controller communicates signaling information.	Adding the APCs, page 4-12
Step 4	Add linksets to connect the Cisco SLTs[5] to the STPs.	Adding Linksets, page 4-14
Step 5	Add the SS7 subsystem to identify the mated STPs.	Adding the SS7 Subsystem, page 4-15
Step 6	Add the SS7 routes for each signaling path from the signaling controller to the destination switch.	Adding SS7 Routes, page 4-16
Step 7	Add the SS7 signaling service from the signaling controller to the destination switch.	Adding the SS7 Signaling Service, page 4-17

	Step	Section and Page
Provision signaling links		
Step 1	Add the Ethernet adapters (cards) in the SC host that carry signaling to and from the Cisco SLTs.	Adding Adapters (Cards), page 4-18
Step 2	Add Ethernet interfaces for the cards in the host.	Adding Ethernet Interfaces, page 4-19
Step 3	Add C7 IP links for each SS7 link from the signaling controller to the SS7 network (through the Cisco SLT).	Adding C7 IP Links to Cisco SLTs, page 4-20
Provision NAS[6] links		
Step 1	Add external nodes for the NASes in your network.	Adding NAS External Nodes, page 4-23
Step 2	Add NAS signaling services for each NAS.	Adding NAS Signaling Services, page 4-24
Step 3	Add IP links for each NAS to each Ethernet card in the SC host.	Adding IP Links, page 4-25
Provision trunks		
Step 1	Create the trunk file and add trunks from each NAS to the signaling controller.	Using a Text File to Add Trunks, page 4-28
Step 2	Import the trunk file.	Using a Text File to Add Trunks, page 4-28
Deploy the session		

1. OPC = origination point code
2. DPC = destination point code
3. APCs = adjacent point codes
4. STPs = Signal Transfer Points
5. Cisco SLTs = Cisco Signaling Link Terminals
6. NAS = network access server

Note Trunk groups and trunk routing are not used in the Cisco SS7 Interconnect for Voice Gateways Solution. This solution uses nailed trunks between the voice gateways and the PSTN switch. The signaling controller does not perform trunk group selection in this solution.

Provisioning Worksheet

Table 4-1 shows a provisioning worksheet for the sample configuration shown in this chapter.

Table 4-1 Provisioning Worksheet

Component	MML Name	Description	Parameters
OPC	opc	Origination point code	• netaddr: 171.1.4 • netind: 2 (national network)
DPC	dpc1	DPC of PSTN Switch A	• netaddr: 171.1.3 • netind: 2 (national network)
APC	apc1	APC for STP A	• netaddr: 171.16.1
APC	apc2	APC for STP B	• netaddr: 171.16.2
Linkset	ls01	Linkset from signaling controller to STP A	• apc: apc1 • type: IP • proto: SS7-ANSI
Linkset	ls02	Linkset from signaling controller to STP B	• apc: apc2 • type: IP • proto: SS7-ANSI
SS7 subsystem	subsys1	Route between STP A and STP B	• svc: apc1 • matedapc: apc2 • proto: SS7-ANSI • pri: 3 • ssn: 0
SS7 route	ss7route1	Route 1 to PSTN Switch A through LS1	• opc: opc • dpc: dpc1 • lnkset: ls01 • pri: 1
SS7 route	ss7route2	Route 2 to PSTN Switch A through LS2	• opc: opc • dpc: dpc1 • lnkset: ls02 • pri: 1
SS7 signaling service	ss7sigsvc	SS7 service to PSTN Switch A	• mdo: ANSISS7_STANDARD • dpc: dpc1
Adapter (card)	encard1	Ethernet Card 1	• type: EN • slot: 0
Adapter (card)	encard2	Ethernet Card 2	• type: EN • slot: 1

Table 4-1 Provisioning Worksheet (continued)

Component	MML Name	Description	Parameters
Ethernet interface	enetif1	Ethernet interface for encard1	• card: encard1
Ethernet interface	enetif2	Ethernet interface for encard2	• card: encard2
C7 IP link	c7iplink1	Link 1 in Linkset 1	• if: enetif1 • ipaddr: IP_Addr1 • port: 5000 • peeraddr: 175.30.241.27 • peerport:32767 • pri: 1 • slc: 0 • lnkset: ls01
C7 IP link	c7iplink2	Link 2 in Linkset 1	• if: enetif2 • ipaddr: IP_Addr2 • port: 5000 • peeraddr: 175.30.238.28 • peerport:32767 • pri: 1 • slc: 1 • lnkset: ls01
C7 IP link	c7iplink3	Link 1 in Linkset 2	• if: enetif2 • ipaddr: IP_Addr1 • port: 5000 • peeraddr: 175.30.241.27 • peerport:32767 • pri: 1 • slc: 0 • lnkset: ls02
C7 IP link	c7iplink4	Link 2 in Linkset 2	• if: enetif2 • ipaddr: IP_Addr2 • port: 5000 • peeraddr: 175.30.238.28 • peerport:32767 • pri: 1 • slc: 1 • lnkset: ls02

Table 4-1 Provisioning Worksheet (continued)

Component	MML Name	Description	Parameters
NAS external node	nas1	NAS 1	none
NAS external node	nas2	NAS 2	none
NAS external node	nas3	NAS 3	none
NAS signaling service	nassvc1	Signaling service for NAS 1	• extnode: nas1 • MDO: BELL_1268
NAS signaling service	nassvc2	Signaling service for NAS 2	• extnode: nas2 • MDO: BELL_1268
NAS signaling service	nassvc3	Signaling service for NAS 3	• extnode: nas3 • MDO: BELL_1268
IP link	iplink1	IP link for NAS 1	• if: enetif1 • ipaddr: IP_Addr1 • port: 3001 • peeraddr: 175.30.241.2 • peerport: 3001 • svc: nassvc1
IP link	iplink2	IP link for NAS 2	• if: enetif2 • ipaddr: IP_Addr2 • port: 3001 • peeraddr: 175.30.238.2 • peerport: 3001 • svc: nassvc2
IP link	iplink3	IP link for NAS 3	• if: enetif1 • ipaddr: IP_Addr1 • port: 3001 • peeraddr: 175.30.241.3 • peerport: 3001 • svc: nassvc3
IP link	iplink4	IP link 2 for NAS 1	• if: enetif2 • ipaddr: IP_Addr2 • port: 3001 • peeraddr: 175.30.238.3 • peerport: 3001 • svc: nassvc1

Table 4-1 Provisioning Worksheet (continued)

Component	MML Name	Description	Parameters
IP link	iplink5	IP link 2 for NAS 2	• if: enetif1 • ipaddr: IP_Addr1 • port: 3001 • peeraddr: 175.30.238.3 • peerport: 3001 • svc: nassvc2
IP link	iplink6	IP link 2 for NAS 3	• if: enetif2 • ipaddr: IP_Addr2 • port: 3001 • peeraddr: 175.30.238.4 • peerport: 3001 • svc: nassvc3

Starting the Provisioning Session

Log in to the signaling controller and start an MML session. For more information on MML commands, see the *Cisco Media Gateway Controller Software Release 7 Reference Guide*.

Caution Do not log in as root when starting MML. If you log in as root and attempt to start an MML session, you cause a core dump and MML does not start.

To start an MML session:

Step 1 Log in to the signaling controller as a user who is a member of the transpath group. (In Cisco media gateway controller software Release 7.4(x), this group has been renamed the mgcgrp group.)

Note If you log in as a user who is not in the transpath or mgcgrp group, you might need to enter the commands **newgrp transpath** (or **newgrp mgcgrp**) and **source .cshrc** after logging in.

Step 2 Enter **mml**:

```
machine-name% mml

copyright © 1998-2000, Cisco Systems, Inc.

machine-name mml>
```

If another session is running, you receive a message similar to the following:

```
machine-name% mml

copyright © 1998-2000, Cisco Systems, Inc.

mml1: Already in use
```

```
Failure to run MML, reason=Entry was already present
machine-name%
```

To see other MML sessions that are running, enter **ls /opt/TransPath/var** (for Cisco media gateway controller software Release 7.4(x), enter **ls /opt/CiscoMGC/var**). MML session numbers range from 1 through 12. Depending on the number of MML sessions, you will see a list of files similar to the following:

```
mml0.LOCK
mml1.LOCK
mml2.LOCK
```

If MML is already running, enter **mml -s x** (x = the number of a session that does not appear as locked; range is 1 through 12):

```
machine-name% mml -s 2

Copyright © 1998-2000, Cisco Systems, Inc.

machine-name mml>
```

Step 3 Start a provisioning session by entering the **prov-sta::srcver="new",dstver="dialcfg1"** command:

```
machine-name mml> prov-sta::srcver="new",dstver="dialcfg1"
   Media Gateway Controller 2000-04-04 15:00:57
M  COMPLD
   "PROV-STA"
   ;
machine-name mml>
```

This starts a new provisioning session ("new"), names it CFG_dialcfg1, and saves the configuration files in /opt/TransPath/etc/CONFIG_LIB.

Note In Cisco media gateway controller software Release 7.4(x), the files are saved in /opt/CiscoMGC/etc/CONFIG_LIB.

Tip If another provisioning session is running, you cannot start a provisioning session. You receive an error similar to Example 4-1.

Example 4-1 Provisioning Session Error

```
machine-name mml> prov-sta::srcver="new",dstver="dial9"
   Media Gateway Controller 2000-04-04 15:02:42
M  DENY
   SROF
   "PROV-STA: POM session is already in use by mml2"
   /* Status, Requested Operation Failed on the component */
   ;
```

To see if another provisioning session is running, enter the **prov-rtrv:session** command:

```
machine-name mml> prov-rtrv:session
   Media Gateway Controller 2000-04-04 15:03:07
```

```
M  RTRV
   "session=dialcfg1:session"
   /*
Session ID = mml2
SRCVER = new
DSTVER = dialcfg1
   */
   ;
```

This example shows that an active provisioning session named dialcfg1 is in use.

Refer to the *Cisco Media Gateway Controller Software Release 7 Provisioning Guide* for more information on provisioning with MML and general provisioning steps.

MML Tips

MML commands use the following syntax:

```
command_name:[target][, target][, target. . .][:Parameter_List][;comments]
```

When entering MML commands, remember the following:

- In general, MML commands are not case sensitive. However, file names are when used as arguments in MML commands (for example, TKGFile, BCFile, RoutingFile).
- Use only one MML command on each line.
- Anything entered after a semicolon (;) is treated as a comment (this is primarily useful for MML command scripts).
- Do not use punctuation (such as the period character) for target names; for example, do not use test.log as a logging destination.
- After starting a provisioning session, MML displays COMPLD, indicating success. The COMPLD message is displayed after successful commands. For failed commands, MML displays DENY.
- Sessions inactive for 30 minutes result in a warning. If the session continues without activity for 5 more minutes, it terminates.
- As many as 12 MML sessions can exist at any given time; however, only one provisioning session is allowed.
- You can create an ASCII text file for batch processing of provisioning commands.
- You can create batch files for individual segments of provisioned data.

- During batch file execution, each MML command response echoes to the terminal. You can log command responses for later review so that the file can run unattended.
- Place quotation marks around all value strings in your commands. For example, card="Interface1". The keyword card does not have to be enclosed in quotation marks. The value Interface1 is being assigned to keyword card and must be enclosed in quotations.

To obtain on-line help in an MML session, enter **help** at the command prompt. For more information, refer to the *Cisco Media Gateway Controller Release 7 Software Reference Guide.*

Tip To repeat the last MML command you entered, use the up arrow. To scroll through all previously entered MML commands, continue to use the up arrow. To modify and reenter a previously entered command, use the up arrow to display the command and then the left- and right-arrows, Backspace, Delete, and alphanumeric keys to edit the command. Press **Enter** to reenter the command.

Note Many procedures in this chapter refer to sections in *Cisco Media Gateway Controller Software Release 7 Provisioning Guide*. Keep that book handy when performing the procedures in this chapter.

Provisioning SS7 Signaling Routes

The SS7 signaling route is the path from the Cisco SC host to a service switching point (SSP) through the Cisco SLTs and signal transfer points (STPs). In the sample configuration in this chapter, the SSP is the PSTN switch. When you provision the SS7 signaling routes, you add the following components:

- OPC—Origination point code or the point code of the signaling controller in your network
- DPC—Destination point code or the point code of the PSTN switch A to which you are connecting
- APCs—Adjacent point codes or the point codes of the adjacent STPs
- Linksets
- SS7 subsystems (to identify mated STPs)
- SS7 routes
- SS7 signaling services

For more information on configuring SS7 signaling routes, see *Cisco Media Gateway Controller Software Release 7 Provisioning Guide.*

Adding the OPC

A point code is an SS7 network address that identifies an SS7 network node, such as an STP or an SSP.

Note ITU point codes contain 14 bits, and North American point codes contain 24 bits.

The following procedure shows how to add the point code for the SC host.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:ptcode:name="opc",netaddr="171.1.4"** **,netind=2,desc="Origination point code"** Media Gateway Controller 2000-04-04 15:04:48 M COMPLD "ptcode" ;	Adds a point code and assigns the name **opc** to the signaling controller **171.1.4**.

Verifying the OPC

To verify that you have added the opc, enter the **prov-rtrv:ptcode:name="opc"** command:

```
machine-name mml> prov-rtrv:ptcode:name="opc"
   Media Gateway Controller 2000-04-04 15:05:44
M  RTRV
   "session=dialcfg1:ptcode"
   /*
NAME = opc
DESC = Origination point code
NETADDR = 171.1.4
NETIND = 2
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all point codes by entering the **prov-rtrv:ptcode:"all"** command as shown in Example 4-2.

Example 4-2 Retrieving All Point Codes

```
machine-name mml> prov-rtrv:ptcode:"all"
Media Gateway Controller 2000-04-04 15:05:32
M  RTRV
"session=dialcfg1:ptcode"
/*
NAME                  NETADDR      NETIND
----                  -------      ------
opc                   171.1.4      2
*/
;
```

Adding the DPC

The following procedure shows how to add the point code for the PSTN switch A.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:ptcode:name="dpc1",netaddr="171.1.3",netind=2,desc="DPC of PSTN Switch A"** Media Gateway Controller 2000-04-04 15:08:41 M COMPLD "ptcode" ;	Adds a point code and assigns the name **dpc1** to switch **171.1.3**.

Verifying the DPC

To verify that you have added the DPC, enter the **prov-rtrv:ptcode:name="dpc1"** command:

```
machine-name mml> prov-rtrv:ptcode:name="dpc1"
   Media Gateway Controller 2000-04-04 15:09:25
M  RTRV
   "session=dialcfg1:ptcode"
   /*
NAME = dpc1
DESC = PPC of PSTN Switch A
NETADDR = 171.1.3
NETIND = 2
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all point codes by entering the **prov-rtrv:ptcode:"all"** command as shown in Example 4-3.

Example 4-3 Retrieving All Point Codes

```
machine-name mml> prov-rtrv:ptcode:"all"
   Media Gateway Controller 2000-04-04 15:10:47
M  RTRV
   "session=dialcfg1:ptcode"
   /*
NAME                  NETADDR      NETIND
----                  -------      ------
opc                   171.1.4      2
dpc1                  171.1.3      2
   */
   ;
```

Adding the APCs

The following procedure shows how to add the adjacent point codes for the STPs.

Note The sample configuration in this chapter uses A-links from the STPs for signaling to the Cisco SLTs. If you have a configuration where F-links come directly from the SSP to the Cisco SLTs, you do not need to add APCs.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:apc:name="apc1",netaddr="171.16.1",desc="APC for STP A"** Media Gateway Controller 2000-04-04 15:11:51 M COMPLD "apc" ;	Adds a point code and assigns the name **apc1** to STP A, **171.16.1**.
Step 2	machine-name mml> **prov-add:apc:name="apc2",netaddr="171.16.2",desc="APC for STP B"** Media Gateway Controller 2000-04-04 15:12:36 M COMPLD "apc" ;	Adds a point code and assigns the name **apc2** to STP A, **171.16.2**.

Verifying the APCs

To verify that you have entered the APCs, enter the **prov-rtrv:apc:name="*MML name*"** command for each APC. For example, to verify the first APC:

```
machine-name mml> prov-rtrv:apc:name="apc1"
   Media Gateway Controller 2000-04-04 15:13:54
M  RTRV
   "session=dialcfg1:apc"
   /*
NAME = apc1
DESC = APC for STP A
NETADDR = 171.16.1
NETIND = 0
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all APCs by entering the **prov-rtrv:apc:"all"** command as shown in Example 4-4.

Example 4-4 Retrieving All APCs

```
machine-name mml> prov-rtrv:apc:"all"
   Media Gateway Controller 2000-04-04 10:45:12
M  RTRV
   "session=dialcfg1:apc"
   /*
NAME                  NETADDR      NETIND
----                  -------      ------
apc1                  171.16.1     2
apc2                  171.16.2     2
   */
   ;
```

Adding Linksets

A linkset is a logical set of one or more links originating from an SS7 node (STP) and connecting to an adjacent node. In this example, the linkset contains communication links that connect from the signaling controller to an adjacent STP. You must provision one linkset for each connection through the STP to the signaling controller.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:lnkset:name="ls01",apc="apc1",type="IP",proto="SS7-ANSI",desc="Linkset from signaling controller to STP A"** Media Gateway Controller 2000-04-04 15:16:42 M COMPLD "lnkset" ;	Defines a linkset **ls01** to STP A.
Step 2	machine-name mml> **prov-add:lnkset:name="ls02",apc="apc2",type="IP",proto="SS7-ANSI",desc="Linkset from signaling controller to STP B"** Media Gateway Controller 2000-04-04 15:17:16 M COMPLD "lnkset" ;	Defines a linkset **ls02** to STP B.

Verifying Linksets

To verify that you have entered the linksets, enter the **prov-rtrv:lnkset:name="*MML name*"** command for each linkset. For example, to verify the first linkset:

```
machine-name mml> prov-rtrv:lnkset:name="ls01"
   Media Gateway Controller 2000-04-04 15:18:40
M  RTRV
   "session=dialcfg1:lnkset"
   /*
NAME = ls01
DESC = Linkset from signaling controller to STP A
APC = apc1
PROTO = SS7-ANSI
TYPE = IP
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all linksets by entering the **prov-rtrv:lnkset:"all"** command as shown in Example 4-5.

Example 4-5 Retrieving All Linksets

```
machine-name mml> prov-rtrv:lnkset:"all"
   Media Gateway Controller 2000-04-04 15:20:43
M  RTRV
   "session=dialcfg1:lnkset"
```

```
   /*
NAME                APC                 PROTO       TYPE
----                ---                 -----       ----
ls01                apc1                SS7-ANSI    IP
ls02                apc2                SS7-ANSI    IP
   */
   ;
```

Note After creating the linksets, you must create the C7 IP links for each linkset. See "Adding C7 IP Links to Cisco SLTs" section on page 4-20.

Adding the SS7 Subsystem

You must add an SS7 subsystem that identifies each pair of mated STPs. This allows the signaling controller to route traffic over the C-links between the STPs in case of a failure between one of the STPs and an endpoint.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:ss7subsys:name="subsys1",svc="apc1",matedapc="apc2",proto="SS7-ANSI",pri=3,ssn=0,desc="Route between STP A and STP B"** Media Gateway Controller 2000-04-04 15:21:56 M COMPLD "ss7subsys" ;	Defines a mated STP subsystem from STP A to STP B.

Verifying the SS7 Subsystem

To verify that you have added the SS7 subsystem, enter the **prov-rtrv:ss7subsys:name="subsys1"** command:

```
machine-name mml> prov-rtrv:ss7subsys:name="subsys1"
   Media Gateway Controller 2000-04-04 15:22:44
M  RTRV
   "session=dialcfg1:ss7subsys"
   /*
NAME = subsys1
DESC = Route between STP A and STP B
SVC = apc1
PRI = 3
MATEDAPC = apc2
SSN = 0
PROTO = SS7-ANSI
STPSCPIND = 0
TRANSPROTO = SCCP
   */
   ;
```

Adding SS7 Routes

An SS7 route is a path through a linkset between the signaling controller and another signaling controller or TDM switch. In this example, the SS7 routes indicate the linksets that carry SS7 signals between the signaling controller and the PSTN switch A.

You must add an SS7 route for each signaling path from the signaling controller to the PSTN switch A. You provision a route for each linkset.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:ss7route:name="ss7route1",opc="opc",dpc="dpc1",lnkset="ls01",pri=1,desc="Route 1 to PSTN Switch A through LS01"** Media Gateway Controller 2000-04-04 15:24:14 M COMPLD "ss7route" ;	Defines an SS7 route from the signaling controller (**opc**) to PSTN Switch A through the previously defined linkset through STP A (**ls01**).
Step 2	machine-name mml> **prov-add:ss7route:name="ss7route2",opc="opc",dpc="dpc1",lnkset="ls02",pri=1,desc="Route 2 to PSTN Switch A through LS02"** Media Gateway Controller 2000-04-04 15:25:44 M COMPLD "ss7route" ;	Defines an SS7 route from the signaling controller (**opc**) to PSTN Switch A through the previously defined linkset through STP B (**ls02**).

Verifying SS7 Routes

To verify that you have entered the SS7 routes, enter the **prov-rtrv:ss7route:name="*MML name*"** command for each SS7 route. For example, to verify the first SS7 route:

```
machine-name mml> prov-rtrv:ss7route:name="ss7route1"
   Media Gateway Controller 2000-04-04 15:32:21
M  RTRV
   "session=dialcfg1:ss7route"
   /*
NAME = ss7route1
DESC = Route 1 to PSTN Switch A through LS01
OPC = opc
DPC = dpc1
LNKSET = ls01
PRI = 1
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all SS7 routes by entering the **prov-rtrv:ss7route:"all"** command as shown in Example 4-6.

Example 4-6 Retrieving All SS7 Routes

```
machine-name mml> prov-rtrv:ss7route:"all"
   Media Gateway Controller 2000-04-04 11:01:18
```

```
M  RTRV
   "session=dialcfg1:ss7route"
   /*
NAME                  OPC                   DPC                   LNKSET
        PRI
----                  ---                   ---                   ------
        ---
ss7route1             opc                   dpc1                  ls01
        1
ss7route2             opc                   dpc1                  ls02
        1
   */
   ;
```

Adding the SS7 Signaling Service

The SS7 signaling service specifies the path and the protocol variant that the signaling controller uses to communicate with a remote switch (SSP) that sends bearer traffic to the NASs.

You must add an SS7 signaling service from the signaling controller to the PSTN switch.

	Command/Action	Purpose
Step 1	machine-name mml>**prov-add:ss7path:name="ss7sigsvc",mdo="ANSISS7_STANDARD",dpc="dpc1",custgrpid=”d125”,desc="SS7 service to PSTN Switch A"** Media Gateway Controller 2000-03-03 14:21:04 M COMPLD "ss7path" ;	Defines the SS7 path and protocol between the signaling controller and PSTN Switch A.

Note We recommend that you go ahead and provision a customer group ID for your SS7 signaling service, even if you are not planning on currently using the screening tools. This is because once the SS7 signaling service is placed in service, you would have to take it out-of-service to add a customer group ID.

Verifying the SS7 Signaling Service

To verify that you have added the SS7 signaling service, enter the **prov-rtrv:ss7path:name="ss7sigsvc"** command:

```
mml> prov-rtrv:ss7path:name="ss7sigsvc"
   Media Gateway Controller 2000-03-03 14:22:12
M  RTRV
   "session=dialcfg1:ss7path"
   /*
NAME = ss7sigsvc
DESC = SS7 service to PSTN Switch A
DPC = dpc1
MDO = ANSISS7_STANDARD
CUSTGRPID = d125
CUSTGRPTBL = 0101
SIDE = network
```

```
ASPPART = N
   */
   ;
```

Provisioning Signaling Links

You must provision links for all physical connections bearing signals that enter and exit the signaling controller. This includes SS7 signals from the SSP (PSTN Switch A) and signals to the NASs. You must add the following components:

- Ethernet cards in the signaling controller that provide an interface from the Cisco SLT
- Ethernet interfaces for the cards you provision
- C7 IP links to the Cisco SLTs

Adding Adapters (Cards)

You must add a card component for each card in the signaling controller. For the example in this chapter, you add one Ethernet card for each connection to the IP network—one card for the 10-Mb signaling network and one for the 100-Mb signaling network. These cards permit SS7 signaling between the signaling controller and the Cisco SLTs.

Note You provision only one set of cards for one signaling controller (the primary), even though both signaling controllers are highlighted.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:card:name="encard1",type="EN",slot=0,desc="Ethernet Card 1"** Media Gateway Controller 2000-03-03 20:38:30 M COMPLD "card" ;	Defines the card (**encard1**) necessary for communications between the signaling controller and Cisco SLTs.
Step 2	machine-name mml> **prov-add:card:name="encard2",type="EN",slot=1,desc="Ethernet Card 2"** Media Gateway Controller 2000-03-03 20:39:07 M COMPLD "card" ;	Defines the card (**encard2**) necessary for communications between the signaling controller and Cisco SLTs.

Verifying Adapters (Cards)

To verify that you have entered the cards, enter the **prov-rtrv:card:name="*MML name*"** command. For example, to verify the first Ethernet card:

```
machine-name mml> prov-rtrv:card:name="encard1"
   Media Gateway Controller 2000-03-03 20:38:44
M  RTRV
   "session=dialcfg1:card"
   /*
```

```
NAME = encard1
DESC = Ethernet Card 1
TYPE = EN
SLOT = 0
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all cards by entering the **prov-rtrv:card:"all"** command as shown in Example 4-7.

Example 4-7 Retrieving All Cards

```
machine-name mml> prov-rtrv:card:"all"
   Media Gateway Controller 2000-04-04 11:10:24
M  RTRV
   "session=dialcfg1:card"
   /*
NAME                  TYPE        SLOT
----                  ----        ----
encard1               EN          0
encard2               EN          1
   */
   ;
```

Note You must provision the card before provisioning the card interfaces.

Adding Ethernet Interfaces

The Ethernet interface provides the physical line interface between the signaling controller's Ethernet card and the physical Ethernet network. You must add an Ethernet interface if you have added an Ethernet card.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:enetif:name="enetif1",card="encard1",desc="Ethernet interface for Card 1"** Media Gateway Controller 2000-03-03 20:39:47 M COMPLD "enetif" ;	Defines the physical line interface (**enetif1**) between a network card/adapter and the physical Ethernet network.
Step 2	machine-name mml> **prov-add:enetif:name="enetif2",card="encard2",desc="Ethernet interface for Card 2"** Media Gateway Controller 2000-03-03 20:40:28 M COMPLD "enetif" ;	Defines the physical line interface (**enetif2**) between a network card/adapter and the physical Ethernet network.

Verifying Ethernet Interfaces

To verify that you have entered the Ethernet interfaces, enter the **prov-rtrv:enetif:name="*MML name*"** command. For example, to verify the first Ethernet interface:

```
va-testing mml> prov-rtrv:enetif:name="enetif1"
   Media Gateway Controller 2000-03-03 20:40:05
M  RTRV
   "session=dialcfg1:enetif"
   /*
NAME = enetif1
DESC = Ethernet interface for Card 1
CARD = encard1
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all Ethernet interfaces by entering the **prov-rtrv:enetif:"all"** command as shown in Example 4-8.

Example 4-8 Retrieving All Ethernet Interfaces

```
machine-name mml> prov-rtrv:enetif:"all"
   Media Gateway Controller 2000-04-04 11:27:16
M  RTRV
   "session=dialcfg1:enetif"
   /*
NAME                  CARD
----                  ----
enetif1               encard1
enetif2               encard2
   */
   ;
```

Adding C7 IP Links to Cisco SLTs

A C7 IP link component identifies a link between the Cisco SLT's IP address and port, and an SSP or an STP in the SS7 network. The C7 IP link identifies one of the links within a linkset.

Note Use C7 IP links only when your configuration has Cisco SLTs that carry SS7 signaling to the signaling controller over IP. If your configuration does not include Cisco SLTs and your links terminate from the STPs directly into TDM cards in the signaling controller, you must provision TDM links. For example, the Cisco SS7 Dial Access Solution
Release 2.0 uses TDM cards and TDM links.

You must add a C7 IP link for each physical SS7 link that is connected to the SS7 network through the Cisco SLT. These links correspond to the linksets you created in the "Adding Linksets" section on page 4-14.

You must add two links for linkset 1 and two links for linkset 2.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:c7iplnk:name="c7iplink1",if="enetif1",ipaddr="IP_Addr1",port=5000,peeraddr="175.30.241.27",pri=1,slc=0,lnkset="ls01",desc="Link 1 in Linkset 1"** Media Gateway Controller 2000-03-03 21:05:46 M COMPLD "c7iplnk" ;	Defines an SS7 link from the previously defined physical line interface (**enetif1**) through Cisco SLT **175.30.241.27** to STP A. Uses the **ls01** linkset.
Step 2	machine-name mml> **prov-add:c7iplnk:name="c7iplink2",if="enetif1",ipaddr="IP_Addr1",port=5000,peeraddr="175.30.238.28",pri=1,slc=1,lnkset="ls01",desc="Link 2 in Linkset 1"** Media Gateway Controller 2000-03-03 21:07:15 M COMPLD "c7iplnk" ;,	Defines an SS7 link from the previously defined physical line interface (**enetif1**) through Cisco SLT **175.30.238.28** to STP A. Uses the **ls01** linkset.
Step 3	machine-name mml> **prov-add:c7iplnk:name="c7iplink3",if="enetif2",ipaddr="IP_Addr2",port=5000,peeraddr="175.30.241.27",pri=1,slc=0,lnkset="ls02",desc="Link 1 in Linkset 2",** Media Gateway Controller 2000-03-03 21:08:51 M COMPLD "c7iplnk" ;	Defines an SS7 link from the previously defined physical line interface (**enetif2**) through Cisco SLT **175.30.241.27** to STP B. Uses the **ls02** linkset.
Step 4	machine-name mml> **prov-add:c7iplnk:name="c7iplink4",if="enetif2",ipaddr="IP_Addr2",port=5000,peeraddr="175.30.238.28",pri=1,slc=1,lnkset="ls02",desc="Link 2 in Linkset 2"** Media Gateway Controller 2000-03-03 21:10:52 M COMPLD "c7iplnk" ;	Defines an SS7 link from the previously defined physical line interface (**enetif2**) through Cisco SLT **175.30.238.28** to STP B. Uses the **ls02** linkset.

Note The value of the remote IP port for each C7 IP link is retrieved from the value set for the *.stPort field in the XECfgParm.dat file you set up during your initial system configuration. Refer to the *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Verifying C7 IP Links

To verify that you have entered the C7 IP links, enter the **prov-rtrv:c7iplnk:name="*MML name*"** command. For example, to verify the first C7 IP link:

```
va-testing mml> prov-rtrv:c7iplnk:name="c7iplink1"
   Media Gateway Controller 2000-03-03 21:12:47
M  RTRV
   "session=dialcfg1:c7iplnk"
   /*
NAME = c7iplink1
```

```
DESC = Link 1 in Linkset 1
LNKSET = ls01
IF = enetif1
IPADDR = IP_Addr1
PORT = 5000
PEERADDR = 175.30.241.27
PEERPORT = 32767
SLC = 0
PRI = 1
TIMESLOT = 0
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all C7 IP links by entering the **prov-rtrv:c7iplnk:"all"** command as shown in Example 4-9.

Example 4-9 Retrieving All C7 IP Links

```
machine-name mml> prov-rtrv:c7iplnk:"all"
   Media Gateway Controller 2000-04-04 11:40:17
M  RTRV
   "session=dialcfg1:c7iplnk"
   /*
NAME                  LNKSET                IF                    IPADDR      PORT
PEERADDR        PEERPORT    PRI         SLC         TIMESLOT
----                  ------                --                    ------      ----
--------        --------    ---         ---         --------
c7iplink1             ls01                  enetif1               IP_Addr1    5000
175.30.241.27   32767       1           0           0
c7iplink2             ls02                  enetif1
IP_Addr2    5000        175.30.238.28   32767       1           1           0
c7iplink3             ls01                  enetif2
IP_Addr1    5000        175.30.241.27   32767       1           0           0
c7iplink4             ls02                  enetif2               IP_Addr2    5000
175.30.238.28   32767       1           1           0
   */
   ;
```

Provisioning NAS Links

NAS links indicate the communication path the signaling controller uses to control the bearer traffic that passes through each voice gateway.

To add links to the voice gateway in your network, you must add the following components:

- NAS external node
- NAS signaling service
- IP links

Adding NAS External Nodes

You must add a NAS external node for each voice gateway in your network.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:extnode:name="nas1",desc="NAS 1"** Media Gateway Controller 2000-03-04 11:36:07 M COMPLD "extnode" ;	Defines network access server **NAS 1** as an external node.
Step 2	machine-name mml> **prov-add:extnode:name="nas2",desc="NAS 2"** Media Gateway Controller 2000-03-04 11:36:21 M COMPLD "extnode" ;	Defines network access server **NAS 2** as an external node.
Step 3	machine-name mml> **prov-add:extnode:name="nas3",desc="NAS 3"** Media Gateway Controller 2000-03-04 11:36:31 M COMPLD "extnode" ;	Defines network access server **NAS 3** as an external node.

Verifying NAS External Nodes

To verify that you have entered the NASs, enter the **prov-rtrv:extnode:name="MML name"** command. For example, to verify the first NAS:

```
va-testing mml> prov-rtrv:extnode:name="nas1"
   Media Gateway Controller 2000-03-04 11:36:46
M  RTRV
   "session=dialcfg1:extnode"
   /*
NAME = nas1
DESC = NAS 1
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all NAS external nodes by entering the **prov-rtrv:extnode:"all"** command as shown in Example 4-10.

Example 4-10 Retrieving All External Nodes

```
machine-name mml> prov-rtrv:extnode:"all"
   Media Gateway Controller 2000-04-04 11:44:41
M  RTRV
   "session=dialcfg1:extnode"
   /*
NAME
----
nas1
nas2
nas3
   */
   ;
```

Adding NAS Signaling Services

You must add a NAS signaling service for each NAS you created in the "Adding NAS External Nodes" section on page 4-23. The NAS signaling service indicates the Q.931 protocol path between the signaling controller and the voice gateways.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:naspath:name="nassvc1",extnode="nas1",mdo="BELL_1268_C3",desc="Signaling service for NAS 1"** Media Gateway Controller 2000-03-04 11:40:11 M COMPLD "naspath" ;	Defines the communications path between the signaling controller and the network access server **nas1**.
Step 2	machine-name mml> **prov-add:naspath:name="nassvc2",extnode="nas2",mdo="BELL_1268_C3",desc="Signaling service for NAS 2"** Media Gateway Controller 2000-03-04 11:41:07 M COMPLD "naspath" ;	Defines the communications path between the signaling controller and the network access server **nas2**.
Step 3	machine-name mml> **prov-add:naspath:name="nassvc3",extnode="nas3",mdo="BELL_1268_C3",desc="Signaling service for NAS 3"** Media Gateway Controller 2000-03-04 11:41:49 M COMPLD "naspath" ;	Defines the communications path between the signaling controller and the network access server **nas3**.

Verifying NAS Signaling Services

To verify that you have entered the NAS signaling services, enter the **prov-rtrv:naspath:name="*MML name*"** command. For example, to verify the first NAS signaling service was added:

```
va-testing mml> prov-rtrv:naspath:name="nassvc1"
   Media Gateway Controller 2000-03-04 11:42:36
M  RTRV
   "session=dialcfg1:naspath"
   /*
NAME = nassvc1
DESC = Signaling service for NAS 1
EXTNODE = nas1
MDO = BELL_1268_C3
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all NAS signaling services by entering the **prov-rtrv:naspath:"all"** command as shown in Example 4-11.

Example 4-11 Retrieving All NAS Signaling Services

```
machine-name mml> prov-rtrv:naspath:"all"
   Media Gateway Controller 2000-04-04 11:49:02
M  RTRV
   "session=dialcfg1:naspath"
   /*
NAME                 EXTNODE              MDO
----                 -------              ---
nassvc1              nas1                 BELL_1268_C3
nassvc2              nas2                 BELL_1268_C3
nassvc3              nas3                 BELL_1268_C3
   */
   ;
```

Adding IP Links

You must add an IP link from each voice gateway to each Ethernet card and interface in the signaling controller. In this example, you provision the following IP links:

- NAS 1 to enetif1
- NAS 1 to enetif2
- NAS 2 to enetif1
- NAS 2 to enetif2
- NAS 3 to enetif1
- NAS 3 to enetif 2

Note If you are provisioning two links from the signaling controller to the same voice gateway, you need two different Ethernet IP addresses on both the signaling controller and the voice gateway.

	Command/Action	Purpose
Step 1	machine-name mml> **prov-add:iplnk:name="iplink1",if="enetif1",ipaddr="IP_Addr1",port=3001,peeraddr="175.30.241.2",peerport=3001,svc="nassvc1",desc="IP link for NAS 1 to Ethernet Interface 1"** Media Gateway Controller 2000-03-04 11:48:54 M COMPLD "iplnk" ;	Defines IP link **iplink1** between the signaling controller and network access server **nas1** for the previously defined NAS signaling service **nassvc1**.
Step 2	machine-name mml> **prov-add:iplnk:name="iplink2",if="enetif2",ipaddr="IP_Addr1",port=3001,peeraddr="175.30.238.2",peerport=3001,svc="nassvc2",desc="IP link for NAS 1 to Ethernet Interface 2"** Media Gateway Controller 2000-03-04 11:50:24 M COMPLD "iplnk" ;	Defines IP link **iplink2** between the signaling controller and network access server **nas1** for the previously defined NAS signaling service **nassvc2**.
Step 3	machine-name mml> **prov-add:iplnk:name="iplink3",if="enetif1",ipaddr="IP_Addr1",port=3001,peeraddr="175.30.241.3",peerport=3001,svc="nassvc3",desc="IP link for NAS 2 to Ethernet Interface 1"** Media Gateway Controller 2000-03-04 11:51:35 M COMPLD "iplnk" ;	Defines IP link **iplink3** between the signaling controller and network access server **nas2** for the previously defined NAS signaling service **nassvc3**.
Step 4	machine-name mml> **prov-add:iplnk:name="iplink4",if="enetif2",ipaddr="IP_Addr2",port=3001,peeraddr="175.30.238.3",peerport=3001,svc="nassvc1",desc="IP link for NAS 2 to Ethernet Interface 2"** Media Gateway Controller 2000-03-04 11:53:17 M COMPLD "iplnk" ;	Defines IP link **iplink4** between the signaling controller and network access server **nas2** for the previously defined NAS signaling service **nassvc1**.
Step 5	machine-name mml> **prov-add:iplnk:name="iplink5",if="enetif1",ipaddr="IP_Addr2",port=3001,peeraddr="175.30.241.4",peerport=3001,svc="nassvc2",desc="IP link for NAS 3 to Ethernet Interface 1"** Media Gateway Controller 2000-03-04 11:54:20 M COMPLD "iplnk" ;	Defines IP link **iplink5** between the signaling controller and network access server **nas3** for the previously defined NAS signaling service **nassvc2**.
Step 6	machine-name mml> **prov-add:iplnk:name="iplink6",if="enetif2",ipaddr="IP_Addr2",port=3001,peeraddr="175.30.238.4",peerport=3001,svc="nassvc3",desc="IP link for NAS 3 to Ethernet Interface 2"** Media Gateway Controller 2000-03-04 11:55:33 M COMPLD "iplnk" ;	Defines IP link **iplink6** between the signaling controller and network access server **nas3** for the previously defined NAS signaling service **nassvc3**.

Note The provisioning examples in this section create two redundant link manager (RLM) links (forming an RLM group) for each NAS. As of Release 7.4(12) of the Cisco MGC software, you can create multiple RLM groups for each NAS. To create multiple RLM groups for each NAS, use the command shown above for each link in each RLM group. Ensure that the IP links in any multiple RLM groups use the following values defined in the associated NAS: the IP address of the loopback interfaces as the peer address value and the port number of the loopback interfaces as the peer port value.

Verifying IP Links

To verify that you have entered the IP links, enter the **prov-rtrv:iplnk:name="*MML name*"** command to verify the first IP link:

```
va-testing mml> prov-rtrv:iplnk:name="iplink1"
   Media Gateway Controller 2000-03-04 12:01:23
M  RTRV
   "session=dialcfg1:iplnk"
   /*
NAME = iplink1
DESC = IP link for NAS 1 to Ethernet Interface 1
SVC = nassvc1
IF = enetif1
IPADDR = IP_Addr1
PORT = 3001
PEERADDR = 175.30.241.2
PEERPORT = 3001
PRI = 1
SIGSLOT = 0
SIGPORT = 0
   */
   ;
```

Note In software Release 7.4(x), you can retrieve and verify all IP links by entering the **prov-rtrv:iplnk:"all"** command as shown in Example 4-12.

Example 4-12 Retrieving All IP Links

```
machine-name mml> prov-rtrv:iplnk:"all"
   Media Gateway Controller 2000-04-04 12:05:43
M  RTRV
   "session=dialcfg1:iplnk"
   /*
```

Provisioning Trunks

You must add trunks for each connection between the NAS and the PSTN switch. NAS 1 has four T1 lines, NAS 2 has four T1 lines, and NAS 3 has three T1 lines. Each T1 contains 24 trunks, or DS0s. For the examples in this section, you must provision 264 trunks (96 for NAS1, 96 for NAS2, and 72 for NAS3).

Note If you have already provisioned the spans on the NAS to be associated with these trunks, you must remove these spans from service on the NAS using the **shutdown** command, before you provision the trunks on the Cisco SC2200.

You can add trunks using any of the following methods:

- Importing a text file you create that contains all of your trunks
- Adding trunks individually with an MML command
- Adding up to 24 trunks for T1 lines or 31 trunks for E1 lines with an MML command.

Note This option is available in software Release 7.4(x) only. However, if you use the CMM with software Release 7.3(x), you can add 24 trunks at one time for T1 lines and 31 trunks at one time for E1 lines. See "Provisioning Trunks" section on page 2-22 for more information on adding trunks with the CMM.

Tip If you have a large number of trunks, use the text file method for adding trunks.

Using a Text File to Add Trunks

Using a text file to add trunks requires you to create a text file that contains the following fields:

- Trunk ID—A unique identifier, maps to NAME (trunk ID).
- Source Service Name—The signaling service you created in "Adding the SS7 Signaling Service" section on page 4-17; used to look up SRCSVC.
- Source Span ID—Maps to SRCSPAN (converted from decimal to hexadecimal except when value is ffff).

Note For nailed trunks in the signaling controller, this value is always ffff.

- Source Time Slot—Identifies the time slot on the T1 at the destination (PSTN switch). Maps to SRCTIMESLOT (converted from decimal to hexadecimal except when value is ffff).
- Destination Service Name—The signaling service for the NAS you created in "Adding NAS Signaling Services" section on page 4-24. Used to lookup DSTSVC.
- Destination Span ID—The appropriate T1 line and T1 controller on the NAS. This value is the nfas_int value that is set in IOS on the NAS. Maps to DSTSPAN (converted from decimal to hex except when value is ffff).

Note The values used for destination span in the following examples are sample values. The real values for this parameter would match whichever PRI port the T1 is connected to on the NAS. Valid values are 0 through 3.

- Destination Time Slot—Identifies the time slot on the T1 that terminates at the NAS. Maps to DSTTIMESLOT (converted from decimal to hexadecimal except when value is ffff)

The following example shows the trunk text file for the sample configuration in this chapter. The fields in the text file correspond to the fields described above.

Example 4-13 Trunk Text File

```
#format2
100 ss7sigsvc ffff 1 nassvc1 1 1
101 ss7sigsvc ffff 2 nassvc1 1 2
102 ss7sigsvc ffff 3 nassvc1 1 3
103 ss7sigsvc ffff 4 nassvc1 1 4
104 ss7sigsvc ffff 5 nassvc1 1 5
105 ss7sigsvc ffff 6 nassvc1 1 6
106 ss7sigsvc ffff 7 nassvc1 1 7
107 ss7sigsvc ffff 8 nassvc1 1 8
108 ss7sigsvc ffff 9 nassvc1 1 9
109 ss7sigsvc ffff 10 nassvc1 1 10
110 ss7sigsvc ffff 11 nassvc1 1 11
111 ss7sigsvc ffff 12 nassvc1 1 12
112 ss7sigsvc ffff 13 nassvc1 1 13
113 ss7sigsvc ffff 14 nassvc1 1 14
114 ss7sigsvc ffff 15 nassvc1 1 15
115 ss7sigsvc ffff 16 nassvc1 1 16
116 ss7sigsvc ffff 17 nassvc1 1 17
117 ss7sigsvc ffff 18 nassvc1 1 18
118 ss7sigsvc ffff 19 nassvc1 1 19
119 ss7sigsvc ffff 20 nassvc1 1 20
120 ss7sigsvc ffff 21 nassvc1 1 21
121 ss7sigsvc ffff 22 nassvc1 1 22
122 ss7sigsvc ffff 23 nassvc1 1 23
123 ss7sigsvc ffff 24 nassvc1 1 24
124 ss7sigsvc ffff 25 nassvc1 1 25
125 ss7sigsvc ffff 26 nassvc1 1 26
126 ss7sigsvc ffff 27 nassvc1 1 27
127 ss7sigsvc ffff 28 nassvc1 1 28
128 ss7sigsvc ffff 29 nassvc1 1 29
129 ss7sigsvc ffff 30 nassvc1 1 30
130 ss7sigsvc ffff 31 nassvc1 1 31
131 ss7sigsvc ffff 32 nassvc1 2 1
132 ss7sigsvc ffff 33 nassvc1 2 2
133 ss7sigsvc ffff 34 nassvc1 2 3
134 ss7sigsvc ffff 35 nassvc1 2 4
135 ss7sigsvc ffff 36 nassvc1 2 5
136 ss7sigsvc ffff 37 nassvc1 2 6
137 ss7sigsvc ffff 38 nassvc1 2 7
138 ss7sigsvc ffff 39 nassvc1 2 8
139 ss7sigsvc ffff 40 nassvc1 2 9
140 ss7sigsvc ffff 41 nassvc1 2 10
141 ss7sigsvc ffff 42 nassvc1 2 11
142 ss7sigsvc ffff 43 nassvc1 2 12
143 ss7sigsvc ffff 44 nassvc1 2 13
144 ss7sigsvc ffff 45 nassvc1 2 14
145 ss7sigsvc ffff 46 nassvc1 2 15
146 ss7sigsvc ffff 47 nassvc1 2 16
147 ss7sigsvc ffff 48 nassvc1 2 17
148 ss7sigsvc ffff 49 nassvc1 2 18
149 ss7sigsvc ffff 50 nassvc1 2 19
150 ss7sigsvc ffff 51 nassvc1 2 20
151 ss7sigsvc ffff 52 nassvc1 2 21
152 ss7sigsvc ffff 53 nassvc1 2 22
153 ss7sigsvc ffff 54 nassvc1 2 23
```

```
154 ss7sigsvc ffff 55 nassvc1 2 24
155 ss7sigsvc ffff 56 nassvc1 2 25
156 ss7sigsvc ffff 57 nassvc1 2 26
157 ss7sigsvc ffff 58 nassvc1 2 27
158 ss7sigsvc ffff 59 nassvc1 2 28
159 ss7sigsvc ffff 60 nassvc1 2 29
160 ss7sigsvc ffff 61 nassvc1 2 30
161 ss7sigsvc ffff 62 nassvc1 2 31
162 ss7sigsvc ffff 63 nassvc1 3 1
163 ss7sigsvc ffff 64 nassvc1 3 2
164 ss7sigsvc ffff 65 nassvc1 3 3
165 ss7sigsvc ffff 66 nassvc1 3 4
166 ss7sigsvc ffff 67 nassvc1 3 5
167 ss7sigsvc ffff 68 nassvc1 3 6
168 ss7sigsvc ffff 69 nassvc1 3 7
169 ss7sigsvc ffff 70 nassvc1 3 8
170 ss7sigsvc ffff 71 nassvc1 3 9
171 ss7sigsvc ffff 72 nassvc1 3 10
172 ss7sigsvc ffff 73 nassvc1 3 11
173 ss7sigsvc ffff 74 nassvc1 3 12
174 ss7sigsvc ffff 75 nassvc1 3 13
175 ss7sigsvc ffff 76 nassvc1 3 14
176 ss7sigsvc ffff 77 nassvc1 3 15
177 ss7sigsvc ffff 78 nassvc1 3 16
178 ss7sigsvc ffff 79 nassvc1 3 17
179 ss7sigsvc ffff 80 nassvc1 3 18
180 ss7sigsvc ffff 81 nassvc1 3 19
181 ss7sigsvc ffff 82 nassvc1 3 20
182 ss7sigsvc ffff 83 nassvc1 3 21
183 ss7sigsvc ffff 84 nassvc1 3 22
184 ss7sigsvc ffff 85 nassvc1 3 23
185 ss7sigsvc ffff 86 nassvc1 3 24
186 ss7sigsvc ffff 87 nassvc1 3 25
187 ss7sigsvc ffff 88 nassvc1 3 26
188 ss7sigsvc ffff 89 nassvc1 3 27
189 ss7sigsvc ffff 90 nassvc1 3 28
190 ss7sigsvc ffff 91 nassvc1 3 29
191 ss7sigsvc ffff 92 nassvc1 3 30
192 ss7sigsvc ffff 93 nassvc1 3 31
193 ss7sigsvc ffff 94 nassvc2 4 1
194 ss7sigsvc ffff 95 nassvc2 4 2
195 ss7sigsvc ffff 96 nassvc2 4 3
196 ss7sigsvc ffff 97 nassvc2 4 4
197 ss7sigsvc ffff 98 nassvc2 4 5
198 ss7sigsvc ffff 99 nassvc2 4 6
199 ss7sigsvc ffff 100 nassvc2 4 7
200 ss7sigsvc ffff 101 nassvc2 4 8
201 ss7sigsvc ffff 102 nassvc2 4 9
202 ss7sigsvc ffff 103 nassvc2 4 10
203 ss7sigsvc ffff 104 nassvc2 4 11
204 ss7sigsvc ffff 105 nassvc2 4 12
205 ss7sigsvc ffff 106 nassvc2 4 13
206 ss7sigsvc ffff 107 nassvc2 4 14
207 ss7sigsvc ffff 108 nassvc2 4 15
208 ss7sigsvc ffff 109 nassvc2 4 16
209 ss7sigsvc ffff 110 nassvc2 4 17
210 ss7sigsvc ffff 111 nassvc2 4 18
211 ss7sigsvc ffff 112 nassvc2 4 19
212 ss7sigsvc ffff 113 nassvc2 4 20
213 ss7sigsvc ffff 114 nassvc2 4 21
214 ss7sigsvc ffff 115 nassvc2 4 22
215 ss7sigsvc ffff 116 nassvc2 4 23
216 ss7sigsvc ffff 117 nassvc2 4 24
217 ss7sigsvc ffff 118 nassvc2 4 25
```

```
218 ss7sigsvc ffff 119 nassvc2 4 26
219 ss7sigsvc ffff 120 nassvc2 4 27
220 ss7sigsvc ffff 121 nassvc2 4 28
221 ss7sigsvc ffff 122 nassvc2 4 29
222 ss7sigsvc ffff 123 nassvc2 4 30
223 ss7sigsvc ffff 124 nassvc2 4 31
224 ss7sigsvc ffff 125 nassvc2 5 1
225 ss7sigsvc ffff 126 nassvc2 5 2
226 ss7sigsvc ffff 127 nassvc2 5 3
227 ss7sigsvc ffff 128 nassvc2 5 4
228 ss7sigsvc ffff 129 nassvc2 5 5
229 ss7sigsvc ffff 130 nassvc2 5 6
230 ss7sigsvc ffff 131 nassvc2 5 7
231 ss7sigsvc ffff 132 nassvc2 5 8
232 ss7sigsvc ffff 133 nassvc2 5 9
233 ss7sigsvc ffff 134 nassvc2 5 10
234 ss7sigsvc ffff 135 nassvc2 5 11
235 ss7sigsvc ffff 136 nassvc2 5 12
236 ss7sigsvc ffff 137 nassvc2 5 13
237 ss7sigsvc ffff 138 nassvc2 5 14
238 ss7sigsvc ffff 139 nassvc2 5 15
239 ss7sigsvc ffff 140 nassvc2 5 16
240 ss7sigsvc ffff 141 nassvc2 5 17
241 ss7sigsvc ffff 142 nassvc2 5 18
242 ss7sigsvc ffff 143 nassvc2 5 19
243 ss7sigsvc ffff 144 nassvc2 5 20
244 ss7sigsvc ffff 145 nassvc2 5 21
245 ss7sigsvc ffff 146 nassvc2 5 22
246 ss7sigsvc ffff 147 nassvc2 5 23
247 ss7sigsvc ffff 148 nassvc2 5 24
248 ss7sigsvc ffff 149 nassvc2 5 25
249 ss7sigsvc ffff 150 nassvc2 5 26
250 ss7sigsvc ffff 151 nassvc2 5 27
251 ss7sigsvc ffff 152 nassvc2 5 28
252 ss7sigsvc ffff 153 nassvc2 5 29
253 ss7sigsvc ffff 154 nassvc2 5 30
254 ss7sigsvc ffff 155 nassvc2 5 31
255 ss7sigsvc ffff 156 nassvc2 6 1
256 ss7sigsvc ffff 157 nassvc2 6 2
257 ss7sigsvc ffff 158 nassvc2 6 3
258 ss7sigsvc ffff 159 nassvc2 6 4
259 ss7sigsvc ffff 160 nassvc2 6 5
260 ss7sigsvc ffff 161 nassvc2 6 6
261 ss7sigsvc ffff 162 nassvc2 6 7
262 ss7sigsvc ffff 163 nassvc2 6 8
263 ss7sigsvc ffff 164 nassvc2 6 9
264 ss7sigsvc ffff 165 nassvc2 6 10
265 ss7sigsvc ffff 166 nassvc2 6 11
266 ss7sigsvc ffff 167 nassvc2 6 12
267 ss7sigsvc ffff 168 nassvc2 6 13
268 ss7sigsvc ffff 169 nassvc2 6 14
269 ss7sigsvc ffff 170 nassvc2 6 15
270 ss7sigsvc ffff 171 nassvc2 6 16
271 ss7sigsvc ffff 172 nassvc2 6 17
272 ss7sigsvc ffff 173 nassvc2 6 18
273 ss7sigsvc ffff 174 nassvc2 6 19
274 ss7sigsvc ffff 175 nassvc2 6 20
275 ss7sigsvc ffff 176 nassvc2 6 21
276 ss7sigsvc ffff 177 nassvc2 6 22
277 ss7sigsvc ffff 178 nassvc2 6 23
278 ss7sigsvc ffff 179 nassvc2 6 24
279 ss7sigsvc ffff 180 nassvc2 6 25
280 ss7sigsvc ffff 181 nassvc2 6 26
281 ss7sigsvc ffff 182 nassvc2 6 27
```

```
282 ss7sigsvc ffff 183 nassvc2 6 28
283 ss7sigsvc ffff 184 nassvc2 6 29
284 ss7sigsvc ffff 185 nassvc2 6 30
285 ss7sigsvc ffff 186 nassvc2 6 31
286 ss7sigsvc ffff 187 nassvc3 7 1
287 ss7sigsvc ffff 188 nassvc3 7 2
288 ss7sigsvc ffff 189 nassvc3 7 3
289 ss7sigsvc ffff 190 nassvc3 7 4
290 ss7sigsvc ffff 191 nassvc3 7 5
291 ss7sigsvc ffff 192 nassvc3 7 6
292 ss7sigsvc ffff 193 nassvc3 7 7
293 ss7sigsvc ffff 194 nassvc3 7 8
294 ss7sigsvc ffff 195 nassvc3 7 9
295 ss7sigsvc ffff 196 nassvc3 7 10
296 ss7sigsvc ffff 197 nassvc3 7 11
297 ss7sigsvc ffff 198 nassvc3 7 12
298 ss7sigsvc ffff 199 nassvc3 7 13
299 ss7sigsvc ffff 200 nassvc3 7 14
300 ss7sigsvc ffff 201 nassvc3 7 15
301 ss7sigsvc ffff 202 nassvc3 7 16
302 ss7sigsvc ffff 203 nassvc3 7 17
303 ss7sigsvc ffff 204 nassvc3 7 18
304 ss7sigsvc ffff 205 nassvc3 7 19
305 ss7sigsvc ffff 206 nassvc3 7 20
306 ss7sigsvc ffff 207 nassvc3 7 21
307 ss7sigsvc ffff 208 nassvc3 7 22
308 ss7sigsvc ffff 209 nassvc3 7 23
309 ss7sigsvc ffff 210 nassvc3 7 24
310 ss7sigsvc ffff 211 nassvc3 7 25
311 ss7sigsvc ffff 212 nassvc3 7 26
312 ss7sigsvc ffff 213 nassvc3 7 27
313 ss7sigsvc ffff 214 nassvc3 7 28
314 ss7sigsvc ffff 215 nassvc3 7 29
315 ss7sigsvc ffff 216 nassvc3 7 30
316 ss7sigsvc ffff 217 nassvc3 7 31
317 ss7sigsvc ffff 218 nassvc3 8 1
318 ss7sigsvc ffff 219 nassvc3 8 2
319 ss7sigsvc ffff 220 nassvc3 8 3
320 ss7sigsvc ffff 221 nassvc3 8 4
321 ss7sigsvc ffff 222 nassvc3 8 5
322 ss7sigsvc ffff 223 nassvc3 8 6
323 ss7sigsvc ffff 224 nassvc3 8 7
324 ss7sigsvc ffff 225 nassvc3 8 8
325 ss7sigsvc ffff 226 nassvc3 8 9
326 ss7sigsvc ffff 227 nassvc3 8 10
327 ss7sigsvc ffff 228 nassvc3 8 11
328 ss7sigsvc ffff 229 nassvc3 8 12
329 ss7sigsvc ffff 230 nassvc3 8 13
330 ss7sigsvc ffff 231 nassvc3 8 14
331 ss7sigsvc ffff 232 nassvc3 8 15
332 ss7sigsvc ffff 233 nassvc3 8 16
333 ss7sigsvc ffff 234 nassvc3 8 17
334 ss7sigsvc ffff 235 nassvc3 8 18
335 ss7sigsvc ffff 236 nassvc3 8 19
336 ss7sigsvc ffff 237 nassvc3 8 20
337 ss7sigsvc ffff 238 nassvc3 8 21
338 ss7sigsvc ffff 239 nassvc3 8 22
339 ss7sigsvc ffff 240 nassvc3 8 23
340 ss7sigsvc ffff 241 nassvc3 8 24
341 ss7sigsvc ffff 242 nassvc3 8 25
342 ss7sigsvc ffff 243 nassvc3 8 26
343 ss7sigsvc ffff 244 nassvc3 8 27
344 ss7sigsvc ffff 245 nassvc3 8 28
345 ss7sigsvc ffff 246 nassvc3 8 29
```

```
346 ss7sigsvc ffff 247 nassvc3 8 30
347 ss7sigsvc ffff 248 nassvc3 8 31
```

When your file is complete, save it in the /opt/TransPath/etc/cust_specific directory by using *filename.extension* (for example, **trunks.txt**.) Then use the **prov-add:files** command to load the table.

Note In Cisco Media Gateway Controller software Release 7.4(x), save the file in the /opt/CiscoMGC/cust_specific directory.

Caution When you import a trunk file, all the existing bearer channels are replaced by the bearer channels that you import.

To provision the trunks:

	Command/Action	Purpose
Step 1	Use a text editor to create the trunk text file.	Provisions the fields needed for creation of trunks.
Step 2	Save the file in /opt/TransPath/etc/cust_specific. **Note** In Cisco Media Gateway Controller Software Release 7.4(x), save the file in /opt/CiscoMGC/etc/cust_specific.	Puts the file in the correct directory.
Step 3	Start a provisioning session. (See "Starting the Provisioning Session" section on page 4-7.)	Begins the session.

Step 4	Enter the **prov-add:files** command:
	`machine-name mml>`
	`prov-add:files:name="BCFile",file="trunks.txt",action="import"`
	`Media Gateway Controller 2000-03-04 13:16:43`
	`M COMPLD`
	`"files"`
	`;`
		Imports a trunk or bearer channel file (BCFile) called **trunks.txt** from the opt/TransPath/etc/cust_specific or /opt/CiscoMGC/etc/cust_specific directory.

Verifying Trunks

To verify that you have added the trunks, exit MML and change to the /opt/TransPath/etc/CONFIG_LIB/CFG_dialcfg1 directory.

Note For Cisco Media Gateway Controller software Release 7.4(x), the bearChan.dat file is located in the /opt/CiscoMGC/etc/CONFIG_LIB/CFG_dialcfg1 directory.

View the bearChan.dat file to ensure it contains the trunk information from the trunks.txt file you imported. The following example shows part of the bearChan.dat file:

```
machine-name% cd /opt/CiscoMGC/etc/CONFIG_LIB/CFG_dialcfg1
machine-name% more bearChan.dat
100  00130002  ffff  1  00140001  2  1
101  00130002  ffff  2  00140001  2  2
102  00130002  ffff  3  00140001  2  3
103  00130002  ffff  4  00140001  2  4
104  00130002  ffff  5  00140001  2  5
105  00130002  ffff  6  00140001  2  6
106  00130002  ffff  7  00140001  2  7
107  00130002  ffff  8  00140001  2  8
108  00130002  ffff  9  00140001  2  9
109  00130002  ffff  a  00140001  2  a
110  00130002  ffff  b  00140001  2  b
111  00130002  ffff  c  00140001  2  c
112  00130002  ffff  d  00140001  2  d
113  00130002  ffff  e  00140001  2  e
114  00130002  ffff  f  00140001  2  f
115  00130002  ffff  10  00140001  2  10
116  00130002  ffff  11  00140001  2  11
117  00130002  ffff  12  00140001  2  12
118  00130002  ffff  13  00140001  2  13
119  00130002  ffff  14  00140001  2  14
120  00130002  ffff  15  00140001  2  15
```

Note In software Release 7.4(x), you can retrieve and verify all trunks by entering the **prov-rtrv:nailedtrnk:"all"** command:

```
machine-name mml> prov-rtrv:nailedtrnk:"all"
   Media Gateway Controller 2000-04-04 16:55:03
M  RTRV
   "session=active:nailedtrnk"
   /*
NAME         SRCSVC               SRCSPAN      SRCTIMESLOT  DSTSVC
   DSTSPAN      DSTTIMESLOT
----         ------               ------       -----------  ------
   -------      -----------
100          ss7sigsvc            ffff         1            nassvc1
   2            1
101          ss7sigsvc            ffff         2            nassvc1
   2            2
102          ss7sigsvc            ffff         3            nassvc1
   2            3
103          ss7sigsvc            ffff         4            nassvc1
   2            4
104          ss7sigsvc            ffff         5            nassvc1
   2            5
105          ss7sigsvc            ffff         6            nassvc1
```

```
   2           6
106          ss7sigsvc             ffff         7            nassvc1
   2           7
107          ss7sigsvc             ffff         8            nassvc1
   2           8
108          ss7sigsvc             ffff         9            nassvc1
   2           9
109          ss7sigsvc             ffff         10           nassvc1
   2           10
110          ss7sigsvc             ffff         11           nassvc1
   2           11
111          ss7sigsvc             ffff         12           nassvc1
   2           12
112          ss7sigsvc             ffff         13           nassvc1
   2           13
113          ss7sigsvc             ffff         14           nassvc1
   2           14
114          ss7sigsvc             ffff         15           nassvc1
   2           15
115          ss7sigsvc             ffff         16           nassvc1
   2           16
116          ss7sigsvc             ffff         17           nassvc1
   2           17
117          ss7sigsvc             ffff         18           nassvc1
   2           18
```

Adding a Nailed Trunk

Although you can add individual trunks with MML, doing so is not recommended if you have a large number of trunks to add. Using MML to add trunks requires that you enter the command to add individual trunks for each of the 264 trunks that you need to provision.

Note In software Release 7.4(x), you can add multiple trunks for a T1 or E1. See the following procedures for more information.

To add individual trunks:

	Command/Action	Purpose
Step 1	`mml>prov-add:nailedtrnk:name="100",srcsvc="ss7svc1", srctimeslot=1, dstsvc="signas1", dstspan=2,dsttimeslot=1`	Adds a nailed trunk named “100” whose source and destination services are both defined at the NAS.

Note Adding individual trunks by using this command requires that you perform this action 24 times for each T1.

To add multiple trunks in software Release 7.4(x):

	Command/Action	Purpose
Step 1	`mml>prov-add:nailedtrnk:name="100",srcsvc="ss7svc1", srctimeslot=1, dstsvc="signas1", dstspan=2,dsttimeslot=1, spansize=24`	Adds 24 nailed trunks named "100" whose source and destination services are both defined at the NAS. For an E1, use a spansize value of 31.

Note If you have already provisioned the spans on the NAS to be associated with these trunks, you can now return those spans to service on the NAS using the **no shutdown** command.

Provisioning the Dial Plan/Number Analysis

The signaling controller provides the ability to create a dial plan to perform number analysis on both the A (calling) number and B (called) number. You can set up dial plans to perform routing, send calls to announcement servers, modify dialed digits, and perform other results.

You do not use the advanced features in the dial plan for the Cisco SS7 Interconnect for Access Servers Solution and the Cisco SS7 Interconnect for Voice Gateways Solution. In these solutions, the signaling controller routes calls directly over the IP network and does not perform routing or switching to trunk groups.

Provisioning White and Black List Screening

In the Cisco SS7 Interconnect for Access Servers Solution, you might want to perform white and black list screening to include or exclude calls from certain numbers. You can provision white lists that specify allowed A-numbers (calling numbers) or B-numbers (called numbers). Black lists block specified A-numbers (calling numbers) or B-numbers (called numbers).

For instructions on using the CMM to provision a sample B white list, see "Configuring the B White List" section on page 2-27.

For information on using MML to provision black and white list screening, see Chapter 6, "Adding System Components with MML," in the *Cisco Media Gateway Controller Software Release 7 Dial Plan Guide*.

Deploying the Session

The example used in this chapter features a continuous-service SC node. You must deploy the session to save it to the machine you are provisioning. The system then copies the files to the standby SC node.

Tip If you receive an error while trying to deploy, your connection between the active and standby SC nodes might be configured improperly. The communication between the active and standby SC nodes is configured in the XECfgParm.dat file on each machine. See the "Configuring the Execution Environment" section in Chapter 2 of *Cisco Media Gateway Controller Software Release 7 Installation and Configuration Guide* for more information.

Procedure

	Command/Action	Purpose
Step 1	machine-name mml> **prov-dply** Media Gateway Controller - VSC-01 2000-03-04 13:48:19 M COMPLD "PROV-DPLY" ;	Saves the configuration as active and copies it to the standby server.

Note Restart the standby server after reconfiguration to apply changes.

Verify

To verify that you have deployed the configuration, enter the **prov-rtrv:all** command and verify that the active configuration shown is the one you provisioned:

```
machine-name mml> prov-rtrv:all
   Media Gateway Controller - VSC-01 2000-03-04 13:50:06
M  RTRV
   "session=active:all"
   /*
NAME                 Parent Name          TID             Description
----                 -----------          ---             -----------
"encard1"            "VSC-01"             CARD            "Ethernet Card 1"
"encard2"            "VSC-01"             CARD            "Ethernet Card 2"
"enetif1"            "encard1"            ENETIF          "Ethernet interface for Card
1"
"enetif2"            "encard2"            ENETIF          "Ethernet interface for Card
2"
"ls01"               "apc1"               LNKSET          "Linkset from signaling
controller to STP A"
"ls02"               "apc2"               LNKSET          "Linkset from signaling
controller to STP B"
"iplink1"            "nassvc1"            IPLNK           "IP link for NAS 1"
"iplink2"            "nassvc2"            IPLNK           "IP link for NAS 2"
"iplink3"            "nassvc3"            IPLNK           "IP link for NAS 3"
"iplink4"            "nassvc1"            IPLNK           "IP link 2 for NAS 1"
"iplink5"            "nassvc2"            IPLNK           "IP link 2 for NAS 2"
"iplink6"            "nassvc3"            IPLNK           "IP link 2 for NAS 3"
"ss7route1"          "VSC-01"             SS7ROUTE        "Route 1 to PSTN Switch A
through LS1"
"ss7route2"          "VSC-01"             SS7ROUTE        "Route 2 to PSTN Switch A
through LS1"
"opc"                "VSC-01"             PTCODE          "Origination point code"
"dpc1"               "VSC-01"             PTCODE          "DPC of PSTN Switch A"
"nassvc1"            "nas1"               NASPATH         "Signaling service for NAS 1"
"nassvc2"            "nas2"               NASPATH         "Signaling service for NAS 2"
"nassvc3"            "nas3"               NASPATH         "Signaling service for NAS 3"

<Press Enter to continue OR Press * and Enter to quit output of command>

"ss7sigsvc"          "dpc1"               SS7PATH         "SS7 service to PSTN Switch
A"
"nas1"               "VSC-01"             EXTNODE         "NAS 1"
"nas2"               "VSC-01"             EXTNODE         "NAS 2"
"nas3"               "VSC-01"             EXTNODE         "NAS 3"
```

```
"c7iplink1"          "ls01"              C7IPLNK         "Link 1 in Linkset 1"
"c7iplink2"          "ls02"              C7IPLNK         "Link 1 in Linkset 1"
"c7iplink3"          "ls01"              C7IPLNK         "Link 1 in Linkset 2"
"c7iplink4"          "ls02"              C7IPLNK         "Link 2 in Linkset 2"
"apc1"               "VSC-01"            APC             "APC for STP A"
"apc2"               "VSC-01"            APC             "APC for STP B"
"subsys1"            "VSC-01"            SS7SUBSYS       "Route between STP A and STP
B"
   */
   ;
```

Creating and Processing an MML Batch File for Provisioning

You can create a file of MML provisioning commands for use as a batch file. All commands are in a single ASCII text file; when they are read by MML, the commands are executed sequentially.

Note It is important that the MML provisioning commands be in the correct provisioning sequence based on component dependencies. For example, a line interface cannot be provisioned before the card.

If you use an MML batch file, you can cut and paste commands, and you can use the batch files repeatedly to "reprovision" the signaling controller or to quickly provision multiple signaling controllers. However, if you intend to run the batch file multiple times on the same host, plan the source and destination directories carefully.

Tip You can create batch files to define complete systems or modify parts of an existing system.

Creating the File

To create a batch file, use an ASCII text editor to create a new file with one MML command on each line, ending with a carriage return. You can use any name for the file (follow UNIX file naming conventions), and you can store it in any location. However, the file must be accessible on the machine where you run MML sessions. The following example shows a sample MML batch file for the configuration in this chapter.

Example 4-14 Sample MML Provisioning Batch File

```
prov-sta::srcver="new",dstver="dialcfg1";
prov-add:ptcode:name="opc",netaddr="171.1.4",netind=2,desc="Origination point code";
prov-add:ptcode:name="dpc1",netaddr="171.1.3",netind=2,desc="DPC of PSTN Switch A";
prov-add:apc:name="apc1",netaddr="171.16.1",desc="APC for STP A";
prov-add:apc:name="apc2",netaddr="171.16.2",desc="APC for STP B";
prov-add:lnkset:name="ls01",apc="apc1",type="IP",proto="SS7-ANSI",desc="Linkset from
signaling controller to STP A";
prov-add:lnkset:name="ls02",apc="apc2",type="IP",proto="SS7-ANSI",desc="Linkset from
signaling controller to STP B";
prov-add:ss7subsys:name="subsys1",svc="apc1",matedapc="apc2",proto="SS7-ANSI",pri=3,ssn=0,
desc="Route between STP A and STP B";
prov-add:ss7route:name="ss7route1",opc="opc",dpc="dpc1",lnkset="ls01",pri=1,desc="Route 1
to PSTN Switch A through LS1";
prov-add:ss7route:name="ss7route2",opc="opc",dpc="dpc1",lnkset="ls02",pri=1,desc="Route 2
to PSTN Switch A through LS1";
```

```
prov-add:ss7path:name="ss7sigsvc",mdo="ANSISS7_STANDARD",dpc="dpc1",desc="SS7 service to
PSTN Switch A";
prov-add:card:name="encard1",type="EN",slot=0,desc="Ethernet Card 1";
prov-add:card:name="encard2",type="EN",slot=1,desc="Ethernet Card 2";
prov-add:enetif:name="enetif1",card="encard1",desc="Ethernet interface for Card 1";
prov-add:enetif:name="enetif2",card="encard2",desc="Ethernet interface for Card 2";
prov-add:c7iplnk:name="c7iplink1",if="enetif1",ipaddr="IP_Addr1",port=7000,peeraddr="175.3
0.241.27",peerport=32767,pri=1,slc=0,lnkset="ls01",desc="Link 1 in Linkset 1";
prov-add:c7iplnk:name="c7iplink2",if="enetif2",ipaddr="IP_Addr2",port=7000,peeraddr="175.3
0.238.28",peerport=32767,pri=1,slc=1,lnkset="ls02",desc="Link 2 in Linkset 1";
prov-add:c7iplnk:name="c7iplink3",if="enetif1",ipaddr="IP_Addr1",port=7000,peeraddr="175.3
0.241.27",peerport=32767,pri=1,slc=0,lnkset="ls01",desc="Link 1 in Linkset 2";
prov-add:c7iplnk:name="c7iplink4",if="enetif2",ipaddr="IP_Addr2",port=7000,peeraddr="175.3
0.238.28",peerport=32767,pri=1,slc=1,lnkset="ls02",desc="Link 2 in Linkset 2";
prov-add:extnode:name="nas1",desc="NAS 1";
prov-add:extnode:name="nas2",desc="NAS 2";
prov-add:extnode:name="nas3",desc="NAS 3";
prov-add:naspath:name="nassvc1",extnode="nas1",mdo="BELL_1268_C3",desc="Signaling service
for NAS 1";
prov-add:naspath:name="nassvc2",extnode="nas2",mdo="BELL_1268_C3",desc="Signaling service
for NAS 2";
prov-add:naspath:name="nassvc3",extnode="nas3",mdo="BELL_1268_C3",desc="Signaling service
for NAS 3";
prov-add:iplnk:name="iplink1",if="enetif1",ipaddr="IP_Addr1",port=6001,peeraddr="172.16.0.
2",peerport=6001,svc="nassvc1",desc="IP link for NAS 1";
prov-add:iplnk:name="iplink2",if="enetif1",ipaddr="IP_Addr1",port=6001,peeraddr="172.16.0.
3",peerport=6001,svc="nassvc2",desc="IP link for NAS 2";
prov-add:iplnk:name="iplink3",if="enetif1",ipaddr="IP_Addr1",port=6001,peeraddr="172.16.0.
4",peerport=6001,svc="nassvc3",desc="IP link for NAS 3";
prov-add:iplnk:name="iplink4",if="enetif2",ipaddr="IP_Addr2",port=6001,peeraddr="172.16.0.
2",peerport=6001,svc="nassvc1",desc="IP link 2 for NAS 1";
prov-add:iplnk:name="iplink5",if="enetif2",ipaddr="IP_Addr2",port=6001,peeraddr="172.16.0.
3",peerport=6001,svc="nassvc2",desc="IP link 2 for NAS 2";
prov-add:iplnk:name="iplink6",if="enetif2",ipaddr="IP_Addr2",port=6001,peeraddr="172.16.0.
4",peerport=6001,svc="nassvc3",desc="IP link 2 for NAS 3";
numan-add:dialplan:custgrpid="t778";
numan-add:awhite:custgrpid="t778",cli="7034843000";
numan-dlt:awhite:custgrpid="t778",cli="7034843001";
prov-cpy;
```

The first command starts a provisioning session, and the last command terminates and commits the provisioning session. If you are not ready to commit a session, use the **prov-stp** command to save and stop the provisioning session.

The **prov-cpy** or **prov-dply** command makes the provisioning session active and automatically stops the provisioning session.

Processing the File

To process the batch file, use the **mml -b** ***path/filename*** UNIX command.

	Command/Action	Purpose
Step 1	**mml -b** *path/filename*	Processes the MML commands in the batch file. Replace the path parameter with the absolute path to the file, and replace the filename parameter with the filename of the batch file containing the provisioning commands. Be sure to include the file extension; for example, **dial1.txt**.

Verifying the File

After you enter the command, MML displays the result of each command as it is executed. When the batch file is done, the MML session is closed.

To verify that you have deployed the configuration, log in and begin an MML session. Enter the **prov-rtrv:all** command and verify that the active configuration shown is the one you provisioned.

Tip MML provides a log function that records the MML commands and responses for you in a log file. If you start this function before you start the provisioning session and stop it after you stop the provisioning session, you can let the batch file run unattended and then check the log file later for any error messages. The log command is called **diaglog**. For more information on using this command, refer to the *Cisco Media Gateway Software Release 7 Reference Guide*.

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