Cisco 6500/7600 Series Manager User Guide

Release 2.1

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Cisco 6500/7600 Series Manager User Guide

CONTENTS

About this Guide

This preface describes who should read the *Cisco 6500/7600 Series Manager User Guide*, how it is organized, and its document conventions.

Audience

This guide is written as a technical resource for network managers, system administrators (the people responsible for managing the network), network analysts (those who configure the network), and operators.

It is assumed that you have a basic understanding of network design, operation, and terminology, and that you are familiar with your own network configurations. It is also assumed that you have a basic familiarity with UNIX and have read and understood the *Cisco Element Management Framework User Guide*.

Organization

This guide is organized as follows:

Chapter	Title	Description
Chapter 1	Product Overview	Provides a context for the Cisco 6500/7600 Series Manager.
Chapter 2	Basic Concepts	Describes basic concepts of the Cisco Element Management Framework (CEMF) and the concepts of network and service management associated with the C65/76M using CEMF.
Chapter 3	Getting Started	Describes the order of the tasks you should perform to get started with the C65/76M software.
Chapter 4	Deploying the C65/76M	Describes the deployment and commissioning process for the C65/76M.

Chapter	Title	Description
Chapter 5	Physical Object Dialog Boxes	Describes the C65/76M dialogs for physical objects and the management functions that can be carried out.
Chapter 6	Logical Object Dialog Boxes	Describes the C65/76M dialogs for logical objects and the management functions that can be carried out.
Chapter 7	Profiles	Describes how to create and apply C65/76M profiles.
Chapter 8	Alarms and Alarm Management	Describes the alarms that are raised in CEMF by the C65/76M.

Related Documentation

In addition to this guide, the following documents are available for the Cisco 6500/7600 Series Manager:

- *Cisco 6500/7600 Series Manager Installation Guide*
- Release Notes for the Cisco 6500/7600 Series Manager

The following documents are available for the Catalyst 6000 family switches:

- *Site Preparation and Safety Guide*
- *Catalyst 6000 Family Quick Software Configuration Guide*
- *Catalyst 6000 Family Module Installation Guide*
- *Catalyst 6000 Family Software Configuration Guide*
- *Catalyst 6000 Family System Functional Description*
- *Catalyst 6000 Family Command Reference*
- *Catalyst 6000 Family IOS Software Configuration Guide*
- *Catalyst 6000 Family IOS Command Reference*
- *ATM Software Configuration and Command Reference*—Catalyst 5000 Family and Catalyst 6000 Family Switches
- *System Message Guide*—Catalyst 6000 Family, 5000 Family, 4000 Family, 2926G Series, 2948G, and 2980G Switches

The following documents are available for the Cisco 7600 Internet Router:

- *Site Preparation and Safety Guide*
- *Cisco 7600 Internet Router Quick Software Configuration Guide*
- *Cisco 7600 Internet Router Software Configuration Guide*
- *Cisco 7600 Internet Router Command Reference*
- *Cisco 7603 and 7606 Internet Router Installation Guide*
- *Cisco 7609 Internet Router Installation Guide*
- *Cisco 7600 Internet Router Module Installation Guide*
- *Cisco 7600 Internet Router System Message Guide*

For information about MIBs, refer to this URL:
http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

Conventions and Terminology

This publication uses the following conventions:

Convention	Description
boldface font	Commands and keywords are in **boldface**. Names of onscreen elements that you click or select are in **boldface**. When describing user actions, keystrokes 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` 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.

Notes use the following conventions:

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

The Cisco EMF software supports a three-button mouse. The buttons are configured as follows:

- Left button—Selects objects and activates controls.
- Middle button—Adjusts a selected group of objects, adding to or deselecting part of the group.
- Right button—Displays and selects from menus.

This guide uses the following conventions and terminology:

- *pointer*—Indicates where the mouse action is to occur.
- *select*—To push and hold down the left mouse button.
- *release*—To let up on a mouse button to initiate an action.
- *click*—To select and release a mouse button without moving the pointer.
- *double-click*—To click a mouse button twice quickly without moving the pointer.
- *drag*—To move the pointer by sliding the mouse with one or more buttons selected.

In situations that allow more than one item to be selected from a list simultaneously, the following actions are supported:

- To select a single item in a list, click on the entry. Clicking a second time on a previously selected entry deselects it.
- To select a contiguous block of items, click on the first entry; then, without releasing the mouse button, drag to the last desired entry and release. (A subsequent click anywhere on the screen deselects all previous selections.)
- To extend a currently selected block, hold the **Shift** key down and click on the entry at the end of the group to be added.
- To add a noncontiguous entry to the selection group, hold down the **Ctrl** (Control) key and click on the entry to be added.

Obtaining Documentation

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

World Wide Web

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We appreciate your comments.

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- 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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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.

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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.

CHAPTER 1

Product Overview

This chapter consists of the following sections:

The Cisco 6500/7600 Series Manager (C65/76M) software manages and monitors one or more Catalyst 6000 family switches or Cisco 7600 series Internet Routers using Cisco Element Management Framework (CEMF), version 3.2. The C65/76M provides standard element-management functionality, such as fault, configuration, accounting, performance, and security (FCAPS).

Cisco 6500/7600 Series Manager Software Overview

The Cisco 6500/7600 Series Manager (C65/76M) software adds custom windows and modeling behavior to the standard CEMF system to provide management of the Catalyst 6000 family switches and Cisco 7600 series Internet Routers.

The software helps network administrators manage Catalyst 6000 family switches or Cisco 7600 series Internet Routers by eliminating the need to have Simple Network Management Protocol (SNMP) and a detailed knowledge of the Cisco IOS or Catalyst OS required commands. The software also helps simplify the deployment process for the Catalyst 6000 family switches or Cisco 7600 series Internet Routers.

Multiple Element Managers can be installed onto a single CEMF server, which allows multidevice and multivendor management from a single system.

Note Refer to the *Cisco Element Management Framework User Guide* for additional information.

Software Features

The C65/76M software provides the following features:

- Manual predeployment of Catalyst 6000 family switches or Cisco 7600 series Internet Routers and subcomponents in the management system before actual installation. The system can automatically detect predeployed objects and begin management when they are installed and configured.
- Autodiscovery feature that identifies newly installed Catalyst 6000 family switches or Cisco 7600 series Internet Routers and their hardware configuration.
- Access to maps that are automatically created by the management system to show the exact representation of Catalyst 6000 family or Cisco 7600 series Internet Router components.
- SNMP alarms presented as color-coded icons on network maps.
- Access to fault, configuration, accounting, performance, and security (FCAPS) functionality (supported through SNMP and Cisco IOS or Catalyst OS software) through GUIs that you can operate without SNMP or Cisco IOS or Catalyst OS software expertise.
- Many operations can be performed to several Catalyst 6000 family switches or Cisco 7600 series Internet Routers, simplifying the management of a large deployment of multiple switches.
- CEMF event browser or performance manager provide historical information analysis.
- Configuration of Ethernet, PoS, ATM, and Sonet modules.
- Configuration management, including backup and restore operations.
- Software-download initiation.

Catalyst 6000 Family Overview

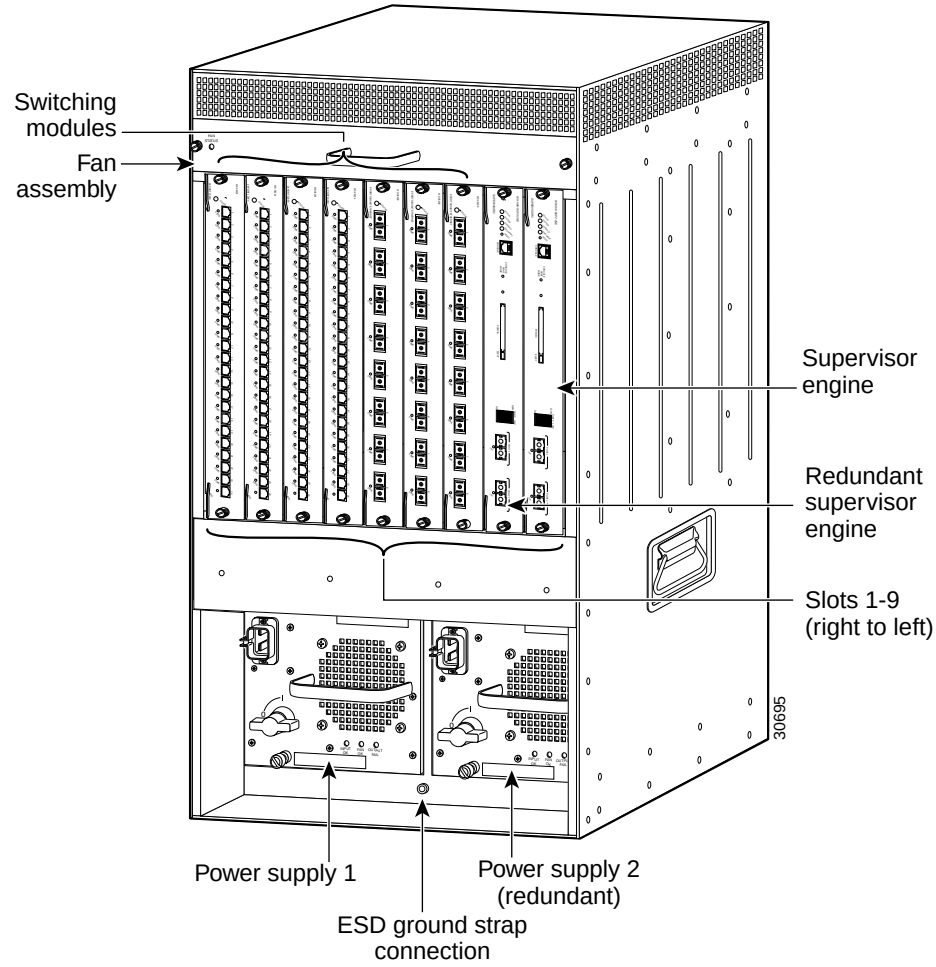
The Catalyst 6000 family consists of the 6-slot Catalyst 6006 switch and the 9-slot Catalyst 6009 switch. The Catalyst 6500 series consists of the 6-slot Catalyst 6506 switch, the 9-slot Catalyst 6509 switch, the 9-slot Catalyst 6509NEB switch (shown in Figure 1-1), and the 13-slot 6513 switch.

These high-performance, modular, frame-based switches support high-density Fast Ethernet and Gigabit Ethernet in both campus-backbone and server-aggregation environments. The Catalyst 6006 and the Catalyst 6009 switches have a 32-Gbps switching capacity, while the Catalyst 6506, the Catalyst 6509, and the Catalyst 6509-NEB switches can support a backplane architecture that scales from 32 Gbps to 256 Gbps.

All platforms share the same supervisor engines, switching modules, and software, and support redundant configurations of supervisor engines, power supplies, and port interfaces.

For additional information about the Catalyst 6000 family switches, refer to the *Catalyst 6000 Family Installation Guide*. For a complete list of Catalyst 6000 family documentation, see the "Related Documentation" section on page xv.

Figure 1-1 Catalyst 6509-NEB Switch



Cisco 7600 Series Overview

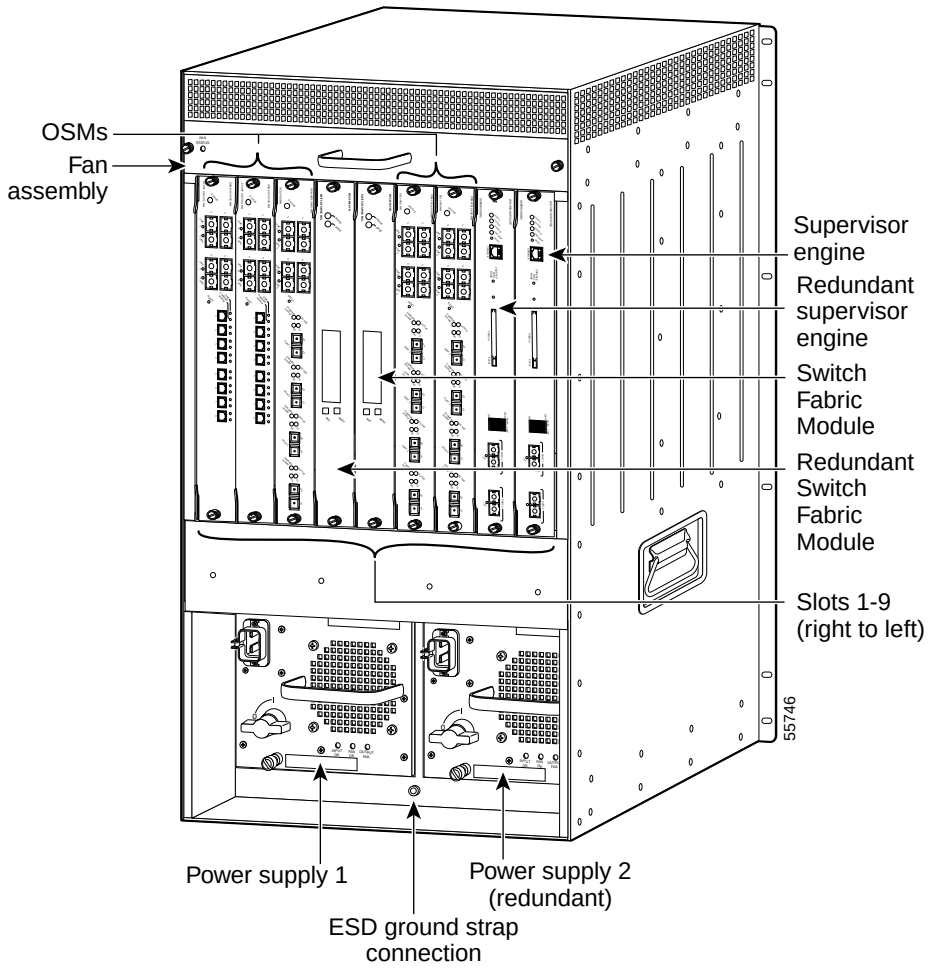
The Cisco 7600 series Internet Routers consist of the 3-slot 7603, the 6-slot 7606, and the vertical 9-slot 7609 (shown in Figure 1-2).

The Cisco 7600 series Internet Routers deliver optical LAN, WAN, and MAN networking with a focus on line-rate delivery of high-touch IP services at the network edge. Service providers can “service enable” their networks at optical speeds, enabling them to differentiate their service offerings for competitive advantage.

The Cisco 7600 series Internet Routers support the following features:

- 30 Mpps forwarding processor and up to 512 MB DRAM for Internet routing
- Up to two distributed Parallel Express Forwarding (PXF) IP services processors on each Optical Services Module (OSM) for flexible IP service implementation
- High-touch, line-rate IP services at 6 Mpps per slot:
  - QoS
  - Hierarchical traffic shaping
  - Destination sensitive services (accounting, billing, and QoS)
- The ability to monitor service levels delivered to customers under service level agreements (SLAs)
- Wide range of WAN and MAN interfaces providing DS0 through OC-48 (using the FlexWAN module)
- Compatibility with the Catalyst 6000 family LAN interfaces offering 10 Mbps Ethernet to 1 Gbps

Figure 1-2 Cisco 7609 Internet Router



For additional information about the Cisco 7600 series Internet Routers, refer to the *Cisco 7603 and 7606 Internet Router Installation Guide* and *Cisco 7609 Internet Router Installation Guide*. For a complete list of Cisco 7600 series Internet Router documentation, see the "Related Documentation" section on page xv.

Supported Hardware

Table 1-1 lists the hardware that is supported by C65/76M, release 2.1:

Table 1-1 Supported Hardware

Platform	Part Number	Description
Catalyst 6000 family chassis	WS-C6006	6-slot Catalyst 6000 series chassis
	WS-C6009	9-slot Catalyst 6000 series chassis
	WS-C6506	6-slot Catalyst 6500 series chassis
	WS-C6509	9-slot Catalyst 6500 series chassis
	WS-C6509-NEB	Vertical 9-slot Catalyst 6500 series chassis
	WS-C6513	13-slot Catalyst 6500 series chassis
Cisco 7600 series chassis	CISCO7603	3-slot Cisco 7600 series chassis
	CISCO7606	6-slot Cisco 7600 series chassis
	OSR-7609	Vertical 9-slot Cisco 7600 series chassis
Catalyst 6000 family power supplies	WS-CAC-1000W	1000W AC power supply
	WS-CAC-1300W	1300W AC power supply
	WS-CAC-2500W	2500W AC power supply
	WS-CAC-4000W	4000W AC power supply
	WS-CDC-1300W	1300W DC power supply
	WS-CDC-2500W	2500W DC power supply
Cisco 7600 series power supplies	PWR-950-AC	950W AC power supply
	PWR-950-DC	950W DC power supply
	PWR-1900-AC/6	1900W AC power supply
	PWR-1900-DC	1900W DC power supply

Table 1-1 Supported Hardware (continued)

Platform	Part Number	Description
Catalyst 6000 family modules	WS-X6K-SUP1A-MSFC	Supervisor Engine 1A with MSFC
	WS-X6K-S1A-MSFC2	Supervisor Engine 1A with MSFC2
	WS-X6K-S2-MSFC2	Supervisor Engine 2 with MSFC2
	WS-X6K-S2U-MSFC2	Supervisor Engine 2 with 256 MB DRAM and MSFC2
	WS-X6066-SLB-APC	Content Switching Module
	WS-X6182-2PA	FlexWAN Module
	WS-X6224-100FX-MT	24-port 100FX, MT-RJ
	WS-X6324-100FX-MM	24-port 100FX, MT-RJ, multimode fiber, 128K per port packet buffers
	WS-X6324-100FX-SM	24-port 100FX, MT-RJ, single-mode fiber, 128K per port packet buffers
	WS-X6248-RJ-45	48-port 10/100TX, RJ-45
	WS-X6248-TEL	48-port 10/100TX, RJ-21
	WS-X6248A-TEL	48-port 10/100TX, RJ-21, 128K per port packet buffers
	WS-X6348-RJ-45	48-port 10/100TX, RJ-45, 128K per port packet buffers
	WS-X6348-RJ45V	48-port 10/100TX, RJ-45, 128K per port packet buffers with inline power
	WS-X6348-RJ-21	48-port 10/100, RJ-21, upgradable to voice
	WS-X6348-RJ-21V	48-port 10/100, RJ-21, inline power
	WS-X6524-100FX-MM	Fabric-enabled 100FX Fast Ethernet Module, multimode fiber, MT-RJ
	WS-X6548-RJ-21	Fabric-enabled 10/100 Fast Ethernet Modules, RJ-21
	WS-X6548-RJ-45	Fabric-enabled 10/100 Fast Ethernet Modules, RJ-45

Table 1-1 Supported Hardware (continued)

Platform	Part Number	Description
Catalyst 6000 family modules (continued)	WS-X6408-GBIC	8-port Gigabit Ethernet
	WS-X6408A-GBIC	8-port Gigabit Ethernet with enhanced QoS
	WS-X6416-GBIC	16-port Gigabit Ethernet
	WS-X6416-GE-MT	16-port Gigabit Ethernet, MT-RJ
	WS-X6516-GBIC	16-port Gigabit Ethernet, single fabric-enabled connection
	WS-X6816-GBIC	16-port Gigabit Ethernet, dual fabric-enabled with Distributed Forwarding, (Req GBICs)
	WS-X6316-GE-TX	16-port Gigabit Ethernet, RJ-45
	WS-X6501-10GEX4	One-port 10GBASE-EX4 Metro Extended Reach 10 Gigabit Ethernet Module (single-mode fiber)
	WS-X6502-10GE	1-port 10GBASE-LR Serial 130nm Long Haul 10 Gigabit Ethernet module (WS-G6488 installed)
	WS-X6516-GE-TX	16-port Gigabit Ethernet, RJ-45, x-bar
	WS-X6066-SLB-APC	Server Load Balancing Module
	WS-C6500-SFM	Switch Fabric Module
	WS-C6500-SFM2	Switch Fabric Module, version 2
	OSM-4GE-WAN-GBIC	4-port Gigabit Ethernet Optical Services Module, GBIC
	OSM-4OC12-POS-MM	4-port OC-12/STM-4 SONET/SDH OSM, MM, with 4 ports of Gigabit Ethernet
	OSM-4OC12-POS-SI	4-port OC-12/STM-4 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet
	OSM-4OC12-POS-SL	4-port OC-12/STM-4 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet
	OSM-1OC48-POS-SS	1-port OC-48/STM-16 SONET/SDH OSM, SM-SR, with 4 ports of Gigabit Ethernet
	OSM-1OC48-POS-SI	1-port OC-48/STM-16 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet

Table 1-1 Supported Hardware (continued)

Platform	Part Number	Description
Cisco 7600 Optical Services Modules (continued)	OSM-1OC48-POS-SL	1-port OC-48/STM-16 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet
	OSM-16OC3-POS-MM	16-port OC-3/STM-1 SONET/SDH OSM, MM, with 4 ports of Gigabit Ethernet
	OSM-16OC3-POS-SI	16-port OC-3/STM-1 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet
	OSM-16OC3-POS-SL	16-port OC-3/STM-1 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet
	OSM-2OC12-POS-MM	2-port OC-12/STM-4 SONET/SDH OSM, MM, with 4 ports of Gigabit Ethernet
	OSM-2OC12-POS-SI	2-port OC-12/STM-4 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet
	OSM-2OC12-POS-SL	2-port OC-12/STM-4 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet
	OSM-8OC3-POS-MM	8-port OC-3/STM-1 SONET/SDH OSM, MM, with 4 ports of Gigabit Ethernet
	OSM-8OC3-POS-SI	8-port OC-3/STM-1 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet
	OSM-8OC3-POS-SL	8-port OC-3/STM-1 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet
	OSM-1CHOC48/T3-SS	1-port channelized OC48 OSM, SM-SR, with 4 Gigabit Ethernet
	OSM-1CHOC48/T3-SI	1-port channelized OC48 OSM, SM-IR, with 4 Gigabit Ethernet
	OSM-2CHOC48/T3-SS	2-port channelized OC48 OSM, SM-SR, with 4 ports of Gigabit Ethernet
	OSM-2CHOC48/T3-SI	2-port channelized OC-48 OSM, SM-IR, with 4 ports of Gigabit Ethernet
Cisco 7600 Optical Services Modules (continued)	OSM-4CHOC12/T3-MM	4-port channelized OC-12 OSM, MM, with 4 ports of Gigabit Ethernet
	OSM-4CHOC12/T3-SI	4-port channelized OC-12 OSM, SI, with 4 ports of Gigabit Ethernet
	OSM-8CHOC12/T3-MM	8-port channelized OC-12 OSM, MM, with 4 ports of Gigabit Ethernet
	OSM-8CHOC12/T3-SI	8-port channelized OC-12 OSM, SI, with 4 ports of Gigabit Ethernet

Supported Software

The Cisco 6500/7600 Series Manager, version 2.1, supports Native IOS Release 12.1(3a)E3 to Release 12.1(11)E. It also supports Hybrid OS in the following combinations:

- Catalyst OS 6.3(3a) and IOS 12.1(8)E
- Catalyst OS 7.1(2) and IOS 12.1(8)E
- Catalyst OS 7.1(2) and IOS 12.1(11)E

Note The Cisco 6500/7600 Series Manager does not support Catalyst 6000 family switches or Cisco 7600 series Internet Routers running only Catalyst software (no Multilayer Switch Feature Card installed).

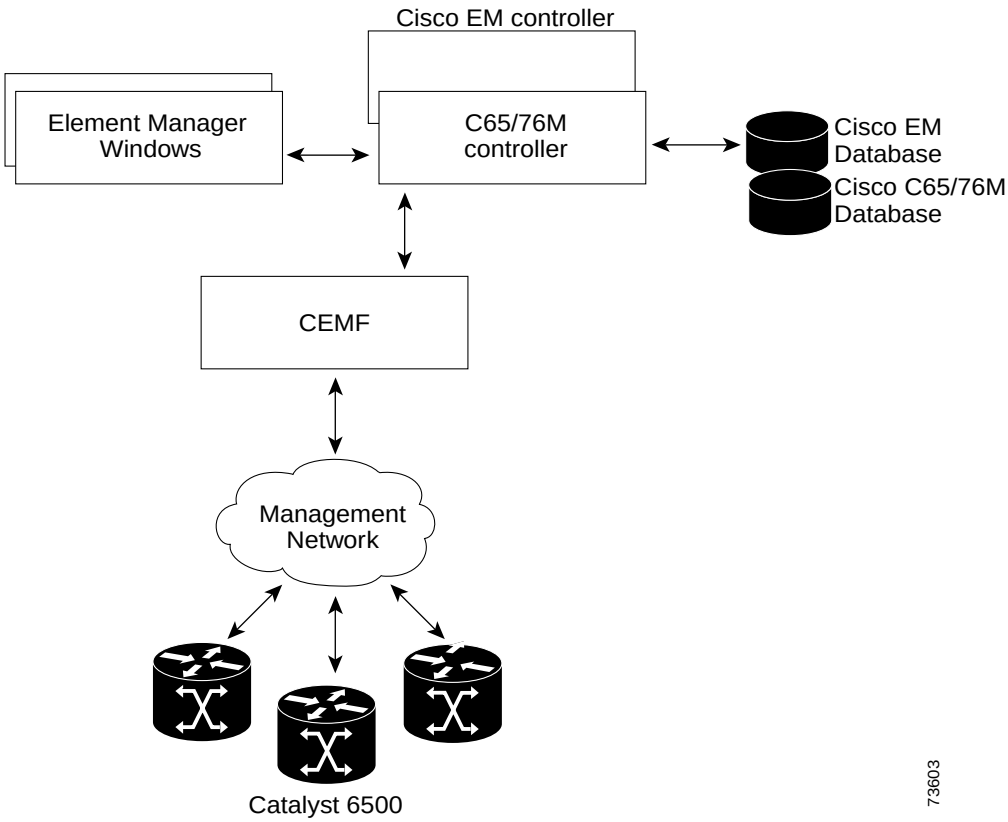
Basic Concepts

This chapter describes basic concepts and terminology used in this guide, and consists of these sections:

Cisco EMF and Cisco 6500/7600 Series Manager Software

The C65/76M is the carrier-class element manager for the Catalyst 6000 family switches and Cisco 7600 series Internet Routers, which “plugs into” CEMF. The C65/76M software adds additional windows and a back-end controller process that communicates with the hardware elements (using CEMF), as shown in the following figure.

Figure 2-1 CEMF and C65/76M Processes



Element Management

An Element Manager is an application that is responsible for providing fault, configuration, accounting, performance and security (FCAPS) management for a particular type of Network Element or family of Network Elements. The C65/76M software primarily provides fault and performance information. The configuration capabilities are limited, and the accounting information is used for inventory purposes. No security information is provided by the C65/76M.

C65/76M Objects and Interfaces

The C65/76M software provides three types of objects:

- Physical—Represents actual components and devices such as the chassis (hardware frame), fans, power supplies, modules, and ports.
- Logical—Represents the nontangible features, such as VLAN configurations, EtherChannels, and routing protocols.
- Network element—Represents the entire Catalyst 6000 family multilayer switch or Cisco 7600 series Internet Router managed through a single SNMP agent and IOS command-line interface.

Physical Objects

The C65/76M software models the following physical components:

- Chassis—The hardware frame of the Catalyst 6000 family switch or the Cisco 7600 series Internet Router
- Power supplies—The source of power for the Catalyst 6000 family switch or the Cisco 7600 series Internet Router
- Supervisor Engine modules—Contain the route and switch processors
- Ethernet interfaces—Ports on Ethernet modules and supervisor engine modules
- Ethernet modules—Represent Ethernet, Fast Ethernet, and Gigabit Ethernet modules
- Switch Fabric Modules—Provide connection to the crossbar switching fabric
- FlexWAN modules —Supports up to two port adapters that provide WAN and MAN connections
- Port adapters—The port adapters plug into the FlexWAN module to provide WAN and MAN connections
- OSM GeWAN modules/interfaces—Modules and associated ports that provide 4 Gigabit Ethernet WAN connections
- OSM PoS modules/interfaces—Modules and associated ports that provide Packet-over-SONET (PoS) connection support
- OSM Channelized SONET modules/interfaces—Modules and associated ports that provide SONET-based channelizing of interface bandwidth, including both PoS and serial subinterfaces
- Content Switching Modules—Defines a virtual server that represents a cluster of real servers

These C65/76M objects have the following hierarchical organization:

- Chassis
  - Power supplies
  - Supervisor engine modules:

    Ethernet interfaces
  - Ethernet modules:

    Ethernet interfaces
  - Switch Fabric Modules
  - FlexWAN Modules

    Port adapters:

    ATM port adapters

    ATM SONET interfaces

    ATM E3 interfaces

    ATM T3 interfaces
  - OSM GeWAN Modules

    OSM GeWAN interfaces
  - OSM PoS Modules

    Ethernet interfaces

    OSM PoS interfaces
  - OSM Channelized SONET Modules

    Ethernet interfaces

    OSM ChSONET interfaces

    OSM Serial Subinterfaces

    OSM PoS Subinterfaces
  - Content Switching Modules

Logical Objects

The C65/76M models the following logical components:

- Software—Represents the IOS image and configuration file on the Catalyst 6000 family switch or Cisco 7600 series Internet Router
- EtherChannels—Creates, deletes, and modifies EtherChannels on the Catalyst 6000 family switch or Cisco 7600 series Internet Router
- VLAN—Lists, creates, and deletes VLAN interfaces on the Catalyst 6000 family switch or Cisco 7600 series Internet Router
- Loopback—Used to isolate the fault on an end-to-end circuit
- Syslog—Represents the standard syslog messaging protocol on the Catalyst 6000 family switch or Cisco 7600 series Internet Router
- ACL—Represent access control lists, both standard and extended, named and numbered

- NDE—NetFlow Data Export (NDE) makes traffic statistics available for analysis by an external data collector
- QoS—Enables and manages the global quality of service (QoS) engine.
- QoS policy map—Describes the traffic filters applied to enforce QoS parameters on ingress traffic received on an interface or VLAN.
- EIGRP—Creates, modifies, and deletes Enhanced Interior Gateway Routing Protocol (EIGRP) instances on the Catalyst 6000 family switch or Cisco 7600 series Internet Router
- BGP—Creates and modifies Border Gateway Protocol (BGP) routing protocol
- OSPF—Displays the Open Shortest Path First (OSPF) routing protocol information for the Catalyst 6000 family switch or Cisco 7600 series Internet Router
- VTP—VLAN Trunking Protocol
- STP—Spanning Tree Protocol
- IS-IS—Creates, modifies, and deletes intermediate system-to-intermediate system (IS-IS) routing processes on the Catalyst 6000 family switch or Cisco 7600 series Internet Router

These components have the following hierarchical organization:

- Software
  - EtherChannels
  - Syslog
  - EIGRP
  - BGP
  - OSPF
  - VTP
  - VLAN
  - STP
  - IS-IS
  - ACL
  - NDE
  - Loopback
  - QoS

    QoS policy map

Network Element Object

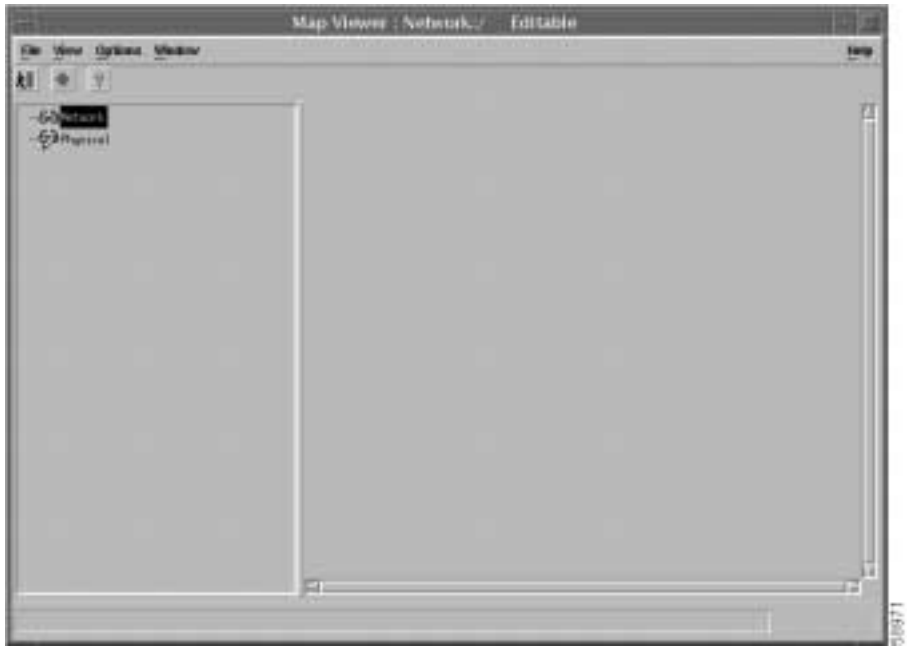
The Network Element object is a logical container representing the entire Catalyst 6000 family multilayer switch or Cisco 7600 series Internet Router managed through the supervisor and/or MSFC SNMP agents and Catalyst OS/IOS command-line interface. This class acts as a container for the physical and logical components of the device. The entire hierarchical structure of the C65/76M components is as follows:

```
Network Element
    Chassis
        Power Supplies
        Supervisor Modules
            Ethernet Interfaces
        Ethernet Modules
            Ethernet Interfaces
        Switch Fabric Modules
        FlexWAN Modules
            Port Adapter
            ATM Port Adapter
                ATM SONET Interfaces
                ATM E3 Interfaces
                ATM T3 Interfaces
        OSM GeWAN Modules
            OSM GeWAN Interfaces
        OSM POS Modules
            Ethernet Interfaces
            OSM POS Interfaces
        OSM Channelized SONET Modules
            Ethernet Interfaces
            OSM Channelized SONET Interfaces
                OSM Serial Sub-interfaces
                OSM POS Sub-interfaces
        Content Switching Modules
    Software
        EtherChannels
        Syslog
        EIGRP
        BGP
        OSPF
        VTP
        VLAN
        STP
        IS-IS
        ACL
        NDE
        Loopback
        QoS
            QoS Policy Map
```

Containment Views

The CEMF Map Viewer application uses a concept called containment views to allow logical grouping of monitored objects. Objects being managed by CEMF must be added to one or more containment views. Objects are organized into different views and can exist in multiple views simultaneously by reference. Objects can be in one or more containment views. Figure 2-2 shows the default network containment view and default physical containment view in the Map Viewer application.

Figure 2-2 Default Network Containment View



When installed, the C65/76M does not modify the visible containment views and all managed objects will appear in the Physical tree. Note that previous versions of the EMS added three other containment views (Catalyst6000Manager, Catalyst6500Manager and Cisco7600Manager) - if these views are present the version 2.0 release of the Manager application is still installed. See the *Cisco 6500/7600 Manager Installation Guide* for instruction on removing the previous version of the Manager.

Network View

The network view is a standard feature in CEMF. This view is used by the CEMF Auto Discovery feature to determine which devices have already been added to the system so that Auto Discovery does not try to discover the same device multiple times. This view displays all IP devices under their parent network (that is, it groups monitored objects in a network layout). This view provides a logical view of the network structure. For example, devices on the same subnet would be grouped together. Refer to the *Cisco Element Management Framework User Guide* for more information.

Physical View

The physical view is a standard feature in CEMF. Objects in the physical view are ordered according to their relative geographical or physical location. The relationships defined in this view are physical containment relationships. For example, monitored objects physically located in the same room or location may be grouped together under the same site. Refer to the *Cisco Element Management Framework User Guide* for more information.

C65/76M Object States

All C65/76M objects have states associated with them. Each state corresponds to a specific task that is performed in that state. For example, in the performance state, attributes are being polled at a predefined rate. State changes can be triggered by actions, or selected SNMP traps from the device. The state of an object can change frequently, depending upon what actions are being performed on the object. All objects in CEMF have a state assigned to them, which appears at the bottom left corner of each dialog box for a selected object. The following are the two most common object states:

- Normal
- Decommissioned

Some states are inherited by an object's children. For example, if a chassis is decommissioned, all subchassis objects are also decommissioned. If performance logging is enabled on a module, performance logging is enabled on all ports of that module.

Decommissioned State

The decommissioned state indicates that an object is not being managed. When an object is initially deployed, it is normally placed into a decommissioned state. The following actions occur on a decommissioned object:

- Active management stops
- All subobjects also are decommissioned

Decommission buttons can be found within certain windows, dependent upon the type of object selected. When an object is decommissioned, the children of that object also change their state to decommissioned. For example, if a module is decommissioned, all interfaces and connections on that module are decommissioned.

Objects can be put into the decommissioned state from any other state.

Discovery State

The discovery state is a temporary state that is assigned to certain objects during subchassis discovery.

This state applies to the Network Element, Chassis and Software objects. It is used to determine the physical and logical components on a switch. If successful, an automatic state transition to normal is made. If communication is lost, the object transitions to the discovery lostcomms state. If physical components are detected that do not match the expected types, the objects are transitioned to the mismatched state.

Normal State

The normal state is applicable to all objects, and represents a situation in which an object is regarded as being actively monitored. When an object enters the normal state, CEMF performs heartbeat polling on the object every five minutes to check for connectivity or changes to the object.

Lostcomms State

This state applies only to the Network Element object. If communication to the Network Element object is lost, it moves into the lostcomms state. Heartbeat polling polls an object every five minutes to verify its existence and current state. Heartbeat polling continues, until the object responds positively to a heartbeat request. When the object can be contacted again, it responds positively to heartbeat requests, and then moves back into the normal state.

Normal Lostcomms State

This state applies all objects except the Network Element object. This state indicates that communication has been lost to an object that was formerly in the normal state. Two transistions can be made out of this state:

- If communication is restored, the object transitions back to the normal state.
- While this object is still in the normal lostcomms state, if the object is stimulated to activate performance logging, then the transistion is immediately to the perflostcomms state.

Performance State

This state applies all physical objects that support Performance Logging. When you enable performance logging on an object in the normal state, the object is moved into the performance state. Specific performance data is collected on the object and can be viewed in the Performance Manager. You can enable performance logging on a global scale or on an individual interface basis. Enabling global performance logging puts all subchassis objects into the performance state.

Performance logging occurs at the specified interval. When you initially enable performance logging or global performance logging on an object, it takes a period of time up to the length of the interval for the data to be collected and become visible in C65/76M performance menus.

Heartbeat polling is performed on an object in the performance state. If the object moves into the lostcomms state, it is returned to the performance state when the error is corrected. For example, if a module is in the performance state and it fails, it moves into the lostcomms state. When heartbeat polling finds the module is back up, it restores the module to the performance state.

There are three transitions out of the performance state:

- If communication to the object is lost while the object is in the performance state, the state transition is into the perflostcomms state.
- To turn off the object's performance logging, you can send the object the normal stimulus. The transistion is to the normal state.
- If heartbeat polling determines that connectivity is lost or changes have been made to the object, the transition is to the discovery state. Once dicovery is completed successfully, the object transitions back to the performance state.

Perflostcomms State

This state applies all physical objects that support Performance Logging. This state indicates that communication has been lost to an object that was formerly in the performance state. Two transistions can be made out of this state:

- If communication is restored, the object transitions back to the performance state.
- While this object is still in the perflostcomms state, if the object is stimulated to deactivate performance logging, then the transistion is immediately to the normal lostcomms state.

If communication to an object is lost, it moves into the lostcomms state. In this state, performance polling (if activated) is stopped; however, heartbeat polling continues, until the object responds positively to a heartbeat request. Heartbeat polling polls an object every five minutes to verify its existence and current state. When the object can be contacted again, it responds positively to heartbeat requests, and then moves back into the previously held state.

Discovery Lostcomms State

The discovery lostcomms state applies to Network Element, Software and Chassis objects. This state is similar to the lostcomms state, except that it only occurs during the discovery process. When connectivity is established with the corresponding object in the device, the discovery is resumed and the object moves out of the discovery lostcomms state.

Mismatched State

The mismatched state occurs when a mismatch is found between the type of hardware discovered and what is predeployed in CEMF. For example, if a 48-port 10/100TX, RJ-45 module is expected, the module is predeployed in CEMF to prepare for that type of module. However, when the module becomes available and is placed into the chassis, it is not a 48-port 10/100TX, RJ-45 module, but an 8-port Gigabit Ethernet module. After the C65/76M detects the new module, it finds a mismatch. The module gets placed into the mismatched state and an alarm is raised against the module.

To correct a mismatch problem, the source of the problem must be assessed. If the operator was at fault and predeployed an incorrect module, the operator should delete the predeployed module and deploy the correct module. If the engineer is at fault and inserted the wrong type of module into the chassis, then the module should be removed and replaced.

The mismatched state applies to the following objects:

- Network element
- All modules
- Port Adapters
- Channelized SONET subinterfaces

For the Network Element object, the mismatched state indicates that there is a major difference between the CEMF information and the actual Catalyst 6000 family switch or a Cisco 7600 series Internet Router. This mismatch can be in the major switch series (e.g. 6000, 6500 or 7600), the specific model of the switch (e.g. 6506, 6509 or 6513) or the type of software installation on the switch (Catalyst OS, Hybrid OS or Native IOS).

CHAPTER 3

Getting Started

This chapter describes the typical tasks to be completed when first using the Cisco 6500/7600 Series Manager, and consists of the following sections:

Preparing to Use the C65/76M Software

The following table outlines the general steps involved in using the C65/76M software.

Table 3-1 Using C65/76M

	Steps	Description
Step 1	Install and start Cisco EMF.	Refer to the *Cisco Element Management Framework Installation and Administration Guide* for more information on how to install and start Cisco EMF.
Step 2	Install the C65/76M software.	Refer to the *Cisco 6500/7600 Manager Installation Guide* for more information.
Step 3	Set up the Catalyst 6000 family switch or the Cisco 7600 series Internet Router.	You must configure the Catalyst 6000 family switch or Cisco 7600 series Internet Router before it can be properly managed by Cisco EMF. Refer to the "Hardware Configuration Requirements" section in the *Cisco 6500/7600 Manager Installation Guide* for more information.
Step 4	Start a Cisco EMF session.	Starting a Cisco EMF user session provides access to all C65/76M functionality.
Step 5	Deploy objects.	Refer to the "Deploying C65/76M Objects" section of this chapter for more information.

Using Cisco EMF

The Cisco EMF Launchpad application is the main starting point for using Cisco EMF. The Launchpad can be accessed by starting a Cisco EMF user session.

Note Before you can start a Cisco EMF user session, Cisco EMF has to be running. If a message is displayed indicating that Cisco EMF is not running, contact the system administrator.

To start a Cisco EMF user session, do the following:

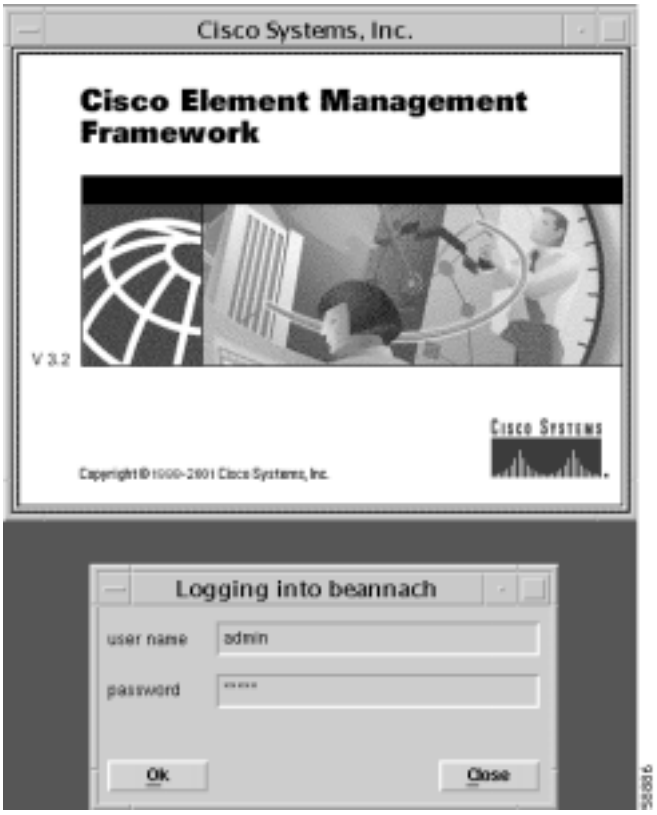
Step 1 From the command line on the terminal window, type the following:

```
Cisco EMF_ROOT/bin/Cisco EMF session
```

Note Replace *Cisco EMF_ROOT* with the root directory in which Cisco EMF is installed (for example, /opt/Cisco EMF).

The login window (Figure 3-1) appears.

Figure 3-1 Login Window



Step 2 Enter your user name and password, then click **Ok** to proceed.

Note When an invalid user name or password is entered, an error is displayed. Click **Ok** and then enter a valid user name and password. Three attempts to enter a valid user name and password are allowed. If a valid user name and password are not entered within three attempts, the login window closes.

When a valid user name and the password are entered, the session starts and the Cisco EMF Launchpad window appears (see Figure 3-2).

Cisco Element Management Framework Launchpad Window

The icons displayed in the Launchpad window (see Figure 3-2) represent applications that are provided by Cisco Element Management Framework (Cisco EMF). The icons and applications are:

Viewer

- Groups
- Access
- Events
- Discovery
- Notify
- Thresholds
- Event Grps

For more information, refer to the *Cisco Element Management Framework User Guide*.

Figure 3-2 Cisco EMF Launchpad

Viewer

The Viewer icon provides access to the Cisco EMF Map Viewer application, which provides complete flexibility in viewing, building, and monitoring a network using graphical representations of Network Elements. The Map Viewer application is the primary access point for C65/76M management functions.

Groups

The Groups icon provides access to the Cisco EMF Object Group Manager application, which provides the opportunity to organize Network Elements into object groups. The Object Group Manager allows the creation, deletion, and modification of object groups. Object groups can be any combination of objects derived from the Cisco EMF managed object class. Objects can be added manually or on the basis of query criteria.

Access

The Access icon provides access to the Cisco EMF User Access Control application, which is a component of Carrier Class Security and provides system administrators the opportunity to control which features of their system can be accessed by various levels of personnel. This is important for security and efficient and effective network management.

Events

The Events icon provides access to the Event Browser application. In Cisco EMF, when a condition (fault) occurs on a managed object in the network, the system is notified immediately. This notification is shown as an event and can be viewed with the Event Browser. One of the most important aspects of network service management is the ability to identify events on the system and to take action to resolve them quickly and efficiently. For example, there may be a power supply fault in a chassis which would require an engineer to be sent out to rectify the fault. This fault is critical to the running of the network and would need prompt attention.

Discovery

The Discovery icon provides access to the Cisco EMF Auto Discovery application, which examines the network for IP and SNMP devices and creates a managed object for each new device discovered. Auto Discovery can be opened from the Cisco EMF Launchpad window or from a pop-up menu available on a selected object.

Notify

The Notify icon provides access to the Notification feature. An important aspect of a monitoring system which captures and reacts to events on the network is when and how a network operator is informed of these events. The Cisco EMF Event Manager uses notifications for providing this information. For example, when the temperature of a module rises 10 degrees above normal, an e-mail might be sent to the network operator warning of a potential problem and a minor event might be generated if the temperature does not fall to within 10 degrees of normal within twenty minutes.

Notification profiles are collections of notifications. Each notification profile has a name and description and can be accessed by all Event Manager users. Each profile includes a list of notifications, and is run following a trigger, which might be an event entering an event group, or a threshold breach in a thresholding regime. For example, when the first event is received by an event group, a notification profile may be triggered that causes a sound to occur, which alerts the operator. As well as audible alerts, a notification can be set up to display on screen, or to trigger an external notification, such as an e-mail.

Thresholds

The Thresholds icon provides access to the Thresholding Regime feature. A Thresholding Regime is a set of threshold conditions for specified object attributes which, when breached, causes one or more notification profiles to be run. The Thresholding Regime defines which attributes should be polled and on what period, and defines the thresholding conditions. The Thresholding Regime specifies object groups that contain the objects whose attributes will be polled.

Event Grps

The Event Grps icon provides access to the Event Groups application, which is used to organize Network Elements into event groups and to view the status of these groups as scoreboards. You can create, delete, and modify event groups and scoreboards. Event groups are available to all users.

Event groups can be any combination of objects derived from the Cisco EMF-managed object class. These groups are set up using queries, which can be configured to match given requirements. For example, a network administrator could choose to monitor a particular device, specify a time period, and choose to look at events that are warnings or critical. You define a query so that the event group only includes the events that meet the specified criteria.

Quitting a Cisco EMF User Session

To quit a Cisco EMF user session, follow these steps:

Step 1 In the Launchpad window, do one of the following:

- Click the **Quit** icon from the toolbar.
- From the **File** menu, choose **Quit**.
- Press **Ctrl-Q**.

Step 2 A window appears, asking, *Do you wish to quit the Cisco EMF Manager System?* Click **Yes** to quit the session. All active applications are closed and the session terminates.

Deploying C65/76M Objects

To manage a Catalyst 6000 family switch or Cisco 7600 series Internet Router using Cisco EMF, a C65/76M object must be deployed within Cisco EMF and commissioned. This section describes how to manually deploy the Network Element object in Cisco EMF. For a detailed description on other deployment options, refer to Chapter 4, "Deploying the C65/76M."

To manually deploy a Catalyst 6500 Network Element object, follow these steps:

Step 1 Launch the Cisco EMF Map Viewer application from the Cisco EMF Launchpad window.

Step 2 Choose **Deployment/QuickStart Deploy Catalyst 6500 Manager** from the pop-up menu. This pop-up menu item is available from the Physical containment tree root or another container object within that tree.

Step 3 Enter the details for the switch and click the **Forward** button (see following figure).

Figure 3-3 Object Parameters

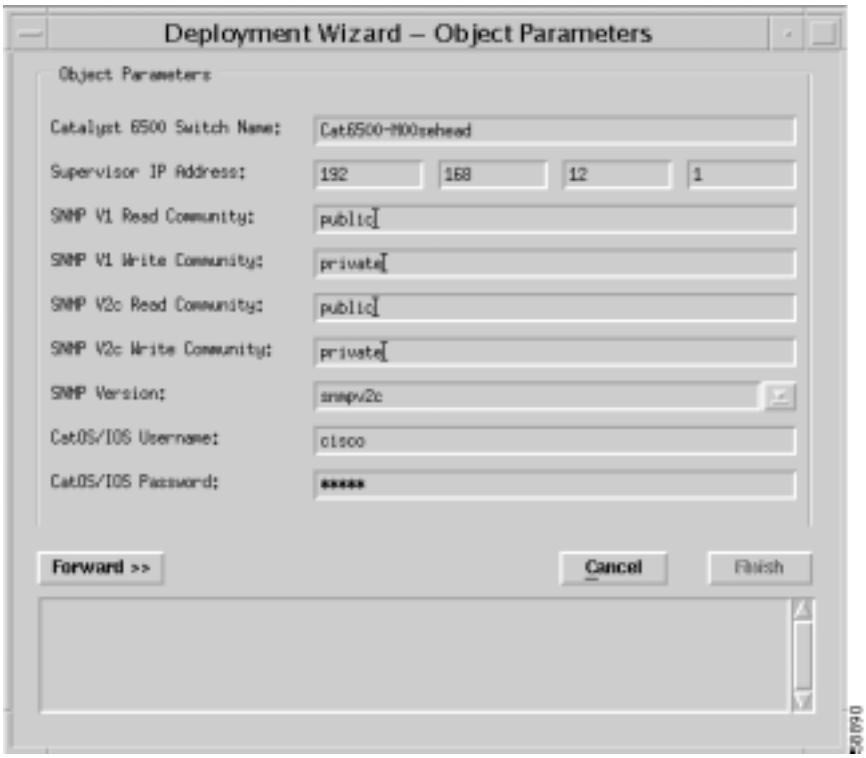
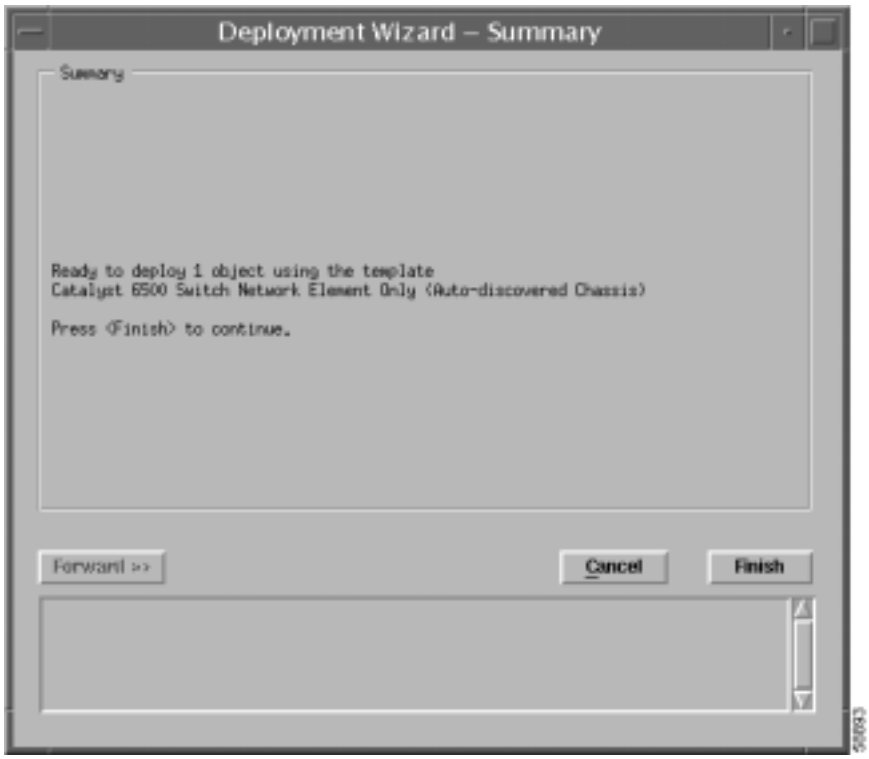


Table 3-2 Object Parameter Definitions

Property	Description
Catalyst 6500 Switch Name	Name of the Network Element object that will be displayed in the Map Viewer application.
Supervisor IP Address	IP address of the switch supervisor engine.
CatOS/IOS SNMP V1 Read Community	SNMP v1 read community used by the device. This deployment mode assumes the same communities for either switch operating system.
CatOS/IOS SNMP V1 Write Community	SNMP v1 write community used by the device. This deployment mode assumes the same communities for either switch operating system.
CatOS/IOS SNMP V2c Read Community	SNMP v2c read community used by the device. This deployment mode assumes the same communities for either switch operating system.
CatOS/IOS SNMP V2c Write Community	SNMP v2c write community used by the device. This deployment mode assumes the same communities for either switch operating system.
CatOS/IOS SNMP Version	The version of the SNMP agent running on the device. This is a drop-down menu containing: • SNMPv1 • SNMPv2c
CatOS/IOS Username	The username used to allow the C65/76M to access the Network Element device using a Telnet connection. This deployment mode assumes the same username for either switch operating system.
CatOS/IOS Password	The password used to allow the C65/76M to access the Network Element using a Telnet connection. The value entered in this text box will not be in plain text. This deployment mode assumes the same password for either switch operating system.
OS Deploy Type	If the specific OS installation type for the switch is known, it can be selected here. Leave the setting as autoDetect to let the EMS determine the OS deployment type.

Figure 3-4 Deployment Wizard—Summary

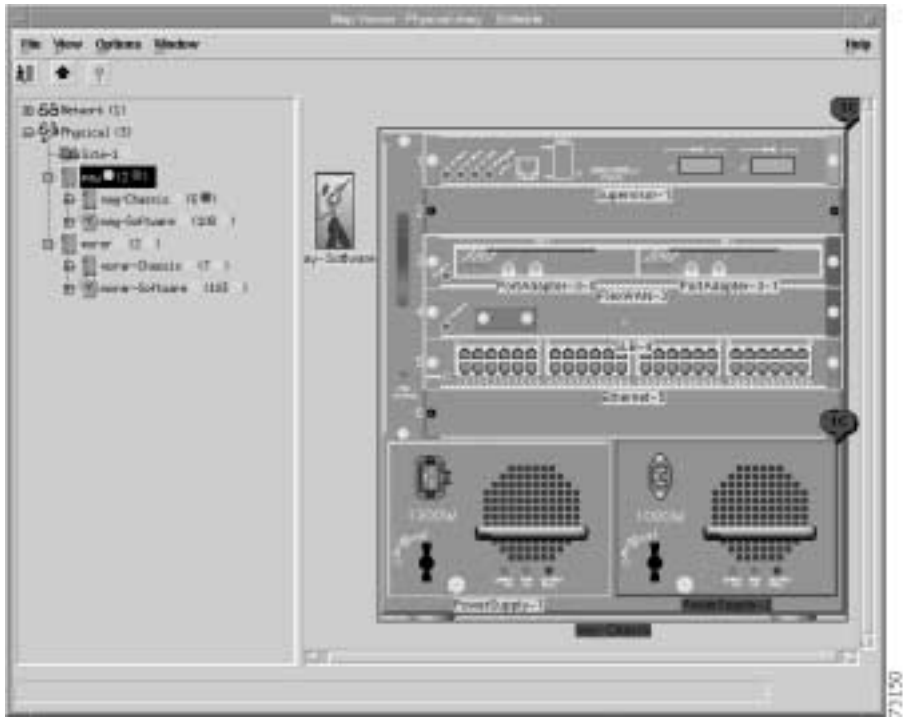


Step 4 Click the **Finish** button to deploy the Network Element object.

This procedure deploys a decommissioned Catalyst 6500 Network Element object in Cisco EMF and automatically commissions it.

Once the network element is commissioned and discovery is complete, the physical view will resemble Figure 3-5.

Figure 3-5 View of Commissioned Object



Note If you have installed hardware that is not supported by C65/76M, the module image will contain a "?" in the hardware view.

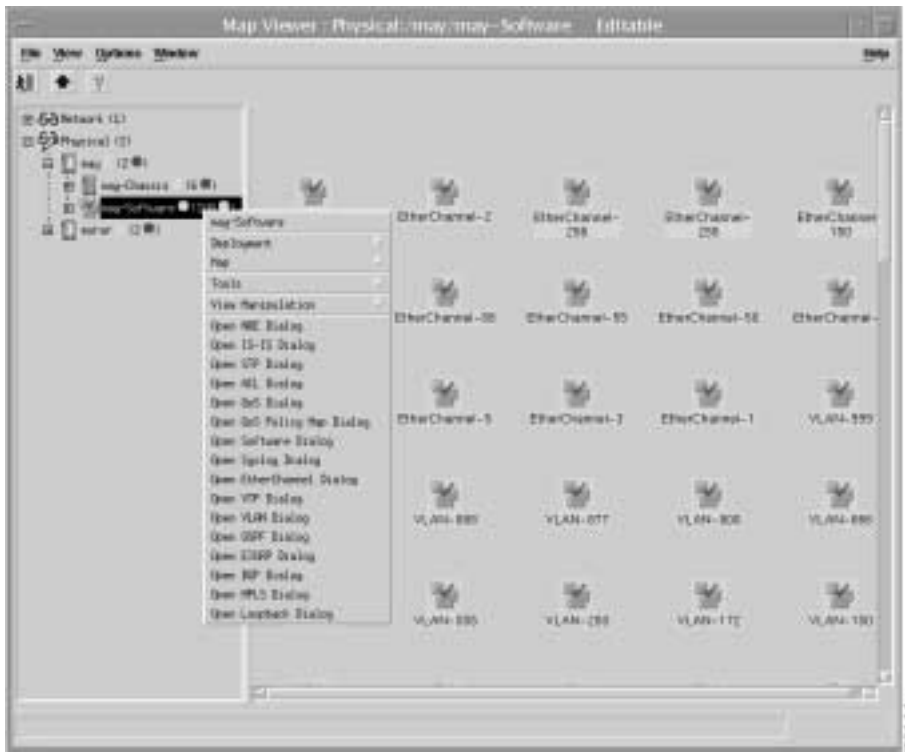
Launching Object Management Dialogs

After all the objects in the network element are in the normal state, dialog boxes can be opened to perform management operations on the network element.

To launch the management dialog box of a C65/76M object, right click its parent object in the Map Viewer application or the object itself in the containment view. Select the option to open the object's dialog box from the pop-up menu. Refer to the "C65/76M Objects and Interfaces" section on page 2-3 for descriptions of the object hierarchies.

For example, to open the EtherChannel Dialog, right-click on the Software object and choose **Open EtherChannel Dialog** from the pop-up menu, as shown in Figure 3-6.

Figure 3-6 Launching an Object Management Dialog Box



Chapter 5, “Physical Object Dialog Boxes,” and Chapter 6, “Logical Object Dialog Boxes,” describe how to use the dialog boxes for the physical and logical objects, respectively.

CHAPTER 4

Deploying the C65/76M

This chapter describes how to deploy the Cisco 6500/7600 Series Manager, and consists of these sections:

Managing a Catalyst 6000 Family Switch or a Cisco 7600 Series Internet Router

Managing a Catalyst 6000 family switch or a Cisco 7600 series Internet Router using CEMF is a two-step process:

1. Deploy objects that need to be managed.

   C65/76M objects can be discovered automatically or deployed manually.
2. Commission the objects to allow CEMF to manage them.

Deploying Objects

The deployment process should be done after you install the C65/76M software for the first time, or after you install new hardware. Deployment informs the C65/76M of the presence of supported hardware.

The C65/76M objects can be automatically discovered or manually deployed. Objects can also be predeployed in CEMF before the actual installation of a Catalyst 6000 family switch or a Cisco 7600 series Internet Router in the field.

Predeployment is the process of reserving a space in CEMF for network equipment, which has not yet been physically slotted into the system rack. When an object or device is predeployed, the physical device or object is not present, but CEMF has been preconfigured to hold an object of similar type. As a result, C65/76M module objects can be deployed and the C65/76M will not monitor their status. When a module is then placed in the physical equipment, the new module will be automatically detected and management of the module will be automatically started.

C65/76M Object Hierarchy

A fully deployed C65/76M object in CEMF has the following object hierarchy:

```
Network Element
    Chassis
        Power Supplies
        Supervisor Modules
            Ethernet Interfaces
        Ethernet Modules
            Ethernet Interfaces
        Switch Fabric Modules
        FlexWAN Modules
            Port Adapter
            ATM Port Adapter
                ATM SONET Interfaces
                ATM E3 Interfaces
                ATM T3 Interfaces
        OSM GeWAN Modules
            OSM GeWAN Interfaces
        OSM PoS Modules
            Ethernet Interfaces
            OSM PoS Interfaces
        OSM Channelized SONET Modules
            Ethernet Interfaces
            OSM Channelized SONET Interfaces
                OSM Serial Sub-interfaces
                OSM PoS Sub-interfaces
        Content Switching Modules
    Software
        EtherChannels
        Syslog
        EIGRP
        BGP
        OSPF
        VTP
        VLAN
        STP
        IS-IS
        ACL
        NDE
        Loopback
        QoS
            QoS Policy Map
```

The top-level Network Element object represents the entire switch including the physical and logical components of the switch. The Chassis object, which is a child of the Network Element object, represents all the physical components of the switch. For example, the chassis frame, power supplies, modules, and ports are all represented under the Chassis object. The Software object, which is a peer of the Chassis object, represents all the logical components of the switch. For example, VLAN configurations, EtherChannels, and routing protocols are represented under the Software object.

Note The software object and its children are available only under the Catalyst6000Manager, Catalyst6500Manager, and Cisco7600Manager containment views.

Commissioning Objects

Commissioning is the action required to notify CEMF to start actively monitoring the object. Only the following C65/76M objects can be commissioned and decommissioned by the user:

- Network Element
- Supervisor Module
- Ethernet Module
- Switch Fabric Module
- FlexWAN Module
- Content Switching Module
- Port Adapter
- OSM Module

When applied to these objects, the commissioning process is propagated down to all the object's children. For example, if the Network Element object is commissioned, all the C65/76M objects are also commissioned. If only a Supervisor Module object is commissioned, then its Ethernet Interface objects are also commissioned.

When the Network Element object is commissioned, a subchassis discovery is started to determine the contents of the switch. If objects on the switch are discovered that do not currently exist in CEMF, then these objects are automatically created and populated. For example, an Ethernet module would be automatically populated with the appropriate number of interfaces when it is discovered. If the object already exists in CEMF, then a type match is made against the CEMF object and the one found during discovery. If a mismatch is found, the object is placed into the Mismatched state and an error is generated. If there is no mismatch, then the object is commissioned successfully and CEMF begins to monitor it.

Figure 4-1 shows the CEMF Map Viewer application with the C65/76M software installed. When an object is deployed in CEMF, the objects are automatically added to the Network, Physical, and the appropriate Manager Views. In this example, the Network Element objects are called "may" and "morar," the Chassis objects are called "may-Chassis" and "morar-Chassis," and the Software objects are called "may-Software" and "morar-Software."

Under the Network container, the Network Element objects are labelled by their IP addresses and added to the group representing the subnet that they belong to (192.168.12.0). Under the Physical container, the Network Element and Chassis objects are available.

Note The Software objects are available only under the Catalyst6000Manager, Catalyst6500Manager, and Cisco7600Manager containment views.

Figure 4-1 Hierarchical Structure of Deployed and Commissioned Objects

Deployment and Commissioning Process

There are three methods that can be used to enable CEMF to monitor a Catalyst 6000 family switch or a Cisco 7600 series Internet Router:

- IP Auto Discovery

  This method should be used to deploy a large number of devices that are currently connected to the network. This method automatically deploys the Network Element and Software objects for each Catalyst 6000 family switch or Cisco 7600 series Internet Router discovered.

- Manual deployment

  This method should be used if a small number of devices that are connected to the network need to be deployed. This method will deploy the Network Element and Software objects for the Catalyst 6000 family switches or Cisco 7600 series Internet Routers specified.

- Predeployment

  This method should be used to predeploy a device that is not connected to the network. The following objects can be predeployed:

  - Network Element and Software
  - Chassis
  - Supervisor Modules
  - Ethernet Modules
  - Switch Fabric Modules
  - FlexWAN Modules
  - Port Adapters
  - OSM Modules

The remaining C65/76M objects are automatically discovered when the Network Element object is commissioned.

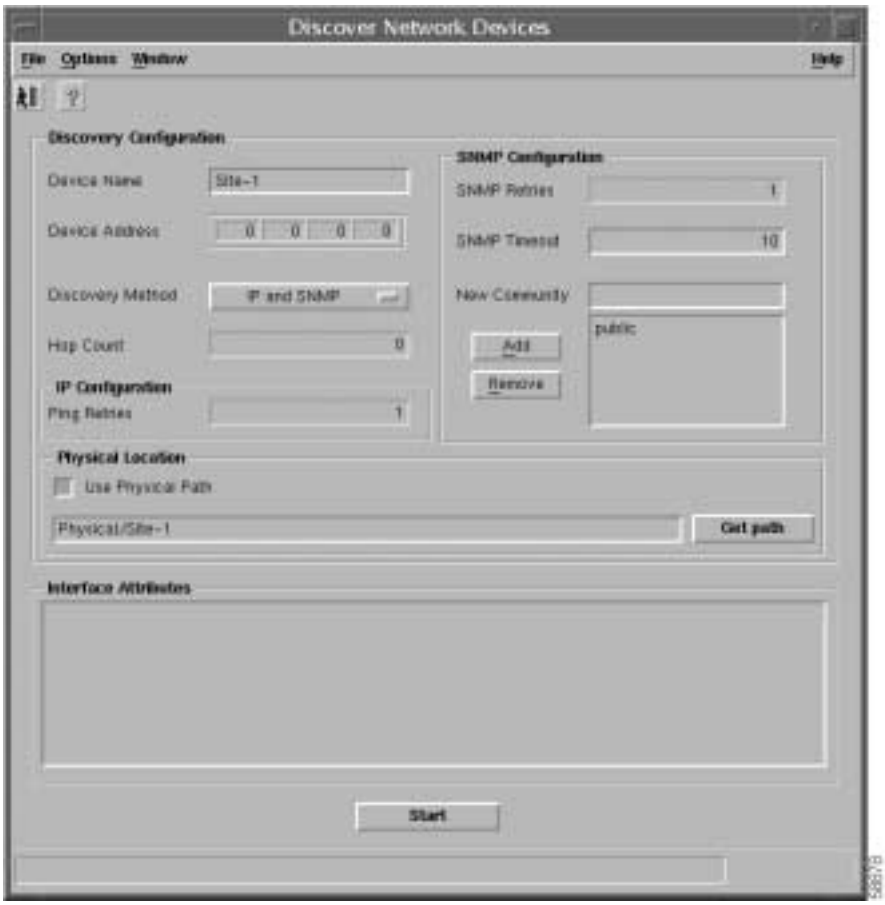
IP Auto Discovery

The CEMF Auto Discovery application is used to search an existing network. The network is examined for IP and SNMP devices. An object is created for each new device discovered. The IP discovery window can be launched from either the Discovery icon from the CEMF Launchpad (Figure 3-2) or from the **Deployment/Auto Discovery...** pop-up menu item on a selected object as shown in Figure 4-2.

Figure 4-2 Launching the IP Discovery Window from the Map Viewer

When first launched, the IP Discovery window will resemble Figure 4-3.

Figure 4-3 IP Discovery Window



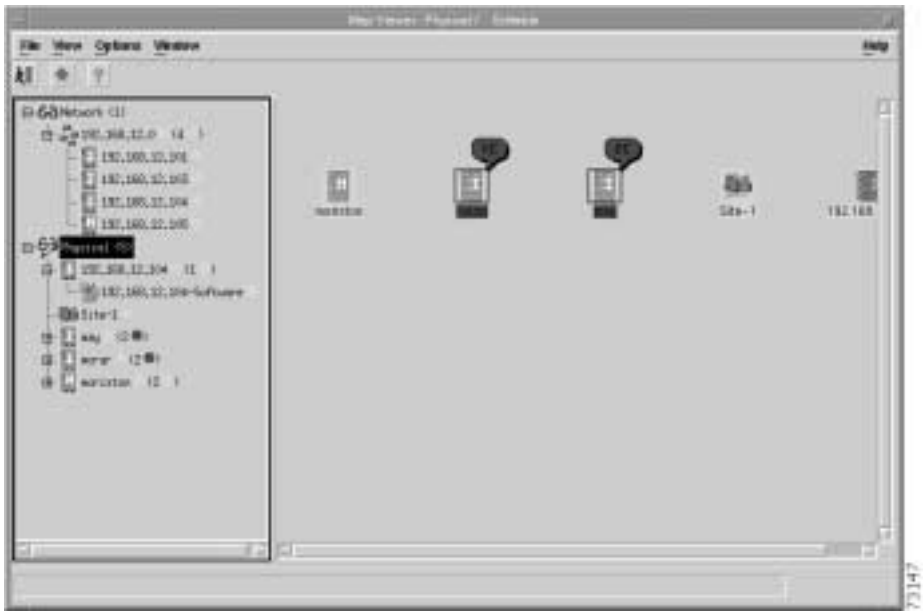
The contents of this window depend on how the window was launched. For example, if this window was launched from an object in the physical containment view, then the Physical Location parameter would be automatically set to the location from which the window was launched, as shown in Figure 4-3. For more information on the CEMF Auto Discovery process, refer to the "Auto Discovery" chapter of the *CEMF 3.1 Users Guide*.

Note When specifying the SNMP community string, use the read-write community string for the switch. If the read community string is used or appears first in the list of community strings, then that will be the SNMP community string used for both the read and read-write operations by the C65/76M. As a result, set operations will fail.

After the discovery process is complete, newly discovered objects will be automatically added to the Network containers and Physical containers. In the Network container, the object will be placed under the appropriate subnet. In the Physical container, discovered objects will be placed in the location based on the value of the Physical Location parameter.

If one of the discovered devices is a Catalyst 6000 family switch or a Cisco 7600 series Internet Router, then a C65/76M Network Element object will also be added into the Network containers, Physical containers, and the appropriate Manager Views. The Software object is also automatically added to the Manager View. In Figure 4-4, the Network Element object is labelled "192.168.12.105" and the Software object is labelled "192.168.12.105-Software."

Figure 4-4 Map Viewer with a Newly Discovered Catalyst 6500 Switch



After the Network Element and Software objects have been created by the Auto Discovery process, their contents need to be determined. This determination is made by commissioning the Network Element object. When the Network Element object is commissioned, it executes a subchassis discovery process that communicates with the switch to automatically determine the contents of the switch.

However, before the Network Element object can be commissioned, additional parameters are required. Specifically, the Telnet and Enable passwords and the SNMP communities are required. To specify the passwords and SNMP communities, right-click on the Network Element object (192.168.12.105 in Figure 4-4) and choose **Open Network Element Dialog** from the pop-up menu, which will launch a window that resembles Figure 4-5.

Figure 4-5 Network Element Dialog Box

When the dialog box is displayed, select the **Configuration** tab. In the CLI Passwords section, specify the Telnet Password and Enable Password parameters. The Telnet Password is the password used to connect to the switch using the Telnet protocol. The Enable Password is the password used to enter the enable mode on the switch or router. All values entered in these text fields will be displayed as "*".

To specify the SNMP read and write community strings, select the **SNMP** tab and enter the correct SNMP read/write community strings.

Note The IP Discovery process only fills in the SNMP community strings based on the version of SNMP discovered on the switch or router. In Figure 4-6, the read and read-write community strings are specified as public and private, respectively, because "private" was specified in the IP Discovery window (see Figure 4-3). The community string used in the IP Discovery window should be the read-write SNMP community.

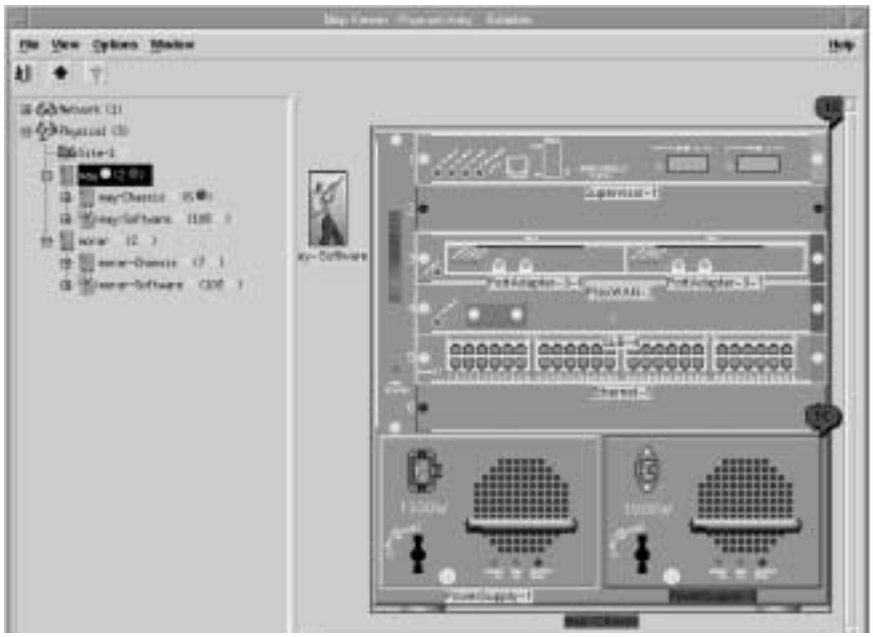
Figure 4-6 SNMP Tab in the Network Element Dialog Box

Click the **Commission** button from the Configuration tab (Figure 4-5) to start the subchassis discovery process, which allows the C65/76M to determine which modules are installed on the switch or the router and also allows CEMF to start monitoring the switch or the router.

Note Commissioning may take a few minutes.

After the Network Element object is commissioned, the Physical view will resemble Figure 4-7.

Figure 4-7 Fully IP-Discovered and Commissioned Catalyst 6513 Switch



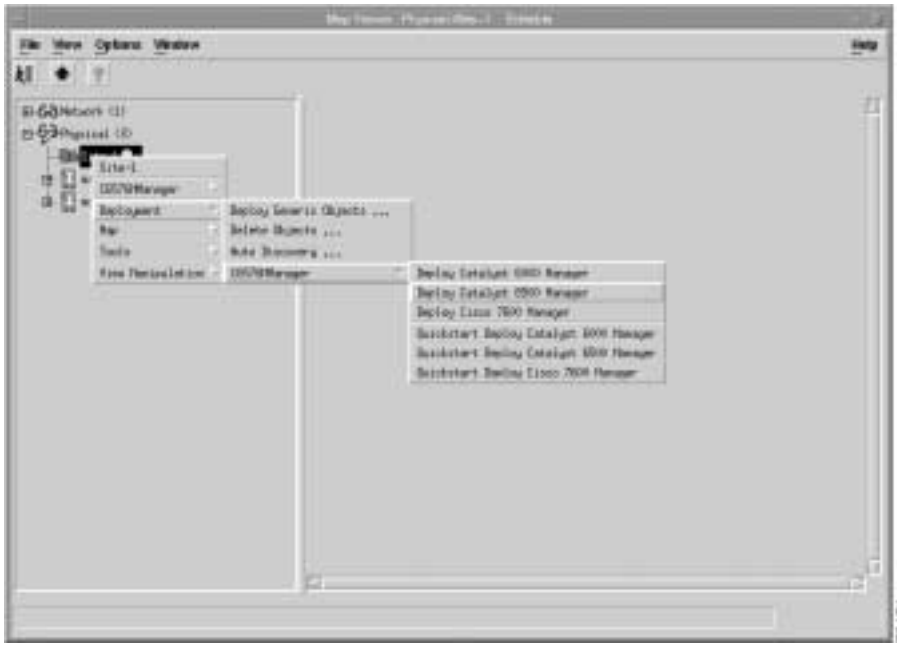
Manual Deployment

The manual deployment method is used when discovery of the entire network is not needed and the specific IP address and type of device that is connected to the network is known.

To manually deploy a Catalyst 6000 family switch or a Cisco 7600 series Internet Router, choose the pop-up menu item, **Deployment >Deploy Manager**, from the appropriate container. The following example describes how to manually deploy a Catalyst 6500 series switch. To manually deploy other devices, use the pop-up menu from the other manager containers.

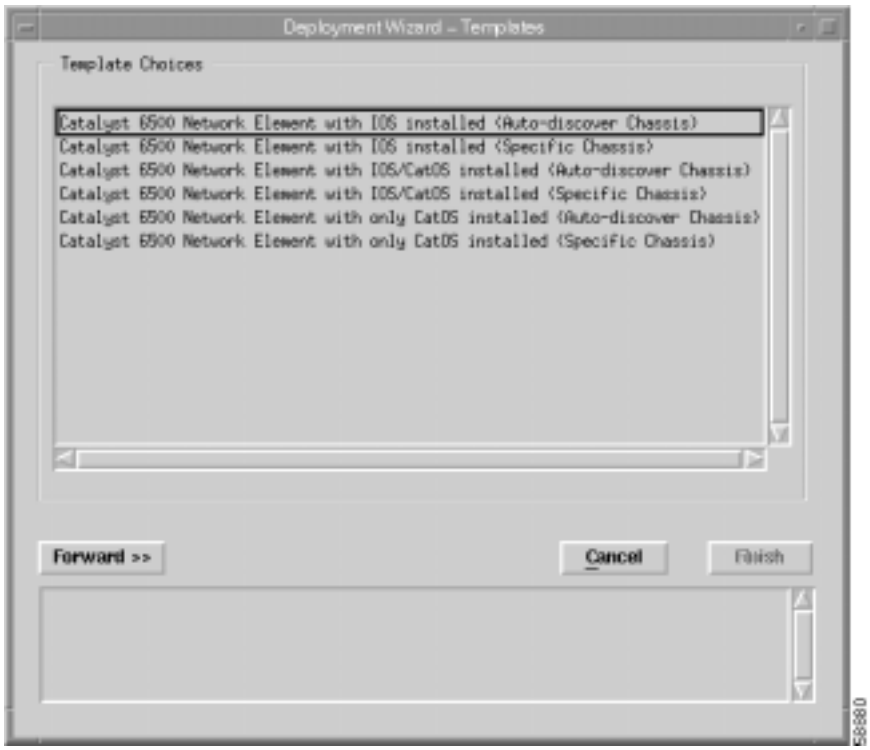
Choose **Deployment > Deploy Catalyst 6500 Manager** from the pop-up menu. This pop-up menu item, shown in Figure 4-8, is available from the Site level in the Physical container and at the top level of the Catalyst6500Manager container.

Figure 4-8 Pop-up Menu for Manually Deploying a C65/76M Switch Object



When you select this item, the Deployment Wizard window shown in Figure 4-9 is displayed.

Figure 4-9 Deployment Wizard—Templates

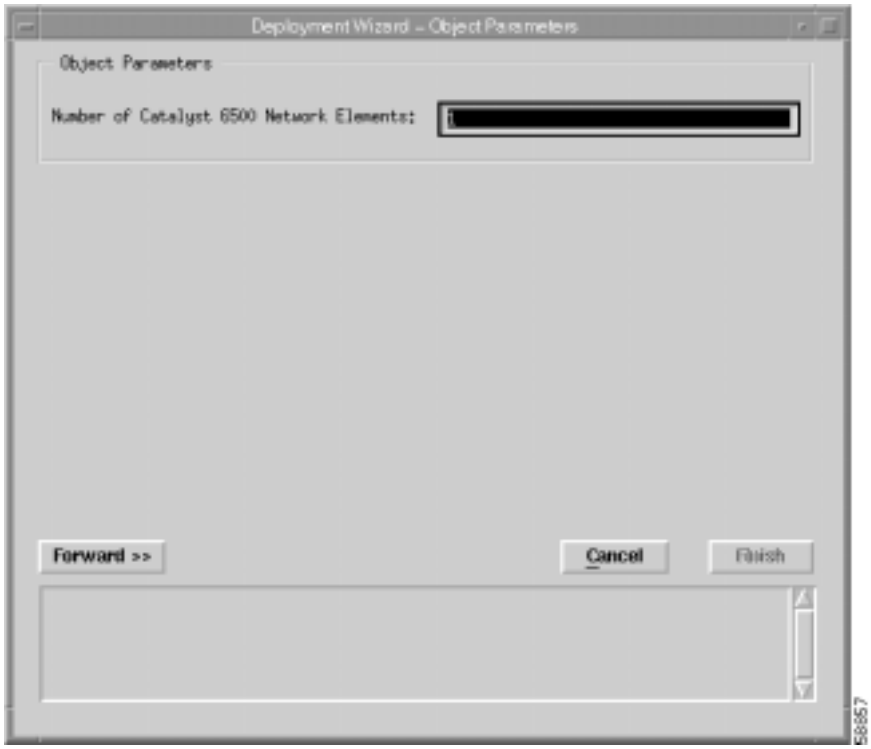


Property	Description
Catalyst 6500 Switch Network Element Only (Auto-discovered chassis)	This option deploys the Network Element and Software objects. Used when you want to perform a subchassis discovery to automatically populate the Network Element object.
Catalyst 6500 Switch Network Element and Chassis	This option deploys the Network Element, Chassis and Software objects. Used when you want to perform predeployment operations.

Choose the **Catalyst 6500 Switch Network Element Only** option and click the **Forward** button. The Object Parameters window, shown in Figure 4-10, is displayed.

Tip The **Catalyst 6500 Switch Network Element and Chassis** option is used for the predeployment processes (see the "Predeployment" section).

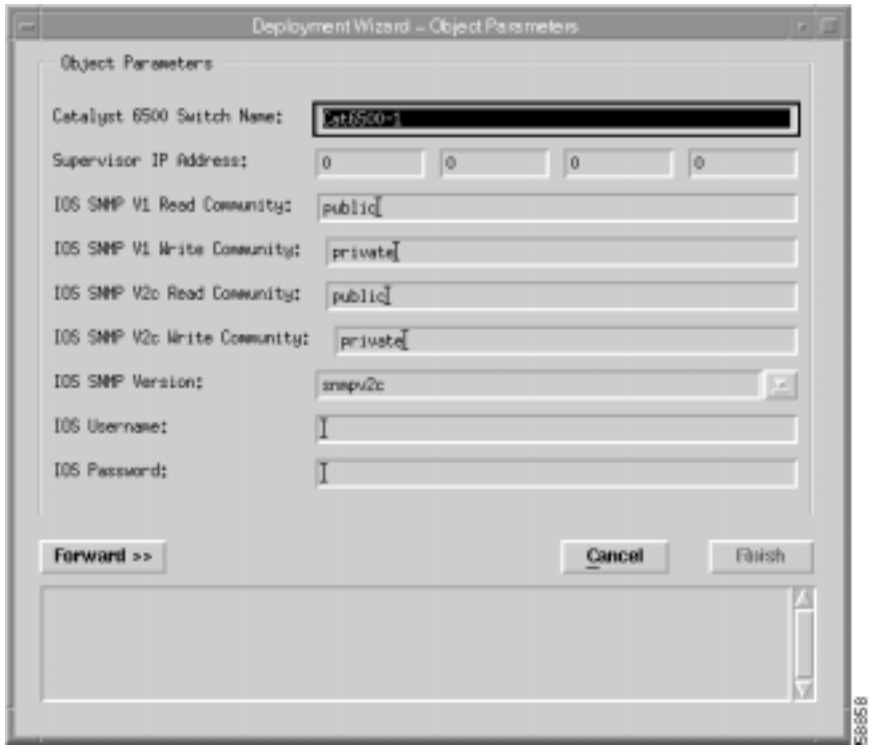
Figure 4-10 Deployment Wizard—Object Parameters



Property	Description
Number of Catalyst 6500 Switch elements	The number of switches or routers that you want to deploy at the same time.

Enter the number of Catalyst 6500 series switches or Cisco 7600 series Internet Routers that you want to deploy at the same time and click the **Forward** button. The remaining screens of this wizard are displayed for each switch or router to be deployed. The Object Parameters window, shown in Figure 4-11, is displayed.

Figure 4-11 Deployment Wizard—Object Parameters Details



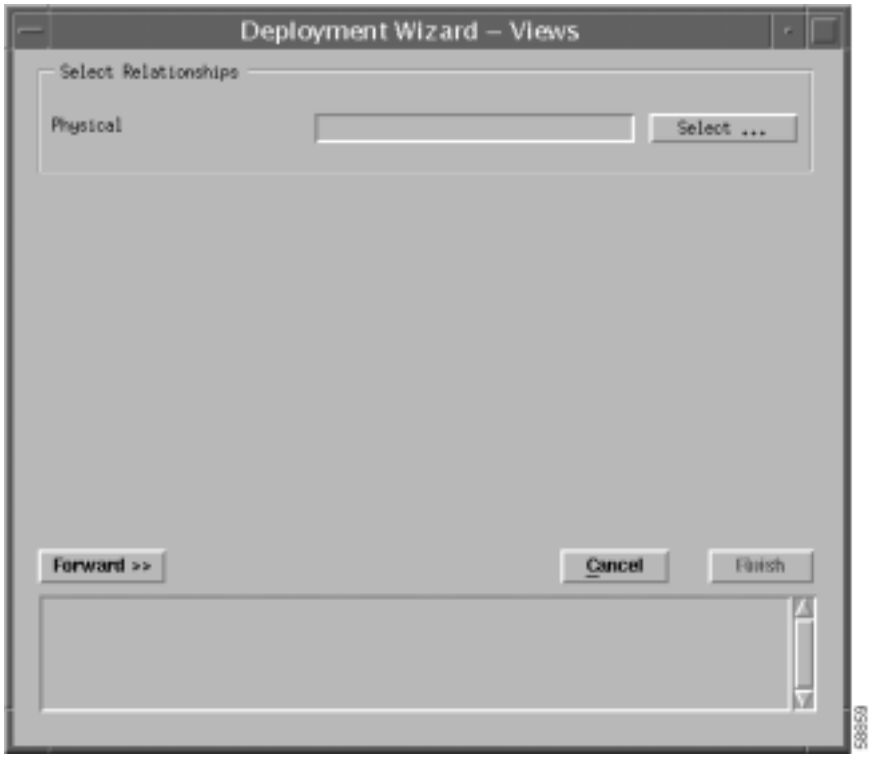
Property	Description
Catalyst 6500 Switch Name	Name of the Network Element object that is displayed in the Map Viewer application.
IP Address	IP address of the switch or router.
SNMP V1 Read Community	SNMP v1 read community used by the device.
SNMP V1 Write Community	SNMP v1 write community used by the device.
SNMP V2c Read Community	SNMP v2c read community used by the device.
SNMP V2c Write Community	SNMP v2c write community used by the device.

Property	Description
SNMP Version	The version of the SNMP agent running on the device. This is a drop-down menu containing: • SNMPv1 • SNMPv2c • SNMPv3 - not supported
IOS Telnet Password	The password used to allow the C65/76M to access the enable level of the Network Element using a Telnet connection. The value entered in this text box is not in plain text.
IOS Enable Password	The password used to allow the C65/76M to access the Network Element using a Telnet connection. The value entered in this text box is not in plain text.

Enter the details for this window and then click the **Forward** button. The Views window, shown in Figure 4-12, may be displayed if the system requires a selection of the "location" of the network element within the physical hierarchy.

Note The Network Element object can be deployed and commissioned without the IOS Telnet or enable passwords being set. However, some of the attributes will have the value of "ERROR" because those values are retrieved using IOS commands.

Figure 4-12 Deployment Wizard—Views



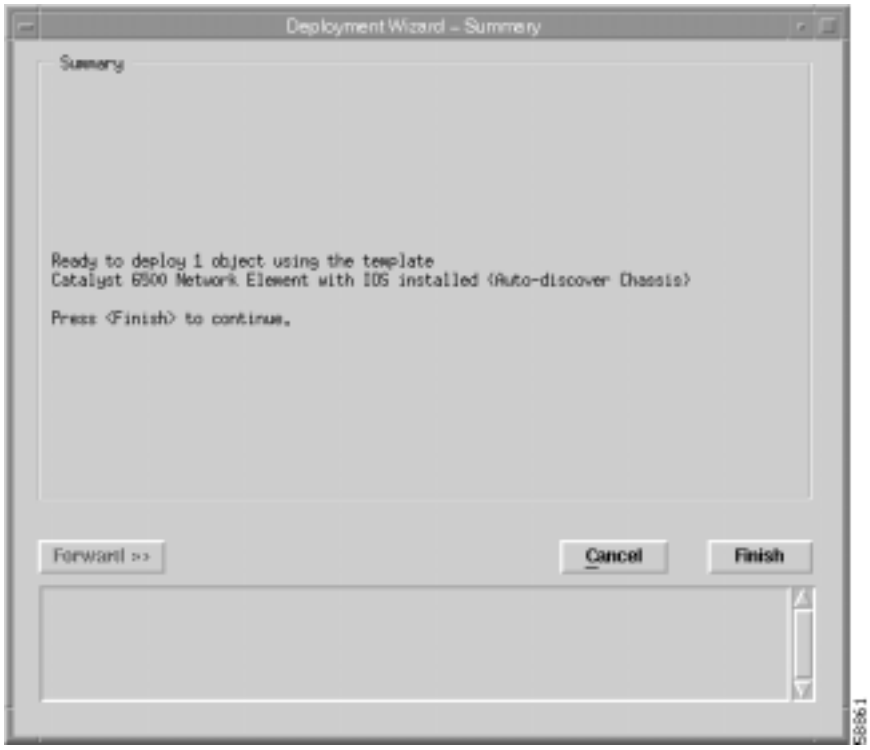
Property	Description
Physical	Location in the Physical containment view where the new object will be deployed.

If the wizard was launched from a Site object in the Physical containment view, this screen will not be displayed, and the Physical parameter is set automatically. If this wizard is launched from any other containment view, this screen is displayed and you must specify the appropriate location in the Physical containment where the new object should be added. You can use the **Select** button to specify the Physical containment (Figure 4-13). Click the **Forward** button when completed.

Figure 4-13 Physical Containment Selection

Choose the Physical containment view and then click **Apply** button. The Summary window, shown in Figure 4-14, is displayed.

Figure 4-14 Deployment Wizard—Summary

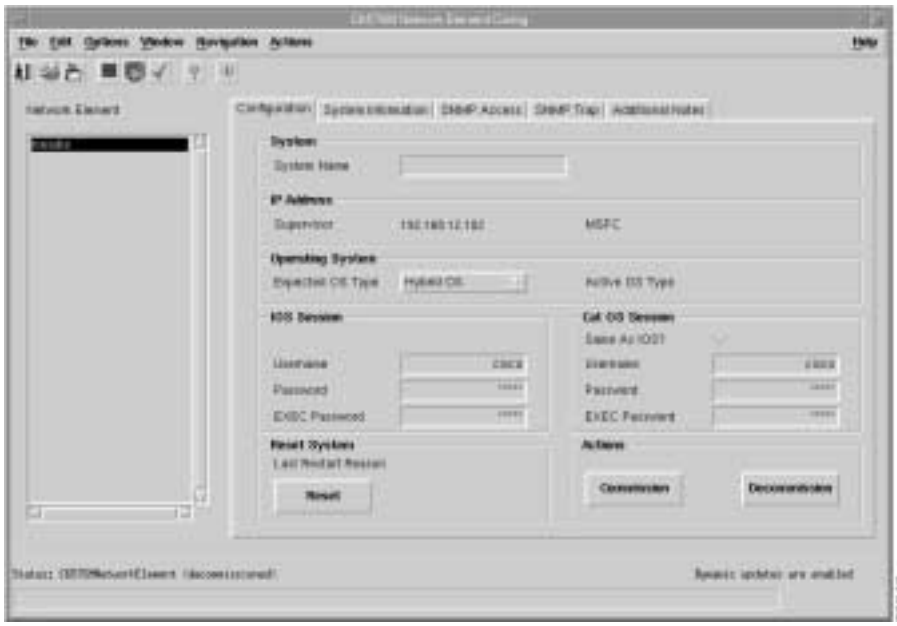


You can either cancel the operation by clicking **Cancel** or click **Finish** to create the object. If you click the **Finish** button, the Network Element and Software objects are added to the Map Viewer. The resulting Map Viewer resembles Figure 4-4.

After the Network Element and Software objects are created by the Deployment Wizard, the type of switch and its contents need to be determined. This determination is made by commissioning the Network Element object. When the Network Element object is commissioned, it executes a subchassis discovery process that communicates with the switch to automatically determine the contents of the switch.

To commission the Network Element object, right-click on the Network Element object and choose **Open Network Element Dialog** from the pop-up menu, which launches a window that resembles Figure 4-15.

Figure 4-15 Network Element Dialog Box

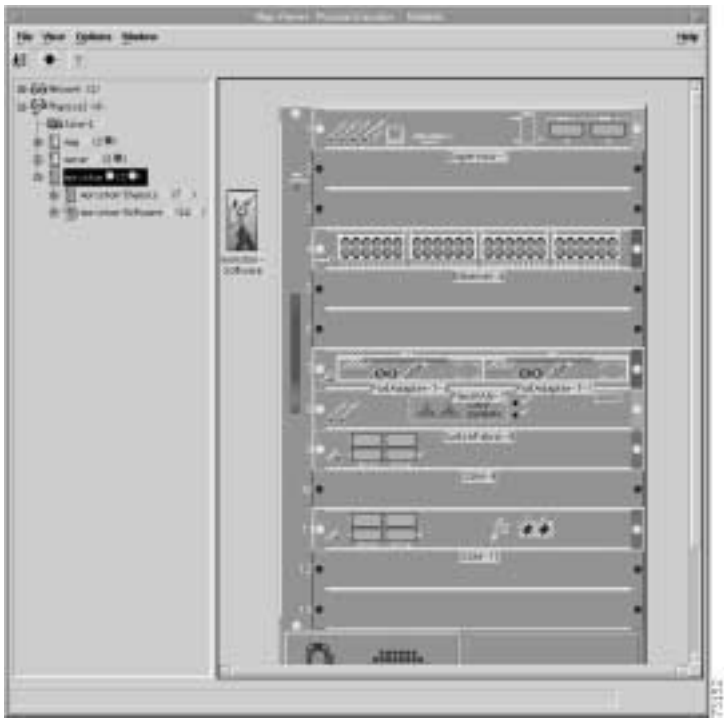


Click the **Commission** button from the **Configuration** tab to start the subchassis discovery, which allows the C65/76M to determine which modules are installed on the switch or router, and also allows CEMF to start monitoring the switch or router.

Note Commissioning may take a few minutes.

Unlike the Auto Discovery process (see the "IP Auto Discovery" section on page 4-5), no additional parameters need to be specified. These parameters were specified in the manual Deployment Wizard (Figure 4-11). After the object is commissioned, the Physical view will resemble Figure 4-16.

Figure 4-16 Manually Deployed and Commissioned Catalyst 6506 Switch



If an error is encountered when the object is commissioned, the Network Element object might go into the Mismatched or Lostcomms state and an alarm would be raised.

The Network Element is placed in the Mismatched state if the IP address specified during the deployment wizard does not correspond to the device type that was deployed. If this occurs, the Network Element object must be deleted from CEMF and redeployed with the correct IP address or type.

The Network Element is placed in the Lostcomms state if the SNMP read community string specified in during the deployment wizard is incorrect. If this occurs, open the Network Element dialog box, decommission the Network Element object, go to the SNMP tab (Figure 4-6) and enter the correct SNMP read community, and then recommission the Network Element object.

Predeployment

This deployment option is used to deploy the Catalyst 6000 family switch or Cisco 7600 series Internet Router into CEMF before it has been attached to the network. After an object has been predeployed, CEMF keeps the object in a decommissioned state until the device corresponding to the object is added to the network. After the switch is brought on-line, the predeployed object will be commissioned automatically. The following objects can be predeployed:

- Network Element, Software and Chassis
- Supervisor Modules
- Ethernet Modules
- Switch Fabric Modules
- FlexWAN Modules
- Port Adapter
- Content Switching Module
- EtherChannel Modules

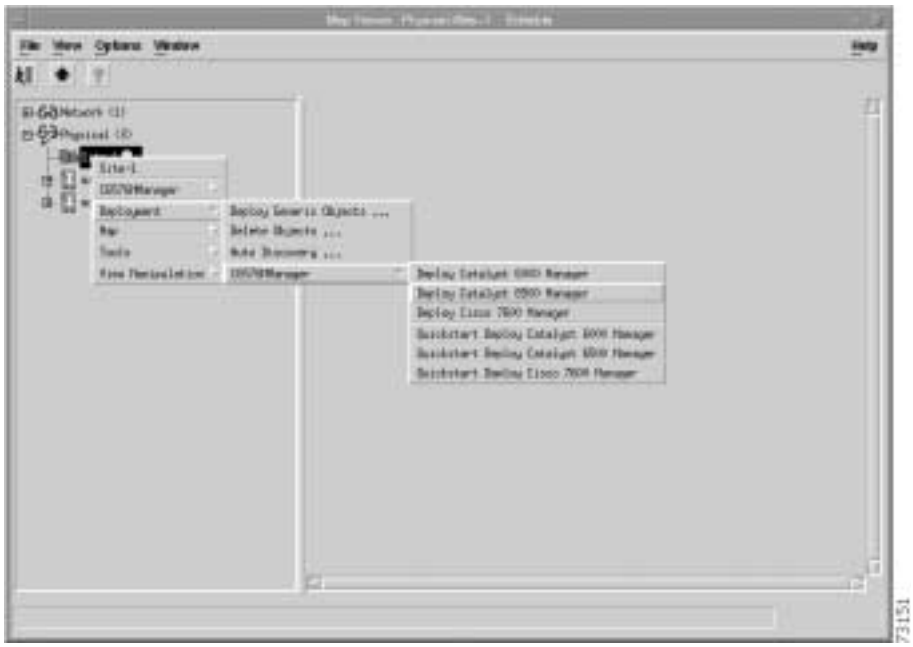
The remaining C65/76M objects are automatically discovered when the Network Element object is commissioned.

Network Element, Software, and Chassis Object Predeployment

To manually predeploy the Network Element, Software, and Chassis C65/76M objects, select the pop-up menu item, **Deployment > Deploy Manager**, from the appropriate container. The following example describes how to manually predeploy a Catalyst 6500 series switch. To manually predeploy other devices, use the pop-up menu from the other manager containers.

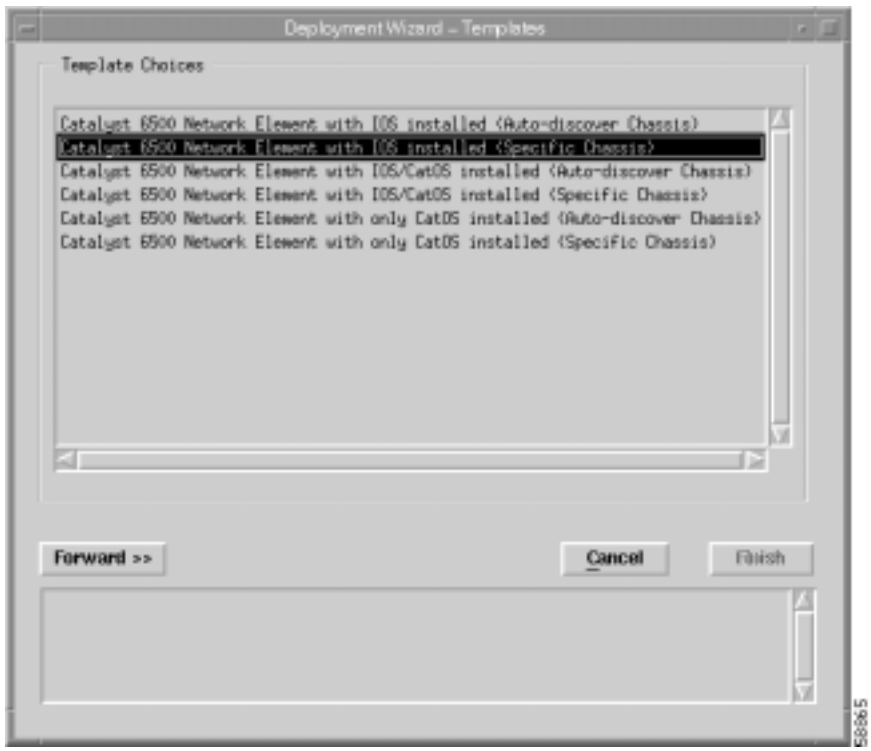
Choose **Deployment > Deploy Catalyst 6500 Manager** from the pop-up menu. This pop-up menu item, shown in Figure 4-17, is available from the Site level in the Physical container and at the top level of the Catalyst 6500 Manager container.

Figure 4-17 Manually Deploying a C65/76M Object



When you choose the **Deployment > Deploy Catalyst 6500 Manager** option, the Deployment Wizard—Templates window, shown in Figure 4-18, is displayed.

Figure 4-18 Deployment Wizard—Templates

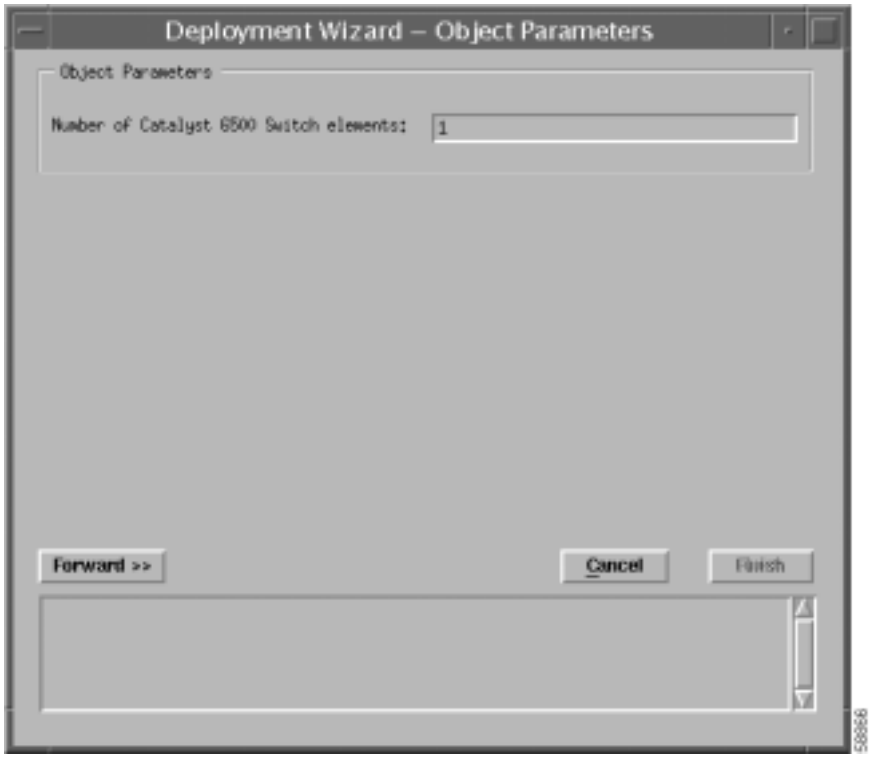


Property	Description
Catalyst 6500 Switch Network Element Only (Auto-discovered chassis)	This option deploys the Network Element and Software objects. Used when you want to perform a subchassis discovery to populate the Network Element object automatically.
Catalyst 6500 Switch Network Element and Chassis	This option deploys the Network Element, Chassis, and Software objects. Used when you want to perform predeployment operations.

Choose the **Catalyst 6500 Switch Network Element and Chassis** option and click the **Forward** button. The Object Parameters window, shown in Figure 4-19, is displayed.

Tip The Catalyst 6500 Switch Network Element Only option is used for the manual deployment process (see the "Manual Deployment" section).

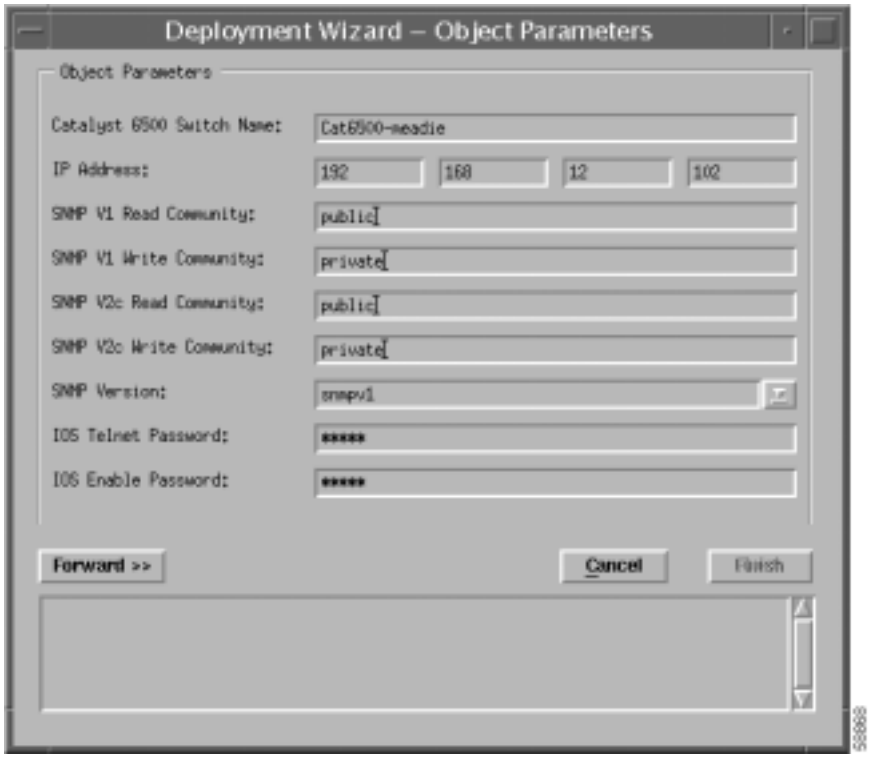
Figure 4-19 Deployment Wizard—Object Parameters



Property	Description
Number of Catalyst 6500 Switch elements	The number of switches or routers that you want to predeploy at the same time.

Enter the number of Catalyst 6500 series switches or Cisco 7600 series Internet Routers that you want to predeploy at the same time and click the **Forward** button. The detailed Object Parameters window, shown in Figure 4-20, is displayed. The remaining screens in this wizard will be displayed for each switch or router to be predeployed.

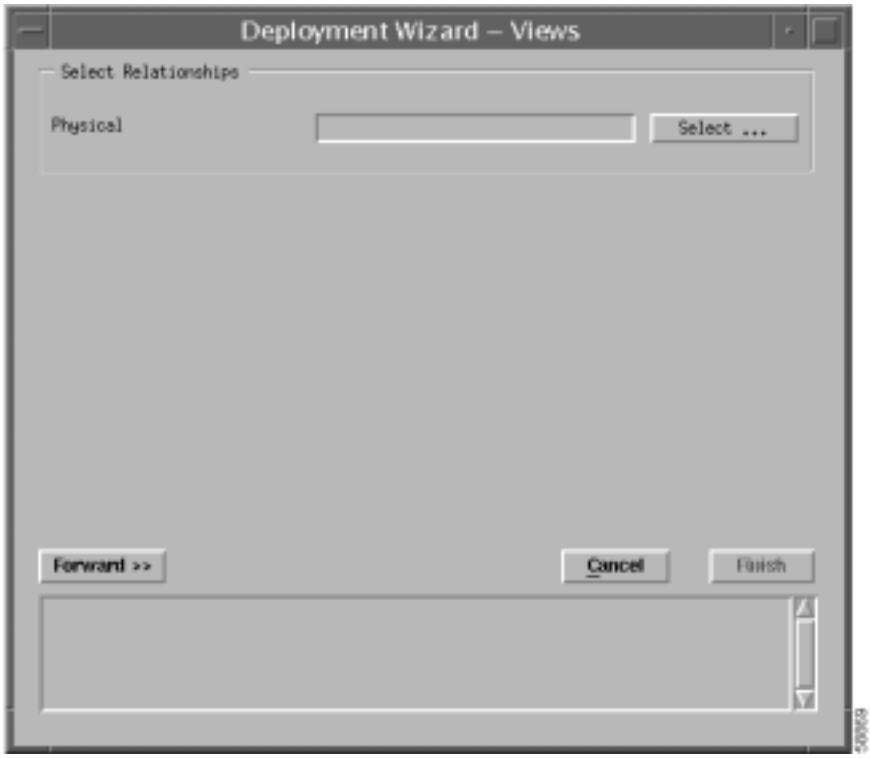
Figure 4-20 Deployment Wizard—Object Parameters Details



Property	Description
Catalyst 6500 Switch Name	Name of the Network Element object that is displayed in the Map Viewer application.
IP Address	IP address that is given to the switch or router when it is connected to the network.
SNMP V1 Read Community	SNMP v1 read community used by the device.
SNMP V1 Write Community	SNMP v1 write community used by the device.
SNMP V2c Read Community	SNMP v2c read community used by the device.
SNMP V2c Write Community	SNMP v2c write community used by the device.
SNMP Version	The version of the SNMP agent running on the device. This is a drop-down menu containing: • SNMPv1 • SNMPv2c • SNMPv3 - not supported
IOS Telnet Password	The password used to allow the C65/76M to access the Network Element using a Telnet connection. The value entered in this text box will not be in plain text.
IOS Enable Password	The password used to allow the C65/76M to access the enable level of the Network Element using a Telnet connection. The value entered in this text box will not be in plain text.

Enter the details for the switch and then click the **Forward** button. The Views window may be displayed if the system requires a selection of the “location” of the network element within the physical hierarchy (see Figure 4-21).

Figure 4-21 Deployment Wizard—Views



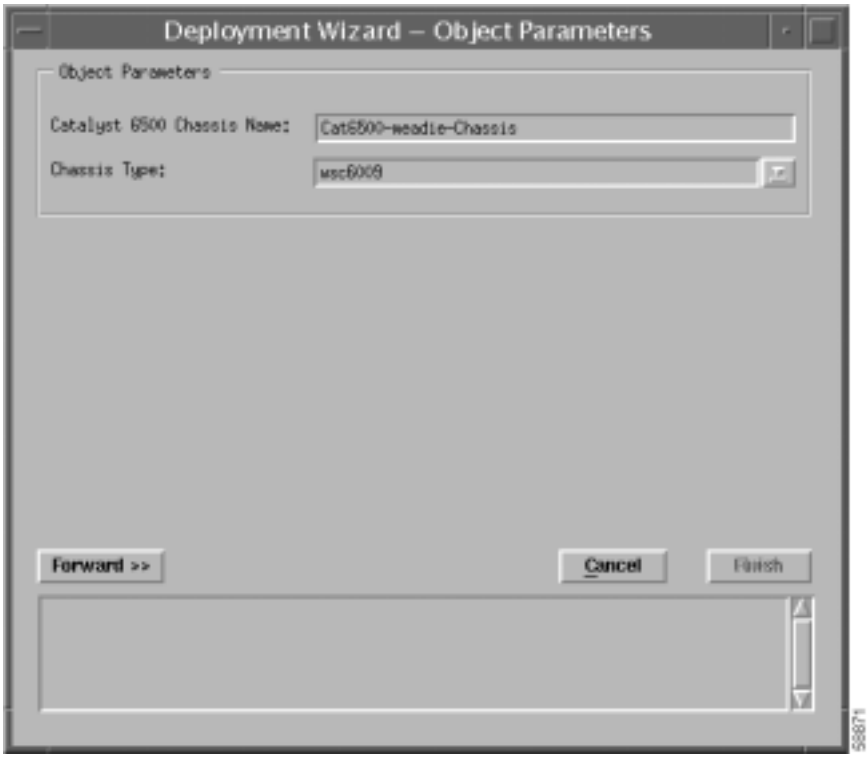
Property	Description
Physical	Location in the Physical containment view where the new object will be deployed.

If this wizard was launched from a site in the Physical containment view, this screen will not be displayed. In this case, the Physical parameter is set automatically. If this wizard is launched from any other containment view, this screen is displayed and you must specify the appropriate location in the Physical containment view where the new object should be added. Click the **Select** button to select the Physical location parameter (see Figure 4-22). Click the Forward button when completed.

Figure 4-22 Physical Location Selection

Click the **Apply** button when the Physical containment has been selected. The Object Parameters window, shown in Figure 4-23, is displayed.

Figure 4-23 Deployment Wizard—Object Parameters



Property	Description
Catalyst 6500 Chassis Name	Label that is used for the Chassis object in the Map Viewer.
Chassis Type	This value specifies the type of chassis to deploy. It is a drop-down list containing the chassis types in the chassis series: • wsc6506 • wsc6509 • wsc6509NEB • wsc6513

Note If you are deploying a Catalyst 6000 series switch, the following chassis types will be displayed in the Chassis Type drop down menu.

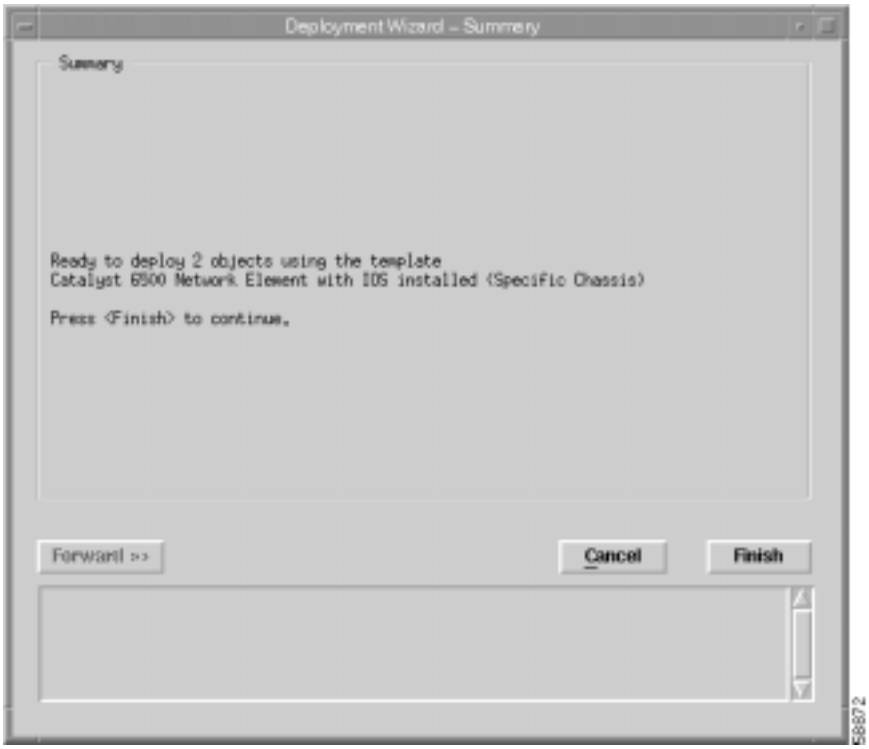
Property	Description
Catalyst 6000 Chassis Name	Label that is used for the Chassis object in the Map Viewer.
Chassis Type	This value specifies the type of chassis to deploy. It is a drop-down list containing the chassis types in the chassis series: • wsc6006 • wsc6009

Note If you are deploying a Cisco 7600 series Internet Router, the following chassis types will be displayed in the Chassis Type drop down menu.

Property	Description
Cisco 7600 Chassis Name	Label that is used for the Chassis object in the Map Viewer.
Chassis Type	This value specifies the type of chassis to deploy. It is a drop-down list containing the chassis types in the chassis series: • wsc7603 • wsc7606 • wsc7609

Specify the name of the Chassis object and the type of chassis to predeploy, and click the **Forward** button. The Summary window, shown in Figure 4-24, is displayed.

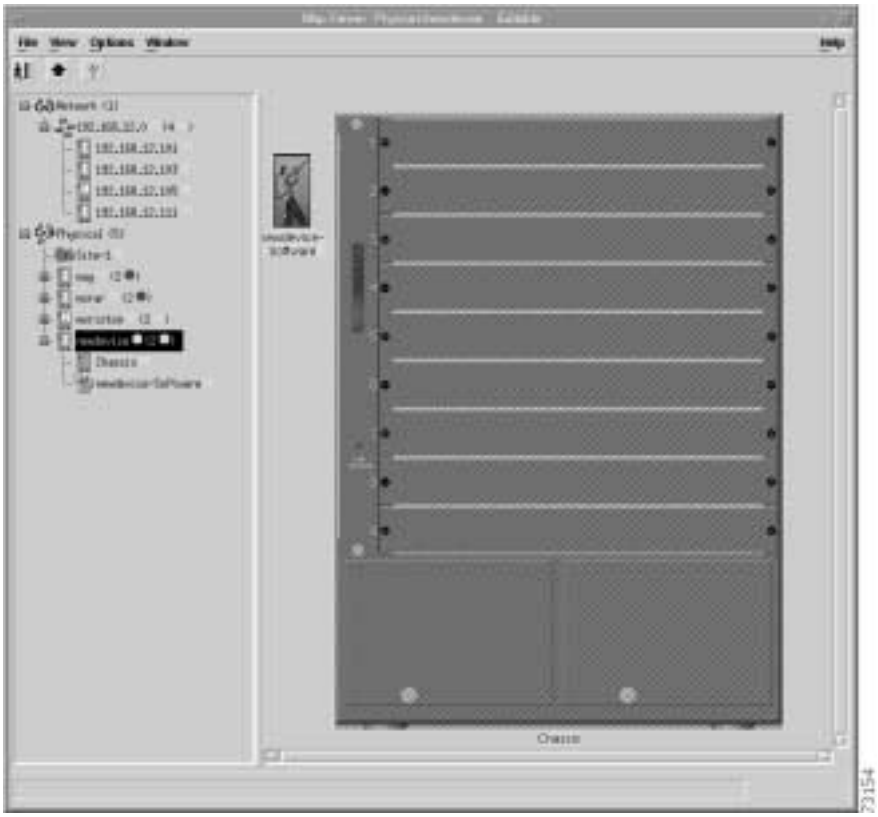
Figure 4-24 Deployment Wizard—Summary



You can either cancel the operation by clicking the **Cancel** button, or click the **Finish** button to create the object.

If you click the **Finish** button, the Network Element, Chassis, and Software objects are added to the Map Viewer. The chassis image that is displayed will depend on the value used for the Chassis Type. Figure 4-25 shows an example of a predeployed Catalyst 6509 chassis. Note that the chassis is empty and has cross hashes indicating that it is in the decommissioned state.

Figure 4-25 Predeployed Catalyst 6509 Chassis Object



Predeploying Subchassis Modules

The next step in predeploying a Catalyst 6000 family switch or a Cisco 7600 series Internet Router in CEMF is to deploy the modules within the chassis. The following subchassis objects can be predeployed:

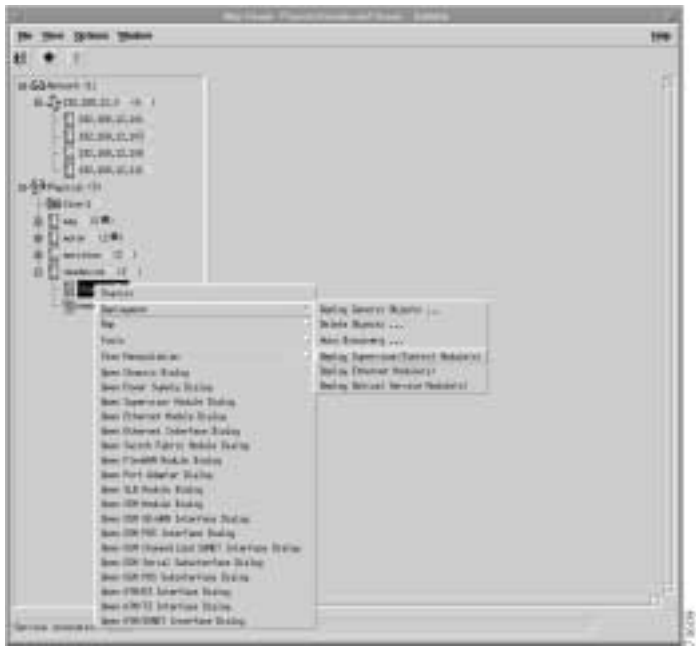
- Supervisor Modules
- Ethernet Modules
- Switch Fabric Modules
- FlexWAN Modules
- Port Adapters
- Optical Services Modules
- Content Switching Module

Tip Supporting modules, such as AC or DC power supplies, are automatically added through subchassis discovery. You cannot manually deploy these objects.

Supervisor Module

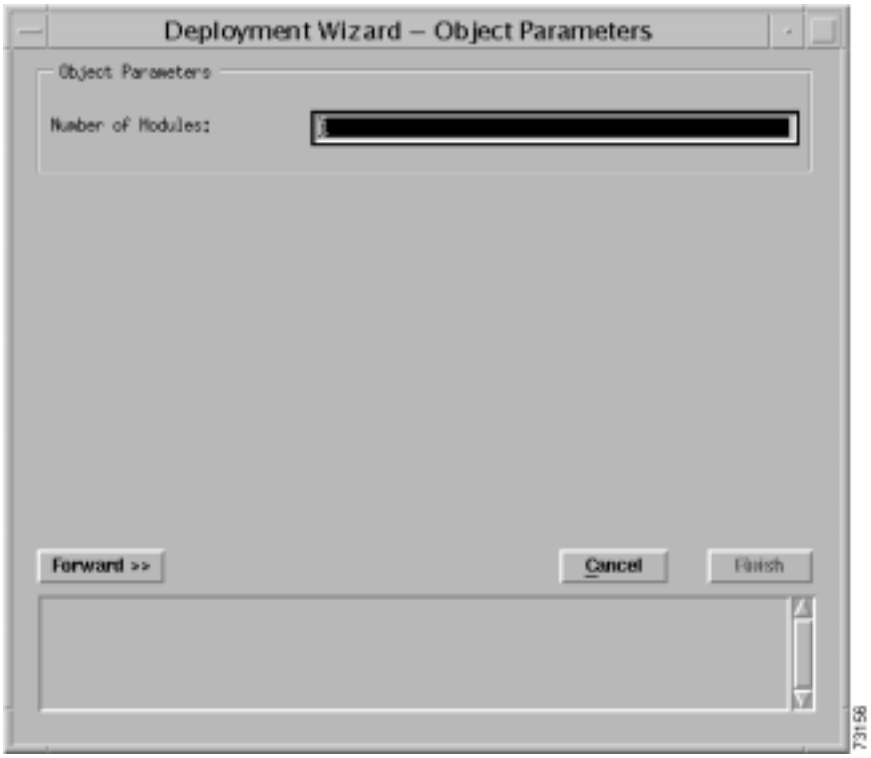
To predeploy a Supervisor Module, choose **Deployment > Deploy Supervisor/Control Modules(s)**from the pop-up menu of the Chassis object (see Figure 4-26).

Figure 4-26 Predeploying Supervisor Modules



The Supervisor Module Deployment Wizard—Object Parameters window, as shown in Figure 4-27, is displayed.

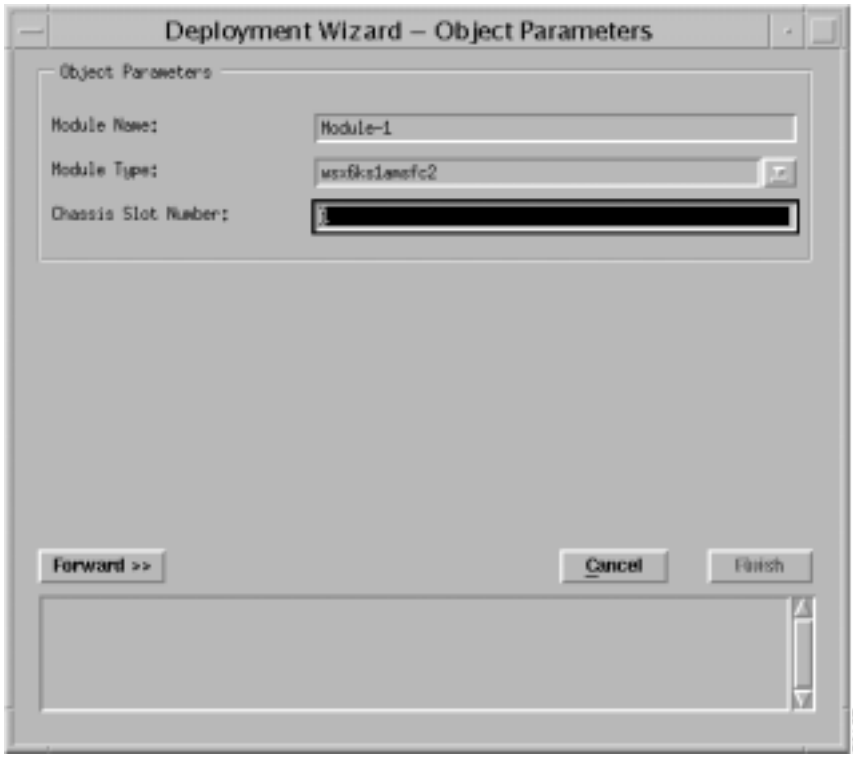
Figure 4-27 Supervisor Module Deployment Wizard—Object Parameters



Property	Description
Number of Modules	The number of supervisor modules to deploy.

Enter the number of supervisor modules to predeploy and click the **Forward** button. The Supervisor Module Deployment Wizard—Object Parameters Details window is displayed for each module to deploy (see Figure 4-28).

Figure 4-28 Supervisor Module Deployment Wizard—Object Parameters Details



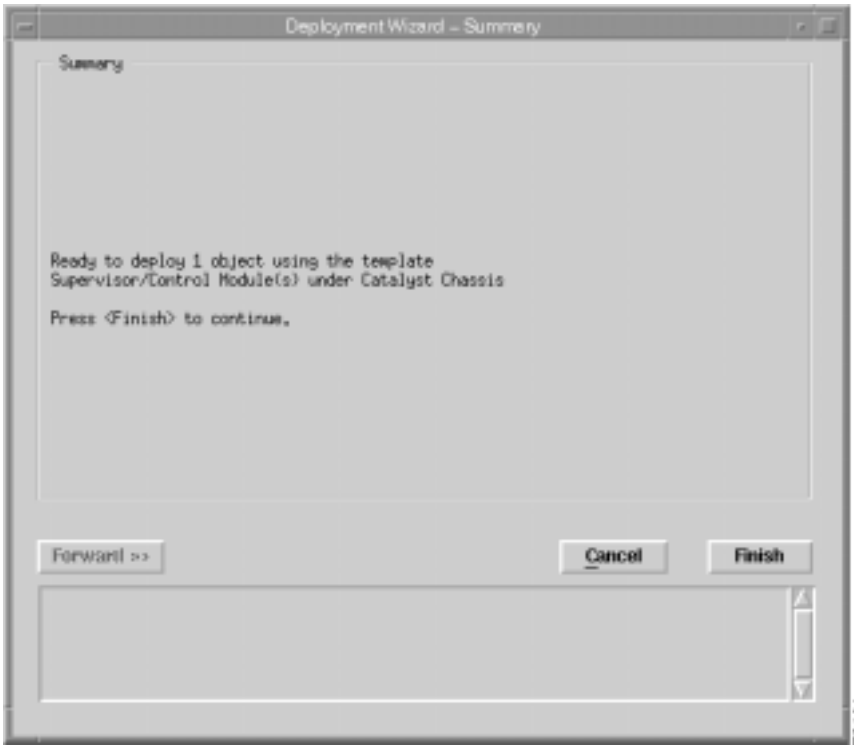
Property	Description
Module Name	The name given to the Supervisor Module object.
Module Type	The type of supervisor module to be deployed. The types are shown in a drop-down list with the following values: • ws-x6k-sup1a-msfc—Supervisor Engine 1A with MSFC • ws-x6k-s1a-msfc2—Supervisor Engine 1A with MSFC2 • ws-x6k-s2-msfc2—Supervisor Engine 2 with MSFC2
Chassis Slot Number	The slot in which the supervisor module is to be deployed.

Note Use ws-x6k-s1a-msfc2 to deploy both the Supervisor Engine 1A with MSFC or Supervisor Engine 1A with MSFC2.

Note Use ws-x6k-s2-msfc2 to deploy the Supervisor Engine 2 with 256 MB DRAM and MSFC2 (ws-x6k-s2u-msfc2).

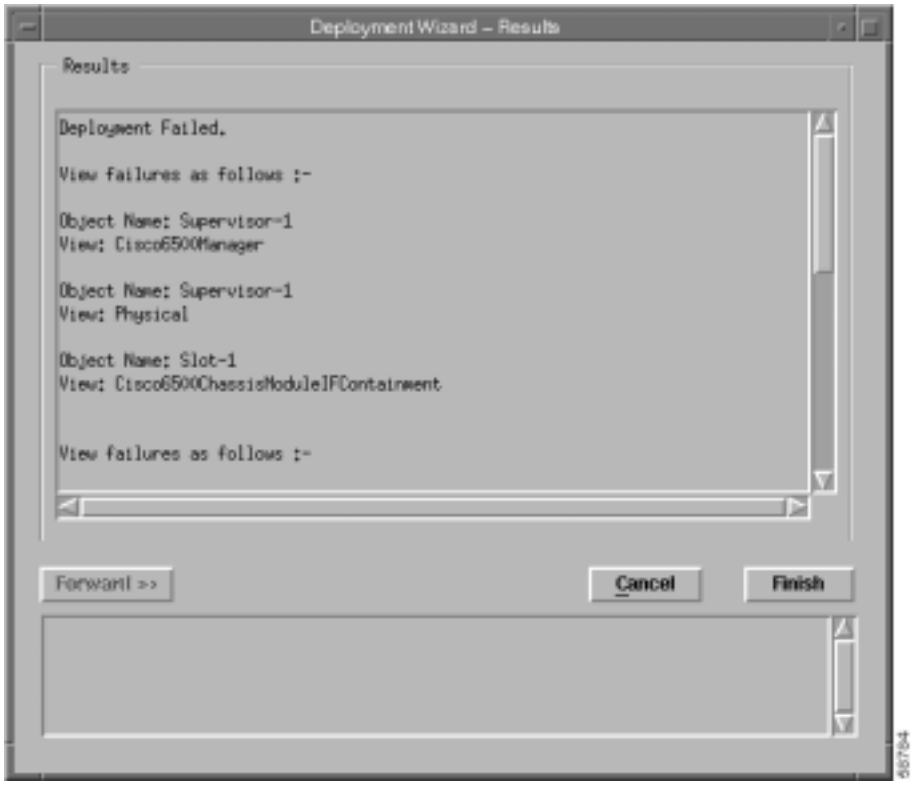
Enter the details for the Supervisor Module object and click the **Forward** button. The Supervisor Module Deployment Wizard—Summary window is displayed (see Figure 4-29).

Figure 4-29 Supervisor Module Deployment Wizard—Summary



You can either click the **Cancel** button to cancel the operation, or click the **Finish** button to create the object. If the Chassis Slot Number corresponds to an occupied slot, an error message will be displayed. The error message resembles the message shown in Figure 4-30.

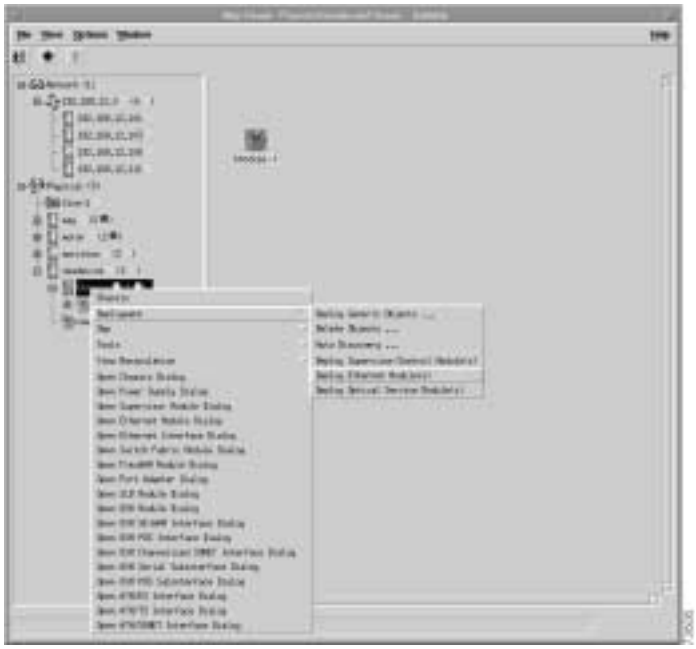
Figure 4-30 Predeployment Failure Due to an Occupied Slot



Ethernet Module

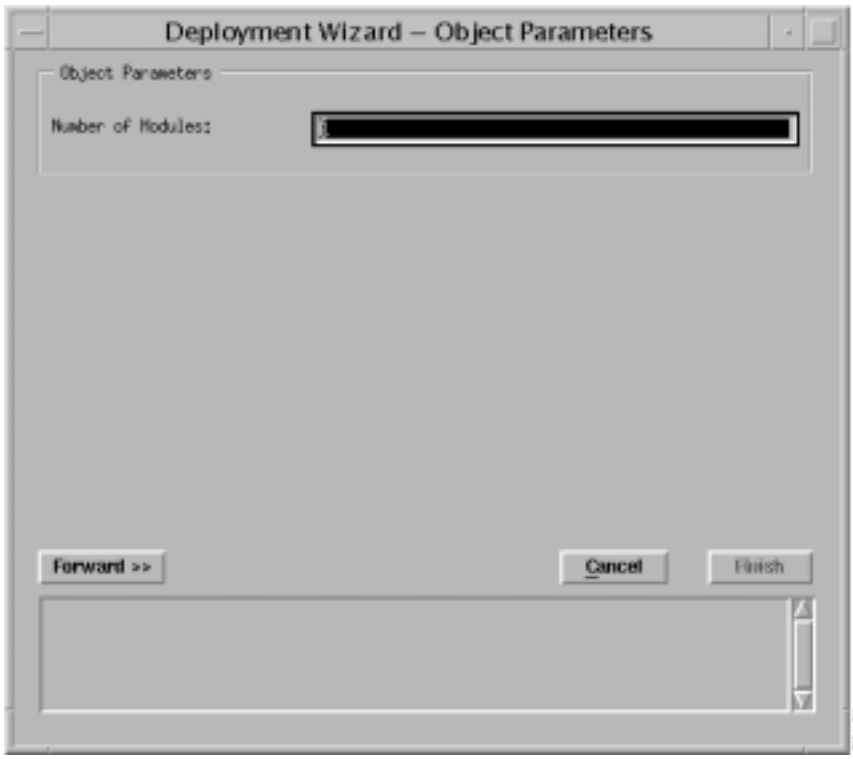
To predeploy an Ethernet module (standard Ethernet, Fast Ethernet, or Gigabit Ethernet), choose the **Deployment > Deploy Ethernet Module(s)** option from the pop-up menu of the Chassis object (see Figure 4-31).

Figure 4-31 Predeploying Ethernet Modules



After you choose the **Deploy Ethernet Module** option, the window shown in Figure 4-32 is displayed.

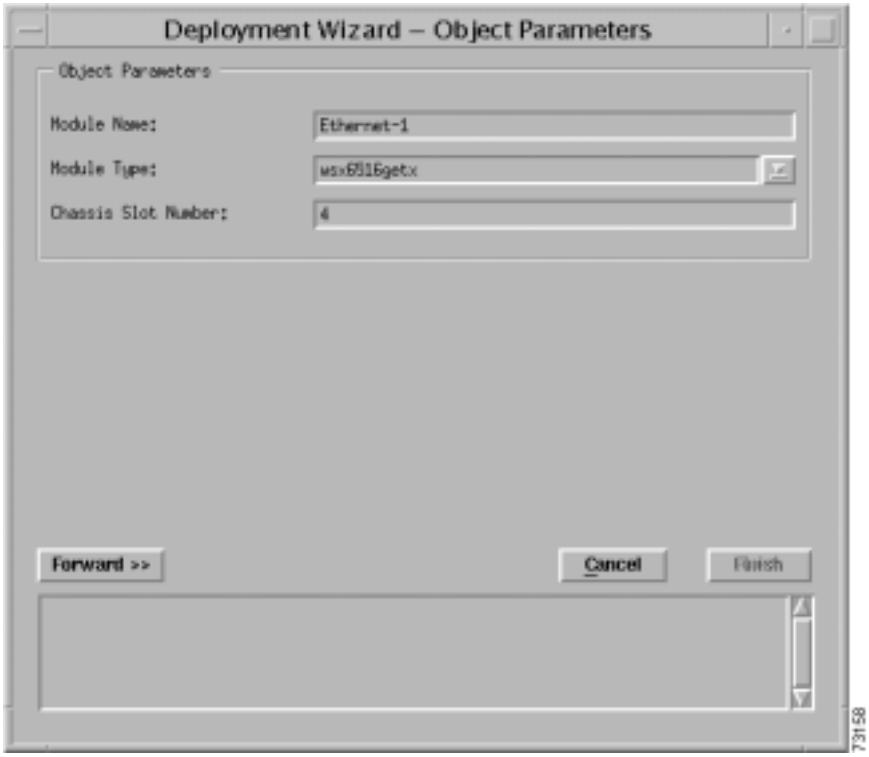
Figure 4-32 Ethernet Module Deployment Wizard—Object Parameters



Property	Description
Number of Modules	The number of Ethernet modules to deploy.

Enter the number of Ethernet module objects to be predeployed at the same time and click the **Forward** button. The window shown in Figure 4-33 is displayed.

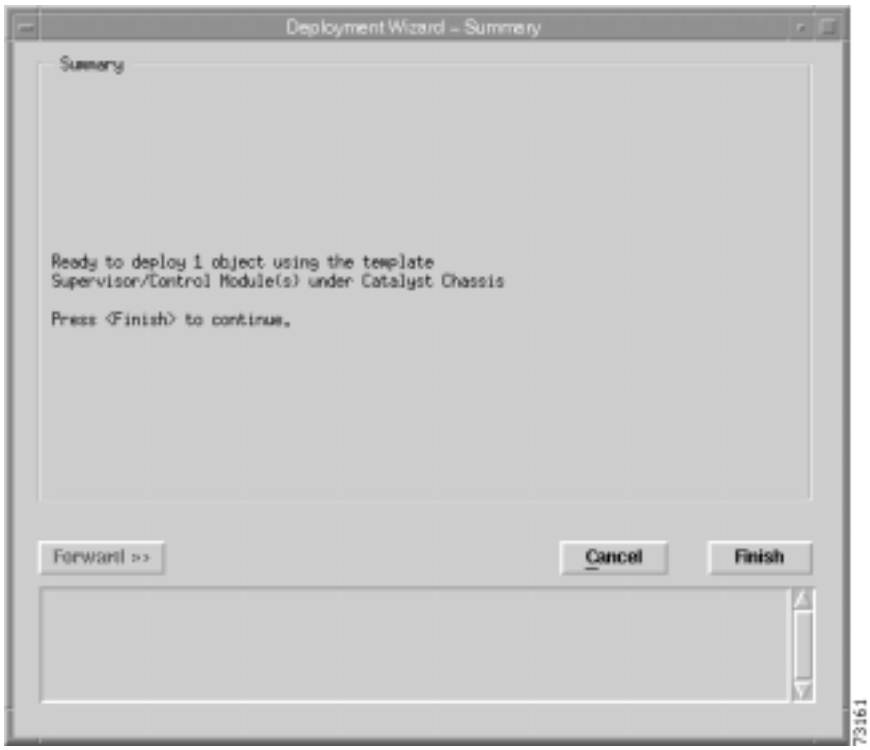
Figure 4-33 Ethernet Module Deployment Wizard—Object Parameters Details



Property	Description
Module Name	The name given to the Ethernet Module object.
Module Type	The type of Ethernet card to be deployed. This is a drop-down list with the following values: • wsx6224100fxmt—24-port 100FX • wsx6324100fxmm—24-port 100FX multimode with enhanced QoS • wsx6324100fxsm—24-port 100FX single-mode with enhanced QoS • wsx6248rj45—48-port 10/100TX with RJ-45 connectors • wsx6248tel—48-port 10/100TX with RJ-21 connectors
Module Type (continued)	• wsx6248atel—48-port 10/100TX with RJ-21 connectors and enhanced QoS • wsx6348rj45—48-port 10/100TX with RJ-45 connectors, enhanced QoS, and upgradeable voice card • wsx6348rj45v—48-port 10/100TX with RJ-45 connectors, enhanced QoS, and voice card • wsx6348rj21—48-port 10/100, RJ-21, upgradable to voice • wsx6524-100fxmm—Fabric-enabled 100FX Fast Ethernet Module, multimode fiber, MT-RJ • wsx6548rj21—Fabric-enabled 10/100 Fast Ethernet Modules, RJ-21 • wsx6548rj45—Fabric-enabled 10/100 Fast Ethernet Modules, RJ-45 • wsx6408gbic—8-port Gigabit Ethernet • wsx6408agbic—8-port Gigabit Ethernet with enhanced QoS • wsx6416gbic—16-port Gigabit Ethernet • wsx6416gemt—16-port Gigabit Ethernet with MT-RJ connectors • wsx6516gbic—16-port Gigabit Ethernet with switch fabric connection • wsx6816gbic—16-port Gigabit Ethernet with dual switch fabric connections • wsx6316getx—16-port Gigabit Ethernet with RJ-45 connectors • wsx6516-getx—16-port Gigabit Ethernet with RJ-45 connectors, x-bar • wsx6501-10gex4—One-port 10GBASE-EX4 metro extended reach 10 Gigabit Ethernet Module (single-mode fiber)
Chassis Slot Number	The slot in which the Ethernet Module is to be deployed.

Enter the details for the Ethernet Module object and click the **Forward** button. The Ethernet Module Deployment Wizard—Summary window is displayed (see Figure 4-34).

Figure 4-34 Ethernet Module Deployment Wizard—Summary

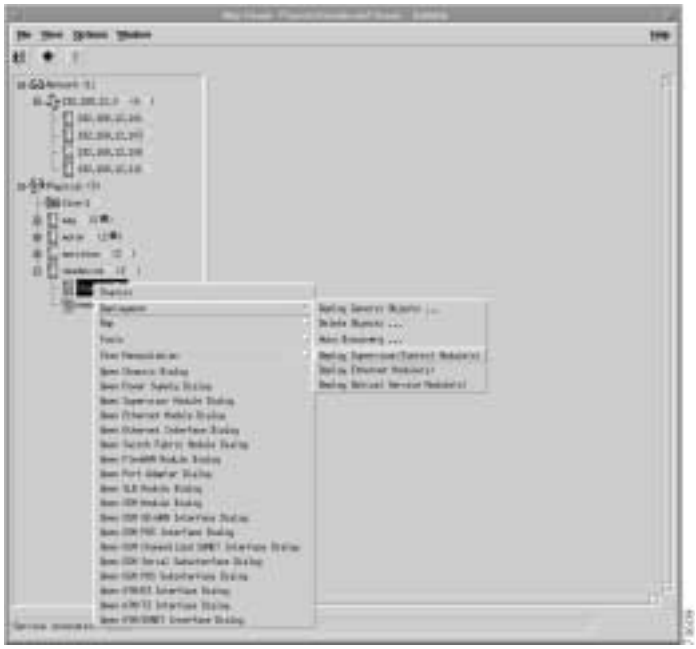


You can either click the **Cancel** button to cancel the operation or click the **Finish** button to create the object. If the Chassis Slot Number corresponds to an occupied slot, an error message is displayed. The error message resembles the message shown in Figure 4-30.

Switch Fabric Module

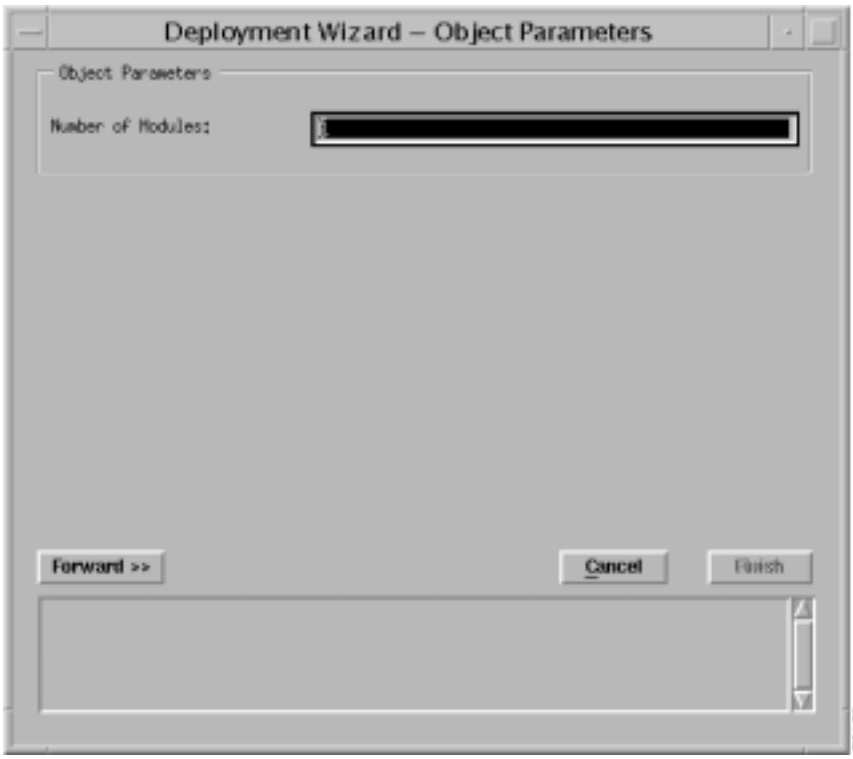
To predeploy a Switch Fabric Module, choose the **Deployment > Deploy Supervisor/Control Module(s)** option in the pop-up menu from the Chassis object (see Figure 4-35).

Figure 4-35 Predeploying Switch Fabric Modules



After you choose the **Deploy Switch Fabric Module(s)** option, the Switch Fabric Module Deployment Wizard—Object Parameters window is displayed (see Figure 4-36).

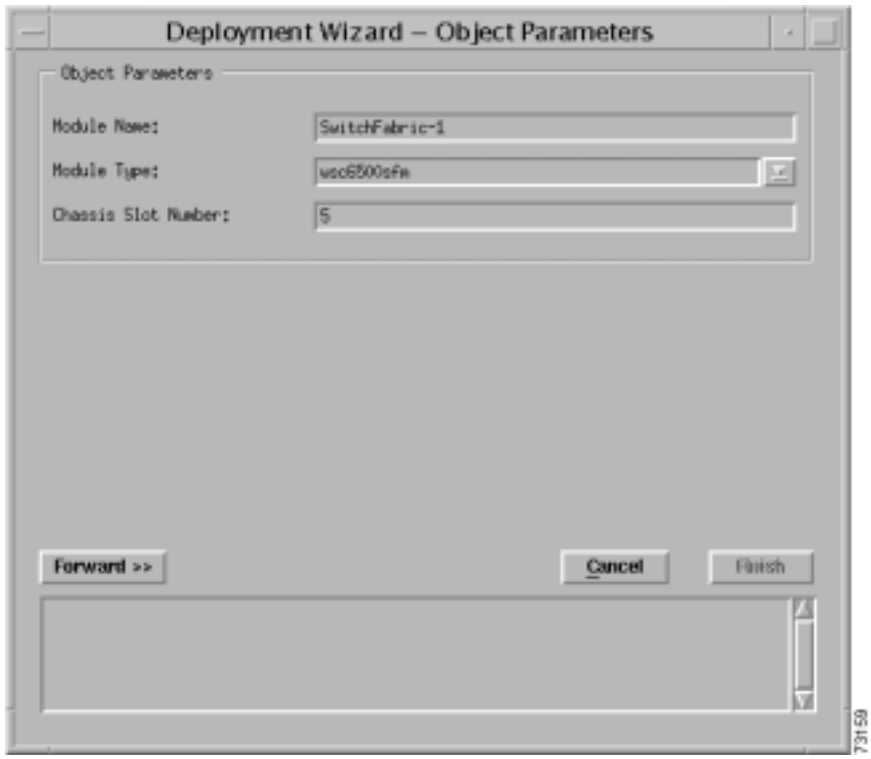
Figure 4-36 Switch Fabric Module Deployment Wizard—Object Parameters



Property	Description
Number of Modules	The number of Switch Fabric Modules to deploy at the same time.

Enter the number of Switch Fabric Modules to be deployed at the same time and click the **Forward** button. The Switch Fabric Module Deployment Wizard—Object Parameters Details window is displayed for each module to deploy (see Figure 4-37).

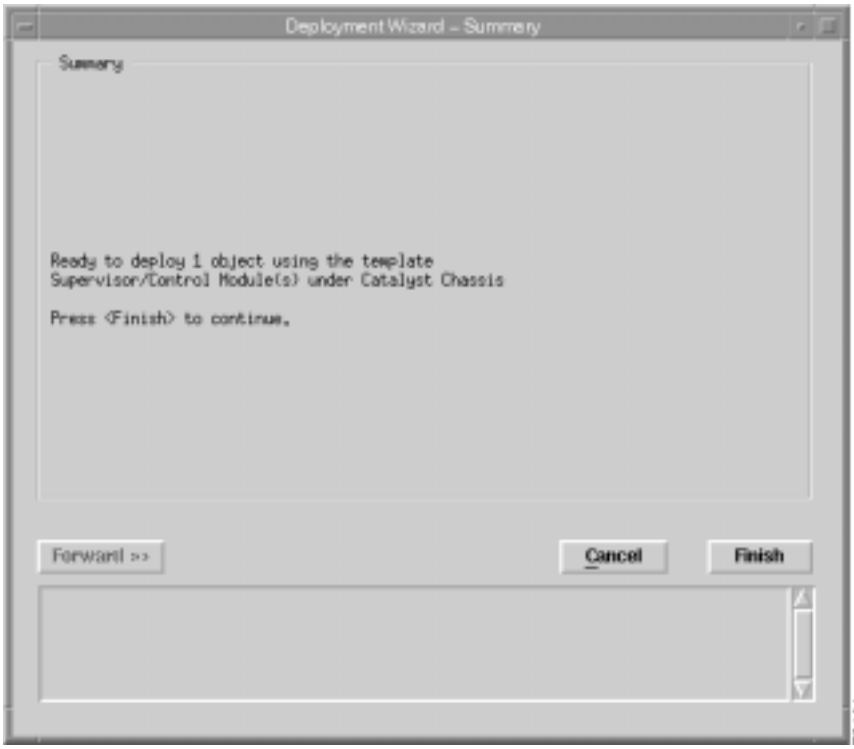
Figure 4-37 Switch Fabric Module Deployment Wizard—Object Parameters Details



Property	Description
Module Name	The name given to the Switch Fabric Module object.
Module Type	The type of Switch Fabric Module to be deployed. This is a drop-down list with the following values: • wsc6500sfm—Switch Fabric Module • wsc6500sfm2—Switch Fabric Module (for the Catalyst 6513 chassis)
Chassis Slot Number	The slot in which the Switch Fabric Module is to be deployed.

Enter the details for the Switch Fabric Module object and click the **Forward** button. The Switch Fabric Module Deployment Wizard—Summary window is displayed (see Figure 4-38).

Figure 4-38 Switch Fabric Module Deployment Wizard—Summary

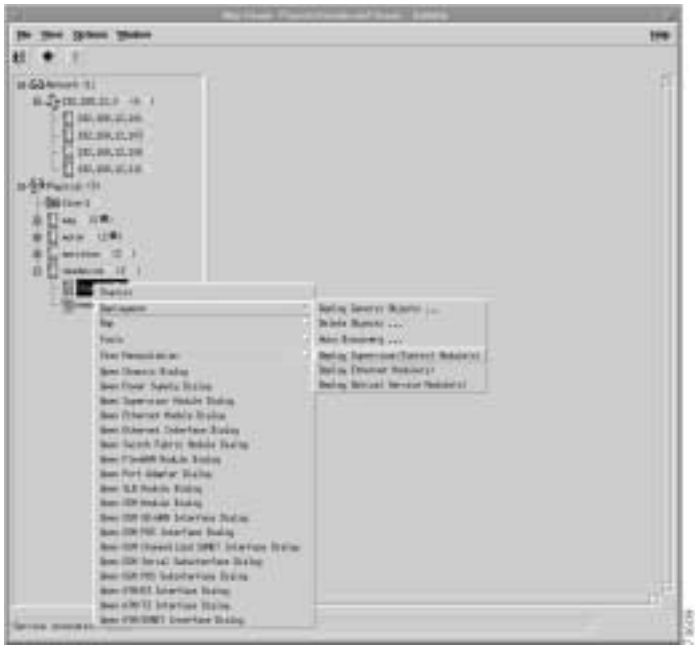


You can either click the **Cancel** button to cancel the operation or click the **Finish** button to create the object. If the Chassis Slot Number corresponds to an occupied slot, an error message is displayed. The error message resembles the message shown in Figure 4-30.

FlexWAN Module

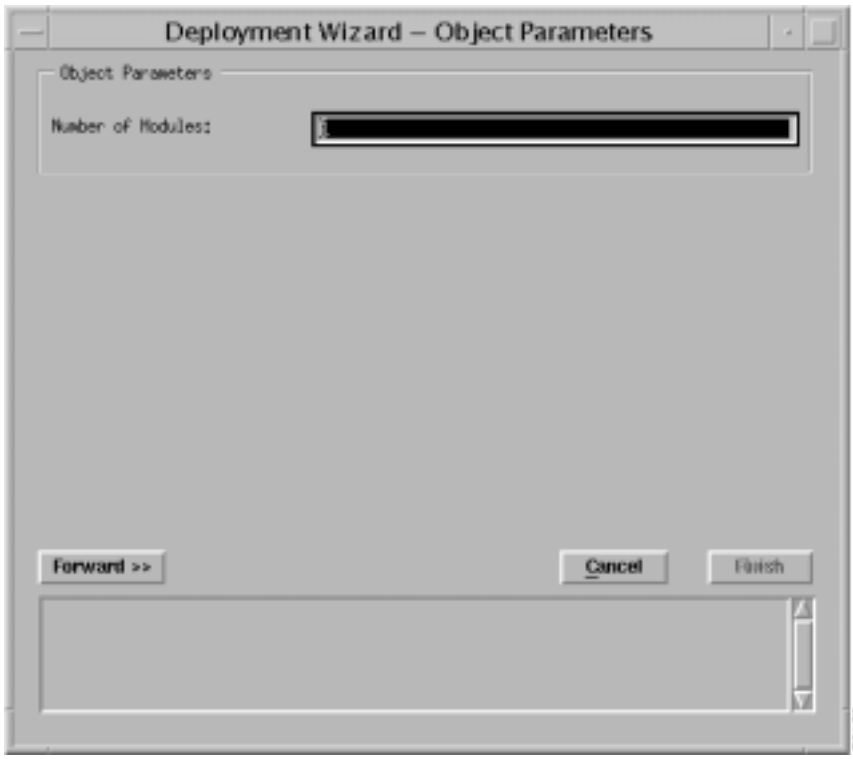
To predeploy a FlexWAN Module, choose the **Deployment > Deploy Supervisor/Control Module(s)** option in the pop-up menu from the Chassis object (see Figure 4-39).

Figure 4-39 Predeploying FlexWAN Modules



After you choose the **Deploy FlexWAN Module(s)** option, the FlexWAN Module Deployment Wizard—Object Parameters window is displayed (see Figure 4-40).

Figure 4-40 FlexWAN Module Deployment Wizard—Object Parameters

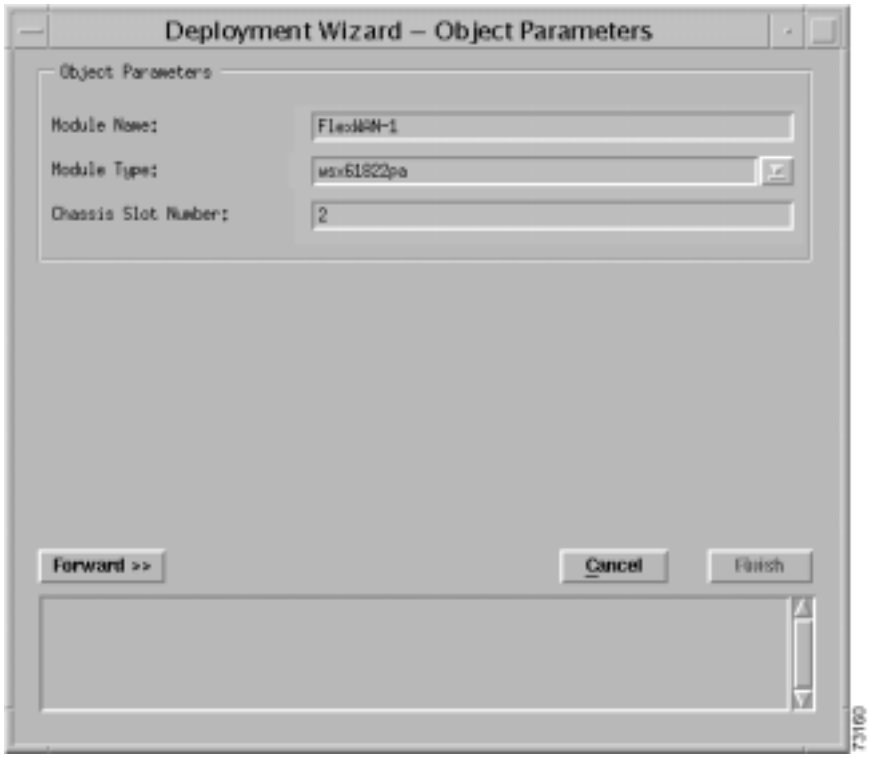


Property	Description
Number of Modules	The number of FlexWAN modules to be deployed at the same time. This value cannot be greater than 12.

Enter the number of FlexWAN modules to be deployed at the same time and click **Forward** button. The FlexWAN Module Deployment Wizard – Object Parameters Details window is displayed for each module to be deployed (see Figure 4-41).

Note This value cannot be greater than 12. If it is, an error message will be displayed and the **Forward** button will not work.

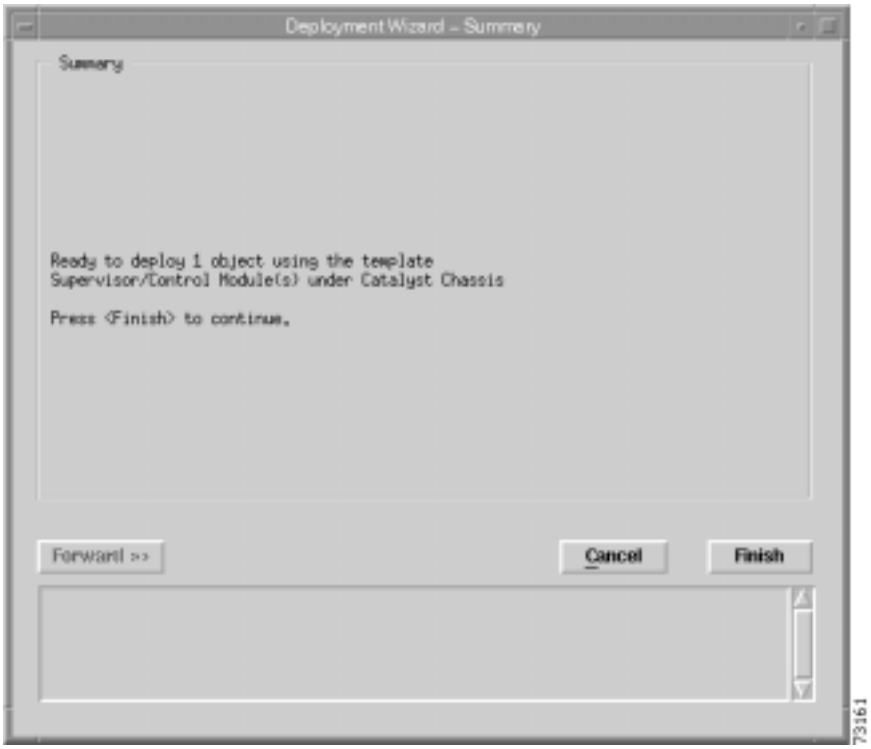
Figure 4-41 FlexWAN Module Deployment Wizard—Object Parameters Details



Property	Description
Module Name	The name given to the FlexWAN Module object.
Module Type	The type of FlexWAN Module to be deployed. This is a drop-down list with the following values: • wsx61822pa—FlexWAN Module
Chassis Slot Number	The slot in which the FlexWAN is to be deployed. The FlexWAN Modules can be deployed on slots 2 through 13.

Enter the details for the FlexWAN Module object and click the **Forward** button. The FlexWAN Module Deployment Wizard—Summary window is displayed (see Figure 4-42).

Figure 4-42 FlexWAN Module Deployment Wizard—Summary



You can either click the **Cancel** button to cancel the operation or click the **Finish** button to create the object. If the Chassis slot number corresponds to an occupied slot, an error message is displayed. The message resembles the message shown in Figure 4-30.

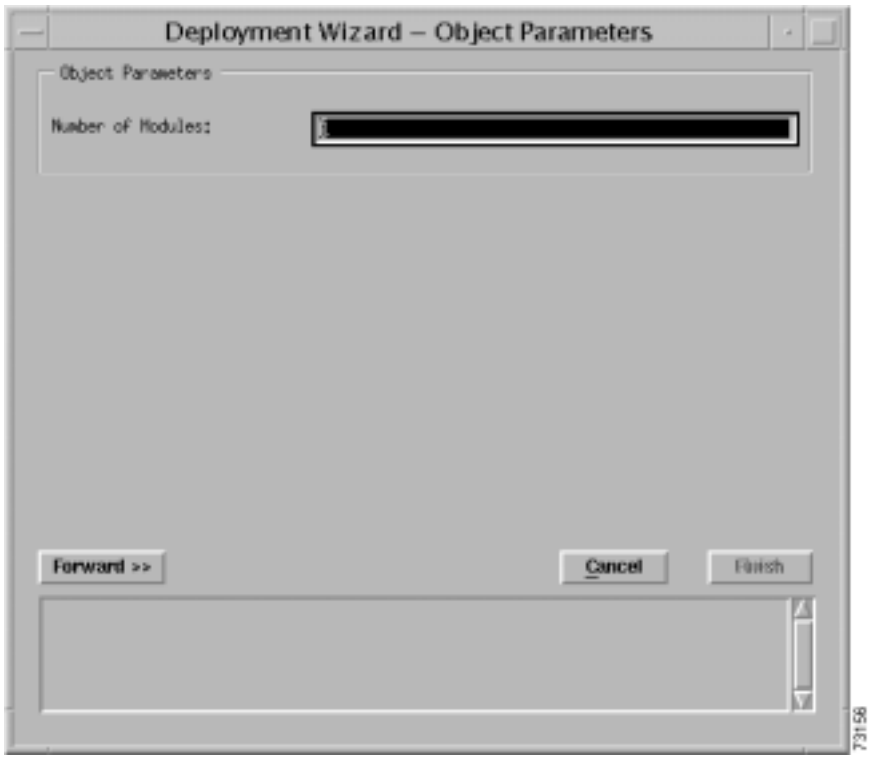
Port Adapters

To predeploy a port adapter, the FlexWAN module must first be deployed (see the "FlexWAN Module" section on page 4-44). Choose the **Deployment > Deploy Port Adapter(s)** option in the pop-up menu from the FlexWAN object (see Figure 4-43).

Figure 4-43 Predeploying Port Adapters

The Port Adapter Deployment Wizard—Object Parameters window is displayed (see Figure 4-44).

Figure 4-44 Port Adapter Deployment Wizard—Object Parameters

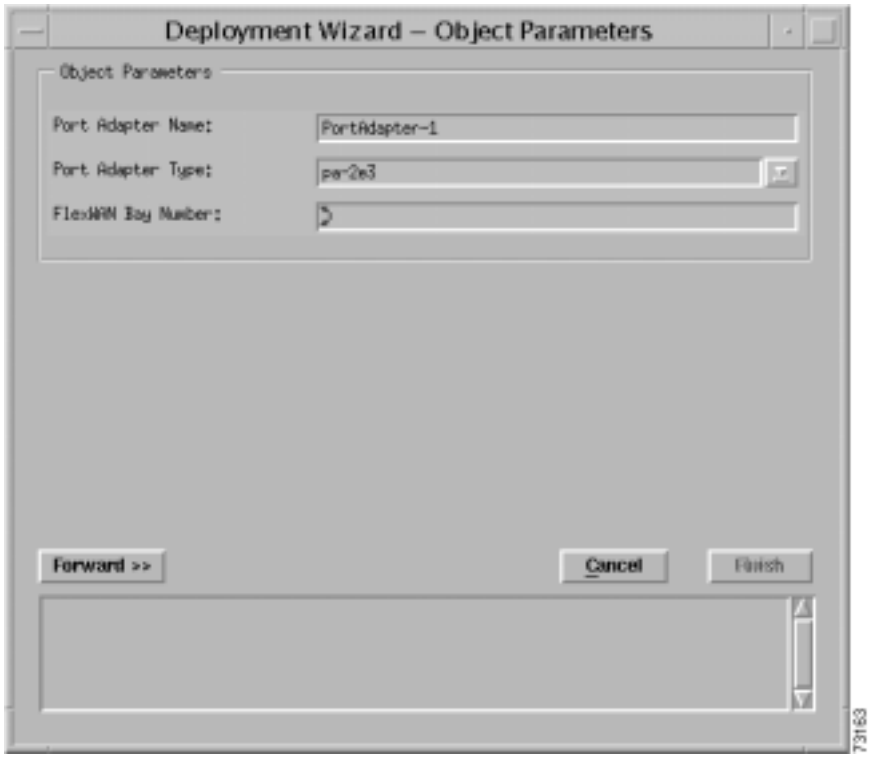


Property	Description
Number of Modules	The number of port adapters to be deployed at the same time.

Enter the number of port adapters to be deployed at the same time and click **Forward** button. The Port Adapter Deployment Wizard – Object Parameters Details window is displayed for each module to be deployed (see Figure 4-45).

Note This value cannot be greater than 2. If it is, an error message will be displayed and the **Forward** button will not work

Figure 4-45 Port Adapter Deployment Wizard—Object Parameters Details

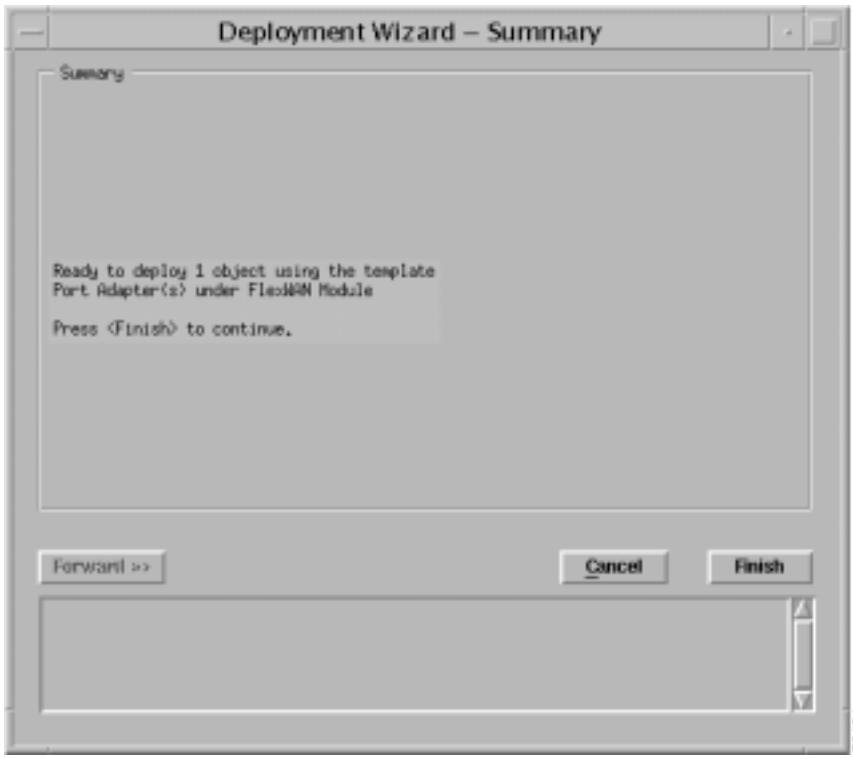


Property	Description
Port Adapter Name	The name given to the Port Adapter object.
Port Adapter Type	The type of port adapter to be deployed. This is a drop-down list with the following values: • pa-ah1t • pa-ah2t • pa-4t-plus • pa-a8t-v35 • pa-atmdx-ds3 • pa-atmdx-e3 • pa-atmdx-sml-oc3 • pa-atmdx-smi-oc3 • pa-atmdx-mm-oc3 • pa-a8t-x21 • pa-a8t-rs232 • pa-1e3 • pa-2e3 • pa-1t3 • pa-2t3 • pa-8ct1-csu • pa-8ce1 • pa-ce3 • pa-possw-sm • pa-possw-mm • pa-possw-lr
Port Adapter Type (continued)	• pa-1t3-plus • pa-2t3-plus • pa-mct3 • pa-mc2t3 • pa-san-fc1
FlexWAN Bay Number	The FlexWAN bay in which the port adapter is to be deployed. The port adapter can be deployed in bays 0 and/or 1.

Note Valid FlexWAN bay numbers are 0 or 1. If you enter any other number, an error message is displayed and the **Forward** button will not work.

Enter the details for the Port Adapter object and click the **Forward** button. The Port Adapter Deployment Wizard—Summary window is displayed (see Figure 4-46).

Figure 4-46 Port Adapter Deployment Wizard—Summary

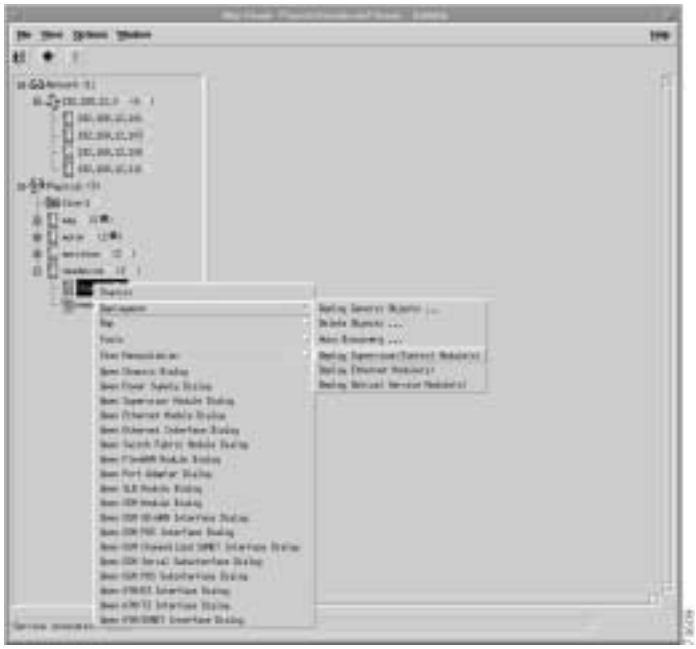


You can either click the **Cancel** button to cancel the operation or click the **Finish** button to create the object. If the Chassis slot number corresponds to an occupied slot, an error message is displayed. The message resembles the message shown in Figure 4-30.

Content Switching Module

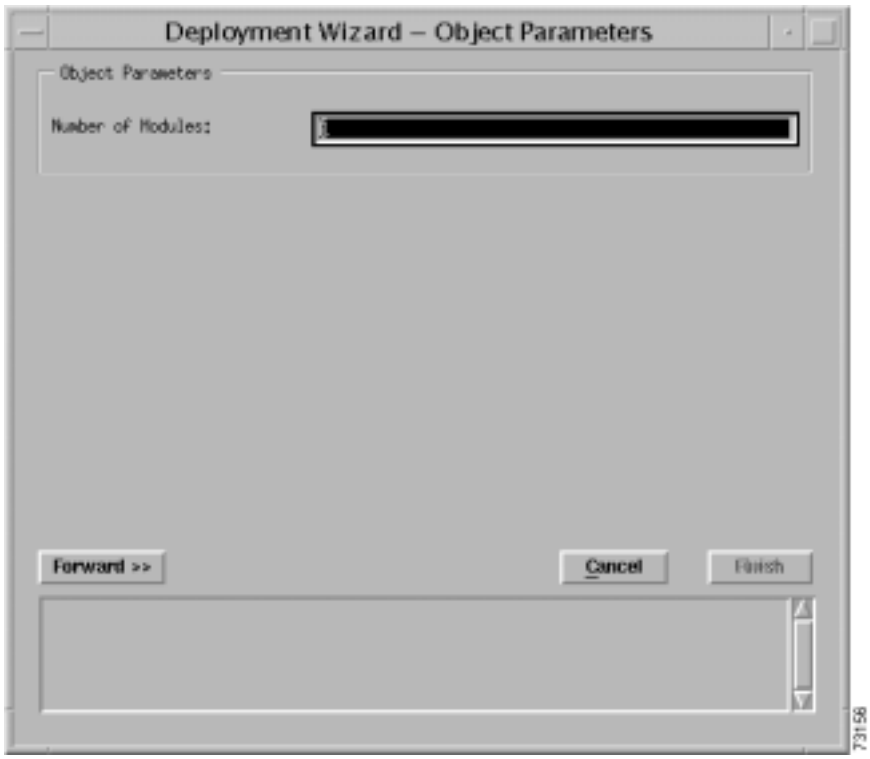
The Content Switching Module is a line card that provides server load balancing (SLB) of client traffic to server farms, firewalls, secure sockets layer (SSL) devices, or VPN termination devices. To predeploy a Content Switching Module (CSM), choose the **Deployment > Deploy Supervisor/Control Module(s)** option in the pop-up menu from the Chassis object (see Figure 4-47).

Figure 4-47 Predeploying Content Switching Modules



After you choose the **Deploy Supervisor/Control Module(s)** option, the Deployment Wizard—Object Parameters window is displayed (see Figure 4-48).

Figure 4-48 Deployment Wizard—Object Parameters



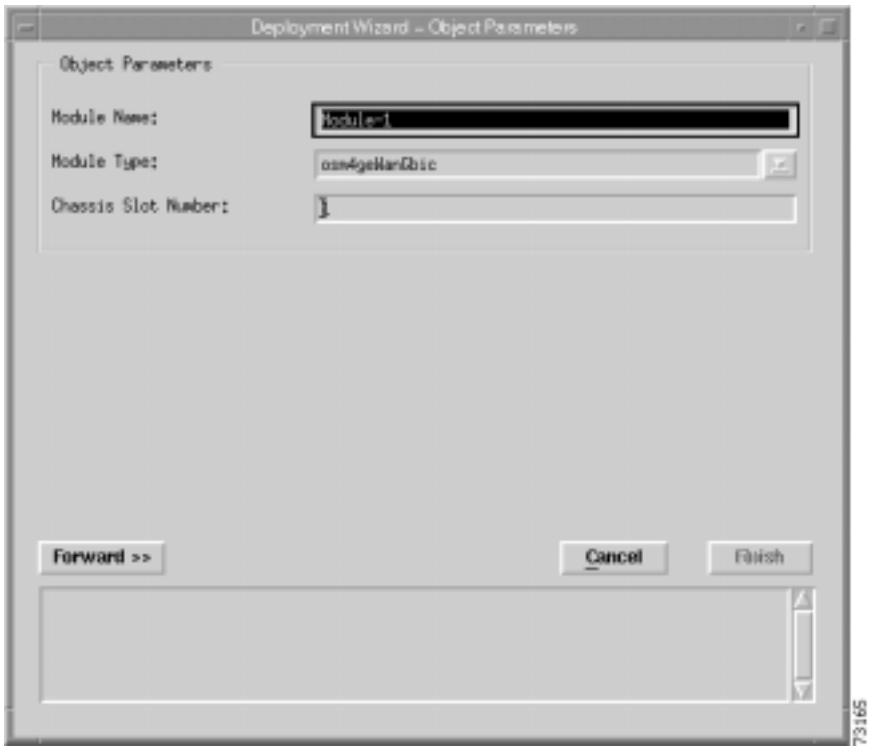
Property	Description
Number of Modules	The number of Content Switching Modules to be deployed at the same time. This value cannot be greater than 1 for IOS 12.1(8a)E3 and earlier, and no greater than 11 for IOS 12.1(8a)EX and later.

Enter the number of Content Switching Modules to be deployed at the same time and click **Forward** button. The Deployment Wizard—Object Parameters Details window is displayed for each module to be deployed (see Figure 4-49).

Note The C65/76M manager supports management and configuration of the CSM if only one CSM is deployed. If you choose to deploy more than one CSM in the chassis, inventory of the CSMs are supported, but the management and configuration of the CSMs are not supported.

Caution If multiple CSMs are deployed on a chassis, appropriate user access controls should be implemented in CEMF to prevent users from accidentally using the C65/76M manager to modify the CSM configurations. Refer to the *Cisco Element Manager Framework User Guide* for additional information about user access control.

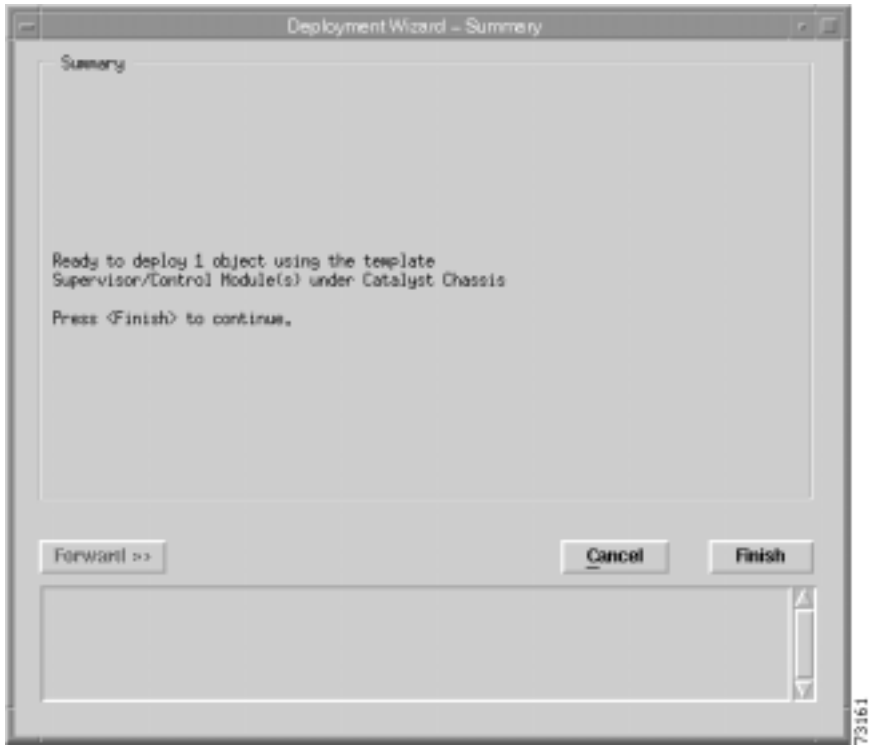
Figure 4-49 Deployment Wizard—Object Parameters Details



Property	Description
Module Name	The name given to the Content Switching Module object.
Module Type	The type of Content Switching Module to be deployed. This is a drop-down list with the following value: • ws-x6066-slb-apc—Content Switching Module
Chassis Slot Number	The slot in which the Content Switching Module is to be deployed. The Content Switching Modules can be deployed on slots 2 through 13.

Enter the details for the Content Switching Module object and click the **Forward** button. The Deployment Wizard—Summary window is displayed (see Figure 4-50).

Figure 4-50 Deployment Wizard—Summary



You can either click the **Cancel** button to cancel the operation or click the **Finish** button to create the object. If the Chassis slot number corresponds to an occupied slot, an error message is displayed. The message resembles the message shown in Figure 4-30.

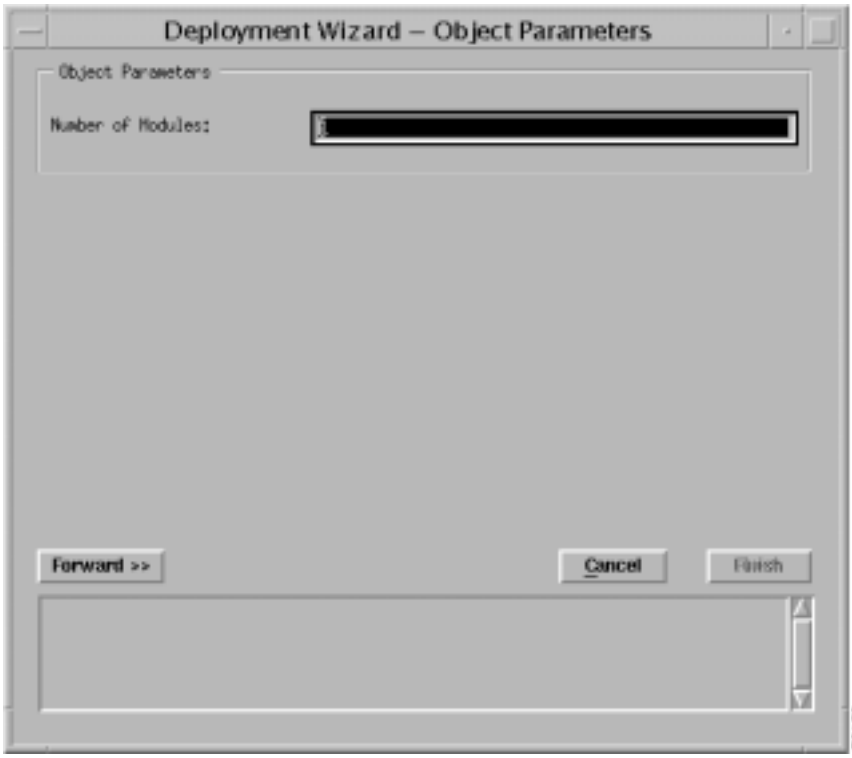
Optical Services Module

To predeploy an Optical Services Module (OSM), choose the **Deploy Module(s), Deploy OSM Module** option in the pop-up menu from the Chassis object (see Figure 4-51).

Figure 4-51 Predeploying OSM Modules

After you choose the **Deploy OSM Module(s)** option, the OSM Module Deployment Wizard—Object Parameters window is displayed (see Figure 4-52).

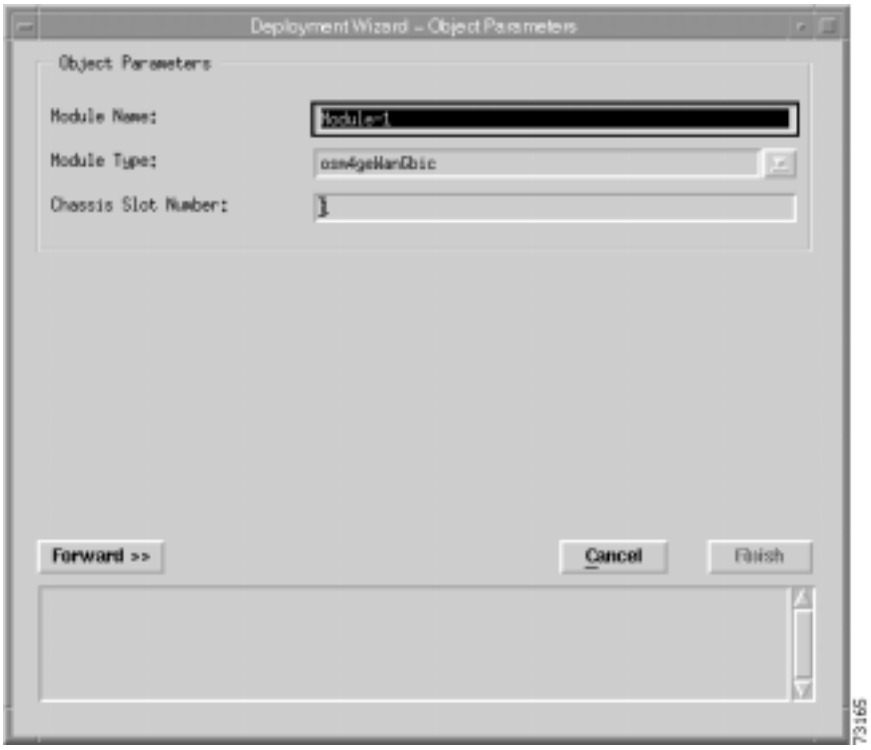
Figure 4-52 OSM Module Deployment Wizard—Object Parameters



Property	Description
Number of Modules	The number of OSMs to be deployed at the same time.

Enter the number of OSMs to be deployed at the same time and click **Forward** button. The Deployment Wizard—Object Parameters Details window is displayed for each module to be deployed (see Figure 4-53).

Figure 4-53 OSM Module Deployment Wizard—Object Parameters Details



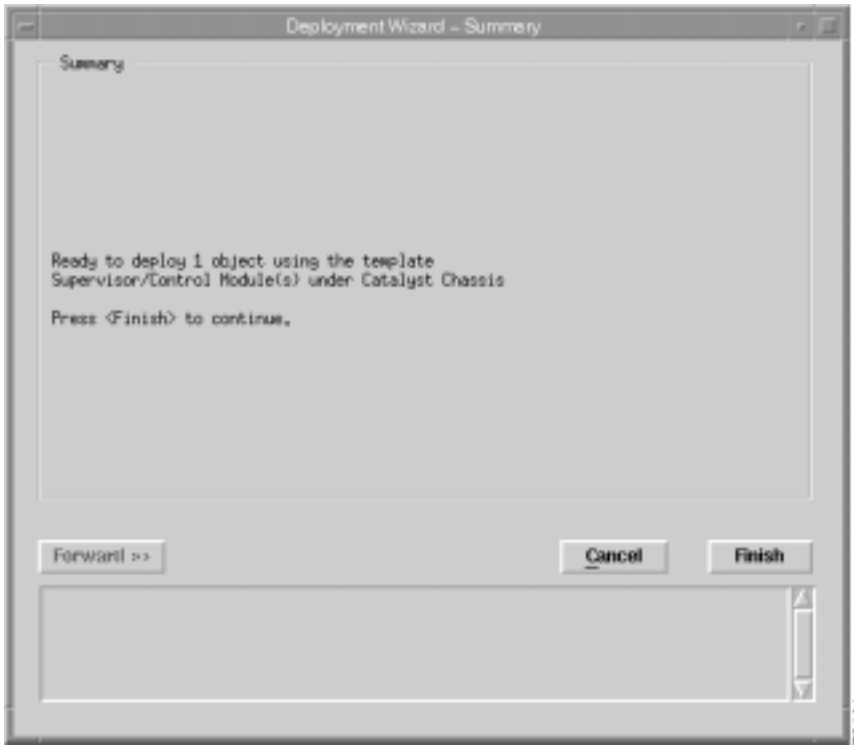
Property	Description
Module Name	The name given to the OSM object.
Module Type	The type of OSM to be deployed. This is a drop-down list with the following values: • osm-4ge-wan-gbic—4-port Gigabit Ethernet Optical Services Module, GBIC • osm-4oc12-pos-mm—4-port OC-12/STM-4 SONET/SDH OSM, MM, with 4 ports of Gigabit Ethernet • osm-4oc12-pos-si—4-port OC-12/STM-4 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet • osm-4oc12-pos-sl—4-port OC-12/STM-4 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet • osm-1oc48-pos-ss—1-port OC-48/STM-16 SONET/SDH OSM, SM-SR, with 4 ports of Gigabit Ethernet • osm-1oc48-pos-si—1-port OC-48/STM-16 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet • osm-1oc48-pos-sl—1-port OC-48/STM-16 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet • osm-16oc3-pos-mm—16-port OC-3/STM-1 SONET/SDH OSM, MM, with 4 ports of Gigabit Ethernet • osm-16oc3-pos-si—16-port OC-3/STM-1 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet

Property	Description
Module Type (continued)	• osm-16oc3-pos-sl—16-port OC-3/STM-1 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet • osm-2oc12-pos-mm—2-port OC-12/STM-4 SONET/SDH OSM, MM, with 4 ports of Gigabit Ethernet • osm-2oc12-pos-si—2-port OC-12/STM-4 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet • osm-2oc12-pos-sl—2-port OC-12/STM-4 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet • osm-8oc3-pos-mm—8-port OC-3/STM-1 SONET/SDH OSM, MM, with 4 ports of Gigabit Ethernet • osm-8oc3-pos-si—8-port OC-3/STM-1 SONET/SDH OSM, SM-IR, with 4 ports of Gigabit Ethernet • osm-8oc3-pos-sl—8-port OC-3/STM-1 SONET/SDH OSM, SM-LR, with 4 ports of Gigabit Ethernet • osm-1choc48/t3-ss—1-port short reach OC48 with 4 Gigabit Ethernet • osm-1choc48/t3-si—1-port channelized OC-48, SM-IR, with 4 ports of Gigabit Ethernet

Property	Description
Module Type (continued)	• osm-2choc48/t3-si—2-port channelized OC-48, SM-IR, with 4 ports of Gigabit Ethernet • osm-2choc48/t3-ss—2-port short reach OC48, with 4 ports of Gigabit Ethernet • osm-4choc12/t3-mm—4-port channelized OC-12, MM, with 4 ports of Gigabit Ethernet • osm-4choc12/t3-si—4-port channelized OC-12, SM-IR, with 4 ports of Gigabit Ethernet • osm-8choc12/t3-mm—8-port channelized OC-12, MM, with 4 ports of Gigabit Ethernet • osm-8choc12/t3-si—8-port channelized OC-12, SM-IR, with 4 ports of Gigabit Ethernet
Chassis Slot Number	The slot in which the OSM is to be deployed. The OSMs can be deployed on slots 2 through 13.

Enter the details for the OSM object and click the **Forward** button. The Deployment Wizard—Summary window is displayed (see Figure 4-54).

Figure 4-54 OSM Deployment Wizard—Summary



You can either click the **Cancel** button to cancel the operation or click the **Finish** button to create the object. If the Chassis slot number corresponds to an occupied slot, an error message is displayed. The message resembles the message shown in Figure 4-30.

Commissioning Predeployed Objects

A predeployed Network Element and subobjects are commissioned automatically when a coldStart SNMP trap that is issued from the switch or the router is received by the CEMF server.

Note For the automatic commissioning to work, the switch or router must be configured to send SNMP traps and the CEMF server host must be in the trap client list.

The subchassis discovery task is executed during commissioning. The discovery task does the following:

- Verifies the predeployed objects.
- If a mismatch between the predeployed object and the discovered object exists, then the predeployed object is placed in a Mismatched state. For example, if a Supervisor Engine 2 MSFC2 is predeployed but a Supervisor Engine 1A MSFC2 is discovered, the Supervisor Module object will be placed in a Mismatched state. If the wrong object was predeployed, delete the object and recommission the Network Element. If the wrong module was inserted in the switch or router, insert the correct module and recommission the object.
- Checks for switch or router components that were not predeployed. Any objects that are discovered will be created and commissioned automatically.
- Automatically creates and commissions the remaining C65/76M objects. These objects include the power supply and all of the logical objects.

If the coldStart trap is not received by the CEMF server when the switch is first brought on-line, then the predeployed Network Element object needs to be commissioned manually by opening the Network Element dialog box and selecting the Commission button (see Figure 4-15).

CHAPTER 5

Physical Object Dialog Boxes

This chapter describes the Cisco 6500/7600 Series Manager dialog boxes for the physical objects. The following physical object dialog boxes are available in the C65/76M:

Table 5-1 lists the pop-up menu launch points for all C65/76M dialog boxes.

Table 5-1 Launch Points for the C65/76M Dialog Boxes

Container	Object	Dialog Box
Network	Network Element	All dialogs (under the Cisco 6500/7600 Series Manager menu entry)
Physical	Container (site, bay, shelf, etc.)	All dialogs (under the Cisco 6500/7600 Series Manager menu entry)
	Network Element	All dialogs (under the Cisco 6500/7600 Series Manager menu entry)
	Chassis	Chassis Dialog Power Supply Dialog All Module Dialogs All Port Adapter Dialogs All Interface Dialogs
	Power Supply	Power Supply Dialog
	Supervisor Module	Supervisor Module Dialog Ethernet Interface Dialog
	All other Interface Modules (Ethernet, OSM, etc.)	Corresponding Module Dialog All Interface Dialogs for interfaces associated with the Module
	Switch Fabric Module, SLB Module, FlexWAN Module	Corresponding Module Dialog
	All Interfaces	Corresponding Interface Dialog

C6576M Chassis Dialog Box

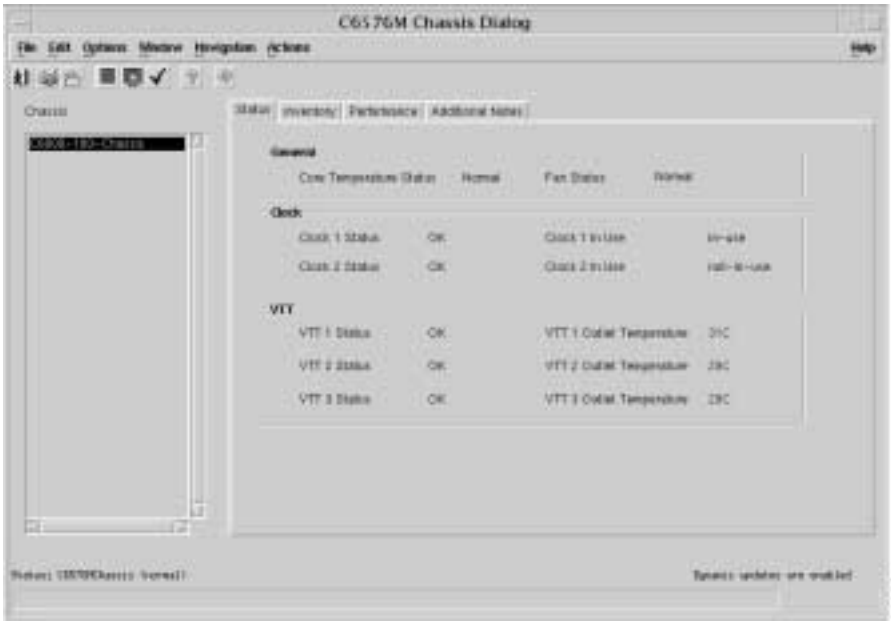
This dialog box provides access to attributes for the physical chassis. This includes items such as the fan, temperature, and power supplies. This dialog box can be launched from a Network Element object or Chassis object within the Network or Physical containment views.

Only one Chassis object can be selected at a time from the Chassis object list on the left-hand side of the dialog box.

Status Tab

Figure 5-1 shows the Status tab of the C6576M Chassis dialog box.

Figure 5-1 Status Tab of the C6576M Chassis Dialog Box



General Area

The General area of the C6576M Chassis dialog box provides the following information:

- Core Temperature Status—Status of the core of the chassis. This attribute can have the following values:
  - Excessive—The current temperature is within normal operating parameters.
  - Normal—The current temperature has exceeded the normal operating range.
  - High—The current temperature is dangerously high. The system will shutdown imminently.

Note If this attribute has a value other than off, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

- Fan Status—Status of the chassis fans. This attribute can have the following values:
  - other—The fan status is unknown.
  - Normal—Fan status is normal.
  - High—There is a minor problem.
  - Excessive—There is a major problem.

Note If this attribute has a value other than ok, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

Clock Area

The Clock area of the C6576M Chassis dialog box provides the following information:

- Clock 1 Status, Clock 2 Status—Operational statuses of clocks 1 and 2. These attributes can have the following values:
  - OK—Clock is operating.
  - failed—Clock is not operating.
- Clock 1 In Use, Clock 2 In Use—Indicates which clock is in use. These attributes can have the following values:
  - in-use—Clock is in use.
  - not-in-use—Clock is not in use.

VTT Area

The VTT area of the C6576M Chassis dialog box provides the following information:

- VTT 1 Status, VTT 2 Status, VTT 3 Status—Operational status of VTT 1, VTT 2, and VTT 3. These attributes can have the following values:
  - OK—VTT is operating.
  - failed—VTT is not operating.
- VTT 1 Outlet Temperature, VTT 2 Outlet Temperature, VTT 3 Outlet Temperature—Outlet Temperatures of VTT 1, VTT 2, and VTT 3. These attributes can have the following values:
  - <n>C—Temperature in degrees Celsius.
  - N/O—Indicates that the sensor is not operational.
  - N/A—Indicates that the sensor value is not available.

Status Field

The Status display-only field located at the bottom of the window indicates the current state of the object. This field can have the following values:

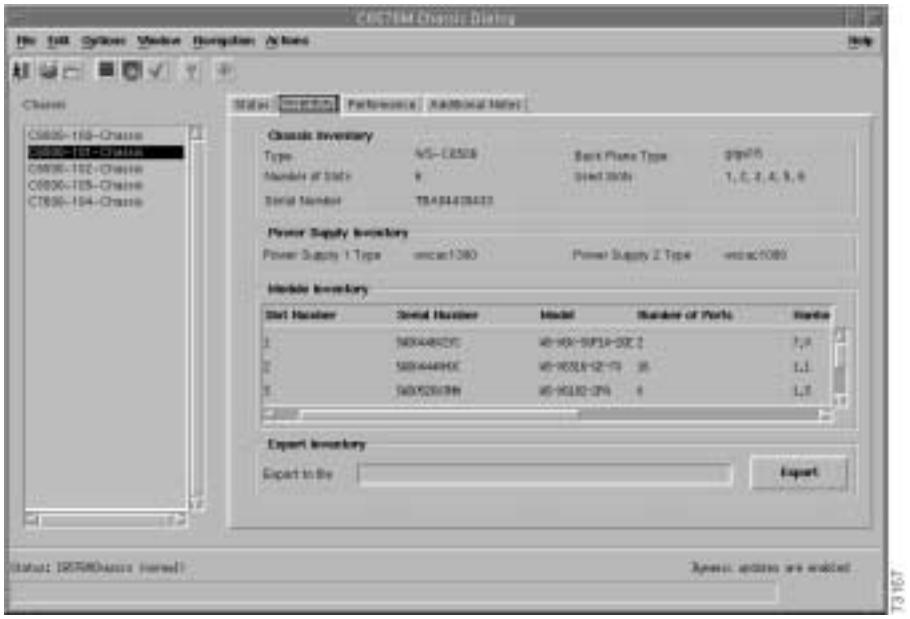
- decommissioned—CEMF is not actively monitoring the object attributes.
- discovery—CEMF is trying to determine the contents and configuration of the Chassis object.
- normal—Presence polling of the object.
- performance—Attributes are collected periodically for trending purposes.
- normallostcomms—CEMF lost communication with the device from the normal state.
- perflostcomms—CEMF lost communication with the device from the performance state.
- discoverylostcomms—CEMF lost communication with the device during discovery.

Note To collect some of the statistics in the Performance tab, the running configuration of the switch is modified to add the following command to each interface: **rmon collection stats** <*n*> **owner monitor**

Inventory Tab

Figure 5-2 shows the Inventory tab of the C6576M Chassis dialog box.

Figure 5-2 Inventory Tab of the C6576M Chassis Dialog Box



Chassis Inventory Area

The Chassis Inventory area of the C6576M Chassis dialog box provides the following information:

- Type—Displays the type of the chassis. One of the following values is displayed:
  - WS-C6006—6-slot Catalyst 6000 series switch
  - WS-C6009—9-slot Catalyst 6000 series switch
  - WS-C6506—6-slot Catalyst 6500 series switch
  - WS-C6509—9-slot Catalyst 6500 series switch
  - WS-C6509NEB— 9-slot vertical Catalyst 6500 series switch
  - WS-C6513—13-slot Catalyst 6500 series chassis
  - OSR-7603—3-slot Cisco 7600 series chassis
  - OSR-7606—6-slot Cisco 7600 series chassis
  - OSR-7609—9-slot Cisco 7600 series chassis
- Number of Slots—Displays the total number of slots in the chassis. The values are 6 or 9.
- Serial Number—Displays the serial number of the chassis.
- Backplane Type—Indicates the chassis backplane type. For a Catalyst 6500 series switch or Cisco 7600 series Internet Router chassis, this attribute has the value “giga16 – 16 Gigabit switch.”
- Used Slots—Displays a comma-separated list indicating the slots that are occupied.

Note If the Serial Number attribute changes, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

Power Supply Inventory Area

The Power Supply Inventory area of the C6576M Chassis dialog box provides the following information:

- Power Supply 1 Type—Indicates the type of the first power supply.
- Power Supply 2 Type—Indicates the type of the second power supply.

The possible types of power supplies are:

- wscac1000—1000W AC power supply
- wscac1300—1300W AC power supply
- wscac2500w—2500W AC power supply
- wscac4000w—4000W AC power supply
- wscdc1300—1300W DC power supply
- wscdc2500w—2500W DC power supply
- pwr950ac—950W AC power supply
- pwr950dc—950W DC power supply
- pwr1900ac—1900W AC power supply
- pwr1900dc—1900W DC power supply
- pwr1900ac6—1900 watt supply AC/6 slots

Module Inventory Area

The Module Inventory area of the C6576M Chassis dialog box provides a list of occupied slots, including the following information:

- Slot Number
- Serial Number
- Model number
- Number of ports
- Hardware version
- Firmware version
- Software version

Export Inventory Area

The Export Inventory area can be used to export the information on this tab to a CSV file on the CEMF server host.

- Export to file—Enter the name of the file to which inventory is to be exported on the CEMF server host. If the file already exists, it will be overwritten.
- **Export** Button—Exports the inventory list to a comma-separated file. The following data is exported from the Chassis object:
  - Type
  - Backplane Type
  - Number of Slots
  - Used Slots
  - Serial Number
  - Power Supply 1 Type
  - Power Supply 2 Type

  The following data is exported for each installed module in the chassis:
  - Slot Number
  - Model
  - Number of Ports
  - Hardware Version
  - Firmware Version
  - Software Version
  - Serial Number

  The inventory attributes are written in sections. Each section contains the attributes applicable to a particular class of object in the Cisco6500Manager containment hierarchy. Each section is preceded by the name of the object of that class in the Cisco6500Manager view hierarchy. If the object has not been deployed in the network model, a default name is used instead. The object name is delimited by the [and] characters.

The default section names are in this order:

- [chassis]
- [power supply 1]
- [power supply 2]
- [slot 1]
- [slot2]
- [slot3]
- [slot4]
- [slot 5]
- [slot 6]
- [slot 7]
- [slot 8]
- [slot 9]

The chassis and power supply sections are always printed. Each slot section is only printed if there is an installed module in that slot. The slot sections are always printed in order.

After each section name, the next line contains a comma-delimited list of attributes for that object class. The line of attributes is terminated by the end-of-line character. Each field is printed regardless of whether it is empty or not. If an attribute in the list has no value, a (nil) tab is written in its place.

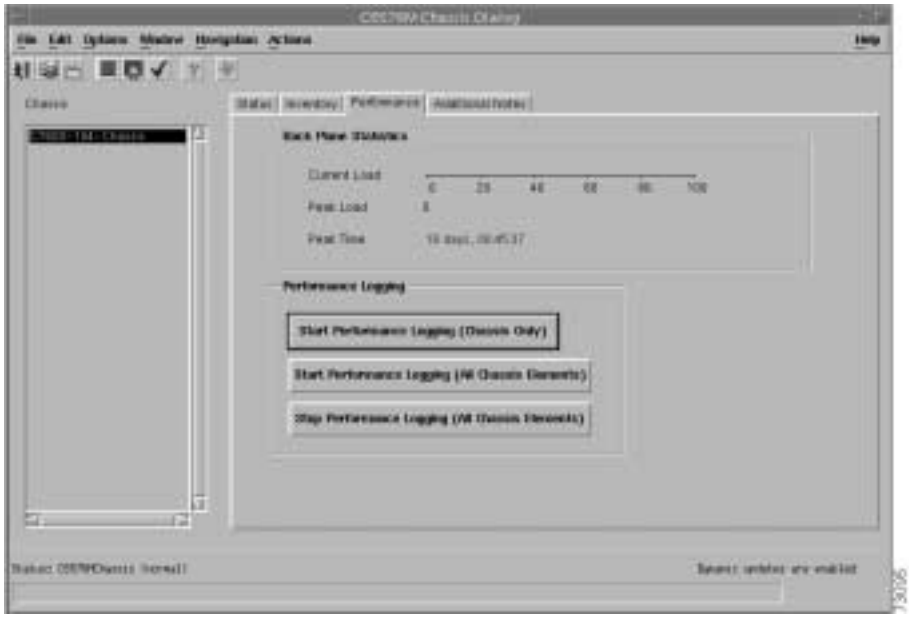
The following is an example of the output:

```
[192.168.12.101-Chassis]
WS-C6506,8,9,TBA04430433,1, 2, 3, 4, 5, 6

[power supply 1]
2

[PowerSupply-2]
30

[Supervisor-1]
1,WS-X6K-SUP1A-2GE,2,7.0,,6.1(0.105)ORL 2000-06-15 06:07:10,SAD04510T8K

[Ethernet-2]
2,WS-X6316-GE-TX,16,1.1,5.4(2) 2000-03-17 10:18:33,6.1(0.105)ORL 2000-06-15
06:44:56,SAD04440H0C

[Ethernet-3]
3,WS-X6416-GBIC,16,1.2,5.4(2) 2000-03-17 10:18:33,6.1(0.105)ORL 2000-06-15
06:44:56,SAD04470EEK

[Ethernet-4]
4,WS-X6324-100FX-SM,24,1.1,5.4(2) 2000-03-17 10:18:33,6.1(0.105)ORL 2000-06-15
06:43:57,SAD04320F4X

[Ethernet-5]
5,WS-X6348-RJ-45,48,1.4,5.4(2) 2000-03-17 10:18:33,6.1(0.105)ORL 2000-06-15
06:43:57,SAD04310F9P

[Ethernet-6]
6,WS-X6248A-TEL,48,1.0,5.4(2) 2000-03-17 10:23:19,6.1(0.105)ORL 2000-06-15
06:43:36,SAD043608EH
```

Performance Tab

Figure 5-3 shows the Performance tab of the C6576M Chassis dialog box.

Figure 5-3 Performance Tab of the C6576M Chassis Dialog Box



Back Plane Statistics Area

The Back Plane Statistics area of the C6576M Chassis dialog box provides the following information:

- Current Load—Displays the current traffic load on the backplane.
- Peak Load—Displays the peak traffic load encountered.
- Peak Time—Displays the time when the peak traffic load was encountered.

The Current Load and Peak Load attributes are polled at the specified interval when the Chassis object is in the Performance state.

Performance Logging Area

The Performance Logging area of the C6576M Chassis dialog box allows users to turn on performance logging for the chassis attributes as well as the attributes of all the chassis elements.

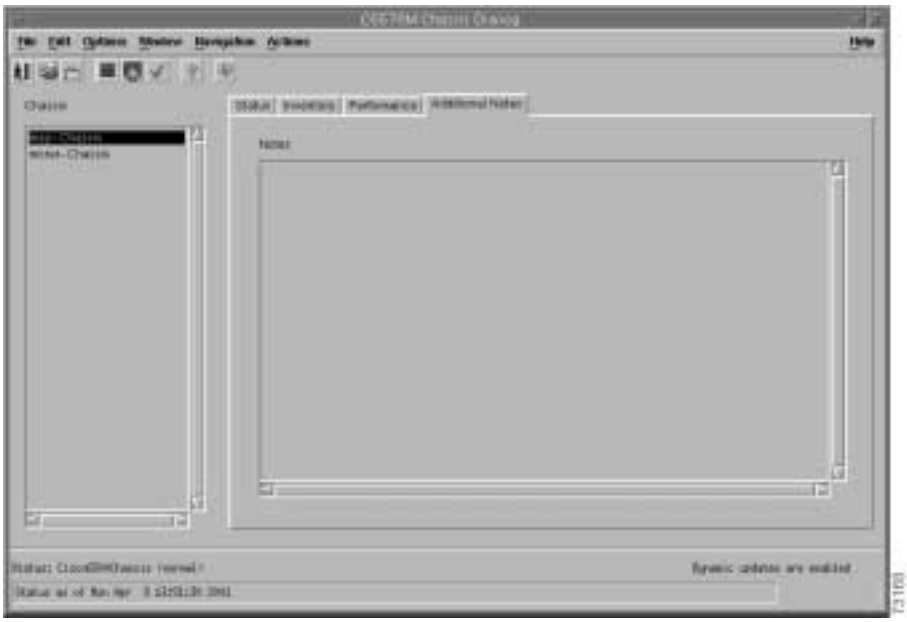
- **Start Performance Logging (Chassis Only) button**—Turns performance data logging on the chassis object.
- **Start Performance Logging (All Chassis Elements) button**—Turns performance data logging on all the chassis elements. This includes all chassis performance attributes, all supervisor performance attributes and all interface performance attributes.
- Stop **Performance** Logging (All Chassis Elements) button—Turns performance data logging off for all the chassis elements.

Note The logged data is available to the user through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Additional Notes Tab

Figure 5-4 shows the Additional Notes tab of the C6576M Chassis dialog box.

Figure 5-4 Additional Notes Tab of the C6576M Chassis Dialog Box



Notes Area

The Notes area of the C6576M Chassis dialog box is a text box that allows you to type in additional notes for this chassis object. This can be used for providing notes, such as contact information, specifics of the chassis and/or network configurations, warnings, etc.

C6576M Power Supply Dialog Box

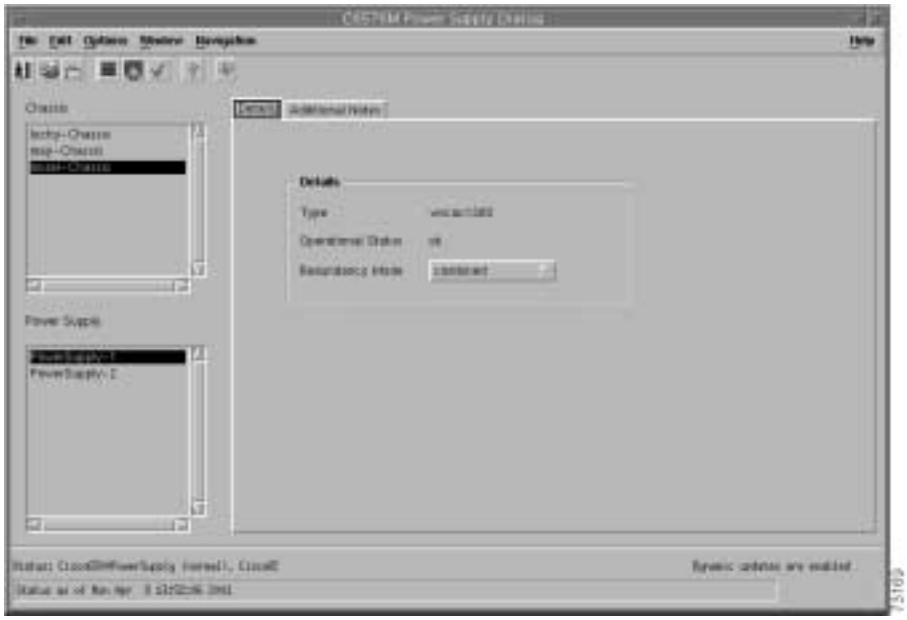
This dialog box provides access to attributes relating to the power supplies. This dialog box can be launched from a Chassis object or Power Supply objects within the Physical containment view.

You can select multiple Chassis and Power Supply objects at a time from the object list on the left side of the dialog box.

Details Tab

Figure 5-5 shows the Details tab of the C6576M Power Supply dialog box.

Figure 5-5 Details Tab of the C6576M Power Supply Dialog Box



Details Area

The Details area of the C6576M Power Supply dialog box provides the following information:

- Type—Displays the type of power supply. This field has one of the following values:
  - wscac1000—1000W AC power supply
  - wscac1300—1300W AC power supply
  - wscac2500w—2500W AC power supply
  - wscac4000w—4000W AC power supply
  - wscdc1300—1300W DC power supply
  - wscdc2500w—2500W DC power supply
  - pwr950ac—950W AC power supply
  - pwr950dc—950W DC power supply
  - pwr1900ac—1900W AC power supply
  - pwr1900dc—1900W DC power supply
  - pwr1900ac6—1900 watt supply AC/6 slots

Note The WS-C6509-NEB chassis does not support the Type attribute. This attribute is displayed as 'unknown' in the Power Supply Dialog.

- Operational Status—Displays the operational status of the power supply. This field has the following values:
  - ok—The power supply status is normal.
  - other—The power supply operational status is unknown.
  - minorFault—There is a minor problem.
  - majorFault—There is a major problem.

Note If this field has a value other than ok, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

- Redundancy Mode—Displays the mode in which the power supply is operating. This is a drop-down list with the following values:
  - redundant—Power supply 1 is used as the primary supply. If power supply 1 fails, power supply 2 becomes the primary power supply.
  - combined—Both power supplies are used to supply power to the modules.

Status Field

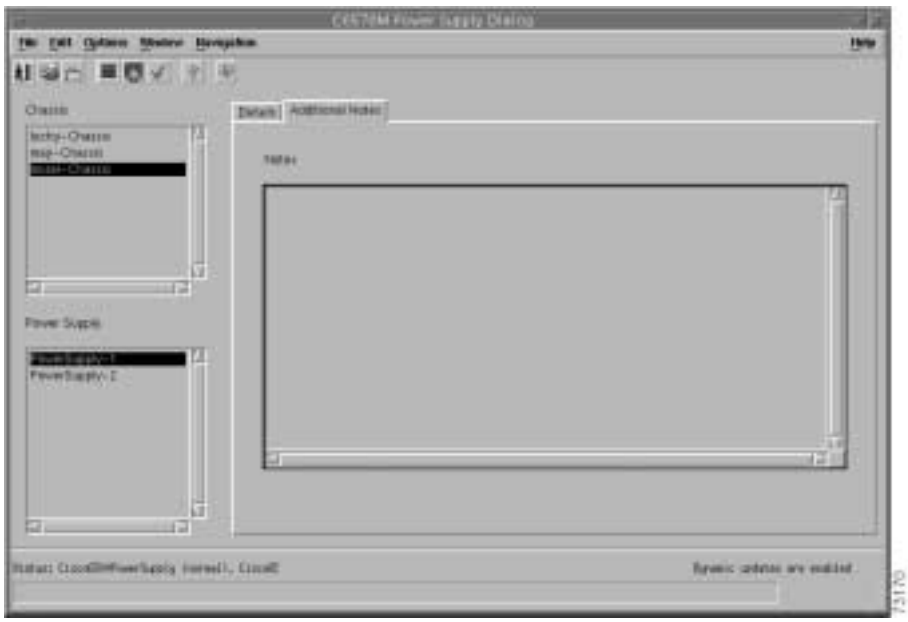
The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the power supply attributes.
- normal—Data is being gathered periodically.
- normallostcomms—CEMF lost communication with the power supply from the normal state.

Additional Notes Tab

Figure 5-6 shows the Additional Notes tab of the C6576M Power Supply dialog box.

Figure 5-6 Additional Notes Tab of the C6576M Power Supply Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the power supply configuration. For example, the note might include the reason why the power supply is in redundant mode.

C6576M Supervisor Module Dialog Box

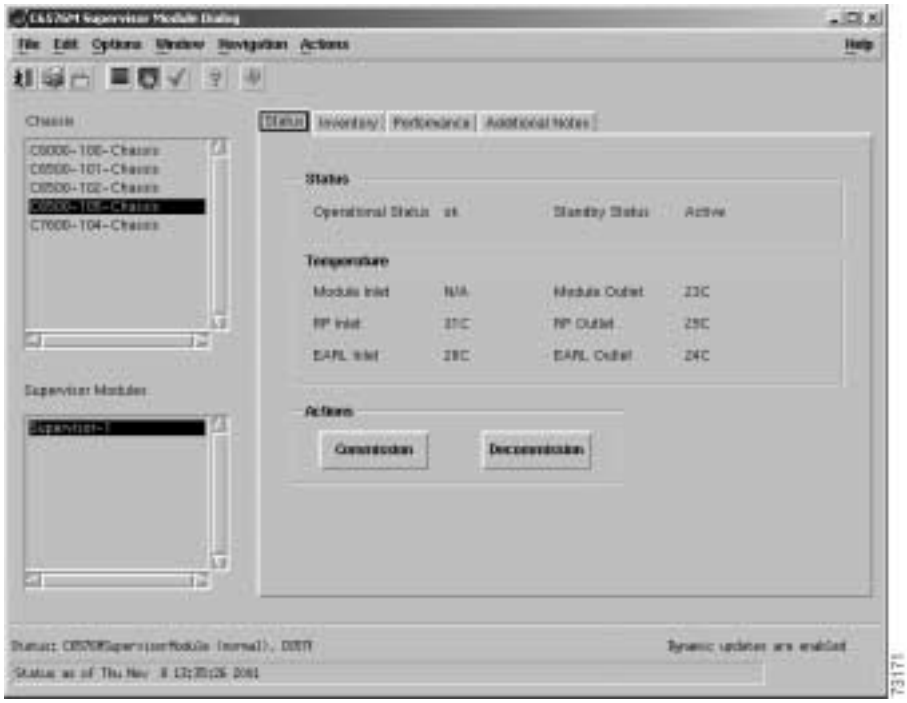
This dialog box provides access to attributes of the supervisor engine modules. This dialog box can be launched from a Chassis object or Supervisor Module object within the Physical view.

You can select one chassis and more than one supervisor engine module at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-7 shows the Status tab of the C6576M Supervisor Module dialog box.

Figure 5-7 Status Tab of the C6576M Supervisor Module Dialog Box



Status Area

The Status area of the C6576M Supervisor Module dialog box provides the following information:

- Operational Status—Displays the operational status of the supervisor engine module. The operation status can have one of the following values:
  - other—The status is unknown.
  - ok—The status is normal.
  - minorFault—There is a minor fault.
  - majorFault—There is a major fault.

Note If this attribute has a value other than ok, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

- Standby Status—Displays the status of the redundant Supervisor module if available. This attribute can have one of the following values:
  - other—Indicates a mode other than standby or active.
  - unknown—Indicates that mode cannot be detected.
  - standby—Indicates that the supervisor engine module status is in standby mode.
  - active—Indicates the supervisor engine module is being used to switch or route packets.

Temperature Area

The Temperature area of the C6576M Supervisor Module dialog box provides the temperature for the following sensors:

- Module Inlet—Inlet temperature of the module in degrees Celsius.
- Module Outlet—Outlet temperature of the module in degrees Celsius.
- RP Inlet—Inlet temperature of the MSFC daughter card in degrees Celsius.
- RP Outlet—Outlet temperature of the MSFC daughter card in degrees Celsius.
- EARL Inlet—Inlet temperature of the Policy Feature Card (PFC) daughter card in degrees Celsius.
- EARL Outlet—Outlet temperature of the PFC daughter card in degrees Celsius.

Each of these sensor attributes can have the following values:

- <n>C—Temperature in degrees Celsius.
- N/O—Indicates that the sensor is not operational.
- N/A—Indicates that the sensor value is not available.

Actions Area

The Actions area of the C6576M Supervisor Module dialog box provides the following information:

- **Commission**—This button is used to commission the object manually. This can only be done if the object is in a decommissioned state. By clicking this button, the two interface subobjects are also commissioned.
- Decommission—This button is used to decommission the object manually. In the decommissioned state, the properties of the object are not monitored. As a result, data displayed in the configuration window is not guaranteed to be current. Decommissioning the Supervisor Module will also decommission its Ethernet Interface objects.

  The decommission action is useful to allow a supervisor engine module to be removed and replaced without generating alarms.

Status Field

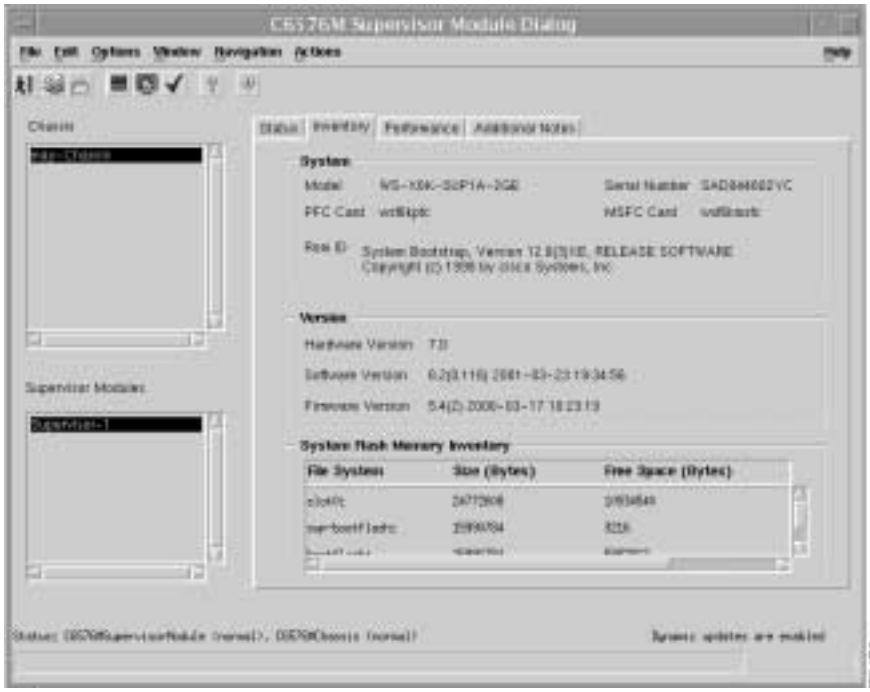
The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF lost communication with the device from the normal state.
- perflostcomms—CEMF lost communication with the device from the performance state.
- mismatched—The type of supervisor engine module discovered does not match the predeployed supervisor engine module.

Inventory Tab

Figure 5-8 shows the Inventory tab of the C6576M Supervisor Module dialog box.

Figure 5-8 Inventory Tab of the C6576M Supervisor Module Dialog Box



System Area

The System area of the C6576M Supervisor Module dialog box provides the following information:

- Model—Displays the model description of supervisor engine module installed.
- Serial Number—Displays the serial number for the supervisor engine module.
- PFC Card—Displays the type of PFC daughter card installed on the Supervisor module.
  - empty—No card installed
  - wsf6kpfc—PFC installed
  - wsf6kpfc2—PFC2 installed
  - other—Card is not one of the above.
- MSFC Card—Displays the type of MSFC daughter card installed on the Supervisor module. Not supported in Hybrid OS.
  - empty—No card installed
  - wsf6kmsfc—MSFC installed
  - wsf6kmsfc2—MSFC installed
  - other—Card is not one of the above
- ROM ID—Displays the bootflash version information.

Version Area

The Version area of the C6576M Supervisor Module dialog box provides the following information:

- Hardware—Displays the hardware version of the supervisor engine module.
- Software—Displays the software version of the supervisor engine module.
- Firmware—Displays the firmware version of the supervisor engine module.

System Flash Memory Inventory Area

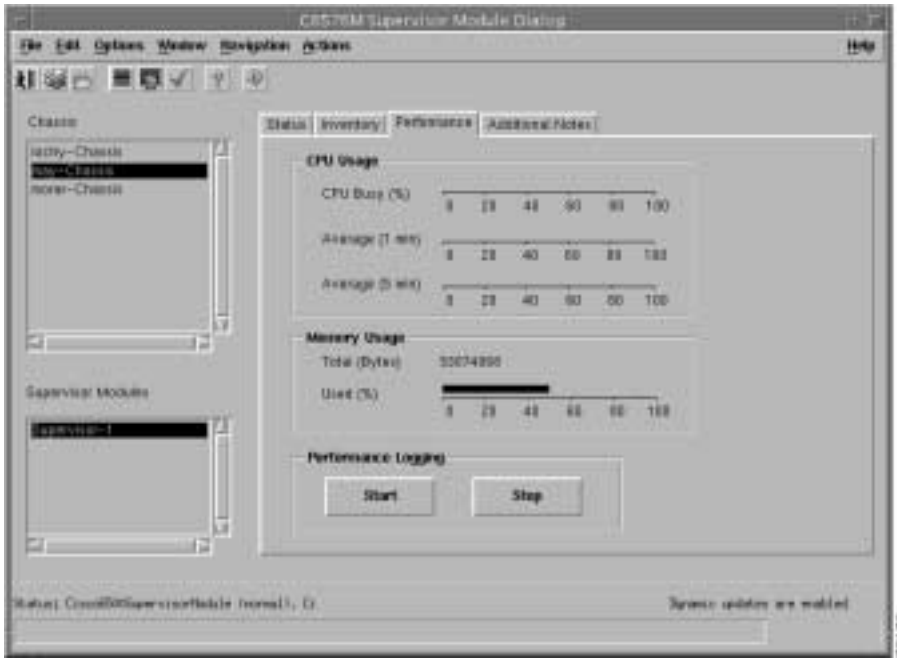
The System Flash Memory Inventory area lists the Flash memory information for the entire switch (including redundant supervisor engines, if available).

- File System—Name used to refer to a partition by the system.
- Size (Bytes)—Total size of Flash memory.
- Free Space (Bytes)—Amount of free space available in the device.
- File Count—Number of files on the device.

Performance Tab

Figure 5-9 shows the Performance tab of the C6576M Supervisor Module dialog box.

Figure 5-9 Performance Tab of the C6576M Supervisor Module Dialog Box



CPU Usage Area

The CPU Usage area of the C6576M Supervisor Module dialog box provides the following information:

- CPU Busy (%)—Displays the current CPU load.
- Average (1 min.)—Displays the 1-minute load average.
- Average (5 min.)—Displays the 5-minute load average.

Memory Usage Area

The Memory Usage area of the C6576M Supervisor Module dialog box provides the following information:

- Total (Bytes)—Displays the total amount of processor memory.
- Used (%)—Displays the current amount of processor memory used.

Performance Logging Area

The Performance Logging area of the C6576M Supervisor Module dialog box allows users to turn on performance logging for the supervisor module attributes as well as the attributes of the two Gigabit Ethernet interfaces.

- **Start**—Turns performance data logging on the Supervisor object and its interfaces.
- Stop—Turns performance data logging off for the Supervisor object and its interfaces.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

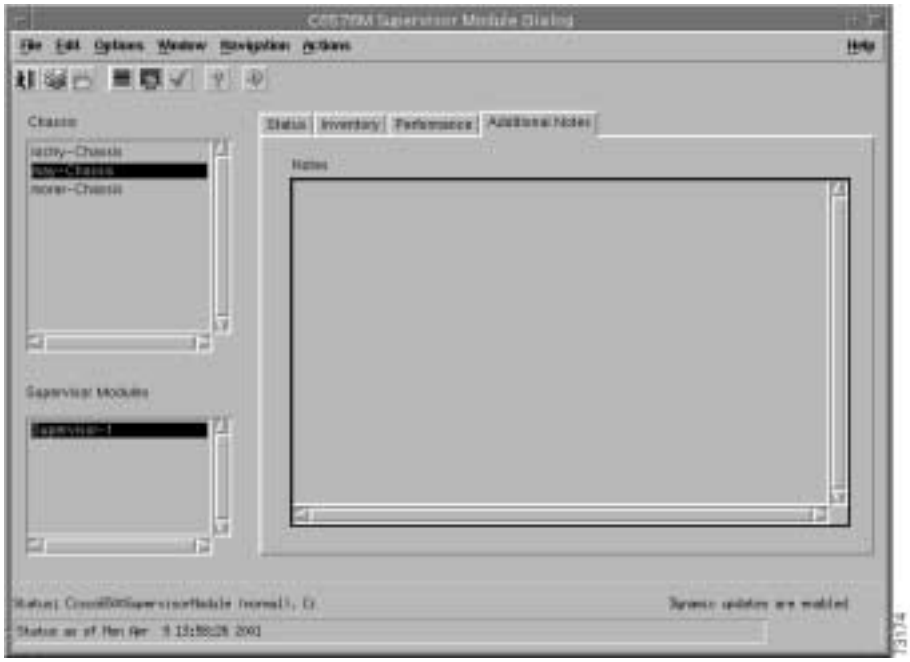
The following Supervisor attributes are polled in the Performance state:

- CPU Usage Average (5 sec)
- CPU Usage Average (1 min)
- CPU Usage Average (5 min)
- Memory Used (%)
- Total amount of memory available (bytes)
- Total amount of memory used (bytes)

Additional Notes Tab

Figure 5-10 shows the Additional Notes tab of the C6576M Supervisor Module dialog box.

Figure 5-10 Additional Notes Tab of the C6576M Supervisor Module Dialog Box



Notes Area

The Notes area is text box that allows you to type in additional notes for the supervisor engine module.

C6576M Ethernet Module Dialog Box

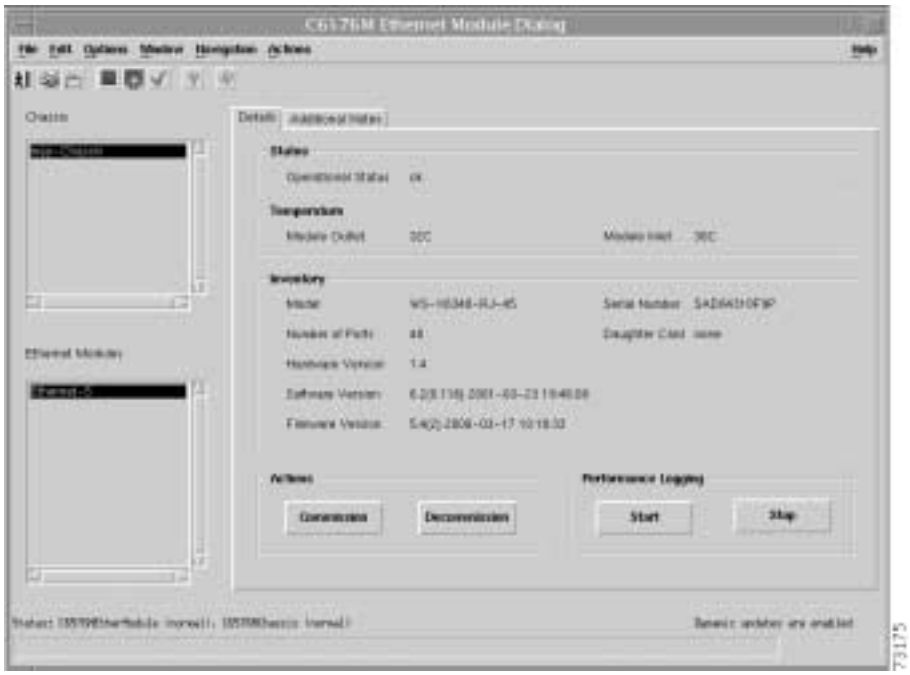
This dialog box provides information on Ethernet modules, including standard Ethernet, Fast Ethernet, and Gigabit Ethernet modules. This dialog box can be launched from a Chassis object or Ethernet Module object within the Physical view.

You can select one chassis and more than one Ethernet module from the object list on the left side of the dialog box.

Details Tab

Figure 5-11 shows the Details tab of the C6576M Ethernet Module dialog box.

Figure 5-11 Details Tab of the C6576M Ethernet Module Dialog Box



Status Area

The Status area of the C6576M Ethernet Module dialog box provides the following information:

- Operational Status—Displays the operational status of the Ethernet module. This attribute can have one of the following values:
  - other—The status is unknown.
  - ok—The status is normal.
  - minorFault—There is a minor problem.
  - majorFault—There is a major problem.

Note If this attribute has a value other than ok, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

Temperature Area

The Temperature area of the C6576M Supervisor Module dialog box provides information for the following sensors:

- Module Inlet—Inlet temperature of the module in degrees Celsius.
- Module Outlet—Outlet temperature of the module in degrees Celsius.

Each sensor can have the following values:

- <n>C—Temperature in degrees Celsius.
- N/O—Indicates that the sensor is not operational.
- N/A—Indicates that the sensor value is not available.

Inventory Area

The Inventory area of the C6576M Ethernet Module dialog box provides the following information:

- Model—Type of Ethernet module. This attribute can have one of the following values:
  - WS-X6524-100FX-MM
  - WS-X6548-RJ-21
  - WS-X6548-RJ-45
  - WS-X6408-GBIC
  - WS-X6408A-GBIC
  - WS-X6416-GBIC
  - WS-X6416-GE-MT
  - WS-X6516-GBIC
  - WS-X6816-GBIC
  - WS-X6316-GE-TX
  - WS-X6501-10GEX4
  - WS-X6224-100FX-MT

  - WS-X6324-100FX-SM
  - WS-X6324-100FX-MM
  - WS-X6248-RJ-45
  - WS-X6248-TEL
  - WS-X6248-A-TEL
  - WS-X6348-RJ-45
  - WS-X6348-RJ-21
  - WS-X6516-GE-TX
  - WS-X6502-10GE
- Serial Number—The serial number of the module.
- Number of Ports—The total number of ports on the module.
- Daughter Card—The type of daughter card installed on the module. The possible values of this attribute are:
  - none—No card installed.
  - WS-F6KDFC—Distributed Forwarding Card for WS-X6516-GBIC module.
  - WS-F6KVPWR—Inline Power Card.
  - unknown—Card installed is not one of the above.
- Hardware Version—The hardware version on the module.
- Software Version—The software version on the module.
- Firmware Version—The firmware version on the module.

Performance Logging Area

The Performance Logging area of the C6576M Ethernet Module dialog box allows users to turn on performance data logging for all interfaces on the module:

- **Start**—Turn performance data logging on for all interfaces.
- **Stop**—Turn performance data logging off for all interfaces.

See the "C6576M Ethernet Interface Dialog Box" section on page 5-27 for a list of the interface attributes that are polled for performance data.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Actions Area

The Actions area of the C6576M Ethernet Module dialog box provides the following information:

- **Commission**—This button is used to commission the object manually. This can only be done if the object is in a decommissioned state. Clicking this button commissions all interfaces.
- **Decommission**—This button is used to decommission the object manually. In the decommissioned state, the properties of the object are not monitored. As a result, data displayed in the configuration window is not guaranteed to be current. Clicking this button decommissions all interfaces.

The decommission action is useful to allow a Ethernet module to be removed and replaced without generating alarms.

Status Field

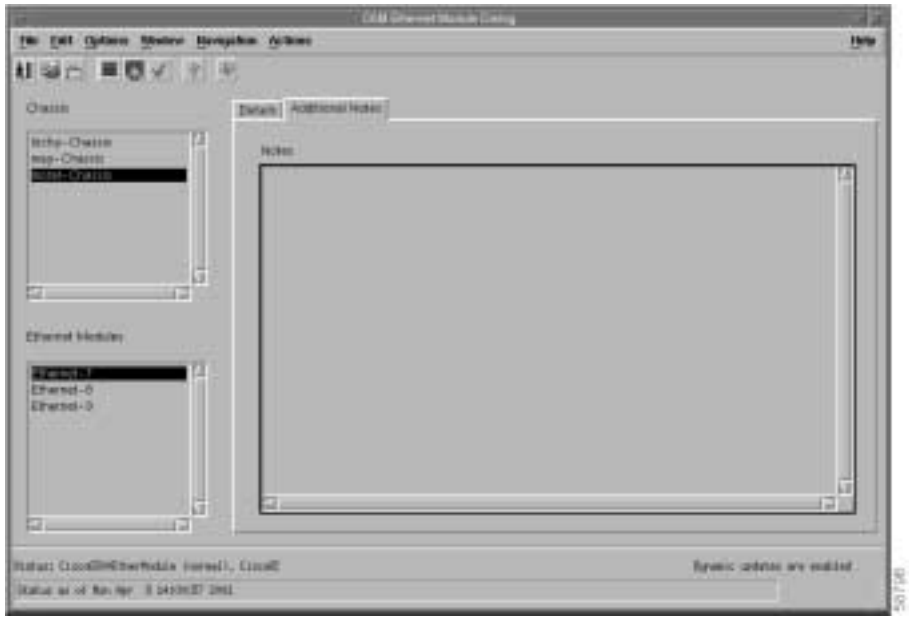
The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF lost communication with the device from the normal state.
- perflostcomms—CEMF lost communication with the device from the performance state.
- mismatched—The type of Ethernet module discovered does not match the predeployed Ethernet module.

Additional Notes Tab

Figure 5-12 shows the Additional Notes tab of the C6576M Ethernet Module dialog box.

Figure 5-12 Additional Notes Tab of the C6576M Ethernet Module Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the Ethernet module.

C6576M Ethernet Interface Dialog Box

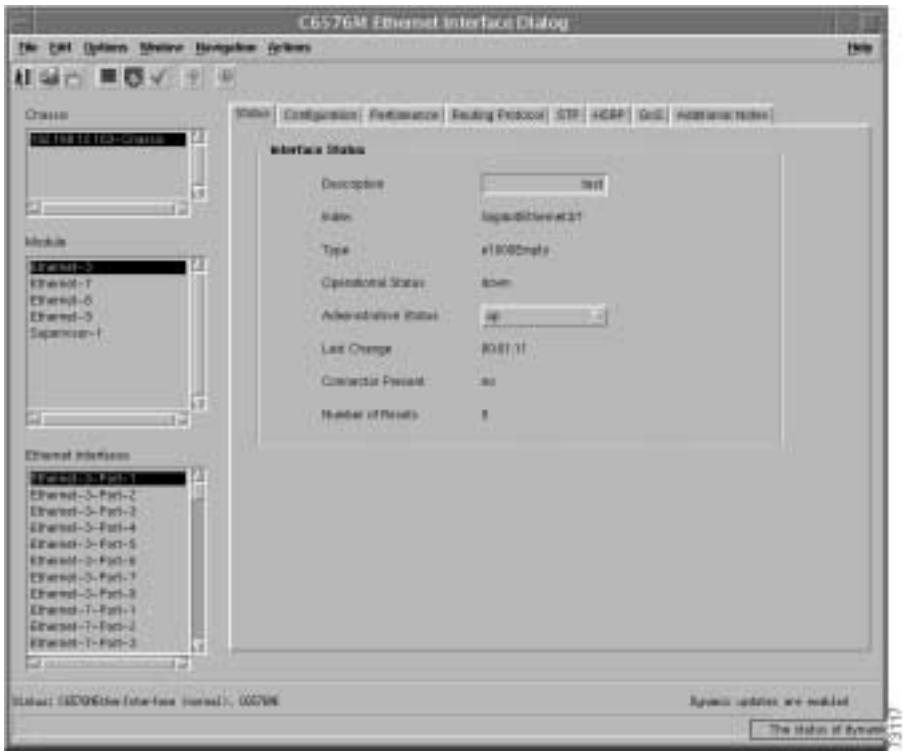
This dialog box provides information for all Ethernet interface attributes, including Ethernet, Fast Ethernet, and Gigabit Ethernet interfaces. This dialog box can be launched from a Chassis object, Supervisor module object, Ethernet module object, or Ethernet Interface object within the Physical view.

You can select one chassis, more than one Ethernet module, and more than one interface at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-13 shows the Status tab of the C6576M Ethernet Interface dialog box.

Figure 5-13 Status Tab of the C6576M Ethernet Interface Dialog Box



Interface Status Area

The Interface Status area of the C6576M Ethernet Interface dialog box provides the following information:

- Description—Descriptive name of the interface.

Note The maximum number of characters allowed for Hybrid OS is 25.

- Index—String index of the interface. This is a read-only attribute.
- Type—Displays the type of physical layer medium dependent interface on the port. This attribute is read-only. These are possible types:
  - e10BaseT
  - e10BaseF
  - e100BaseTX
  - e100BaseT4
  - e100BaseF
  - e100BaseFsm
  - e10a100BaseTX
  - mii
  - e1000BaseLX
  - e1000BaseSX
  - e1000BaseCX
  - e1000Empty
  - e1000BaseLH
  - e1000BaseT
  - e1000UnsupportedGbic
  - e1000BaseZX
- Operational Status—Displays the operational status of the interface. This attribute is read-only and has one of the following values:
  - up—Interface is ready to transmit and receive packets.
  - down—No packets are being passed. The interface is in this state if there is a fault preventing it from going to the up state.
  - testing—No operational packages can be passed.
  - unknown
  - dormant—Interface is up but waiting for external actions.
  - notPresent—The interface is in this state if the interface has missing components (typically hardware).
  - lowerLayerDown—The interface in the lower layer is down.
- Administrative Status—Displays the administrative status of the interface. These are the values:
  - up—The interface is up and operational.

  - down—The interface is in a down administrative status; this value causes the operational status to be set to down as well.
  - testing (read-only)—In this state, no operational packets can be transmitted or received. This value is read-only.
- Last Change—The timestamp indicating when the configuration for this interface was last changed. This is a read-only attribute.
- Connector Present—Displays if a cable is attached to the interface. These are the values:
  - yes
  - no
  - unknown—This value is used when the Administrative Status is not set to “up”. In this case, it cannot be determined if a connection is present or not.
- Number of Resets—The number of times this interface has been reset. This attribute is read-only.

Status Field

The display-only Status field located at the bottom of the window indicates that current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.

Configuration Tab

Figure 5-14 shows the Configuration tab of the C6576M Ethernet Interface dialog box.

Figure 5-14 Configuration Tab of the C6576M Ethernet Interface Dialog Box

General Area

The General area of the C6576M Ethernet Interface dialog box provides the following information:

- Speed—The desired speed of this port in bits per second. This attribute is only editable if it is a Fast Ethernet interface. In this case, you can choose one of the following values:
  - autoDetect
  - 10 Mb/s
  - 100 Mb/s
  - 1000 Mb/s
  - s10G

  If set to autoDetect, the Duplex attribute is set to auto, which forces the interface to determine the speed and duplex mode for the interface automatically.

Note If an unsupported speed is selected, an error is reported.

- Duplex—Displays the duplex mode for the port. This attribute is only editable if it is a Fast Ethernet interface. In this case, you can choose one of the following modes:
  - half
  - full
  - disagree (read-only)
  - auto

  If the Speed attribute is set to autoDetect, the Duplex will be set to auto.
- Link Up/Down Trap—Indicates if link up or link down traps are being generated. This list contains the following values:
  - enabled
  - disabled
- Input Queue Length—Displays the input queue length in packets.
- Output Queue Length—Displays the output queue length in packets.
- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP); you cannot adjust the actual delay of an interface with this command.

- Bandwidth—Overwrites default bandwidth in kilobits per second.

Layer 2 Area

The Layer 2 area of the C6576M Ethernet Interface dialog box provides the following information:

- MAC Address—Displays the MAC address of the interface. This attribute is read-only.
- MTU—Displays the maximum transmission unit (MTU) size in bytes. The size of the largest packet which can be sent/received on the interface, specified in octets. For interfaces that are used for transmitting network datagrams, this is the size of the largest network datagram that can be sent on the interface.

Note IOS 12.1(8a)E5 caveat: Jumbo frame support is incompatible with the IS-IS routing protocol. Leave the MTU size at the default value on any interface where IS-IS provides routing.

Note For Native IOS, any value for the MTU will be accepted although it is recommeneded that only 1500 or 9600 bytes is configured. For Hybrid OS, if jumbo frames are enabled, the MTU will be reported as 9216 bytes. If jumbo frames are not enabled, the MTU will be reported as 1500 bytes. Any input value greater than or equal to 9216 bytes will be taken as 9216 bytes, and the jumbo frames will be enabled. Any input value less than 9216 bytes will be taken as 1500 bytes, and the jumbo frames will be disabled.

- Default VLAN—Displays the VLAN to which this interface belongs if it stops trunking. This is a read-only attribute.

- Trunking Mode—Indicates the administrative status set on the trunk port, while the operational status is the one that indicates whether the port is actually trunking or not. This mode is one of the following values:
  - off—The port is permanently set to be a non-trunk.
  - onNoNegotiate—The port is permanently set to be a trunk and no negotiation takes place with the far end to try to ensure consistent operation.
  - on—The port initiates a request to become a trunk and will become a trunk regardless of the response from the far end.
  - desirable—The port initiates a request to become a trunk and will become a trunk if the far end agrees.
  - auto—The port does not initiate a request to become a trunk but will do so if it receives a request to become a trunk from the far end.

Layer 3 Area

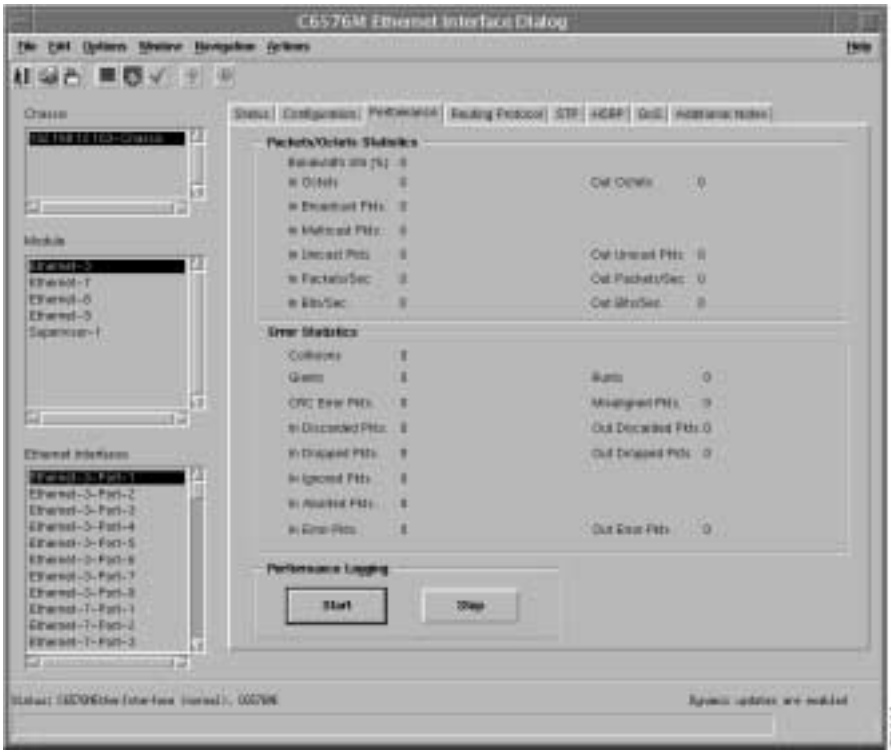
The Layer 3 area of the C6576M Ethernet Interface dialog box provides the following information:

- IP Address—Displays the IP address of the layer 3 interface.
- Netmask—Subnet mask of the interface IP address. Enabled bits indicate the network addressing bits in the IP address.
- Clear IP Address button— After receiving confirmation, will unset the IP address for this interface.

Performance Tab

Figure 5-15 shows the Performance tab of the C6576M Ethernet Interface dialog box.

Figure 5-15 Performance Tab on the C6576M Ethernet Interface Dialog Box



Packets/Octets Statistics Area

The Packets/Octets Statistics area C6576M Ethernet Interface dialog box provides the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization of the interface.

Note This value will be disabled if the Chassis object is not in the normal or performance state.

- In Octets—Total number of received octets including framing characters.
- In Broadcast Pkts.—The total number of good packets received that were directed to the broadcast address. Note that this does not include multicast packets.
- In Multicast Pkts.—The total number of good packets received that were directed to a multicast address. Note that this number does not include packets directed to the broadcast address.
- In Unicast Packets—The number of packets, delivered by this sublayer to a higher (sub)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.

- Out Octets—Total number of transmitted octets including framing characters.
- Out Unicast Pkts—The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Error Statistics Area

The Error Statistics area C6576M Ethernet Interface dialog box provides the following information:

- Collisions—Number of collisions on this segment.
- Giants—Total number of packets received that were longer than 1518 octets (excluding framing bits, but including FCS octets) and were otherwise well formed.
- CRC Error Pkts.—Packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, but had either a bad Frame Check Sequence (FCS) with an integral number of octets (FCS Error) or a bad FCS with a nonintegral number of octets (Alignment Error).
- In Discarded Pkts.—Number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher layer protocol. One reason to discard such a packet is to free up buffer space.
- In Dropped Pkts.—Number of events in which packets were dropped by the probe due to lack of resources. This number is not necessarily the number of packets dropped, but is the number of times this condition has been detected.
- In Ignored Pkts.—Number of packets ignored.
- In Aborted Pkts.—Number of packets aborted.
- In Error Pkts.—Number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
- Runts—Total number of packets received that were less than 64 octets long (excluding framing bits, but including FCS octets) and were otherwise well formed.
- Misaligned Pkts.—Alignment errors.
- Out Discarded Pkts.—Number of outbound packets that were chosen to be discarded.
- Out Dropped Pkts.—Number of events in which outbound packets were dropped.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

Performance Logging Area

The Performance Logging area of the C6576M Ethernet Interface dialog box allows users to turn on performance data logging for a single interface.

- **Start**—Turns performance data logging on for this specific interface's attributes.
- **Stop**—Turns performance data logging off for this specific interface's attributes.

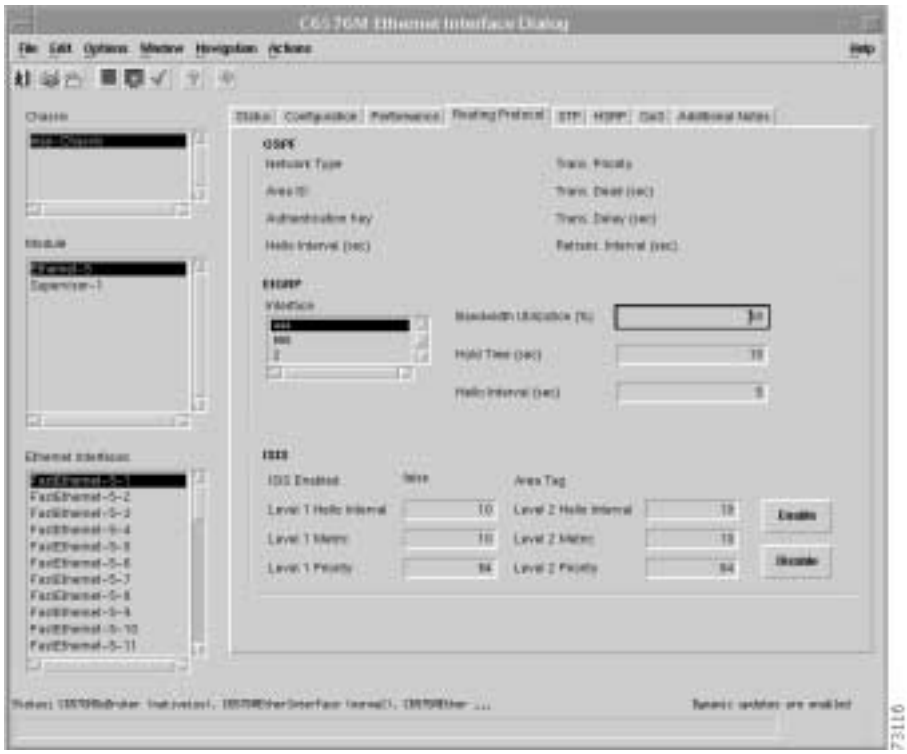
All attributes in the Performance tab are logged when the object is placed into the Performance state.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Routing Protocol Tab

Figure 5-16 shows the Routing Protocol tab of the C6576M Ethernet Interface dialog box.

Figure 5-16 Routing Protocol Tab on the C6576M Ethernet Interface Dialog Box



OSPF Area

The OSPF area of the C6576M Ethernet Interface dialog box provides the following information:

- Network Type—The OSPF interface type. For Ethernet interfaces, the type is always broadcast. This is a read-only attribute.
- Area ID—The predefined ID uniquely identifying the area to which the interface connects. It can be specified as either a decimal value or as an IP address. This is a read-only attribute.
- Authentication Key—The OSPF authentication key. This is a read-only attribute.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets. This is a read-only attribute.
- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. If more than one router has the same value for this field, the routers use their router ID as a tie breaker. This is a read-only attribute.
- Trans. Dead (sec)—The number of seconds that a router's hello packets have not been seen before its neighbors declare the router down. This value should be a multiple of the hello interval. This value must be the same for all routers attached to a common network. This is a read-only attribute.
- Trans. Delay (sec)—The estimated number of seconds it takes to transmit a link state update packet over this interface. This is a read-only attribute.

EIGRP Area

The EIGRP Area of the C6576M Ethernet Interface dialog box provides the following information:

- EIGRP Interface Table—A list of the EIGRP processes. The following attributes can be configured for an EIGRP process:
  - Bandwidth Utilization (%) —The percentage of the interface bandwidth that the EIGRP protocol can use.
  - Hold Time (sec)—Hold time during which the device will wait for a hello packet to be received on the specified interface and EIGRP autonomous system number. The hold time should be at least three times the hello interval.
  - Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.

ISIS Area

The ISIS area of the C6576M Ethernet Interface dialog box provides the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface:
  - true—IS-IS routing is enabled.
  - false—IS-IS routing is disabled.
- Area Tag—The IS-IS routing area in which the interface participates. If mutliarea IS-IS is configured on the device, the IS-IS area must be named; otherwise, this value may be an implicit null tag.
- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 2 Metric—Cost of the interface for IS-IS level 2 (inter-area) route calculation.
- Level 1 Priority—The priority is used to determine which router on a LAN will be the designated router or Designated Intermediate System (DIS).
- Level 2 Priority—The priority is used to determine which router on a LAN will be the designated router or Designated Intermediate System (DIS).
- Enable button—Enables IS-IS routing on the interface.

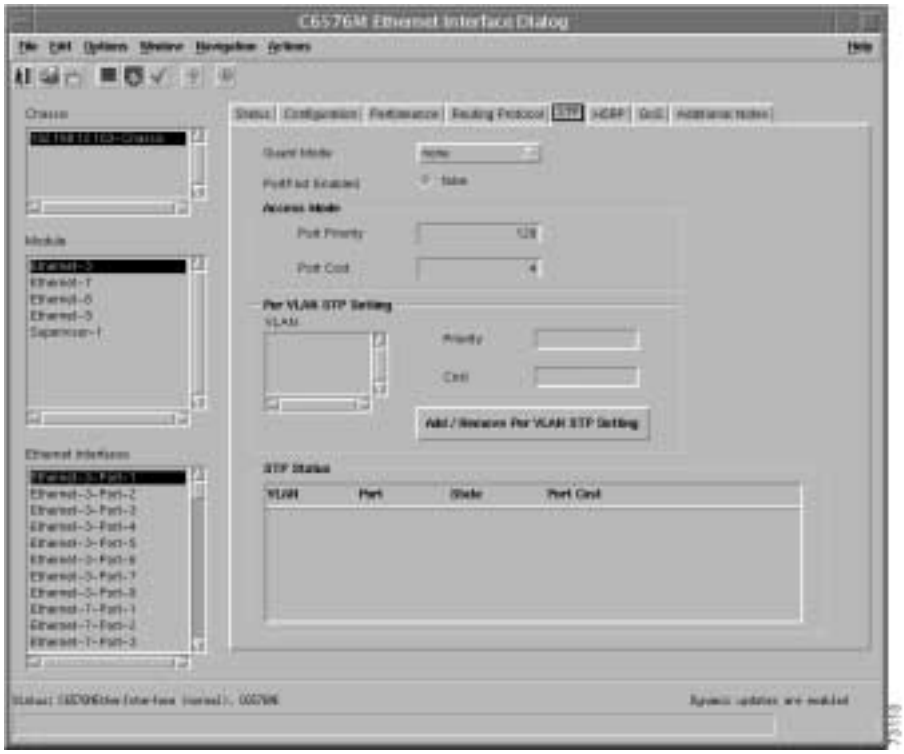
Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

- Disable button—Disables IS-IS routing on the interface.

STP Tab

Figure 5-17 shows the STP tab of the C6576M Ethernet Interface dialog box.

Figure 5-17 STP Tab on the C6576M Ethernet Interface Dialog Box



The area at the top of the STP tab provides the following information:

- Guard Mode—Indicates whether or not STP guard mode is enabled on an interface. These are possible values:
  - root
  - none
  - loop (Hybrid OS only)
- PortFast Enabled—Indicates whether or not an interface is enabled to move directly to the forwarding state on link up. This is a read-only attribute. Portfast can be configured on a trunking interface, but it only has an effect when the interface is in access mode. These are possible values:
  - true
  - false

Access Mode Area

The Access Mode area of the C6576M Ethernet Interface dialog box provides the following information:

- Port Priority—Describes the STP port priority of this interface. This is a metric used to represent the location of an interface in a network topology. It is used to determine which port will be placed in a blocking state when two or more ports are part of a loop. The default value is 128 in all versions of IOS, 32 in all versions of CatOS. The valid values are:
  - Native IOS 12.1(6)E and earlier:Integer (0..248) [increments of 8]
  - Native IOS 12.1(8a)E and later:Integer (0..252) [increments of 4]
  - CatOS 6.3:Integer(0..63)
  - CatOS 7.1:Integer(1..63)
- Port Cost—Describes the STP port cost for this interface. The port cost is a metric used to represent the speed of the interface. STP will use this value in determining the preferred path when a loop is detected in the network.

Per VLAN STP Setting Area

The Per VLAN STP Setting area in the STP tab of the C6576M Ethernet Interface dialog box provides the following information:

- STP VLAN Table—Describes the STP per-VLAN configurations of a trunking interface. There is one entry for each explicit per-VLAN spanning-tree configuration on the interface.

Note The VLAN STP instance does not have to be currently carried on the trunk in order to configure the per-VLAN STP settings. The settings will take effect when the interface actually begins trunking the VLAN traffic.

- Priority—Describes the STP VLAN port priority of this interface. The VLAN port priority is used on trunking interfaces. On any switchport that is not in trunking mode, the STP port priority is used instead. The default value is 128 in all versions of IOS, 32 in all versions of CatOS. The valid values are:
  - Native IOS 12.1(6)E and earlier:Integer (0..248) [increments of 8]
  - Native IOS 12.1(8a)E and later:Integer (0..252) [increments of 4]
  - CatOS 6.3:Integer(0..63)
  - CatOS 7.1:Integer(1..63)
- Cost—Describes the STP VLAN path cost of this interface. The VLAN path cost is only used on trunking interfaces. On any switchport that is not in trunking mode, the STP port path cost is used instead.

Note Default values for priority and cost will be used if one of these arguments is not provided by the user. The user must provide a nondefault value for at least one of these arguments; otherwise, the action will fail.

- Add/Remove Per VLAN STP Setting button—Launches a subdialog box to add and remove an explicit STP VLAN configuration to the interface. The configuration will only have an effect if the interface is in trunking mode and the VLAN has an associated STP instance. The interface does not

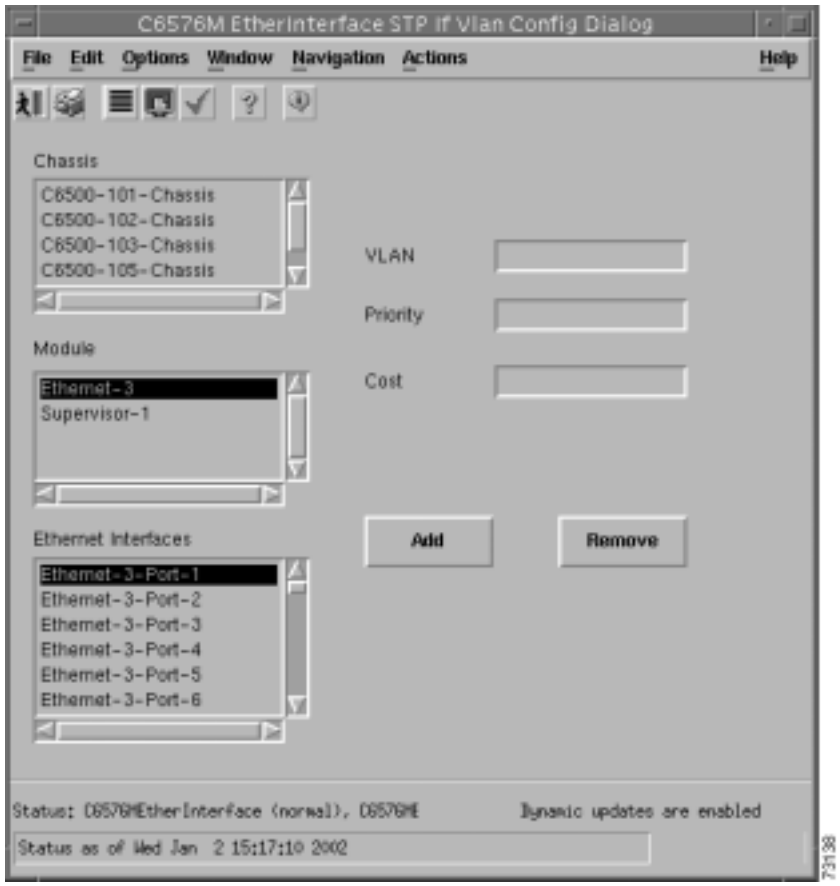
currently need to be configured as a trunking port, nor does the VLAN or the VLAN STP instance need to exist. Figure 5-18 shows the subdialog box that is displayed when the Add/Remove Per VLAN STP Setting button is selected. The subdialog box contain the following:

- VLAN—Identifies the VLAN STP instance. This is the numeric identifier of the access mode VLAN or a VLAN that is carried on the trunk.
- Priority—Describes the STP VLAN port priority of this interface.

Note This value is the same as the Per VLAN STP Port Priority in the Per VLAN STP Setting Area.

- Cost—Describes the STP VLAN path cost of this interface.
- Add button—Adds an explicit STP VLAN configuration to the interface.
- Remove button—Removes an explicit STP VLAN configuration to the interface.

Figure 5-18 Add/Remove Per VLAN STP Setting Subdialog Box



STP Status Area

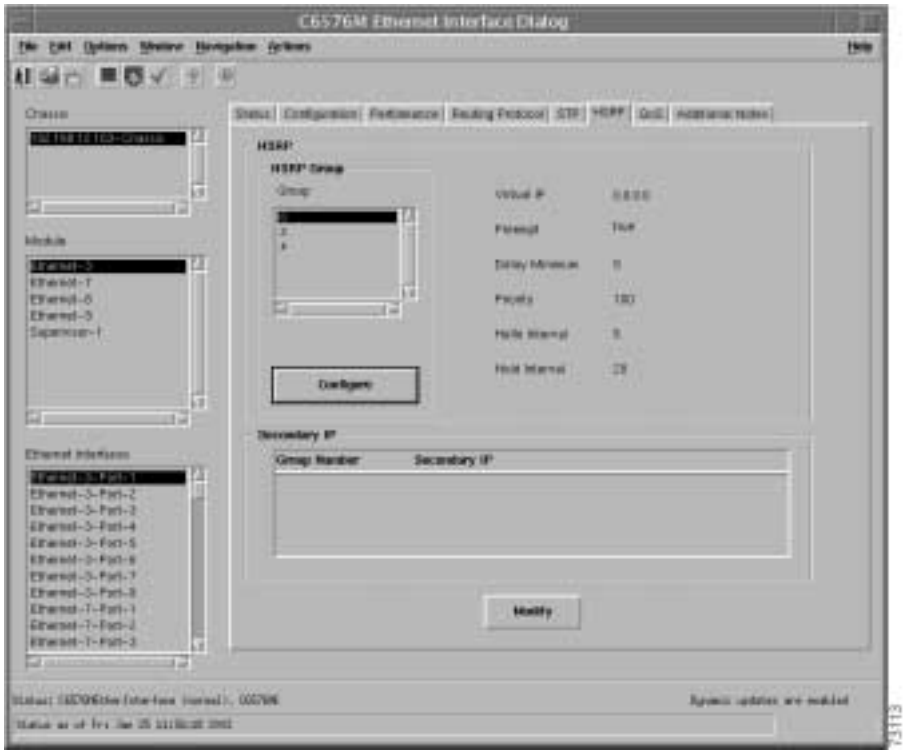
The STP Status area of the C6576M Ethernet Interface dialog box provides the following information:

- STP VLAN Status Table—Describes the status of the active STP VLAN port configurations of the interface. No data is displayed if it is in the linkDown or STP misconfigured state. Data is displayed in the following columns:
  - VLAN—Identifies the VLAN STP instance that this status applies to. This is the numeric identifier of the access mode VLAN or a VLAN that is carried on the trunk.
  - Port—Unique port identifier for the interface in the STP instance. This identifier is unique for that port across all devices in the STP management domain.
  - State—Describes the interface state in the STP instance.
  - Port Cost—Indicates the current calculated port path cost of the interface in the STP instance.

HSRP Tab

Figure 5-19 shows the HSRP tab of the C6576M Ethernet Interface dialog box.

Figure 5-19 HSRP Tab on the C6576M Ethernet Interface Dialog Box



HSRP Area

The HSRP area of the C6576M Ethernet Interface dialog box provides the following information:

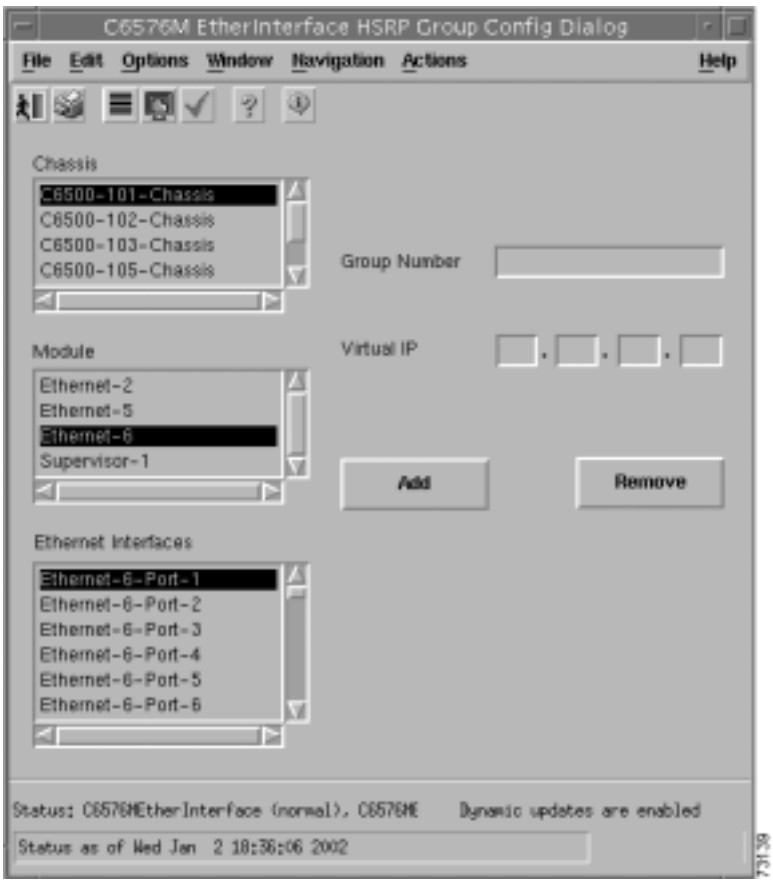
- HSRP Group Table—Describes HSRP groups deployed on an interface.

Note There may be multiple groups deployed on an interface. Using a group number on one logical or physical interface does not preclude using it on another.

- Virtual IP—Primary virtual IP address of the HSRP group. If this address is not configured, the agent attempts to discover the virtual address through a discovery process which scans the hello messages.
- Preempt—If enabled, the current router attempts to overthrow a lower priority active router and attempt to become the active router. If disabled, this router becomes the active router only if there is no such router or the active router fails.
  - true—preempt enabled.
  - false—preempt disabled.

- Delay Minimum—Time difference (in seconds) between a router power up and the time it can start preempting the currently active router. This value is only applicable when preemption is enabled.
- Priority—Priority value that prioritizes a potential hot standby router. The range is 1 to 255, where 1 indicates the lowest priority and 255 indicates the highest priority. The default priority value is 100. The router in the HSRP group with the highest priority value becomes the active router.
- Hello Interval—Hello interval in milliseconds. If this value is not configured, it can be learned from the active router.
- Hold Interval—Hold interval in milliseconds. If this value is not configured, it can be learned from the active router.
- Configure button—Enable HSRP for IP on an interface. This action deploys an HSRP group on the interface. The HSRP group may optionally be assigned a primary IP address. If no address is explicitly assigned, the device attempts to discover the virtual IP address from the active server using Hello messages. Figure 5-20 shows the subdialog box displayed when the Add/Remove button is pressed.

Figure 5-20 HSRP Group Configure Subdialog Box

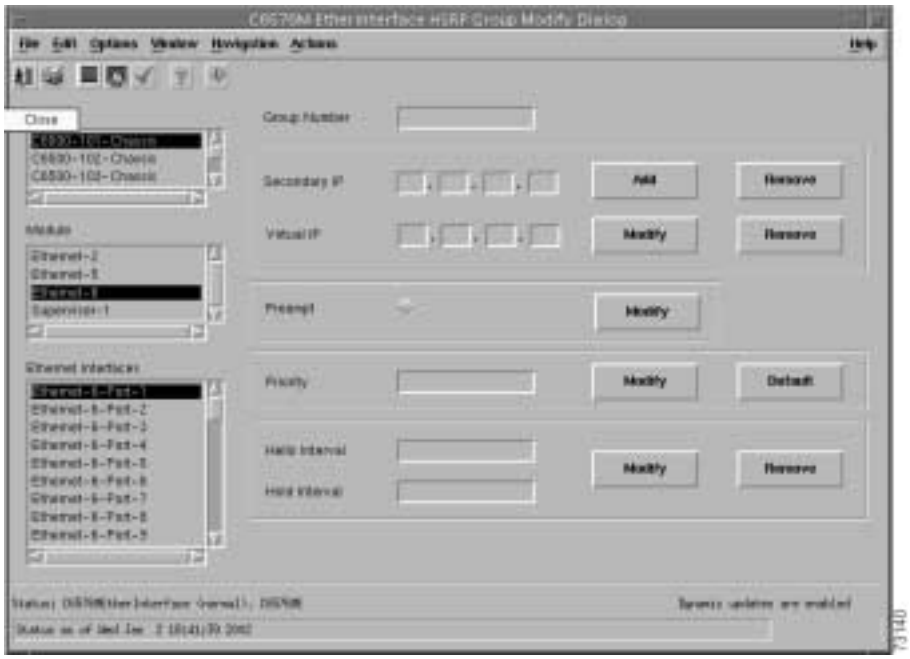


Secondary IP Area

The Secondary IP area of the C6576M Ethernet Interface dialog box provides the following information:

- HSRP Secondary Address Table—Describes secondary IP addresses of HSRP groups deployed on the interface. Data is displayed in the following columns:
  - Group Number—Unique identifier along of an HSRP group.
  - Secondary IP—Secondary IP address of HSRP group.
- Modify button—Figure 5-21 shows the subdialog box that is displayed when the Modify button is pressed. This subdialog box is used to modify the following C6576M Ethernet Interface attributes of a given HSRP group:
  - Secondary IP
  - Virtual IP
  - Preempt
  - Delay Minimum
  - Priority
  - Hello Interval
  - Hold Interval

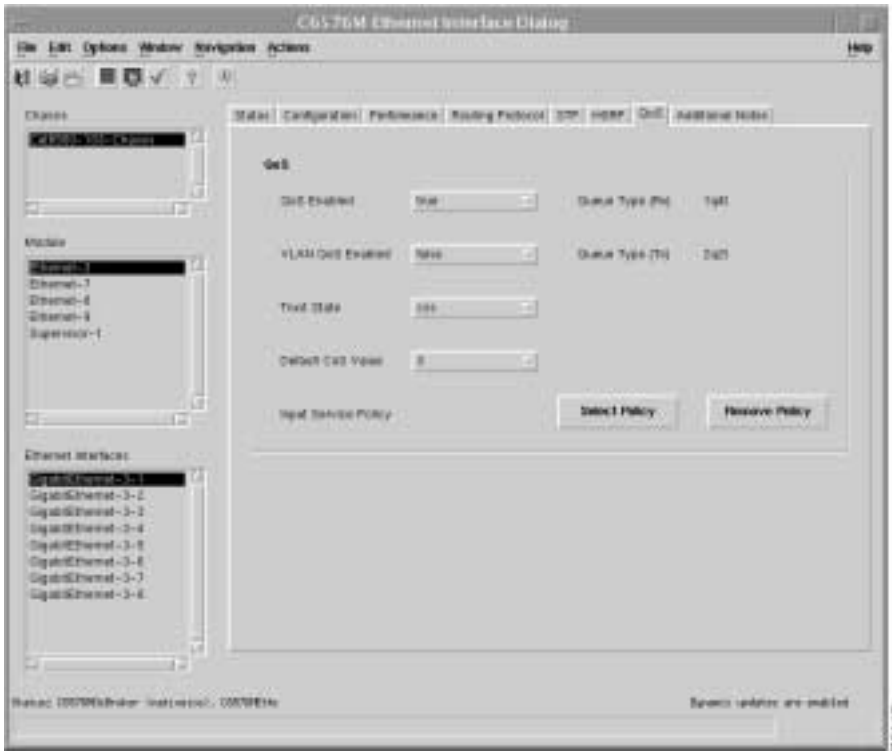
Figure 5-21 HSRP Secondary IP Modify Subdialog Box



QoS Tab

Figure 5-22 shows the QoS tab of the C6576M Ethernet Interface dialog box.

Figure 5-22 QoS Tab on the C6576M Ethernet Interface Dialog Box



QoS Area

The QoS area of the C6576M Ethernet Interface dialog box provides the following information:

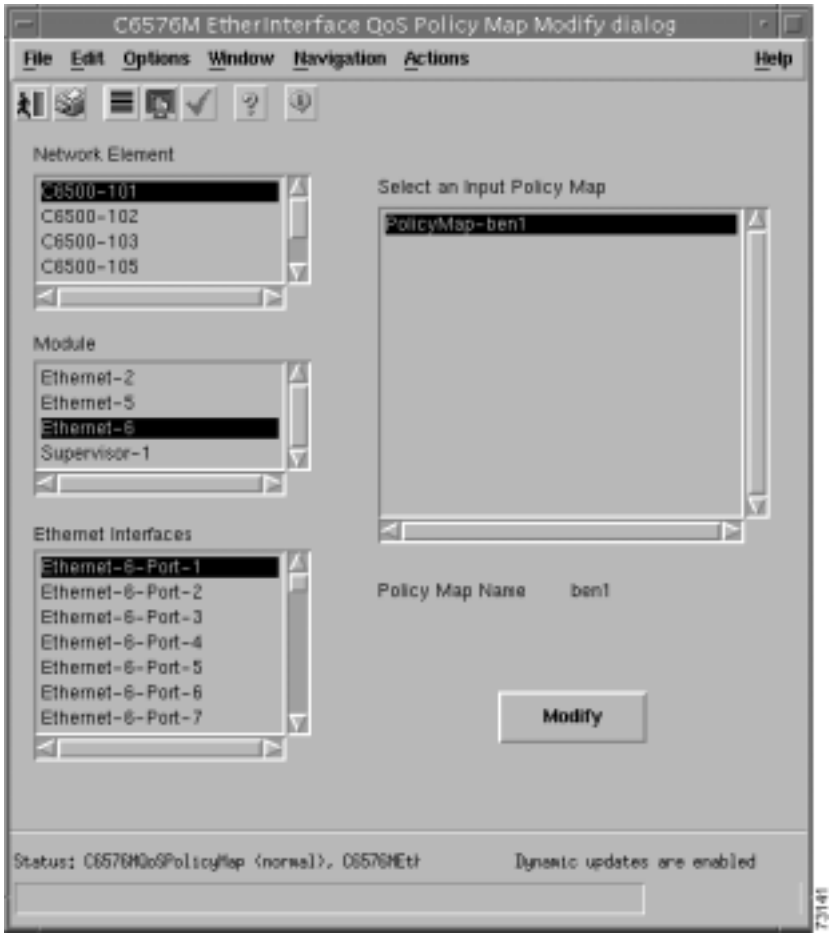
- QoS Enabled—Enables or disables QoS on the interface.
  - true—QoS enabled.
  - false—QoS disabled.

Note By default, if global QoS is enabled on the device, then the port QoS is also enabled unless explicitly disabled.

- VLAN QoS Enabled—Enables/disables VLAN-based QoS on the interface.
  - true—VLAN-based QoS enabled.
  - false—VLAN-based QoS disabled.
- Interface Trust State—The trust state of an interface determines how it marks, schedules, and classifies received L2 frames, and whether or not congestion avoidance is implemented. This attribute can have the following values:

  - untrusted—The interface is marked as untrusted.
  - DSCP—The DSCP value of the frame is trusted.
  - CoS—The CoS value of the frame is trusted.
  - IP-precedence—The IP-precedence value of the frame is trusted.
- Default CoS Value—Interface class of service value. QoS assigns the CoS value to untagged frames from a trusted interface and to all frames of an untrusted interface.
- Input Service Policy—The QoS policy map applied to the interface. This policy map is only applied if QoS is enabled on the interface and VLAN-based QoS is disabled on the interface.
- Queue Type (RX)—Desribes the queue structure for traffic on an egress port.
- Queue Type (TX)—Desribes the queue structure for traffic on an ingress port.
- Select Policy button—Launches a subdialog box to attach an input QoS policy map to the interface. This action may fail if the specified policy map is not suitable for use with an Ethernet interface. Figure 5-23 shows subdialog box that is displayed when the Select Policy button is pressed. The subdialog box contains the following:
  - Input Policy Map Table—Lists the QoS policy maps to apply to the interface.
  - Modify button—Attaches an input QoS policy map to the interface
- Remove Policy button—Detaches an input QoS policy map from the interface. When you click the **Remove Policy** button, a subdialog box is displayed prompting you to confirm the removal action.

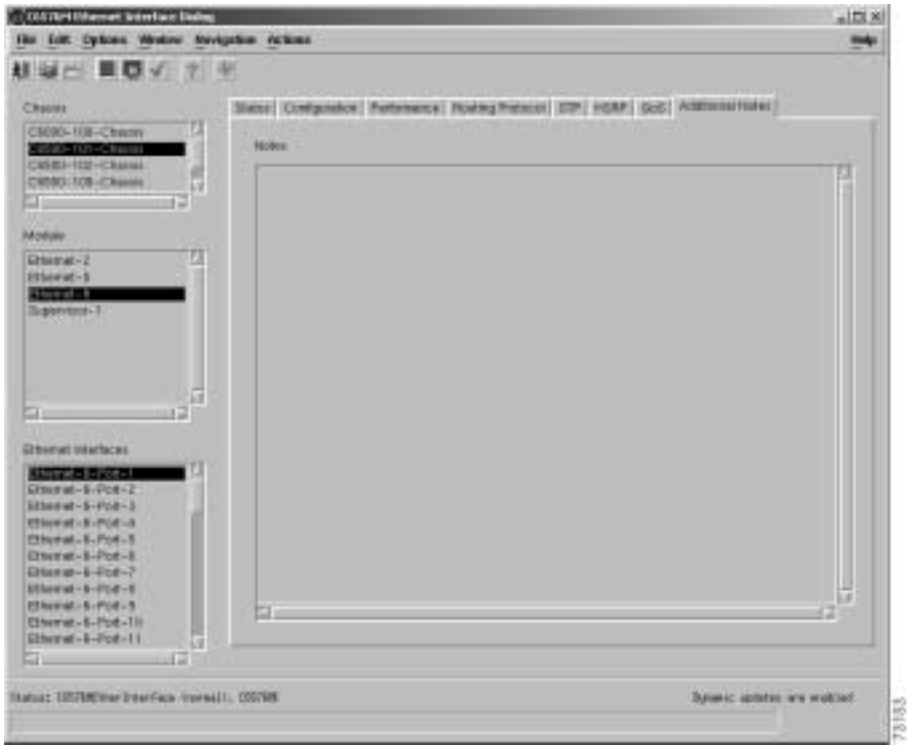
Figure 5-23 Select Policy Subdialog Box



Additional Notes Tab

Figure 5-24 shows the Additional Notes tab of the C6576M Ethernet Interface dialog box.

Figure 5-24 Additional Notes Tab on the C6576M Ethernet Interface Dialog Box



Notes Area

The Notes tab is a text box that allows you to type in additional notes for the interface.

C6576M Switch Fabric Module Dialog Box

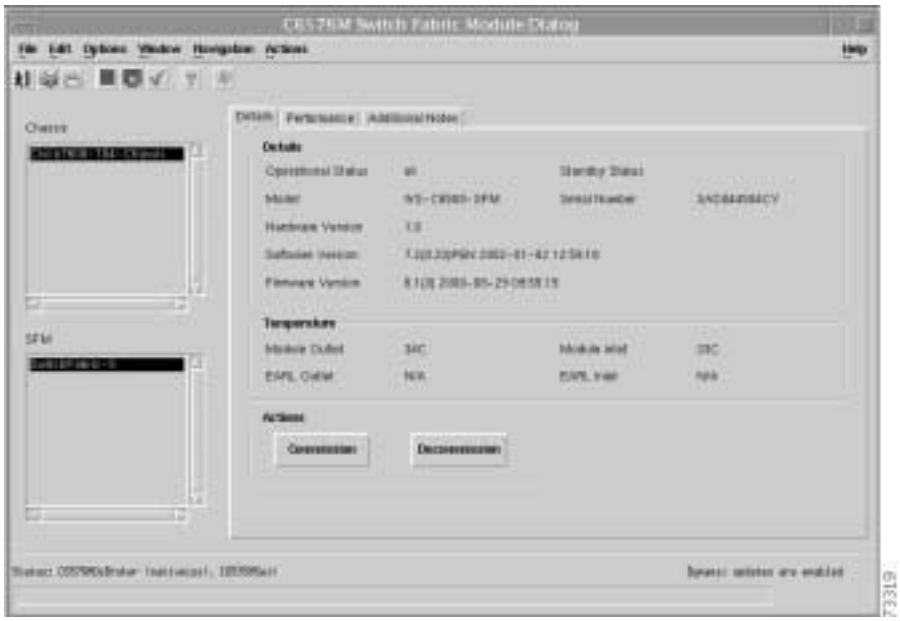
This dialog box provides information for the Switch Fabric Modules. This dialog box can be launched from a Chassis object or Switch Fabric Module object within the Physical view.

You can select one chassis and more than one Switch Fabric Module at a time from the object list on the left side of the dialog box.

Details Tab

Figure 5-25 shows the Details tab of the C6576M Switch Fabric Module dialog box. All the attributes displayed in this tab are read-only.

Figure 5-25 Details Tab of the C6576M Switch Fabric Module Dialog Box



Details Area

The Details area of the C6576M Switch Fabric Module dialog box provides the following information:

- Operational Status—Displays the operational status of the Switch Fabric Module. This attribute has one of the following values:
  - other—The status is unknown.
  - ok—The status is normal.
  - minorFault—There is a minor problem.
  - majorFault—There is a major problem.

Note If this attribute has a value other than ok, an alarm is generated. (See Chapter 8, “Alarms and Alarm Management.”)

- Standby Status—Displays the status of the Switch Fabric Module. This attribute has one of the following values:
  - other (Hybrid OS only)
  - active
  - standby
  - error (Hybrid OS only)
- Model—Model of the Switch Fabric Module. This attribute has the following value:
  - WS-X6500-SFM
  - WS-X6500-SFM2
- Serial Number—The serial number of the module.
- Hardware Version—The hardware version on the module.
- Software Version—The software version on the module.
- Firmware Version—The firmware version on the module.

Temperature Area

The Temperature area of the C6576M Switch Fabric Module dialog box provides the following information:

- **Module Outlet**—The outlet temperature, in degrees Celsius, of the module.
- Module Inlet—The inlet temperature, in degrees Celsius, of the module.
- **EARL Outlet**—The outlet temperature, in degrees Celsius, of the Distributed Forwarding daughter card.
- **EARL Inlet**—The inlet temperature, in degrees Celsius, of the Distributed Forwarding daughter card.

Actions Area

The Actions area of the C6576M Switch Fabric Module dialog box provides the following actions:

- **Commission**—This button is used to commission the object manually. This can only be done if the object is in a decommissioned state.
- **Decommission**—This button is used to decommission the object manually. In the decommissioned state, the properties of the object are not monitored. As a result, data displayed in the configuration window is not guaranteed to be current.

  The decommission action allows a Switch Fabric Module to be removed and replaced without generating alarms.

Status Field

The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.
- mismatched—The type of Switch Fabric Module discovered does not match the predeployed Switch Fabric Module.

Performance Tab

Figure 5-26 shows the Performance tab of the C6576M Switch Fabric Module dialog box.

Figure 5-26 Performance Tab of the C6576M Switch Fabric Module Dialog Box

Statistics Area

The Statistics Table of the Statistics area dialog box provides the fabric channel counters and utilization for the device. There is an entry in this table for each fabric-enabled module installed in the chassis.

- Slot—Slot number of the fabric-enabled module.
- Channel—Fabric channel number.
- InErrors—Total number of error packets received on the module through the fabric channel since the entry was last initialized.

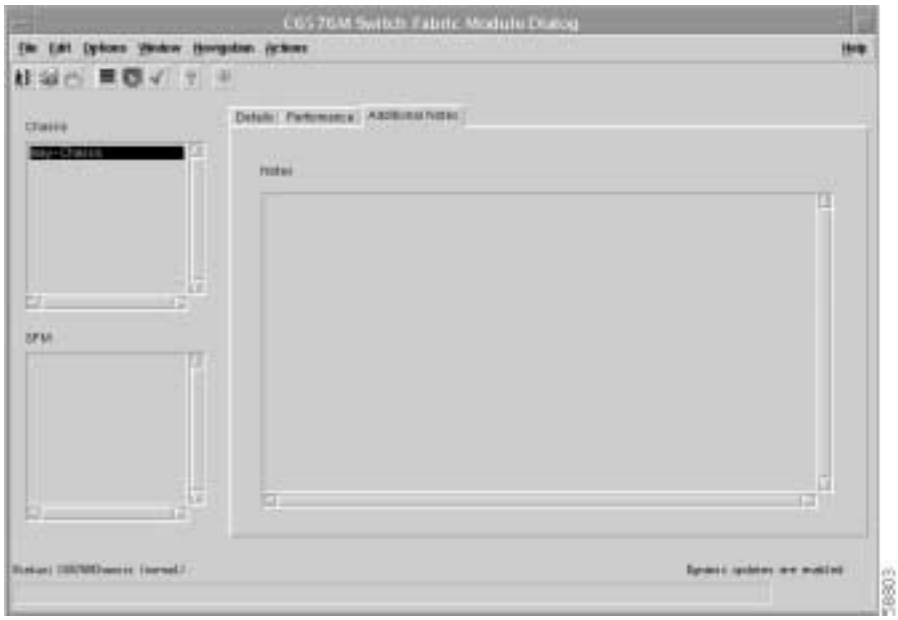
- Out Errors—Total number of error packets transmitted on the module through the fabric channel since the entry was last initialized.
- Out Dropped—Total number of dropped packets transmitted on the module through the fabric channel since the entry was last initialized.
- In Util—Input utilization of the fabric channel for the module.
- Out Util—Output utilization of the fabric channel for the module.

Note This table is only supported in IOS versions 12.1(8a)EX and later; in earlier IOS versions, the table will be empty.

Additional Notes Tab

Figure 5-27 shows the Additional Notes tab of the C6576M Switch Fabric Module dialog box.

Figure 5-27 Additional Notes Tab of the C6576M Switch Fabric Module Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the Switch Fabric Module.

C6576M FlexWAN Module Dialog Box

This dialog box provides information for the FlexWAN modules. This dialog box can be launched from a Chassis object or FlexWAN module object within the Physical view.

You can select one chassis and more than one FlexWAN module at a time from the object list on the left side of the dialog box.

Details Tab

Figure 5-28 shows the Details tab of the C6576M FlexWAN module dialog box.

Figure 5-28 Details Tab of the C6576M FlexWAN Module Dialog Box

Status Area

The Status area of the C6576M FlexWAN Module dialog box provides the following information:

- Operational Status—Displays the operational status of the FlexWAN module. This attribute is read-only and has one of the following values:
  - other—The status is unknown.
  - ok—The status is normal.
  - minorFault—There is a minor problem.
  - majorFault—There is a major problem.

Note If this attribute has a value other than ok, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

Inventory Area

The Inventory area of the C6576M FlexWAN Module dialog box provides the following information. All the attributes in this area are read-only.

- Model—Model of the FlexWAN module. This attribute has the following value:
  - WS-X6182-2PA
- Serial Number—The serial number of the module.
- Hardware Version—The hardware version on the module.
- Software Version—The software version on the module.
- Firmware Version—The firmware version on the module.

Performance Logging Area

The Performance Logging area of the C6576M FlexWAN Module dialog box contains these buttons to enable and disable performance logging of the interface attributes of the port adapters (if installed) on the FlexWAN module:

- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to the user through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Actions Area

The Actions area of the C6576M FlexWAN Module dialog box provides the following actions:

- **Commission**—This button is used to commission the object manually. This can only be done if the object is in a decommissioned state.
- **Decommission**—This button is used to decommission the object manually. In the decommissioned state, the properties of the object are not monitored. As a result, data displayed in the configuration window is not guaranteed to be current.

  The decommission action allows a FlexWAN module to be removed and replaced without generating alarms.

Status Field

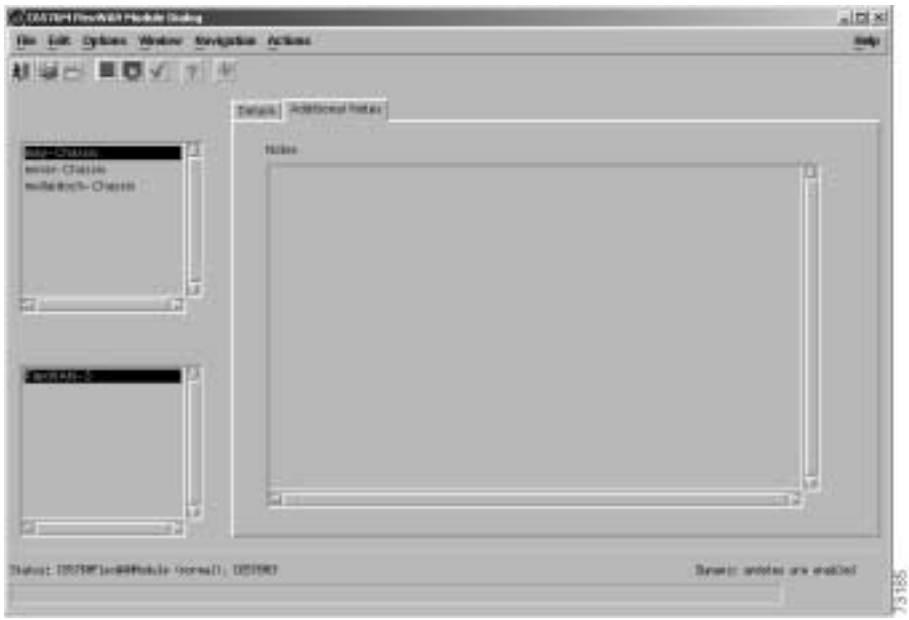
The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.
- mismatched—The type of FlexWAN module discovered does not match the predeployed FlexWAN module.

Additional Notes Tab

Figure 5-29 shows the Additional Notes tab of the C6576M FlexWAN Module dialog box.

Figure 5-29 Additional Notes Tab of the C6576M FlexWAN Module Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the FlexWAN module.

C6576M Port Adapter Dialog Box

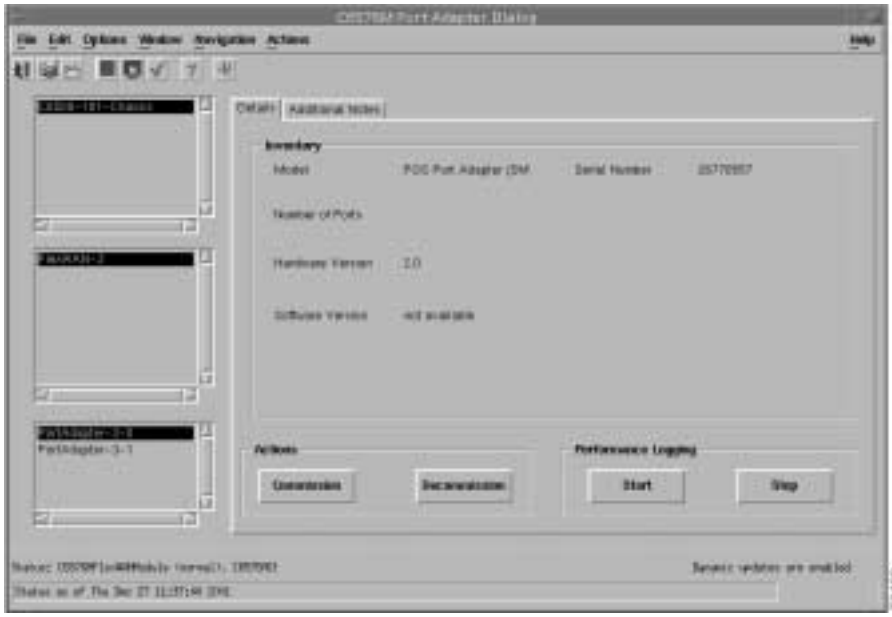
This dialog box provides information for the port adapters. This dialog box can be launched from a Chassis object or FlexWAN object within the Physical view.

You can select multiple chassis and port adapters at a time from the object list on the left side of the dialog box.

Details Tab

Figure 5-30 shows the Details tab of the C6576M Port Adapter dialog box.

Figure 5-30 Details Tab of the C6576M Port Adapter Dialog Box



Inventory Area

The Inventory area of the C6576M Port Adapter dialog box provides the following information. All the attributes in this area are read-only.

- Model—Model of the port adapter. This attribute may have one of the following values:
  - PA-2E3—2-port serial E3 port adapter
  - PA-2H—2-port HSSI port adapter
  - PA-2T3—2-port serial T3 port adapter
  - PA-2T3+—Enhanced 2-port serial T3 port adapter
  - PA-4T+—Enhanced 4-port serial port adapter
  - PA-8T-232—8-port EIA/TIA-232 serial port adapter
  - PA-8T-V35—8-port V.35 serial port adapter

  - PA-8T-X21—8-port X.21 serial port adapter
  - PA-A3-E3—Enhanced ATM E3 port adapter
  - PA-A3-OC3MM—Enhanced ATM, OC-3 multimode port adapter
  - PA-A3-OC3SMI—Enhanced ATM, OC-3 single-mode intermediate reach port adapter
  - PA-A3-OC3SML—Enhanced ATM, OC-3 single-mode long reach port adapter
  - PA-A3-T3—Enhanced ATM T3 port adapter
  - PA-E3—1-port serial E3 port adapter
  - PA-H—1-port HSSI port adapter
  - PA-MC-2T3+—Dual interface multichannel T3 port adapter
  - PA-MC-8E1—8-port multichannel E1 port adapter
  - PA-MC-8T1—8-port multichannel T1 port adapter
  - PA-MC-E3—1-port multichannel E3 port adapter
  - PA-MC-T3—1-port multichannel T3 port adapter
  - PA-POS-OC3MM—Multimode PoS, OC3 port adapter
  - PA-POS-OC3SMI—Single-mode intermediate reach PoS, OC3 port adapter
  - PA-POS-OC3SML—Single-mode long reach PoS, OC3 port adapter
  - PA-T3—1-port T3 serial port adapter
  - PA-T3+—Enhanced 1-port T3 serial port adapter
- Serial Number—The serial number of the port adapter.

Note This attribute is unsupported for PA-ATMDX-E3 port adapter.

- Number of Ports—The number of ports on the port adapter.
- Hardware Version—The hardware version of the port adapter.
- Software Version—The software version of the port adapter.

Performance Logging Area

The Performance Logging area of the C6576M ATM Interface dialog box contains the buttons to enable data logging of all the interface attributes of the port adapter.

- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Actions Area

The Actions area of the C6576M Port Adapter dialog box provides the following actions:

- **Commission**—This button is used to commission the object manually. This can only be done if the object is in a decommissioned state.
- **Decommission**—This button is used to decommission the object manually. In the decommissioned state, the properties of the object are not monitored. As a result, data displayed in the configuration window is not guaranteed to be current.

  The decommission action allows a port adapter to be removed and replaced without generating alarms.

Status Field

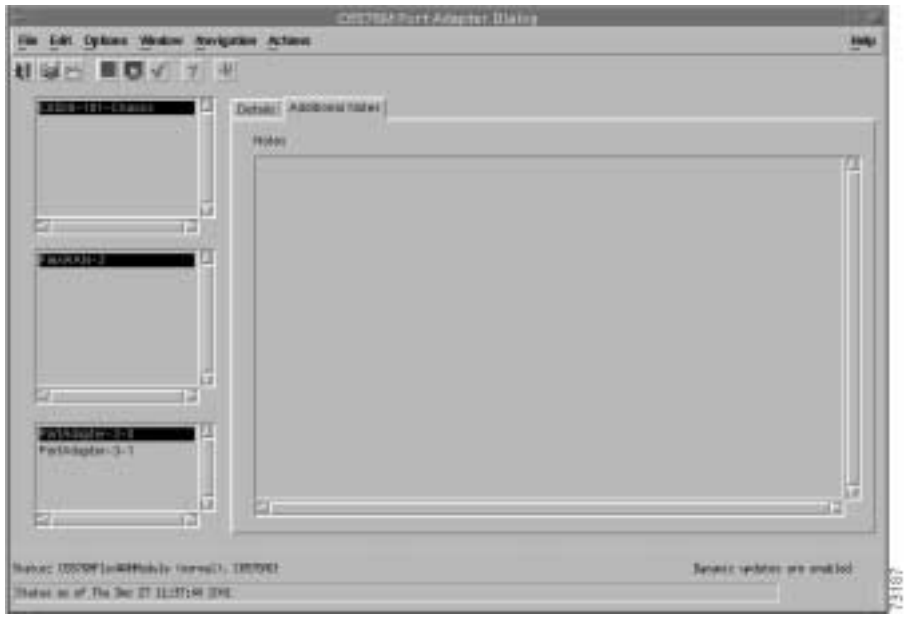
The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.
- mismatched—The type of port adapter discovered does not match the predeployed port adapter.

Additional Notes Tab

Figure 5-31 shows the Additional Notes tab of the C6576M Port Adapter dialog box.

Figure 5-31 Additional Notes Tab of the C6576M Port Adapter Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the port adapter.

C6576M Optical Services Modules Dialog Box

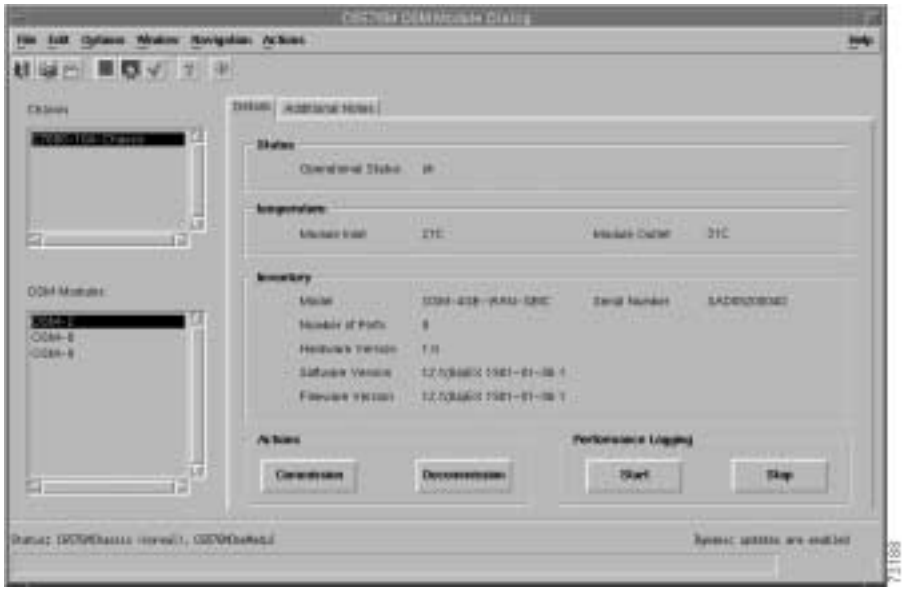
This dialog box describes the physical Gigabit Ethernet WAN OSM (OSM GE-WAN), Packet over Sonet OSM (OSM PoS), and channelized SONET OSM on a Cisco 7600 series Internet Router. This dialog box can be launched from a Chassis object or an OSM module object within the Physical view.

You can select multiple chassis and OSMs at a time from the object list on the left side of the dialog box.

Details Tab

Figure 5-32 shows the Details tab of the C6576M OSM dialog box.

Figure 5-32 Details Tab of the C6576M OSM Dialog Box



Status Area

The Status area of the C6576M OSM dialog box provides the following information.

- Operational Status—Displays the operational status of the OSM. This attribute has one of the following values. This is a read-only attribute.
  - other—The status is unknown.
  - ok—The status is normal.
  - minorFault—There is a minor problem.
  - majorFault—There is a major problem.

Note If this attribute has a value other than ok, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

Temperature Area

The Temperature area of the C6576M OSM dialog box provides information for the following sensors. All the attributes in this area are read-only.

- Module Inlet—Inlet temperature of the module in degrees Celsius.
- Module Outlet—Outlet temperature of the module in degrees Celsius.

Each sensor can have the following values:

- <n>C—Temperature in degrees Celsius.
- N/O—Indicates that the sensor is not operational.
- N/A—Indicates that the sensor value is not available.

Inventory Area

The Inventory area of the C6576M OSM dialog box provides the following information. All the attributes in this area are read-only.

- Model—Model of the OSM. This attribute has the following value:
  - OSM-4GE-WAN-GBIC—4-port Gigabit Ethernet Optical Services Module, GBIC
  - OSM-4OC12-POS-MM—4-port OC-12/STM-4 SONET/SDH OSM, MM, with 4 Gigabit Ethernet ports
  - OSM-4OC12-POS-SI—4-port OC-12/STM-4 SONET/SDH OSM, SM-IR, with 4 Gigabit Ethernet ports
  - OSM-4OC12-POS-SL—4-port OC-12/STM-4 SONET/SDH OSM, SM-LR, with 4 Gigabit Ethernet ports
  - OSM-1OC48-POS-SS—1-port OC-48/STM-16 SONET/SDH OSM, SM-SR, with 4 Gigabit Ethernet ports
  - OSM-1OC48-POS-SI—1-port OC-48/STM-16 SONET/SDH OSM, SM-IR, with 4 Gigabit Ethernet ports
  - OSM-1OC48-POS-SL—1-port OC-48/STM-16 SONET/SDH OSM, SM-LR, with 4 Gigabit Ethernet ports

  - OSM-16OC3-POS-MM—16-port OC-3/STM-1 SONET/SDH OSM, MM, with 4 Gigabit Ethernet ports
  - OSM-16OC3-POS-SI—16-port OC-3/STM-1 SONET/SDH OSM, SM-IR, with 4 Gigabit Ethernet ports
  - OSM-16OC3-POS-SL—16-port OC-3/STM-1 SONET/SDH OSM, SM-LR, with 4 Gigabit Ethernet ports
  - OSM-2OC12-POS-MM—2-port OC-12/STM-4 SONET/SDH OSM, MM, with 4 Gigabit Ethernet ports
  - OSM-2OC12-POS-SI—2-port OC-12/STM-4 SONET/SDH OSM, SM-IR, with 4 Gigabit Ethernet ports
  - OSM-2OC12-POS-SL—2-port OC-12/STM-4 SONET/SDH OSM, SM-LR, with 4 Gigabit Ethernet ports
  - OSM-8OC3-POS-MM—8-port OC-3/STM-1 SONET/SDH OSM, MM, with 4 Gigabit Ethernet ports
  - OSM-8OC3-POS-SI—8-port OC-3/STM-1 SONET/SDH OSM, SM-IR, with 4 Gigabit Ethernet ports
  - OSM-8OC3-POS-SL—8-port OC-3/STM-1 SONET/SDH OSM, SM-LR, with 4 Gigabit Ethernet ports
  - OSM-1CHOC48/T3-SS—1-port Channelized OC48 to T3, Short Reach, with 4 Gigabit Ethernet ports
  - OSM-1CHOC48/T3-SI—1-port Channelized OC48 to T3, Single-mode Intermediate Reach, with 4 Gigabit Ethernet ports
  - OSM-2CHOC48/T3-SS—2-port Channelized OC48 to T3, Short Reach, with 4 Gigabit Ethernet ports
  - OSM-2CHOC48/T3-SI—2-port Channelized OC48 to T3, Single-mode Intermediate Reach, with 4 Gigabit Ethernet ports
  - OSM-4CHOC12/T3-MM—4-port Channelized OC12 to T3, Multi-mode, with 4 Gigabit Ethernet ports
  - OSM-4CHOC12/T3-SI—4-port Channelized OC12 to T3, Single-mode Intermediate Reach, with 4 Gigabit Ethernet ports
  - OSM-8CHOC12/T3-MM—8-port Channelized OC12 to T3, Multi-mode, with 4 Gigabit Ethernet ports
  - OSM-8CHOC12/T3-SI—8-port Channelized OC12 to T3, Single-mode Intermediate Reach, with 4 Gigabit Ethernet ports
- Serial Number—The serial number of the module.
- Hardware Version—The hardware version on the module.
- Software Version—The software version on the module.
- Firmware Version—The firmware version on the module.

Performance Logging Area

The Performance Logging area of the C6576M Port Adapter dialog box contains the buttons to enable data logging of all the interface attributes of the OSM.

- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Actions Area

The Actions area of the C6576M OSM dialog box provides the following actions:

- **Commission**—This button is used to commission the object manually. This can only be done if the object is in a decommissioned state.
- **Decommission**—This button is used to decommission the object manually. In the decommissioned state, the properties of the object are not monitored. As a result, data displayed in the configuration window is not guaranteed to be current.

  The decommission action allows a OSM to be removed and replaced without generating alarms.

Status Field

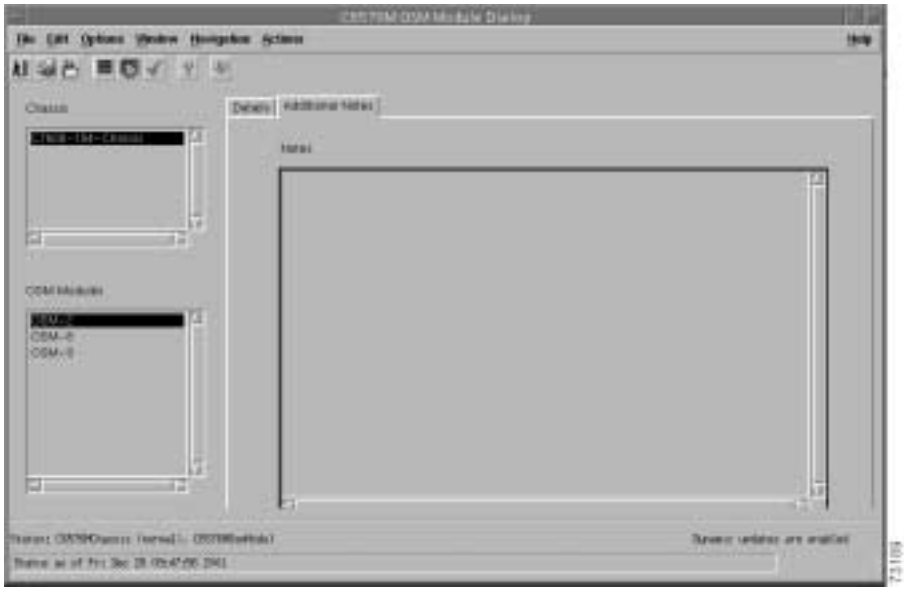
The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.
- mismatched—The type of OSM discovered does not match the predeployed OSM.

Additional Notes Tab

Figure 5-33 shows the Additional Notes tab of the C6576M OSM dialog box.

Figure 5-33 Additional Notes Tab of the C6576M OSM Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the OSM.

C6576M SLB Dialog Box

The Content Switching Module is a line card that provides server load balancing (SLB) of client traffic to server farms, firewalls, Secure Sockets Layer (SSL) devices, or VPN termination devices. This dialog box provides information for SLB. This dialog box can be launched from a Chassis object or SLB object within the Physical view.

You can select one chassis and one SLB object at a time from the object list on the left side of the dialog box.

Details Tab

Figure 5-34 shows the Details tab of the C6576M SLB dialog box.

Figure 5-34 Details Tab of the C6576M SLB Dialog Box

Status Area

The Status area of the C6576M SLB dialog box provides the following information:

- Operational Status—Displays the operational status of the CSM. This attribute has one of the following values. This is a read-only attribute.
  - other—The status is unknown.
  - ok—The status is normal.
  - minorFault—There is a minor problem.
  - majorFault—There is a major problem.

Note If this attribute has a value other than ok, an alarm is generated. (See Chapter 8, "Alarms and Alarm Management.")

Temperature Area

The Temperature area of the C6576M SLB dialog box provides information for the following sensors. All the attributes in this area are read-only.

- Module Inlet—Inlet temperature of the module in degrees Celsius.
- Module Outlet—Outlet temperature of the module in degrees Celsius.

Each sensor can have the following values:

  - <n>C—Temperature in degrees Celsius.
  - N/O—Indicates that the sensor is not operational.
  - N/A—Indicates that the sensor value is not available.

Inventory Area

The Inventory area of the C6576M SLB dialog box provides the following information. All the attributes in this area are read-only.

- Model—Model of the Content Switching Module. This attribute has the following value:
  - WS-X6066-SLB-APC
- Type—The type of module.
- Number of Ports—The number of internal ports in the module.
- Serial Number—The serial number of the module.
- Hardware Version—The hardware version on the module.
- Software Version—The software version on the module.
- Firmware Version—The firmware version on the module.

SLB Setting Area

The Inventory area of the C6576M SLB dialog box provides the following information:

- Forwarding Mode—The current SLB operating mode. This attribute has one of the following values. This is a read-only attribute.
  - csm(1)
  - rp(2)
- Configured Mode—The current configured SLB mode. This attribute has one of the following values:
  - csm(1)
  - rp(2)

Note The configured SLB mode does not take effect until the Content Switching Module is reloaded. The reload is performed manually by executing the IOS config mode command **power cycle module** *slot_number.*

Note When changing the configured SLB mode from CSM to RP, the SLB configurations for CSM will be erased.

Actions Area

The Actions area of the C6576M SLB dialog box provides the following actions:

- **Commission**—This button is used to commission the object manually. This can only be done if the object is in a decommissioned state.
- **Decommission**—This button is used to decommission the object manually. In the decommissioned state, the properties of the object are not monitored. As a result, data displayed in the configuration window is not guaranteed to be current.

  The decommission action allows a Content Switching Module to be removed and replaced without generating alarms.

Status Field

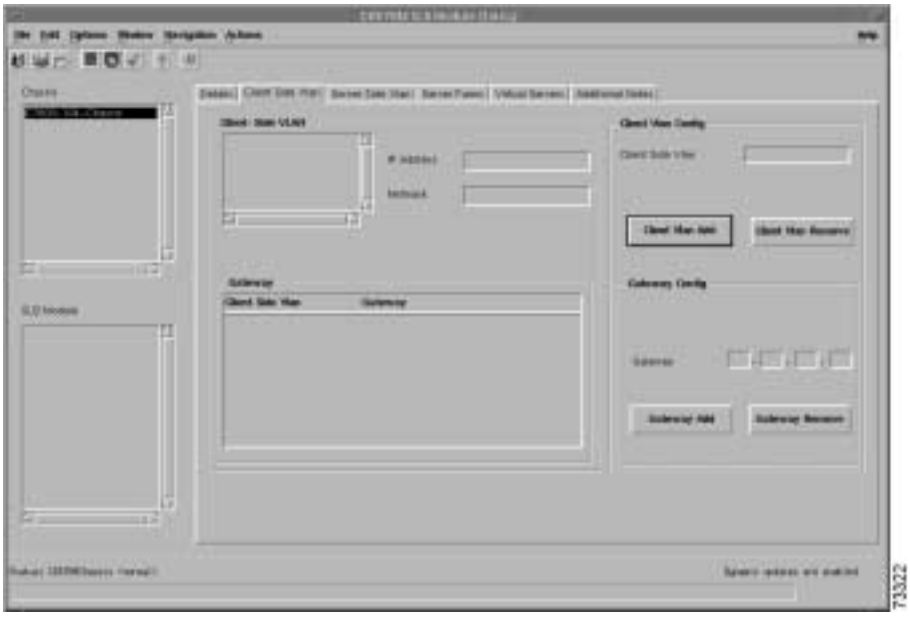
The display-only Status field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.
- mismatched—The type of Content Switching Module discovered does not match the predeployed Content Switching Module.

Client Side VLAN Tab

Figure 5-35 shows the Client Side VLAN tab of the C6576M SLB module dialog box.

Figure 5-35 Client Side VLAN Tab of the C6576M SLB Module Dialog Box



Client Side VLAN Area

The Client Side VLAN area of the C6576M SLB dialog box provides the following information:

- Client VLAN Table—Identifies the client VLANs used by the CSM. These are the VLANs on the device to which clients will connect. The following attributes are displayed for the selected client VLANs in the table:
  - IP Address—IP address of the client VLAN.
  - Netmask—Subnet mask of the client VLAN IP address. Enabled bits indicate network addressing bits in the IP address.
- Client VLAN Gateway Table—Describes the default gateways associated with the client VLANs. There may be multiple gateways associated with each client VLAN. The following columns are displayed in this table:
  - Client Side VLAN—Unique identifier of a client VLAN on the device.
  - Gateway—Default gateway of a client VLAN. A router to the client VLAN must have this gateway address configured and real servers must point their gateways to this address.

Client VLAN Config Area

The Client VLAN Config area of the C6576M SLB dialog box allows the user to add client side VLANs. The following attributes are configured:

- Client Side VLAN field—Unique identifier of a client VLAN on the device.

Note VLAN 1 is the default VLAN. VLAN identifiers greater than 1001 are reserved as the default VLANs for various media and for hidden VLANs generated by the device.

- Client VLAN Add button—Adds the client VLAN specified in the client side VLAN field. If you do not specify a VLAN in the Client Side VLAN field, no action will take effect.
- Client VLAN Remove button—Removes the client VLAN that is selected in the Client VLAN Table. A subdialog box is displayed asking the user to confirm the action.

Gateway Config Subarea

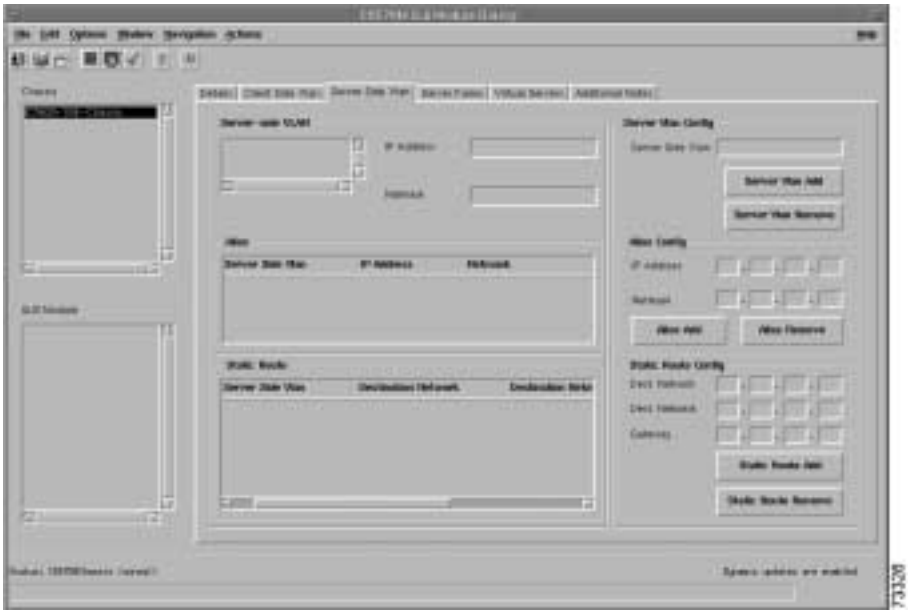
The Gateway Config subarea allows the user to add a default gateways associated with the client VLAN specified in the Client Side VLAN field. This VLAN must already be configured as a client side VLAN.

- Gateway field—Default gateway associated with the client VLAN.
- Gateway Remove button—Removes the default gateway specified by the Gateway field and the Client Side VLAN field. You need to specify a VLAN in the Client Side VLAN field and an IP address in the Gateway field for the action to take effect.
- Gateway Add button—Adds the default gateway specified by the Gateway field and the Client Side VLAN field. You need to specify a VLAN in the Client Side VLAN field and an IP address in the Gateway field for the action to take effect.

Server Side VLAN Tab

Figure 5-36 shows the Server Side VLAN tab of the C6576M SLB dialog.

Figure 5-36 Server Side VLAN Tab of the C6576M SLB Dialog Box



Server Side VLAN Area

The Server Side VLAN area of the C6576M SLB dialog box provides the following information:

- Server VLAN Table—Identifies the server VLANs used by the CSM. These are the VLANs on the device to which servers will connect. The following attributes are displayed for the selected server VLANs in the table:
  - IP Address—IP address of the server VLAN.
  - Netmask—Subnet mask of the server VLAN IP address. Enabled bits indicate network addressing bits in the IP address.
- Server VLAN Alias Table—Describes the aliases of a server VLAN. If the CSM is in a different subnet from the real servers, aliases may be used to eliminate the need for a router. Only used in server mode. There may be multiple aliases associated with each server VLAN. The following attributes are displayed in the table:
  - Server Side VLAN—Unique identifier of a server VLAN on the device.
  - IP Address—IP address of the server VLAN.
  - Netmask—Subnet mask of the server VLAN alias IP address. Enabled bits indicate network addressing bits in the IP address.
- Server VLAN Static Route Table—Describes the static routes of a server VLAN. A static route is configured to reach a real server if it is more than one network hop away from the CSM. There may be multiple static routes configured for a server VLAN. The following attributes are displayed in the table:

- Server Side VLAN—Unique identifier of a server VLAN on the device.
- Destination Network—IP address of network on the server VLAN.
- Destination Netmask—Subnet mask of the network on the server VLAN. Enabled bits indicate network addressing bits in the IP address.
- Gateway—Default gateway of a server VLAN. A router to the client VLAN must have this gateway address configured and real servers must point their gateways to this address.

Server VLAN Config Area

The Server VLAN Config area of the C6576M SLB dialog box allows you to add server side VLANs. The following attributes are configured:

- Server Side VLAN field—Unique identifier of a server VLAN on the device.
- Server VLAN Add button—Adds the server VLAN specified in the Server Side VLAN field. You need to specify a VLAN in the Server Side VLAN field for the action to take effect.
- Server VLAN Remove button—Removes the server VLAN that is selected in the Server VLAN Table. A subdialog box is displayed asking the user to confirm the action.

Alias Config Subarea

This subarea allows you to add aliases associated with the server VLAN specified in the Server Side VLAN field. This VLAN must already be configured as a Server Side VLAN.

- IP Address field—IP address of the server VLAN.
- Netmask field—Subnet mask of the server VLAN alias IP address. Enabled bits indicate network addressing bits in the IP address.
- Alias Remove button—Removes the alias specified by the IP Address, Netmask, and Server Side VLAN fields. You need to specify a VLAN in the Server Side VLAN field, an IP address in the Alias IP Address field, and a subnet mask in the Alias Netmask field for the action to take effect.
- Alias Add button—Adds the alias specified by the IP Address, Netmask, and Server Side VLAN fields. You need to specify a VLAN in the Server Side VLAN field, an IP address in the Alias IP Address field, and a subnet mask in the Alias Netmask field for the action to take effect.

Static Route Config Subarea

This subarea allows the user to add static routes of a server VLAN specified in the Server Side VLAN field. This VLAN must already be configured as a server side VLAN.

- Destination Network field—IP address of network on the server VLAN.
- Destination Netmask field—Subnet mask of the network on the server VLAN. Enabled bits indicate network addressing bits in the IP address.
- Gateway field—Default gateway of a server VLAN. A router to the client VLAN must have this gateway address configured and real servers must point their gateways to this address.
- Static Route Remove button—Removes the static route specified by the Destination Network, Destination Netmask, Gateway, and Server Side VLAN fields.
- Static Route Add button—Adds the static route specified by the Destination Network, Destination Netmask, Gateway, and Server Side VLAN fields.

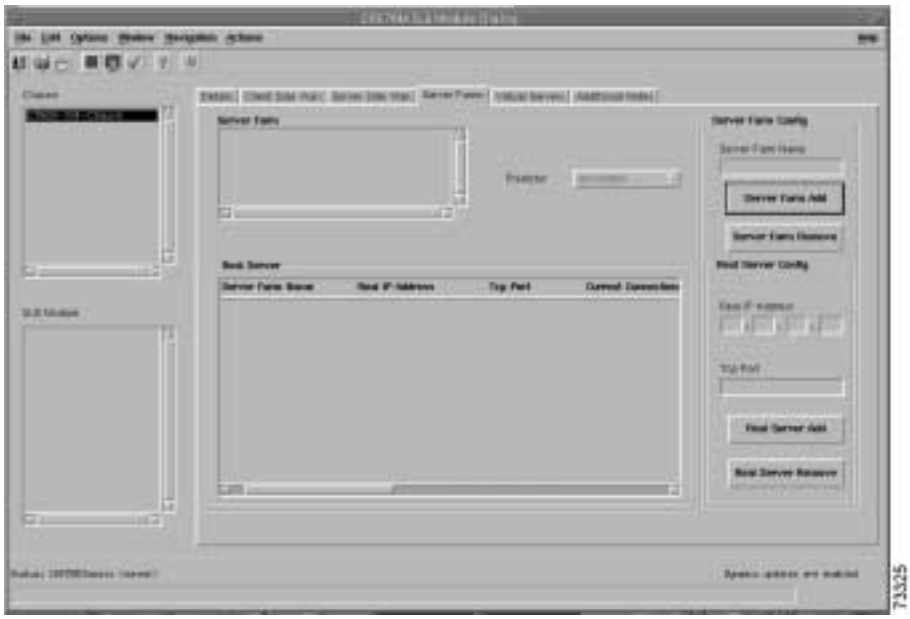
For the Static Route Remove and Static Route Add button actions to take effect, you need to specify the static route using one of the following sets of attributes:

- Option (A)
  - A VLAN in the Server Side VLAN field
  - An IP address in the Destination Network field
  - A Subnet Mask in the Destination Netmask field
- Option (B)
  - A VLAN in the Server Side VLAN field
  - An IP address in the Gateway field
- Option (C)
  - A VLAN in the Server Side VLAN field
  - An IP address in the Destination Network field
  - A Subnet Mask in the Destination Netmask field
  - An IP address in the Gateway field

Server Farms Tab

Figure 5-37 shows the Server Farms tab of the C6576M SLB dialog box.

Figure 5-37 Server Farms Tab of the C6576M SLB Dialog Box



Server Farm Area

The Server Farm area of the C6576M SLB dialog box provides the following information:

- Server Farm Table—Describes the configured server farms. The following attributes are displayed for the selected server farm in the table:
  - Server Farm Index—Unique identifier of a server farm on the device.
  - Predictor—Load-balancing predictor algorithm. This attribute can have one of the following values:
    - roundrobin (1)
    - leastconns (2)
    - other (3) (not in write)

Note A value of other (3) indicates the predictor algorithm is of a type unsupported by the C65/76M EMS. A value of other (3) is not supported for write operations.

- Real Server Table—Describes the real servers in a server farm. The following columns are displayed in the table:
  - Server Farm Name—Unique identifier of a server farm on the device.
  - Real IP Address—IP address of the real server.
  - TCP Port—Optional TCP Port translation for the real server.
  - Current Connections—Number of current connections to the real server.
  - Operation Status—The operational status of the real server. This attribute can have the following values:
    - outOfService (1)
    - operational (2)
    - failed (3)
  - Admin Status—The administrative status of the real server. When the administrative status is changed to inService (2), it enables the real server for use by SLB. This attribute can have the following values:
    - outOfService (1)
    - inService (2)
  - Admin Weight—Configured weighting value to use for virtual server predictor algorithm.
  - Current Weight—Actual real server weighting factor.
  - Minimum Connections—When the maximum connections is exceeded, no more connections will be established to the real server until the number of connections falls below this value. The valid values range from 0 to 4294967295. This value must be less than the currently configured maximum connections.
  - Maximum Connections—Maximum number of active connections on the real server at any one point. If the value is set to the maximum of 4294967295, it indicates that the maximum is infinite (not monitored). This value must be greater than the currently configured minimum connections.

Server Farm Config Area

The Server Farm Config area of the C6576M SLB dialog box allows you to add and configure server farms. The following attributes are configured:

- Server Farm Name field—Unique identifier of a server farm on the device.
- Server Farm Add button—Adds the server farm specified in the Server Farm Name field. You need to specify a name in the Server Farm Name field for the action to take effect.
- Server Farm Remove button—Removes the server farm that is selected in the Server Farm Table. A subdialog box is displayed asking the user to confirm the action.

Real Server Config Subarea

This subarea allows the user to add and remove real servers to the server farm specified in the Server Farm Name field.

- Real IP Address field—IP address of the real server.
- TCP Port—Optional TCP Port translation for the real server.
- Real Server Add button—Adds the real server specified by the Real IP Address, TCP Port, and Server Farm Name fields. You need to specify a name in the Server Farm Name field, an IP address in the Real IP Address field, and a port number in the TCP Port field for the action to take effect.
- Real Server Remove button—Removes the real server specified by the Real IP Address, TCP Port, and Server Farm Name fields. You need to specify a name in the Server Farm Name field, an IP address in the Real IP Address field, and a port number in the TCP Port field for the action to take effect.

Virtual Servers Tab

Figure 5-38 shows the Virtual Servers tab of the C6576M SLB dialog box.

Figure 5-38 Virtual Servers Tab of the C6576M SLB Dialog Box

Virtual Server Area

The Virtual Server area of the C6576M SLB dialog box allows the user to configure a virtual server to bring it into service.

Note To modify attribute values, enter the desired value into the fields and press the Save icon in order for changes to take effect. Click **Refresh** to display the new settings.

The following information is provided:

- Virtual Server Table—Describes the virtual servers. The following attributes are displayed for the selected virtual server in the table:
  - Virtual Server Index—Unique identifier of a virtual server on the device.
  - IP Address—IP address of the virtual server. A value of 0.0.0.0 indicates that no IP address is configured.
  - TCP Port—TCP port of the virtual server. A value of 0 indicates all ports are supported. Well known port numbers include:
  - dns (53)
  - ftp (21)
  - https (443)
  - matip-a (350)
  - nntp (119)
  - pop2 (109)
  - pop3 (110)
  - smtp (25)
  - telnet (23)
  - www (80)
  - xot (1998)

Note This attribute cannot be nil if the virtual server IP address is set to a value other than 0.0.0.0. If virtual server IP address is set to 0.0.0.0, it indicates that no IP address has been configured and the value of the TCP port number is not applicable. On read, a value of 0 will always be returned.

  - Server Farm Name—Identifies the server farm associated with the virtual server. This referenced server farm must be unique on the device.
  - Idle Timer—The duration that connection information is maintained in the absence of packet activity for a connection.
  - Current Connections—Number of current connections to the virtual server.
  - Operation Status—The operational status of the virtual server. This attribute can have the following values:
  - outOfService (1)
  - operational (2)
  - failed (3)

  - Admin Status—The administrative status of the virtual server. This attribute can have the following values:
    - outOfService (1)
    - inService (2)
- Virtual Server Client Table—Describes the restricted clients of a virtual server. Client ranges are configured to permit or deny clients using the virtual server. The following columns are displayed in the table:
  - Virtual Server Name field—Unique identifier of a virtual server on the device.
  - IP Address field—IP address of a virtual server restricted client range.
  - Netmask field—Subnet mask of a virtual server restricted client range. Enabled bits indicate network addressing bits in the IP address.
  - Mode—Indicates whether or not the restricted client range defines clients that may not use the virtual server.

Virtual Server Config Area

The Virtual Server Config area of the C6576M SLB dialog box allows the user to add and configure virtual servers. The following attributes are configured:

- Virtual Server Name field—Unique identifier of a virtual server on the device.
- Virtual Server Add button—Adds the virtual server specified in the Virtual Server Name field. You need to specify a name in the Virtual Server Name field for the action to take effect.
- Virtual Server Remove button—Removes the virtual server that is selected in the Virtual Server Table. A subdialog box is displayed asking the user to confirm the action.

Client Config Subarea

- This subarea allows the user to add a client range to a virtual server definition. This action is used to restrict which clients are allowed to connect to the virtual server. The following attributes can be configured:
  - IP Address field—IP address of a virtual server restricted client range.
  - Netmask field—Subnet mask of a virtual server restricted client range. Enabled bits indicate network addressing bits in the IP address.

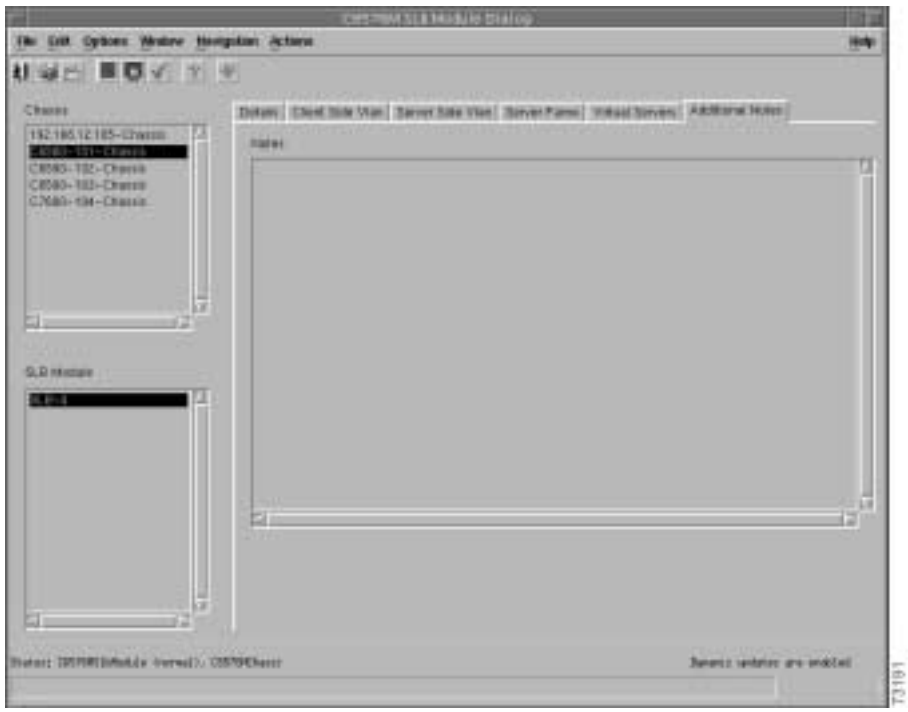
Note The IP address and netmask must specify a unique client range on the virtual server. The netmask must agree with the class of network address specified by the IP address.

  - Mode button—Indicates that the restricted client range defines clients that may not use the virtual server. The client is excluded.
  - Client Add button—Adds the client range to a virtual server definition. You need to specify a name in the Server Farm Name field, an IP address in the IP Address field, and a subnet mask in the Netmask field, and select a mode for the action to take effect.
  - Client Remove button—Removes the client range to a virtual server definition.

Additional Notes Tab

Figure 5-39 shows the Additional Notes tab of the C6576M SLB dialog box.

Figure 5-39 Additional Notes Tab of the C6576M SLB Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the SLB.

C6576M ATM T3 Interface Dialog Box

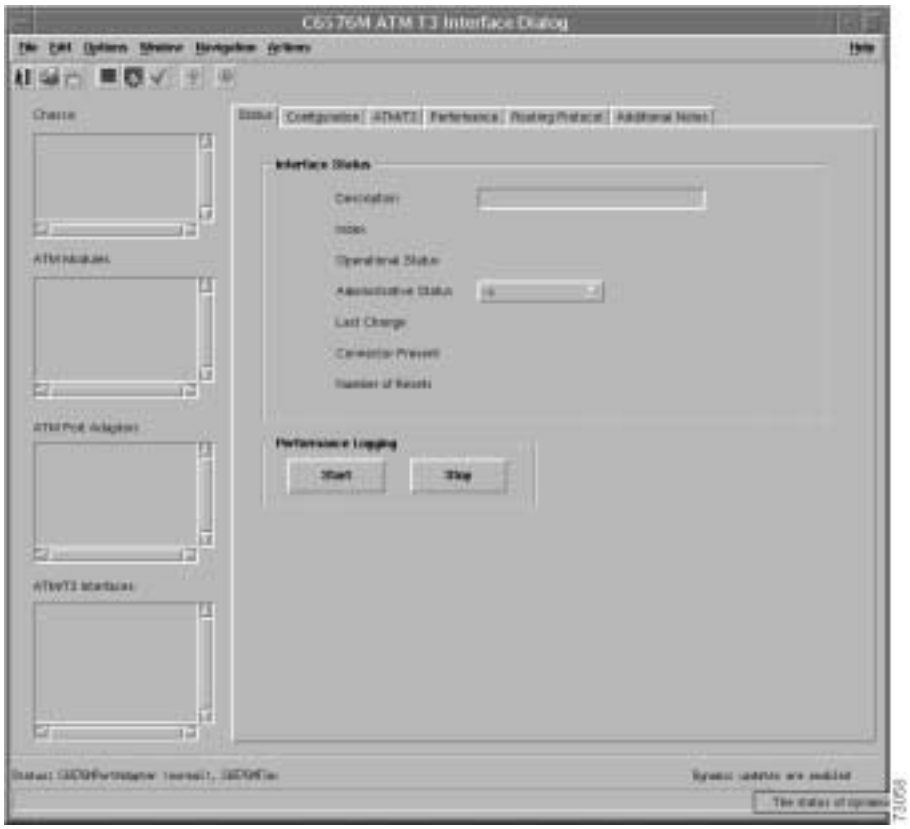
This dialog box describes a physical and logical enhanced ATM T3 interface of the PA-A3-T3 port adapter on the Catalyst 6000 family switches or Cisco 7600 series Internet Routers. This dialog box is launched from the ATM port adapter or the ATM T3 interface object within the Physical view.

You can select multiple ATM T3 interfaces, port adapters, FlexWAN modules, and chassis at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-40 shows the Status tab of the C6576M ATM T3 Interface dialog box.

Figure 5-40 Status Tab of the C6576M ATM T3 Interface Dialog Box



Interface Status Area

The Status area of the C6576M ATM T3 Interface dialog box provides the following information to describe the general characteristics of the interface.

- Description—Comment or a description to help you remember what is attached to this interface. The description is only put in the configuration to help you remember what specific interfaces are used for.
- Index—String index of the interface. This is a read-only attribute.
- Operational Status—The current operational state of the interface. This is a read-only attribute. This attribute has one of the following values:
  - testing—Indicates that no operational packets can be passed.
  - unknown
  - down
  - up
  - dormant—Interface is waiting for external actions (such as a serial line waiting for an incoming connection)
  - notPresent—Interface has missing (typically, hardware) components.
  - lowerLayerDown—The interface in the lower layer is down.
- Administrative Status—The desired state of the interface. This attribute has one of the following values:
  - testing (read-only)—Indicates that no operational packets can be passed.
  - up
  - down
- Last Change—The value (in seconds) of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, then this object contains a zero value. This is a read-only attribute.
- Connector Present—Indication if a cable is connected to the interface. If the ifAdminStatus is down, then this value cannot be determined and an “unknown” message is displayed. This is a read-only attribute. This attribute can have the following values:
  - yes—Cable is connected to the interface.
  - no—Cable is not connected to the interface.
  - unknown—Cannot determine if a cable is connected to the interface.
- Number of Resets—Number of times the interface internally reset. This is a read-only attribute.

Performance Logging Area

The Performance Logging area of the C6576M ATM T3 Interface dialog box contains the buttons to enable data logging of all the interface attributes of the interface.

- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Status Field

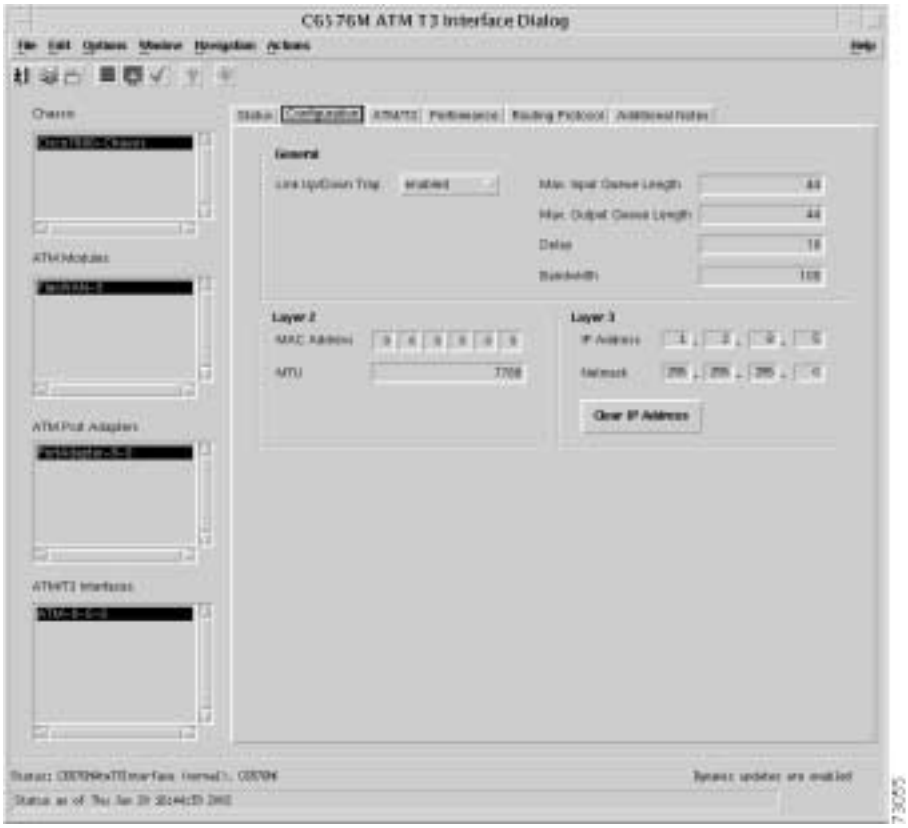
The display-only Status field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF lost communication with the device from the normal state.
- perflostcomms—CEMF lost communication with the device from the performance state.

Configuration Tab

Figure 5-41 shows the Configuration tab of the C6576M ATM T3 Interface dialog box.

Figure 5-41 Configuration Tab of the C6576M ATM T3 Interface Dialog Box



General Area

The General area contains the following information:

- Link Up/Down Trap—Enables or disables linkUp and linkDown trap generation for the interface.
- Bandwidth—Overwrites default bandwidth in kilobits per second.

Note The Bandwidth attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP, and OSPF); you cannot adjust the actual bandwidth of an interface with this command.

- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP and EIGRP); you cannot adjust the actual delay of an interface with this command.

- Input Queue Length—Input queue length in packets.
- Output Queue Length—Output queue length in packets.

Layer 2 Area

The Layer 2 area contains the following information:

- MAC Address—Displays the MAC address of the interface.
- MTU—The size of the largest packet which can be sent/received on the interface, specified in octets.

Layer 3 Area

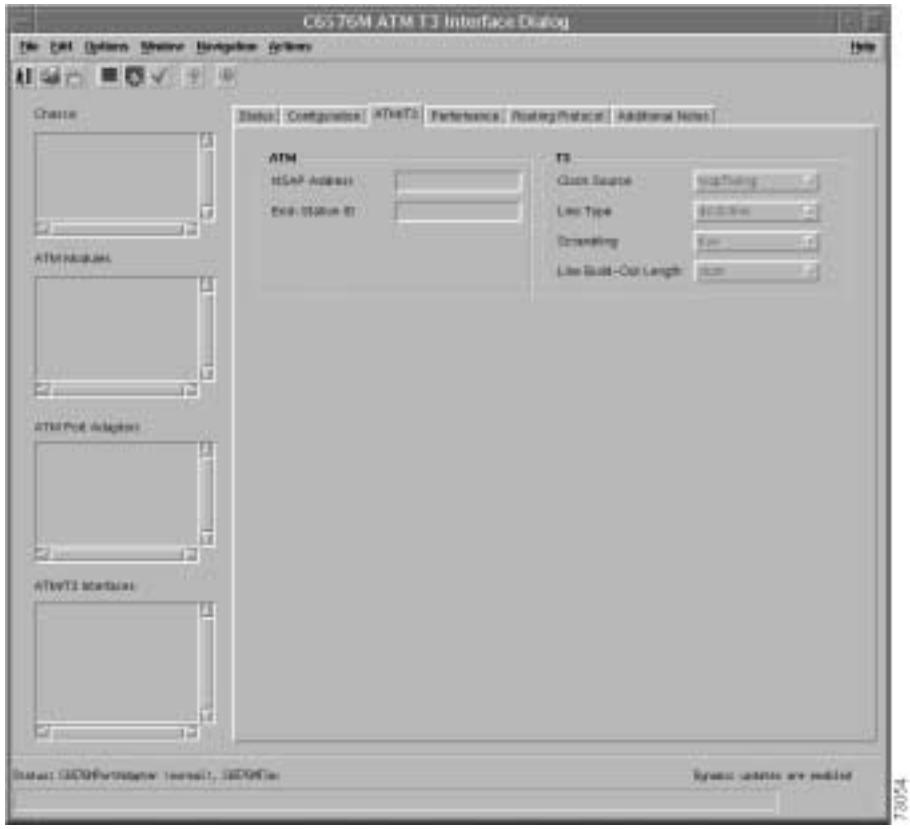
The Layer 3 area contains the following information:

- IP Address—Displays the IP address of the layer 3 interface.
- Netmask—Subnet mask of the interface IP address. Enabled bits indicate the network addressing bits in the IP address.
- Clear IP Address - After receiving confirmation, will unset the IP address for this interface.

ATM/T3 Tab

Figure 5-42 shows the ATM/T3 tab of the C6576M ATM T3 Interface dialog box.

Figure 5-42 ATM/T3 Tab of the C6576M ATM T3 Interface Dialog Box



ATM Area

The ATM area contains the following information:

- NSAP Address—Unique identifier of node in ATM network. This address is required if not implemented by ATM CM.
- End-Station ID—End-station ID of node in ATM network. The NSAP address prefix is provided by the switch to the router through ILMI. There must be a PVC configured for ILMI communication with the switch. This address is required if not implemented by ATM CM.

T3 Area

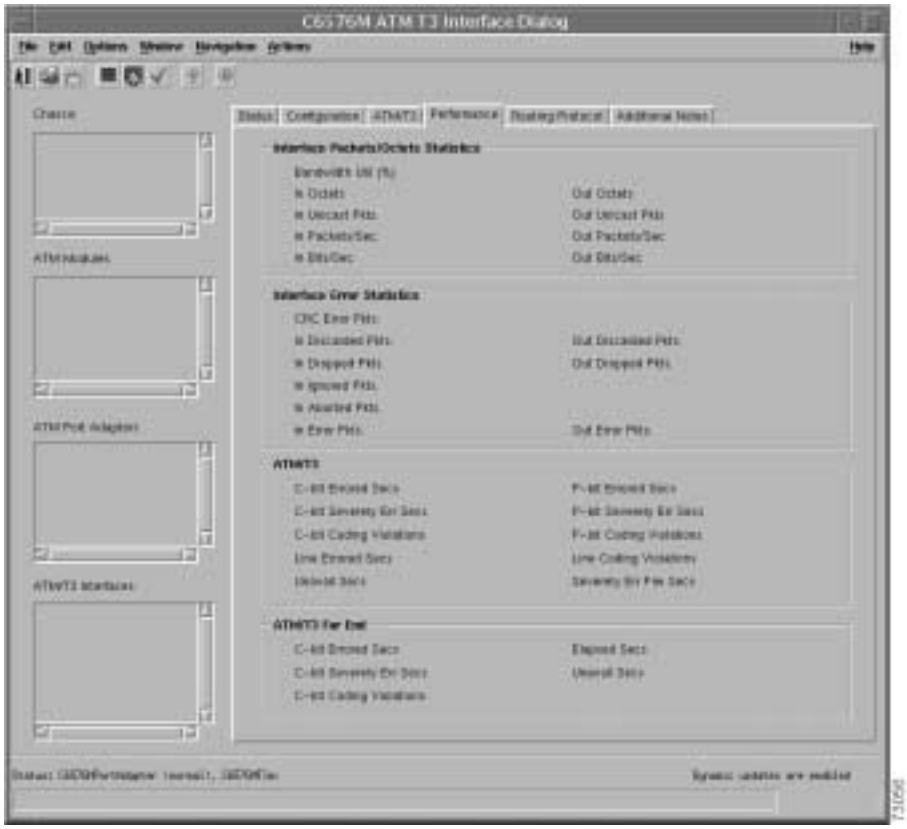
The T3 area contains the following information:

- Clock Source—Source of the transmit clock.
  - loopTiming—Indicates that the recovered receive clock is used as the transmit clock.
  - localTiming—Indicates that a local clock source is used or that an external clock is attached to the box containing the interface.
- Line Type—Indicates DS-3 framing. The following values are possible:
  - dsx3other
  - dsx3M23
  - dsx3CbitParity
  - dsx3ClearChan
- Scrambling—Indicates whether DS-3 scrambling is enabled on the interface. Scrambling assists recovery of the clock by the receiver.
- Line Build-Out Length—Line build-out length.
  - short—0 to 50 feet
  - long—Greater than 50 feet

Performance Tab

Figure 5-43 shows the Performance tab of the C6576M ATM T3 Interface dialog box.

Figure 5-43 Performance Tab of the C6576M ATM T3 Interface Dialog Box



Interface Packets/Octets Statistics Area

The Interface Packets/Octets Statistics area contains the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization.
- In Octets—Total number of received octets including framing characters.
- Out Octets—Total number of transmitted octets including framing characters.
- In Unicast Pkts.—The number of packets, delivered by this sublayer to a higher (sub-)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- Out Unicast Pkts.—The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.
- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Interface Error Statistics Area

The Interface Error Statistics area contains the following information:

- CRC Error Pkts.—Number of input packets that had cyclic redundancy checksum errors.
- In Discarded Pkts.—The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent them from being delivered to a higher-layer protocol. One possible reason for discarding such a packet is to free up buffer space.
- Out Discarded Pkts.—The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent them from being transmitted. One possible reason for discarding such a packet is to free up buffer space.
- In Dropped Pkts.—The number of packets dropped because the input queue was full.
- Out Dropped Pkts.—The number of packets dropped because the output queue was full.
- In Ignored Pkts.—Number of input packets that were ignored by this interface.
- In Aborted Pkts.—Number of input packets that were aborted.
- In Error Pkts.—The number of inbound packets that contained errors that prevented them from being deliverable to a higher-layer protocol.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

ATM/T3 Area

The ATM/T3 area contains the following information:

- C-bit Errored Secs—C-bit errored seconds.
- C-bit Severely Err Secs—C-bit severely errored seconds.
- C-bit Coding Violations—C-bit coding violations.
- P-bit Errored Secs—P-bit errored seconds.

- P-bit Severely Err Secs—P-bit severely errored seconds.
- P-bit Coding Violations—P-bit coding violations.
- Line Errored Secs—Line errored seconds.
- Line Coding Violations—Line coding violations
- Unavail Secs—Unavailable seconds.
- Severely Err Frm Secs—Severely errored framing seconds.

ATM/T3 Far End Area

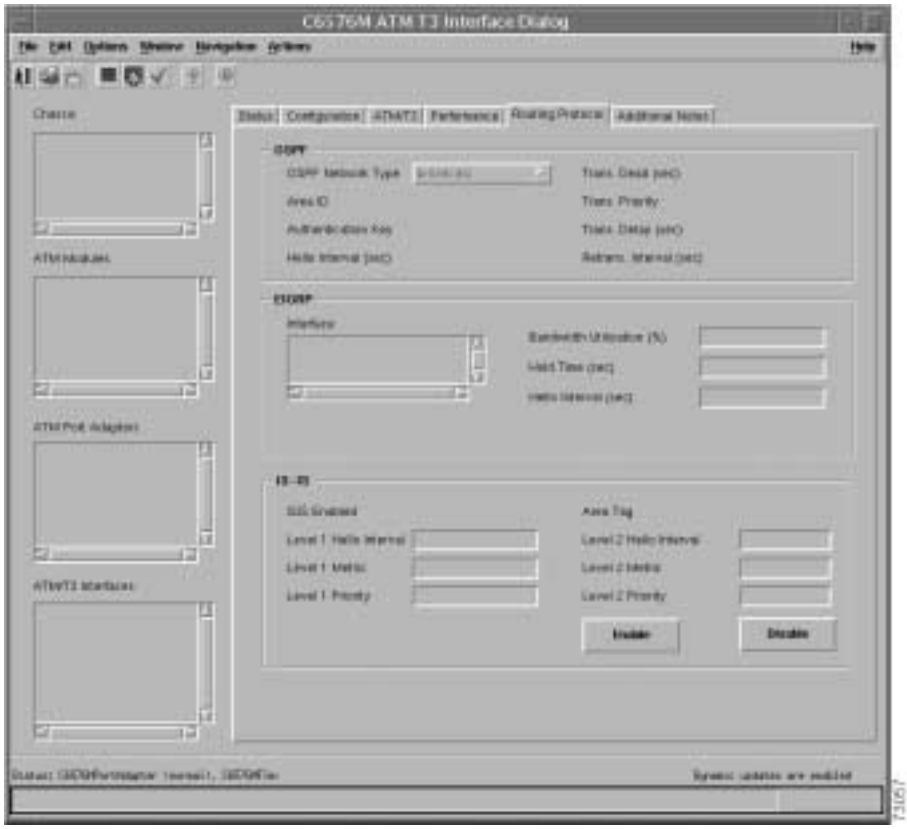
The ATM/T3 Far End area contains the following information:

- C-bit Errored Secs—Far end C-bit errored seconds.
- C-bit Severely Err Secs—Far end C-bit severely errored seconds.
- C-bit Coding Violations—Far end C-bit coding violations.
- Elapsed Secs—Number of seconds which have elapsed since the beginning of the far end current error-measurement period.
- Unavail Secs—Far end unavailable seconds.

Routing Protocol Tab

Figure 5-44 shows the Routing Protocol tab of the C6576M ATM T3 Interface dialog box.

Figure 5-44 Routing Protocol Tab of the C6576M ATM T3 Interface Dialog Box



OSPF Area

The OSPF area contains the following information:

- OSPF Network Type—OSPF network type. ATM is a point-to-point service; by default it is considered to be nonbroadcast by the OSPF routing process. An ATM interface can be configured as a broadcast interface. The OSPF network type also can be dependent on the ATM network configuration, whether or not the network is partially meshed or fully meshed.
- Area ID—The predefined ID uniquely identifying the area to which the interface connects. It can be specified as either a decimal value or as an IP address. Value is 0.0.0.0 if interface is a layer 2 (no IP address assigned) interface. This attribute is read-only.
- Authentication Key—Password to be used by neighboring OSPF routers on a network segment that is using OSPF simple password authentication. It is ignored if OSPF Authentication Type is not “simple”. This attribute is read-only.
- Hello Interval—Length of time between the hello packets sent on an OSPF interface. Must be consistent between all routers on an attached network. This attribute is read-only.

- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. In the event of a tie in this value, routers will use their router ID as a tie breaker. This attribute is read-only.
- Trans. Dead (sec)—Number of seconds that a device's hello packets must not have been seen before its neighbors declare the OSPF router down. Must be consistent among all routers on an attached network. This attribute is read-only.
- Trans. Delay (sec)—Estimated number of seconds it takes to send a link-state update packet this interface. This attribute is read-only.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions for adjacencies belonging to this interface. This value also is used when retransmitting database description and link-state request packets. This attribute is read-only.

EIGRP Area

The EIGRP area describes the EIGRP configuration of the interface on each active autonomous system. This area contains the following information:

- EIGRP Interface Table—Lists the active EIGRP routing processes on the router. Each routing process handles routing updates for a single autonomous system. The routing process only is active if it is deployed on at least one network.
- Hold Time (sec)—Hold time during which the device will wait for a hello packet to be received on the specified interface and EIGRP autonomous system number. The hold time should be at least three times the hello interval.
- Bandwidth Utilization (%)—Percentage of bandwidth that may be used by EIGRP on the interface. Values greater than 100 percent may be configured; this can be useful if the bandwidth is set artificially low for other reasons.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.

IS-IS Area

The IS-IS area contains the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface. This attribute is read-only.
- Area Tag—Identifies the IS-IS routing area that the interface participates in. If multiarea IS-IS is configured on the device, the IS-IS area must be named; otherwise, this value may be an implicit null tag. This attribute is read-only.
- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing. With smaller hello intervals, topological changes are detected faster, but there is more routing traffic.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 1 Priority—Level 1 priority. The priority is used to determine which router on a LAN will be the designated router or Designated Intermediate System (DIS). The router with the highest priority will become the DIS. In the case of equal priorities, the highest MAC address breaks the tie.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.

- Level 2 Metric—Cost of the interface for IS-IS level 2 (inter-area) route calculation.
- Level 2 Priority—Level 2 priority.
- Enable button—Enables IS-IS routing on the interface.

Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

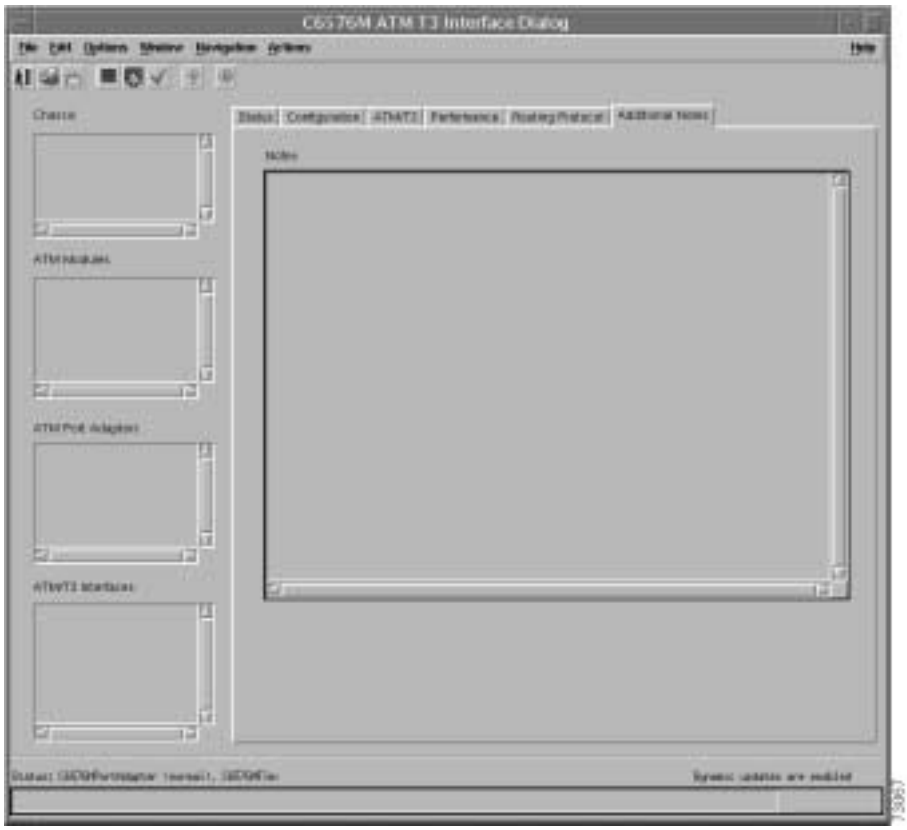
- Disable button—Disables IS-IS routing on the interface.

Note By default, all interfaces are configured as IS-IS Circuit-type Level 1-2.

Additional Notes Tab

Figure 5-45 shows the Additional Notes tab of the C6576M ATM T3 Interface dialog box.

Figure 5-45 Additional Notes Tab of the C6576M ATM T3 Interface Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the ATM T3 Interface.

C6576M ATM E3 Interface Dialog Box

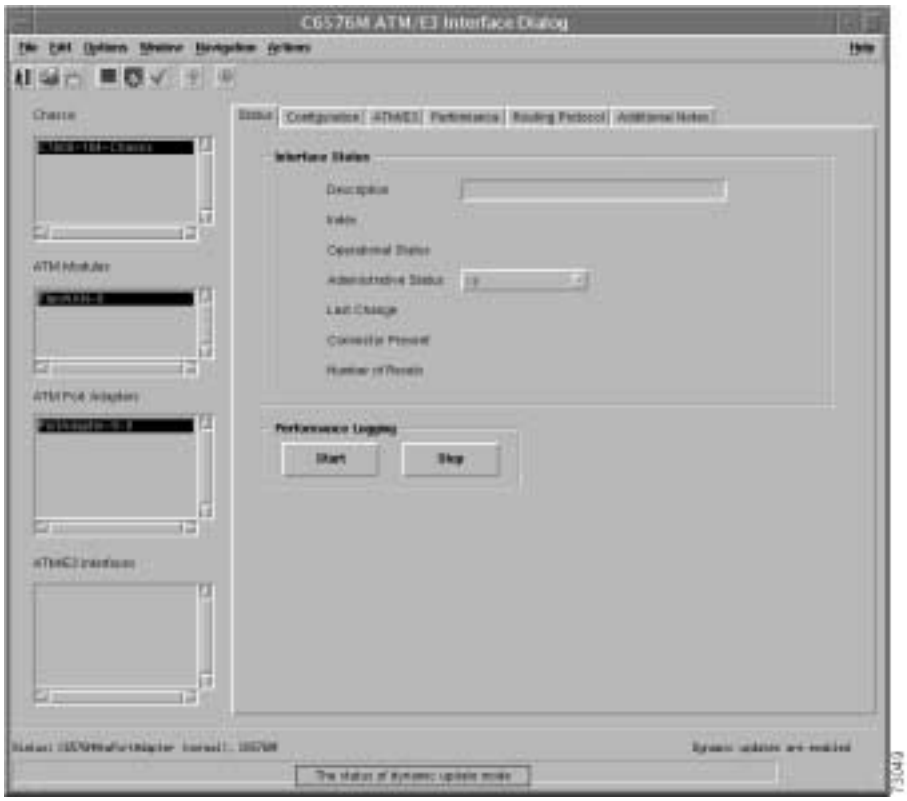
This dialog box describes a physical and logical enhanced ATM E3 interface of the PA-A3-E3 FlexWAN port adapter on the Catalyst 6000 family switches or Cisco 7600 series Internet Routers. This dialog box can be launched from the ATM port adapter or the ATM T3 interface object within the Physical view.

You can select multiple ATM E3 Interfaces, port adapters, FlexWAN modules, and chassis at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-46 shows the Status tab of the C6576M ATM E3 Interface dialog box.

Figure 5-46 Status Tab of the C6576M ATM E3 Interface Dialog Box



Interface Status Area

The Status area of the C6576M ATM E3 Interface dialog box provides the following information to describe the general characteristics of the interface:

- Description—Comment or a description to help you remember what is attached to this interface. The description is only put in the configuration to help you remember what specific interfaces are used for.

- Index—String index of the interface. This attribute is read-only.
- Operational Status—The current operational state of the interface. This attribute is read-only. This attribute has one of the following values:
  - testing—Indicates that no operational packets can be passed.
  - unknown
  - down
  - up
  - dormant—Interface is waiting for external actions (such as a serial line waiting for an incoming connection)
  - notPresent—Interface has missing (typically, hardware) components.
  - lowerLayerDown—The interface in the lower layer is down.
- Administrative Status—The desired state of the interface. This attribute has one of the following values:
  - testing (read-only)—Indicates that no operational packets can be passed.
  - up
  - down
- Last Change—The value (in seconds) of sysUpTime at the time the interface entered its current operational state. If the current state was entered prior to the last reinitialization of the local network management subsystem, then this object contains a zero value. This attribute is read-only.
- Connector Present—Indication if a cable is connected to the interface. If the ifAdminStatus is down, then this value cannot be determined and an "unknown" message is given. This attribute is read-only. This attribute can have the following values:
  - yes—Cable is connected to the interface.
  - no—Cable is not connected to the interface.
  - unknown—Cannot determine if a cable is connected to the interface.
- Number of Resets—Number of times the interface internally reset. This attribute is read-only.

Performance Logging Area

The Performance Logging area of the C6576M ATM E3 Interface dialog box contains the buttons to enable data logging of all the interface attributes of the interface.

- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to the user through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Status Field

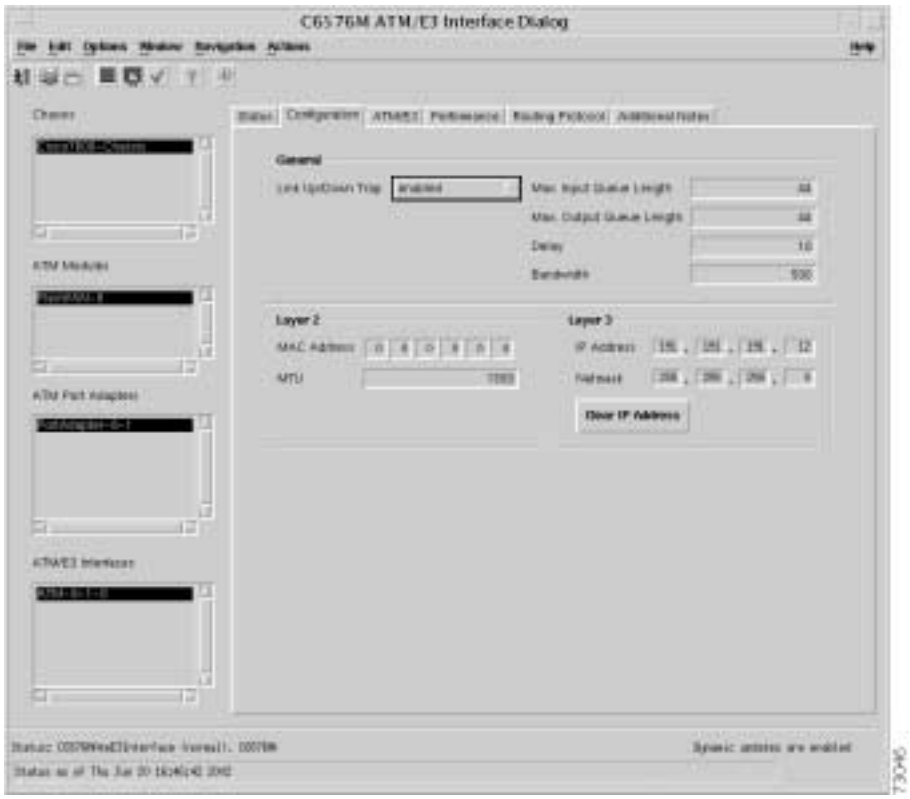
The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.

Configuration Tab

Figure 5-47 shows the Configuration tab of the C6576M ATM E3 Interface dialog box.

Figure 5-47 Configuration Tab of the C6576M ATM E3 Interface Dialog Box



General Area

The General area contains the following information:

- Link Up/Down Trap—Enables or disables linkUp and linkDown trap generation for the interface.
- Bandwidth—Overwrites default bandwidth in kilobits per second.

Note The Bandwidth attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP, and OSPF); you cannot adjust the actual bandwidth of an interface with this command.

- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP and EIGRP); you cannot adjust the actual delay of an interface with this command.

- Input Queue Length—Input queue length in packets.
- Output Queue Length—Output queue length in packets.

Layer 2 Area

The Layer 2 area contains the following information:

- MAC Address—Displays the MAC address of the interface.
- MTU—The size of the largest packet which can be sent/received on the interface, specified in octets.

Layer 3 Area

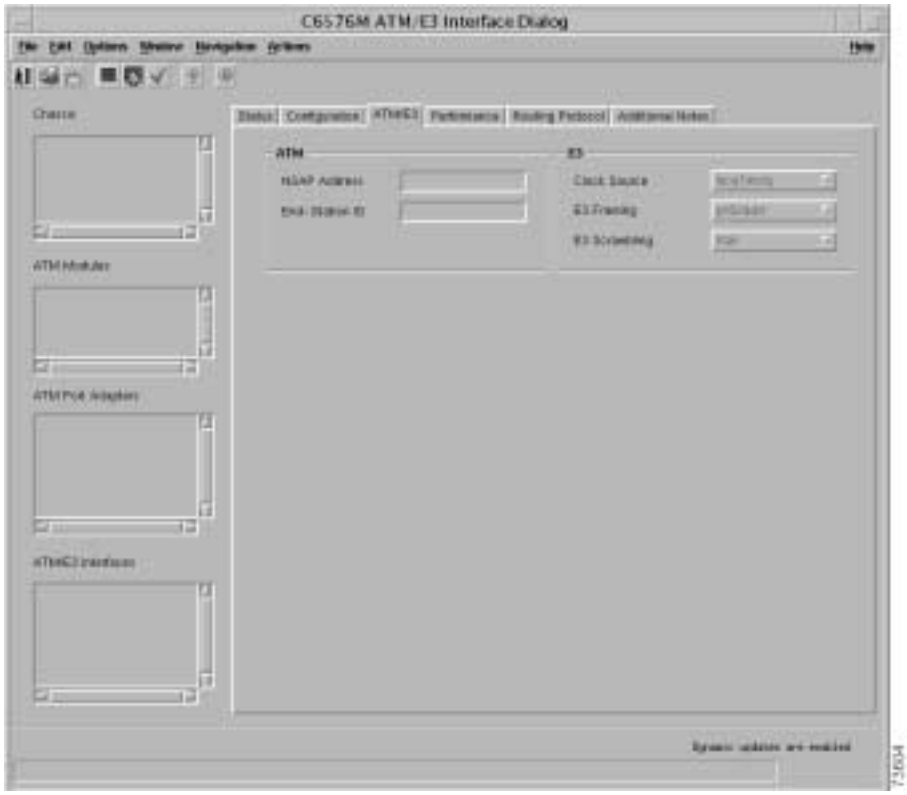
The Layer 3 area contains the following information:

- IP Address—Displays the IP address of the layer 3 interface.
- Netmask—Subnet mask of the interface IP address. Enabled bits indicate the network addressing bits in the IP address.
- Clear IP Address button— After receiving confirmation, will unset the IP address for this interface.

ATM/E3 Tab

Figure 5-48 shows the ATM/E3 tab of the C6576M ATM E3 Interface dialog box.

Figure 5-48 ATM/E3 Tab of the C6576M ATM E3 Interface Dialog Box



ATM Area

The ATM area contains the following information:

- NSAP Address—Unique identifier of node in ATM network. This address is required if not implemented by ATM CM.
- End-Station ID—End-station ID of node in ATM network. The NSAP address prefix is provided by the switch to the router through ILMI. There must be a PVC configured for ILMI communication with the switch. This address is required if not implemented by ATM CM.

E3 Area

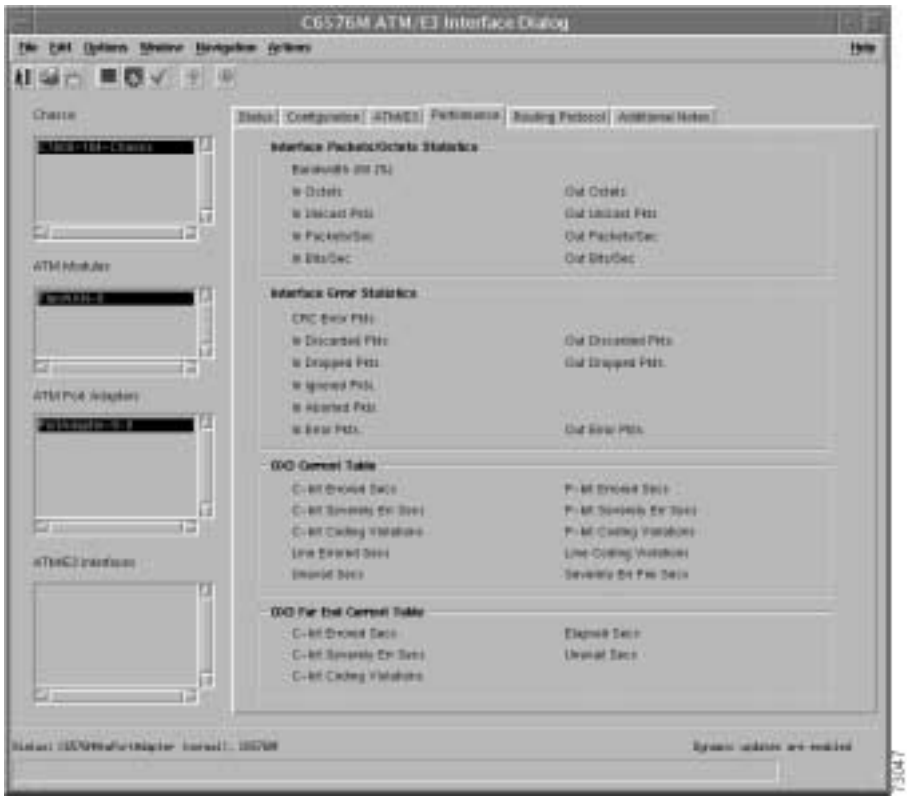
The E3 area contains the following information:

- Clock Source—Source of the transmit clock.
  - loopTiming—Indicates that the recovered receive clock is used as the transmit clock.
  - localTiming—Indicates that a local clock source is used or that an external clock is attached to the box containing the interface.
- E3 Framing—Describes E3 framing. The following values are possible:
  - g832adm
  - g751adm
  - g751plcp
- E3 Scrambling—Indicates whether or not E3 scrambling is enabled on the interface. Scrambling assists recovery of the clock by the receiver.

Performance Tab

Figure 5-49 shows the Performance tab of the C6576M ATM E3 Interface dialog box. All attributes shown in this tab are read-only.

Figure 5-49 Performance Tab of the C6576M ATM E3 Interface Dialog Box



Interface Packets / Octets Statistics Area

The Interface Packets/Octets Statistics area contains the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization.
- In Octets—Total number of received octets including framing characters.
- Out Octets—Total number of transmitted octets including framing characters.
- In Unicast Pkts.—The number of packets, delivered by this sublayer to a higher (sub-)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- Out Unicast Pkts.—The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.
- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Interface Error Statistics Area

The Interface Error Statistics area contains the following information:

- CRC Error Pkts.—Number of input packets which had cyclic redundancy checksum errors.
- In Discarded Pkts.—The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent them from being deliverable to a higher-layer protocol. One possible reason for discarding such a packet is to free up buffer space.
- Out Discarded Pkts.—The number of outbound packets which were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.
- In Dropped Pkts.—The number of packets dropped because the input queue was full.
- Out Dropped Pkts.—The number of packets dropped because the output queue was full.
- In Ignored Pkts.—Number of input packets that were simply ignored by this interface.
- In Aborted Pkts.—Number of input packets that were aborted.
- In Error Pkts.—The number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

DX3 Current Area

The DX3 Current area contains the following information:

- C-bit Errored Secs—C-bit errored seconds.
- C-bit Severely Err Secs—C-bit severely errored seconds.
- C-bit Coding Violations—C-bit coding violations.
- P-bit Errored Secs—P-bit errored seconds.

- P-bit Severely Err Secs—P-bit severely errored seconds.
- P-bit Coding Violations—P-bit coding violations.
- Line Errored Secs—Line errored seconds.
- Line Coding Violations—Line coding violations
- Unavail Secs—Unavailable seconds.
- Severely Err Frm Secs—Severely errored framing seconds.

DX3 Far End Current Area

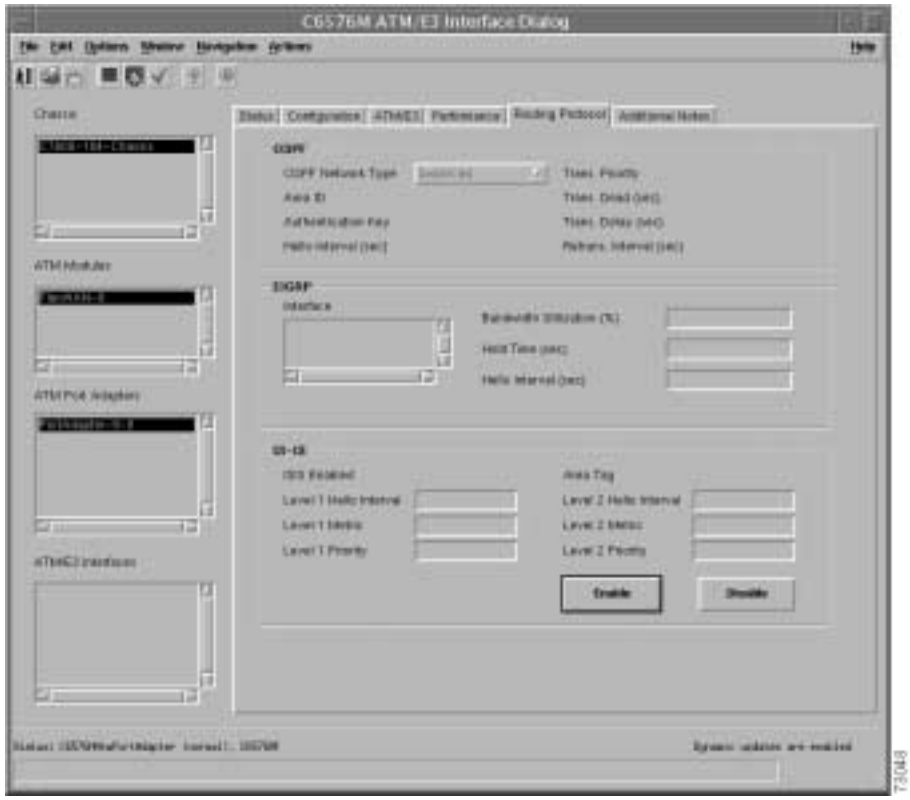
The DX3 Far End Current area contains the following information:

- C-bit Errored Secs—Far end C-bit errored seconds.
- C-bit Severely Err Secs—Far end C-bit severely errored seconds.
- C-bit Coding Violations—Far end C-bit coding violations.
- Elapsed Secs—Number of seconds that have elapsed since the beginning of the far end current error-measurement period.
- Unavail Secs—Far end unavailable seconds.

Routing Protocol Tab

Figure 5-50 shows the Routing Protocol tab of the C6576M ATM E3 Interface dialog box.

Figure 5-50 Routing Protocol Tab of the C6576M ATM E3 Interface Dialog Box



OSPF Area

The OSPF area contains the following information:

- OSPF Network Type—OSPF network type. ATM is a point-to-point service; by default it is considered to be nonbroadcast by the OSPF routing process. An ATM interface can, however, be configured as a broadcast interface. The OSPF network type can also be dependent on the ATM network configuration, whether the network is partially meshed or fully meshed.
- Area ID—The predefined ID uniquely identifying the area to which the interface connects. It can be specified as either a decimal value or as an IP address. Value is 0.0.0.0 if interface is a layer 2 (no IP address assigned) interface. This attribute is read-only.
- Authentication Key—Password to be used by neighboring OSPF routers on a network segment that is using OSPF simple password authentication. This password is ignored if OSPF Authentication Type is not “simple”. This attribute is read-only.
- Hello Interval—Length of time between the hello packets sent on an OSPF interface. Must be consistent among all routers on an attached network. This attribute is read-only.

- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. In the event of a tie in this value, routers will use their Router ID as a tie breaker. This attribute is read-only.
- Trans. Dead (sec)—Number of seconds that a device's hello packets must not have been seen before its neighbors declare the OSPF router down. Must be consistent among all routers on an attached network. This attribute is read-only.
- Trans. Delay (sec)—Estimated number of seconds it takes to send a link-state update packet this interface. This attribute is read-only.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions, for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets. This attribute is read-only.

EIGRP Area

The EIGRP area describes the EIGRP configuration of the interface on each active autonomous system. This area contains the following information:

- EIGRP Interface Table—Lists the active EIGRP routing processes on the router. Each routing process handles routing updates for a single autonomous system. The routing process is only active if it is deployed on at least one network.
- Hold Time (sec)—Hold time during which the device will wait for a hello packet to be received on the specified interface and EIGRP autonomous system number. The hold time should be at least three times the hello interval.
- Bandwidth Utilization (%)—Percentage of bandwidth that may be used by EIGRP on the interface. Values greater than 100 percent may be configured; this can be useful if the bandwidth is set artificially low for other reasons.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.

IS-IS Area

The IS-IS area contains the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface. This attribute is read-only.
- Area Tag—Identifies the IS-IS routing area that the interface participates in. If multiarea IS-IS is configured on the device, the IS-IS area must be named; otherwise, this value may be an implicit null tag. This attribute is read-only.
- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing. With smaller hello intervals, topological changes are detected faster, but there is more routing traffic.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 1 Priority—Level 1 priority. The priority is used to determine which router on a LAN will be the designated router or designated intermediate system (DIS). The router with the highest priority will become the DIS. In the case of equal priorities, the highest MAC address breaks the tie.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.

- Level 2 Metric—Cost of the interface for IS-IS level 2 (inter-area) route calculation.
- Level 2 Priority—Level 2 priority.
- Enable button—Enable IS-IS routing on the interface.

Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

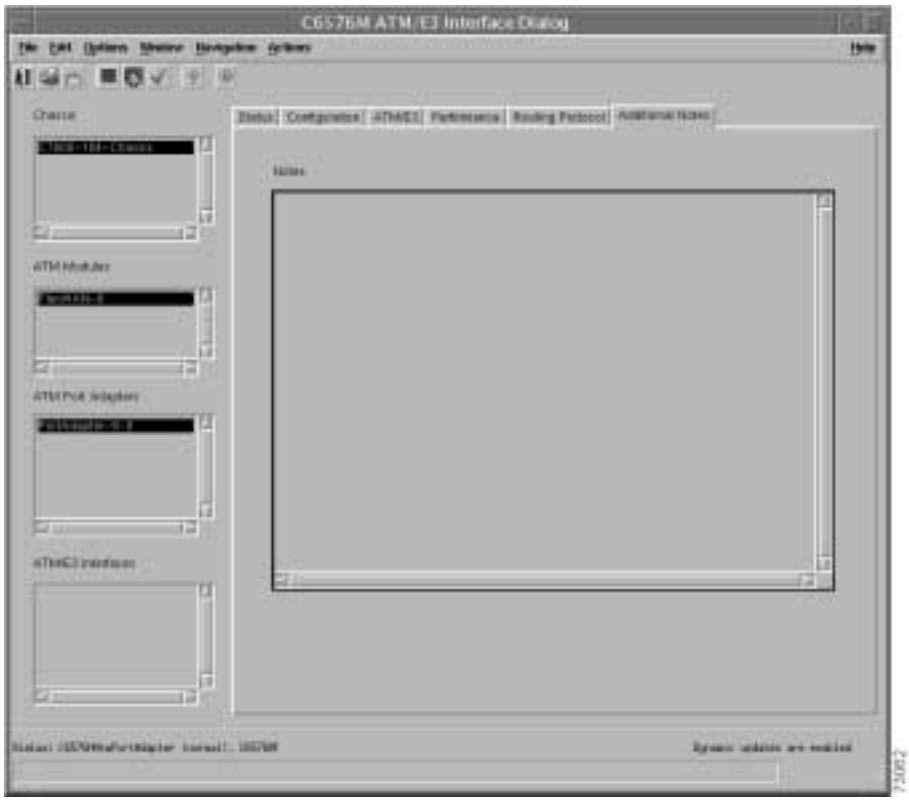
- Disable button—Disable IS-IS routing on the interface.

Note By default, all interfaces are configured as IS-IS Circuit-type Level 1-2.

Additional Notes Tab

Figure 5-51 shows the Additional Notes tab of the C6576M ATM E3 Interface dialog box.

Figure 5-51 Additional Notes Tab of the C6576M ATM E3 Interface Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the ATM E3 Interface.

C6576M ATM SONET Interface Dialog Box

This dialog box describes a physical and logical enhanced ATM OC-3 interface of a FlexWAN port adapter on the Catalyst 6000 family switches or Cisco 7600 series Internet Routers. This dialog box can be launched from the ATM Port Adapter or ATM Sonet interface object within the Physical view.

You can select multiple ATM SONET interfaces, port adapters, FlexWAN modules, and chassis at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-52 shows the Status tab of the C6576M ATM SONET Interface dialog box.

Figure 5-52 Status Tab of the C6576M ATM SONET Interface Dialog Box

Interface Status Area

The Status area of the C6576M ATM SONET Interface dialog box provides the following information to describe the general characteristics of the interface:

- Description—Comment or a description to help you remember what is attached to this interface. The description is only put in the configuration to help you remember what specific interfaces are used for.
- Index—String index of the interface. This attribute is read-only.
- Operational Status—The current operational state of the interface. This attribute is read-only. This attribute has one of the following values:
  - testing—Indicates that no operational packets can be passed.
  - unknown
  - down
  - up
  - dormant—Interface is waiting for external actions (such as a serial line waiting for an incoming connection)
  - notPresent—Interface has missing (typically, hardware) components.
  - lowerLayerDown—The interface in the lower layer is down.
- Administrative Status—The desired state of the interface. This attribute has one of the following values:
  - testing (read-only)—Indicates that no operational packets can be passed.
  - up
  - down
- Last Change—The value (in seconds) of sysUpTime at the time the interface entered its current operational state. If the current state was entered before the last reinitialization of the local network management subsystem, then this object contains a zero value. This attribute is read-only.
- Connector Present—Indication if a cable is connected to the interface. If the ifAdminStatus is down, then this value cannot be determined and an “unknown” message is given. This attribute is read-only. This attribute can have the following values:
  - yes—Cable is connected to the interface.
  - no—Cable is not connected to the interface.
  - unknown—Cannot determine if a cable is connected to the interface.
- Number of Resets—Number of times the interface internally reset. This attribute is read-only.

ATM/SONET Area

The ATM/SONET area of the C6576M ATM SONET Interface dialog box provides the following information:

- **SONET Section Status**—Status of the SONET Section. This status may indicate multiple simultaneous defects. This has one of the following values:
  - sonetSectionNoDefect—No defect.
  - sonetSectionLOS—Error condition, Loss Of Signal.
  - sonetSectionLOF—Error condition, Loss Of Frame.
- **SONET Line Status**—Status of the SONET Line. This status may indicate multiple simultaneous defects. This can have one of the following values:
  - sonetLineNoDefect—No defect.
  - sonetLineAIS—Line defect Alarm Indication Signal.
  - sonetLineRDI—Line defect Remote Defect Indication.
- **SONET Path Status**—Status of the SONET Path. This status may indicate multiple simultaneous defects. This can have one of the following values:
  - sonetPathNoDefect—No defect.
  - sonetPathSTSLOP—STS-Path Loss of Pointer.
  - sonetPathSTSAIS—STS-Path Alarm Indication Signal.
  - sonetPathSTSRDI—STS-Path Remote Defect Indication.
  - sonetPathUnequipped—Unequipped.
  - sonetPathSignalLabelMismatch—Signal Label Mismatch.

Performance Logging Area

The Performance Logging area of the C6576M ATM T3 Interface dialog box contains buttons to enable data logging of all the interface attributes of the interface:

- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Status Field

The display-only Status field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF lost communication with the device from the normal state.
- perflostcomms—CEMF lost communication with the device from the performance state.

Configuration Tab

Figure 5-53 shows the Configuration tab of the C6576M ATM SONET Interface dialog box.

Figure 5-53 Configuration Tab of the C6576M ATM SONET Interface Dialog Box

General Area

The General area contains the following information:

- Link Up/Down Trap—Enables or disables linkUp and linkDown trap generation for the interface.
- Bandwidth—Overwrites default bandwidth in kilobits per second.

Note The Bandwidth attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP, and OSPF); you cannot adjust the actual bandwidth of an interface with this command.

- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP and EIGRP); you cannot adjust the actual delay of an interface with this command.

- Input Queue Length—Input queue length in packets.
- Output Queue Length—Output queue length in packets.

Layer 2 Area

The Layer 2 area contains the following information:

- MAC Address—Displays the MAC address of the interface.
- MTU—The size of the largest packet which can be sent or received on the interface, specified in octets.

Layer 3 Area

The Layer 3 area contains the following information:

- IP Address—Displays the IP address of the Layer 3 interface.
- Netmask—Subnet mask of the interface IP address. Enabled bits indicate the network addressing bits in the IP address.
- Clear IP Address button - After receiving confirmation, will unset the IP address for this interface.

ATM/Sonet Tab

Figure 5-54 shows the ATM/Sonet tab of the C6576M ATM/Sonet Interface dialog box.

Figure 5-54 ATM/Sonet Tab of the C6576M ATM /Sonet Interface Dialog Box

ATM/SONET Configuration Area

The ATM/SONET Configuration area contains the following information:

- Clock Source—Source of the transmit clock.
  - loopTiming—Indicates that the recovered receive clock is used as the transmit clock.
  - localTiming—Indicates that a local clock source is used or that an external clock is attached to the box containing the interface.
- SONET Framing—SONET framing for ATM cell transmission. The following values are possible:
  - sts-3c—Synchronous Transport Signal level 3 concatenated is the SONET (N. American) format that specifies the frame structure for a 155.52-Mbps line.
  - stm-1—Synchronous Transport Module level 1 is the SDH (European) format that specifies the frame structure for a 155.52-Mbps line.

- NSAP Address—Unique identifier of node in ATM network. Required if not implemented by ATM CM.
- End-Station ID—End-station ID of node in ATM network. The NSAP address prefix is provided by the switch to the router through ILMI. There must be a PVC configured for ILMI communication with the switch. Required if not implemented by ATM CM.
- SONET Path Width—Width of the SONET path. This attribute is read-only. This is described by the STS-Nc SPE.
  - STS-3c/STM-1—For OC-3 signal (155.52 Mbps).
  - STS-12c/STM-4—For OC-12 signal (622.08 Mbps).

SONET Medium Configuration Area

The SONET Medium Configuration area contains the following information. All attributes in this area are read-only.

- Type—Indicates whether or not a SONET or SDH signal is used on the interface.
- Line Type—Line type of the interface. The following values are possible:
  - sonetShortSingleMode
  - sonetLongSingleMode
  - sonetMultiMode
- Line Coding—Line coding for the interface:
  - sonetMediumB3ZS—For electrical SONET/SDH signals (STS-1 and STS-3).
  - sonetMediumCMI—For electrical SONET/SDH signals (STS-1 and STS-3).
  - sonetMediumNRZ—Non-return to Zero, which is used for optical SONET/SDH signals.
  - sonetMediumRZ—Return to Zero, which is used for optical SONET/SDH signals.
  - sonetMediumOther—Other.

Performance Tab

Figure 5-55 shows the Performance tab of the C6576M ATM SONET Interface dialog box. All attributes in this area are read-only.

Figure 5-55 Performance Tab of the C6576M ATM SONET Interface Dialog Box

Interface Packets/Octets Statistics Area

The Interface Packets/Octets Statistics area contains the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization.
- In Octets—Total number of received octets including framing characters.
- Out Octets—Total number of transmitted octets including framing characters.
- In Unicast Pkts.—The number of packets delivered by this sublayer to a higher (sub)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- Out Unicast Pkts.—The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.

- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Interface Error Statistics Area

The Interface Error Statistics area contains the following information:

- CRC Error Pkts.—Number of input packets that had cyclic redundancy checksum errors.
- In Discarded Pkts.—The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
- Out Discarded Pkts.—The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent them from being transmitted. One possible reason for discarding such a packet is to free up buffer space.
- In Dropped Pkts.—The number of packets dropped because the input queue was full.
- Out Dropped Pkts.—The number of packets dropped because the output queue was full.
- In Ignored Pkts.—Number of input packets which were ignored by this interface.
- In Aborted Pkts.—Number of input packets that were aborted.
- In Error Pkts.—The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

SONET Section Error Statistics Area

The SONET Section Error Statistics area contains the following information:

- Errored Secs—Number of errored seconds encountered by the SONET Section in the current 15-minute interval.
- Severely Err Secs—Number of severely errored seconds encountered by the SONET Section in the current 15-minute interval.
- Coding Violations—Number of coding violations encountered by the SONET Section in the current 15-minute interval.
- Severely Err Frm Secs—Number of severely errored framing seconds encountered by the SONET Section in the current 15-minute interval.

SONET Line Error Statistics Area

The SONET Line Error Statistics area contains the following information:

- Errored Secs—Number of errored seconds encountered by the SONET Line in the current 15-minute interval.
- Severely Err Secs—Number of severely errored seconds encountered by the SONET Line in the current 15-minute interval.
- Coding Violations—Number of coding violations encountered by the SONET Line in the current 15-minute interval.
- Unavailable Secs—Number of unavailable seconds encountered by the SONET Line in the current 15-minute interval.

SONET Far End Line Error Statistics Area

The SONET Far End Line Error Statistics area contains the following information:

- Errored Secs—Number of far end errored seconds encountered by the SONET Line in the current 15-minute interval.
- Severely Err Secs—Number of severely far end errored seconds encountered by the SONET Line in the current 15-minute interval.
- Coding Violations—Number of far end coding violations encountered by the SONET Line in the current 15-minute interval.
- Unavailable Secs—Number of far end unavailable seconds encountered by the SONET Line in the current 15-minute interval.

SONET Path Error Statistics Area

The SONET Path Error Statistics area contains the following information:

- Errored Secs—Number of errored seconds encountered by the SONET Path in the current 15-minute interval.
- Severely Err Secs—Number of severely errored seconds encountered by the SONET Path in the current 15-minute interval.
- Coding Violations—Number of coding violations encountered by the SONET Path in the current 15-minute interval.
- Unavailable Secs—Number of unavailable seconds encountered by the SONET Path in the current 15-minute interval.

SONET Far End Path Error Statistics Area

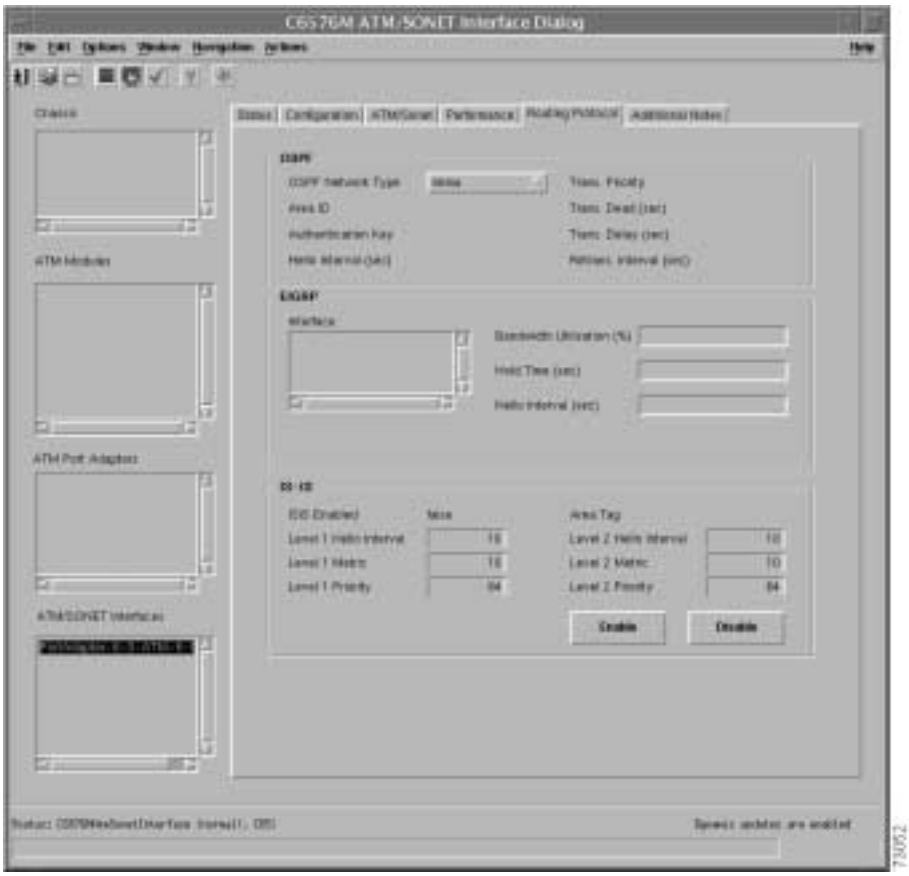
The SONET Far End Path Error Statistics area contains the following information:

- Errored Secs—Number of far end errored seconds encountered by the SONET Path in the current 15-minute interval.
- Severely Err Secs—Number of far end severely errored seconds encountered by the SONET Path in the current 15-minute interval.
- Coding Violations—Number of far end coding violations encountered by the SONET Path in the current 15-minute interval.
- Unavailable Secs—Number of far end unavailable seconds encountered by the SONET Path in the current 15-minute interval.

Routing Protocol Tab

Figure 5-56 shows the Routing Protocol tab of the C6576M ATM SONET Interface dialog box.

Figure 5-56 Routing Protocol Tab of the C6576M ATM SONET Interface Dialog Box



OSPF Area

The OSPF area contains the following information:

- OSPF Network Type—OSPF network type. ATM is a point-to-point service; by default it is considered to be nonbroadcast by the OSPF routing process. An ATM interface can be configured as a broadcast interface. The OSPF network type also can be dependent on the ATM network configuration, whether the network is partially meshed or fully meshed.
- Area ID—The predefined ID uniquely identifying the area to which the interface connects. It can be specified as either a decimal value or as an IP address. Value is 0.0.0.0 if interface is a layer 2 (no IP address assigned) interface. This attribute is read-only.
- Authentication Key—Password to be used by neighboring OSPF routers on a network segment that is using OSPF simple password authentication. It is ignored if OSPF Authentication Type is not “simple”. This attribute is read-only.
- Hello Interval—Length of time between the hello packets sent on an OSPF interface. Must be consistent between all routers on an attached network. This attribute is read-only.
- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. In the event of a tie in this value, routers will use their router ID as a tie breaker. This attribute is read-only.
- Trans. Dead (sec)—Number of seconds that a device’s hello packets must not have been seen before its neighbors declare the OSPF router down. Must be consistent among all routers on an attached network. This attribute is read-only.
- Trans. Delay (sec)—Estimated number of seconds it takes to send a link-state update packet this interface. This attribute is read-only.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions for adjacencies belonging to this interface. This value also is used when retransmitting database description and link-state request packets. This attribute is read-only.

EIGRP Area

The EIGRP area describes the EIGRP configuration of the interface on each active autonomous system. This area contains the following information:

- EIGRP Interface Table—Lists the active EIGRP routing processes on the router. Each routing process handles routing updates for a single autonomous system. The routing process only is active if it is deployed on at least one network.
- Hold Time (sec)—Hold time during which the device will wait for a hello packet to be received on the specified interface and EIGRP autonomous system number. The hold time should be at least three times the hello interval.
- Bandwidth Utilization (%)—Percentage of bandwidth that may be used by EIGRP on the interface. Values greater than 100 percent may be configured; this can be useful if the bandwidth is set artificially low for other reasons
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.

IS-IS Area

The IS-IS area contains the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface. This attribute is read-only.
- Area Tag—Identifies the IS-IS routing area that the interface participates in. If multiyear IS-IS is configured on the device, the IS-IS area must be named; otherwise, this value may be an implicit null tag. This attribute is read-only.
- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing. With smaller hello intervals, topological changes are detected faster, but there is more routing traffic.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 1 Priority—Level 1 priority. The priority is used to determine which router on a LAN will be the designated router or designated intermediate system (DIS). The router with the highest priority will become the DIS. In the case of equal priorities, the highest MAC address breaks the tie.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.
- Level 2 Metric—Cost of the interface for IS-IS level 2 (interarea) route calculation.
- Level 2 Priority—Level 2 priority.
- Enable button—Enables IS-IS routing on the interface.

Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

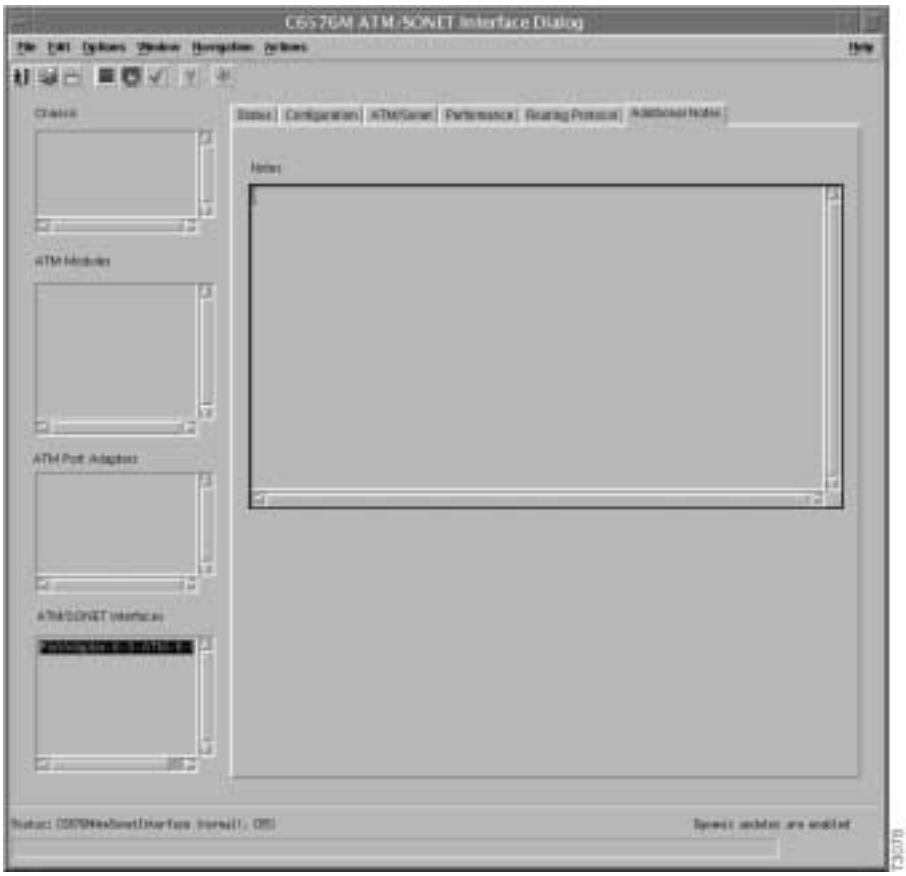
- Disable button—Disables IS-IS routing on the interface.

Note By default, all interfaces are configured as IS-IS Circuit-type Level 1-2.

Additional Notes Tab

Figure 5-57 shows the Additional Notes tab of the C6576M ATM SONET Interface dialog box.

Figure 5-57 Additional Notes Tab of the C6576M ATM SONET Interface Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the ATM SONET Interface.

C6576M OSM GE-WAN Interface Dialog Box

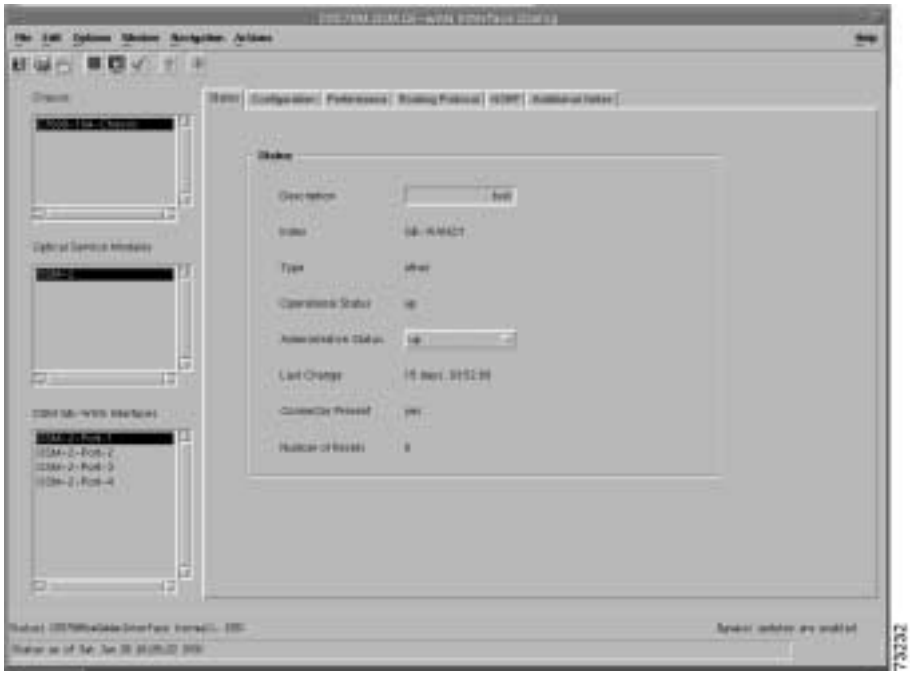
This dialog box describes a physical and logical Gigabit Ethernet WAN (GE-WAN) interface on the OSM-4GE-WAN-GBIC module. This dialog box can be launched from the OSM object or OSM GE-WAN Interface object within the Physical view.

You can select multiple OSM GE-WAN Interfaces, OSMs, and chassis at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-58 shows the Status tab of the C6576M OSM GE-WAN Interface dialog box.

Figure 5-58 Status Tab of the C6576M OSM GE-WAN Interface Dialog Box



Status Area

The Status area of the C6576M OSM GE-WAN Interface dialog box provides the following information to describe the general characteristics of the interface:

- Description—Comment or a description to help you remember what is attached to this interface. The description is only put in the configuration to help you remember what specific interfaces are used for.
- Index—String index of the interface. This attribute is read-only.
- Type—Describes the physical interface type. This attribute is read-only.
- Operational Status—The current operational state of the interface. This attribute is read-only. This attribute has one of the following values:

  - other
  - ok
  - minorFault
  - majorFault
- Administrative Status—The desired state of the interface. This attribute has one of the following values:
  - testing (read-only)—Indicates that no operational packets can be passed.
  - up
  - down
- Last Change—The value (in seconds) of sysUpTime at the time the interface entered its current operational state. If the current state was entered before the last reinitialization of the local network management subsystem, then this object contains a zero value. This attribute is read-only.
- Connector Present—Indication if a cable is connected to the interface. If the ifAdminStatus is down, then this value cannot be determined and an “unknown” message is given. This attribute is read-only. This attribute has the following values:
  - yes—Cable is connected to the interface.
  - no—Cable is not connected to the interface.
  - unknown—Cannot determine if a cable is connected to the interface.
- Number of Resets—Number of times the interface internally reset. This attribute is read-only.

Status Field

The display-only Status field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.

Configuration Tab

Figure 5-59 shows the Configuration tab of the C6576M OSM GE-WAN Interface dialog box.

Figure 5-59 Configuration Tab of the C6576M OSM GE-WAN Interface Dialog Box

General Area

The General area of the C6576M OSM GE-WAN Interface dialog box provides the following information:

- Speed—The desired speed of this port in bits per second. This attribute should have this value:
  - 1 Gb/s

Note If an unsupported speed is selected, an error is reported.

- Duplex—Displays the duplex mode for the port. This attribute should have this value:
  - full-duplex
- Input Queue Length—Displays the input queue length in packets.
- Output Queue Length—Displays the output queue length in packets.
- Link Up/Down Trap—Indicates if link up or link down traps are being generated. This list contains the following values:
  - enabled
  - disabled
- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP and EIGRP); you cannot adjust the actual delay of an interface with this command.

- Bandwidth—Overwrites default bandwidth in kilobits per second.

Note The Bandwidth attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP, and OSPF); you cannot adjust the actual bandwidth of an interface with this command.

Layer 2 Area

The Layer 2 area of the C6576M OSM GE-WAN interface dialog box provides the following information:

- MAC Address—Displays the MAC address of the interface.
- MTU—The size, specified in octets, of the largest datagram (frame) that can be sent on the interface.

Note A GE interface that is using a nondefault MTU cannot be added to an EtherChannel with GE interfaces using the default MTU. If the interface MTU is changed for one interface, the change is applied to all interfaces (GE and GE EtherChannel) using a nondefault MTU.

Note **IOS 12.1(8a)E5 caveat**: Jumbo frame support is incompatible with the IS-IS routing protocol. Leave the MTU size at the default value on any interface where IS-IS provides routing.

Layer 3 Area

The Layer 3 area of the C6576M Ethernet Interface dialog box provides the following information:

- IP Address—Displays the IP address of the layer 3 interface.
- Netmask—Subnet mask of the interface IP address. Enabled bits indicate the network addressing bits in the IP address.
- Clear IP Address button—After receiving confirmation, will unset the IP address for this interface.

Performance Tab

Figure 5-60 shows the Performance tab of the C6576M OSM GE-WAN Interface dialog box. All attributes in this area are read-only.

Figure 5-60 Performance Tab of the C6576M OSM GE-WAN Interface Dialog Box

Packets/Octets Statistics Area

The Interface Packets/Octets Statistics area contains the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization.
- In Octets—Total number of received octets including framing characters.
- Out Octets—Total number of transmitted octets including framing characters.
- In Unicast Pkts.—The number of packets, delivered by this sublayer to a higher (sub-)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- Out Unicast Pkts.—The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.
- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Error Statistics Area

The Interface Error Statistics area contains the following information:

- CRC Error Pkts.—Number of input packets that had cyclic redundancy checksum errors.

- In Discarded Pkts.—The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being delivered to a higher-layer protocol. One possible reason for discarding such a packet is to free up buffer space.
- Out Discarded Pkts.—The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet is to free up buffer space.
- In Dropped Pkts.—The number of packets dropped because the input queue was full.
- Out Dropped Pkts.—The number of packets dropped because the output queue was full.
- In Ignored Pkts.—Number of input packets that were ignored by this interface.
- In Aborted Pkts.—Number of input packets that were aborted.
- In Error Pkts.—The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

Performance Logging Area

The Performance Logging area of the C6576M OSM GE-WAN Interface dialog box contains buttons to enable data logging of all the interface attributes of the interface:

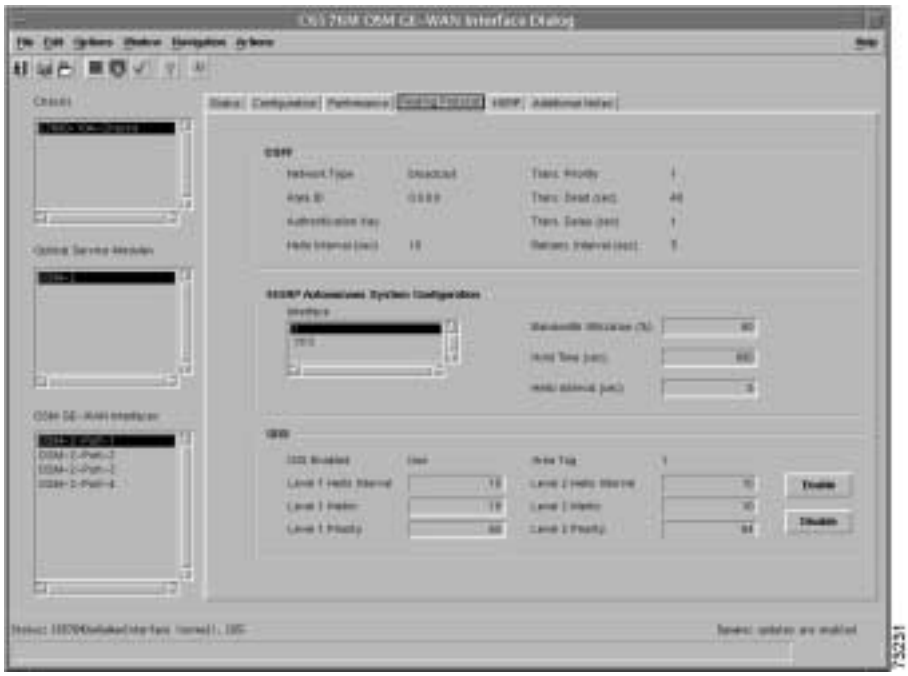
- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Routing Protocol Tab

Figure 5-61 shows the Routing Protocol tab of the C6576M OSM GEWAN Interface dialog box.

Figure 5-61 Routing Protocol Tab on the C6576M OSM GE-WAN Interface Dialog Box



OSPF Area

The OSPF area of the C6576M OSM GE-WAN Interface dialog box provides the following information. All the attributes in this area are read-only.

- Network Type—OSPF interface type. OSPF network type can be nonbroadcast multiaddress (NBMA) even on a broadcast media such as Ethernet. This attribute can have one of the following values:
  - broadcast
  - nbma
  - pointToPoint
  - pointToMultipoint
- Area ID—The predefined ID uniquely identifying the area to which the interface connects. It can be specified as either a decimal value or as an IP address. Value is 0.0.0.0 if interface is a layer 2 (no IP address assigned) interface. This attribute is read-only.
- Authentication Key—Password to be used by neighboring OSPF routers on a network segment that is using OSPF simple password authentication. It is ignored if Authentication Type is not “simple”.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.
- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. If more than one router has the same value for this field, the routers use their router ID as a tie breaker.
- Trans. Dead (sec)—Number of seconds that a device’s hello packets must not have been seen before its neighbors declare the OSPF router down. Must be consistent among all routers on an attached network.
- Trans. Delay (sec)—The estimated number of seconds it takes to transmit a link-state update packet over this interface.

EIGRP Area

The EIGRP Area of the C6576M OSM GE-WAN Interface dialog box provides the following information:

- EIGRP Interface Table—Describes the EIGRP configuration of the interface on each active autonomous system. The EIGRP parameters of the interface on an autonomous system may be explicitly configured even if EIGRP routing updates in the autonomous system are not currently carried on the interface.
- Bandwidth Utilization (%) —The percentage of the interface bandwidth that the EIGRP protocol can use.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.
- Hold Time (sec)—Hold time during which the device will wait for a hello packet to be received on the specified interface and EIGRP autonomous system number. The hold time should be at least three times the hello interval.

ISIS Area

The ISIS area of the C6576M Ethernet Interface dialog box provides the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface. This attribute is read-only.
  - true—ISIS routing is enabled.
  - false—ISIS routing is disabled.
- Area Tag—The IS-IS routing area in which the interface participates. If multiarea IS-IS is configured on the device, the IS-IS area must be named; otherwise, this value may be an implicit null tag. This attribute is read-only.
- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 2 Metric—Cost of the interface for IS-IS level 2 (inter-area) route calculation.
- Level 1 Priority—The priority is used to determine which router on a LAN will be the designated router or designated intermediate system (DIS).
- Level 2 Priority—The priority is used to determine which router on a LAN will be the designated router or DIS.
- Enable button—Enable IS-IS routing on the interface.

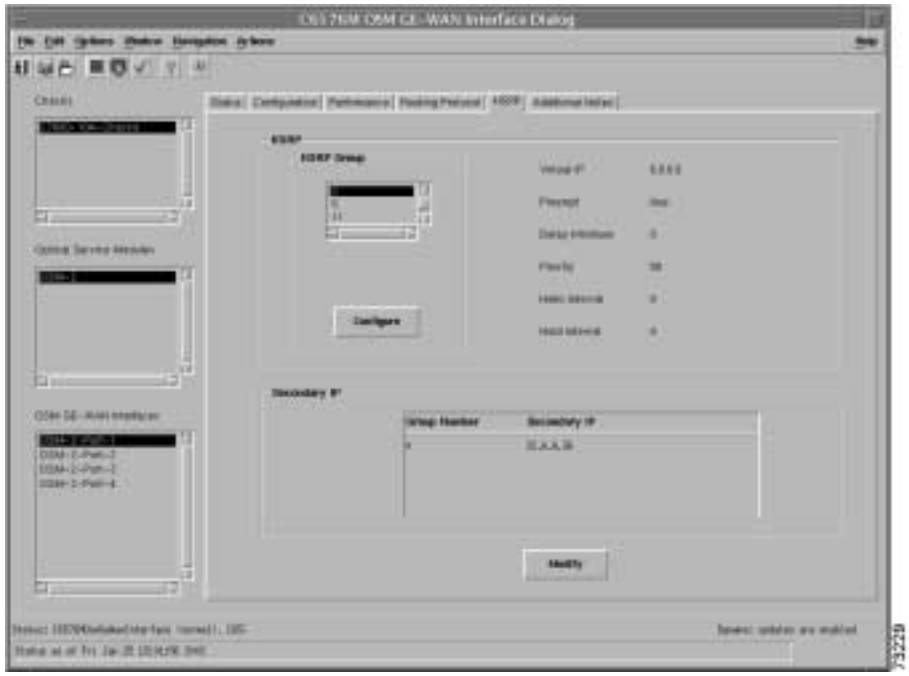
Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

- Disable button—Disable IS-IS routing on the interface.

HSRP Tab

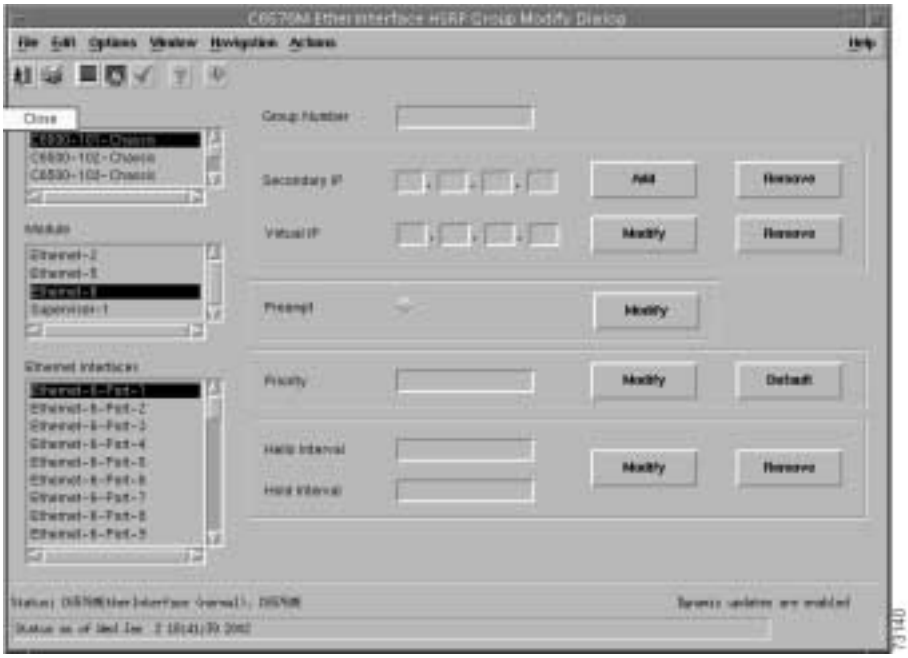
Figure 5-62 shows the HSRP tab of the C6576M OSM GE-WAN Interface dialog box. The attributes in this tab are read-only. To modify the attributes, click the **Modify** button.

Figure 5-62 HSRP Tab on the C6576M OSM GE-WAN Interface Dialog Box



- Modify button—Figure 5-63 shows the subdialog box that is displayed when you click the **Modify** button. This subdialog box is used to modify the following C6576M OSM GE-WAN Interface attributes of a given HSRP group:
  - Secondary IP
  - Virtual IP
  - Preempt
  - Delay Minimum
  - Priority
  - Hello Interval
  - Hold Interval

Figure 5-63 HSRP Secondary IP Modify Subdialog Box



HSRP Area

The HSRP area of the C6576M OSM GE-WAN Interface dialog box provides the following information:

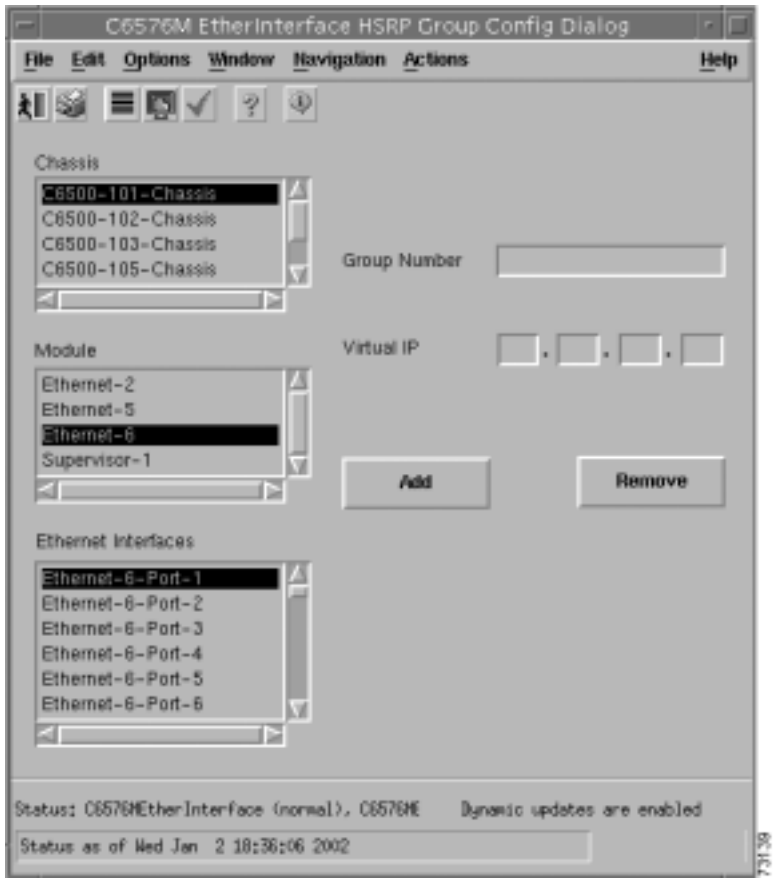
- HSRP Group Table—Describes HSRP groups deployed on an interface.

Note There may be multiple groups deployed on an interface. Using a group number on one logical or physical interface does not preclude using it on another.

- Virtual IP—Primary virtual IP address of the HSRP group. If this address is not configured, the agent attempts to discover the virtual address through a discovery process which scans the hello messages.
- Preempt—If enabled, the current router attempts to overthrow a lower priority active router and attempts to become the active router. If disabled, this router becomes the active router only if there is no such router or the active router fails.
  - true—Preempt enabled.
  - false—Preempt disabled.
- Delay Minimum—Time difference (in seconds) between a router power up and the time it can start preempting the currently active router. This value is only applicable when preemption is enabled.
- Priority—Metric used to select the active and standby routers. 0 is lowest priority, 255 is highest. Router with highest priority is selected to be the active router.
- Hello Interval—Hello interval in milliseconds. If this value is not configured, it can be learned from the active router.
- Hold Interval—Hold interval in milliseconds. If this value is not configured, it can be learned from the active router.

- Configure button—Enables HSRP for IP on an interface. Figure 5-64 shows the subdialog box displayed when you click the **Configure** button. The following is displayed in the subdialog box:
  - Group Number—Unique identifier of an HSRP group.
  - IP Address—The HSRP group may optionally be assigned a primary IP address. If no address is explicitly assigned, the device attempts to discover the virtual IP address from the active server using hello messages.
  - Add button—Adds an HSRP group on the interface.
  - Remove button—Removes an HSRP group on the interface.

Figure 5-64 HSRP Group Configure Subdialog Box



Secondary IP Area

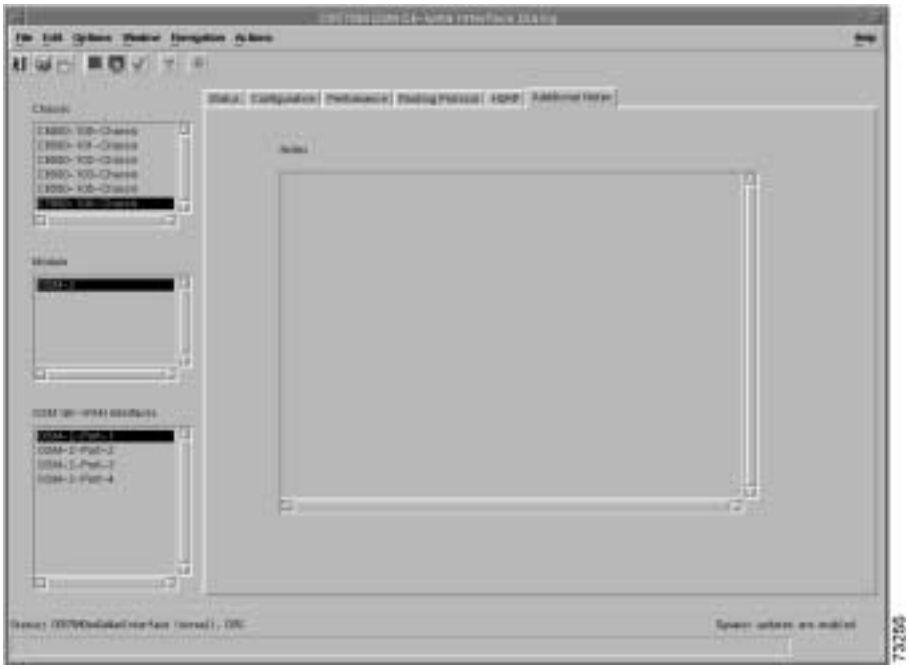
The Secondary IP area of the C6576M OSM GE-WAN Interface dialog box provides the following information:

- HSRP Secondary Address Table—Describes secondary IP addresses of HSRP groups deployed on the interface. Data is displayed in the following columns:
  - Group Number—Unique identifier of an HSRP group.
  - Secondary IP—Secondary IP address of HSRP group.

Additional Notes Tab

Figure 5-65 shows the Additional Notes tab of the C6576M OSM GE-WAN Interface dialog box.

Figure 5-65 Additional Notes Tab of the C6576M OSM GE-WAN Interface Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the OSM GE-WAN Interface.

C6576M OSM Channelized SONET Interface Dialog Box

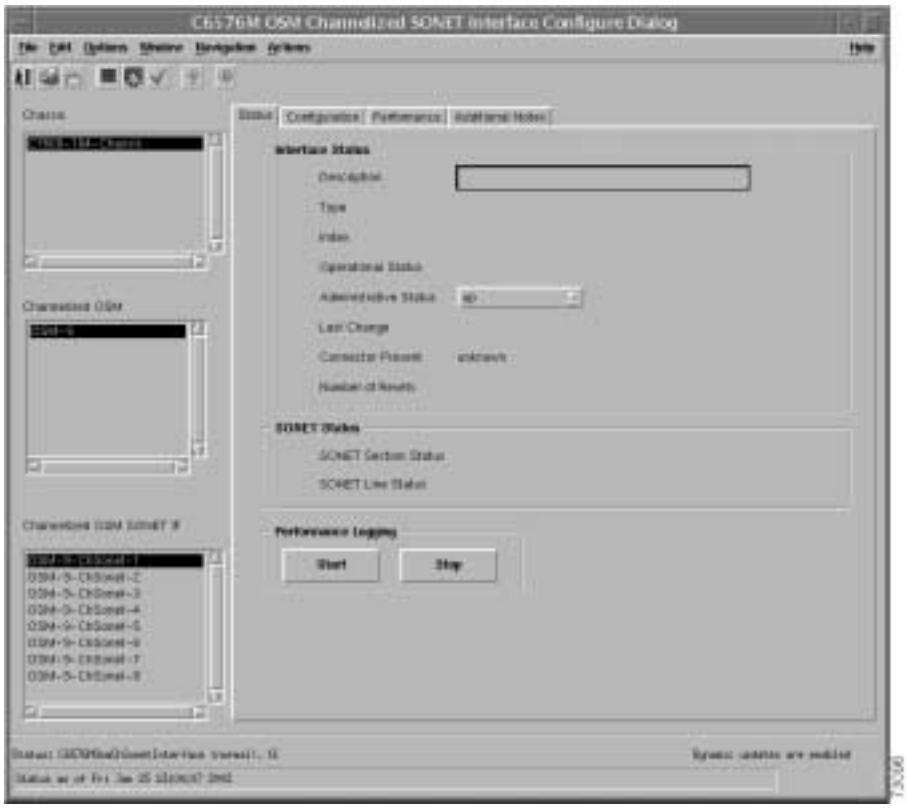
This dialog box describes a physical and logical channelized OC-12 (Ch-OC12) or OC-48 (Ch-OC48) SONET interface on an OSM. This dialog box can be launched from the OSM Channelized SONET Module or Interface object within the Physical view.

You can select multiple OSM Channelized SONET Interfaces, OSMs, and chassis at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-66 shows the Status tab of the C6576M OSM Channelized SONET Interface dialog box.

Figure 5-66 Status Tab of the C6576M OSM Channelized SONET Interface Dialog Box



Interface Status Area

The Status area of the C6576M OSM Channelized SONET Interface dialog box provides the following information to describe the general characteristics of the interface.

- Description—Comment or a description to help you remember what is attached to this interface. The description is only put in the configuration to help you remember what specific interfaces are used for.
- Type—Describes the type of allocated channel. This attribute is read-only.

  - t3—A DS3 channel is provisioned as a serial subinterface with T3 (DS3) content formatting.
  - e3—A DS3 channel is provisioned as a serial subinterface with E3 (DS3) content formatting.
  - pos—An OC-3 channel is provisioned as a POS subinterface.
- Index—String index of the interface. This attribute is read-only.
- Operational Status—The current operational state of the interface. This attribute is read-only. This attribute has one of the following values:
  - testing—Indicates that no operational packets can be passed.
  - unknown
  - down
  - up
  - dormant—Interface is waiting for external actions (such as a serial line waiting for an incoming connection)
  - notPresent—Interface has missing (typically, hardware) components.
  - lowerLayerDown—The interface in the lower layer is down.
- Administrative Status—The desired state of the interface. This attribute has one of the following values:
  - up
  - down
- Last Change—The value (in seconds) of sysUpTime at the time the interface entered its current operational state. If the current state was entered before the last reinitialization of the local network management subsystem, then this object contains a zero value. This attribute is read-only.
- Connector Present—Indicates whether or not a cable is connected to the interface. If the ifAdminStatus is down, then this value cannot be determined and an “unknown” message is given. This attribute is read-only. This attribute has the following values:
  - yes—Cable is connected to the interface.
  - no—Cable is not connected to the interface.
  - unknown—Cannot determine if a cable is connected to the interface.
- Number of Resets—Number of times the interface internally reset. This attribute is read-only.

SONET Status Area

The ATM/SONET area of the C6576M OSM Channelized SONET Interface dialog box provides the following information:

- **SONET Section Status**—Status of the SONET Section. This status may indicate multiple simultaneous defects. This attribute is read-only. This can have one of the following values:
  - sonetSectionNoDefect—No defect.
  - sonetSectionLOS—Error condition, Loss Of Signal.
  - sonetSectionLOF—Error condition, Loss Of Frame.
- **SONET Line Status**—Status of the SONET Line. This status may indicate multiple simultaneous defects. This attribute is read-only. This can have one of the following values:
  - sonetLineNoDefect—No defect.

  - sonetLineAIS—Line defect Alarm Indication Signal.
  - sonetLineRDI—Line defect Remote Defect Indication.

Performance Logging Area

The Performance Logging area of the C6576M OSM Channelized SONET Interface dialog box contains buttons to enable data logging of all the interface attributes of the interface:

- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Status Field

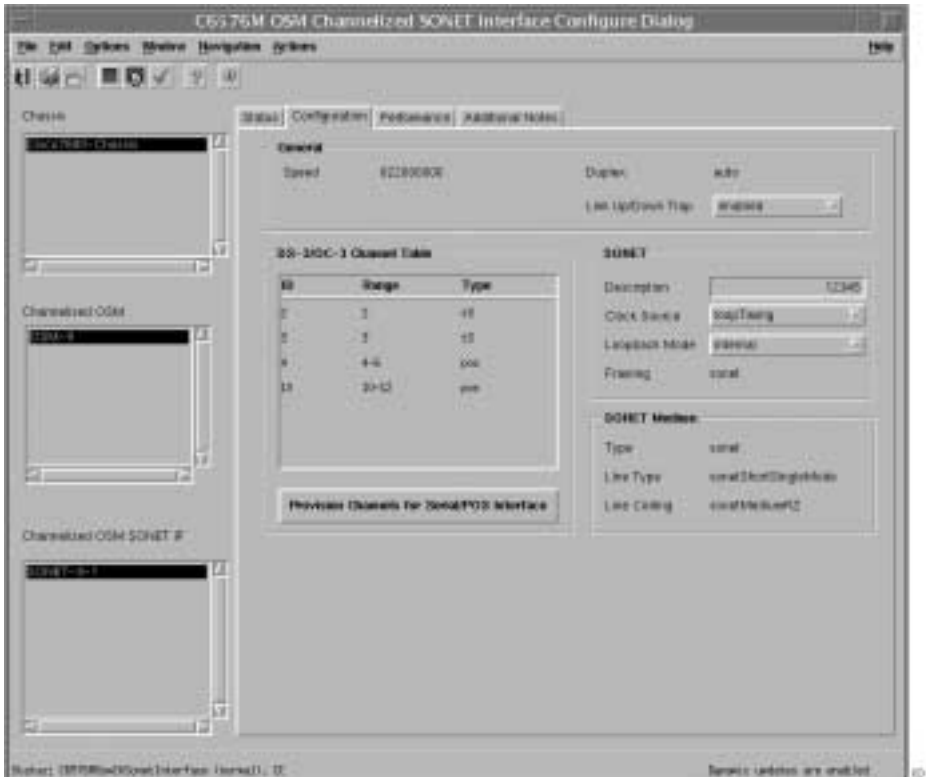
The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.

Configuration Tab

Figure 5-67 shows the Configuration tab of the C6576M OSM Channelized SONET Interface dialog box.

Figure 5-67 Configuration Tab of the C6576M OSM Channelized SONET Interface Dialog Box



General Area

The General area contains the following information:

- Speed—The desired speed of the port in bits per second.
- Duplex—SONET interfaces are by definition full duplex.
- Link Up/Down Trap—Enables or disables linkUp and linkDown trap generation for the interface.

SONET Area

The SONET area contains the following information:

- Description—Description of the SONET interface.
- Clock Source—Source of the transmit clock.
  - loopTiming—Indicates that the recovered receive clock is used as the transmit clock.
  - loopTimingPrimary—Indicates that loop timing is used and the SONET controller provides the first priority clock for internal circuitry.

  - loopTimingSecondary—Indicates that loop timing is used and the SONET controller provides the clock if the primary clock source fails.
  - Primary—Indicates that the SONET controller provides the first priority clock for internal circuitry. Secondary indicates that the SONET controller provides the clock if the primary clock source fails.
  - localTiming—Indicates that the transmit clock source is generated internally.
  - localTimingPrimary—Indicates that local timing is used and the SONET controller provides the first priority clock for internal circuitry.
  - localTimingSecondary—Indicates that local timing is used and the SONET controller provides the clock if the primary clock source fails.
- Loopback Mode—Indicates whether or not SONET loopback mode is enabled. The possible values are:
  - None—Indicates that the loopback is disabled.
  - Internal—Indicates data is looped from the transmit path to the receive path allowing diagnostics to send data to itself without relying on any external connections. To enable internal loopback, you must first set the clock source to internal.
  - Line—(external) Indicates data is looped from the external port to the transmit port and back out the external port.
- Framing—Framing for optical digital transmission.

Note SDH framing is currently unsupported on the channelized SONET modules even though IOS CLI allows the interface to be configured for SDH framing.

SONET Medium Area

The SONET Medium area contains the following information. All attributes in this area are read-only.

- Type—Indicates whether a SONET or SDH signal is used on the interface.
- Line Type—Line type of the interface. The following values are possible:
  - sonetShortSingleMode
  - sonetLongSingleMode
  - sonetMultiMode
- Line Coding—Line coding for the interface.
  - sonetMediumB3ZS—For electrical SONET/SDH signals (STS-1 and STS-3).
  - sonetMediumCMI—For electrical SONET/SDH signals (STS-1 and STS-3).
  - sonetMediumNRZ—Non-return to zero, which is used for optical SONET/SDH signals.
  - sonetMediumRZ—Return to zero, which is used for optical SONET/SDH signals.
  - sonetMediumOther—Other.

DS-3/OC-3 Channel Table Area

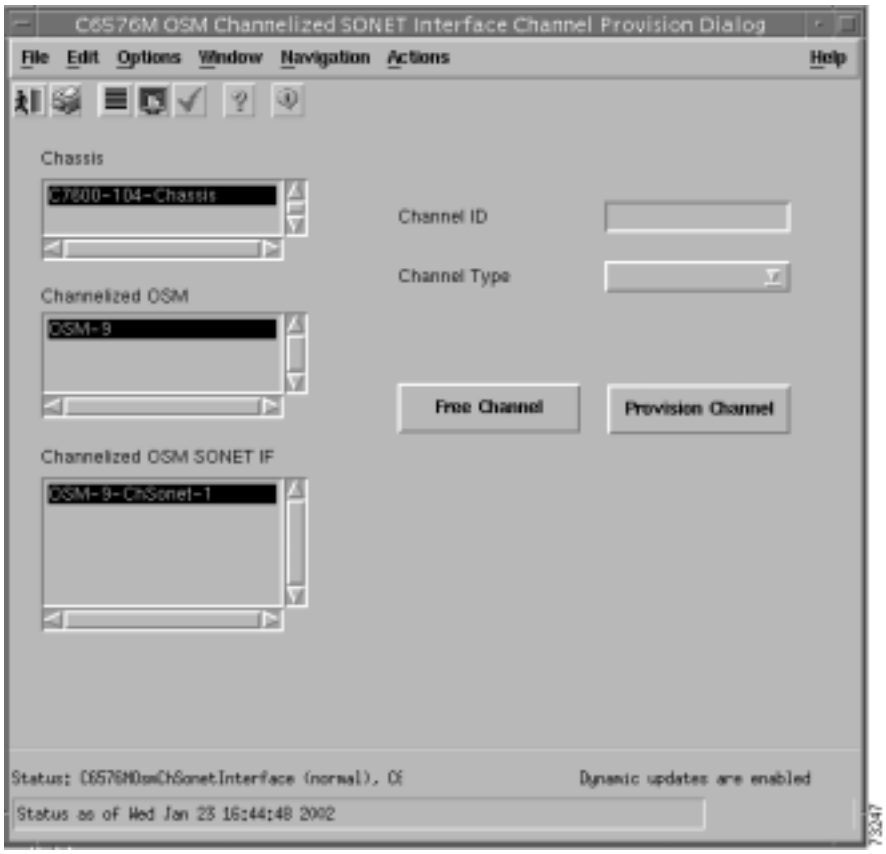
- DS-3/OC-3 Channel Table—Lists the DS3 and OC-3 channels that have been provisioned on the SONET interface. The following items are listed in the table:

  - ID—Unique identifier of a channel on the SONET interface. This coincides with the number of the first sts-1 service payload envelope (SPE) allocated in the channel. It is also the subinterface number of the serial or POS interface representing the DS3 or OC-3 channel. Numbering is 1-based.
  - Range—Range of allocated channels. Numbering is 1-based. A DS3 subinterface has a width of sts-1 and it occupies a single channel. An OC-3 subinterface has a width of sts-3c and it occupies three consecutive channels.
  - Type—Describes the type of allocated channel. A DS3 channel is provisioned as a serial subinterface with E3 or T3 (DS3) content formatting. An OC-3 channel is provisioned as a POS subinterface.

- Provision Channels for Serial/PoS Interface button—Launches a subdialog box to provision a DS3 or OC-3 channel from the SONET interface's constituent sts-1 service payload envelopes (SPEs). Figure 5-68 shows the Channel Provision subdialog box of the C6576M OSM Channelized SONET Interface dialog box. The following items are displayed:
  - Channel ID field—Unique identifier of a channel on the SONET interface.
  - Channel Type field—Describes the type of allocated channel.
  - Free Channel button—Frees a provisioned DS3 or OC-3 channel from the SONET interface.
  - Provision Channel button—Provisions the interface.

Note The provisioned sts-1 SPEs cannot be in use by any other channel on the interface.

Figure 5-68 Channel Provision Subdialog Box of the C6576M OSM Channelized SONET Interface Dialog Box



Performance Tab

Figure 5-69 shows the Performance tab of the C6576M OSM Channelized SONET Interface dialog box.

Figure 5-69 Performance Tab of the C6576M OSM Channelized SONET Interface Dialog Box

Interface Packets/ Octets Statistics Area

The Interface Packets/Octets Statistics area contains the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization.
- In Octets—Total number of received octets including framing characters.
- Out Octets—Total number of transmitted octets including framing characters.
- In Unicast Pkts.—The number of packets delivered by this sublayer to a higher (sub)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- Out Unicast Pkts.—The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.
- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Interface Error Statistics Area

The Interface Error Statistics area contains the following information:

- CRC Error Pkts.—Number of input packets that had cyclic redundancy checksum errors.
- In Discarded Pkts.—The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet is to free up buffer space.
- Out Discarded Pkts.—The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet is to free up buffer space.
- In Dropped Pkts.—The number of packets dropped because the input queue was full.
- Out Dropped Pkts.—The number of packets dropped because osteopath queue was full.
- In Ignored Pkts.—Number of input packets that were ignored by this interface.
- In Aborted Pkts.—Number of input packets that were aborted.
- In Error Pkts.—The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

SONET Section Error Statistics Area

The SONET Section Error Statistics area contains the following information:

- Errored Secs—Number of errored seconds encountered by the SONET section in the current 15-minute interval.
- Severely Err Secs—Number of severely errored seconds encountered by the SONET section in the current 15-minute interval.
- Coding Violations—Number of coding violations encountered by the SONET section in the current 15-minute interval.
- Severely Err Frm Secs—Number of severely errored framing seconds encountered by the SONET section in the current 15-minute interval.

SONET Line Error Statistics Area

The SONET Line Error Statistics area contains the following information:

- Errored Secs—Number of errored seconds encountered by the SONET line in the current 15-minute interval.
- Severely Err Secs—Number of severely errored seconds encountered by the SONET line in the current 15-minute interval.
- Coding Violations—Number of coding violations encountered by the SONET line in the current 15-minute interval.
- Unavailable Secs—Number of unavailable seconds encountered by the SONET line in the current 15-minute interval.

SONET Far End Line Error Statistics Area

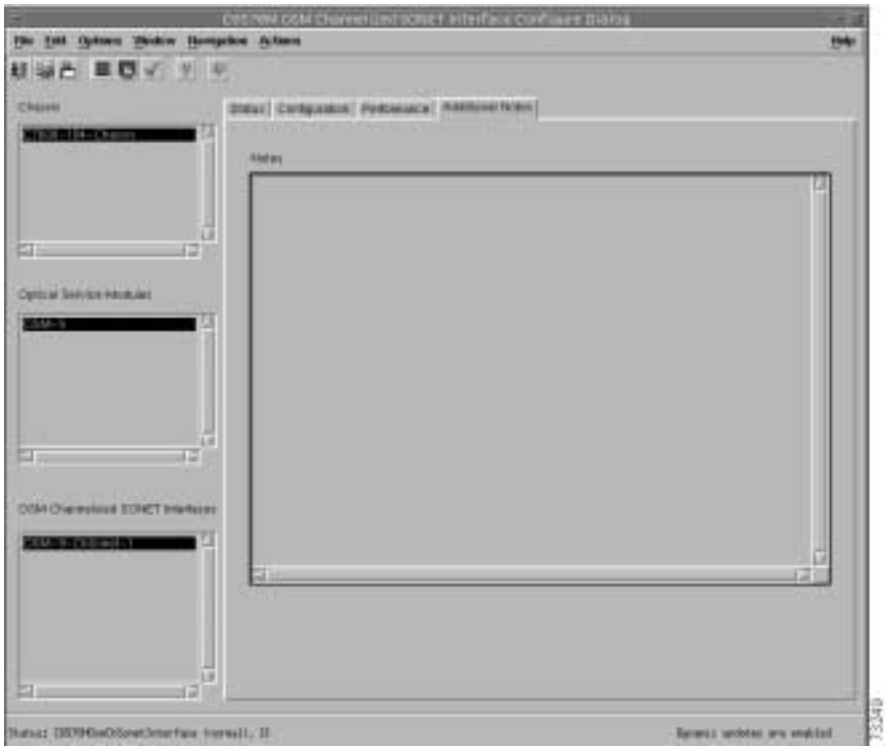
The SONET Far End Line Error Statistics area contains the following information:

- Errored Secs—Number of far end errored seconds encountered by the SONET line in the current 15-minute interval.
- Severely Err Secs—Number of severely far end errored seconds encountered by the SONET line in the current 15-minute interval.
- Coding Violations—Number of far end coding violations encountered by the SONET line in the current 15-minute interval.
- Unavailable Secs—Number of far end unavailable seconds encountered by the SONET line in the current 15-minute interval.

Additional Notes Tab

Figure 5-70 shows the Additional Notes tab of the C6576M OSM Channelized SONET Interface dialog box.

Figure 5-70 Additional Notes Tab of the C6576M OSM Channelized SONET Interface Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the OSM Channelized SONET Interface.

C6576M OSM POS Interface Dialog Box

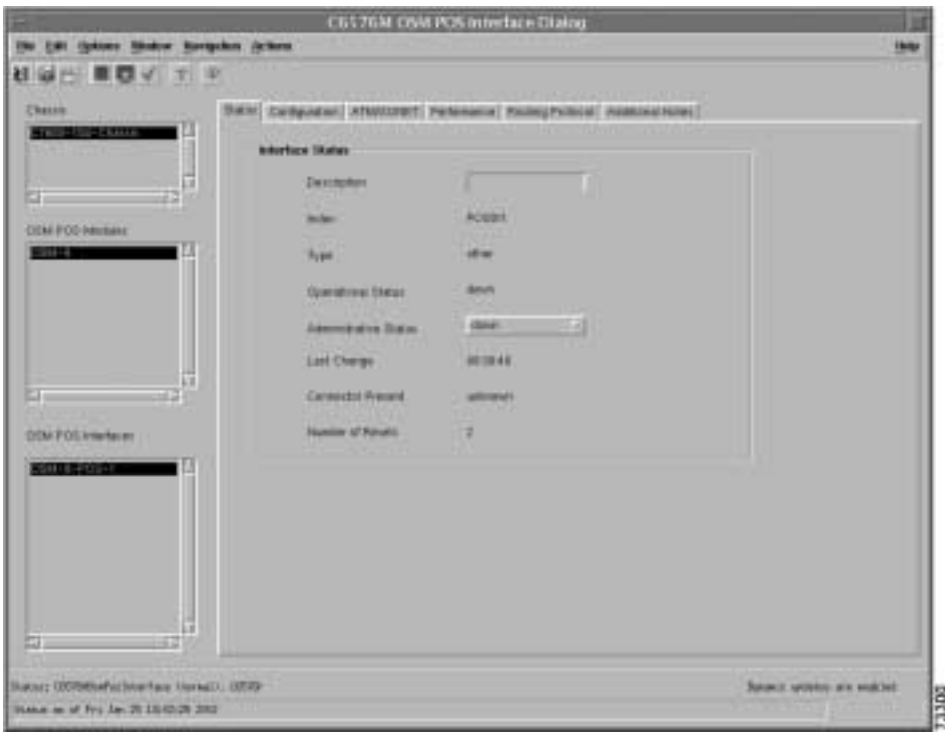
This dialog box describes a physical and logical PoS interface on an OSM. This dialog box can be launched from the OSM POS Module or Interface object within the Physical view.

You can select multiple OSM POS Interfaces, OSMs, and chassis at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-71 shows the Status tab of the C6576M OSM POS Interface dialog box.

Figure 5-71 Status Tab of the C6576M OSM POS Interface Dialog Box



Interface Status Area

The Status area of the C6576M OSM POS Interface dialog box provides the following information to describe the general characteristics of the interface:

- Description—Comment or a description to help you remember what is attached to this interface. The description is only put in the configuration to help you remember what specific interfaces are used for.
- Index—String index of the interface. This attribute is read-only.
- Type—Describes the physical interface type. This attribute is read-only. The possible values of this attribute are:

  - posOc12mm
  - posOc12smi
  - posOc12sml
  - posOc48mm
  - posOc48smi
  - posOc48sml
  - posOc3mm
  - posOc3smi
  - posOc3sml
- Operational Status—The current operational state of the interface. This attribute is read-only. This attribute has one of the following values:
  - other
  - ok
  - minorFault
  - majorFault
- Administrative Status—The desired state of the interface. This attribute has one of the following values:
  - up
  - down
- Last Change—The value (in seconds) of sysUpTime at the time the interface entered its current operational state. If the current state was entered before the last reinitialization of the local network management subsystem, then this object contains a zero value. This attribute is read-only.
- Connector Present—Indicates whether or not a cable is connected to the interface. If the ifAdminStatus is down, then this value cannot be determined and an “unknown” message is given. This attribute is read-only. This attribute has the following values:
  - yes—Cable is connected to the interface.
  - no—Cable is not connected to the interface.
  - unknown—Cannot determine if a cable is connected to the interface.
- Number of Resets—Number of times the interface internally reset. This attribute is read-only.

Status Field

The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.

Configuration Tab

Figure 5-72 shows the Configuration tab of the C6576M OSM POS Interface dialog box.

Figure 5-72 Configuration Tab of the C6576M OSM POS Interface Dialog Box

General Area

The General area contains the following information:

- Speed—The desired speed of the port in bits per second.
- Duplex—SONET interfaces are by definition full duplex.
- Link Up / Down Trap—Enables or disables linkUp and linkDown trap generation for the interface.
- Input Queue Length—Displays the input queue length in packets.
- Output Queue Length—Displays the output queue length in packets.
- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP and EIGRP); you cannot adjust the actual delay of an interface with this command.

- Bandwidth—Overwrites default bandwidth in kilobits per second.

Note The Bandwidth attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP, and OSPF); you cannot adjust the actual bandwidth of an interface with this command.

Layer 2 Area

The Layer 2 area contains the following information:

- MTU—The size of the largest datagram (frame) which can be sent or received on the interface, specified in octets.

Layer 3 Area

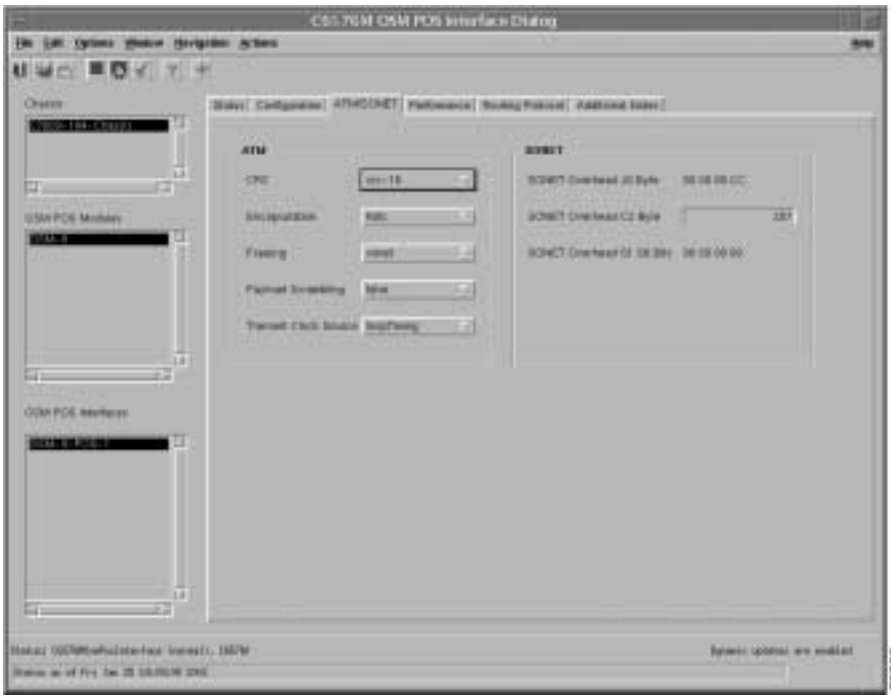
The Layer 3 area contains the following information:

- IP Address—Displays the IP address of the layer 3 interface.
- Netmask—Subnet mask of the IP address. Enabled bits indicate network addressing bits in the IP address.
- Clear IP Address button—After receiving confirmation, will unset the IP address for this interface.

ATM/SONET Tab

Figure 5-73 shows the ATM/SONET tab of the C6576M OSM POS Interface dialog box.

Figure 5-73 ATM/SONET Tab of the C6576M OSM POS Interface Dialog Box



ATM Area

The ATM area contains the following information:

- CRC—Cyclical redundancy check (CRC) word size. The CRC is an error-checking technique that uses a calculated numeric value to detect errors in transmitted data.
- Encapsulation—Indicates whether HDLC or PPP encapsulation is used on the interface.
- Framing—Framing for optical digital transmission. SONET is the North American standard, SDH is the European standard.
- Payload Scrambling—Indicates whether or not SONET payload scrambling is enabled on the interface. Payload scrambling ensures that there is sufficient bit-transition density to maintain the transmit clock for synchronous signalling. Both ends of the connection must use the same scrambling algorithm.
- Transmit Clock Source—Source of the transmit clock.
  - loopTiming—Indicates that the recovered receive clock is used as the transmit clock.
  - localTiming—Indicates that the transmit clock source is generated internally.

SONET Area

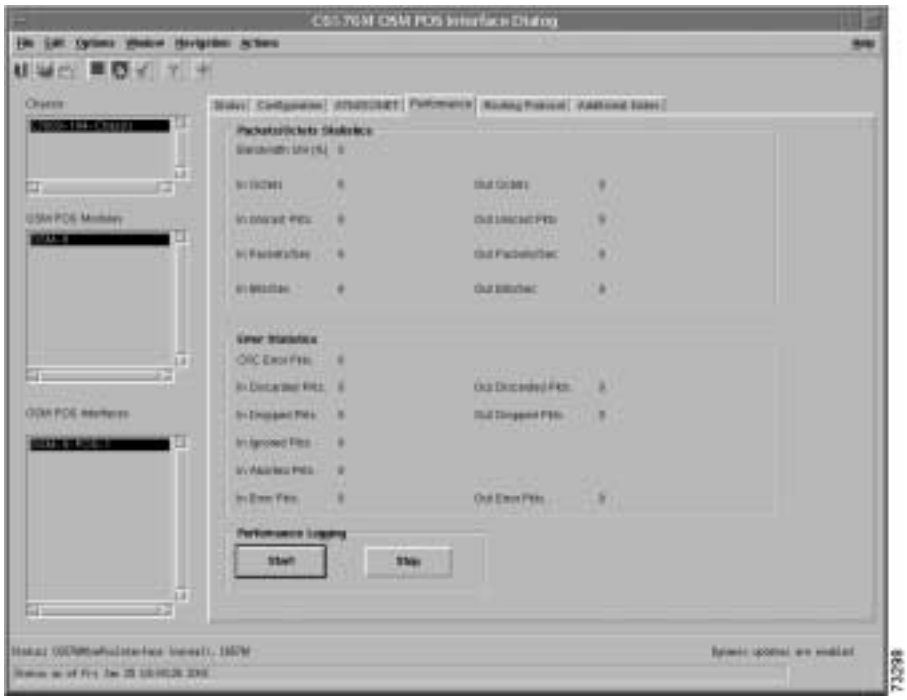
The SONET area contains the following information:

- SONET Overhead J0 Byte—Value of the SONET overhead section trace byte. A value of 0x10 is for interoperability with some Synchronous Digital Hierarchy (SDH) devices in Japan. This attribute is read-only.
- SONET Overhead C2 Byte—Value of the SONET overhead path signal identifier. This attribute is read-only. These are possible values:
  - 0xCF = PPP or HDLC
  - 0x13 = ATM
- SONET Overhead S1 S0 Bits—Value of the SONET overhead S1 & S0 bits. These bits are part of the payload pointer byte. This attribute is read-only. These are possible values:
  - 0 = OC-3c
  - 2 = AU-4

Performance Tab

Figure 5-74 shows the Performance tab of the C6576M OSM POS Interface dialog box. All the attributes in this tab are read-only.

Figure 5-74 Performance Tab of the C6576M OSM POS Interface Dialog Box



Packets/Octets Statistics Area

The Packets/Octets Statistics area contains the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization.
- In Octets—Total number of received octets including framing characters.
- Out Octets—Total number of transmitted octets including framing characters.
- In Unicast Pkts.—The number of packets delivered by this sublayer to a higher (sub)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- Out Unicast Pkts.—The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.
- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Error Statistics Area

The Error Statistics area contains the following information:

- CRC Error Pkts.—Number of input packets that had cyclic redundancy checksum errors.
- In Discarded Pkts.—The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet is to free up buffer space.
- Out Discarded Pkts.—The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet is to free up buffer space.
- In Dropped Pkts.—The number of packets dropped because the input queue was full.
- Out Dropped Pkts.—The number of packets dropped because the output queue was full.
- In Ignored Pkts.—Number of input packets that were ignored by this interface.
- In Aborted Pkts.—Number of input packets that were aborted.
- In Error Pkts.—The number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

Performance Logging Area

The Performance Logging area of the C6576M OSM POS Interface dialog box contains buttons to enable data logging of all the interface attributes of the interface:

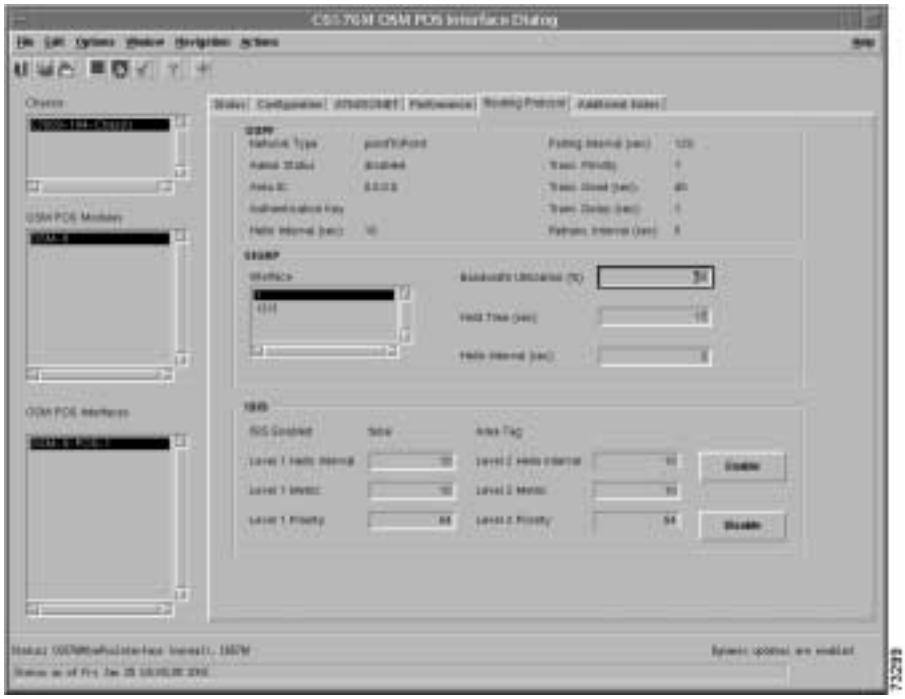
- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

Routing Protocol Tab

Figure 5-75 shows the Routing Protocol tab of the C6576M OSM POS Interface dialog box.

Figure 5-75 Routing Protocol Tab on the C6576M OSM POS Interface Dialog Box



OSPF Area

The OSPF area of the C6576M OSM POS Interface dialog box provides the following information. All the attributes in this area are read-only.

- Network Type—OSPF interface type. By default, a POS interface is point-to-point, however, the OSPF network type may be modified to accommodate different types of network configurations. This attribute can have one of the following values:
  - broadcast
  - nbma
  - pointToPoint
  - pointToMultipoint
- Admin Status—The desired state of the interface.

- Area ID—The predefined ID uniquely identifying the area to which the interface connects. It can be specified as either a decimal value or as an IP address. Value is 0.0.0.0 if interface is a layer 2 (no IP address assigned) interface. This attribute is read-only.
- Authentication Key—Password to be used by neighboring OSPF routers on a network segment that is using OSPF simple password authentication. It is ignored if Authentication Type is not “simple”.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.
- Polling Interval—Polling interval in seconds.
- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. If more than one router has the same value for this field, the routers use their router ID as a tie breaker.
- Trans. Dead (sec)—Number of seconds that a device’s hello packets must not have been seen before its neighbors declare the OSPF router down. Must be consistent among all routers on an attached network.
- Trans. Delay (sec)—The estimated number of seconds it takes to transmit a link state update packet over this interface.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.

EIGRP Area

The EIGRP Area of the C6576M OSM POS Interface dialog box provides the following information:

- EIGRP Interface Table—Describes the EIGRP configuration of the interface on each active autonomous system. The EIGRP parameters of the interface on an autonomous system may be explicitly configured even if EIGRP routing updates in the autonomous system are not currently carried on the interface.
- Bandwidth Utilization (%) —The percentage of the interface bandwidth that the EIGRP protocol can use.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.
- Hold Time (sec)—Hold time during which the device will wait for a hello packet to be received on the specified interface and EIGRP autonomous system number. The hold time should be at least three times the hello interval.

ISIS Area

The ISIS area of the C6576M OSM POS Interface dialog box provides the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface:
  - true—ISIS routing is enabled.
  - false—ISIS routing is disabled.
- Area Tag—The IS-IS routing area in which the interface participates. If multiarea IS-IS is configured on the device, the IS-IS area must be named; otherwise, this value may be an implicit null tag.

- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 2 Metric—Cost of the interface for IS-IS level 2 (inter-area) route calculation.
- Level 1 Priority—Determines which router on a LAN will be the designated router or Designated Intermediate System (DIS).
- Level 2 Priority—Determines which router on a LAN will be the designated router or Designated Intermediate System (DIS).
- Enable button—Enables IS-IS routing on the interface.

Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

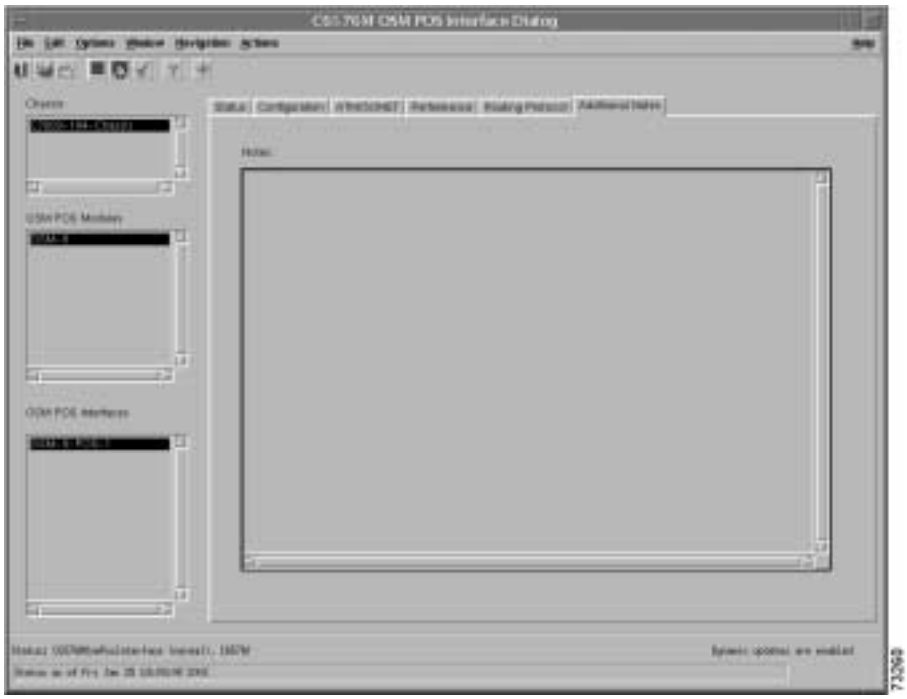
- Disable button—Disables IS-IS routing on the interface.

Note By default, all interfaces are configured as IS-IS Circuit-type Level 1-2.

Additional Notes Tab

Figure 5-76 shows the Additional Notes tab of the C6576M OSM POS Interface dialog box.

Figure 5-76 Additional Notes Tab of the C6576M OSM POS Interface Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the OSM POS Interface.

C6576M OSM Serial Subinterface Dialog Box

This dialog box describes a logical DS3 channel on a channelized OC-12 (ChOC-12) or OC-48 (ChOC-48) SONET interface of an Optical Service Module (OSM). A DS3 channel of a SONET interface is provisioned as a logical Serial interface. This dialog box can be launched from the OSM Channelized SONET Module or Interface object or the Serial Subinterface object within the Physical view.

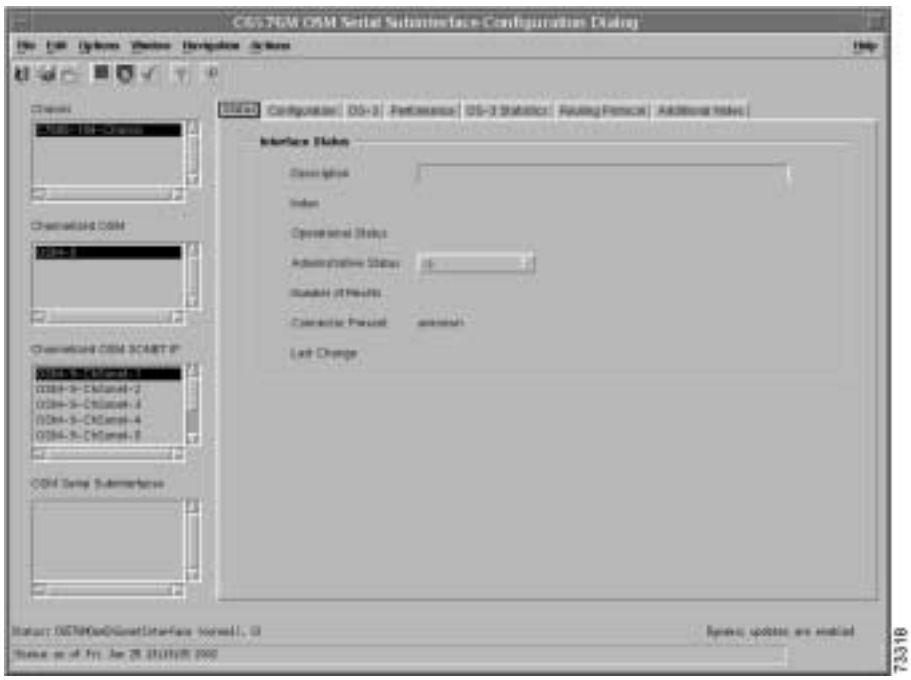
You can select multiple OSM serial subinterfaces, OSM Channelized SONET interfaces, OSMs, and chassis at a time from the object list on the left side of the dialog box.

Note E3 serial subinterfaces can be configured through the CLI, but the OSM Channelized SONET cards do not support SDH (E3) content formatting. The EMS will discover these interfaces but does not support any operations against them.

Status Tab

Figure 5-77 shows the Status tab of the C6576M OSM Serial Subinterface dialog box.

Figure 5-77 Status Tab of the C6576M OSM Serial Subinterface Dialog Box



Interface Status Area

The Status area of the C6576M OSM Serial Subinterface dialog box provides the following information to describe the general characteristics of the interface:

- Description—Comment or a description to help you remember what is attached to this interface. The description is put in the configuration to help you remember what specific interfaces are used for.
- Index—String index of the interface. This attribute is read-only.
- Operational Status—The current operational state of the interface. This attribute is read-only. This attribute has one of the following values:
  - unknown
  - down
  - up
  - dormant—Interface is waiting for external actions (such as a serial line waiting for an incoming connection)
  - notPresent—Interface has missing components (typically hardware).
  - lowerLayerDown—Indicates that the primary channelized SONET interface has failed.
- Administrative Status—The desired state of the interface. This attribute has one of the following values:
  - up
  - down
- Number of Resets—Number of times the interface internally reset. This attribute is read-only.
- Connector Present—Displays if a cable is attached to the parent interface (the OSM Channelized SONET Interface). These are the values:
  - yes
  - no
  - unknown—This value is used when the Administrative Status is not set to “up”. In this case, it cannot be determined if a connection is present or not.
- Last Change—The value (in seconds) of sysUpTime at the time the interface entered its current operational state. If the current state was entered before the last reinitialization of the local network management subsystem, then this object contains a zero value. This attribute is read-only.

Status Field

The display-only Status field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- perflostcomms—CEMF has lost communication with the device from the performance state.

Interface Configuration Tab

Figure 5-78 shows the Interface Configuration tab of the C6576M OSM Serial Subinterface dialog box.

Figure 5-78 Interface Configuration Tab of the C6576M OSM Serial Subinterface Dialog Box

General Area

The General area contains the following information:

- Bandwidth—Overwrites default bandwidth in kilobits per second.

Note The Bandwidth attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP, and OSPF); you cannot adjust the actual bandwidth of an interface with this command.

- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP and EIGRP); you cannot adjust the actual delay of an interface with this command.

- Input Queue Length—Displays the input queue length in packets.
- Output Queue Length—Displays the output queue length in packets.
- Link Up / Down Trap—Enables or disables linkUp and linkDown trap generation for the interface.

Layer 2 Area

The Layer 2 area contains the following information:

- MTU—The size of the largest datagram (frame) which can be sent or received on the interface, specified in octets.

Layer 3 Area

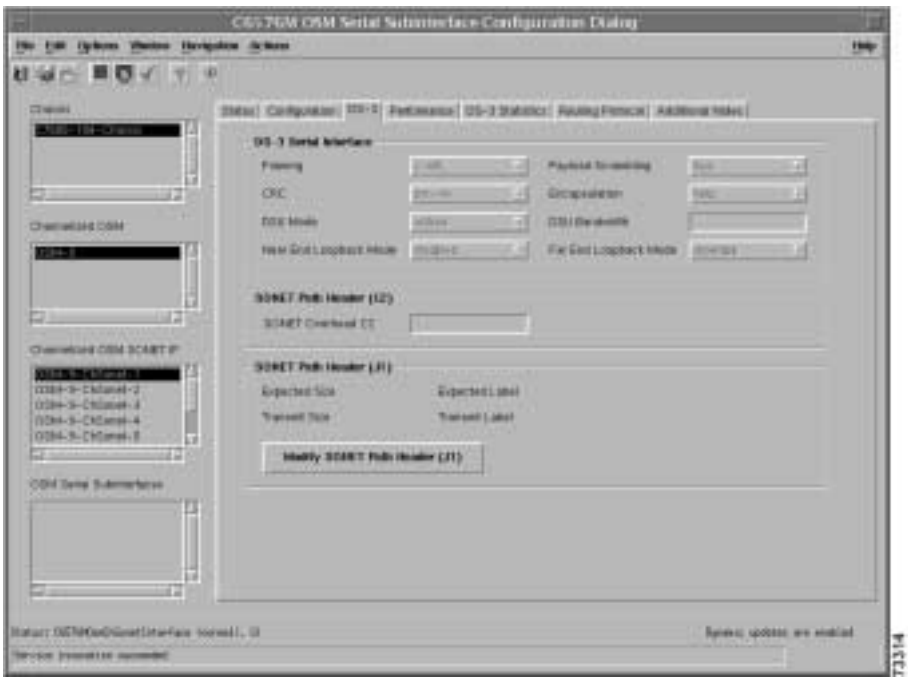
The Layer 3 area contains the following information:

- IP Address—Displays the IP address of the Layer 3 interface.
- Netmask—Subnet mask of the IP address. Enabled bits indicate network addressing bits in the IP address.
- Clear IP Address button—After receiving confirmation, will unset the IP address for this interface.

DS-3 Configuration Tab

Figure 5-79 shows the DS-3 Configuration tab of the C6576M OSM Serial Subinterface dialog box.

Figure 5-79 DS-3 Configuration Tab of the C6576M OSM Serial Subinterface Dialog Box



DS-3 Serial Interface Area

The DS-3 Serial Interface area contains the following information:

- Framing—Framing for optical digital transmission. SONET is the North American standard; SDH is the European standard.

- CRC—Cyclical redundancy check (CRC) word size. The CRC is an error-checking technique that uses a calculated numeric value to detect errors in transmitted data.
- DSU Mode—Data Service Unit (DSU) mode. This enables interoperability with other DSUs. The local interface configuration must match the remote configuration. This attribute can have the following values:
  - adtran
  - cisco
  - digital-link
  - larscom
  - verilink
  - kentrox (6)

Note The Kentrox DSU/CSU mode is configurable in the CLI but is currently not supported. The C6576M EMS will allow a user to configure this value, but it will log a warning message indicating that the value is unsupported by IOS.

- Near End Loopback Mode—Near end channel loopback mode. This mode can have the following values:
  - disabled
  - local—Sets the loopback after going through the framer toward the terminal.
  - network—Puts the near end in network loopback.
- Far End Loopback Mode—Far end channel loopback mode. If enabled, this mode puts the far end in loopback by sending far-end alarm control (FEAC). This mode has the following values:
  - disabled
  - remote
- Payload Scrambling—Indicates whether or not SONET payload scrambling is enabled on the interface. Payload scrambling ensures that there is sufficient bit-transition density to maintain the transmit clock for synchronous signalling. Both ends of the connection must use the same scrambling algorithm.
- Encapsulation—Indicates whether HDLC or PPP encapsulation is used on the interface.
- DSU Bandwidth—DSU subrate bandwidth in kilobits per second. This attribute reduces the DS3 bandwidth by padding the T3 frame.

SONET Path Header (C2) Area

The SONET Path Header (C2) area contains the following information:

- SONET Overhead C2 Byte—Value of the SONET overhead Path Signal Label (C2), which indicates the contents of the SONET STS-SPE Higher Order VC. This attribute is read-only. These are possible values:
  - 207 (0xCF) = PPP or HDLC with no payload scrambling
  - 22 (0x16) = PPP or HDLC with payload scrambling

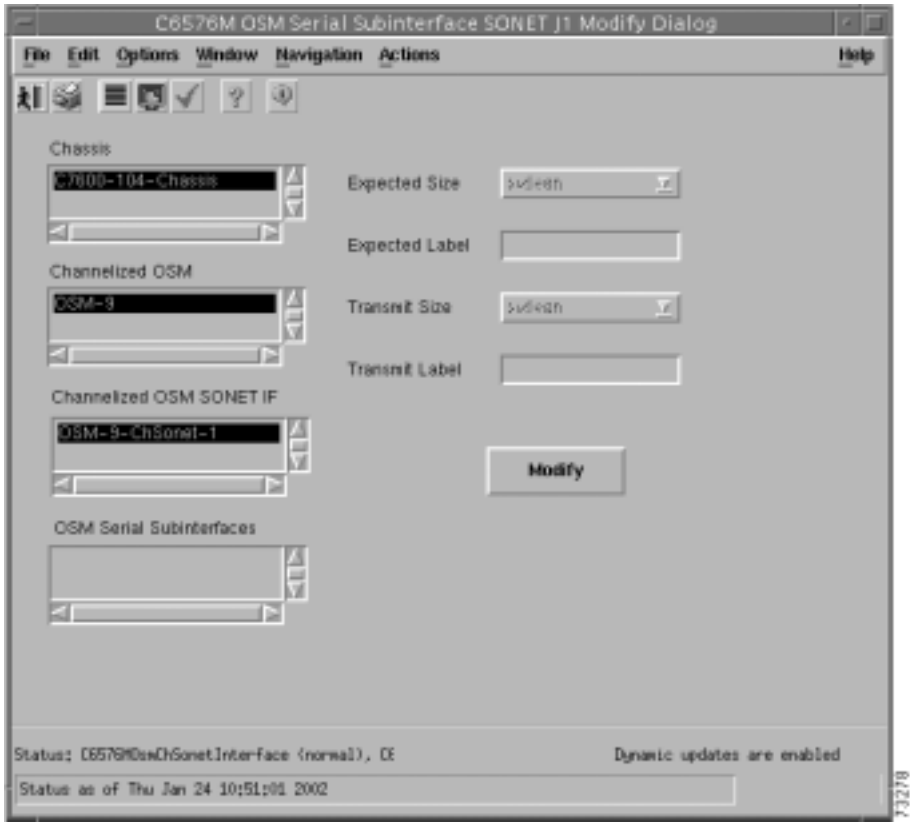
SONET Path Header (J1) Area

The SONET Path Header (J1) area contains the following information:

- Expected Size—Maximum length of the expected receive SONET Path overhead message in bytes.
- Transmit Size—Maximum length of the transmitting SONET Path overhead message in bytes.
- Expected Label—The expected receive SONET Path overhead message. If the expected label is longer than the expected size, it will be truncated.
- Transmit Label—Transmitting SONET Path overhead message. If the transmitting label is longer than the transmitting size, it will be truncated.
- Modify SONET Path Header (J1) button—Launches a subdialog box to modify the expected receive and transmit SONET Path overhead message. Figure 5-80 shows the subdialog box launched by this button. The following items are displayed in the subdialog box:
  - Expected Size
  - Transmit Size
  - Expected Label
  - Transmit Label
  - Modify button—Sets the specified values of the attributes given in the subdialog box.

Note In 12.1(11b)E and later the values for the Expected Size and the Transmit Size should be the same since the Tx and Rx message sizes cannot be independently configured. If the received values are different, the J1 Path Overhead message size will be set to the larger of the two values.

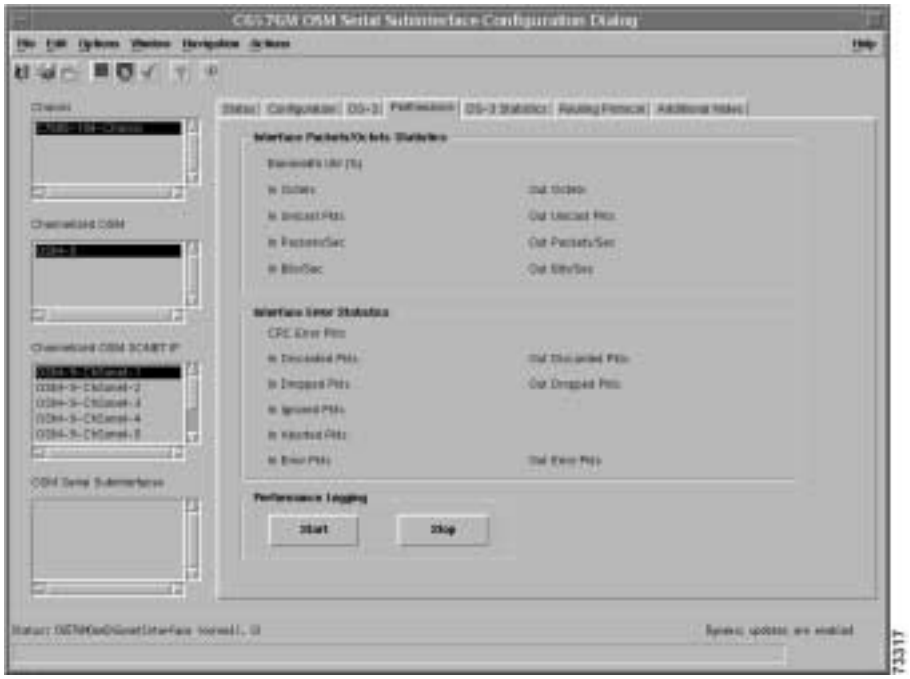
Figure 5-80 SONET J1 Modify Subdialog Box of the C6576M OSM Serial Subinterface Dialog Box



Performance Tab

Figure 5-81 shows the Performance tab of the C6576M OSM Serial Subinterface dialog box. All the attributes shown in this tab are read-only.

Figure 5-81 Interface Performance Tab of the C6576M OSM Serial Subinterface Dialog Box



Interface Packets/Octets Statistics Area

The Interface Packets/Octets Statistics area contains the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization.
- In Octets—Total number of received octets including framing characters.
- Out Octets—Total number of transmitted octets including framing characters.
- In Unicast Pkts.—The number of packets delivered by this sublayer to a higher (sub)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- Out Unicast Pkts.—The total number of packets that higher-level protocols requested be transmitted, and that were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.
- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Interface Error Statistics Area

The Interface Error Statistics area contains the following information:

- CRC Error Pkts.—Number of input packets that had cyclic redundancy checksum errors.
- In Discarded Pkts.—The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
- Out Discarded Pkts.—The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.
- In Dropped Pkts.—The number of packets dropped because the input queue was full.
- Out Dropped Pkts.—The number of packets dropped because the output queue was full.
- In Ignored Pkts.—Number of input packets that were ignored by this interface.
- In Aborted Pkts.—Number of input packets that were aborted.
- In Error Pkts.—The number of inbound packets that contained errors preventing them from being delivered to a higher-layer protocol.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

Performance Logging Area

The Performance Logging area of the C6576M OSM Serial Subinterface dialog box contains these buttons to enable data logging of all the interface attributes of the interface:

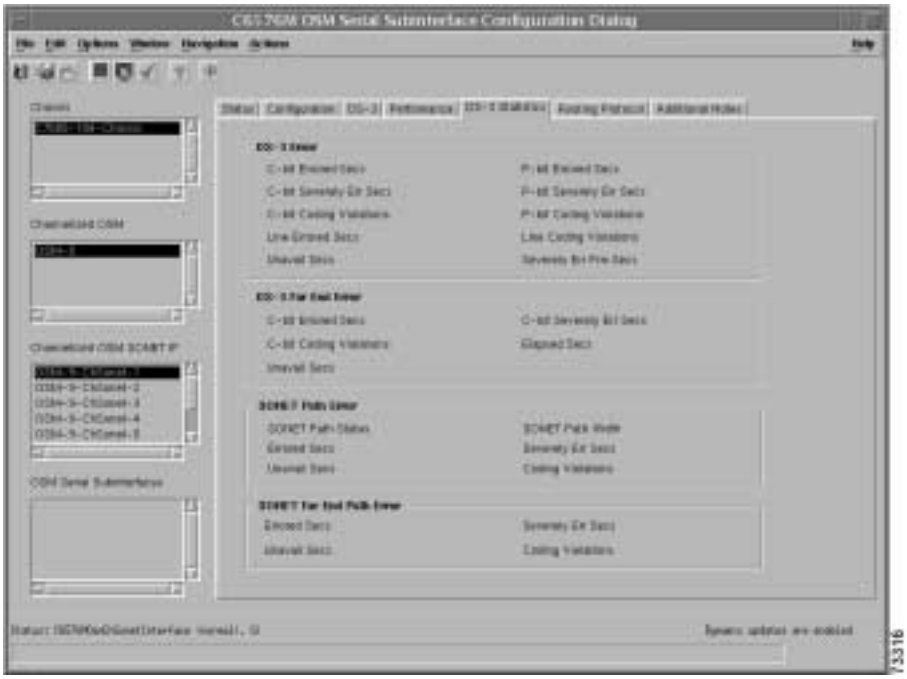
- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

DS-3 Statistics Tab

Figure 5-82 shows the DS-3 Statistics tab of the C6576M OSM Serial Subinterface dialog box.

Figure 5-82 DS-3 Statistics Tab on the C6576M OSM Serial Subinterface Dialog Box



DS-3 Error Area

The DS-3 Error area contains the following information:

- C-bit Errored Secs—C-bit errored seconds.
- C-bit Severely Err Secs—C-bit severely errored seconds.
- C-bit Coding Violations—C-bit coding violations.
- P-bit Errored Secs—P-bit errored seconds.
- P-bit Severely Err Secs—P-bit severely errored seconds.
- P-bit Coding Violations—P-bit coding violations.
- Line Errored Secs—Line errored seconds.
- Line Coding Violations—Line coding violations.
- Unavail Secs—Unavailable seconds.
- Severely Err Frm Secs—Severely errored framing seconds.

DS-3 Far End Error Area

The DS-3 Far End Error area contains the following information:

- C-bit Errored Secs—Far end C-bit errored seconds.
- C-bit Severely Err Secs—Far end C-bit severely errored seconds.
- C-bit Coding Violations—Far end C-bit coding violations.
- Elapsed Secs—Number of seconds that have elapsed since the beginning of the far end current error-measurement period.
- Unavail Secs—Far end unavailable seconds.

SONET Path Error Area

The SONET Path Error area contains the following information:

- SONET Path Status—Status of the SONET Path. This status may indicate multiple simultaneous defects. There are possible Path defects:
  - STS-Path Loss of Pointer
  - STS-Path Alarm Indication Signal
  - STS-Path Remote Defect Indication
  - Unequipped
  - Signal Label Mismatch
- SONET Path Width—Width of the SONET path. This is described by the STS-Nc SPE. A DS3 channel has a width of STS-1 (55.84 Mbps).
- Errored Secs—Number of errored seconds encountered by the SONET Path in the current 15-minute interval.
- Severely Err Secs—Number of severely errored seconds encountered by the SONET Path in the current 15-minute interval.
- Coding Violations—Number of coding violations encountered by the SONET Path in the current 15-minute interval.
- Unavailable Secs—Number of unavailable seconds encountered by the SONET Path in the current 15-minute interval.

SONET Far End Path Error Area

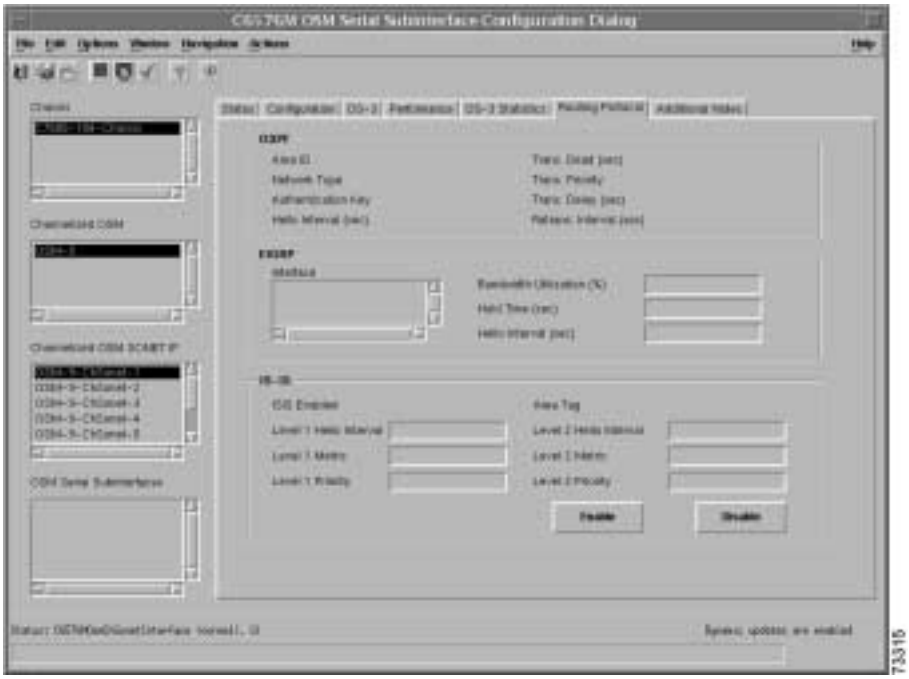
The SONET Far End Path Error area contains the following information:

- Errored Secs—Number of far end errored seconds encountered by the SONET Path in the current 15-minute interval.
- Severely Err Secs—Number of far end severely errored seconds encountered by the SONET Path in the current 15-minute interval.
- Coding Violations—Number of far end coding violations encountered by the SONET Path in the current 15-minute interval.
- Unavailable Secs—Number of far end unavailable seconds encountered by the SONET Path in the current 15-minute interval.

Routing Protocol Tab

Figure 5-83 shows the Routing Protocol tab of the C6576M OSM Serial Subinterface dialog box.

Figure 5-83 Routing Protocol Tab on the C6576M OSM Serial Subinterface Dialog Box



OSPF Area

The OSPF area of the C6576M OSM POS Interface dialog box provides the following information. All the attributes in this area are read-only.

- Network Type—OSPF interface type. By default, a POS interface is point-to-point, however, the OSPF network type may be modified to accommodate different types of network configurations. This attribute has one of the following values:
  - broadcast
  - nbma
  - pointToPoint
  - pointToMultipoint
- Area ID—The predefined ID uniquely identifying the area to which the interface connects. It can be specified as either a decimal value or as an IP address. Value is 0.0.0.0 if the interface is a Layer 2 (no IP address assigned) interface. This attribute is read-only.
- Authentication Key—Password to be used by neighboring OSPF routers on a network segment that is using OSPF simple password authentication. Ignored if Authentication Type is not “simple”.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.

- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. If more than one router has the same value for this field, the routers use their router ID as a tie breaker.
- Trans. Dead (sec)—Number of seconds that a device's hello packets must not have been seen before its neighbors declare the OSPF router down. Must be consistent among all routers on an attached network.
- Trans. Delay (sec)—The estimated number of seconds it takes to transmit a link state update packet over this interface.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.

EIGRP Area

The EIGRP Area of the C6576M Ethernet Interface dialog box provides the following information:

- EIGRP Interface Table—Describes the EIGRP configuration of the interface on each active autonomous system. The EIGRP parameters of the interface on an autonomous system may be explicitly configured even if EIGRP routing updates in the autonomous system are not currently carried on the interface.
- Bandwidth Utilization (%) —The percentage of the interface bandwidth that the EIGRP protocol can use.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.
- Hold Time (sec)—Hold time during which the device will wait for a hello packet to be received on the specified interface and EIGRP autonomous system number. The hold time should be at least three times the hello interval.

ISIS Area

The ISIS area of the C6576M Ethernet Interface dialog box provides the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface:
  - true—IS-IS routing is enabled.
  - false—IS-IS routing is disabled.
- Area Tag—The IS-IS routing area in which the interface participates. If multiarea IS-IS is configured on the device, the IS-IS area must be named; otherwise, this value may be an implicit null tag.
- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 2 Metric—Cost of the interface for IS-IS level 2 (inter-area) route calculation.
- Level 1 Priority—The priority is used to determine which router on a LAN will be the designated router or designated intermediate system (DIS).

- Level 2 Priority—The priority is used to determine which router on a LAN will be the designated router or DIS.
- Enable button—Enables IS-IS routing on the interface.

Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

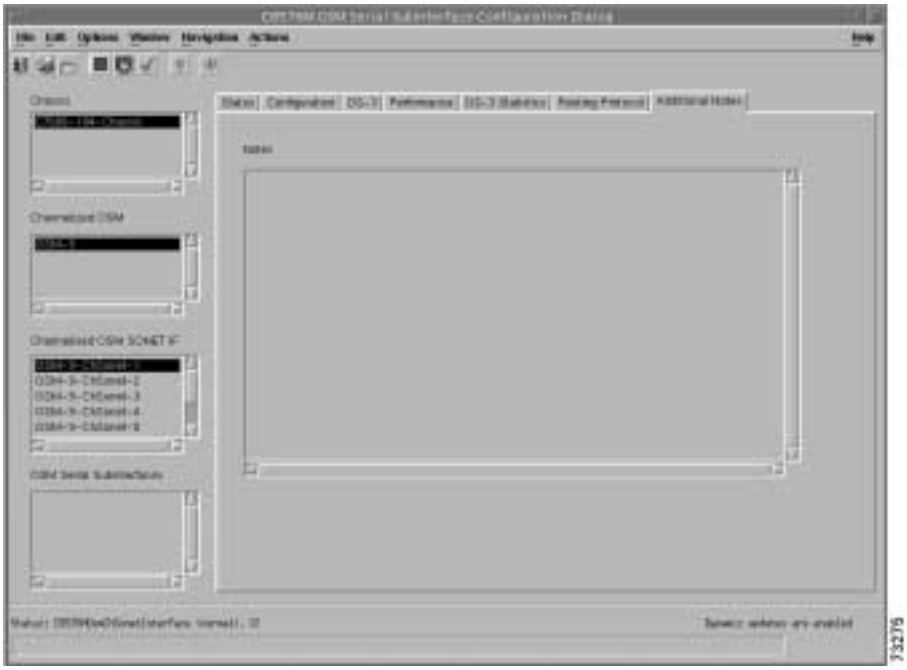
- Disable button—Disables IS-IS routing on the interface.

Note By default, all interfaces are configured as IS-IS Circuit-type Level 1-2.

Additional Notes Tab

Figure 5-84 shows the Additional Notes tab of the C6576M OSM Serial Subinterface dialog box.

Figure 5-84 Additional Notes Tab of the C6576M OSM Serial Subinterface Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the OSM Serial Subinterface.

C6576M OSM POS Subinterface Dialog Box

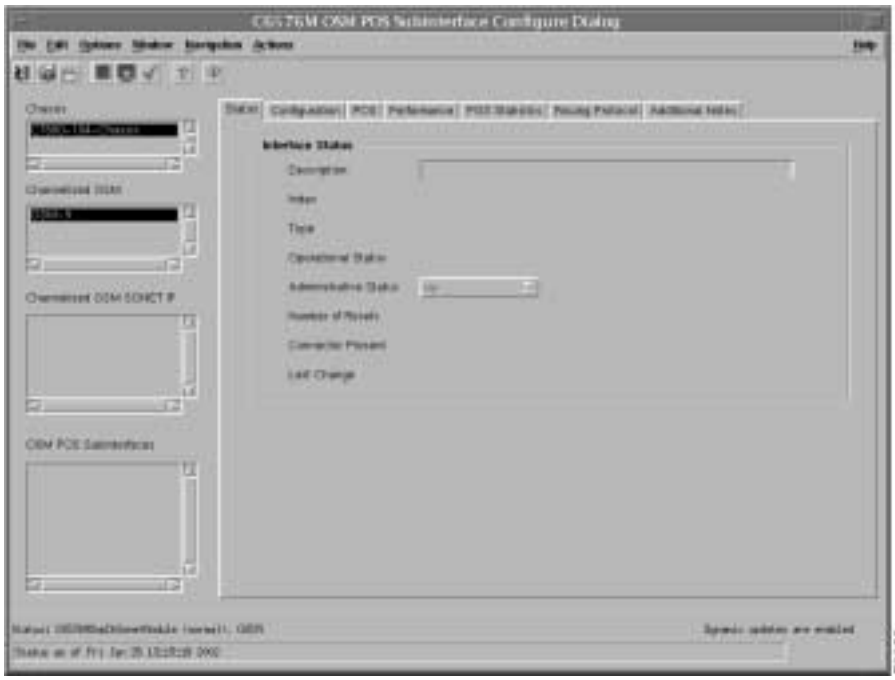
This dialog box describes a logical OC-3 channel on a channelized OC-12 (ChOC-12) or OC-48 (ChOC-48) SONET interface of an Optical Service Module (OSM). An OC-3 channel of a SONET interface is provisioned as a logical packet over SONET (POS) interface. This dialog box can be launched from the OSM Channelized SONET Module or Interface object or the POS Subinterface within the Physical view.

You can select multiple OSM POS subinterfaces, OSM Channelized SONET interfaces, OSMs, and chassis at a time from the object list on the left side of the dialog box.

Status Tab

Figure 5-85 shows the Status tab of the C6576M OSM POS Subinterface dialog box.

Figure 5-85 Status Tab of the C6576M OSM POS Subinterface Dialog Box



Interface Status Area

The Status area of the C6576M OSM POS Subinterface dialog box provides the following information to describe the general characteristics of the interface.

- Description—Comment or a description to help you remember what is attached to this interface. The description is only put in the configuration to help you remember what specific interfaces are used for.
- Index—String index of the interface. This attribute is read-only.
- Type—Indicates the type of interface distinguished by the physical and link layer protocols on the interface.
- Operational Status—The current operational state of the interface. This attribute is read-only. This attribute has one of the following values:
  - unknown
  - down
  - up
  - dormant—Interface is waiting for external actions (such as a serial line waiting for an incoming connection)
  - notPresent—Interface has missing (typically, hardware) components.
  - lowerLayerDown—Indicates that the primary channelized SONET interface has failed.
- Administrative Status—The desired state of the interface. This attribute has one of the following values:
  - up
  - down
- Number of Resets—Number of times the interface internally reset. This attribute is read-only.
- Connector Present—Displays if a cable is attached to the parent interface (the OSM Channelized SONET Interface). These are the values:
  - yes
  - no
  - unknown—This value is used when the Administrative Status is not set to “up”. In this case, it cannot be determined if a connection is present or not.
- Last Change—The value (in seconds) of sysUpTime at the time the interface entered its current operational state. If the current state was entered before the last reinitialization of the local network management subsystem, then this object contains a zero value. This attribute is read-only.

Status Field

The display-only Status field located at the bottom of the window indicates the current state of the object. This field can have the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling is performed periodically.
- performance—Some attributes are collected periodically for trending purposes.
- normallostcomms—CEMF has lost communication with the device from the normal state.

- perflostcomms—CEMF has lost communication with the device from the performance state.

Interface Configuration Tab

Figure 5-86 shows the Interface Configuration tab of the C6576M OSM POS Subinterface dialog box.

Figure 5-86 Interface Configuration Tab of the C6576M OSM POS Subinterface Dialog Box

General Area

The General area contains the following information:

- Bandwidth—Overwrites default bandwidth in kilobits per second.

Note The Bandwidth attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP, and OSPF); you cannot adjust the actual bandwidth of an interface with this command.

- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP and EIGRP); you cannot adjust the actual delay of an interface with this command.

- Input Queue Length—Displays the input queue length in packets.
- Output Queue Length—Displays the output queue length in packets.
- Link Up/Down Trap—Enables or disables linkUp and linkDown trap generation for the interface.

Layer 2 Area

The Layer 2 area contains the following information:

- MTU—The size of the largest datagram (frame) which can be sent or received on the interface, specified in octets.

Layer 3 Area

The Layer 3 area contains the following information:

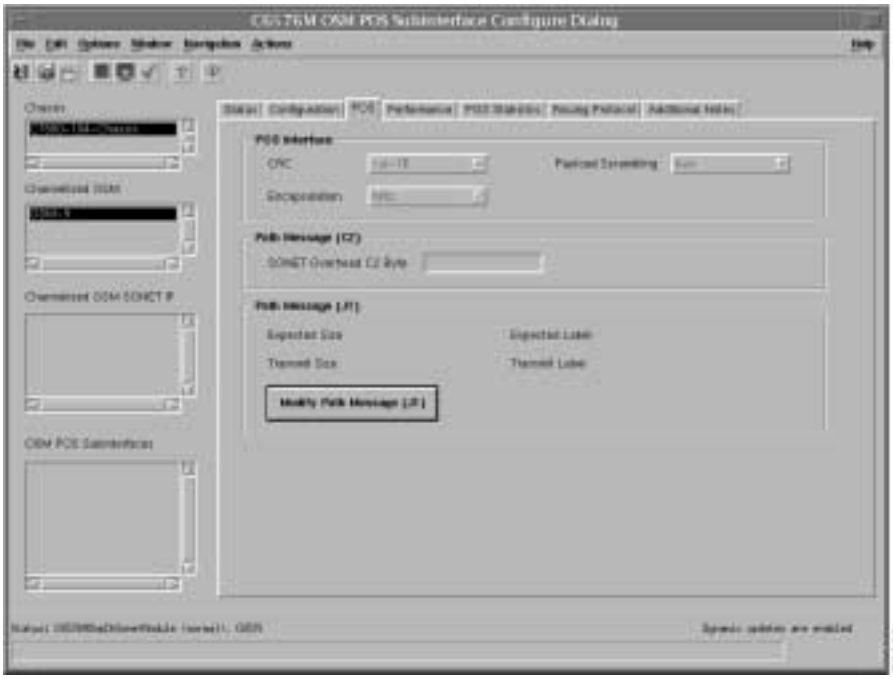
- IP Address—Displays the IP address of the Layer 3 interface.
- IP MTU—Layer 3 MTU. The size of the largest datagram (packet) that can be sent/received on the interface. Cannot exceed the size of the largest layer 2 datagram on the interface. If the Layer 2 MTU is updated, the Layer 3 MTU must be adjusted so that it does not exceed the new Layer 2 MTU.
- Netmask—Subnet mask of the IP address. Enabled bits indicate network addressing bits in the IP address.
- Modify IP button—Launches a subdialog box to modify the IP address of the interface. Figure 5-87 shows the subdialog box that is displayed when the Modify IP button is selected. The subdialog box contain the following:
  - IP Address—Primary IP address of interface.
  - Netmask—Subnet mask for the interface.
  - Modify IP button—Modify the IP address.

Figure 5-87 Modify IP Subdialog Box

POS Tab

Figure 5-88 shows the POS tab of the C6576M OSM POS Subinterface dialog box.

Figure 5-88 POS Tab of the C6576M OSM POS Subinterface Dialog Box



POS Interface Area

The POS Serial Interface area contains the following information:

- CRC—Cyclical redundancy check (CRC) word size. The CRC is an error-checking technique that uses a calculated numeric value to detect errors in transmitted data.
- Payload Scrambling—Indicates whether or not SONET payload scrambling is enabled on the interface. Payload scrambling ensures that there is sufficient bit-transition density to maintain the transmit clock for synchronous signalling. Both ends of the connection must use the same scrambling algorithm.
- Encapsulation—Indicates whether HDLC or PPP encapsulation is used on the interface.

Path Message (C2) Area

The Path Message (C2) area contains the following information:

- SONET Overhead C2 Byte—Value of the SONET overhead Path Signal Label (C2), which indicates the contents of the SONET STS-SPE Higher Order VC. This attribute is read-only. These are possible values:
  - 207 (0xCF) = PPP or HDLC with no payload scrambling
  - 22 (0x16) = PPP or HDLC with payload scrambling

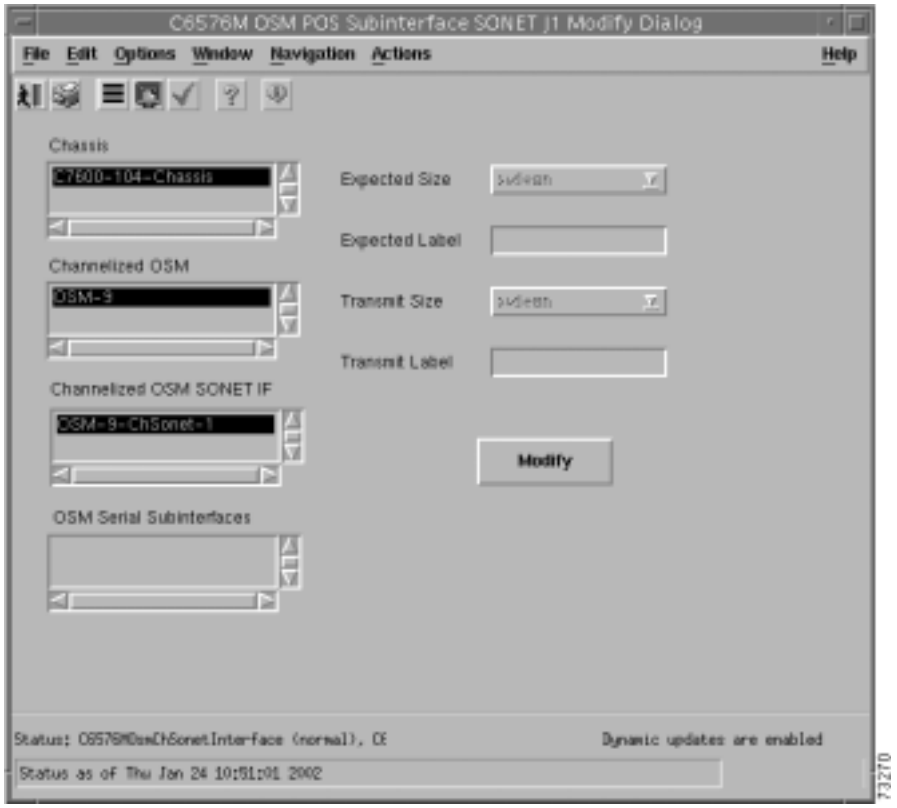
Path Message (J1) Area

The SONET Path Header (J1) area contains the following information:

- Expected Size—Maximum length of the expected receive SONET Path overhead message in bytes.
- Transmit Size—Maximum length of the transmitting SONET Path overhead message in bytes.
- Expected Label—The expected receive SONET Path overhead message. If the expected label is longer than the expected size, it will be truncated.
- Transmit Label—Transmitting SONET Path overhead message. If the transmitting label is longer than the transmitting size, it will be truncated.
- Modify Path Message (J1) button—Launches a subdialog box to modify the expected receive and transmit SONET Path overhead message. Figure 5-89 shows the subdialog box launched by this button. The following items are displayed in the subdialog box:
  - Expected Size
  - Transmit Size
  - Expected Label
  - Transmit Label
  - Modify button—Sets the specified values of the attributes given in the subdialog box.

Note In 12.1(11b)E and later the values for the Expected Size and the Transmit Size should be the same since the Tx and Rx message sizes cannot be independently configured. If the received values are different, the J1 Path Overhead message size will be set to the larger of the two values.

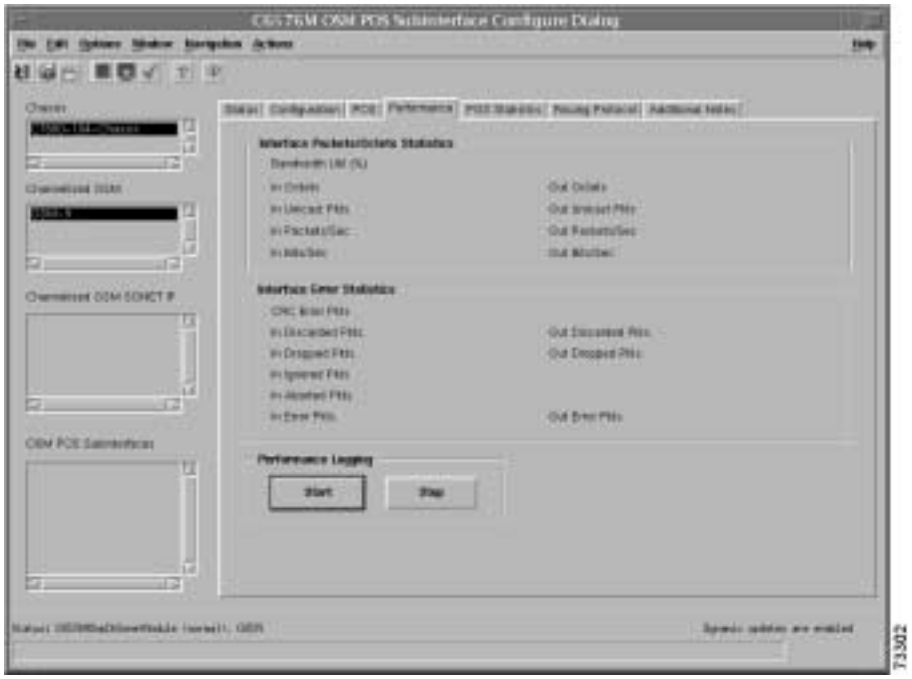
Figure 5-89 SONET J1 Modify Subdialog Box of the C6576M OSM POS Subinterface Dialog Box



Performance Tab

Figure 5-90 shows the Performance tab of the C6576M OSM POS Subinterface dialog box. All the attributes shown in this tab are read-only.

Figure 5-90 Performance Tab of the C6576M OSM POS Subinterface Dialog Box



Interface Packets/Octets Statistics Area

The Interface Packets/Octets Statistics area contains the following information:

- Bandwidth Util (%)—Percentage of bandwidth utilization.
- In Octets—Total number of received octets including framing characters.
- Out Octets—Total number of transmitted octets including framing characters.
- In Unicast Pkts.—The number of packets delivered by this sublayer to a higher (sub-)layer, which were not addressed to a multicast or broadcast address at this sublayer.
- Out Unicast Pkts.—The total number of packets that higher-level protocols requested be transmitted, and which were not addressed to a multicast or broadcast address at this sublayer, including those that were discarded or not sent.
- In Packets/Sec—Five-minute exponentially decayed moving average of input packets per second.
- Out Packets/Sec—Five-minute exponentially decayed moving average of output packets per second.
- In Bits/Sec—Five-minute exponentially decayed moving average of input bits per second.
- Out Bits/Sec—Five-minute exponentially decayed moving average of output bits per second.

Interface Error Statistics Area

The Interface Error Statistics area contains the following information:

- CRC Error Pkts.—Number of input packets that had cyclic redundancy checksum errors.

- In Discarded Pkts.—The number of inbound packets that were chosen to be discarded even though no errors had been detected to prevent their being deliverable to a higher-layer protocol. One possible reason for discarding such a packet could be to free up buffer space.
- Out Discarded Pkts.—The number of outbound packets that were chosen to be discarded even though no errors had been detected to prevent their being transmitted. One possible reason for discarding such a packet could be to free up buffer space.
- In Dropped Pkts.—The number of packets dropped because the input queue was full.
- Out Dropped Pkts.—The number of packets dropped because the output queue was full.
- In Ignored Pkts.—Number of input packets that were ignored by this interface.
- In Aborted Pkts.—Number of input packets that were aborted.
- In Error Pkts.—The number of inbound packets that contained errors preventing them from being deliverable to a higher-layer protocol.
- Out Error Pkts.—Number of outbound packets that could not be transmitted because of errors.

Performance Logging Area

The Performance Logging area of the C6576M OSM POS Subinterface dialog box contains buttons to enable data logging of all the interface attributes of the interface.

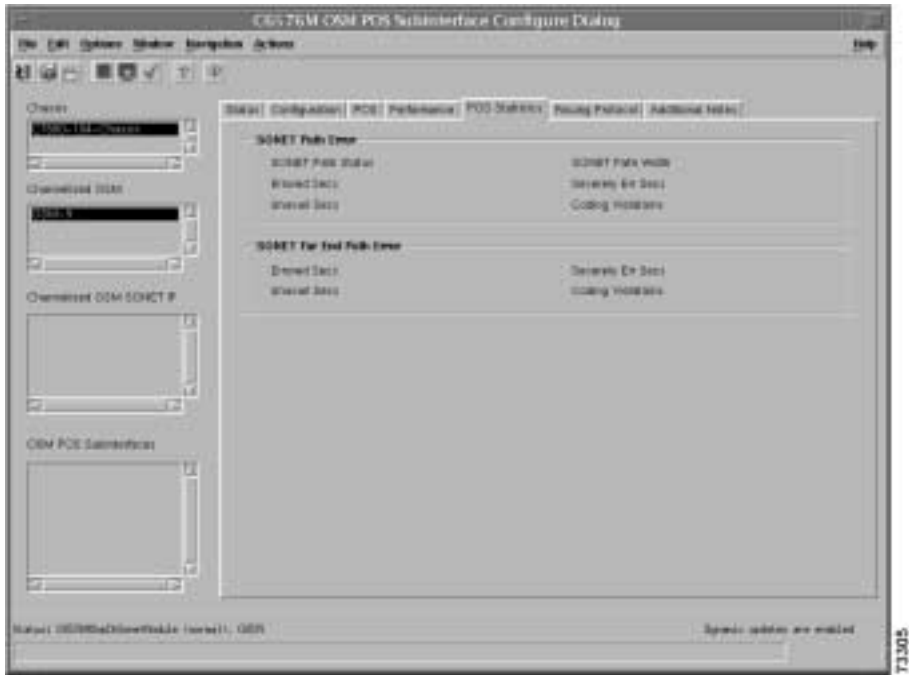
- **Start**—Turns on performance data logging.
- **Stop**—Turns off performance data logging.

Note The logged data is available to you through the CEMF Performance Manager. Refer to the *Cisco Element Management Framework User Guide* for more information about the Performance Manager.

POS Statistics Tab

Figure 5-91 shows the POS Statistics tab of the C6576M OSM POS Subinterface dialog box.

Figure 5-91 POS Statistics Tab on the C6576M OSM POS Subinterface Dialog Box



SONET Path Error Area

The SONET Path Error area contains the following information:

- SONET Path Status—Status of the SONET Path. This status may indicate multiple simultaneous defects. These are possible path defects (bitmask):
  - No defects (1)
  - STS-Path Loss of Pointer (2)
  - STS-Path Alarm Indication Signal (4)
  - STS-Path Remote Defect Indication (8)
  - Unequipped (16)
  - Signal Label Mismatch (32)
- SONET Path Width—Width of the SONET path. This is described by the STS-Nc SPE. A DS3 channel has a width of STS-1 (55.84 Mbps).
- Errored Secs—Number of errored seconds encountered by the SONET Path in the current 15-minute interval.
- Severely Err Secs—Number of severely errored seconds encountered by the SONET Path in the current 15-minute interval.

- Coding Violations—Number of coding violations encountered by the SONET Path in the current 15-minute interval.
- Unavailable Secs—Number of Unavailable Seconds encountered by the SONET Path in the current 15-minute interval.

SONET Far End Path Error Area

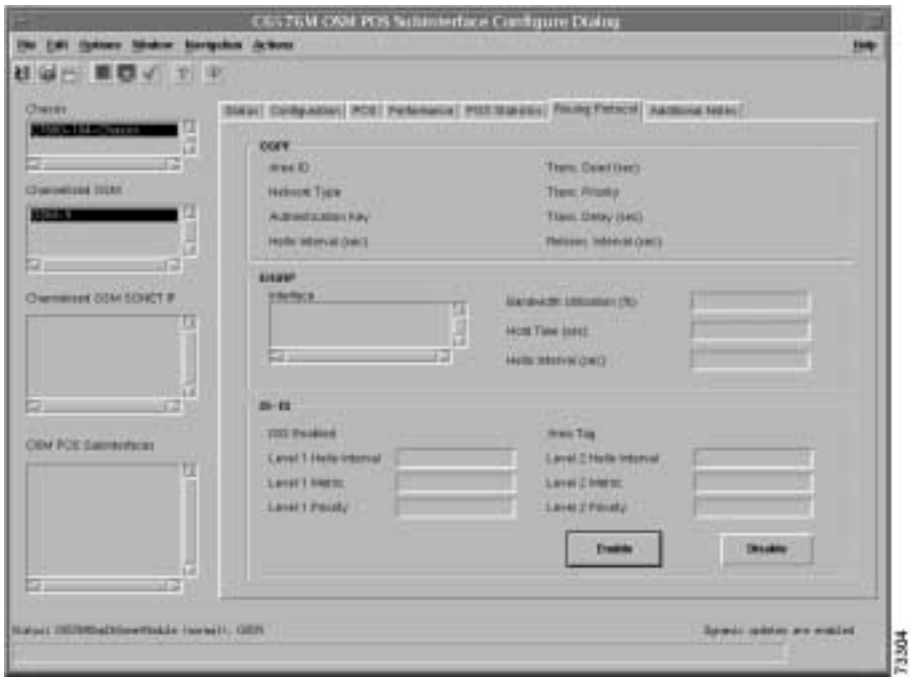
The SONET Far End Path Error area contains the following information:

- Errored Secs—Number of far end errored seconds encountered by the SONET Path in the current 15-minute interval.
- Severely Err Secs—Number of far end severely errored seconds encountered by the SONET Path in the current 15-minute interval.
- Coding Violations—Number of far end coding violations encountered by the SONET Path in the current 15-minute interval.
- Unavailable Secs—Number of far end unavailable seconds encountered by the SONET Path in the current 15-minute interval.

Routing Protocol Tab

Figure 5-92 shows the Routing Protocol tab of the C6576M OSM POS Subinterface dialog box.

Figure 5-92 Routing Protocol Tab on the C6576M OSM POS Subinterface Dialog Box



OSPF Area

The OSPF area of the C6576M OSM POS Interface dialog box provides the following information. All the attributes in this area are read-only.

- Network Type—OSPF interface type. By default, a POS interface is point-to-point, however, the OSPF network type may be modified to accommodate different types of network configurations. This attribute has one of the following values:
  - broadcast
  - nbma
  - pointToPoint
  - pointToMultipoint
- Area ID—The predefined ID uniquely identifying the area to which the interface connects. It can be specified as either a decimal value or as an IP address. Value is 0.0.0.0 if interface is a Layer 2 (no IP address assigned) interface. This attribute is read-only.
- Authentication Key—Password to be used by neighboring OSPF routers on a network segment that is using OSPF simple password authentication. It is ignored if Authentication Type is not “simple”.
- Hello Interval (sec)—Frequency at which the device will send hello packets on the specified interface and EIGRP autonomous system number.
- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. If more than one router has the same value for this field, the routers use their router ID as a tie breaker.
- Trans. Dead (sec)—Number of seconds that a device’s hello packets must not have been seen before its neighbors declare the OSPF router down. Must be consistent among all routers on an attached network.
- Trans. Delay (sec)—The estimated number of seconds it takes to transmit a link state update packet over this interface.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.

EIGRP Area

The EIGRP Area of the C6576M Ethernet Interface dialog box provides the following information:

- EIGRP Interface Table—Describes the EIGRP configuration of the interface on each active autonomous system. The EIGRP parameters of the interface on an autonomous system may be explicitly configured even if EIGRP routing updates in the autonomous system are not currently carried on the interface.
- Bandwidth Utilization (%) —The percentage of the interface bandwidth that the EIGRP protocol can use.
- Hello Interval (sec)—Frequency at that the device will send hello packets on the specified interface and EIGRP autonomous system number.
- Hold Time (sec)—Hold time during that the device will wait for a hello packet to be received on the specified interface and EIGRP autonomous system number. The hold time should be at least three times the hello interval.

ISIS Area

The ISIS area of the C6576M Ethernet Interface dialog box provides the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface:
  - true—IS-IS routing is enabled.
  - false—IS-IS routing is disabled.
- Area Tag—The IS-IS routing area in which the interface participates. If multiarea IS-IS is configured on the device, the IS-IS area must be named; otherwise, this value may be an implicit null tag.
- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 2 Metric—Cost of the interface for IS-IS level 2 (inter-area) route calculation.
- Level 1 Priority—Determines which router on a LAN will be the designated router or designated intermediate system (DIS).
- Level 2 Priority—Determines which router on a LAN will be the designated router or DIS.
- Enable button—Enables IS-IS routing on the interface.

Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

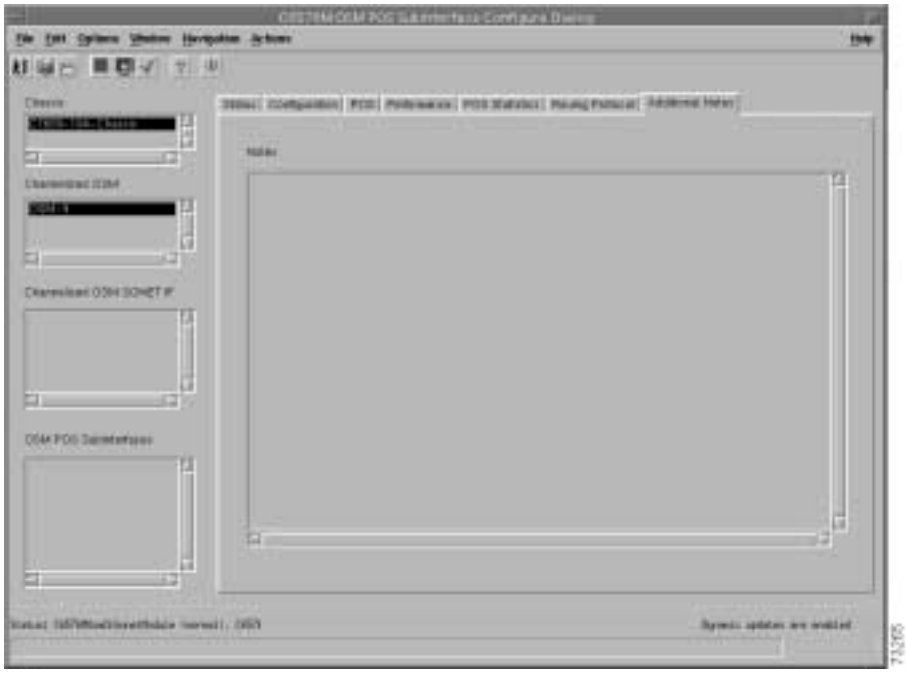
- Disable button—Disables IS-IS routing on the interface.

Note By default, all interfaces are configured as IS-IS Circuit-type Level 1-2.

Additional Notes Tab

Figure 5-93 shows the Additional Notes tab of the C6576M OSM POS Subinterface dialog box.

Figure 5-93 Additional Notes Tab of the C6576M OSM POS Subinterface Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the OSM POS Subinterface.

CHAPTER 6

Logical Object Dialog Boxes

This chapter describes the C65/76M dialog boxes for the logical objects. The following logical object dialog boxes are available in the C65/76M:

Table 6-1 lists the pop-up menu launch points for all C65/76M dialog boxes.

Table 6-1 Launch Points for the C65/76M Dialog Boxes

Container	Object	Dialog Box
Network	Network Element	All dialogs (under the Cisco 6500/7600 Series Manager menu entry)
Physical	Container (site, bay, shelf, etc.)	All dialogs (under the Cisco 6500/7600 Series Manager menu entry)
	Network Element	NE Config/Mgmt Dialog All logical object dialogs
	Software	Software Dialog Syslog Dialog VTP Dialog VLAN Dialog EtherChannel Dialog BGP Dialog OSPF Dialog EIGRP Dialog
	EtherChannel	EtherChannel Dialog
	Syslog	Syslog Dialog
	EIGRP	EIGRP Dialog
	BGP	BGP Dialog
	OSPF	OSPF Dialog
	VTP	VTP Dialog
	VLAN	VLAN Dialog
	STP	STP Dialog
	ISIS	IS-IS Dialog
	ACL	ACL Dialog
	NDE	NDE Dialog
	Loopback	Loopback Dialog
	QoS	QoS Dialog QoS Policy Map Dialog

C6576M NE Config/Mgmt Dialog Box

The C6576M NE Config/Mgmt dialog box provides monitoring and management information for properties related to the Catalyst 6000 family switch or Cisco 7600 series Internet Router. These properties include the Telnet and Enable passwords, global performance logging, and SNMP properties for the entire switch. This dialog box can be launched from a Network Element object within the Network or Physical views.

The Network Element object list (left-hand side of the dialog box) allows multiple objects to be selected, so that configuration changes can be applied to multiple Network Element objects at the same time.

Configuration Tab

Figure 6-1 shows the Configuration tab of the C6576M Network Element dialog box.

Figure 6-1 Configuration Tab of the C6576M Network Element Dialog Box

System Area

The System area of the C6576M Network Element dialog box provides the following information:

- System Name—Fully qualified name of the switch or router.

IP Address Area

The IP Address area of the C6576M Network Element dialog box provides the following information:

- IP Address—IP address used to access the switch or router.
- MSFC—IP address of the management agent on the MSFC daughter card (only in Hybrid OS).

Operating System Area

The Operating System area of the C6576M Network Element dialog box provides the following information:

- Expected OS Type—This attribute is used by a client that initiates a deployment context to indicate the type of operating system expected on a managed device. This can only be changed when the device is decommissioned.
- Active OS Type—The operating system type detected on the managed device.

IOS Session

The IOS Session area of the C6576M Network Element dialog box provides the following information:

- Username—User name to establish an IOS management session with the device over telnet.
- Password—Password to establish an IOS management session with the device over telnet.
- EXEC Password—Password to enter privileged EXEC mode.

Cat OS Session Area

The Cat OS Session area of the C6576M Network Element dialog box provides the following information:

- Same As IOS?—If enabled, the IOS telnet username and password will be used to connect to the Supervisor module over CatOS in Hybrid OS configurations.
- Username—User name to establish a CatOS management session with the device over telnet.
- Password—Password to establish a CatOS management session with the device over telnet.
- EXEC Password—Password to enter privileged EXEC mode in a CatOS session.

Note If the above passwords are incorrect, some dialog box values may report as ERROR.

Reset System Area

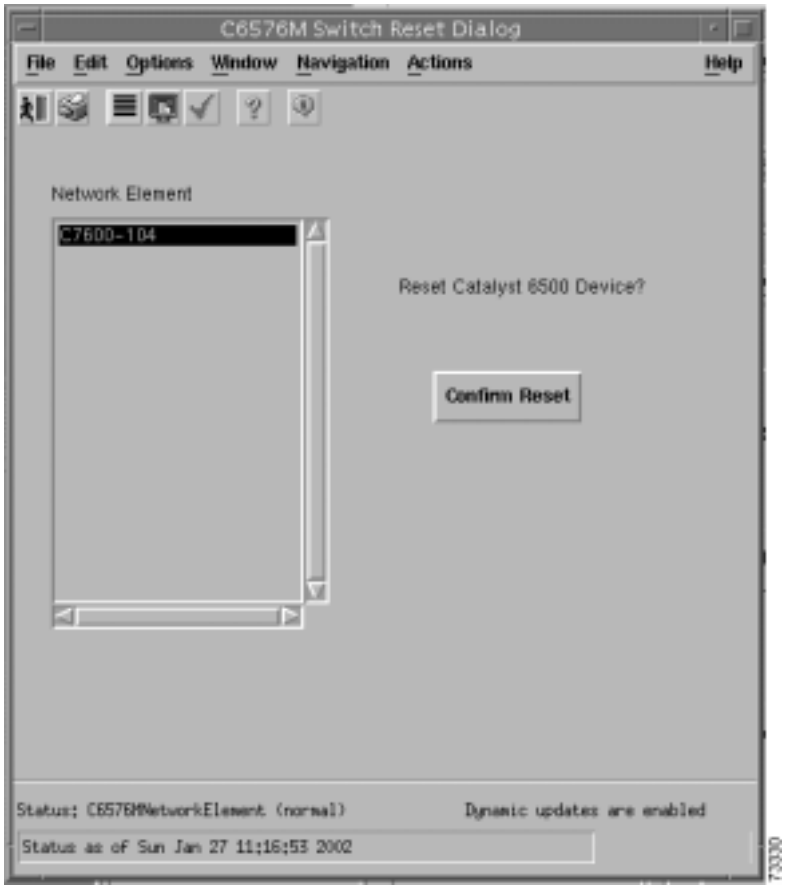
The Reset System area of the C6576M Network Element dialog box provides the following information:

- **Last Restart Reason**—Text message displaying why the switch or router was restarted.
- **Reset button**—Button used to reset the switch or router. This action power cycles the switch or router. If clicked, a pop-up is displayed asking if you really want to reset the switch or router (see Figure 6-2).

Note Only users with administrative privileges can use the Reset button.

Note Any changes to the running configuration will be saved automatically when the switch or router is reset using the Reset button.

Figure 6-2 Confirmation Reset Window for a Network Element



Actions Area

The Actions area of the C6576M Network Element dialog box provides the following information:

- **Commission button**— Commissions the object manually. You can commission the object only if the object is in a decommissioned state. Clicking this button forces a subchassis discovery to be executed, and propagates the commissioned status to all subobjects.
- **Decommission button**—Decommissions the object manually and propagates the decommissioned status to all subobjects. In the decommissioned state, the properties of the object are not monitored. As a result, data displayed in the configuration window is not guaranteed to be current.

Status Field

The display-only Status field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- discovery—CEMF is trying to determine the contents and configuration of the switch/router.
- normal—Presence polling is performed periodically.
- normallostcomms—CEMF has lost communication with the device from the normal state.

- discoverylostcomms—CEMF lost communication with the device during discovery, which occurs if the SNMP read community is incorrect.
- mismatched—The network element for the given IP address does not corrspond to a Catalyst 6000 family switch or Cisco 7600 series Internet Router.

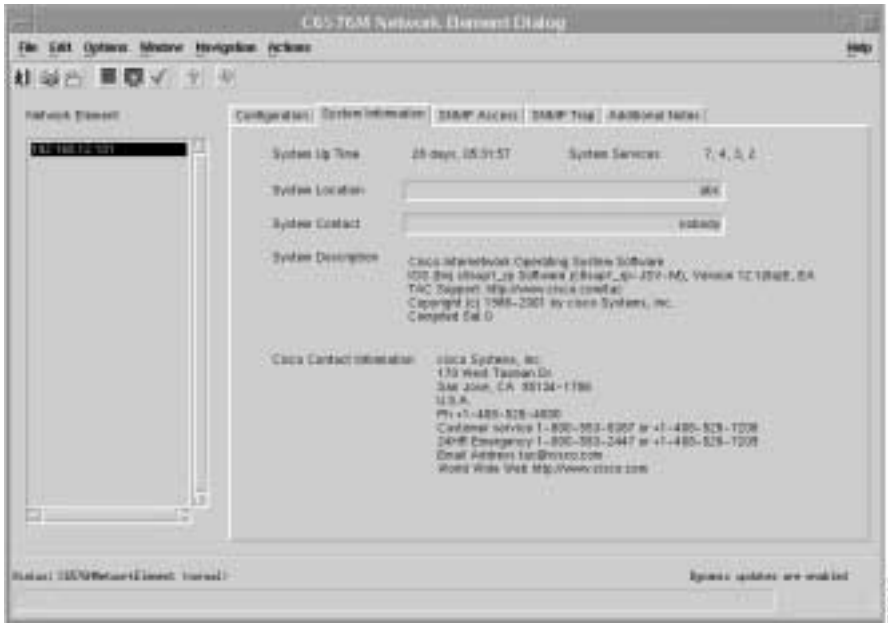
System Information Tab

Figure 6-3 shows the System Information tab of the C6576M Network Element dialog box.

The System Information tab provides the following information:

- System Up Time—The duration of time indicating how long the system has been running. This attribute is read-only.
- System Services—List of OSI layers supported by the switch or router. This attribute is read-only.
- System Location—Displays the location of the switch or router.
- System Contact—Displays the name of the person who is the contact for this switch/router.
- System Description—A multiline text description of the switch/router. This attribute is read-only.
- Cisco Contact Information—Details on how to contact Cisco Systems. This attribute is read-only.

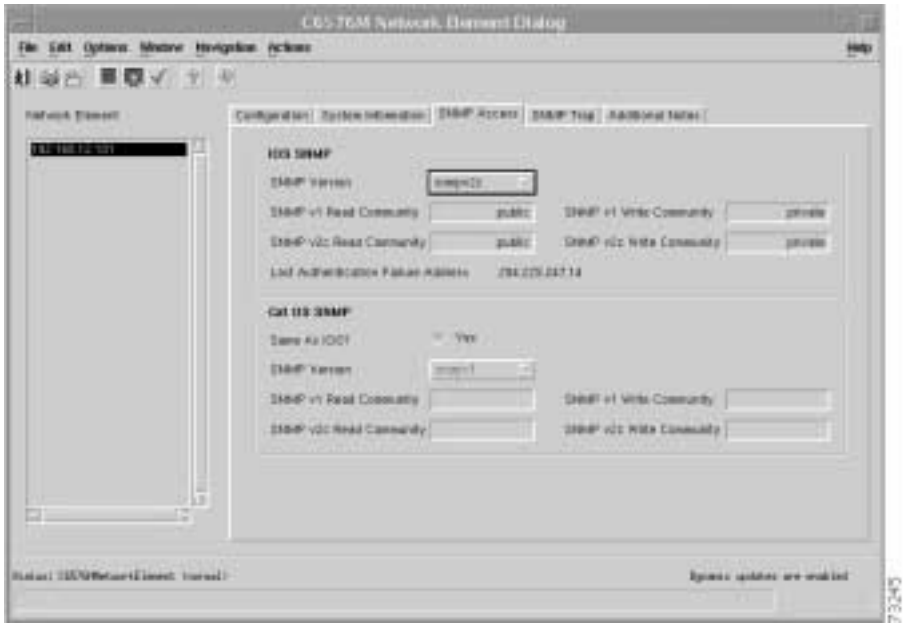
Figure 6-3 System Information Tab of the C6576M Network Element Dialog Box



SNMP Tab

Figure 6-4 shows the SNMP tab of the C6576M Network Element dialog box.

Figure 6-4 SNMP Access Tab of the C6576M Network Element Dialog Box



IOS SNMP Area

The IOS SNMP area of the C6576M Network Element dialog box provides the following information:

- SNMP Version—The version of the SNMP agent running on the switch or router. The version is one of these values:
  - SNMPv1
  - SNMPv2c
  - SNMPv3—Not supported by the Catalyst 6000 family switches or the Cisco 7600 series Internet Routers
- SNMP v1 Read Community—The v1 community string used to read data from the agent.
- SNMP v2c Read Community—The v2c community string used to read data from the agent.
- Last Authentication Failure Address—The IP address of the last host that caused an SNMP authentication failure to occur.
- SNMP v1 Write Community—The v1 community string used to write data to the agent.
- SNMP v2c Write Community—The v2c community string used to write data to the agent.

Cat OS SNMP Area

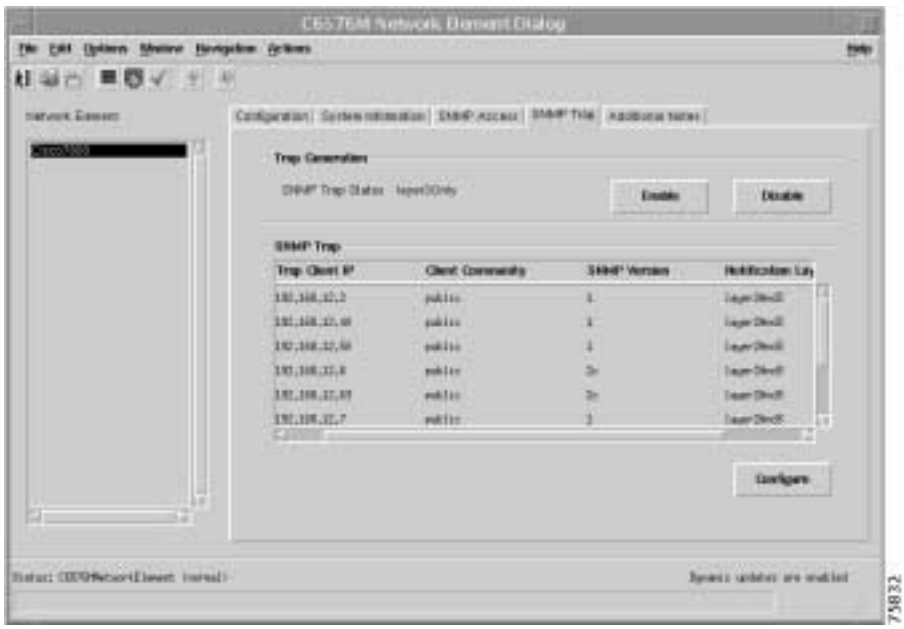
The Cat OS SNMP area of the C6576M Network Element dialog box provides the following information:

- Same As IOS?—If enabled, the IOS SNMP version and communities will be used to access the SNMP Agent on the Supervisor module in Hybrid OS configurations.
- SNMP Version—The version of the SNMP agent running on the switch or router. The version is one of these values:
  - SNMPv1
  - SNMPv2c
  - SNMPv3—Not supported by the Catalyst 6000 family switches or the Cisco 7600 series Internet Routers
- SNMP v1 Read Community—The v1 community string used to read data from the agent.
- SNMP v2c Read Community—The v2c community string used to read data from the agent.
- SNMP v1 Write Community—The v1 community string used to write data to the agent.
- SNMP v2c Write Community—The v2c community string used to write data to the agent.

SNMP Trap Tab

Figure 6-5 shows the SNMP Trap tab of the C6576M Network Element dialog box.

Figure 6-5 SNMP Trap Tab of the C6576M Network Element Dialog Box



Trap Generation Area

The Trap Generation area of the C6576M Network Element dialog box provides the following information:

- SNMP Trap Status—Indicates the level at which SNMP traps are enabled. The level is one of these values:
  - disabled
  - layer2Only
  - layer3Only
  - layer2And3
- Enable button—Enables all SNMP trap generation from the switch or router.
- Disable button—Disables all SNMP trap generation from the switch or router.

SNMP Trap Area

The SNMP Trap area of the C6576M Network Element dialog box provides the following information:

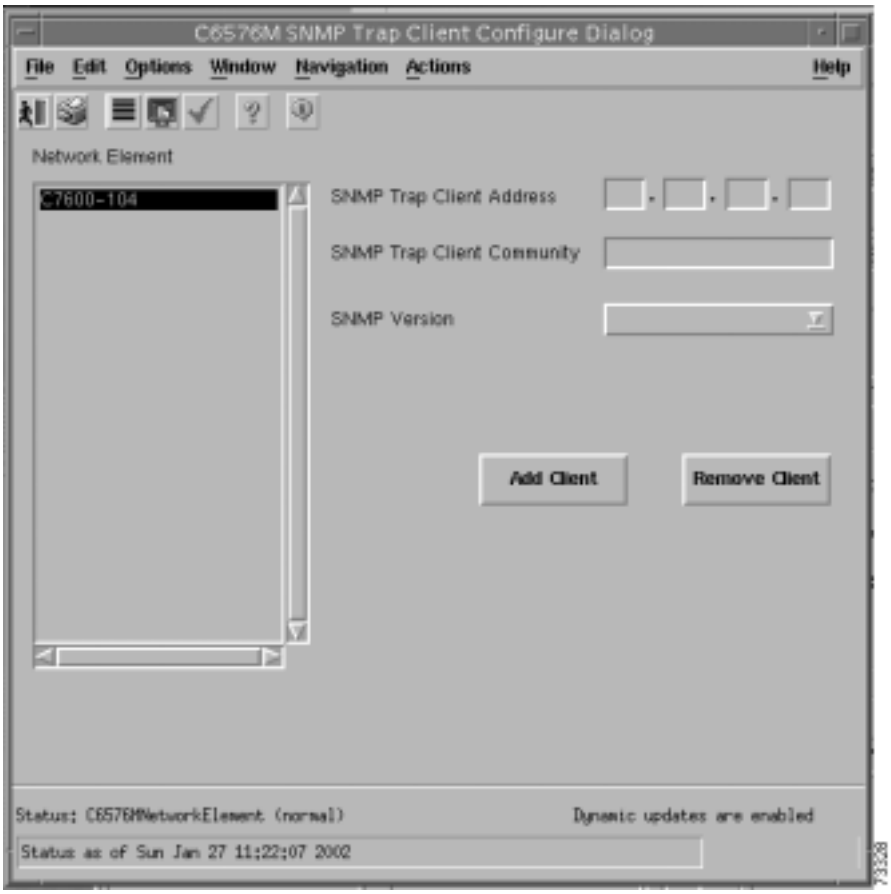
- Trap Client IP Table—IP address table to which SNMP traps generated by the switch or router are sent.
  - Trap Client IP—The IP address to which SNMP traps are sent.
  - Client Community—The community string used within the SNMP trap.
  - SNMP Version—Version of the SNMP protocol used by CEMF to communicate with the managed device. This field has the following values:
    - snmpv1
    - snmpv2c
  - Notification Layer - Indicates the level at which the SNMP trap client is defined. The level is one of these values:
    - layer2Only
    - layer3Only
    - layer2And3

Note The IP address of the CEMF server host should be in this list at all times. If it is not, then CEMF will not receive any traps from the switch or router, which might result in an event being reported in an untimely fashion or an event being missed.

- **Configure button**—Displays the subdialog box, shown in Figure 6-6, for modifying the Trap Client list.
  - SNMP Trap Client Address—The IP address to which SNMP traps are sent.
  - SNMP Trap Client Community String—The community string used within the SNMP trap.
  - Add Client button—Adds a client to the client list.
  - Remove Client button—Removes the client from the client list.

Note An error is reported if a nonexistent client is removed or if an existing client is added.

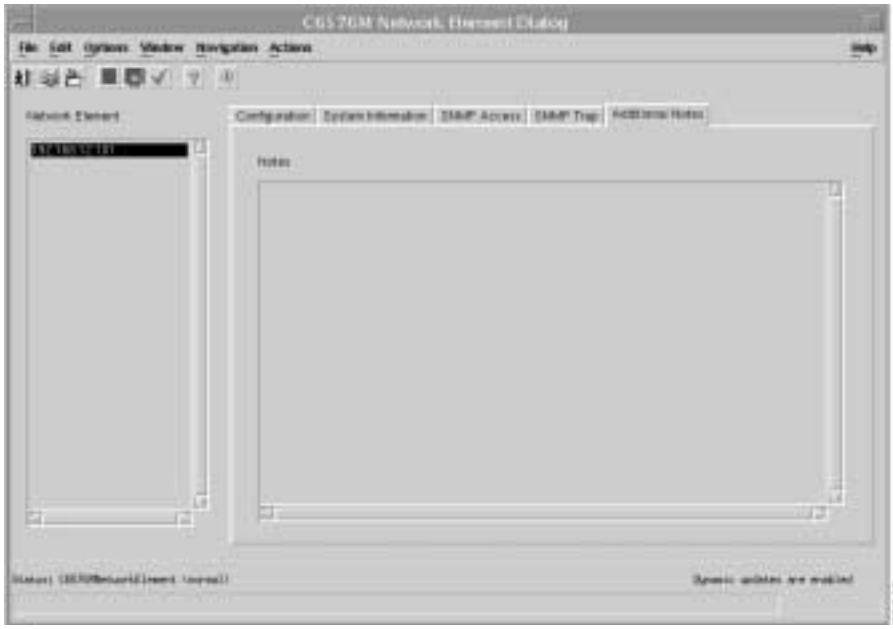
Figure 6-6 Configure Trap Client List Popup Window



Additional Notes Tab

Figure 6-7 shows the Additional Notes tab of the C6576M Network Element dialog box.

Figure 6-7 Additional Notes Tab of the C6576M Network Element Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes. For example, this information can include text indicating why global performance logging is turned on.

C6576M Software Dialog Box

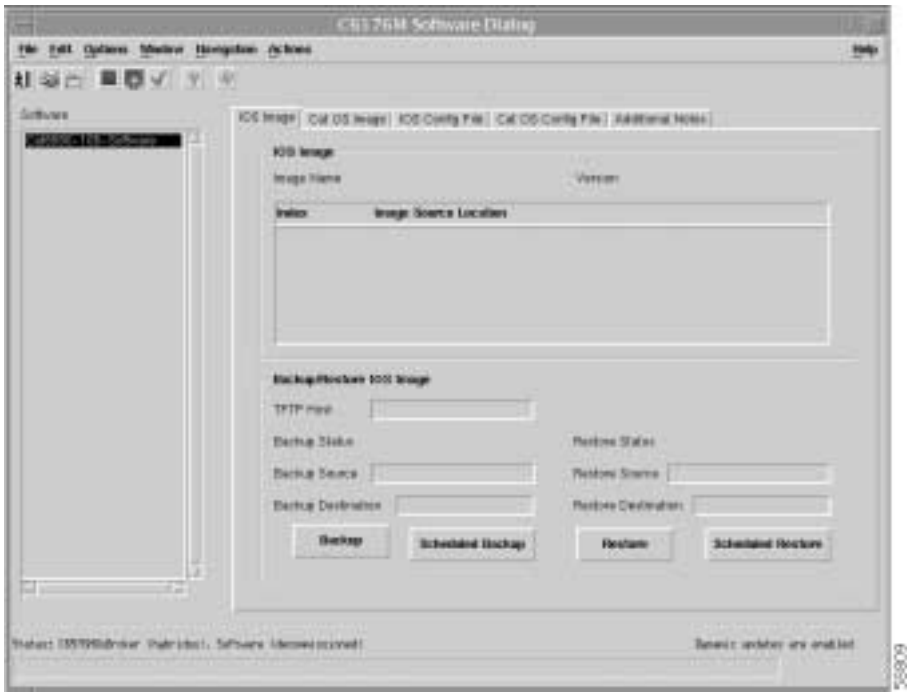
This dialog box provides information on the IOS image and configuration of the switch or router. This dialog box is launched from a Network Element object within the Network or Physical view and the Software object in the Physical view.

You can choose only one software object at a time from the object list on the left side of the dialog box.

IOS Image Tab

Figure 6-8 shows the IOS Image tab of the C6576M Software dialog box.

Figure 6-8 IOS Image Tab of the C6576M Software Dialog Box



IOS Image Area

The IOS Image area of the C6576M Software dialog box provides the following information:

- Image Name—Name of the IOS image currently executing on the switch or router.
- Version—Version of the currently executing IOS image.
- Index—Index of the Image Source Location item in the table.
- Image Source Location—The list of files (in order) that are used to boot the switch or router.

Backup/Restore IOS Image Area

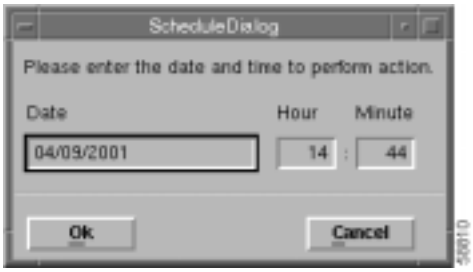
The Backup/Restore IOS Image area of the C6576M Software dialog box provides the following information:

- TFTP Host—The IP address or hostname of the TFTP server that the IOS image was restored from or backed up to.
- Backup Status—Status of the last image backup operation. The Backup Status has the following values:
  - Ok—The backup operation completed without errors.
  - Failed—The backup operation failed.
  - Not executed—A backup has not been executed.
- Backup Source—The IOS image file to be backed up. Specify the full path to the image (for example, “slot0:c6sup12-jsv-mz.121-6.E.bin”).
- Backup Destination—The destination filename on the TFTP Host to which the image will be backed up.
- Restore Status—Status of the last image restore operation. The Restore Status has the following values:
  - Ok—The restore operation completed without errors.
  - Failed—The restore operation failed.
  - Not executed—A restore has not been executed.
- Restore Source—The filename of the IOS image that will be restored from the TFTP Host to the switch or router.
- Restore Destination—The destination filename on the switch or router to which the image will be restored. The file attribute can include the file system as well as the filename; for example: Slot0:/c6sup22jsv.bin.
- **Backup** button—Backs up the IOS image specified in the Backup Source attribute to the file specified in the Backup Destination attribute on the TFTP Host.
- **Scheduled Backup** button—Schedules the backup of an IOS image file (from the device to the TFTP server). Launches the dialog box shown in Figure 6-9:
  - Date—The date when the backup will start. The format is MM/DD/YYYY.
  - Hour—The hour when the backup will start. It is a 24-hour clock.
  - Minute—The minute when the backup will start.
- **Restore** button—Restores an IOS image. Copies the Restore Source file from the TFTP Host to the Restore Destination location/file.

Note The Switch or router needs to be reset in order to run with the new IOS image.

- **Scheduled Restore** button—Schedules the restore operation of an IOS image file (from the TFTP server to the device). Launches the dialog box shown in Figure 6-9:
  - Date—The date when the restore will start. The format is MM/DD/YYYY.
  - Hour—The hour when the restore will start. It is a 24-hour clock.
  - Minute—The minute when the restore will start.

Figure 6-9 Scheduled Backup/Restore IOS Image Dialog Box



Note An alarm is generated if the Backup Status and Restore Status attributes are set to Failed. (See Chapter 8, "Alarms and Alarm Management.")

Status Field

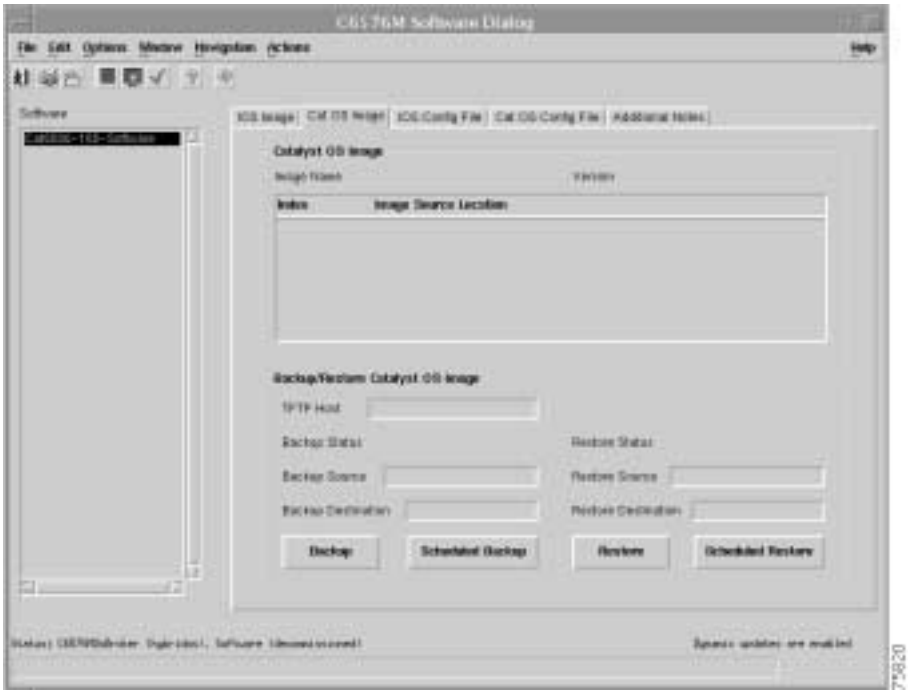
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- discovery—CEMF is trying to determine the contents and configuration of the Chassis object.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.
- discoverylostcomms—CEMF lost communication with the device during discovery.

Cat OS Image Tab

Figure 6-10 shows the Cat OS Image tab of the C6576M Software dialog box.

Figure 6-10 Cat OS Image Tab of the C6576M Software Dialog Box



Catalyst OS Image Area

The Catalyst OS Image area of the C6576M Software dialog box provides the following information:

- Image Name—Name of the Cat OS image currently executing on the switch or router.
- Version—Version of the currently executing Cat OS image.
- Image Source Location—The list of files (in order) that are used to boot the switch or router.

Backup/Restore Catalyst OS Image Area

The Backup/Restore Catalyst OS Image area of the C6576M Software dialog box provides the following information:

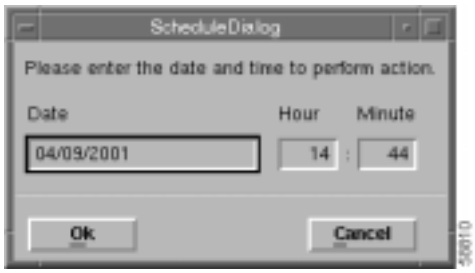
- TFTP Host—The IP address or hostname of the TFTP server that the Cat OS image was restored from or backed up to.
- Backup Status—Status of the last image backup operation. The Backup Status has the following values:
  - Ok—The backup operation completed without errors.
  - Failed—The backup operation failed.
  - Not executed—A backup has not been executed.

- Backup Source—The Cat OS image file to be backed up. Specify the full path to the image (for example, “slot0:c6sup12-jsv-mz.121-6.E.bin”).
- Backup Destination—The destination filename on the TFTP Host to which the image will be backed up.
- Restore Status—Status of the last image restore operation. The Restore Status has the following values:
  - Ok—The restore operation completed without errors.
  - Failed—The restore operation failed.
  - Not executed—A restore has not been executed.
- Restore Source—The filename of the Cat OS image that will be restored from the TFTP Host to the switch or router.
- Restore Destination—The destination filename on the switch or router to which the image will be restored. The file attribute can include the file system as well as the filename; for example: Slot0:/c6sup22jsv.bin.
- **Backup** button—Backs up the Cat OS image specified in the Backup Source attribute to the file specified in the Backup Destination attribute on the TFTP Host.
- **Scheduled Backup** button—Schedules the backup of a Cat OS image file (from the device to the TFTP server). Launches the dialog box shown in Figure 6-11:
  - Date—The date when the backup will start. The format is MM/DD/YYYY.
  - Hour—The hour when the backup will start. It is a 24-hour clock.
  - Minute—The minute when the backup will start.
- **Restore** button—Restores an Cat OS image. Copies the Restore Source file from the TFTP Host to the Restore Destination location/file.

Note The Switch or router needs to be reset in order to run with the new Cat OS image.

- **Scheduled Restore** button—Schedules the restore operation of an Cat OS image file (from the TFTP server to the device). Launches the dialog box shown in Figure 6-11:
  - Date—The date when the restore will start. The format is MM/DD/YYYY.
  - Hour—The hour when the restore will start. It is a 24-hour clock.
  - Minute—The minute when the restore will start.

Figure 6-11 Scheduled Backup/Restore Cat OS Image Dialog Box

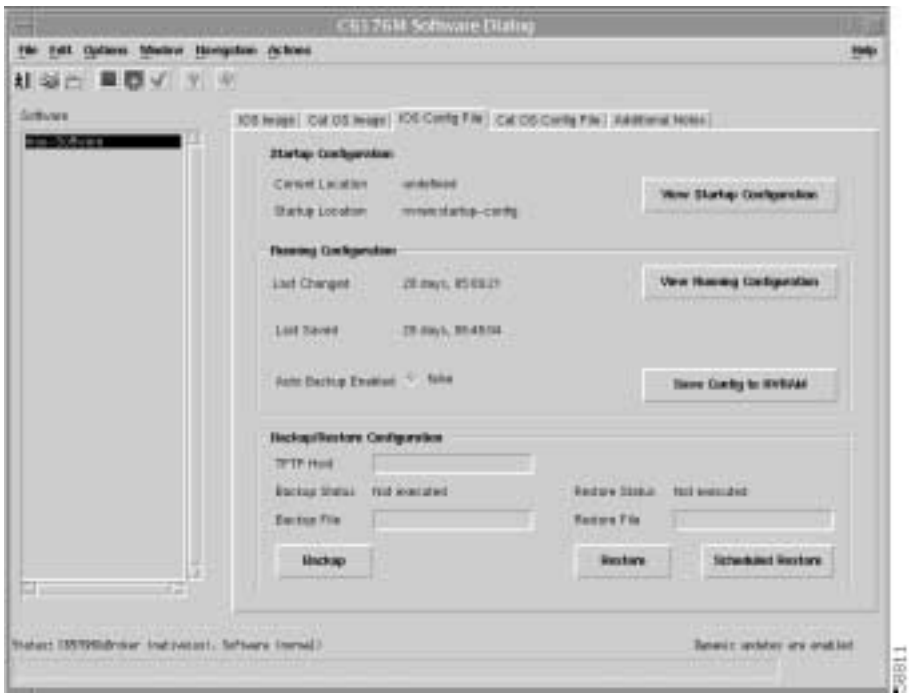


Note An alarm is generated if the Backup Status and Restore Status attributes are set to Failed. (See Chapter 8, "Alarms and Alarm Management.")

IOS Config File Tab

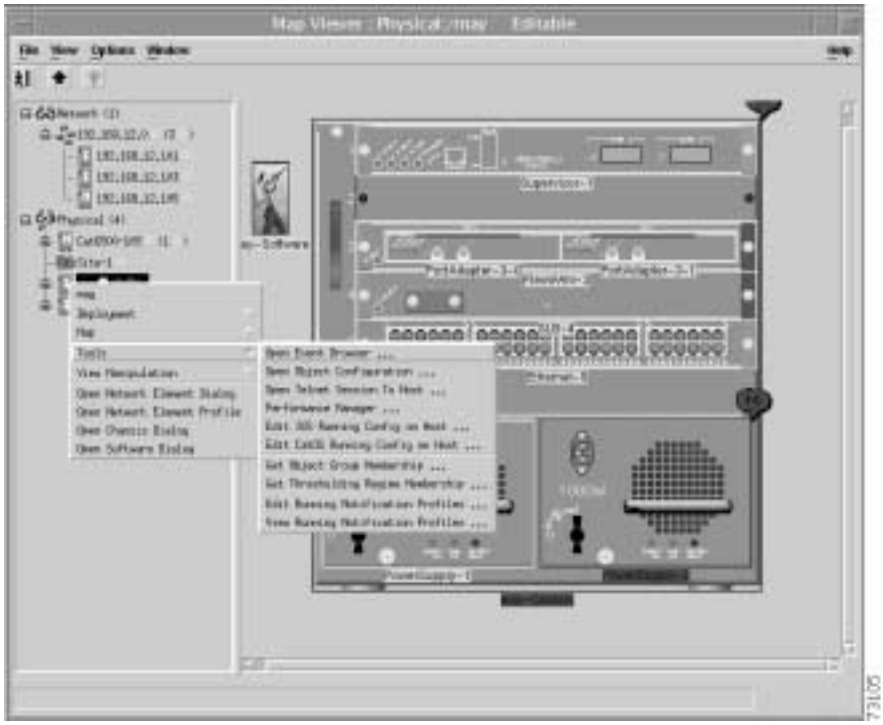
Figure 6-12 shows the IOS Config File tab of the C6576M Software dialog box.

Figure 6-12 IOS Config File Tab of the C6576M Software Dialog Box



The running configuration file can be edited by selecting the pop-up menu option of the network element object, shown in Figure 6-13.

Figure 6-13 Pop-up Menu Option to Edit the Running Configuration File

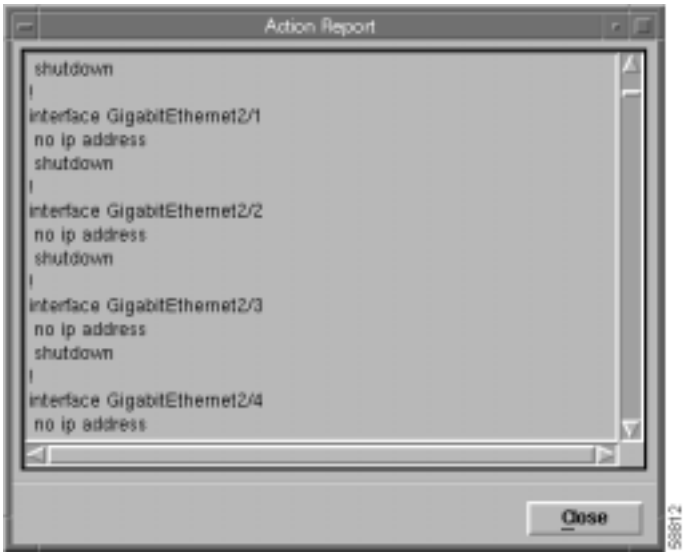


Startup Configuration Area

The Startup Configuration area of the C6576M Software dialog box provides the following information:

- Current Location—The location of the startup configuration file that will be used on the next restart. If this location is not set, then undefined is displayed. This attribute is read-only.
- Startup Location—The location of the startup configuration file that was used the last time the system was booted up. This attribute is read-only.
- View Startup Configuration button—Displays the startup configuration in a text box (see Figure 6-14). This attribute is read-only.

Figure 6-14 Startup Configuration Window Action Report

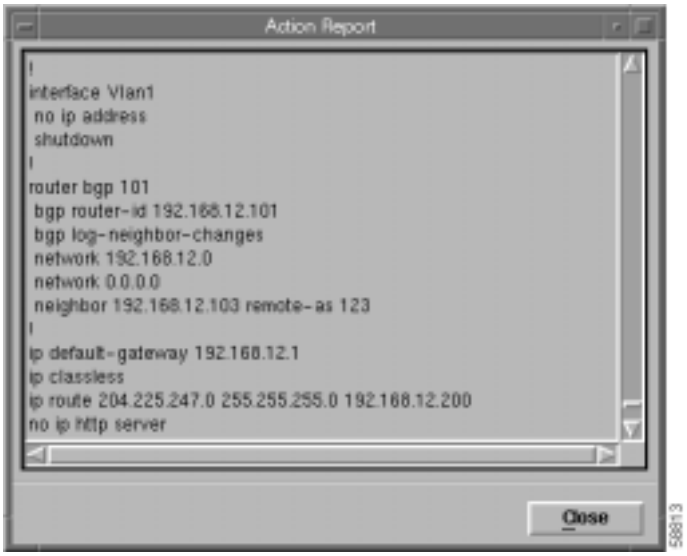


Running Configuration Area

The Running Configuration area of the C6576M Software dialog box provides the following information:

- Last Changed—The time since the running configuration was last changed. This attribute is read-only.
- Last Saved—The time since the running configuration was last saved. This attribute is read-only.
- Auto Backup Enabled—The backup action is executed automatically whenever the Save Running Configuration action is executed.
- View Running Configuration button—Displays the current running configuration in a text box (see Figure 6-15).
- Save Config to NVRAM—Saves the current running configuration to the location specified by the Startup Location attribute (see Figure 6-15).

Figure 6-15 Running Configuration Window Action Report



Backup/Restore Configuration Area

The Backup/Restore Configuration area of the C6576M Software dialog box provides the following information:

- TFTP Host—The IP address or hostname of the TFTP server that the startup or running configurations were backed up to or restored from.

Note The TFTP Host field must be configured in order to back up and restore the configuration. The TFTP Host must be accessible from the managed device, and there must be sufficient disk space on the host to store the device's startup configuration.

- Backup Status—Status of the last backup action. This attribute (read-only) hashas the following values:
  - Ok—The backup completed successfully.
  - Failed—The backup failed.
  - Not executed—The backup operation was not executed.
- **Backup File**—The name of the file to which the startup configuration will be copied.

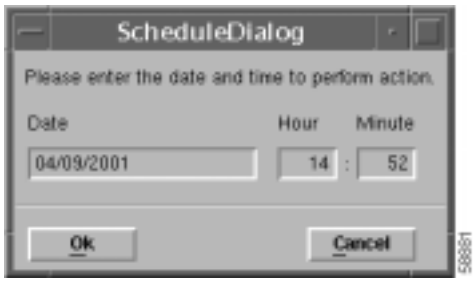
Note If the TFTP server is not the CEMF server, then the file specified by the Backup File field must already exist. If it does not, the backup action will fail. If the TFTP server is the CEMF server, the file will be automatically created.

- **Backup** button—Backs up the current startup configuration to the TFTP server. The backup filename is specified by the Backup File attribute.
- Restore Status—Status of the last restore action. This attribute (read-only) has the following values:
  - Ok—The restore operation completed successfully.

  - Failed—The restore operation failed.
  - Not executed—The restore operation was not executed.
- Restore File—The name of the configuration file that will be restored.
- Restore button—Restores the file specified in the Restore File attribute from the TFTP Host to the startup configuration.
- Scheduled Restore—Schedules the restore operation. It will launch the dialog box shown in Figure 6-16.

Note The switch or router needs to be reset for the new configuration to take effect.

Figure 6-16 Scheduled Restore Configuration Dialog Box



The Scheduled Restore Configuration dialog box provides the following information:

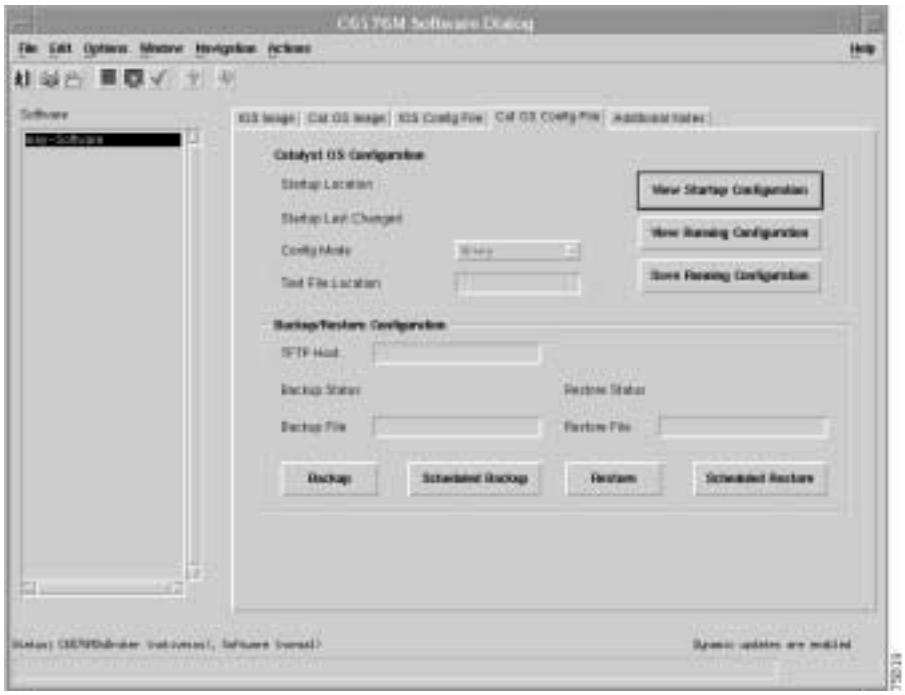
- Date—The date when the restore will start. The format is MM/DD/YYYY.
- Hour—The hour when the restore will start. It is a 24-hour clock.
- Minute—The minute when the restore will start.

Tip The configuration Backup/Restore actions are used to upload the switch or router startup configuration to a server. The configuration can then be edited on the server and downloaded back to the switch or router.

Cat OS Config File Tab

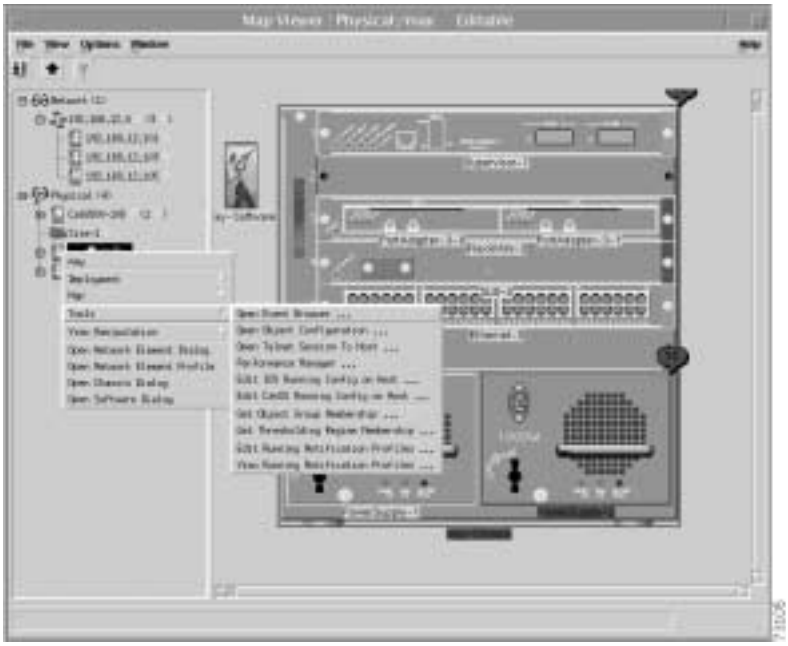
Figure 6-17 shows the Cat OS Config File tab of the C6576M Software dialog box.

Figure 6-17 Cat OS Config File Tab of the C6576M Software Dialog Box



The running configuration file can be edited by selecting the pop-up menu option of the network element object, shown in Figure 6-18.

Figure 6-18 Pop-up Menu Option to Edit the Running Configuration File

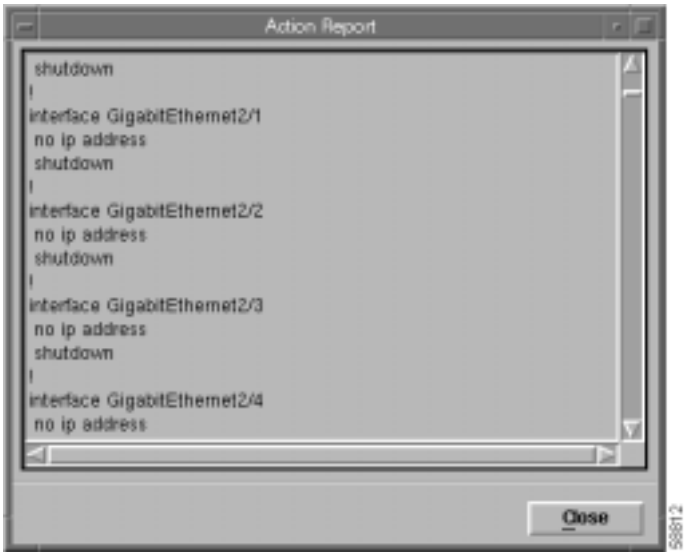


Startup Configuration Area

The Startup Configuration area of the C6576M Software dialog box provides the following information:

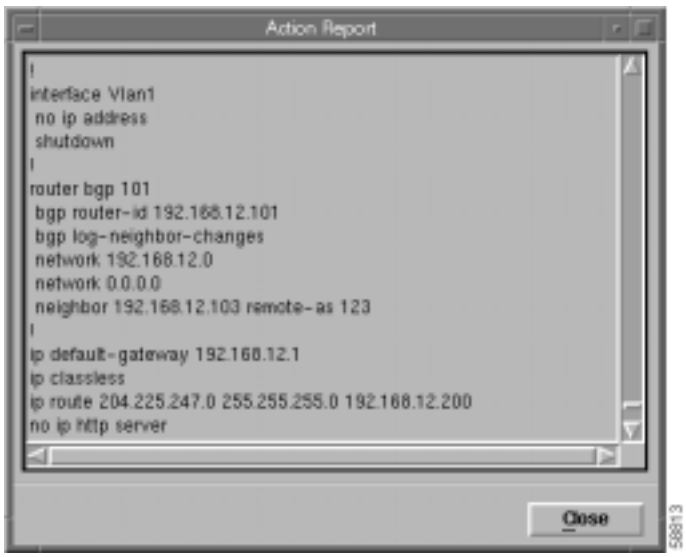
- Current Location—The location of the startup configuration file that will be used on the next restart. If this location is not set, then undefined is displayed. This attribute is read-only.
- Startup Location—The location of the startup configuration file that was used the last time the system was booted up. This attribute is read-only.
- Config Mode—Cat OS configuration mode. The mode can be one of these values:
  - binary—In binary config mode, any changes to the running configuration are automatically written to NVRAM.
  - text—In text file configuration mode, the changes are only written to DRAM.
- Text File Location—The location of the Cat OS text configuration file which can be either NVRAM or a file in the FLASH file system.
- View Startup Configuration button—Displays the startup configuration in a text box (see Figure 6-19). This attribute is read-only.

Figure 6-19 Startup Configuration Window Action Report



- View Running Configuration button—Displays the current running configuration in a text box (see Figure 6-20).
- Save Running Configuration button—Saves the current running configuration to the location specified by the Startup Location attribute (see Figure 6-20).

Figure 6-20 Running Configuration Window Action Report



Backup/Restore Configuration Area

The Backup/Restore Configuration area of the C6576M Software dialog box provides the following information:

- TFTP Host—The IP address or hostname of the TFTP server that the startup or running configurations were backed up to or restored from.

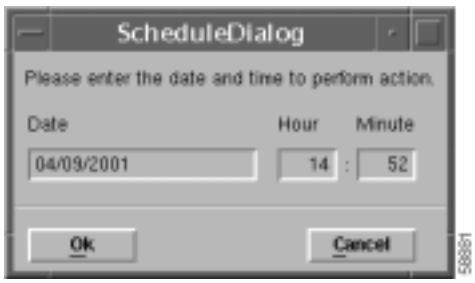
Note The TFTP Host field must be configured in order to back up and restore the configuration. The TFTP Host must be accessible from the managed device, and there must be sufficient disk space on the host to store the device's startup configuration.

- Backup Status—Status of the last backup action. This attribute (read-only) hashas the following values:
  - Ok—The backup completed successfully.
  - Failed—The backup failed.
  - Not executed—The backup operation was not executed.
- **Backup File**—The name of the file to which the startup configuration will be copied.

Note If the TFTP server is not the CEMF server, then the file specified by the Backup File field must already exist. If it does not, the backup action will fail. If the TFTP server is the CEMF server, the file will be automatically created.

- **Backup** button—Backs up the current startup configuration to the TFTP server. The backup filename is specified by the Backup File attribute.
- Scheduled Backup—Schedules the backup operation. It will launch the dialog box shown in Figure 6-21.

Figure 6-21 Scheduled Backup Configuration Dialog Box



The Scheduled Backup Configuration dialog box provides the following information:

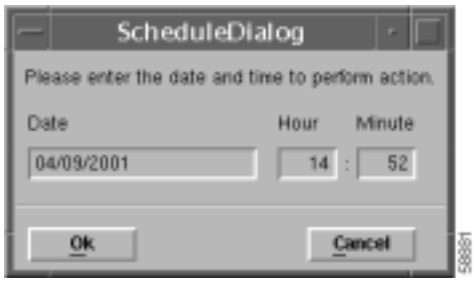
- Date—The date when the restore will start. The format is MM/DD/YYYY.
- Hour—The hour when the restore will start. It is a 24-hour clock.
- Minute—The minute when the restore will start.

Tip The configuration Backup/Restore actions are used to upload the switch or router startup configuration to a server. The configuration can then be edited on the server and downloaded back to the switch or router.

- Restore Status—Status of the last restore action. This attribute (read-only) has the following values:
  - Ok—The restore operation completed successfully.
  - Failed—The restore operation failed.
  - Not executed—The restore operation was not executed.
- Restore File—The name of the configuration file that will be restored.
- Restore button—Restores the file specified in the Restore File attribute from the TFTP Host to the startup configuration.
- Scheduled Restore—Schedules the restore operation. It will launch the dialog box shown in Figure 6-22.

Note The switch or router needs to be reset for the new configuration to take effect.

Figure 6-22 Scheduled Restore Configuration Dialog Box



The Scheduled Restore Configuration dialog box provides the following information:

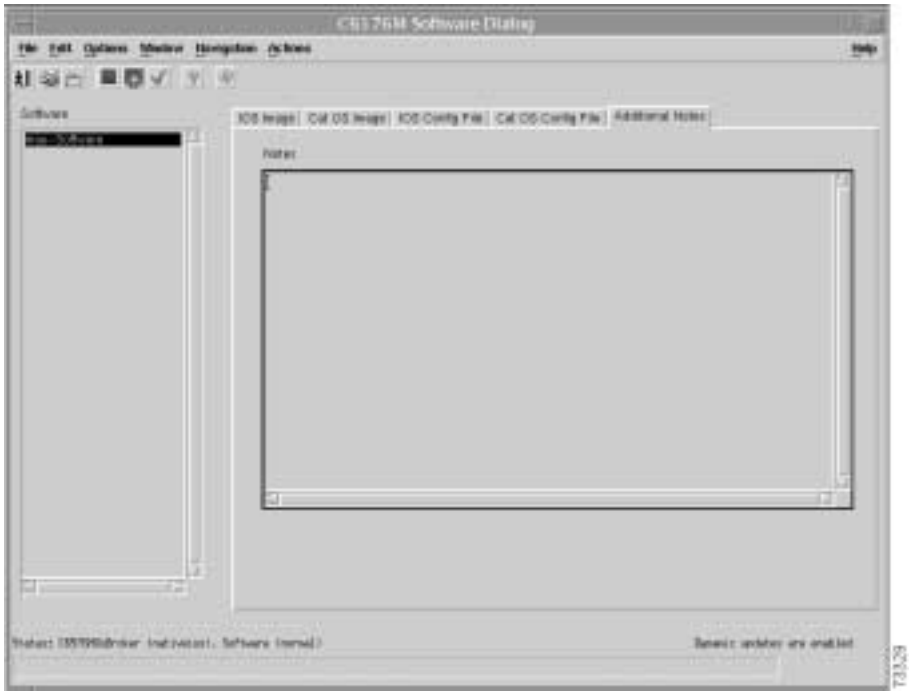
- Date—The date when the restore will start. The format is MM/DD/YYYY.
- Hour—The hour when the restore will start. It is a 24-hour clock.
- Minute—The minute when the restore will start.

Tip The configuration Backup/Restore actions are used to upload the switch or router startup configuration to a server. The configuration can then be edited on the server and downloaded back to the switch or router.

Additional Notes Tab

Figure 6-23 shows the Additional Notes tab of the C6576M Software dialog box.

Figure 6-23 Additional Notes Tab of the C6576M Software Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

C6576M Syslog Dialog Box

This dialog box displays attributes for the system log messages on the switch or router. This dialog box can be launched from a Software object or Syslog object within the Physical view.

You can choose more than one Software object at a time from the object list on the left side of the dialog box.

IOS Tab

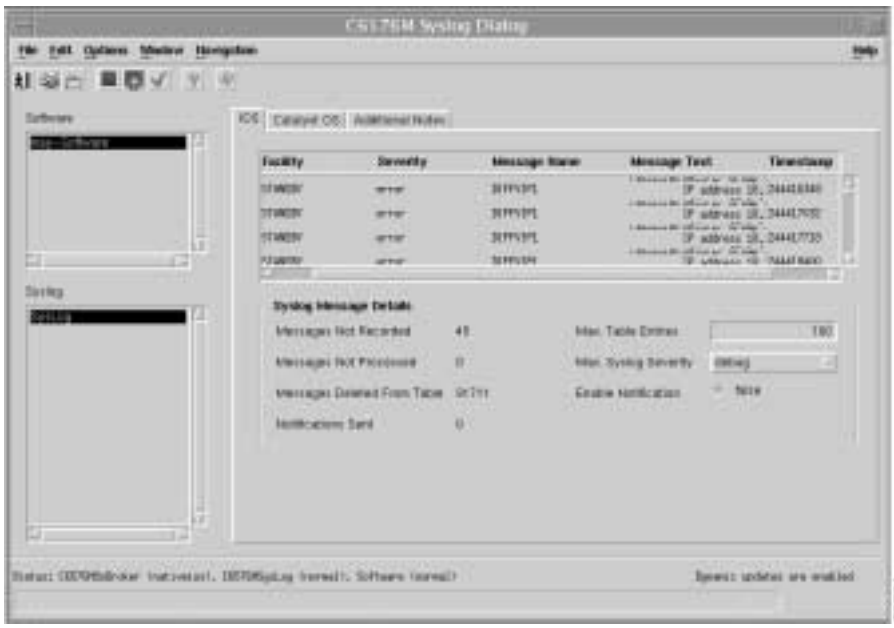
Figure 6-24 shows the IOS tab of the C6576M Syslog dialog box.

The IOS tab provides the following information:

- Facility—The facility that generated the syslog message.
- Severity—The severity of the message.
- Message Name—Identifies the message type. The Message Name and Facility together uniquely identify a message type.
- Message Text—The text of the message. If the message text exceeds 255 characters, the message is truncated to 254 characters and an asterisk (*) is appended to the text to indicate that the message has been truncated.
- Timestamp—The timestamp when the message was generated.

Note An alarm will be generated for each entry in this table. (See Chapter 8, "Alarms and Alarm Management.")

Figure 6-24 IOS Tab of the C6576M Syslog Dialog Box



Syslog Message Details Area

The Syslog Message Details area of the C6576M Syslog dialog box provides the following information:

- Messages Not Recorded—The number of syslog messages not recorded. A message is not recorded if it has a severity value greater than the Max. Syslog Severity attribute. This attribute is read-only.
- Messages Not Processed—The number of messages that were not processed due to a lack of system resources. This attribute is read-only.
- Messages Deleted From Table—The number of messages that were deleted from the table in order to make room for new messages. The maximum number of messages kept in the table is dependent on the Max. Table Entries attribute. This attribute is read-only.
- Notifications Sent—The number of syslog notifications sent. This attribute is read-only.
- Max. Table Entries—The maximum number of messages in the syslog table. When this limit has been reached, the oldest messages are deleted to make room for newer messages.
- Max. Syslog Severity—The maximum severity that will be recorded. Messages with a higher numeric value of severity will not be recorded. This attribute has one of the following values (listed in ascending order of severity):
  - emergency (1)
  - alert (2)
  - critical (3)
  - error (4)
  - warning (5)
  - notice (6)
  - info (7)
  - debug (8)

Note The greatest severity state has the smallest numeric value of severity. For example, the emergency state has a value of (1) and is more severe than the info state, which has a value of (7). If you set Max. Syslog Severity to 7, then all states except debug will be recorded. This is because the debug state has a value of (8), which is greater than the value of the Max. Syslog Severity attribute.

- Enable Notifications—SNMP syslog notifications are sent whenever a new syslog message is generated and recorded.
  - true—Notifications enabled.
  - false—Notifications disabled.

Status Field

The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Catalyst OS Tab

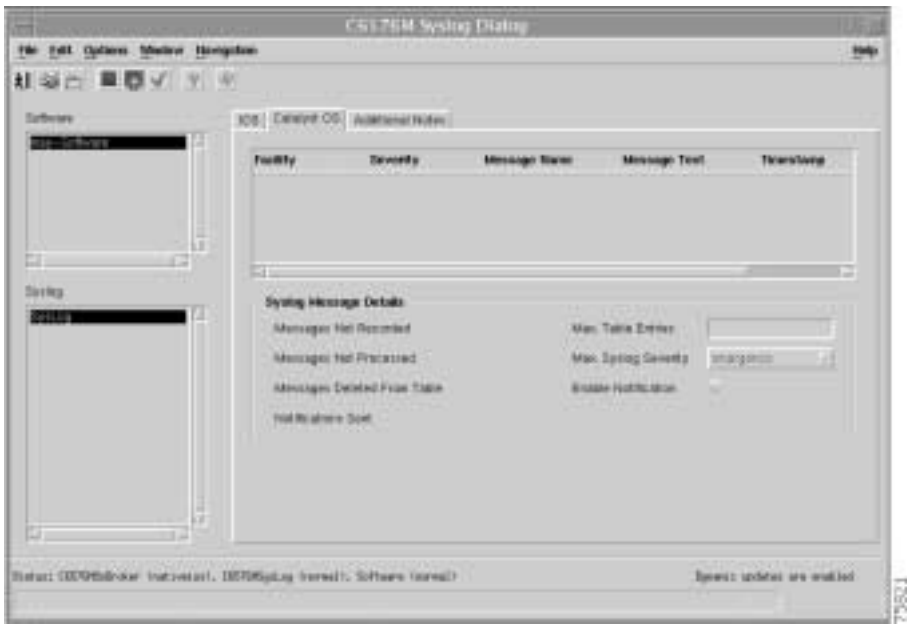
Figure 6-25 shows the Catalyst OS tab of the C6576M Syslog dialog box.

The Catalyst OS tab provides the following information:

- Facility—The facility that generated the syslog message.
- Severity—The severity of the message.
- Message Name—Identifies the message type. The Message Name and Facility together uniquely identify a message type.
- Message Text—The text of the message. If the message text exceeds 255 characters, the message is truncated to 254 characters and an asterisk (*) is appended to the text to indicate that the message has been truncated.
- Timestamp—The timestamp when the message was generated.

Note An alarm will be generated for each entry in this table. (See Chapter 8, "Alarms and Alarm Management.")

Figure 6-25 Catalyst OS Tab of the C6576M Syslog Dialog Box



Syslog Message Details Area

The Syslog Message Details area of the C6576M Syslog dialog box provides the following information:

- Messages Not Recorded—The number of syslog messages not recorded. A message is not recorded if it has a severity value greater than the Max. Syslog Severity attribute. This attribute is read-only.
- Messages Not Processed—The number of messages that were not processed due to a lack of system resources. This attribute is read-only.
- Messages Deleted From Table—The number of messages that were deleted from the table in order to make room for new messages. The maximum number of messages kept in the table is dependent on the Max. Table Entries attribute. This attribute is read-only.
- Notifications Sent—The number of syslog notifications sent. This attribute is read-only.
- Max. Table Entries—The maximum number of messages in the syslog table. When this limit has been reached, the oldest messages are deleted to make room for newer messages.
- Max. Syslog Severity—The maximum severity that will be recorded. Messages with a higher numeric value of severity will not be recorded. This attribute has one of the following values (listed in ascending order of severity):
  - emergency (1)
  - alert (2)
  - critical (3)
  - error (4)
  - warning (5)
  - notice (6)
  - info (7)
  - debug (8)

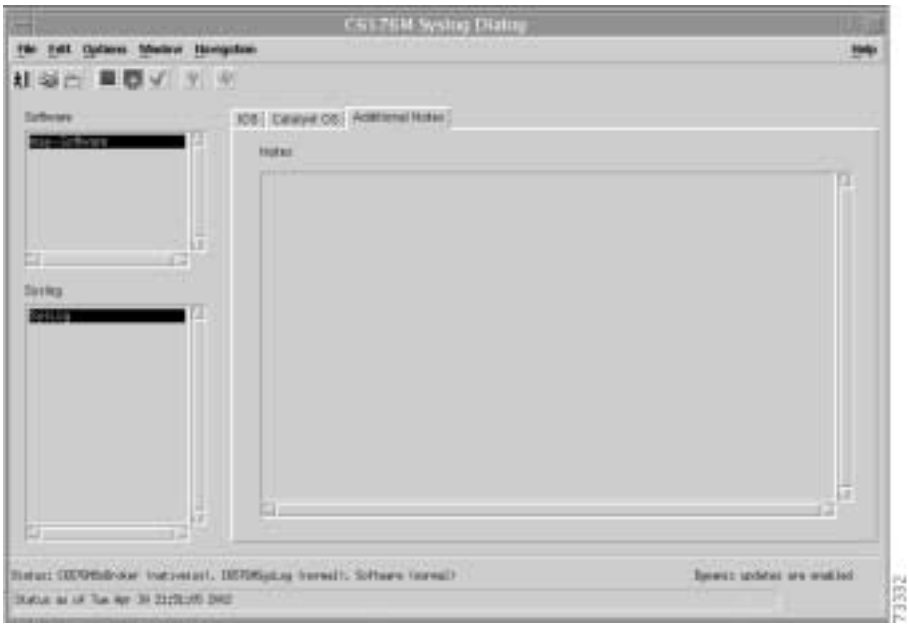
Note The greatest severity state has the smallest numeric value of severity. For example, the emergency state has a value of (1) and is more severe than the info state, which has a value of (7). If you set Max. Syslog Severity to 7, then all states except debug will be recorded. This is because the debug state has a value of (8), which is greater than the value of the Max. Syslog Severity attribute.

- Enable Notifications—SNMP syslog notifications are sent whenever a new syslog message is generated and recorded.
  - true—Notifications enabled.
- false—Notifications disabled.

Additional Notes Tab

Figure 6-26 shows the Additional Notes tab of the C6576M Syslog dialog box.

Figure 6-26 Additional Notes Tab of the C6576M Syslog Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

C6576M VTP Dialog Box

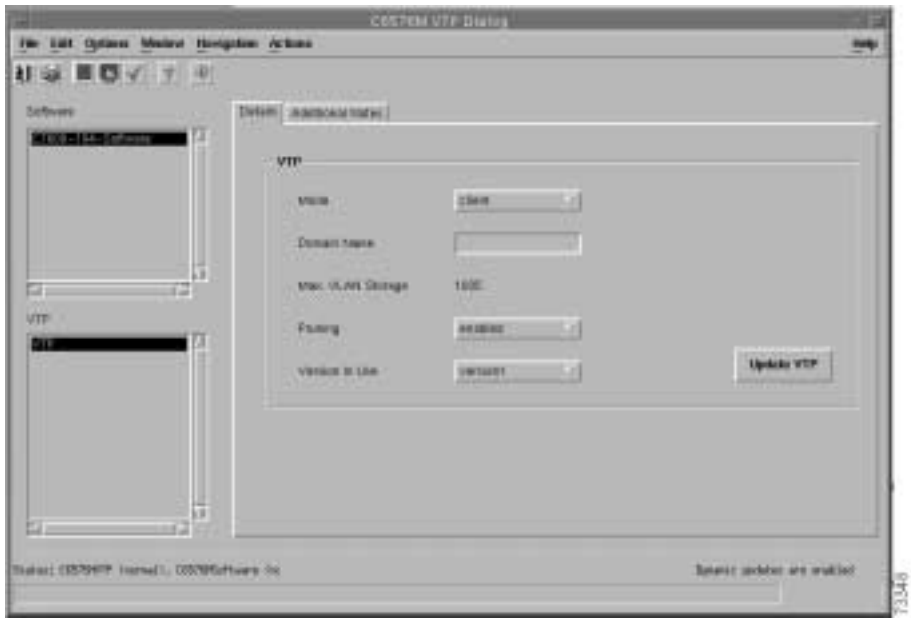
The VTP dialog box allows you to configure VTP domains on the switch or router. This dialog box can be launched from a Software object or VTP object within the Physical view.

You can choose more than one Software object at a time from the object list on the left side of the dialog box.

Details Tab

Figure 6-27 shows the Details tab of the C6576M VTP dialog box.

Figure 6-27 Details Tab for the C6576M VTP Dialog Box



VTP Area

The VTP area of the C6576M VTP dialog box provides the following information:

- **Mode**—An indication of whether the local system is acting as a VTP Client or as a VTP server in this management domain. The value “transparent”.
  - **client**—Users cannot create, edit, or delete VLANs.
  - **server**—Users can create, delete, and edit VLANs for this management domain.
  - **transparent**—Indicates that a device is not supporting VTP for this VTP management domain.

Note It is not possible to configure VLANs on a device where Mode is equal to client.

- **Domain Name**—The name of the management domain in which this switch or router is participating.

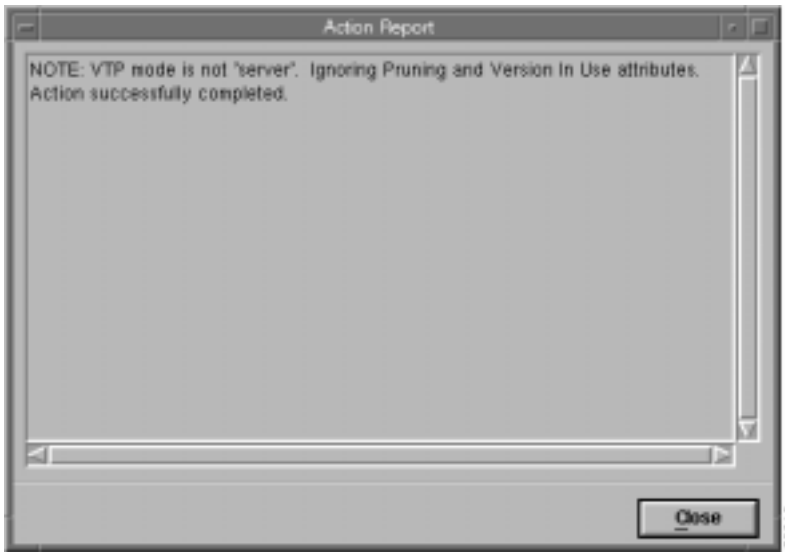
- **Max. VLAN Storage**—Estimate of the maximum number of VLANs about which the local system can recover complete VTP information after a reboot. If the number of defined VLANs is greater than this value, then the system cannot act as a VTP Server. For a device that has no means to calculate the estimated number, this value is -1. This attribute is read-only.
- **Pruning**—An indication of whether VTP pruning is enabled or disabled in this management domain. This value can only be modified by local/network management when the Mode is server.
- **Version**—The current version of the VTP that is in use by this management domain.
- **Update button**—Updates any configuration changes made in this dialog box (see Figure 6-28).

Note The Update button must be used to save configuration changes to the VTP dialog box. The save icon has been removed from the icon bar from the top of the dialog box.

Note The Mode must be set to server or transparent in order to save all configuration changes (Mode, Domain Name, Pruning, Version) to the VTP dialog box.

Note If the Mode is not set to server and the Update button is used, a message is displayed indicating that changes to the “Pruning” and “Version in Use” attributes are ignored (Figure 6-28). These values can only set when the Mode is set to server.

Figure 6-28 Update Button Selected in Client Mode Message



Status Field

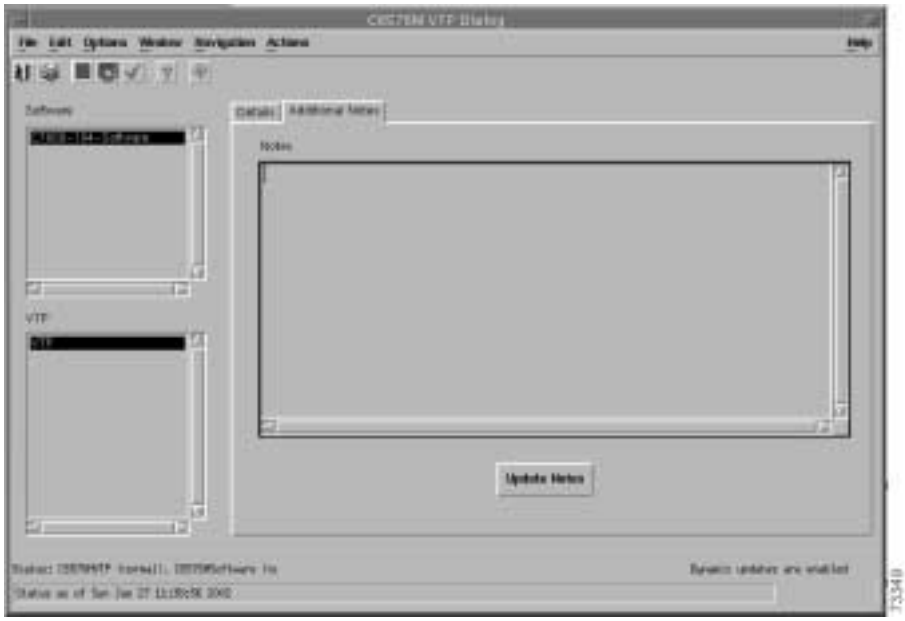
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Additional Notes Tab

Figure 6-29 shows the Additional Notes tab of the C6576M VTP dialog box.

Figure 6-29 Additional Notes Tab of the C6576M VTP Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

C6576M VLAN Dialog Box

This dialog box provides attributes for VLAN configurations. This dialog box can be launched from the Software object or VLAN object in the Physical view.

You can choose only one Software object and one VLAN object at a time from the object list on the left side of the dialog box.

Status Tab

Figure 6-30 shows the Status tab of the C6576M VLAN dialog box.

Figure 6-30 Status Tab for the C6576M VLAN Dialog Box

Interface Status Area

The Details area of the C6576M VLAN dialog box provides the following information:

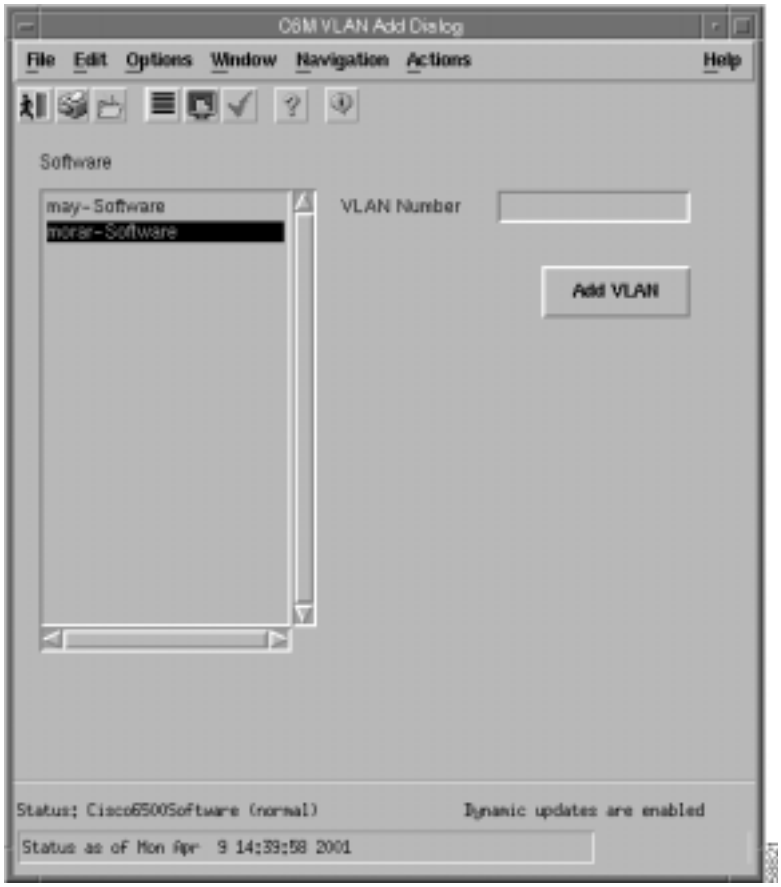
- **VLAN Number**—The number of the VLAN.
- **Name**—The VLAN identification name.
- **Type**—The type of VLAN. This value is always Ethernet.
- **Operational Status**—The state of this VLAN. This attribute has one of the following values:
  - operational
  - suspended
  - mtuTooBigForDevice—Indicates that this device cannot participate in this VLAN because the VLAN's MTU is larger than the device can support.

- mtuTooBigForTrunk—Indicates that while this VLAN's MTU is supported by this device, it is too large for one or more of the device's trunk ports.
- **VLAN OS Type** —The type of VLAN. This attribute has one of the following values:
  - catOsOnly - the VLAN exists on a hybrid chassis in the CatOS configuration only
  - msfcIosOnly - the VLAN exists on a hybrid chassis in the MSFC IOS configuration only
  - catOsAndMsfcIos - the VLAN exists on a hybrid chassis in both the CatOS and IOS configurations
  - nativeIos - the VLAN exists on a chassis running native IOS (no CatOS)
- **Create VLAN in CatOS Running Config** —If the VLAN OS Type is msfcIosOnly, this button will create the corresponding entries for this VLAN in the CatOS configuration
- **Create VLAN in IOS Running Config** —If the VLAN OS Type is catOsOnly, this button will create the corresponding entries for this VLAN in the IOS configuration
- Add VLAN button—Adds a VLAN. Launches the subdialog box shown in Figure 6-31.

  Specify the VLAN number to be added and click the **Add VLAN** button. The string VLAN- will prepended to the VLAN number specified.

Note The newly added VLAN will not appear automatically in the VLAN object list (bottom left of Figure 6-30). To refresh the VLAN list, reselect the appropriate Software object.

Figure 6-31 Add VLAN Subdialog Box



- **Delete VLAN** button—Deletes the currently selected VLAN. If you click this button, you are asked to confirm deletion of the current VLAN (see Figure 6-32).

Figure 6-32 Delete VLAN Subdialog Box

Status Field

The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Configuration Tab

Figure 6-33 shows the Configuration tab of the C6576M VLAN dialog box.

Figure 6-33 Configuration Tab for the C6576M VLAN Dialog Box

Configuration Area

- **MAC Address**—MAC address of the VLAN interface.

Note Native IOS a VLAN that is in a suspended state is only partially manageable. The MAC Address field will display a value of ERROR (or blank) as a result.

- **Interface MTU**—Layer 2 (link layer) maximum transmission unit on Ethernet VLAN. This determines the maximum size of Ethernet frames transmitted on the VLAN interface. The value is read-only on Ethernet and FastEthernet VLANs. The value is read-write on GigabitEthernet VLANs.

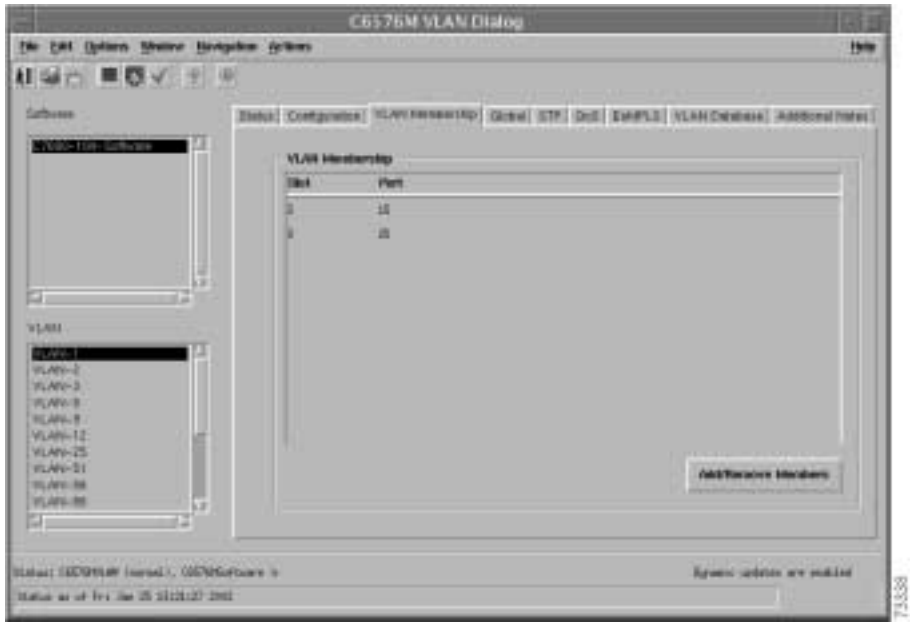
Note IOS 12.1(8a)E5 caveat: Jumbo frame support is incompatible with the IS-IS routing protocol. Leave the MTU size at the default value on any interface where IS-IS provides routing.

- **IP Address**—Primary IP address of interface. Value is nil on a layer-2 interface.
- Netmask—Subnet mask for the primary IP address.
- Clear IP Address ——After receiving confirmation, will unset the IP address for this interface.

VLAN Membership Tab

Figure 6-34 shows the VLAN Membership tab of the C6576M VLAN dialog box.

Figure 6-34 VLAN Membership Tab for the C6576M VLAN Dialog Box



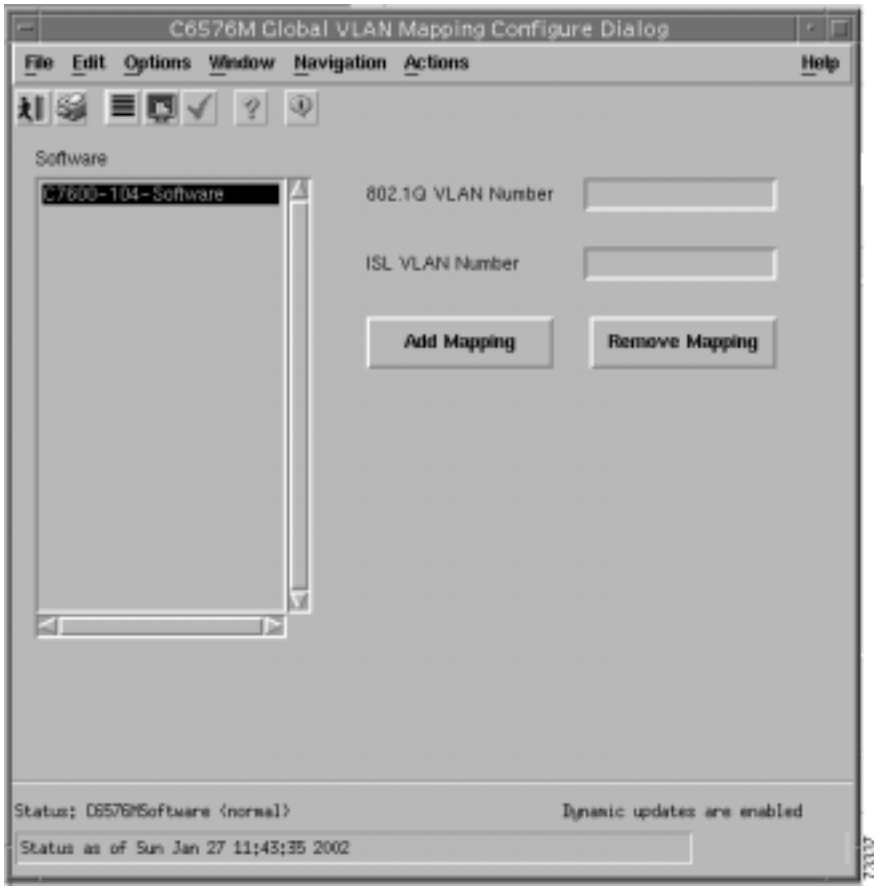
VLAN Membership Area

The VLAN Membership area displays the members of this VLAN.

- **VLAN Membership Table**—Members are identified by the slot and port numbers in the table.
- **Add/Remove Members** button—Adds or removes a VLAN member. Launches the subdialog box, shown in Figure 6-35.

  Specify the slot and port number of the interface that you want to add to the VLAN or delete from the VLAN.

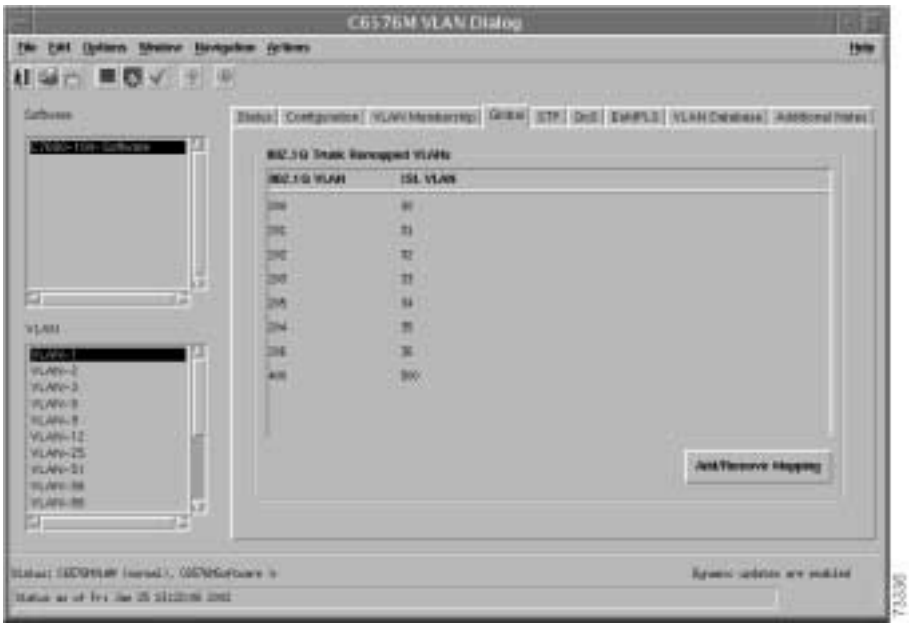
Figure 6-35 Add/Remove VLAN Members Subdialog Box



Global Tab

Figure 6-36 shows the Global tab of the C6576M VLAN dialog box.

Figure 6-36 Global Tab of the C6576M VLAN Dialog Box



802.1Q Trunk Remapped VLANs Area

This area lists the mappings between 802.1Q and ISL VLANs. The information in this area is common to all VLAN objects for a particular switch or router:

- **802.1Q Trunk Remapped VLANs Table**—This table lists the following:
  - **802.1Q VLAN Number**—The 802.1Q VLAN number to be mapped.
  - ISL VLAN Number—The ISL VLAN to which the 802.1Q VLAN number is to be mapped.
- **Add/Remove Mapping** button—Adds or removes a mapping. Launches the subdialog box shown in Figure 6-37.

Note A maximum of eight mappings are supported by the Catalyst 6000 family switch and the Cisco 7600 series Internet Router.

Enter the 802.1Q VLAN and ISL VLAN numbers for which a mapping is to be added or removed.

Note The valid range for 802.1Q VLAN numbers is 1001 to 4095. The valid range of ISL VLAN numbers is 1 to 1000.

Figure 6-37 Add/Remove VLAN Mapping Subdialog Box

- **802.1Q VLAN Number**—The 802.1Q VLAN number to be mapped.
- ISL VLAN Number—The ISL VLAN to which the 802.1Q VLAN number is to be mapped.
- **Add Mapping** button—Adds mapping of 802.1Q and ISL VLANs specified by the 802.1Q VLAN Number and ISL VLAN Number fields.
- **Add/Remove Mapping** button—Removes mapping of 802.1Q and ISL VLANs specified by the 802.1Q VLAN Number and ISL VLAN Number fields.

STP Tab

Figure 6-38 shows the VLAN STP tab of the C6576M VLAN dialog box.

Figure 6-38 VLAN STP Tab for the C6576M VLAN Dialog Box

STP Area

The STP area of the C6576M VLAN dialog provides the following information:

- **Spanning Tree Protocol**—Configures whether or not Spanning Tree Protocol is enabled for this virtual LAN. This attribute has one of the following values:
  - enabled
  - disabled
  - notApplicable
- **Primary Root**—Configures whether or not the switch is the root node in the STP instance. If there is no spanning tree instance for the VLAN, the value is nil.

Root Area

The Root area of the C6576M VLAN dialog provides the following information:

- **Current Root Priority**—Bridge priority of the current root switch in the spanning tree instance. If there is no spanning tree instance for the VLAN, the value is nil. This attribute is read-only.
- **Root Interface**—If this switch is not the root of the spanning tree, indicates the local port used to reach the root node. This is a local port that is a member of the VLAN. This value should match the Name field in the Interface dialog box corresponding to the root port (for example, “FastEthernet 2/5”). If the switch is currently the root or there is no spanning tree instance for the VLAN, the value is nil. This attribute is read-only.

- Current Root MAC—Bridge identifier address. This is the MAC address of the VLAN on the root bridge in the STP instance. If there is no spanning tree instance for the VLAN, the value is nil. This attribute is read-only.
- Root Path Cost—If this is not the root of the spanning tree, indicates the path cost to the root (this is the path cost of the root port). If the switch is currently the root or there is no spanning tree instance for the VLAN, the value is nil. This attribute is read-only.

Root Election Area

The Root Election area of the C6576M VLAN dialog provides the following information:

- **Root Preference**—STP root priority. This attribute may has following values:
  - no (0)
  - primary (1)
  - secondary (2)
- **Hello Time**—Hello-time in seconds.
- Diameter—Specifies the network diameter (maximum number of bridges between two end nodes). If specified, the switch will calculate the optimal hello-time, forward-time, and max-age. User may optionally specify an explicit hello-time.
- Set Root button—Configures the root priority of the device in the VLAN STP instance. This action will set the VLAN STP bridge-priority and reset the hello-time, forward-delay, and max-age timers. This action does not guarantee that the switch will be elected the STP root, it only sets these values.

Advanced Area

The Advanced area of the C6576M VLAN dialog box allows you to configure the attributes described in this section. While these attributes are configurable, this is not the recommended method for configuring them. Alternately, if you specify a network diameter but no hello time, forward-delay timer, or max-age timer, using the Set Root button (in the Root Election Area) causes the switch to automatically calculate the optimal hello time, forward-delay timer, and max-age timer for that diameter.

- **Hello Time**—Indicates how often the switch broadcasts hello messages to other switches in the STP domain. If there is no spanning tree instance for the VLAN, value is nil. You can optionally provide a diameter and hello-time to override the calculated value. If no diameter or hello-time are provided, the switch will use the default hello time of 2 seconds.
- **Priority**—Spanning tree bridge priority. If there is no spanning tree instance for the VLAN, the value is nil.
- Forward Delay—Forward delay timer for STP state transitions. Determines how long each of the listening and learning states will last before the interface begins forwarding. If there is no spanning tree instance for the VLAN, the value is nil. If no diameter is specified, the switch will use the default delay of 15 seconds.
- Max Age—Describes the amount of time that STP protocol information received by a switch is stored before it expires. If there is no spanning tree instance for the VLAN, the value is nil. If no diameter is specified, the switch will use the default duration of 20 seconds.

QoS Tab

Figure 6-39 shows the QoS tab of the C6576M VLAN dialog box.

Figure 6-39 QoS Tab of the VLAN Dialog Box

QoS Area

The QoS area allows you to enable or disable Microflow policing of bridged traffic on the VLAN, and attach or detach service policies to VLAN interfaces.

Note To enable QoS, the managed device must be a VTP server or operating in VTP transparent mode.

- **Microflow Policing Enabled**—Indicates whether Microflow policing of bridged traffic is enabled on the VLAN.
- Input Service Policy—Indicates the QoS policy map applied to the VLAN.
- **Modify Policy button**—Attaches an input QoS policy map to the VLAN interface. This action may fail if the policy map is not suitable for use with an Ethernet VLAN.

Note The policy map name must identify an existing policy map on the device.

- Remove Policy button—Detaches an input QoS policy map from the VLAN interface.

Membership QoS Area

The Membership QoS area allows you to enable or disable VLAN-based QoS on the VLAN's member interfaces.

- **Enable VLAN-Based QoS button**—Enables VLAN-based QoS on each of the VLAN's member interfaces.
- **Disable VLAN-Based QoS button**—Disables VLAN-based QoS on each of the VLAN's member interfaces.

EoMPLS Tab

Figure 6-40 shows the EoMPLS tab of the C6576M VLAN dialog box.

Figure 6-40 EoMPLS Tab of the C6576M VLAN Dialog Box

EoMPLS Area

This area contains the followng information:

- **Destination IP**—Describes where packets are to be sent. A value of "0 0 0 0" will clear any previously configured value.
- **VC ID**—Label applied to packets entering the tunnel. A value of "0" will clear any previously configured value.

VLAN Database Tab

Figure 6-41 shows the VLAN Database tab of the C6576M VLAN dialog box. There is no VLAN Database in Hybrid OS.

Figure 6-41 VLAN Database Tab of the C6576M VLAN Dialog Box

VLAN Database Backup/Restore Area

The VLAN Database Backup/Restore area of the C6576M VLAN dialog box allows you to back up and restore the VLAN configuration to a remote TFTP server.

- **TFTP Host**—The IP address of the TFTP server to which the VLAN configuration is backed up or restored from.
- Backup Status—Status of the last VLAN configuration backup operation. The Backup Status has the following values:
  - Ok—The backup operation completed without errors.
  - Failed—The backup operation failed.
  - Not executed—A backup has not been executed.
- **Backup File—Name of the file on the TFTP server to which the VLAN configuration will be copied to.**
- Save config file before reset— “true” indicates that the VLAN configuration file will be saved before switch reset.
- Restore Status—Status of the last VLAN configuration restore operation. The Restore Status has the following values:
  - Ok—The restore operation completed without errors.
  - Failed—The restore operation failed.

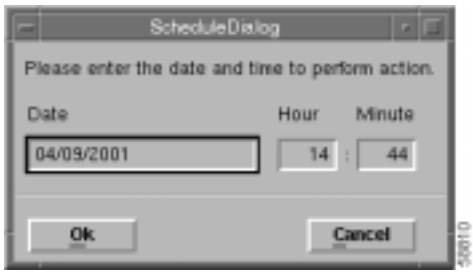
  - Not executed—A restore has not been executed.

- Restore File—**Name of the file on the TFTP server to which the VLAN configuration will be restored from.**
- **Backup** button—Backs up the **VLAN configuration** to the file specified in the Backup File field on the TFTP Host.
- **Restore** button—Restores a VLAN configuration backup or loads a new VLAN configuration. Copies the file specified by the Restore File field from the TFTP Host to the switch or router.

Caution The Restore and Schedule Restore buttons will cause the switch to be reset after the VLAN database restoration process is complete.

- **Schedule Restore** button—Schedules the restore operation. Launches the dialog box shown in Figure 6-42.

Figure 6-42 Scheduled Restore VLAN Configuration Dialog Box



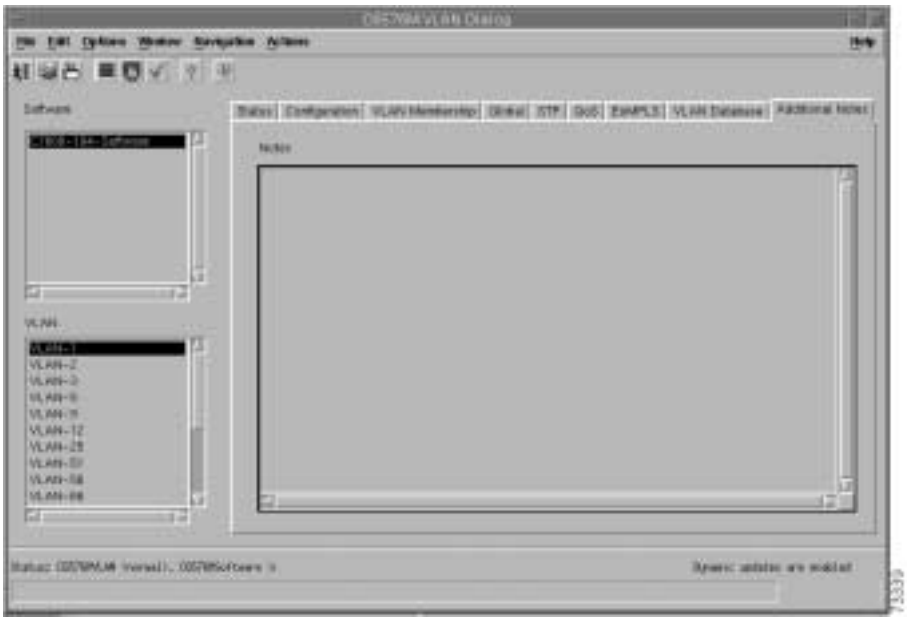
Note An alarm is generated if the Backup Status and Restore Status attributes are set to Failed. (See Chapter 8, “Alarms and Alarm Management.”)

Note VLAN Database Backup/Restore is not supported in VTP Client/Transparent mode as of IOS 12.1(8a)EX and later.

Additional Notes Tab

Figure 6-43 shows the Additional Notes tab of the C6576M VLAN dialog box.

Figure 6-43 Additional Notes Tab of the C6576M VLAN Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

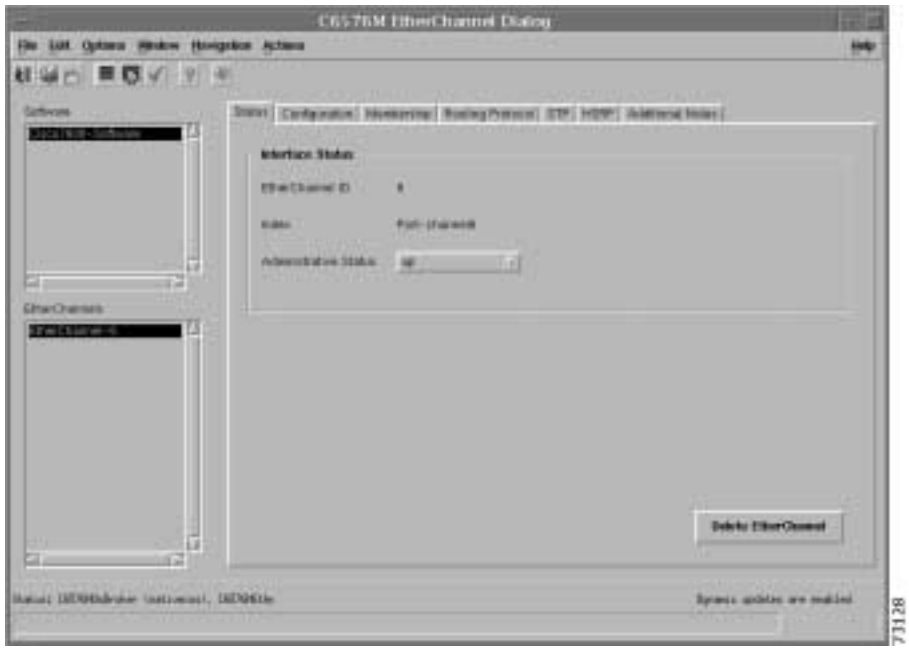
C6576M EtherChannel Dialog Box

This dialog box provides attributes for EtherChannel configurations. This dialog box can be launched from the Software object or EtherChannel objects in the Physical view.

Status Tab

Figure 6-44 shows the Status tab of the C6576M EtherChannel dialog box.

Figure 6-44 Status Tab of the C6576M EtherChannel Dialog Box



Interface Status Area

The Details area of the C6576M EtherChannel dialog box provides the following information:

- **EtherChannel ID**—The EtherChannel number.
- **Description**—Description of the EtherChannel.
- **Administrative Status**—The desired state of the EtherChannel interface. The status has the following values:
  - testing (read-only)—Indicates that no operational packets can be passed.
  - up
  - down

Note This is read-only in Hybrid OS. If the EtherChannel exists, the value is always up (1).

Note When a managed system initializes, all interfaces start with Administrative Status in the down state. As a result of either explicit management action or per configuration information retained by the managed system, Administrative Status is then changed to either the up(1) or “testing (read-only)”(3) states (or remains in the down(2) state).

- **Delete EtherChannel button**—Deletes the EtherChannel instance selected in the EtherChannels object selection list. All interface members of this EtherChannel must be removed before the EtherChannel instance can be deleted. This only applies to Native IOS devices only, on hybrid devices the EtherChannel will automatically delete on removal of the last member.

Status Field

The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Configuration Tab

Figure 6-45 shows the Configuration tab of the C6576M EtherChannel dialog box.

Figure 6-45 Configuration Tab of the C6576M EtherChannel Dialog Box

General Area

The General area provides the following information:

- **Interface Mode**—The current operational mode of the interface. This field has the following values:
  - switchport—Layer 2.
  - routed—Layer 3.
- **Speed**—The transmission speed in bits per second of the EtherChannel interface.
- Bandwidth—Overwrites default bandwidth in kilobits per second.

Note The Bandwidth attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP and OSPF); you cannot adjust the actual bandwidth of an interface with this command.

- Delay—Specifies the delay in tens of microseconds for an interface or network segment.

Note The Delay attribute is an informational parameter used only to communicate the current bandwidth to the higher-level protocols (such as IGRP, EIGRP); you cannot adjust the actual delay of an interface with this command.

- **Distribution Protocol—P**rotocol used for load balancing on the EtherChannel. This field has the following values:
  - ip—IP address.
  - mac—MAC address.
- **Distribution Address**—Address used for load balancing on the EtherChannel. This field has the following values:
  - source
  - destination
  - both

Layer 2 Area

The Layer 2 area contains the following information:

- **MTU—The size of the largest datagram (frame) which can be sent or received on the EtherChannel, specified in octets. This is also the maximum size of Layer 3 datagrams sent on the EtherChannel**.

Layer 3 Area

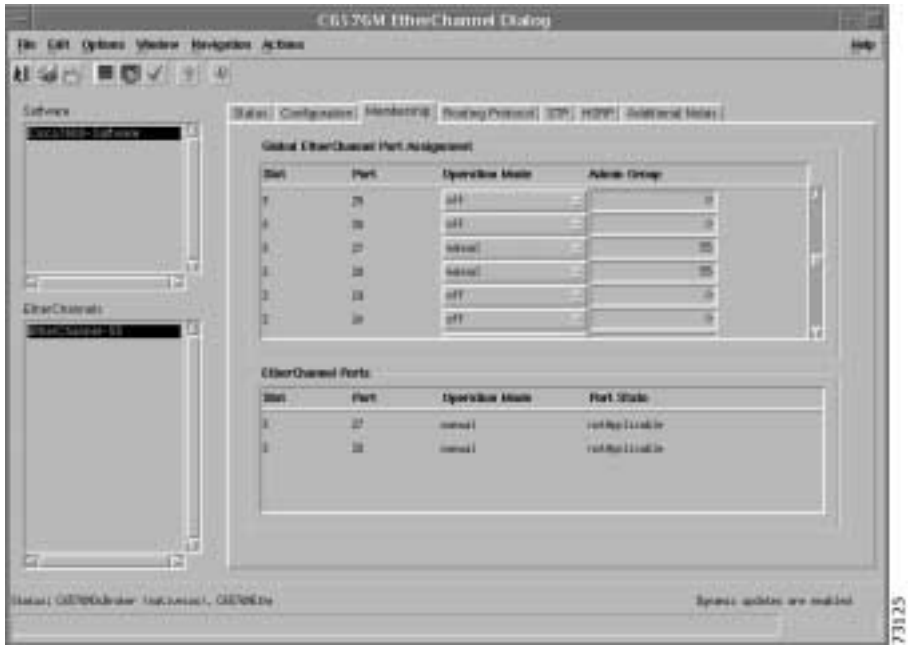
The Layer 3 area contains the following information:

- I**P Address**—IP address of the EtherChannel interface.
- **Netmask**—The subnet mask associated with the EtherChannel IP Address. The value of the mask is in the format of an IP address with all the network bits set to 1 and all the host bits set to 0.
- **Clear IP Address** —After receiving confirmation, will unset the IP address for the EtherChannel.

Membership Tab

Figure 6-46 shows the Membership tab of the C6576M EtherChannel dialog box.

Figure 6-46 Membership Tab of the C6576M EtherChannel Dialog Box



Global EtherChannel Ports Assignment Area

This area lists the EtherChannel assignments for all interfaces on the selected software (switch) instance and is not specific to any EtherChannel instance. In native IOS, this can be used to add ports to an EtherChannel instanceby setting the operational mode to “manual” or “auto” and specifying the channel number. If the specified channel number does not exist, it will be immediately created on the switch. In hybrid mode, this area assigns ports to channel admin groups, from which the switch will automatically form active EtherChannel instances. The table contains the following information:

- **Slot**—Slot number of the interface.
- **Port**—Port number of the interface.
- **Operation Mode**—The operation mode of the interface in the admin group. This field has one of the following values:
  - off—The interface does not belong to an admin group. Setting the value to this selection will remove the interface from the current admin group. Note that removing the last interface from an active EtherChannel instance on a hybrid switch will automatically delete the EtherChannel, while in native IOS the EtherChannel will still need to be deleted using the Delete EtherChannel button on the Status Tab.
  - manual or auto—Indicates that the port is to belong to the admin group with the indicated PAgP operational mode. Setting the value to this selection with an admin group specified will immediately add the interface to the indicated EtherChannel in native IOS or to the admin group (from which an EtherChannel may form) in hybrid OS.

- **Admin Group**—In native IOS, this is the EtherChannel identifier that the interface belongs to (or the new EtherChannel to be created). In hybrid OS, this is the channel group to which the interface belongs.

Note When a new EtherChannel is created, either through Admin Group assignment in native IOS or dynamic formation in hybrid OS, the EtherChannel list on this dialog will not automatically update with the new EtherChannel object. Reselect the appropriate software object to refresh the list.

EtherChannel Ports Area

The EtherChannel Ports area lists the interfaces that belong to the selected EtherChannel:

- **Slot**—Slot number of the interface.
- **Port**—Port number of the interface.
- **Operation Mode**—The PAgP operational mode of the component interface. This field has one of the following values:
  - desirable—PAgP packets sent on interface. If no data packets are received, the interface is never attached to a portchannel and cannot be used for data.
  - desirableSilent—PAgP packets sent on interface. If no data packets received after some timeout, the interface is attached by itself, to a portchannel and can be used for data.
  - automatic—PAgP packets are not sent on interface until at least one PAgP packet is received which indicates the sender is operating in desirable or desirableSilent mode. If no data packets received, the interface is never attached to a portchannel and cannot be used for data.
  - automaticSilent—PAgP packets are not sent on interface until at least one PAgP packet is received which indicates the sender is operating in desirable or desirableSilent mode. If no data packets received after some timeout, the interface is attached by itself, to a portchannel and can be used for data.
- Port State—State of the PAgP state machine on this interface. The state has the following values:
  - portDown—The current operational state of the interface is not up.
  - portUp—The current operational state of the interface is up, no packets yet received.
  - dataReceived—Data packets, but no PAgP packets, have been received.
  - upData—Interface is aggregated, but no PAgP packets have been received.
  - pagpReceived—One or more PAgP packets have been received.
  - biDirectional—Interface has passed PAgP packets in both directions.
  - upPagp—Interface is aggregated by means of PAgP.
  - upMult—Interface is aggregated to an agport, but connects to more than one external device.

Routing Protocol Tab

Figure 6-47 shows the Routing Protocol tab of the C6576M EtherChannel dialog box.

Figure 6-47 Routing Protocol Tab of the C6576M EtherChannel Dialog Box

EIGRP Area

The EIGRP area of the C6576M EtherChannel dialog box provides the following information:

- **EIGRP Interface Table—**A list of the EIGRP processes. The following attributes can be configured for a EIGRP process:
- Bandwidth Utilization (%)—Percentage of the EtherChannel interface bandwidth that the EIGRP protocol can use.
- Hold Time (sec)—Length of time in seconds that neighbors should consider the sender valid.
- Hello Interval (sec)—Interval in seconds between hello packets.

ISIS Area

The ISIS area of the C6576M EtherChannel dialog box provides the following information:

- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface. This attribute is read-only.
  - true—IS-IS routing is enabled.
  - false—IS-IS routing is disabled.
- Area Tag—The IS-IS routing area in which the interface participates. If mutli-area IS-IS is configured on the device, the IS-IS area must be named. Otherwise, this value may be an implicit null tag. This attribute is read-only.

- Level 1 Hello Interval—Length of time between hello packets generated on the interface for level 1 routing.
- Level 2 Hello Interval—Length of time between hello packets generated on the interface for level 2 routing.
- Level 1 Metric—Cost of the interface for IS-IS level 1 (intra-area) route calculation.
- Level 2 Metric—Cost of the interface for IS-IS level 2 (inter-area) route calculation.
- Level 1 Priority—Determines which router on a LAN will be the designated router or Designated Intermediate System (DIS).
- Level 2 Priority—Determines which router on a LAN will be the designated router or Designated Intermediate System (DIS).
- Enable IS-IS button—Enables IS-IS routing on the interface.

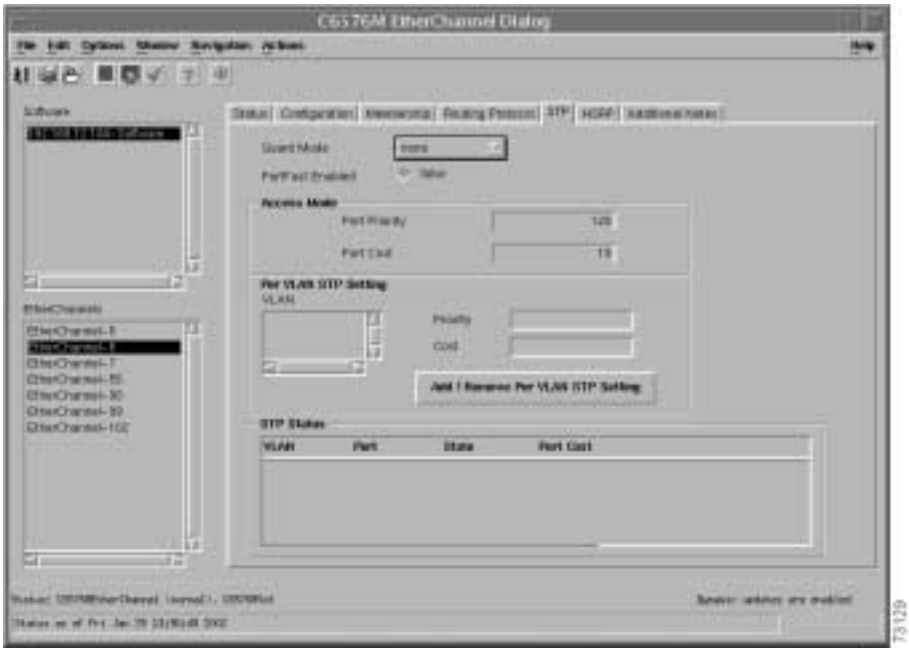
Note To enable IS-IS on an interface, the user must specify an IS-IS routing process that is already deployed on the device. If the process does not exist, the action will fail.

- Disable IS-IS button—Disables IS-IS routing on the interface.

STP Tab

Figure 6-48 shows the STP tab of the C6576M EtherChannel dialog box.

Figure 6-48 STP Tab for the C6576M EtherChannel Dialog Box



The area at the top of the STP tab provides the following information:

- Guard Mode—Indicates whether or not STP guard mode is enabled on an interface. The possible values are:

  - root
  - none
- PortFast Enabled—Indicates whether or not an interface is enabled to move directly to the forwarding state on link up. This is a read-only attribute. Portfast can be configured on a trunking interface, but it only has an effect when the interface is in access mode. The following are possible values:
  - true
  - false

Access Mode Area

The Access Mode area of the C6576M Ethernet Interface dialog box provides the following information:

- Port Priority—Describes the STP port priority of this interface. This is a metric used to represent the location of an interface in a network topology. It is used to determine which port will be placed in a blocking state when two or more ports are part of a loop. The default value is 128 in all versions of IOS, 32 in all versions of CatOS. The valid values are:
  - Native IOS 12.1(6)E and earlier:Integer (0..248) [increments of 8]
  - Native IOS 12.1(8a)E and later:Integer (0..252) [increments of 4]
  - CatOS 6.3:Integer(0..63)
  - CatOS 7.1:Integer(1..63)
- Port Cost—Describes the STP port cost for this interface. The port cost is a metric used to represent the speed of the interface. STP will use this value in determining the preferred path when a loop is detected in the network.

Note On a Hybrid OS device, the port cost cannot be configured directly. The actual port cost used is a calculated value and is the one being displayed.

Per VLAN STP Setting Area

The Per VLAN STP Setting area in the STP tab of the C6576M Ethernet Interface dialog box provides the following information:

- STP VLAN Table—Describes the STP per-VLAN configurations of a trunking interface. There is one entry for each explicit per-VLAN spanning tree configuration on the interface.

Note The VLAN STP instance does not have to be currently carried on the trunk in order to configure the per-VLAN STP settings. The settings will take effect when the interface actually begins trunking the VLAN traffic.

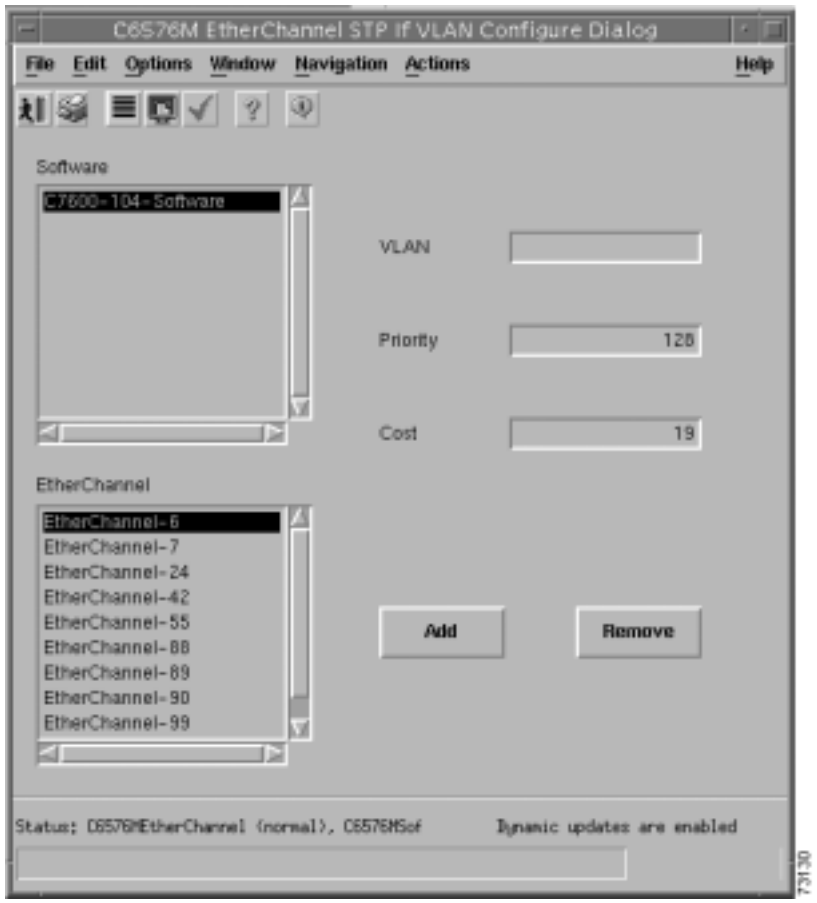
- Priority—Describes the STP VLAN port priority of this interface. The VLAN port priority is used on trunking interfaces. On any switch port that is not in trunking mode, the STP port priority is used instead. The default value is 128 in all versions of IOS, 32 in all versions of CatOS. The valid values are:
  - Native IOS 12.1(6)E and earlier:Integer (0..248) [increments of 8]
  - Native IOS 12.1(8a)E and later:Integer (0..252) [increments of 4]

  - CatOS 6.3:Integer(0..63)
  - CatOS 7.1:Integer(1..63)
- Cost—Describes the STP VLAN path cost of this interface. The VLAN path cost is only used on trunking interfaces. On any switch port that is not in trunking mode, the STP port path cost is used instead.

Note Default values for priority and cost will be used if you do not provide one of these arguments. You must provide a nondefault value for at least one of these arguments, otherwise the action will fail.

- Add/Remove Per VLAN STP Setting button—Launches a subdialog box to add and remove an explicit STP VLAN configuration to the interface. The configuration will only have an effect if the interface is in trunking mode and the VLAN has an associated STP instance. The interface does not currently need to be configured as a trunking port, nor does the VLAN or the VLAN STP instance need to exist. Figure 6-49 shows the subdialog box that is displayed when the Add/Remove Per VLAN STP Setting button is selected. The subdialog box contains the following items:
  - VLAN—Idenifies the VLAN STP instance. This is the numeric identifier of the access mode VLAN or a VLAN that is carried on the trunk.
  - Priority—Describes the STP VLAN port priority of this interface.
  - Cost—Describes the STP VLAN path cost of this interface.
  - Add button—Adds an explicit STP VLAN configuration to the interface.
  - Remove button—Removes an explicit STP VLAN configuration to the interface.

Figure 6-49 Add / Remove Per VLAN STP Setting Subdialog Box



STP Status Area

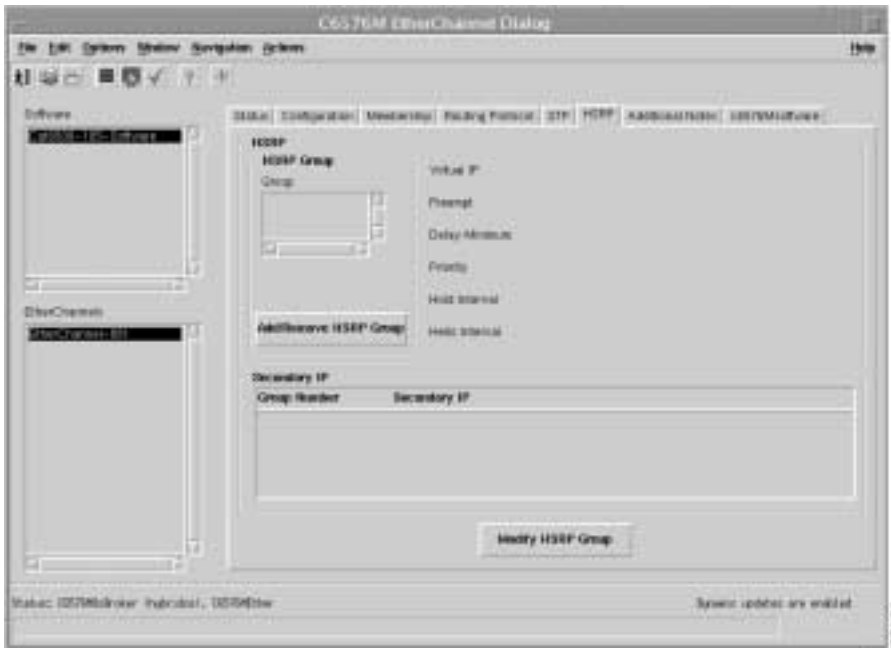
The STP Status area of the C6576M Ethernet Interface dialog box provides the following information:

- STP VLAN Status Table—Describes the status of the active STP VLAN port configurations of the interface. Data is displayed in the following columns:
  - VLAN—Idenifies the VLAN STP instance that this status applies to. This is the numeric identifier of the access mode VLAN or a VLAN that is carried on the trunk.
  - Port—Unique port identifier for the interface in the STP instance. This identifier is unique for that port across all devices in the STP management domain.
  - State—Describes the interface state in the STP instance.
  - Port Cost—Indicates the current calculated port path cost of the interface in the STP instance.

HSRP Tab

Figure 6-50 shows the HSRP tab of the C6576M EtherChannel dialog box.

Figure 6-50 HSRP Tab for the C6576M EtherChannel Dialog Box



HSRP Area

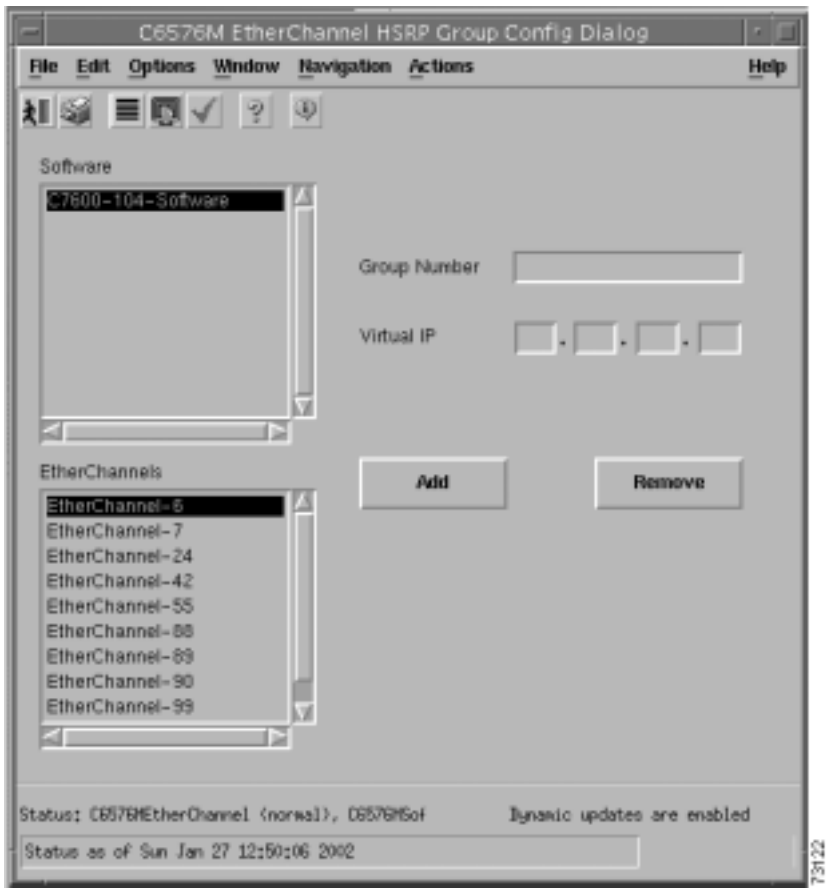
The HSRP area of the C6576M Ethernet Interface dialog box provides the following information:

- HSRP Group Table—Describes HSRP groups deployed on an interface.

Note There may be multiple groups deployed on an interface. Using a group number on one logical or physical interface does not preclude using it on another.

- Virtual IP—Primary virtual IP address of the HSRP group. If this address is not configured, the agent will attempt to discover the virtual address through a discovery process which scans the hello messages.
- Preempt—If enabled, the current router will attempt to overthrow a lower priority active router and attempt to become the active router. If disabled, this router will become the active router only if there is no such router or the active router fails.
  - true—Preempt enabled.
  - false—Preempt disabled.
- Delay Minimum—Time difference (in seconds) between a router power up and the time it can start preempting the currently active router. This value is only applicable when preemption is enabled.
- Priority—Priority value that prioritizes a potential hot standby router. The range is 1 to 255, where 1 indicates the lowest priority and 255 indicates the highest priority. The default priority value is 100. The router in the HSRP group with the highest priority value becomes the active router.
- Hello Interval—Hello interval in milliseconds. If this value is not configured, it can be learned from the active router.
- Hold Interval—Hold interval in milliseconds. If this value is not configured, it can be learned from the active router.
- Add/Remove HSRP Group button—This action deploys or remove an HSRP group on the interface. The HSRP group may optionally be assigned a primary IP address. If no address is explicitly assigned, the device will attempt to discover the virtual IP address from the active server using hello messages. Figure 6-51 shows the subdialog box that is displayed when you click the button.

Figure 6-51 HSRP Group Configure Subdialog Box



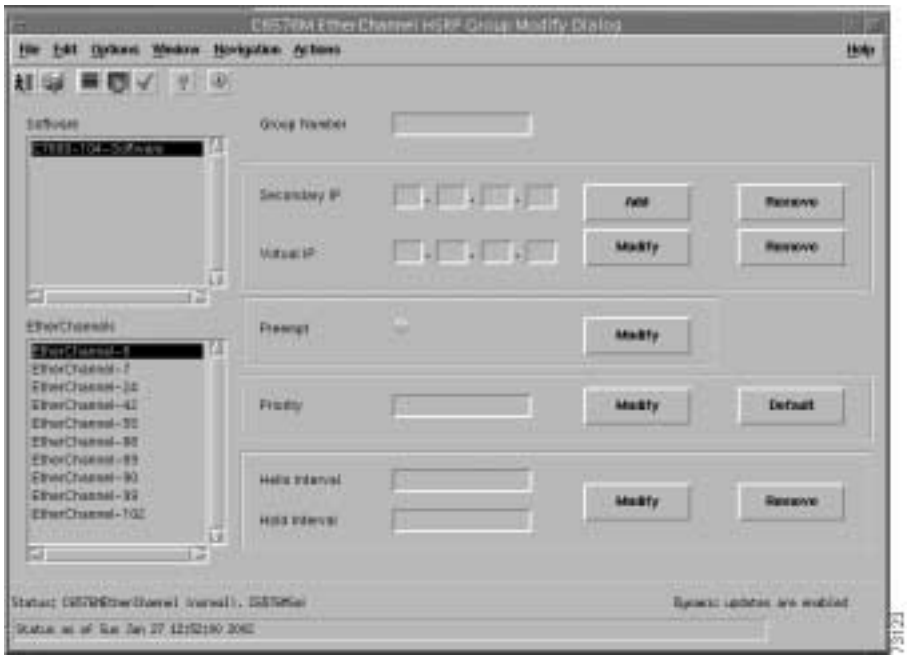
Secondary IP Area

The Secondary IP area of the C6576M Ethernet Interface dialog box provides the following information:

- HSRP Secondary Address Table—Describes secondary IP addresses of HSRP groups deployed on the interface. Data is displayed in the following columns:
  - Group Number—Unique identifier of an HSRP group.
  - Secondary IP—Secondary IP address of HSRP group.
- Modify HSRP Group button—Figure 6-52 shows the subdialog box that is displayed when the Modify button is clicked. This subdialog box is used to modify the following C6576M Ethernet Interface attributes of a given HSRP group:
  - Secondary IP
  - Virtual IP
  - Preempt
  - Delay Minimum
  - Priority
  - Hello Interval

– Hold Interval

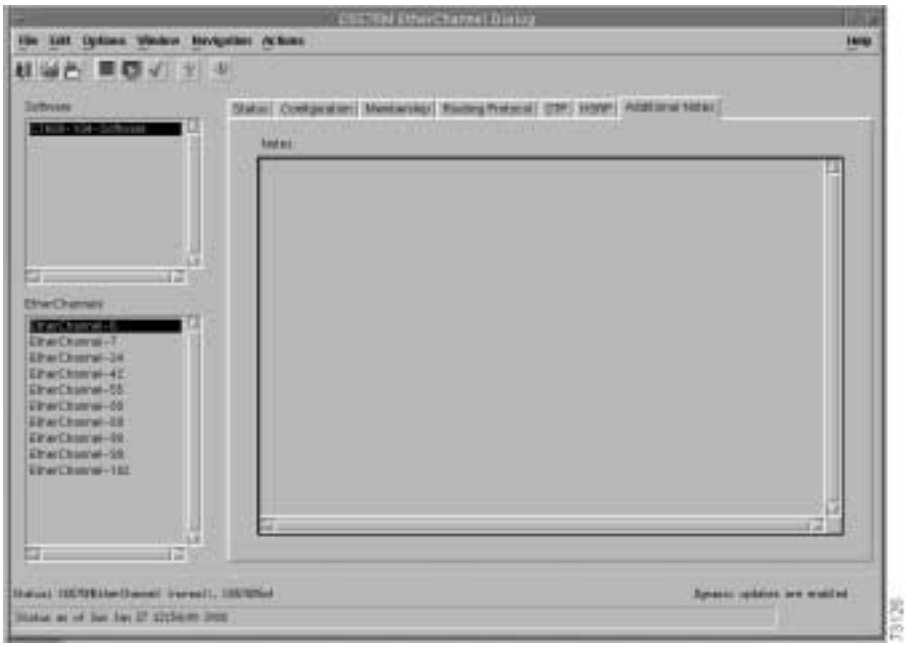
Figure 6-52 HSRP Secondary IP Modify Subdialog Box



Additional Notes Tab

Figure 6-53 shows the Additional Notes tab of the C6576M EtherChannel dialog box.

Figure 6-53 Additional Notes Tab of the C6576M EtherChannel Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

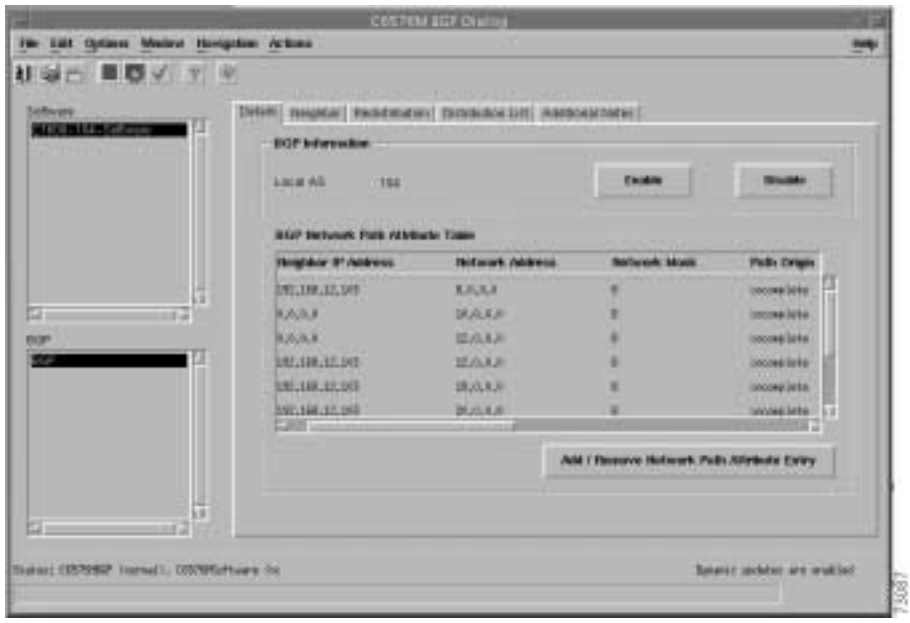
C6576M BGP Dialog Box

The C6576M BGP dialog box provides information for the IOS Border Gateway Protocol (BGP). This dialog box can be launched from the Software object or BGP object in the Physical view.

BGP Tab

Figure 6-54 shows the BGP tab of the C6576M BGP dialog box.

Figure 6-54 BGP Tab of the C6576M BGP Dialog Box



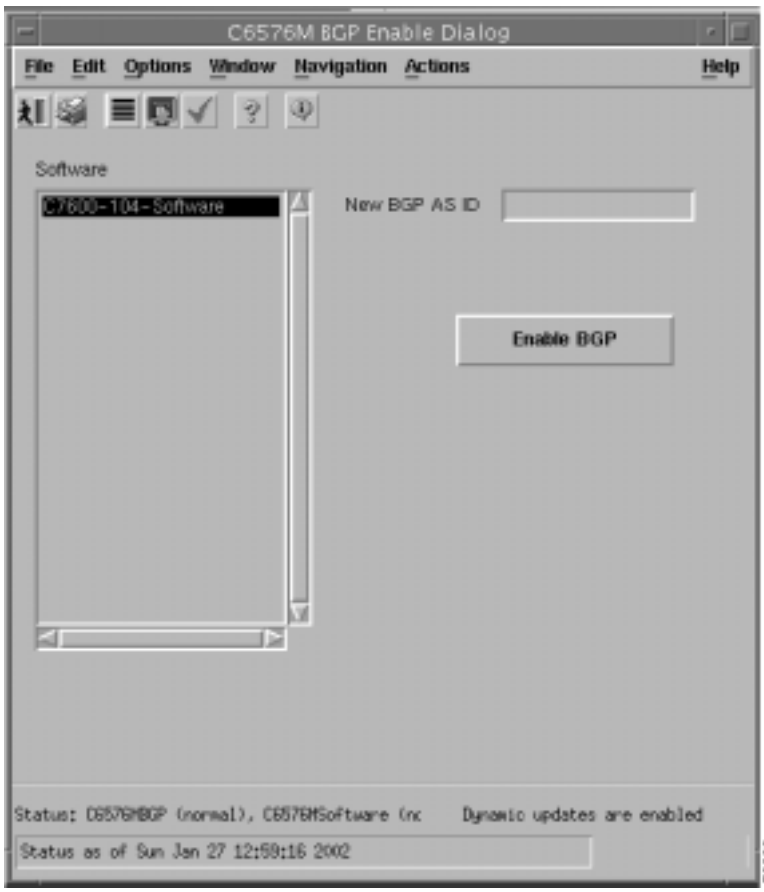
BGP Information Area

The BGP Information area of the C6576M BGP dialog box provides the following information:

- Local AS ID—Autonomous system number for the local BGP process. This attribute has a value of 0 if BGP is disabled on the switch or router.
- **Enable** button—Enables BGP on the switch or router. Launches the dialog box shown in Figure 6-55.

  To enable BGP on the switch or router, specify the BGP autonomous system number and then click **Enable BGP**. An error will be reported if BGP is already enabled on the switch or router.
- **Disable** button—Disables BGP on the switch or router.

Figure 6-55 BGP Enable Dialog Box



BGP Network Path Attribute Table Area

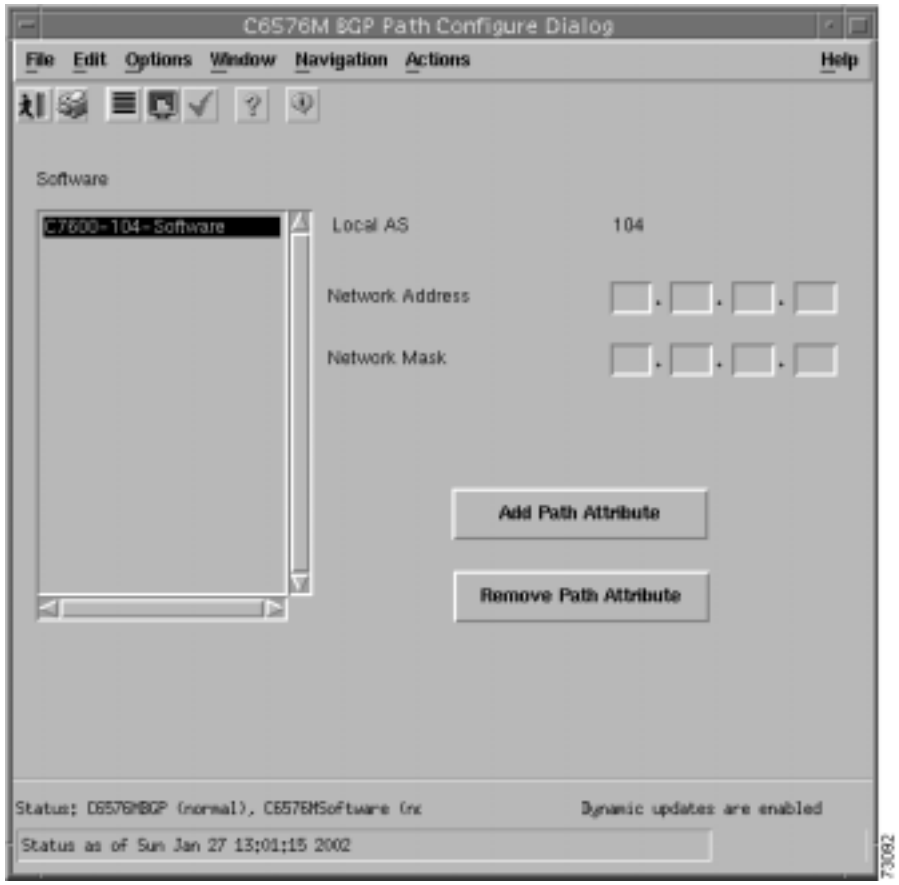
The BGP Network Path Attribute Table area contains information about paths to destination networks received from all BGP peers. This area contains the following columns:

- Peer IP Address—IP address of the peer from which the path information was learned. This address is 0.0.0.0 if this information was learned internally.
- IP Address—IP address of the destination network.
- Network Mask—Length of the destination network IP adddress prefix in the Network Layer Reachability Information field.
- **Path Origin**—Ultimate origin of the path information. This has the following values:
  - igp—Interior Gateway Protocol advertised with a **network** router configuration command.
  - egp—Exterior Gateway Protocol.
  - incomplete—Unknown origin. Usually, a router that is distributed into BGP from an IGP.
- **Border Router IP Address—A**ddress of the border router that should be used for the destination network.
- **Multiple Exit Point Discriminate Metric**—Metric used to discriminate between multiple exit points to an adjacent autonomous system. A value of -1 indicates the absence of this attribute.

- **Degree of Preference—D**egree of preference for an advertised route. A value of -1 indicates an absence of this attribute.
- **Add/Remove Network Path Attribute Entry button**—Adds or removes specific network(s) to be advertised (or not to be advertised) by the Border Gateway Protocol (BGP). Launches the dialog box shown in Figure 6-56.

  Specify the IP and network mask of the network to be added or removed from the BGP process.

Figure 6-56 Add or Remove BGP Path Attributes Dialog Box



Status Field

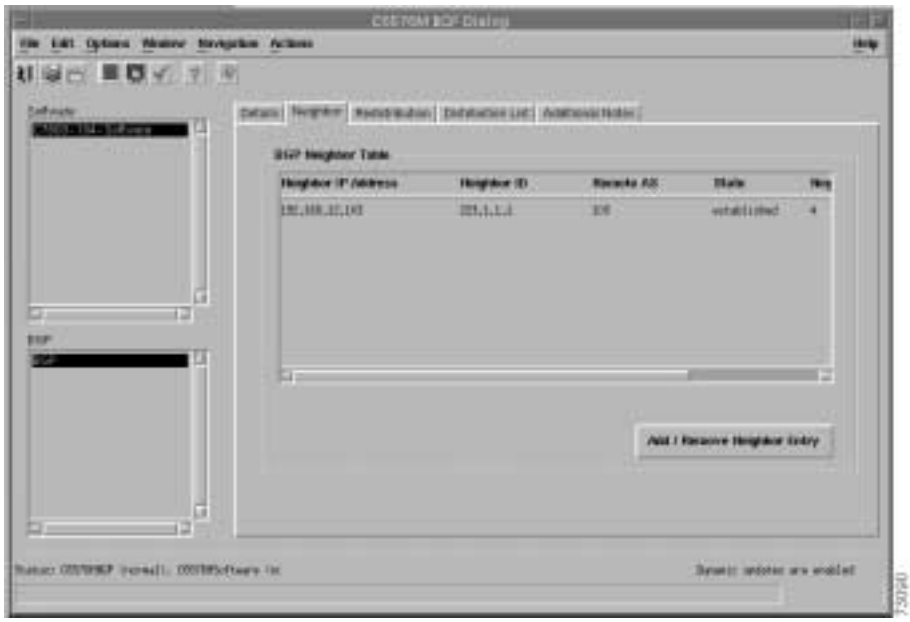
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Neighbor Tab

Figure 6-57 shows the Neighbor tab of the C6576M BGP dialog box.

Figure 6-57 Neighbor Tab of the C6576M BGP Dialog Box



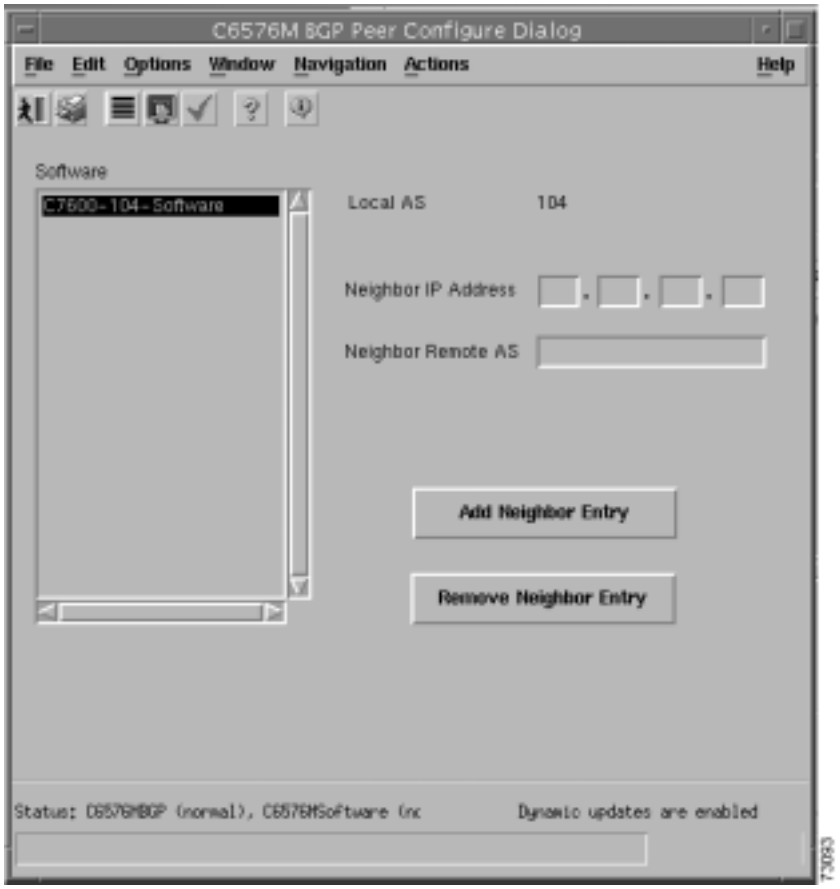
BGP Neighbor Table Area

This area lists the BGP neighbors of the local BGP process:

- Neighbor IP Address—Remote IP address of this entry's BGP neighbor.
- Neighbor ID—IP address of the neighbor.
- Remote AS—Autonomous system number of the neighbor.
- State—Operational state of the connection between the neighbor and local BGP process. This field has the following values:
  - idle
  - connect
  - active
  - opensent
  - openconfirm
  - established
- Negotiated Version—Negotiated version of BGP running between the two neighbors.
- Add/Remove Neighbor Entry button—Adds or removes BGP neighbors from this table. Launches the dialog box shown in Figure 6-58.

  Specify the neighbor IP address and remote AS number to add or remove the neighbor from the local BGP neighbor table.

Figure 6-58 Add or Remove BGP Peers Dialog Box



Redistribution Tab

Figure 6-59 shows the Redistribution tab of the C6576M BGP dialog box.

Figure 6-59 Redistribution Tab of the C6576M BGP Dialog Box

Redistribution Table Area

This area describes the route redistribution configuration of the BGP routing process. Routes learned from other interior and exterior routing protocols may be redistributed into the BGP routing domain.

- Protocol—Source protocol from which routes are being distributed into BGP.
  - IS-IS
  - EIGRP
  - OSPF
- AS/Tag—The autonomous system tag identifying the BGP routing domain.
- IS-IS Routing Level—Indicates IS-IS route level redistribution. This field has the following values:
  - none—For protocols other than IS-IS.
  - level-1—Local area/intra-area dedistribution.
  - level-1-2—Redistribution for both inter and intra-area routing.
  - level-2—Backbone/interarea redistribution (default).
- Metric—BGP metric used to weigh the redistributed route. If no value is specified for Default Metric (in the BGP tab), this value defaults to 0.

Default Metric Area

This area has one attribute:

- Default Metric—Default metric used for route redistribution. This metric is used when and explicit metric is not given during route redistribution process.

Edit Redistribution Table Area

This area allows changes to be made to the Redistribution Table:

- Protocol—Source protocol from which routes are being distributed. This attribute along with Source ID uniquely identifies a source of network paths to be redistributed through BGP. There may be, at most, one redistribution entry for a given source of network path information.
- AS/Tag—The autonomous system tag identifying the BGP routing domain.
- IS-IS Routing Level—Indicates IS-IS route level redistribution. This field has the following values:
  - level-1—Local area/intra-area dedistribution.
  - level-1-2—Redistribution for both inter and intra-area routing.
  - level-2—Backbone/interarea redistribution (default).
- Metric—BGP metric used to weigh the redistributed route. If no value is specified for Default Metric (in the BGP tab), this value defaults to 0.
- Add button—Enables route redistribution from another IP routing process into the BGP routing domain. Routes may be learned from an IS-IS, EIGRP, or OSPF routing process.
- Delete button—Disables route redistribution from another IP routing process into the BGP routing domain.

Distribution List Tab

Figure 6-60 shows the Distribution List tab of the C6576M BGP dialog box.

Figure 6-60 Distribution List Tab of the C6576M BGP Dialog Box

Distribution List Table Area

This area describes filtering of routing updates sent or received by the routing process.

- ACL ID—Unique identifer of an ACL for filtering routing updates sent or received by a routing process. The ACL specifies which network routes will be permitted or denied in routing updates. This field has the following values:
  - <1-199>—Standard access list number.
  - <1300-2699>—Expanded access list number.
  - alphanumeric—Named access list.
- Direction—Indicates whether the filter will be applied against routing updates received by the routing process or advertised by the routing process.
  - in—Applies to updates received.
  - out—Applies to updates advertised.
- Interface—Identifies a particular interface that the filter is applied to. For an incoming filter, suppresses routing updates received on a specific interface; if not specified, routing updates are suppressed on all interfaces. For an outgoing filter, suppresses routes from being advertised on a particular interface; if not specified, route advertisements are suppressed on all interfaces.
  - Null 0
  - FastEthernet <slot>/<port> (Native IOS only)
  - GigabitEthernet <slot>/<port> (Native IOS only)

  - GE-WAN <slot>/<port>
  - POS <slot>/<port>
  - ATM <slot>/<subslot>/<port>
  - Port-channel <n> (Native IOS only)
  - VLAN <n>
- Protocol—Identifies the routing protocol source of network routes.
- Source ID—Identifies the routing process from which routes are being distributed. This field may have the following values:
  - IS-IS—This is either an implicit null tag or the tag of a named IS-IS routing process.
  - BGP—This is a 16-bit autonomous system ID in the range of 1 to 65535.
  - EIGRP—This is a 16-bit autonomous system ID in the range of 1 to 65535.
  - OSPF—This is a 16-bit OSPF process ID in the range of 1 to 65535.

Edit Distribution Table Area

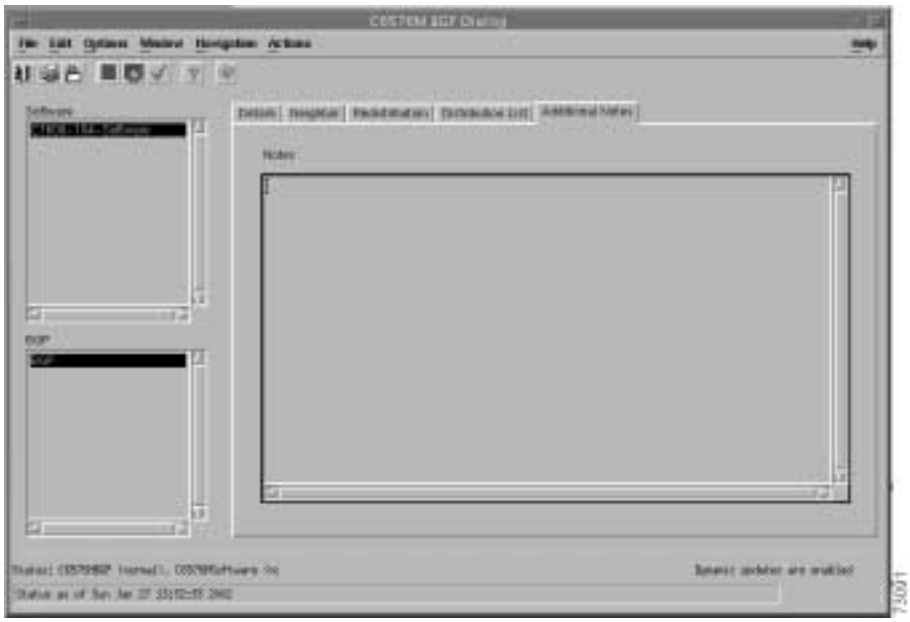
This area allows changes to be made to the Distribution Table attributes described in the "Distribution List Table Area" section on page 6-75:

- ACL ID—Unique identifer of an ACL for filtering routing updates sent/received by a routing process.
- Direction—Indicates whether the filter will be applied against routing updates received by the routing process or advertised by the routing process.
- Interface—Identifies a particular interface that the filter is applied to.
- Protocol—Identifies a protocol source of network routes.
- Source ID—Identifies a specific routing process instance that redistributed routes are derived from.
- Add button—Specifies a filter for suppressing or allowing distribution of network routes through BGP.
- Delete button—Removes a filter for suppressing or allowing distribution of network routes through BGP.

Additional Notes Tab

Figure 6-61 shows the Additional Notes tab of the C6576M BGP dialog box.

Figure 6-61 Additional Notes Tab of the C6576M BGP Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

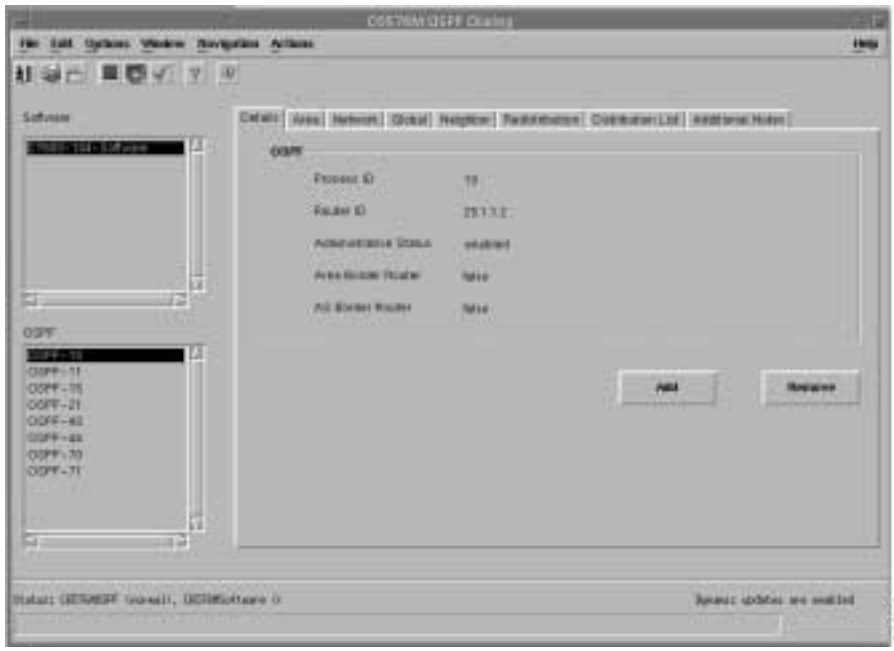
C6576M OSPF Dialog Box

The C6576M OSPF dialog box provides information for all IOS Open Shortest Path First (OSPF) routing protocol processes. This dialog box can be launched from the Software object or OSPF objects in the Physical view.

Details Tab

Figure 6-62 shows the Details tab of the C6576M OSPF dialog box.

Figure 6-62 Details Tab of the C6576M OSPF Dialog Box



OSPF Area

The OSPF area of the C6576M OSPF dialog box describes the OSPF area configurations:

- Process ID—Process number of this OSPF process.
- Router ID—Unique identifier of the router in the autonomous system. By convention, to ensure uniqueness this defaults to the value of one of the router's IP interface addresses.
- Administrative Status—Administrative status of this OSPF router process. The enabled value denotes that the OSPF process is active on at least one interface; the disabled value indicates that all interfaces are disabled.
- Area Border Router—Flag to note whether or not this router is an area border router.
- AS Border Router—Flag to note whether or not this router is configured as an autonomous system border router.
- Add button—Adds an OSPF process to the switch or router. Launches the dialog box shown in Figure 6-63.

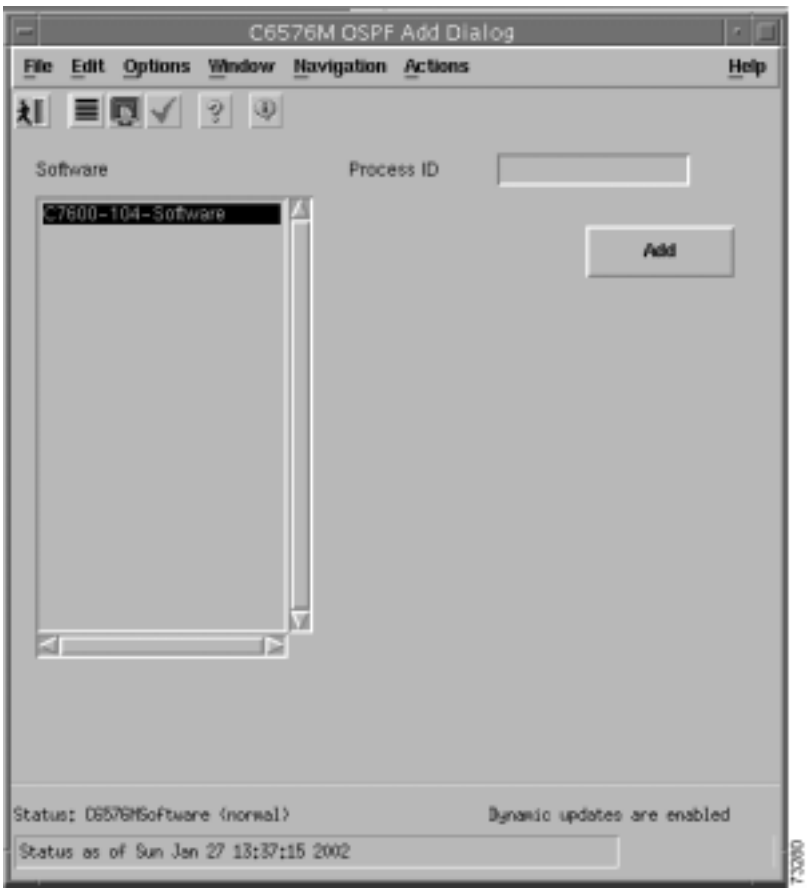
Note The Catalyst 6000 family switches and the Cisco 7600 series Internet Routers support only three OSPF processes.

Specify the OSPF Process ID (number only) and click **Add** to create the OSPF process on the switch or router. The string "OSPF-" will be prepended automatically to the process ID.

Note A newly created OSPF process will not automatically be listed in the OSPF object list (bottom left of Figure 6-62). To list the new process, reselect the current Software object from the Software object list (top left of Figure 6-62).

- Remove button—Deletes the currently selected OSPF process.

Figure 6-63 Add OSPF Processes Dialog Box



Status Field

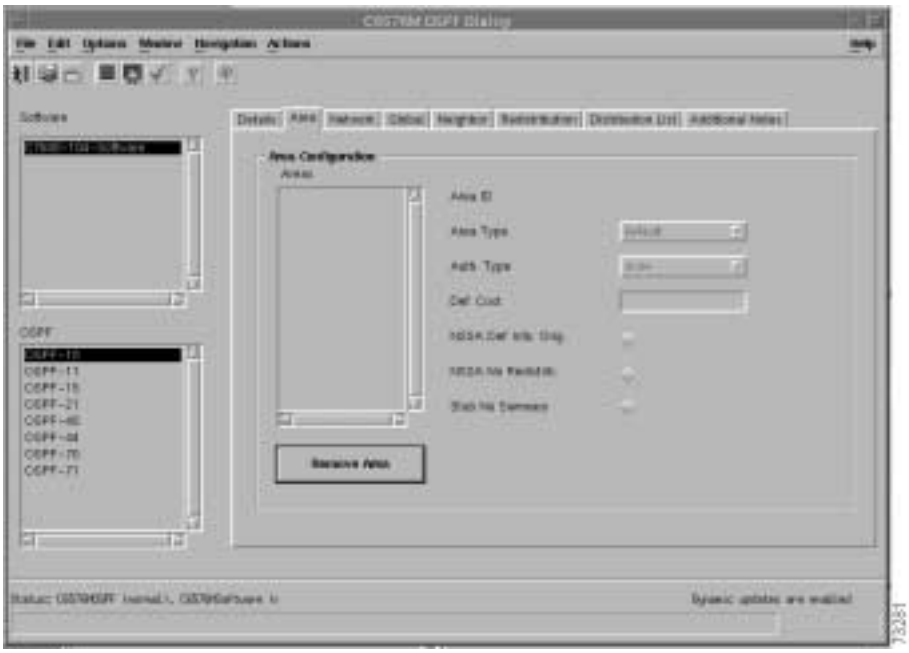
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Area Tab

Figure 6-64 shows the Area tab of the C6576M OSPF dialog box.

Figure 6-64 Area Tab of the C6576M OSPF Dialog Box



Area Configuration Area

This describes OSPF NSSA and stub area configurations. The information for a particular area can be displayed by selecting the desired area from the Areas list. When you select an area, the following information is provided:

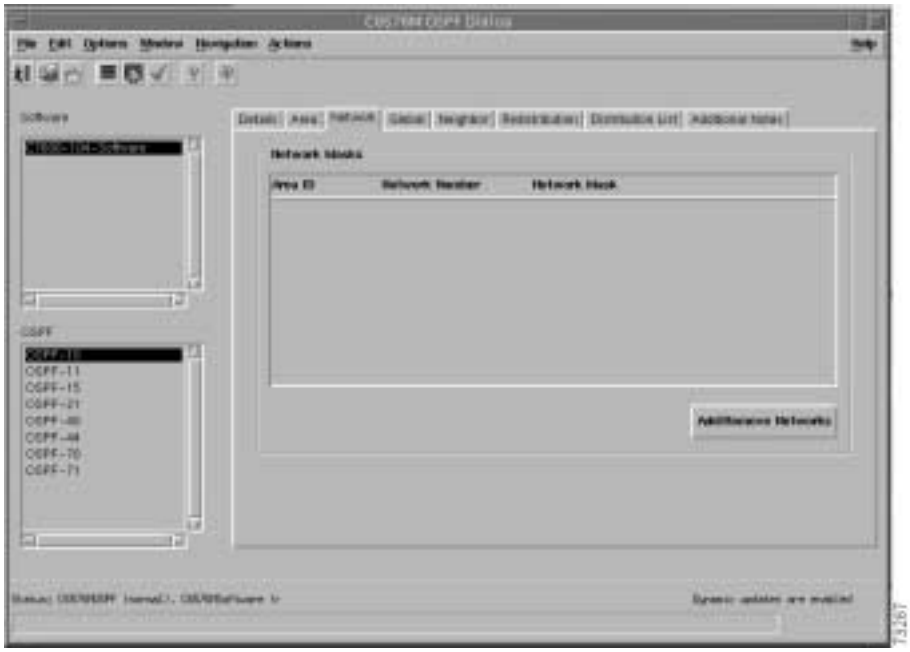
- Area ID—Identifies a stub or NSSA area adjacent to the router. The identifier can be specified as either a decimal value or as an IP address.
- Area Type—Type of area. The type has the following values:
  - default—Not a stub or NSSA area.
  - stub—Information on external routes are not sent to stub areas.

  - nssa—Similar to a stub area but autonomous system external routes can be imported into the area.
- Auth. Type—Authentication type for the area. The authentication type must be the same for all routers and access servers in an area. The authentication password for all OSPF routers on a network must be the same if they are to communicate with each other using OSPF. The Authentication type has the following values:
  - none—The area does not enforce any authentication.
  - simple—Simple password authentication is used.
  - md5—MD5 authentication is enabled for the area.
- Def. Cost—Default cost for the area. Use this value only on an area border router attached to a stub area. It provides a metric for the summary default route generated by the area border router into the stub area.
- NSSA Def. Info. Orig.—Generates a Type 7 default into the NSSA area. This argument takes effect only on an NSSA area border router or an NSSA AS border router.
- NSSA No Redistrib.—Used when the router is a NSSA area border router and routes are to be imported only into the normal areas, but not into the NSSA area.
- Stub No Summary—Indicates that an area border router is sending summary link advertisements into the stub area.
- Remove Area—Removes an explicit NSSA or stub area configuration to the OSPF routing process. The action can only be used on an area border router attached to a stub or NSSA area.

Network Tab

Figure 6-65 shows the Network tab of the C6576M OSPF dialog box.

Figure 6-65 Network Tab of the C6576M OSPF Dialog Box



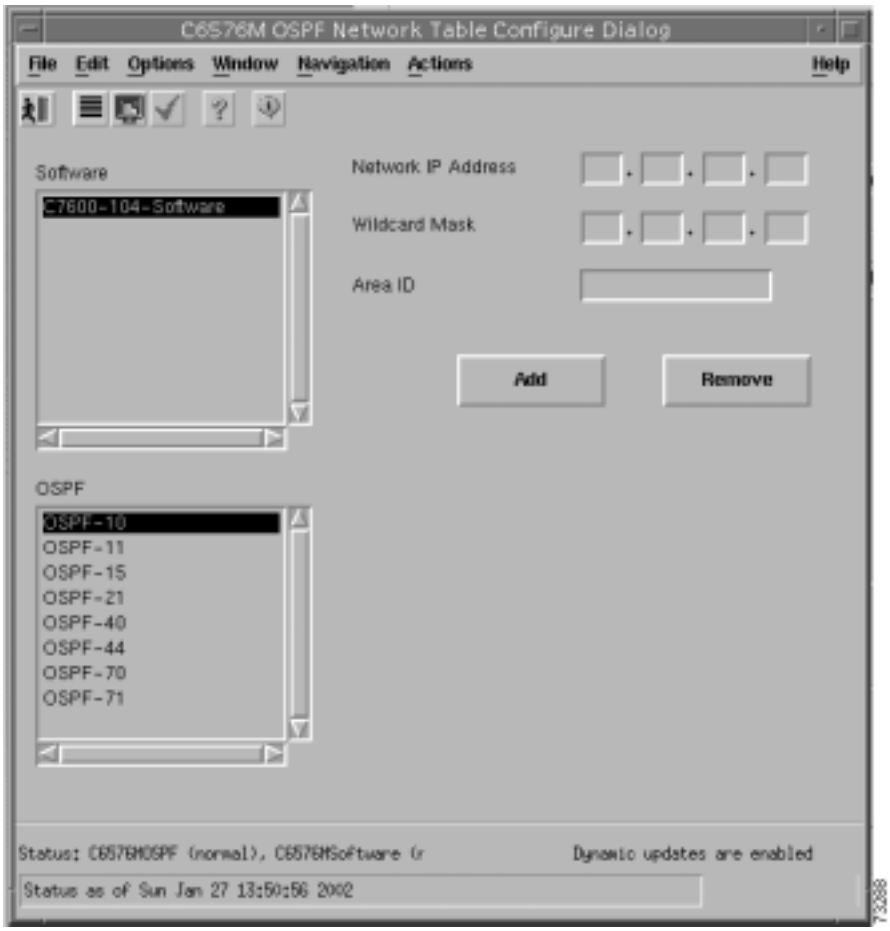
Network Masks Area

The table in this area displays the networks associated with the selected OSPF process. This table contains the following information:

- Area ID—Area ID assigned to the networks and subnets.
- Network Number—IP address of the network.
- Network Mask—Netmask associated with the IP address.
- Add/Remove Networks—Adds or removes networks from the OSPF process. Launches the dialog box shown in Figure 6-66.

  Specify the Network IP Address, Wildcard Mask, and the Area ID to be added or removed from the OSPF process.

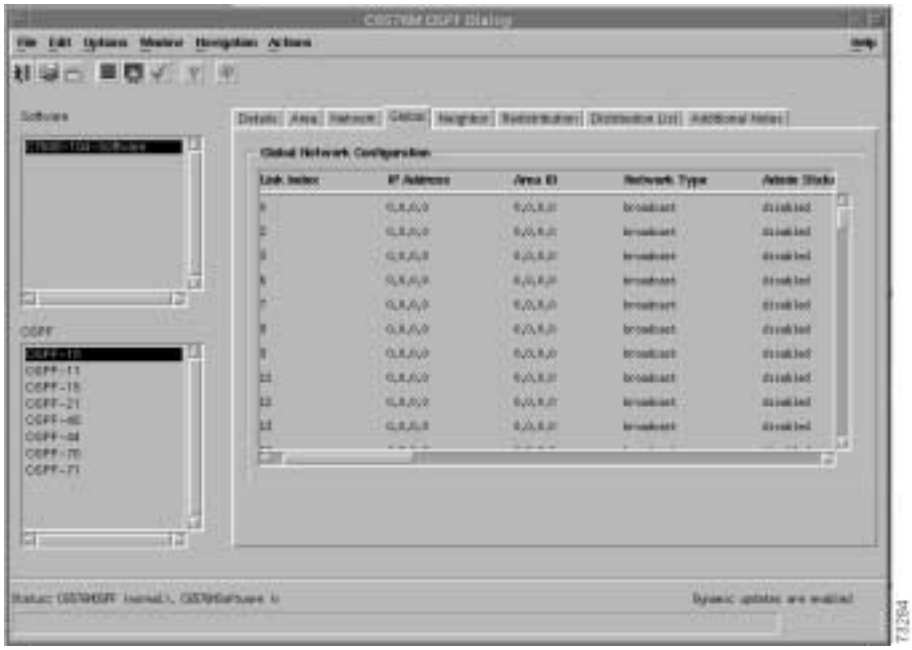
Figure 6-66 Add or Remove OSPF Networks Dialog Box



Global Tab

Figure 6-67 shows the Global tab of the C6576M OSPF dialog box.

Figure 6-67 Global Tab of the C6576M OSPF Dialog Box



Global Network Configuration Table

This describes the OSPF view of all interfaces on the router. This table contains the following columns:

- Link Index—Unique identifier of an interface on the router. This value is equal to the unique identifier of the interface if this is a Layer 2 (address-less) interface. If the interface is a Layer 3 (addressed) interface, this value is 0. This identifier is dynamic, it may change over the lifetime of an interface.
- IP Address—IP address of the interface.
- Area ID—Unique identifier of the area to which the interface connects. An Area ID of 0.0.0.0 is used for the OSFP backbone.
- Network Type—OSPF interface type. OSPF network type can be NBMA even on a broadcast media such as Ethernet. This column has the following values:
  - broadcast
  - nbma
  - pointToPoint
  - pointToMultipoint
- Admin Status—OSPF interface's administrative status.
  - enabled—Indicates that neighbor relationships can be formed on the interface, and the interface will be advertised as an internal route to some area.

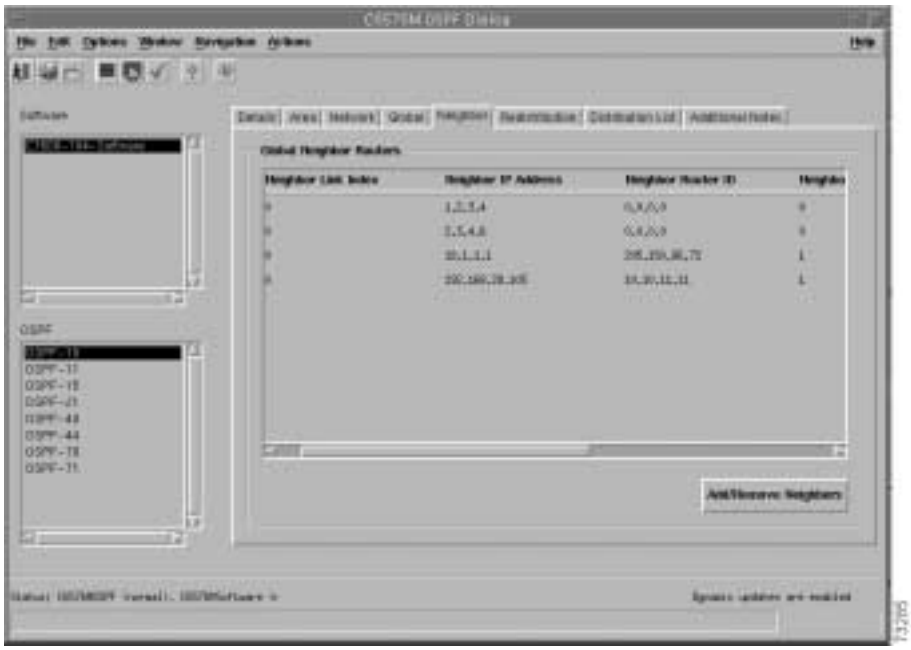
  - disabled—Indicates that the interface is external to OSPF.

- Trans. Priority—The priority of this interface. Used in multiaccess networks, this field is used in the designated router election algorithm. The value 0 signifies that the router is not eligible to become the designated router on this particular network. If more than one router has the same value, the routers use their router ID as a tie breaker.
- Trans. Delay (sec)—The estimated number of seconds it takes to transmit a link state update packet over this interface.
- Retrans. Interval (sec)—The number of seconds between link-state advertisement retransmissions for adjacencies belonging to this interface. This value is also used when retransmitting database description and link-state request packets.
- Hello Interval (sec)—The length of time, in seconds, between the hello packets that the router sends on the interface. This value must be the same for all routers attached to a common network.
- Trans. Dead (sec)—The number of seconds that a router's hello packets have not been seen before its neighbors declare the router down. This should be some multiple of the hello interval. This value must be the same for all routers attached to a common network.
- Polling Interval (sec)—The larger time interval, in seconds, between the hello packets sent to an inactive nonbroadcast multiaccess neighbor.
- State—The OSPF interface state.
- Designated Router—IP address of the designated router.
- Backup Designated Router—IP address of the backup designated router.
- Authentication Key—Password to be used by neighboring OSPF routers on a network segment that is using OSPF simple password authentication. Ignored if ospfAuthType is not "simple".

Neighbor Tab

Figure 6-68 shows the Neighbor tab for the C6576M OSPF dialog box.

Figure 6-68 Neighbor Tab of the C6576M OSPF Dialog Box



Global Neighbor Routers Area

This area lists all OSPF neighbors for all OSPF processes. This area consists of the following columns:

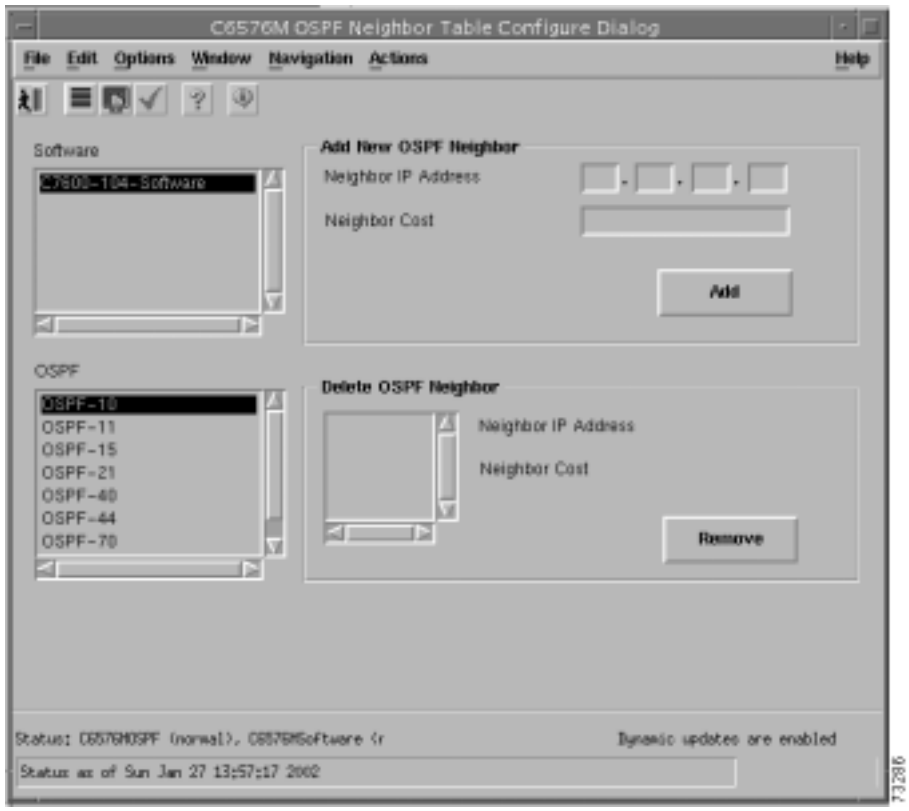
- Neighbor Link Index—Unique identifier of the interface on which the neighbor can be reached. This value is set to 0 if the interface has an IP address.
- Neighbor IP Address—IP address of the neighbor. On links without addresses, this address will not be 0.0.0.0, but the address of another of the neighbor's interfaces.
- Neighbor Router ID—IP address uniquely identifying the neighbor router in the autonomous system.
- Neighbor Priority—Priority of this neighbor in the designated router election algorithm. The value 0 signifies that the neighbor is not eligible to become the designated router on this particular network.
- Neighbor State—The state of the relationship with this Neighbor. This column may have the following values:
  - down
  - attempt
  - init
  - twoWay
  - exchangeStart

  - exchange
  - loading
  - full
- Neighbor Entry Status—This variable displays the status of the entry. Setting the variable to "invalid" can make it inoperative.
- Add/Remove Neighbors—Adds or removes neighbors. Launches the dialog box shown in Figure 6-69.

  When adding a new neighbor, specify the neighbor router's IP address and the cost associated for this neighbor, and click the **Add** button.

  To remove a neighbor, choose the neighbor in the Neighbor Table and click the **Remove** button. The Neighbor IP Address and Cost are displayed for the neighbor selected.

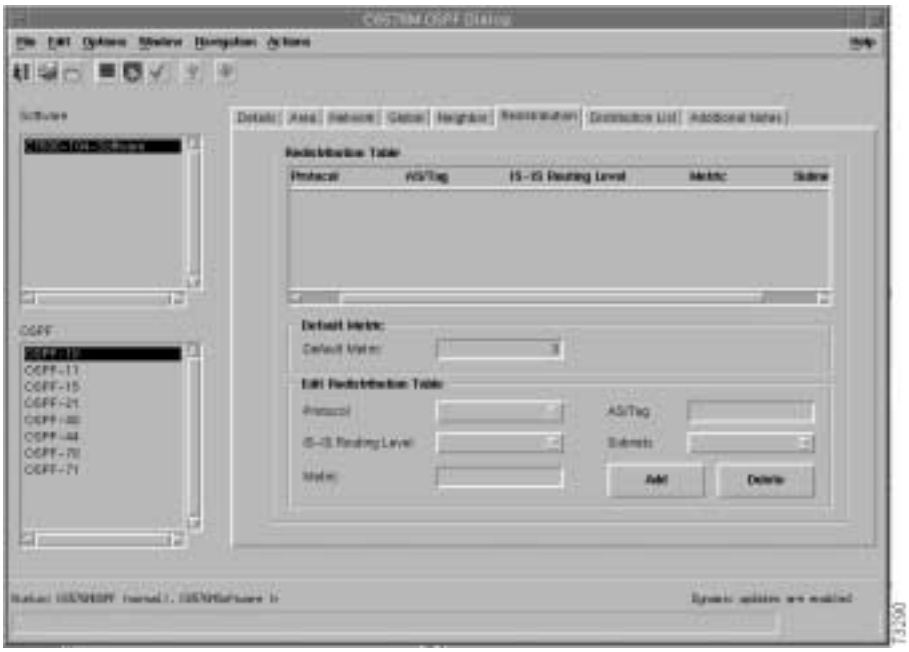
Figure 6-69 Add or Remove OSPF Neighbors Dialog Box



Redistribution Tab

Figure 6-70 shows the Redistribution tab of the C6576M OSPF dialog box.

Figure 6-70 Redistribution Tab of the C6576M OSPF Dialog Box



Redistribution Table Area

This area describes the route redistribution configuration of the OSPF routing process. Routes learned from other interior and exterior routing protocols may be redistributed into the OSPF routing domain.

- Protocol—Source routing protocol from which routes are being distributed into OSPF.
  - IS-IS
  - EIGRP
  - OSPF
  - BGP
- AS/Tag—The autonomous system tag identifying the BGP routing domain.
- IS-IS Routing Level—Indicates IS-IS route level redistribution. This field has the following values:
  - none—For protocols other than IS-IS.
  - level-1—Local area/intra-area dedistribution.
  - level-1-2—Redistribution for both inter and intra-area routing.
  - level-2—Backbone/interarea redistribution (default).
- Metric—OSPF metric used to weigh the redistributed route. If no value is specified for Default Metric (in the General tab), this value defaults to 0.
- Subnets—Indicates whether or not subnets will be considered for redistribution into OSPF. This column has the value of either ‘true’ or ‘false’.

Default Metric Area

- Default Metric—Default OSPF metric used for redistributed routes. This metric is used when an explicit metric is not given in the Metric entry of the Redistribution tab. A value of 0 indicates that no default metric has been specified.

Edit Redistribution Table Area

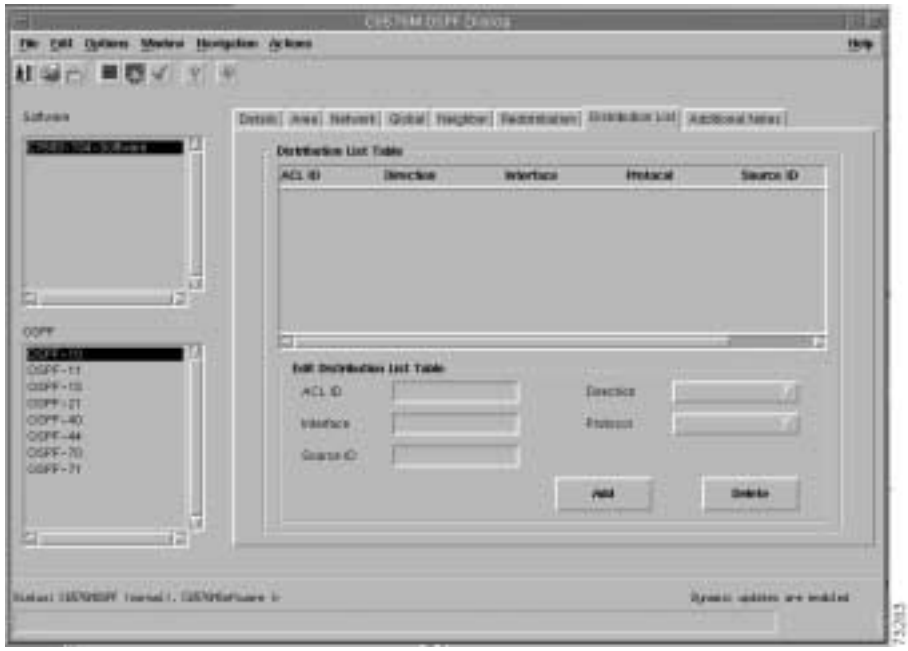
This area allows changes to be made to the attributes in the Redistribution Table. These attributes are discussed in detail in the “Redistribution Table Area” section on page 6-88.

- Protocol—Source routing protocol from which routes are being distributed into OSPF.
- AS/Tag—The autonomous system tag identifying the BGP routing domain.
- IS-IS Routing Level—Indicates IS-IS route level redistribution.
- Metric—OSPF metric used to weigh the redistributed route.
- Subnets—Indicates whether or not subnets will be considered for redistribution into OSPF.
- Add button—Enables route redistribution from another IP routing process into the OSPF routing domain. Routes may be learned from an IS-IS, EIGRP, or BGP routing process.
- Delete button—Disables route redistribution from another IP routing process into the BGP routing domain.

Distribution List Tab

Figure 6-71 shows the Distribution List tab of the C6576M OSPF dialog box.

Figure 6-71 Distribution List Tab of the C6576M OSPF Dialog Box



Distribution List Table Area

This area describes filtering of routing updates sent or received by the routing process.

- ACL ID—Unique identifer of an ACL for filtering routing updates sent or received by a routing process. The ACL specifies which network routes will be permitted or denied in routing updates. This field has the following values:
  - <1-199>—IP standard access list number.
  - <1300-2699>—IP expanded access list number.
  - alphanumeric—Named access list.
- Direction—Indicates whether the filter will be applied against routing updates received by the routing process or advertised by the routing process.
  - in—Applies to updates received.
  - out—Applies to updates advertised.
- Interface—Identifies a particular interface that the filter is applied to. For an incoming filter, suppresses routing updates received on a specific interface; if not specified, routing updates are suppressed on all interfaces. For an outgoing filter, suppresses routes from being advertised on a particular interface; if not specified, route advertisements are suppressed on all interfaces.
  - Null 0
  - FastEthernet <slot>/<port> (Native IOS only)

  - GigabitEthernet <slot>/<port> (Native IOS only)
  - GE-WAN <slot>/<port>
  - POS <slot>/<port>
  - ATM <slot>/<subslot>/<port>
  - Port-channel <n> (Native IOS only)
  - VLAN <n>
- Protocol—Source routing protocol from which routes are being distributed into OSPF.
- Source ID—Identifies a specific routing process instance that redistributed routes are derived from.

Edit Distribution Table Area

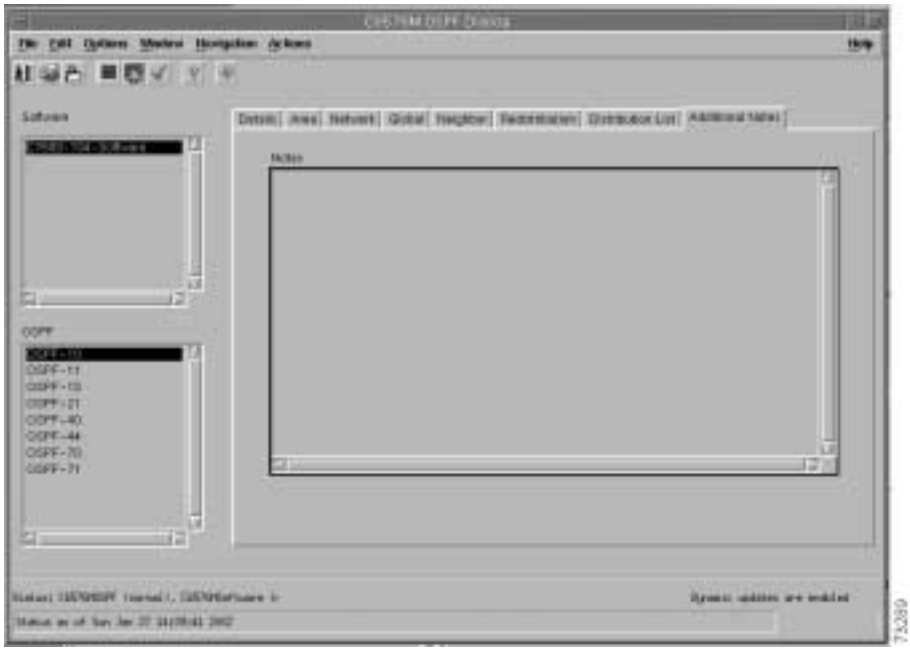
This area allows changes to be made to the Distribution Table:

- ACL ID—Unique identifer of an ACL for filtering routing updates sent or received by a routing process.
- Direction—Indicates whether the filter will be applied against routing updates received by the routing process or advertised by the routing process.
- Interface—Identifies a particular interface that the filter is applied to.
- Protocol—Source routing protocol from which routes are being distributed into OSPF.
- Source ID—Identifies a specific routing process instance that redistributed routes are derived from.
- Add button—Specifies a filter for suppressing or allowing distribution of network routes through OSPF routing process.
- Delete button—Removes a filter for suppressing or allowing distribution of network routes through OSPF routing process.

Additional Notes Tab

Figure 6-72 shows the Additional Notes tab of the C6576M OSPF dialog box.

Figure 6-72 Additional Notes Tab of the C6576M OSPF Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

C6576M EIGRP Dialog Box

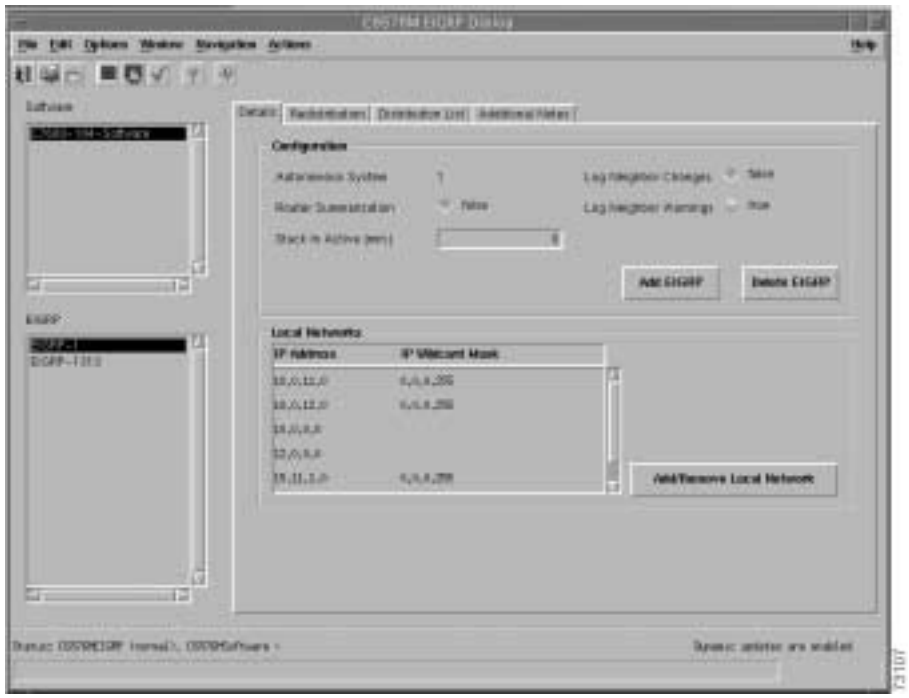
The C6576M EIGRP dialog box provides information on the Enhanced Interior Gateway Routing Protocol (EIGRP) enabled in IOS. This dialog box is launched from the Software object or EIGRP objects in the Physical view.

Note All information in this dialog box is retrieved or set using IOS commands. If the IOS Telnet or the Enable password specified in the Network Element dialog box is incorrect, attributes in this dialog box might be displayed as ERROR.

Details Tab

Figure 6-73 shows the Details tab of the C6576M EIGRP dialog box.

Figure 6-73 Details Tab of C6576M EIGRP Dialog Box



Configuration Area

The Configuration area of the C6576M EIGRP dialog box provides the following information:

- Autonomous System—Autonomous system number for this EIGRP process.
- Router Summarization—If true, subnet routes are summarized automatically into network-level routes. Automatic summarization is performed when there are two or more networks associated with the EIGRP process.

- Stuck In Active—Length of time (in minutes) that a route stays active. This value determines the maximum period of time that an EIGRP router will wait for replies to its queries. If this value is set too low, there might not be enough time for all the neighboring routers to send their replies to the active router.
- Log Neighbor Changes—If true, changes to neighbor adjacencies are logged. This can be useful to monitor the stability of the routing system and help detect problems.
- Log Neighbor Warnings—If true, neighbor warning messages are logged.
- Delete EIGRP button—Deletes the currently selected EIGRP process from the switch or router.
- Add EIGRP button—Adds EIGRP processes to the switch or router. Launches the dialog box shown in Figure 6-74. Specify the following attributes and click **Add** to add an EIGRP process to IOS:
  - Autonomous System Number—Autonomous system number for this EIGRP process.
  - IP Address—IP address of a local network. A local network must be specified to add an EIGRP process.
  - Wildcard Mask—Mask to be used with the IP address. This field is optional.

Figure 6-74 Add EIGRP Processes Dialog Box

Note If no netmask is provided, the EIGRP routing process is only deployed on a single network.

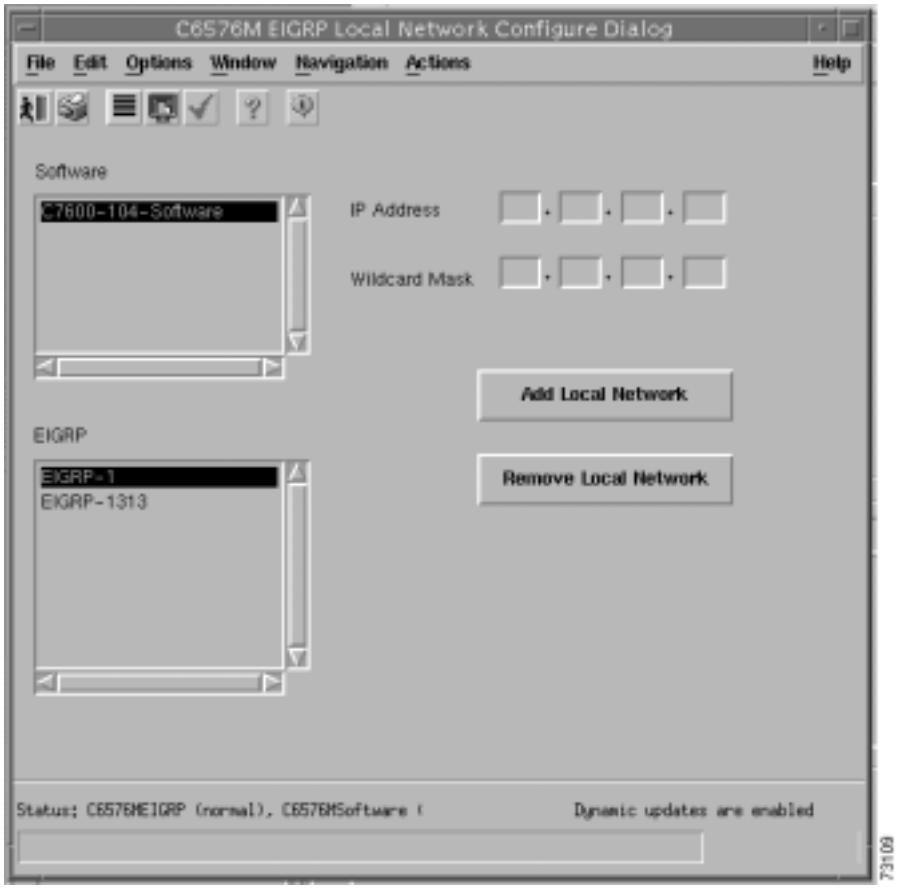
Local Networks Area

This area describes the networks supported by EIGRP. EIGRP will send routing updates on the interfaces in the networks. If the network of an interface is not specified, it will not be advertised by EIGRP. This area consists of the following columns:

- IP Address—IP address of an interface or a range of interfaces in a network supported by the EIGRP routing process.
- IP Wildcard Mask—Network wildcard bitmask. Enabled bits indicate wildcard bits in the IP address. This allows multiple interfaces to be specified in a single network entry.
- Add/Remove Local Network button—Defines or disables the interfaces that an EIGRP process will run on. EIGRP sends updates to the interfaces in the specified networks. Also, if the network of an interface is not specified, it will not be advertised in any IGRP or Enhanced IGRP update. The wildcardmask can be used to specify a range of interfaces supported by the EIGRP routing process. Launches the dialog box shown in Figure 6-75.

  Specify the IP address and IP mask of the entry to be added or removed from the local network table.

Figure 6-75 Add or Remove Networks to the EIGRP Process Dialog Box



Status Field

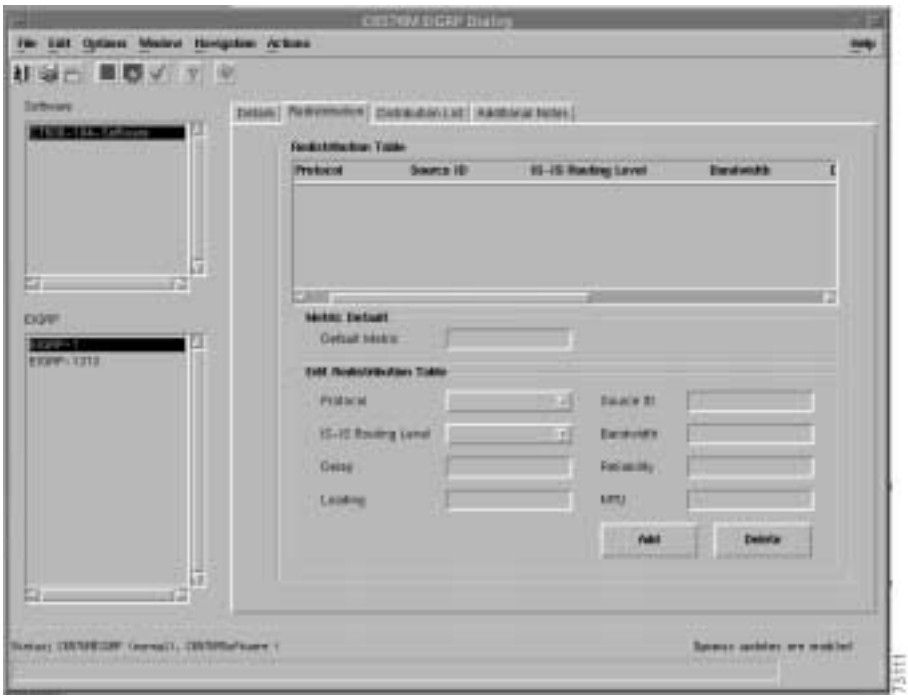
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Redistribution Tab

Figure 6-76 shows the Redistribution tab of the C6576M EIGRP dialog box.

Figure 6-76 Redistribution Tab of the C6576M EIGRP Dialog Box



Redistribution Table Area

This area describes the route redistribution configuration of the EIGRP routing process. Routes learned from other interior and exterior routing protocols may be redistributed into the EIGRP routing domain.

- Protocol—Source routing protocol from which routes are being distributed into EIGRP.
  - IS-IS
  - EIGRP
  - BGP
  - OSPF
  - static

- Source ID—Identifies the routing process from which routes are being distributed. This field may have the following values:
  - IS-IS—This is either an implicit null tag or the tag of a named IS-IS routing process.
  - EIGRP—This is a 16-bit autonomous system ID in the range of 1..65535
  - BGP—This is a 16-bit autonomous system ID in the range of 1..65535
  - OSPF—This is a 16-bit OSPF process ID in the range of 1..65535
- IS-IS Routing Level—Indicates IS-IS route level redistribution. This field has the following values:
  - none—For protocols other than IS-IS.
  - level-1—Local area/intra-area dedistribution.
  - level-1-2—Redistribution for both inter- and intra-area routing.
  - level-2—Backbone/interarea redistribution (default).
- Bandwidth—Bandwidth metric. This redistribution metric must be specified for protocols other than EIGRP if the Default Metric in the Details tab is nil.
- Delay—Delay metric. This redistribution metric must be specified if the Default Metric is nil.
- Reliability—Reliability metric. 0 is least reliable, 255 is 100 percent reiliable. This redistribution metric must be specified if the default metric is nil.
- Loading—Loading metric. This indicates the effective bandwidth of the network paths where 0 is least loaded and 255 is 100 percent loaded. This redistribution metric must be specified if the Default Metric is nil.
- MTU—Maximum transmission unit of the path metric. This redistribution metric must be specified if the Default Metric is nil.

Metric Default Area

- Default Metric—Default metric used for route redistribution. This metric is used when and explicit metric is not given during route redistribution process.

Edit Redistribution Table Area

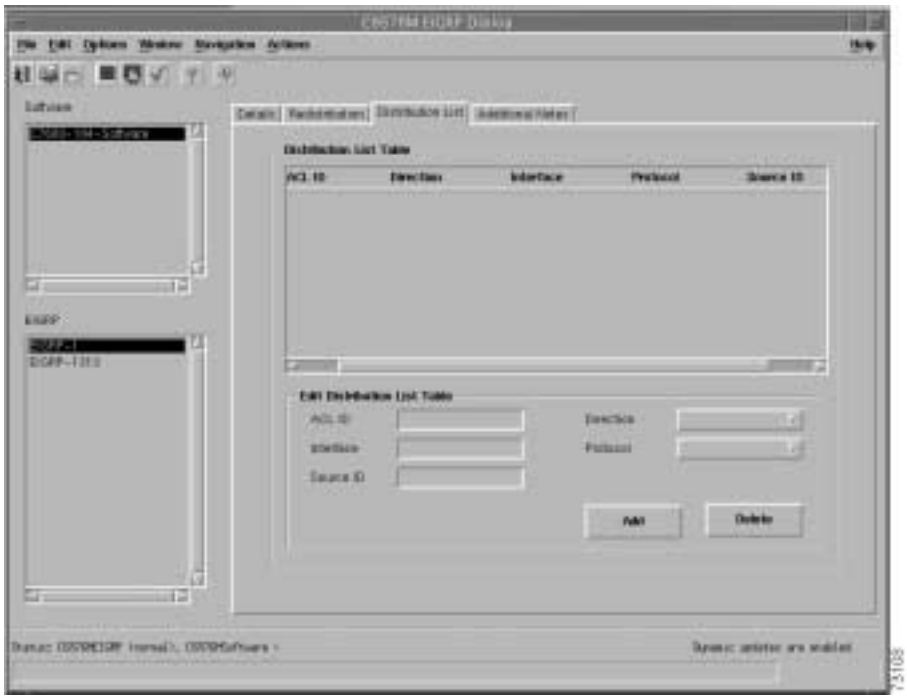
This area allows changes to be made to the attributes shown in the Redistribution Table. These attributes are discussed in detail in the "Redistribution Table Area" section on page 6-95.

- Protocol—Source routing protocol from which routes are being distributed into EIGRP. This field may have the following values:
  - IS-IS
  - EIGRP
  - OSPF
  - BGP
  - static
- IS-IS Routing Level—Indicates IS-IS route level redistribution.
- Delay—Delay metric.
- Loading—Loading metric.
- Source ID—Identifies the routing process from which routes are being distributed.
- Bandwidth—Bandwidth metric.
- Reliability—Reliability metric.
- MTU—Maximum transmission unit of the path metric.
- Add button—Enables route redistribution from another IP routing process into the EIGRP routing domain. Routes may be learned from an IS-IS, OSPF, or BGP routing process.
- Delete button—Disables route redistribution from another IP routing process into the EIGRP routing domain.

Distribution List Tab

Figure 6-77 shows the Distribution List tab of the C6576M EIGRP dialog box.

Figure 6-77 Distribution List Tab of the C6576M EIGRP Dialog Box



Distribution List Table Area

This area describes filtering of routing updates sent or received by the routing process.

- ACL ID—Unique identifer of an ACL for filtering routing updates sent or received by a routing process. The ACL specifies which network routes will be permitted or denied in routing updates. This field has the following values:
  - <1-199>—IP standard access list number.
  - <1300-2699>—IP expanded access list number.
  - alphanumeric—Named access list.
- Direction—Indicates whether the filter will be applied against routing updates received by the routing process or advertised by the routing process.
  - in—Applies to updates received.
  - out—Applies to updates advertised.
- Interface—Identifies a particular interface that the filter is applied to. For an incoming filter, suppresses routing updates received on a specific interface; if not specified, routing updates are suppressed on all interfaces. For an outgoing filter, suppresses routes from being advertised on a particular interface; if not specified, route advertisements are suppressed on all interfaces.
  - Null 0
  - FastEthernet <slot>/<port> (Native IOS only)
  - GigabitEthernet <slot>/<port> (Native IOS only)
  - GE-WAN <slot>/<port>

  - POS <slot>/<port>
  - ATM <slot>/<subslot>/<port>
  - Port-channel <n> (Native IOS only)
  - VLAN <n>
- Protocol—Source routing protocol from which routes are being distributed into EIGRP. This field may have the following values:
  - none
  - OSPF
  - EIGRP
  - BGP
  - static
- Source ID—Identifies a specific routing process instance that redistributed routes are derived from.

Edit Distribution List Table Area

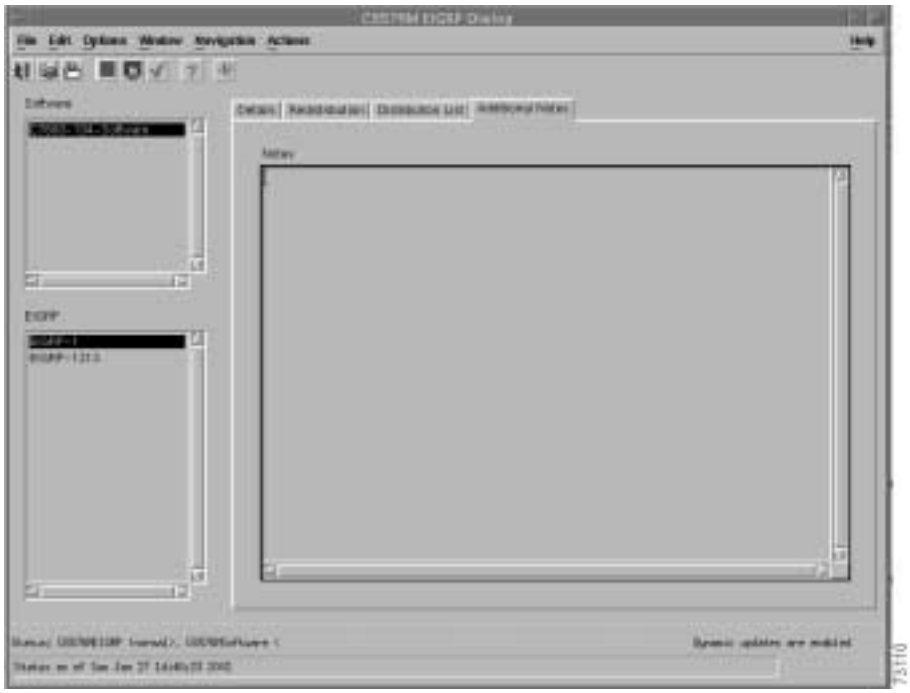
This area allows changes to be made to the Distribution Table:

- ACL ID—Unique identifer of an ACL for filtering routing updates sent/received by a routing process.
- Interface—Identifies a particular interface that the filter is applied to.
- Protocol—Source routing protocol from which routes are being distributed into EIGRP. This field may have the following values:
  - OSPF
  - EIGRP
  - BGP
  - static
- Direction—Indicates whether the filter will be applied against routing updates received by the routing process or advertised by the routing process.
- Source ID—Identifies a specific routing process instance that redistributed routes are derived from.
- Add button—Specifies a filter for suppressing or allowing distribution of network routes through EIGRP routing process.
- Delete button—Removes a filter for suppressing or allowing distribution of network routes through EIGRP routing process.

Additional Notes Tab

Figure 6-78 shows the Additional Notes tab of the C6576M EIGRP dialog box.

Figure 6-78 Additional Notes Tab of the C6576M EIGRP Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

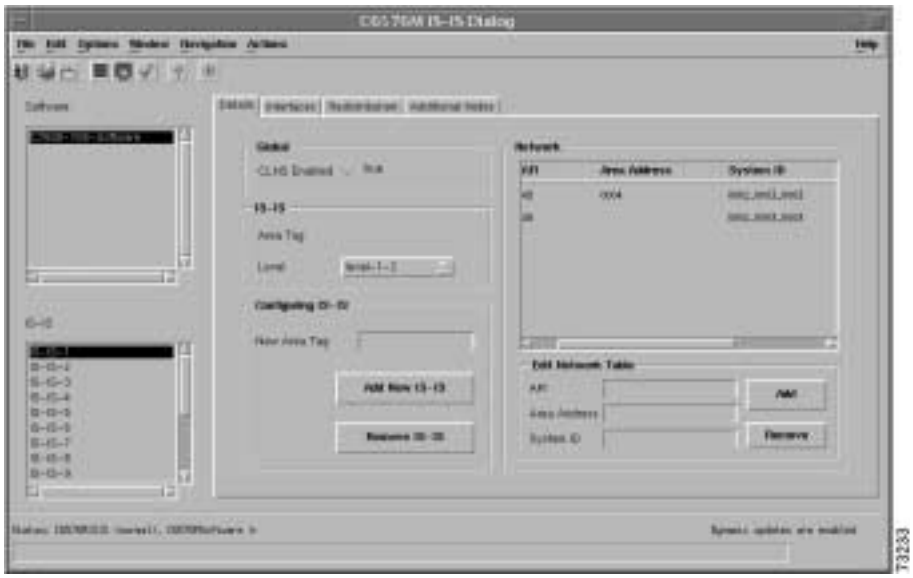
C6576M IS-IS Dialog Box

The C6576M IS-IS dialog box provides information on the OSI Intermediate System to Intermediate System (IS-IS) routing process on a Catalyst 6000/6500 series switch or Cisco 7600 series Internet Router. This dialog box is launched from the Software object or IS-IS objects in the Physical view.

Details Tab

Figure 6-79 shows the Details tab of the C6576M IS-IS dialog box.

Figure 6-79 Details Tab of C6576M IS-IS Dialog Box



Global Area

The Global area of the C6576M IS-IS dialog box provides the following information:

- CLNS Enabled—Indicates whether or not CLNS routing is enabled on the device. CLNS routing must be enabled for the IS-IS routing process to function. If CLNS routing is disabled, some attributes of the IS-IS object may not be accessible.

IS-IS Area

The IS-IS area of the C6576M IS-IS dialog box provides the following information:

- Area Tag—IS-IS routing process area tag. Mandatory if configuring multiarea IS-IS; otherwise, it is optional. If no tag is specified, the default null tag is assumed.
- Level—Describes whether the routing process performs Layer 1, Layer 1 and Layer 2, or Layer 2 only routing. By default, the first IS-IS routing process created on a device is set to perform Layer 1 and Layer 2 routing; any other processes created will by default be configured to perform Layer 1 routing only.

Note There may be, at most, one process on the device performing Layer 2 routing; this process can also perform Layer 1 routing. There may be up to 29 additional routing processes performing Layer 1 only routing.

Configuring IS-IS Area

The Configuring IS-IS area allows you to create an IS-IS routing process on the managed device and deploy an instance of the IS-IS object in the element manager.

- New Area Tag—IS-IS routing process area tag. Mandatory if configuring multiarea IS-IS; otherwise, it is optional. If no tag is specified, the default null tag is assumed.

- Add New IS-IS button—Creates an IS-IS routing process on the managed device.
- Remove IS-IS button—Deletes the currently selected IS-IS object.

Network Area

The Network area of the C6576M IS-IS dialog box provides the following information:

- Network Table—Describes the Network Entity Titles for an IS-IS routing process. The NETs define the area addresses for the IS-IS area and the system ID of the router. There must be at least one entry in this table in order for the IS-IS routing process to be functional. This table displays the following columns:
  - AFI—Authority and Format Identifier (AFI). This is the first byte in the IS-IS NSAP Area Identifier.
  - Area Address—Area Address of the NET. Identifies the IS-IS routing area that the routing process participates in.
  - System-ID—System ID of the NET. Unique identifier of the device in the routing area.
  - N-Selector—n-selector portion of the NET. Occupies the last byte of NET. Value is always 00.

Edit Network Table Subarea

This subarea allows you to modify the Network Table. The Add and Remove buttons adds a NET address and removes a NET address from the IS-IS routing process, respectively. The following parameters must be specified.

- AFI
- Area Address
- System ID

Status Field

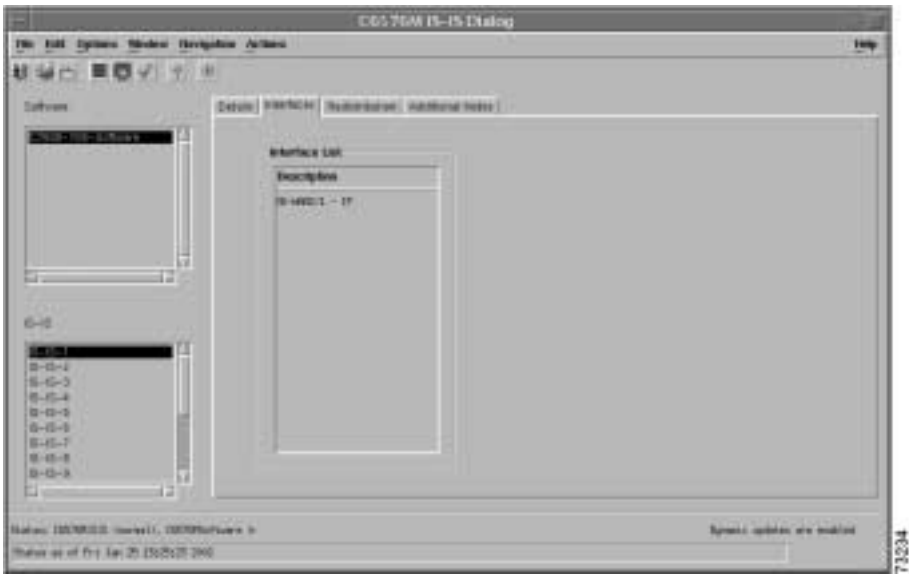
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Interfaces Tab

Figure 6-80 shows the Interfaces tab of the C6576M IS-IS dialog box.

Figure 6-80 Interfaces Tab of C6576M IS-IS Dialog Box



Interface List Area

The Interface List area of the C6576M IS-IS dialog box lists the interfaces supported by a given IS-IS routing process. This table will be empty if CLNS routing is not enabled on the managed device. The table contains one column:

- Description—Identifies the supported interface. The interface may be an Ethernet, FastEthernet, or GigabitEthernet. The interface may also be an Ethernet portchannel group or virtual LAN.

Redistribution Tab

Figure 6-81 shows the Interfaces tab of the C6576M IS-IS dialog box.

Figure 6-81 Redistribution Tab of C6576M IS-IS Dialog Box

Redistribution Table Area

The Redistribution Table area of the C6576M IS-IS dialog box describes the route redistribution configuration of an IS-IS routing process.

- Protocol—Source routing protocol from which routes are learned and redistributed into the IS-IS area.
- Source ID—This identifies the routing process.
  - BGP—An autonomous system number, which is a 16-bit decimal number.
  - EIGRP—Same as BGP.
  - OSPF—An appropriate OSPF process ID from which routes are to be redistributed. This value takes the form of a non-zero decimal number.
- Metric—IS-IS metric used for the redistributed route.

Edit Redistribution Table Area

The Edit Redistribution Table area of the C6576M IS-IS dialog box allows you to enable or disable route redistribution from another IP routing process into the IS-IS area. The following parameters must be given:

- Protocol
- Source ID
- Metric

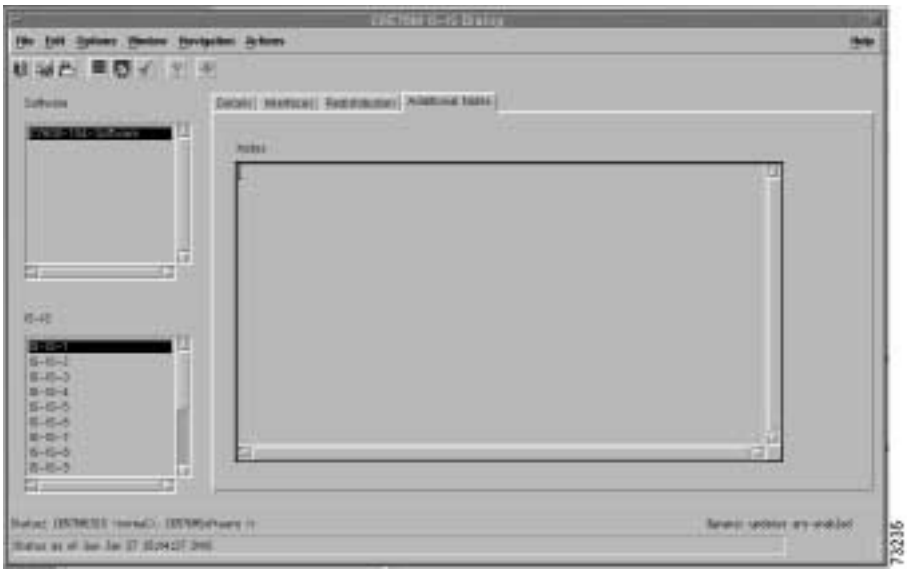
The Add and Remove buttons enable and disable route redistribution from another IP routing process into the IS-IS area, respectively.

Note Explicit route redistribution from another IS-IS process is not allowed, however, routes may be learned from a BGP, EIGRP, or OSPF routing process.

Additional Notes Tab

Figure 6-82 shows the Additional Notes tab of the C6576M IS-IS dialog box.

Figure 6-82 Additional Notes Tab of the C6576M IS-IS Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object

C6576M NDE Configuration Dialog Box

The C6576M NDE Configuration dialog box provides information on the Netflow Data Export (NDE) configuration on a Catalyst 6000 family switch or a Cisco 7600 series Internet Router. There is only one instance of this class per managed device.

NDE makes traffic statistics available for analysis by an external data collector. You can use NDE to monitor all Layer 3 switched and all routed IP unicast traffic.

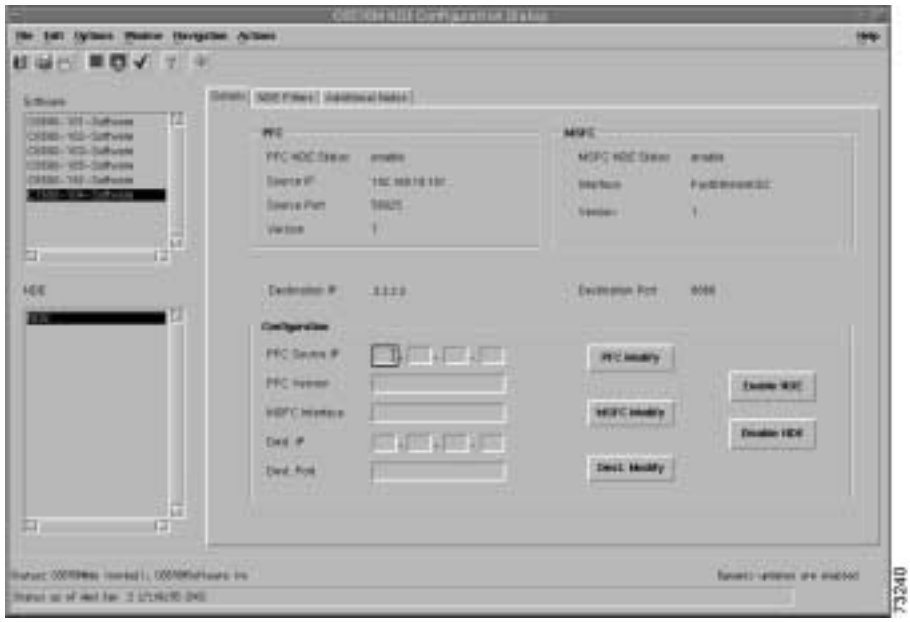
This dialog box is launched from the Software object or the NDE object in the physical view.

Details Tab

Figure 6-83 shows the Details tab of the C6576M NDE dialog box. The following attributes are shown in this tab:

- Destination IP—IP address of destination Netflow Collector where NDE packets are sent to.
- Destination Port—UDP port number of destination Netflow Collector where NDE packets are delivered to.

Figure 6-83 Details Tab of C6576M NDE Dialog Box



PFC Area

The PFC area of the C6576M NDE dialog box provides the following information:

- PFC NDE Status—Indicates whether or not NDE is enabled for the export of statistics on Layer 3-switched traffic collected in the PFC cache.
- Version—NDE version supported by the PFC for collected traffic statistics. NDE uses NDE version 7 to export the statistics captured on the PFC for Layer 3-switched traffic.
- Source IP—Source IP address in the NDE packets delivered by the PFC to the Netflow Collector. These packets deliver statistics on the Layer 3-switched traffic.
- Source Port—Egress port on the router used to export Layer 3-switched traffic statistics from the PFC cache.
- Dest. IP—IP address of destination Netflow Collector where NDE packets on switched traffic flows from the PFC are sent to.
- Dest. Port—UDP port number of destination Netflow Collector where NDE packets on switched traffic flows from the PFC are delivered to.

MSFC Area

The MSFC area of the C6576M NDE dialog box provides the following information:

- MSFC NDE Status—Indicates whether or not NDE is enabled for the export of statistics on routed traffic flows from the MSFC cache.
- Version—NDE version used for collection of routed traffic flow statistics on the MSFC. NDE can use NDE version 1, 5, or 6 to export the statistics captured on the MSFC for routed traffic.
- Interface—Interface used as the source of the NDE packets containing statistics from the MSFC. These statistics describe the routed flows. The source interface must have an IP address. It may be a loopback interface.
- Dest. IP—IP address of destination Netflow Collector where NDE packets on routed traffic flows from the MSFC are sent to.
- Dest. Port—UDP port number of destination Netflow Collector where NDE packets on routed traffic flows from the MSFC are delivered to.

Configuration Area

The Configuration area of the C6576M NDE dialog box allows you to modify the following attributes:

- PFC Source IP—The NDE source IP address must be an unused address from the subnet of a router interface, and cannot be an address currently used by the interface. You cannot use an address from a subnet on a loopback interface.
- PFC Version—NDE version supported by the PFC for collected traffic statistics.
- MSFC Interface—Interface used as the source of the NDE packets containing statistics from the MSFC.
- Dest. IP—IP address of destination Netflow Collector where NDE packets are sent to.
- Dest. Port—UDP port number of destination Netflow Collector where NDE packets are delivered to.

The configuration attributes are modified by clicking the following buttons:

- PFC Modify button—Modifies the source address used in the NDE packets containing statistics from the PFC.
- MSFC Modify button—Modifies the source interface for NDE packets containing statistics on routed flows exported from the MSFC cache.
- Dest. Modify button—Modifies the NDE destination host IP address and UDP port.
- Enable NDE button—Enables the export of traffic statistics on Layer 3-switched and routed flows that have expired or been purged from the MSFC and PFC caches.

Note To enable NDE, several parameters must be configured: the source interface for NDE packets containing statistics on routed flows exported from the MSFC cache; the desination address and port of the Netflow Collector; and an IP route cache on the MSFC source interface.

- Disable NDE button—Disables NDE flow export on Layer 3-switched and routed flows.

Status Field

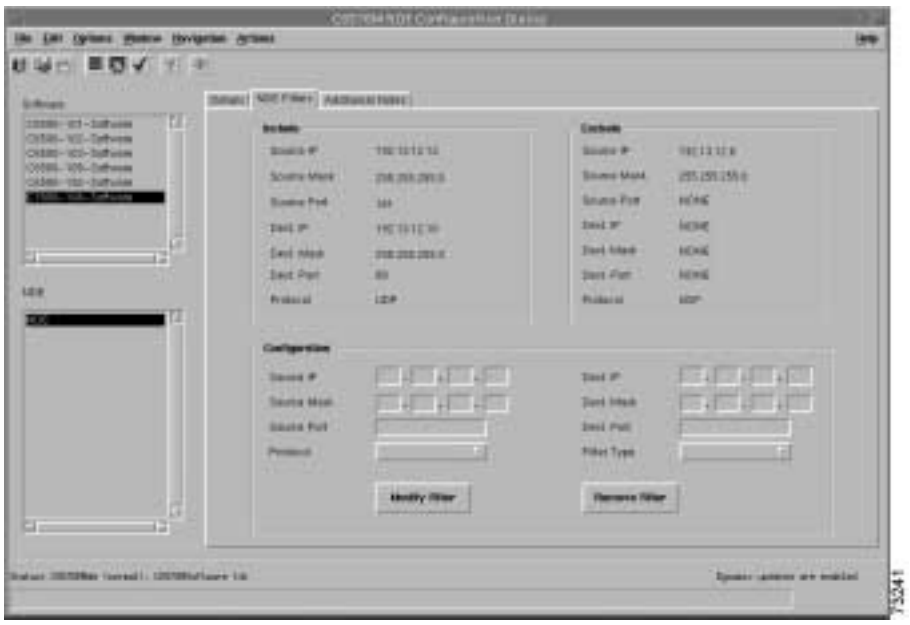
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

NDE Filters Tab

Figure 6-84 shows the NDE Filters tab of the C6576M NDE Configuration dialog box.

Figure 6-84 NDE Filters Tab of C6576M NDE Configuration Dialog Box



Include Area

This area allows you to specify include parameters for the NDE flow filters. This area consists of the following parameters:

- Source IP—Include flow filter source host IP address.
- Source Mask—Include flow filter source IP wildcard mask.
- Source Port—Include flow filter source port.
- Dest. IP—Include flow filter destination host IP address.
- Dest. Mask—Include flow filter destination IP wildcard mask.
- Dest. Port—Include flow filter destination port.
- Protocol—Include flow filter protocol.

Exclude Area

This area allows you to specify exclude parameters for the NDE flow filters. This area consists of the following parameters:

- Source IP—Exclude flow filter source host IP address.
- Source Mask—Exclude flow filter source IP wildcard mask.
- Source Port—Exclude flow filter source port.
- Dest. IP—Exclude flow filter destination host IP address.
- Dest. Mask—Exclude flow filter destination IP wildcard mask.
- Dest. Port—Exclude flow filter destination port.
- Protocol—Exclude flow filter protocol.

Configuration Area

This area allows you to modify all the parameters for the NDE flow filter, or to remove the filter.

- Source IP
- Source Mask
- Source Port
- Dest. IP
- Dest. Mask
- Dest. Port
- Filter Type—Choose from the drop-down menu:
  - include
  - exclude
- Protocol—Choose the flow filter protocol:
  - none
  - tcp
  - udp

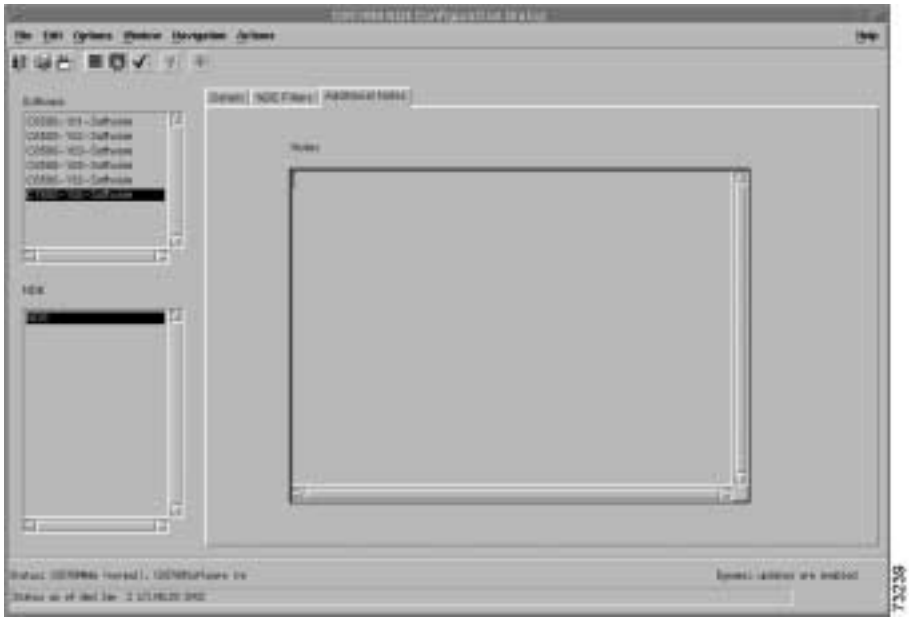
The following buttons implement the configuation changes:

- Modify Filter—Applies the NDE configuration changes.
- Remove Filter—Removes a configured NDE Include or Exclude Flow Mask filter.

Additional Notes Tab

Figure 6-85 shows the Additional Notes tab of the C6576M NDE Configuration dialog box.

Figure 6-85 Additional Notes Tab of the C6576M NDE Configuration Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object

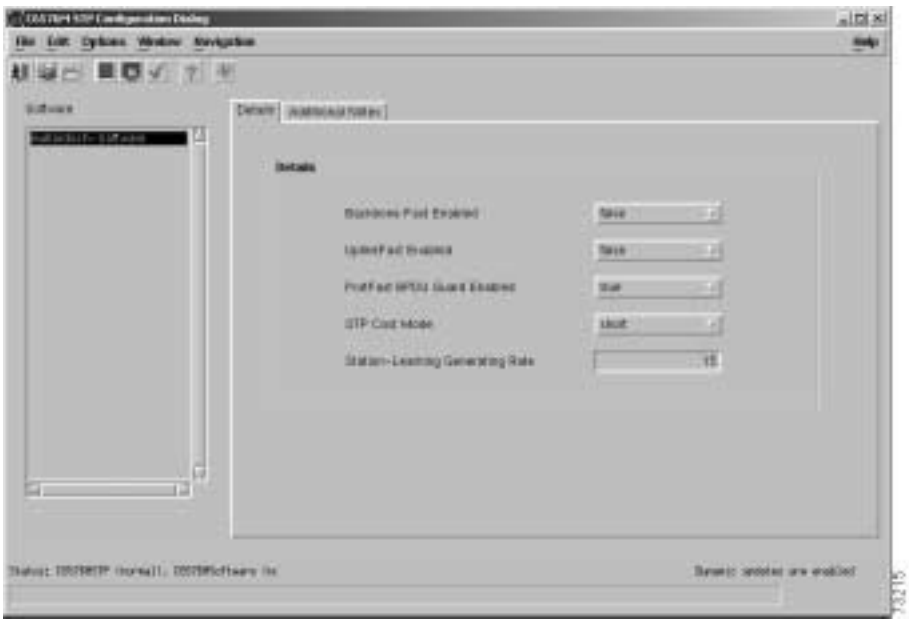
C6576M STP Dialog Box

The C6576M STP dialog box provides information on the global Spanning Tree Protocol configuration on a managed Catalyst 6000 family switch or Cisco 7600 series Internet Router. This dialog box is launched from the Software object or STP object in the Physical view.

Details Tab

Figure 6-86 shows the Details tab of the C6576M STP dialog box.

Figure 6-86 Details Tab of C6576M STP Dialog Box



Details Area

The Details area of the C6576M STP dialog box provides the following information:

- BackboneFast Enabled—Indicates whether or not the BackboneFast capability is enabled on the device. Applies to all STP instances running on the device.
- UplinkFast Enabled—Indicates whether or not the UplinkFast capability is enabled on the device. Applies to all STP instances running on the device.
- PortFast BPDU Guard Enabled—Indicates whether or not the PortFast BPDU guard is enabled on the device. Applies to all STP instances running on the device.
- STP Cost Mode—Indicates the type of spanning tree path cost mode configured on the device. Applies to all STP instances running on the device. When the value is changed, the path cost of all ports will be reassigned to the default path cost values based on the new spanning tree path cost mode and ports' speed. This attribute may have the following values:
  - short
  - long

- Station-Learning Generating Rate—The maximum number of station-learning frames that the device will generate in each 100-milisecond period after an UplinkFast transition. Applies to all STP instances running on the device.
- EtherChannel Misconfig. Guard Enabled—when enabled the device will report an error if it detects a routing loop due to the misconfiguration of an EtherChannel.

Status Field

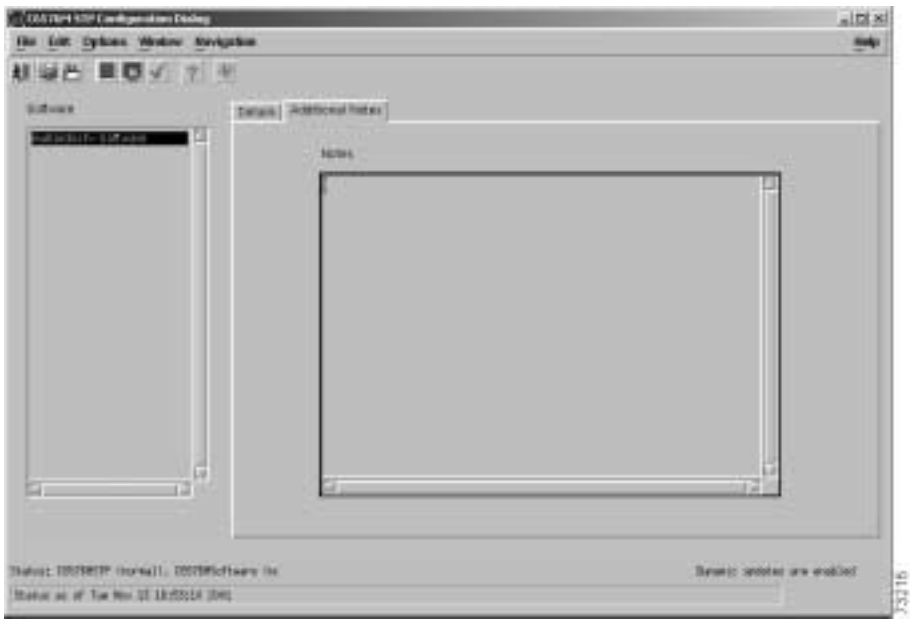
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Additional Notes Tab

Figure 6-87 shows the Additional Notes tab of the C6576M STP dialog box.

Figure 6-87 Additional Notes Tab of the C6576M STP Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

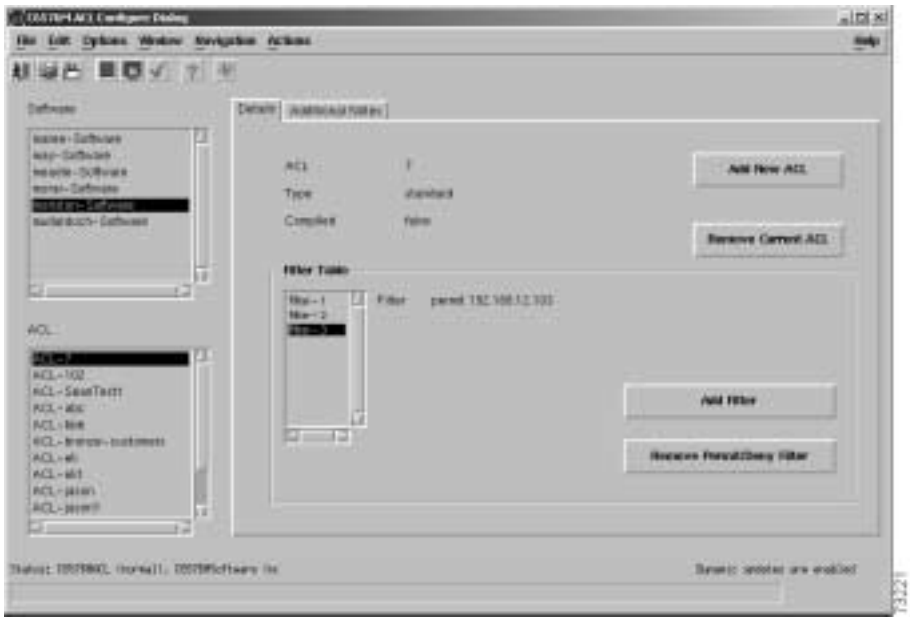
C6576M ACL Configuration Dialog Box

The C6576M ACL dialog box describes a numbered or named access control list (ACL) on a Catalyst 6000/6500 series switch or Cisco 7600 series Internet Router. The C65/76M Controller supports standard and extended, named or numbered ACLs.

Details Tab

Figure 6-88 shows the Details tab of the C6576M ACL dialog box.

Figure 6-88 Details Tab of C6576M ACL Dialog Box



The Details tab of the C6576M ACL dialog box displays the following:

- ACL—Numeric or string identifier of an ACL. This attribute, along with Type attribute below, makes up the unique identifier of the ACL on the managed device.
- Type—Indicates the type of ACL: standard or extended.
- Remove Current ACL button—Deletes the currently selected ACL object and remove the referenced ACL from the managed device. The filters defined in the ACL will automatically be disabled against the incoming/outgoing routing updates of any routing process that references the ACL in its route distribution list.
- Add New ACL button—Displays the subdialog box, shown in Figure 6-89, which allows you to create a named or numbered, standard or extended Access Control List on the managed device and deploy an instance of the ACL object in the element manager.

  The ACL instance will be deployed with the object name “ACL-<id>”. The following fields are displayed in the ACL Add subdialog box:

  - ACL—Numeric or string identifier of an ACL.
  - Type—Indicates the type of ACL: standard or extended.

- Remark—Mandatory comment that describes the access list entry, up to 100 characters long.

Figure 6-89 ACL Add Dialog Box

Filter Table Area

The Filter Table area of the C6576M ACL dialog box describes permit/deny filters or remark entries of an ACL. The order of entries in the list is relevant; filters are applied in the order they appear in the list.

Note Removing the last entry from a numbered ACL deletes the ACL on the managed device.

The list of filters is shown in the text box. Selecting one of the entries in the text box displays a description of the filter to the right of the box.

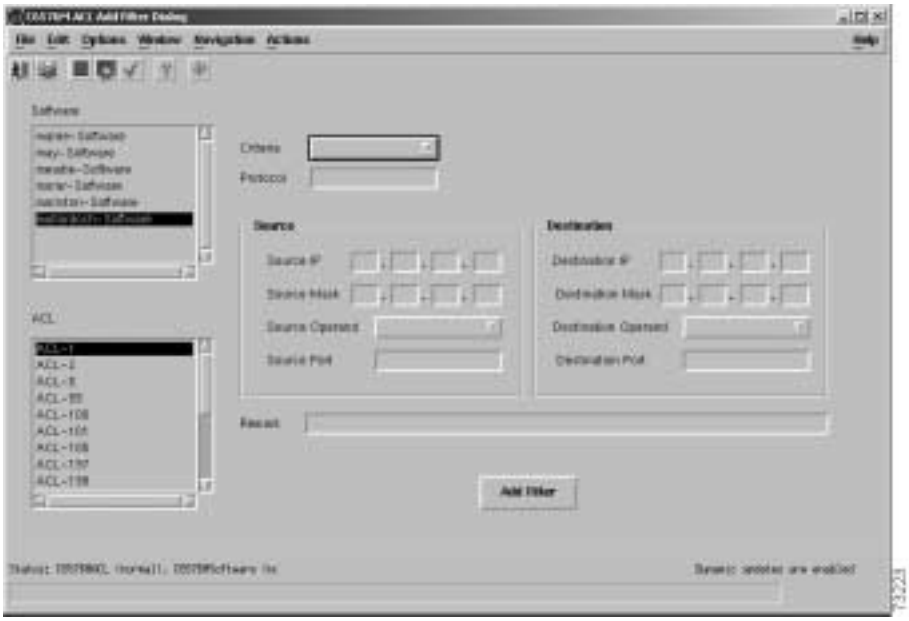
- A permit entry defines a filter for permitting a traffic flow. Filter entries are structured according to the syntax defined for standard or extended ACLs.
- A deny entry defines a filter for blocking a traffic flow.
- A remark entry is a free-form text entry up to 100 characters. It is generally a comment describing the ACLs entries which follow it sequentially in the ACL.

Filters can be configured using the following buttons:

- Remove Permit/Deny Filter—Removes an entry from a named or numbered, standard or extended ACL. The entry may be a permit or deny filter. Entries may be removed from the ACL in any order.

- Add Filter button—Launches the Add Filter subdialog box, shown in Figure 6-90, to append a permit or deny filter to an ACL. On a standard ACL, a filter may only be defined against traffic flows originating from a source host or range of hosts. On an extended ACL, filters may be defined against specific traffic types, against the source or destination of a traffic flow, and against specific source or destination TCP or UDP ports.

Figure 6-90 Add Filter Dialog Box



The following fields are displayed in this Add Filter subdialog box:

- Criteria—filter type:
  - permit—Filter allows packets in a traffic flow if the filter conditions are met.
  - deny—Filter blocks packets in a traffic flow if the filter conditions are met.
- Protocol—Name or number of an IP protocol to apply an extended ACL filter to. To match any Internet protocol (including ICMP, TCP, and UDP) use the keyword “ip”. This argument is not applicable when creating standard ACL filters, and mandatory for extended ACL filters.
- Source IP—Number of the network or host from which the packet is being sent.
- Source Mask—Bitmask used in combination with Source IP to specify a host address or a range of addresses to apply filter. Place ones in the bit positions you want to ignore.
- Source Operand—Comparison operator for source TCP or UDP ports. The range operator requires two source ports, all others require a single port. This is an optional argument that is only applicable when creating extended ACL filters against TCP or UDP traffic. The following values are available:
  - none
  - lessThan
  - equal
  - greaterThan
  - notEqual
  - range

- Source Port—The decimal number or name of a source TCP or UDP port. TCP port names can only be used when filtering TCP. UDP port names can only be used when filtering UDP.
- Destination IP—Number of the network or host to which the packet is being sent.
- Destination Mask—Bitmask used in combination with Destination IP to specify a host address or a range of addresses to apply filter.
- Destination Operand—Comparison operator for destination TCP or UDP ports.
- Destination Port—The decimal number or name of a destination TCP or UDP port.
- Remark—Comment that describes the access list entry, up to 100 characters long.
- Add Filter button—Appends a permit or deny filter to an ACL.

Status Field

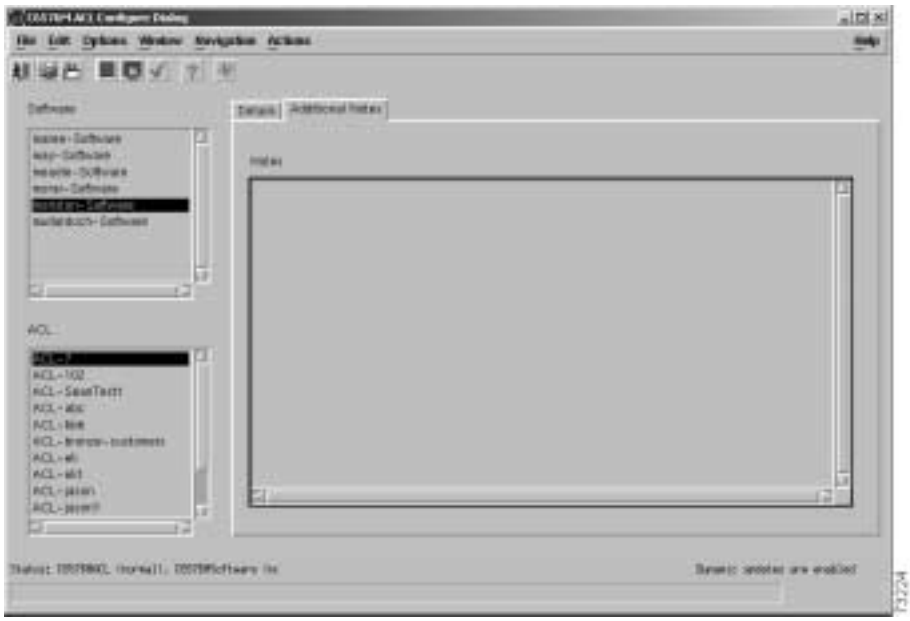
The Status display-only field located at the bottom of the window indicates the current state of the object. This field has the following values:

- decommissioned—CEMF is not actively monitoring the object attributes.
- normal—Presence polling of the object.
- normallostcomms—CEMF has lost communication with the device from the normal state.

Additional Notes Tab

Figure 6-91 shows the Additional Notes tab of the C6576M ACL dialog box.

Figure 6-91 Additional Notes Tab of the C6576M ACL Configure Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object

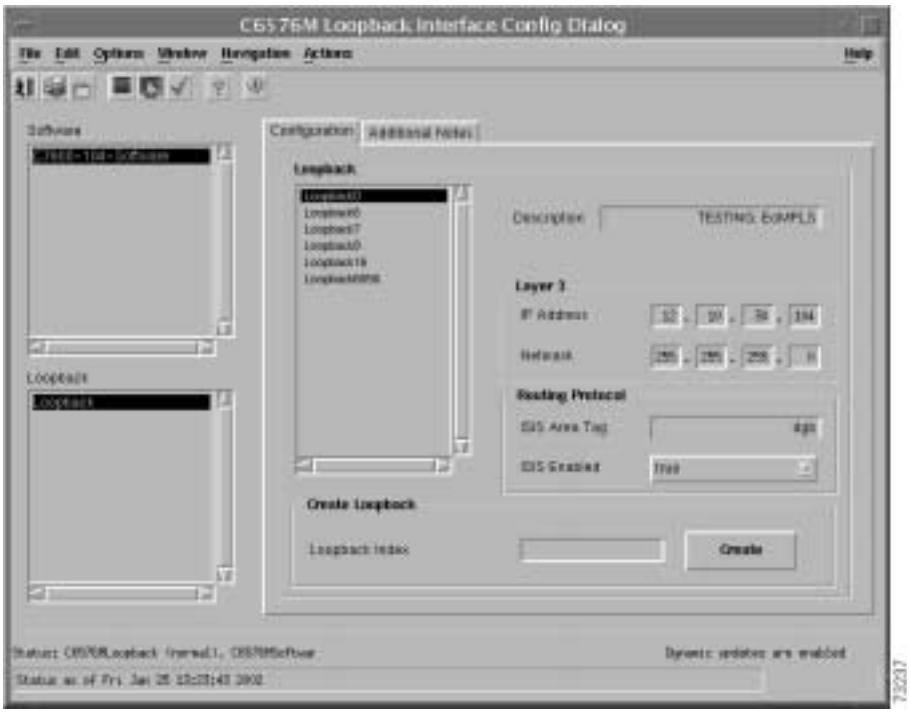
C6576M Loopback Dialog Box

The C6576M Loopback dialog box describes the deployment of all loopback interfaces on a Catalyst 6000/6500 series or Cisco 7600 series Internet Router. This dialog box is launched from the Software object or Loopback object in the Physical view.

Configuration Tab

Figure 6-92 shows the Configuration tab of the C6576M Loopback dialog box.

Figure 6-92 Configuration Tab of C6576M Loopback Dialog Box



Loopback Area

The Loopback area of the C6576M Loopback dialog box provides the following information:

- Loopback Interface Table—Lists the loopback interfaces that have been deployed on the device. The following attribute is displayed in this table:
  - Index—Free index. Unique identifier of a Loopback interface in the device.
- Description—Description of the interface corresponding to the index selected in the Loopback Interface Table.

Layer 3 Subarea

- IP Address—IP address of the interface. A value of 0.0.0.0 indicates that no IP address has been configured on the interface.
- Netmask—IP subnet mask of the interface. The value of the mask is an IP address with all the network bits set to 1 and all the host bits set to 0.

Routing Protocol Subarea

- ISIS Area Tag—Identifies the IS-IS routing area that the Loopback participates in. If mutli-area IS-IS is configured on the device, the IS-IS area must be named. Otherwise, this value may be an implicit null tag. This attribute is only valid if the IS-IS Enabled attribute is true (1).
- ISIS Enabled—Indicates whether or not IS-IS routing is enabled on the interface. IS-IS routing can only be enabled if the loopback interface has been assigned an IP address.

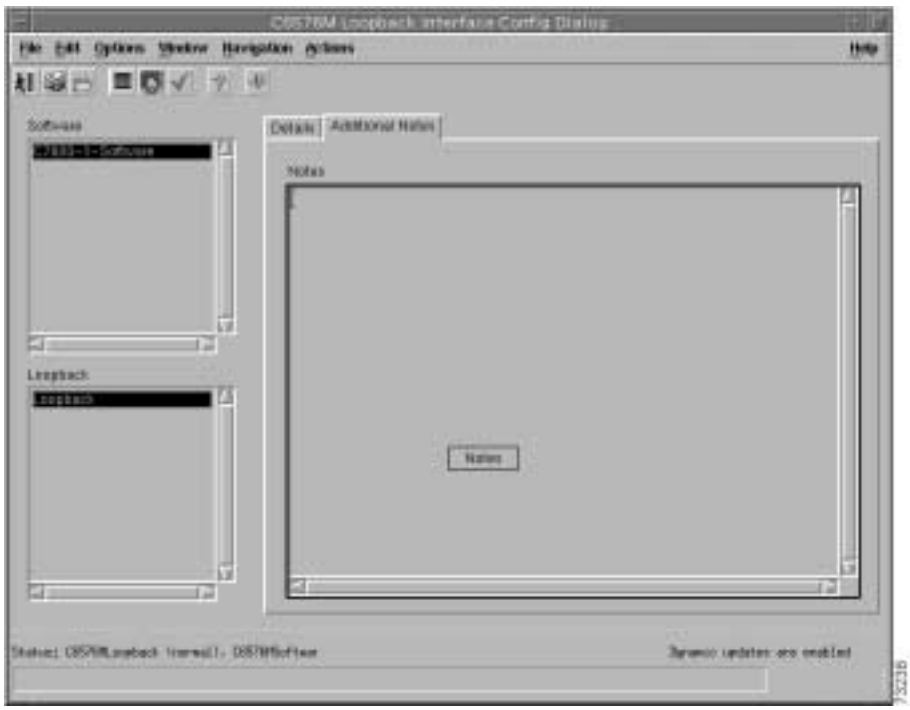
Create Loopback Subarea

- Loopback Index—Unique identifier of a new loopback interface to be deployed on the device.
- Create button—Deploys on the managed device a loopback interface identified by the Loopback Index field. The newly added loopback interface will be displayed in the Loopback Interface Table.

Additional Notes Tab

Figure 6-93 shows the Additional Notes tab of the C6576M Loopback dialog box.

Figure 6-93 Additional Notes Tab of the C6576M Loopback Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

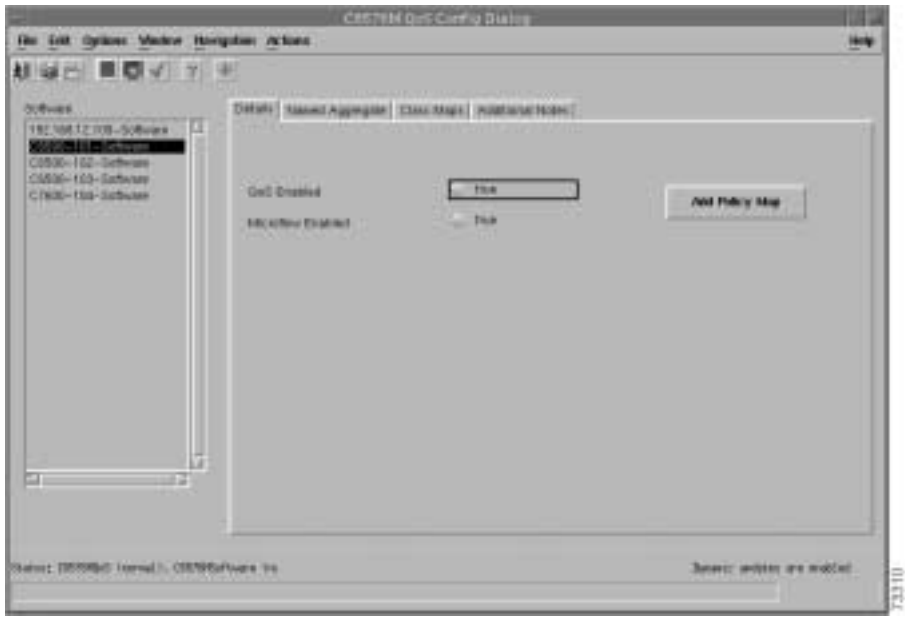
C6576M QoS Dialog Box

The C6576M QoS dialog box describes the global quality of service (QoS) engine process on a Catalyst 6000/6500 series or Cisco 7600 series Internet Router. This dialog box is launched from the Software object or QoS objects in the Physical view.

Details Tab

Figure 6-94 shows the Details tab of the C6576M QoS dialog box.

Figure 6-94 Details Tab of C6576M QoS Dialog Box



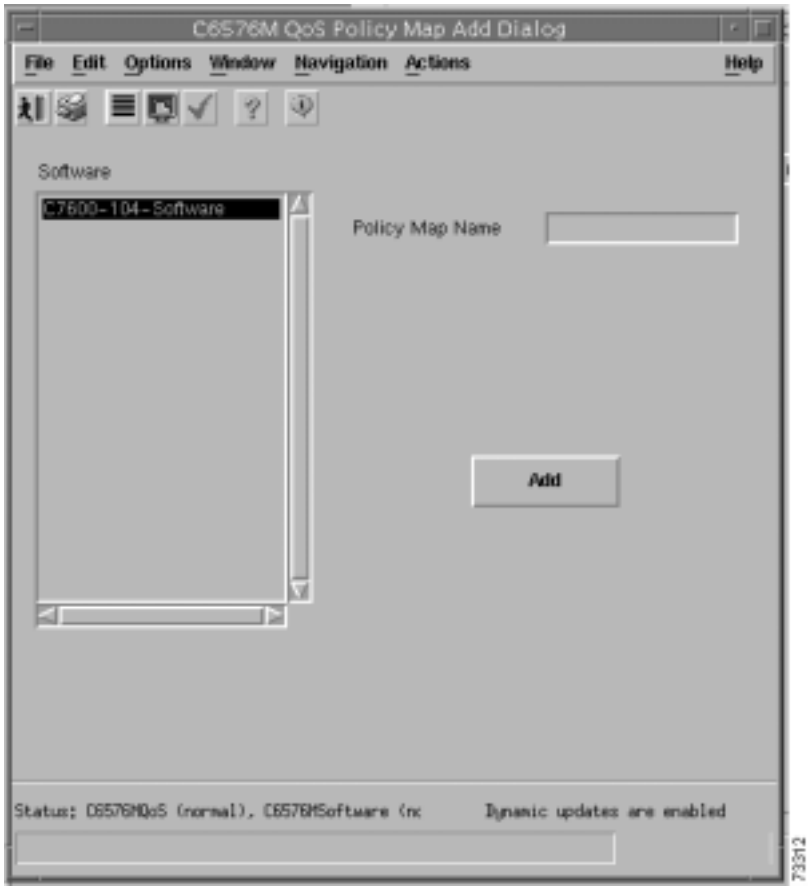
Details Area

The Details area of the C6576M QoS dialog box provides the following information:

- QoS Enabled—Indicates whether or not QoS is enabled on the device. By default, enabling QoS globally also enables QoS on each physical and logical IP interface unless explicitly disabled on the individual interfaces. These are the possible values for this attribute:
  - true—QoS is enabled.
  - false—QoS is not enabled.

- Microflow Enabled—Indicates whether or not Microflow policing is enabled on the device. This enables QoS policing against Layer 3 switched traffic flows. This feature can only be enabled when QoS is enabled. By default, it will be automatically enabled if global QoS is enabled. These are the possible values for this attribute:
  - true—Microflow is enabled.
  - false—Microflow is not enabled.
- Add Policy Map button Launches a subdialog box, shown in Figure 6-95, to create a policy map on the managed device. A policy map defines trust states and policers to enforce QoS parameters against traffic selected by defined class map criteria. The following attribute is shown in this subdialog box:
  - Policy Name—Unique identifier of the new policy map to be deployed on the device.
  - Add Policy button—Creates a policy map on the managed device.

Figure 6-95 Add Policy Map Subdialog Box of the C6576M QoS Dialog Box



Named Aggregate Tab

Figure 6-96 shows the Named Aggregate tab of the C6576M QoS dialog box.

Figure 6-96 Named Aggregate Tab of C6576M QoS Dialog Box

Named Aggregate Area

The Named Aggregate area of the C6576M QoS dialog box describes the named aggregate policers defined globally on the device. This tab (not supported in Hybrid OS) contains the following information attributes:

- Named Policers table—Lists by aggregate name the named aggregate policers defined globally on the device. This table displays the following:
  - Aggregate Name—Unique identifier of a named aggregate policer on the managed device.
- Rate—Maximum transmission rate (in bits per second) to enforce against policed traffic.
- Burst—Normal burst size in bytes to enforce against policed traffic.
- Max. Burst—Maximum burst size in bytes to enforce against policed traffic. A value of 0 indicates that a maximum burst size has not been specified.

Note The Max. Burst feature is not supported in 12.1(8a)E and earlier.

Conform Action Area

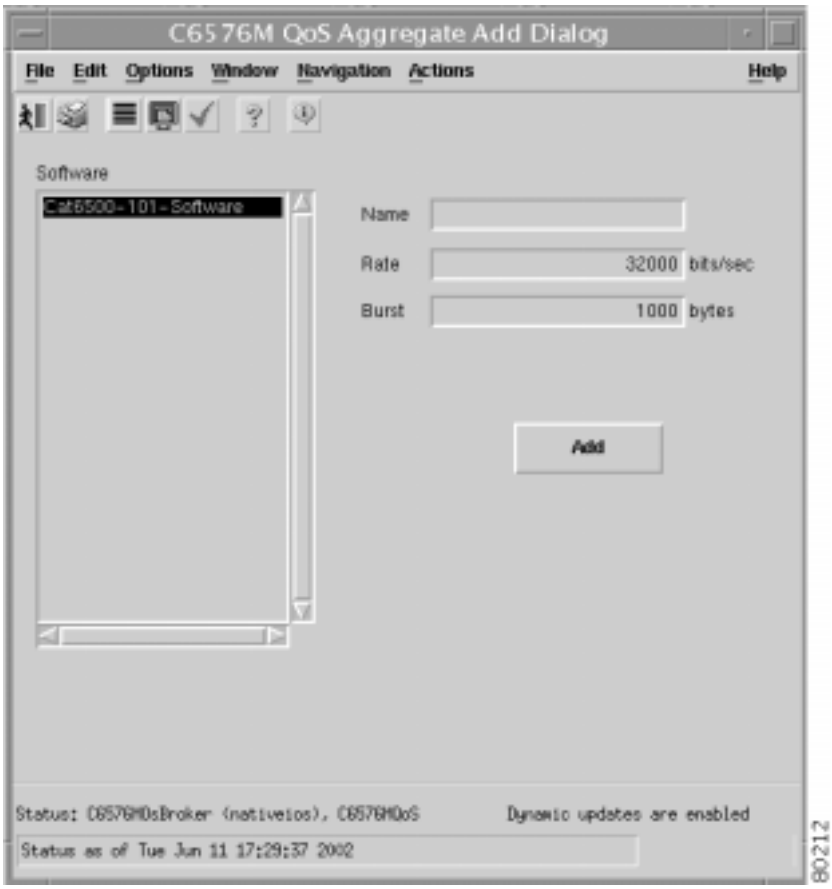
The Conform Action area of the C6576M QoS dialog box describes the named aggregate policers defined globally on the device. This tab contains the following information:

- Conform Action—Action to be taken when traffic conforms to QoS parameters. This attribute has one of the following values:
  - Drop—Drops packet
  - Transmit—Transmits packet
  - Set DSCP—Assigns DSCP value to packet before it is transmitted.
  - Set Precedence—Assigns IP Precedence value to packet before it is transmitted.
  - A value of none (0) indicates no conform action has been specified.
- Set DSCP—Integer DSCP value assigned to packets of conforming ingress traffic before transmitting on egress interfaces. This value is only relevant and will only be set in the running configuration of the device if the Conform Action attribute is Set DSCP.
- Set IP Precedence—IP Precedence integer value assigned to packets of conforming ingress traffic before transmitting on egress interfaces. This value is only relevant and will only be set in the running configuration of the device if Conform Action is Set Precedence.
- Exceed Action—Action to be taken when traffic exceeds QoS parameters. This atttribute has one of the following values:
  - Drop—Drops packet.
  - Policed DSCP Transmit—Changes the DSCP as per the policed DSCP map before transmitting.
  - Transmit—Transmits packet.
  - A value of none (0) indicates an exceed action has not been specified.
- Violate Action—Action to be taken when traffic violates QoS parameters. This atttribute has one of the following values:
  - Drop—Drops packet.
  - Policed DSCP Transmit—Changes the DSCP as per the policed DSCP map before transmitting.
  - Transmit—Transmits packet.
  - A value of none (0) indicates that a violate action has not been specified.

Note The Violate Action feature is not supported in IOS 12.1(6)E and earlier. A PFC2 card is also required.

- New Policer button—Launches a subdialog box, shown in Figure 6-97, to create an aggregrate policer on the managed device with the specified rate, burst, and max-burst values.

Figure 6-97 QoS Aggregate Add Subdialog Box of the C6576M QoS Dialog Box

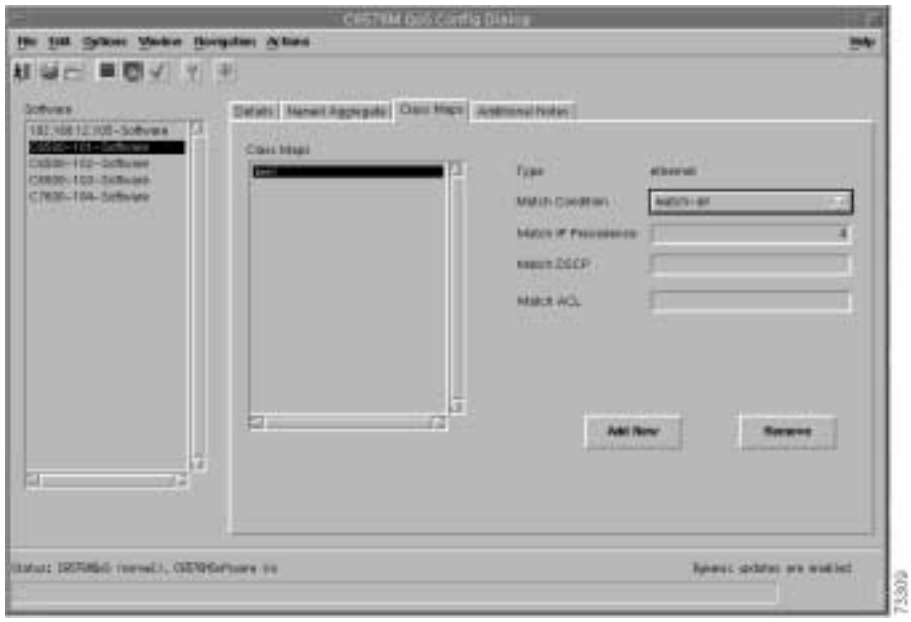


- Remove button—Deletes one or more aggregrate policers on the managed device selected in the Named Policers Table.

Class Maps Tab

Figure 6-98 shows the Class Maps tab of the C6576M QoS dialog box.

Figure 6-98 Class Maps Tab of C6576M QoS Dialog Box



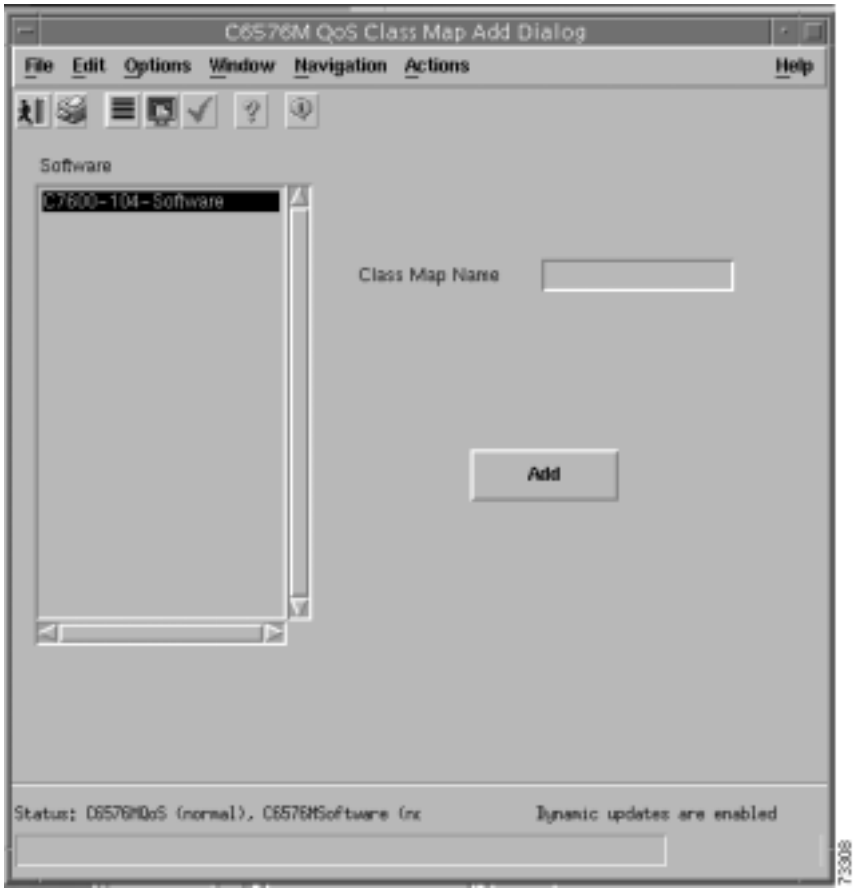
Class Maps Area

The Class Maps area of the C6576M QoS dialog box describes globally defined class maps on the device. Class maps identify a selected stream of IP traffic based on a defined set of matching criteria. This tab contains the following information:

- Class Maps Table—Lists globally defined class maps on the device.
  - Class Map Name—Unique identifier of a class map on the managed device.
- Type—Indicates whether the class map can be used on Ethernet interfaces or not. The C65/76M EMS will discover class maps that are not suitable for use with Ethernet interfaces, however you cannot add, remove, or configure these class maps. They are listed in the table only to indicate that the class map names are in use. This attribute has one of the following values:
  - ethernet—The class map can be used on Ethernet interfaces.
  - other—Indicates that a class map contains more than one match entry or it contains a match criteria that is unsupported on Ethernet interfaces.
  - empty—Indicates a class map with no match entries. An empty class map cannot be applied to an Ethernet interface, however you may modify it.
- Match Condition—Specifies whether to match all criteria in the class map or any criteria in the list.
- Match IP Precedence—Specifies IP Precedence values to match. Up to eight values may be specified. If no values are specified, IP Precedence matching criteria is disabled. This attribute may only have a value if the Type attribute is ethernet (1) and both Match DSCP and Match ACL attributes are nil.

- Match DSCP—Specifies DSCP values to match. Up to eight values may be specified. If no values are specified, DSCP matching criteria is disabled. This attribute may only have a value if the Type attribute is ethernet and both Match IP Precedence and Match ACL attributes are nil.
- Match ACL—Identifier of a named or numbered (standard or extended) ACL. In no identifier is specified, the ACL matching criteria is disabled. The named or numbered ACL must be configured on the device before this class map can be associated with an interface. The device will not detect an invalid class map until you associate the class map with an Ethernet interface. This attribute may only have a value if the Type attribute is ethernet and both Match IP Precedence and Match DSCP attributes are nil.
- Add New button—Launches a subdialog box, shown in Figure 6-99, to create a class map on the managed device. The subdialog box contains the following attribute:
  - Class Map Name—Unique identifier of the class map to be added on the device.
  - Add button—Creates the class map specified by the Class Map Name attribute.

Figure 6-99 Add Class Map Subdialog Box of the C6576M QoS Dialog Box

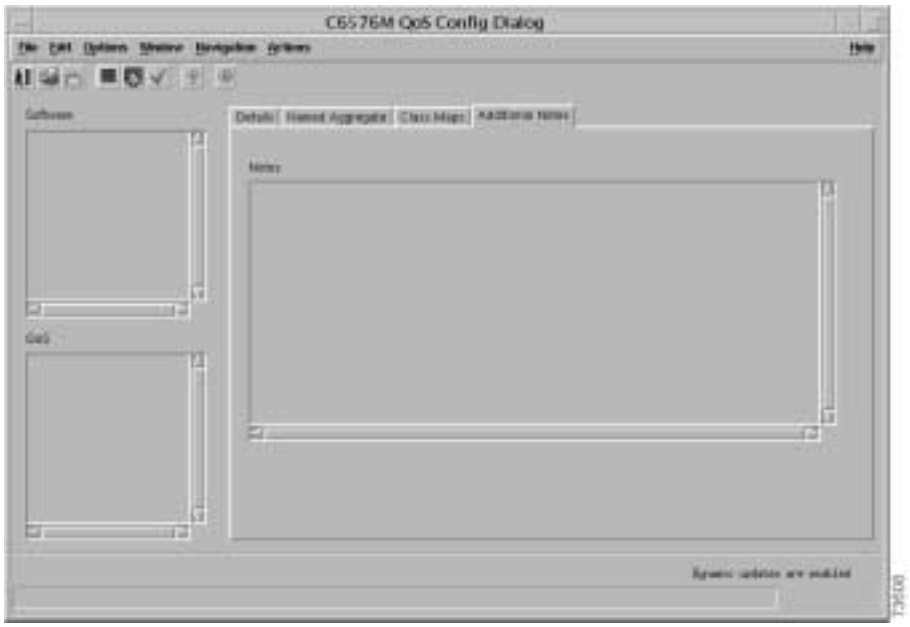


- Remove button—Deletes from the managed device one or more class maps selected in the Class Map Table. The C65/76M will only allow an Ethernet class map to be removed.

Additional Notes Tab

Figure 6-100 shows the Additional Notes tab of the C6576M QoS dialog box.

Figure 6-100 Additional Notes Tab of the C6576M QoS Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

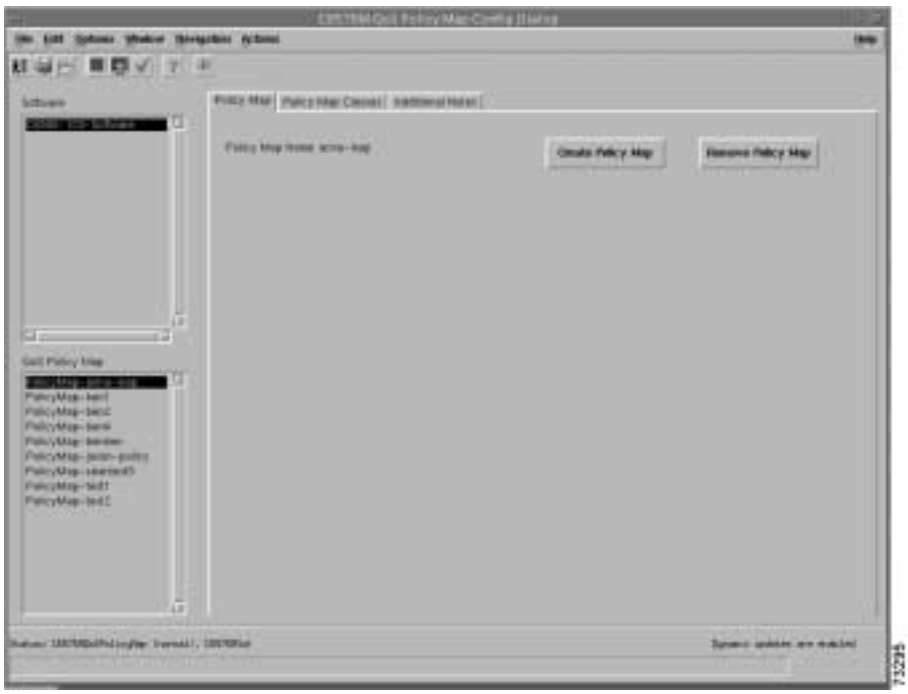
C6576M QoS Policy Map Dialog Box

The C6576M QoS Policy Map dialog box describes a quality of service (QoS) policy map on a Catalyst 6000/6500 series or Cisco 7600 series Internet Router. A policy map consists of one or more traffic filters defined by class maps. This dialog box is launched from the Software object or QoS Policy Map objects in the Physical view.

Policy Map Tab

Figure 6-101 shows the Policy Map tab of the C6576M QoS Policy Map dialog box.

Figure 6-101 Policy Map Tab of C6576M QoS Policy Map Dialog Box

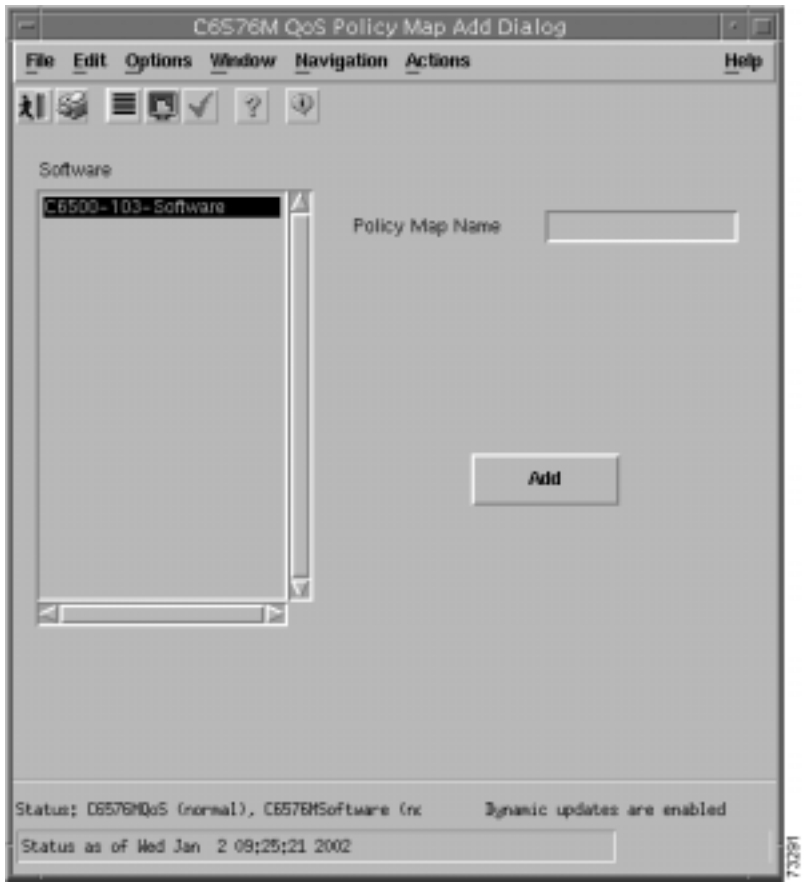


Policy Map Area

The Details area of the C6576M QoS Policy Map dialog box provides the following information:

- Policy Map Name—Unique identifier of the policy map on the device.
- Create Policy Map button—Launches the Policy Map Add subdialog box, shown in Figure 6-102, to create a policy map class entry in the referenced policy maps and defines at least one policer for the entry. The following is shown in this subdialog box:
  - Policy Map Name—Unique identifier of the policy map on the device.
  - Add button—Adds the Policy Map specified by Policy Map Name.
- Remove Policy Map button—Deletes from the managed device one or more policy maps selected in the object list of the QoS Policy Map dialog. A subdialog box is launched asking you to confirm the delete action.

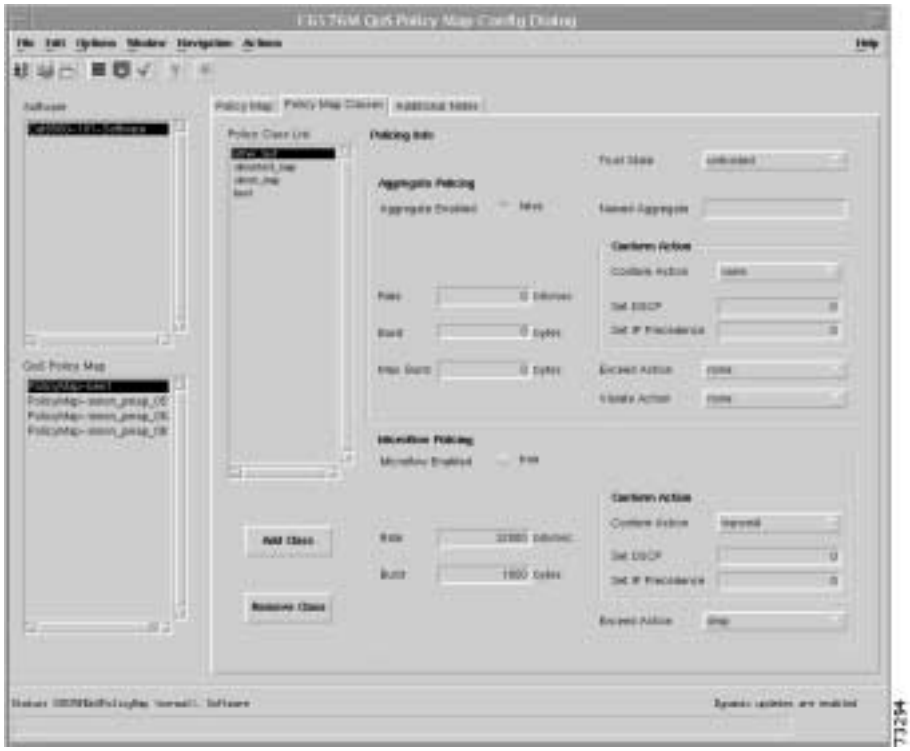
Figure 6-102 Policy Map Add Subdialog Box of C6576M QoS Policy Map Dialog Box



Policy Map Classes Tab

Figure 6-103 shows the Policy Map Classes tab of the C6576M QoS Policy Map dialog box.

Figure 6-103 Policy Map Classes Tab of C6576M QoS Policy Map Dialog Box

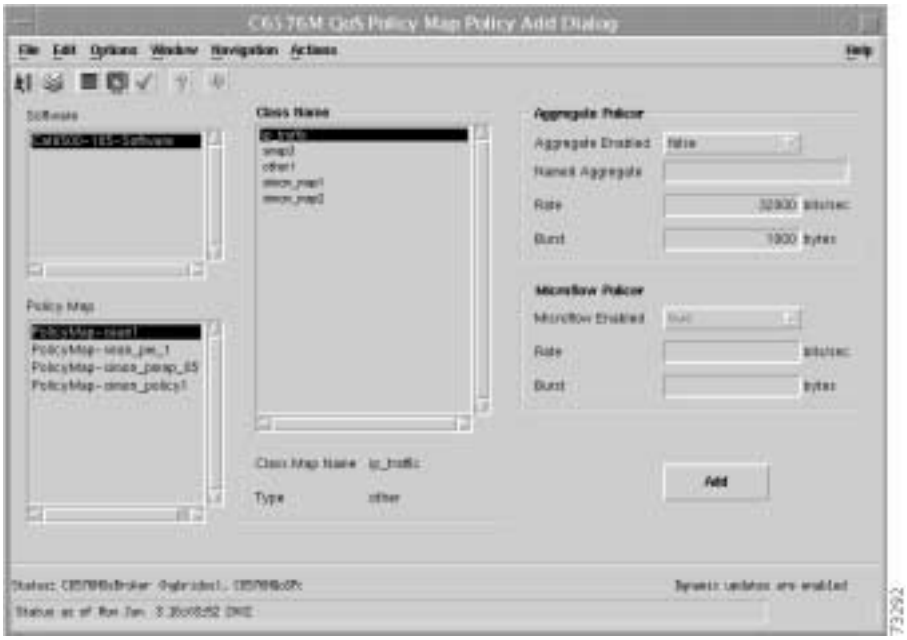


Policy Class List Area

The Policy Class List area of the C6576M QoS Policy Map dialog box provides the following information:

- Policy Class List Table—Describes the policy map class entries. The following attributes are displayed in this table:
  - Policy Class Map Name—Unique identifier of a class map on the device. The class map defines the criteria for filtering traffic that the policers will enforce QoS parameters against.
- Remove Class button—Removes one or more class map entries from a policy map. This also removes the trust state and policers associated with the class map entries.
- Add Class button—Launches the Policy Map Add subdialog box, shown in Figure 6-104, to create a policy map class entry in the referenced policy maps and defines at least one policer for the entry.

Figure 6-104 Policy Map Add Class Subdialog Box of C6576M QoS Policy Map Dialog Box



The following is shown in this subdialog box.

Class Name Area

- Class Name Table—Lists the classes by the Class Map Name.
- Class Map Name—Unique identifier of the policy map class on the device.
- Type—Indicates whether the selected class map can be used on Ethernet interfaces or not. The C65/76M EMS will discover class maps that are not suitable for use with Ethernet interfaces, however you cannot add, remove, or configure these class maps. They are listed in the table only to indicate that the class map names are in use. This attribute has one of the following values:
  - ethernet—The class map can be used on Ethernet interfaces.
  - other—Indicates that a class map contains more than one match entry or it contains a match criteria that is unsupported on Ethernet interfaces.
  - empty—Indicates a class map with no match entries. An empty class map cannot be applied to an Ethernet interface, however you may modify it.

Aggregate Policer

- Aggregate Enabled— Indicates whether or not an explicit policer is defined for the policy map class. This enables QoS policing against Layer-3 switched traffic flows.
- Named Aggregate—Unique string identifier of an aggregate policer on the device. This value is nil if an explicit aggregate policer is defined within this policy map class. This is supported in Native IOS only.
- Rate—Maximum transmission rate, in bits per second, to enforce against policed traffic. This value is mandatory when defining an explicit policer. A value of 0 is returned on read if an explicit policer is not defined for the policy map class.

- Burst—Normal burst size, in bytes, to enforce against policed traffic. This value is mandatory when defining an explicit policer. A value of 0 is returned on read if an explicit policer is not defined for the policy map class.

Microflow Policer

This is supported only in Native IOS.

- Microflow Enabled—Indicates whether or not a Microflow policer is defined for the policy map class. This enables QoS policing against Layer-3 switched traffic flows. This attribute may have one of the following values:
  - true
  - false
- Rate—Maximum transmission rate, in bits per second, to enforce against policed traffic. This value is mandatory when defining an explicit policer. A value of 0 is returned on read if an explicit policer is not defined for the policy map class.
- Burst—Normal burst size, in bytes, to enforce against policed traffic. This value is mandatory when defining an explicit policer. A value of 0 is returned on read if an explicit policer is not defined for the policy map class.
- Add button—Adds the class map onto the device.

Policing Info Area

The Policing Info area of the C6576M QoS Policy Map dialog box provides the following information:

- Trust State—Trust state associated with the traffic selected by the class map criteria. If no trust state is defined, the trust state configured on the ingress interface is used instead. The possible values of this attribute are:
  - untrusted
  - dscp
  - cos
  - ip-precedence

Note This attribute is only supported in Native IOS.

Aggregate Policing Subarea

- Aggregate Enabled— Indicates whether or not an explicit policer is defined for the policy map class. This enables QoS policing against Layer-3 switched traffic flows.
- Named Aggregate—Unique string identifier of an aggregate policer on the device. This value is nil if an explicit aggregate policer is defined within this policy map class. This is supported in Native IOS only.
- Rate—Maximum transmission rate, in bits per second, to enforce against policed traffic. This value is mandatory when defining an explicit policer. A value of 0 is returned on read if an explicit policer is not defined for the policy map class.
- Burst—Normal burst size, in bytes, in bytes to enforce against policed traffic. This value is mandatory when defining an explicit policer. A value of 0 is returned on read if an explicit policer is not defined for the policy map class.

- Max. Burst—Maximum burst size, in bytes, in bytes to enforce against policed traffic.A value of 0 is returned on read if an explicit policer is not defined for the policy map class.

Note The Max. Burst attribute is not supported in 12.1(8a)E and earlier.

- Exceed Action—Action to be taken when policed traffic exceeds QoS parameters.
  - Drop—Drops packet.
  - Policed DSCP Transmit—Changes the DSCP as per the policed DSCP map before transmitting.
  - Transmit—Transmits packet.
  - A value of none (0) is returned on read if an explicit policer is not defined for the policy map class.
- Violate Action—Action to be taken when policed traffic violates QoS parameters.
  - Drop—Drops packet.
  - Policed DSCP Transmit—Changes the DSCP as per the policed DSCP map before transmitting.
  - Transmit—Transmits packet.
  - A value of none (0) is returned on read if an explicit policer is not defined for the policy map class or a violate action has not been explicitly configured for the policy map class.

Note The Policy Violate Action is not supported in IOS 12.1(6)E and earlier. A PFC2 card is also required.

Conform Action Subarea

- Conform Action—Action to be taken when Policed traffic conforms to QoS parameters. This attribute may have one of the following values:
  - Drop—Drops packet
  - Transmit—Transmita packet
  - Set DSCP—Assigns DSCP value to packet before it is transmitted.
  - Set Precedence—Assigns IP Precedence value to packet before it is transmitted.
  - A value of none (0) is returned on read if an explicit policer is not defined for the policy map class.
- Set DSCP—DSCP value assigned to packets of conforming ingress traffic before transmitting on egress interfaces.This value is only relevant and will only be set in the running configuration of the device if the Policy Conform Action is Set DSCP. A value of 0 is returned on read if an explicit policer is not defined for the policy map class or the conform action is not Set DSCP.
- Set IP Precedence—IP Precedence value assigned to packets of conforming ingress traffic before transmitting on egress interfaces. This value is only relevant and will only be set in the running configuration of the device if the Policy Conform Action is Set Precedence. A value of 0 is returned on read if an explicit policer is not defined for the policy map class or the conform action is not Set Precedence.

Microflow Policing Subarea

This is supported in Native IOS only.

- Microflow Enabled—Indicates whether or not a Microflow policer is defined for the policy map class. This enables QoS policing against Layer 3 switched traffic flows. This attribute may have one of the following values:
  - true
  - false
- Rate—Maximum transmission rate, in bits per second, to enforce against policed traffic. This value is mandatory when defining an explicit policer. A value of 0 is returned on read if an explicit policer is not defined for the policy map class.
- Burst—Normal burst size, in bytes, to enforce against policed traffic. This value is mandatory when defining an explicit policer. A value of 0 is returned on read if an explicit policer is not defined for the policy map class.
- Exceed Action—Action to be taken when policed traffic exceeds QoS parameters.
  - Drop—Drops packet.
  - Policed DSCP Transmit—Changes the DSCP as per the policed DSCP map before transmitting.
  - Transmit—Transmits packet.
  - A value of none (0) is returned on read if an explicit policer is not defined for the policy map class.

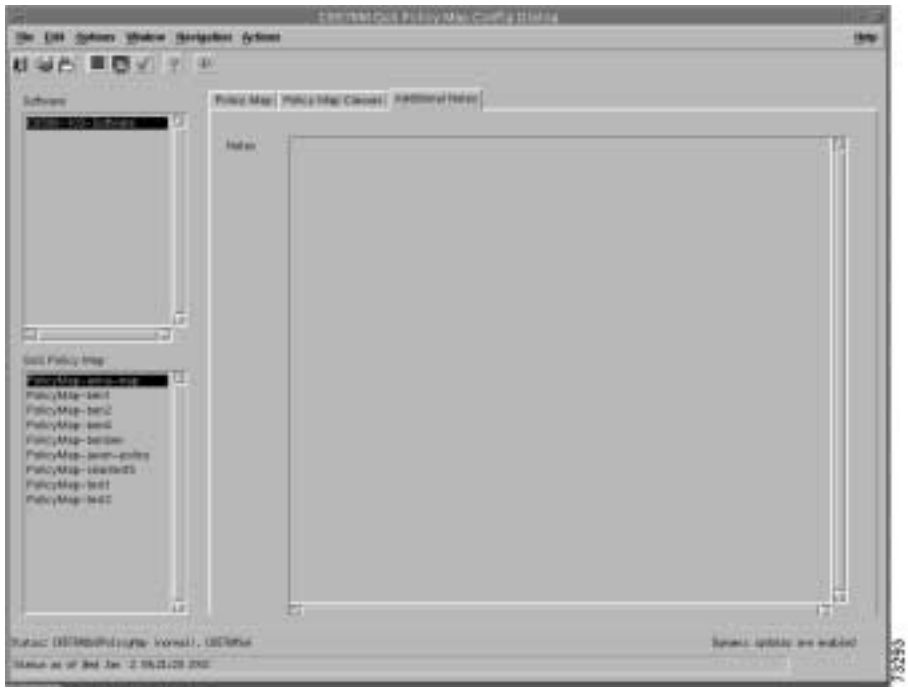
Conform Action Subarea

- Conform Action—Action to be taken when Policed traffic conforms to QoS parameters. This attribute may have one of the following values:
  - Drop—Drops packet
  - Transmit—Transmits packet
  - Set DSCP—Assigns DSCP value to packet before it is transmitted.
  - Set Precedence—Assigns IP Precedence value to packet before it is transmitted.
  - A value of none (0) is returned on read if an explicit policer is not defined for the policy map class.
- Set DSCP—DSCP value assigned to packets of conforming ingress traffic before transmitting on egress interfaces.This value is only relevant and will only be set in the running configuration of the device if the Policy Conform Action is Set DSCP. A value of 0 is returned on read if an explicit policer is not defined for the policy map class or the conform action is not Set DSCP.
- Set IP Precedence—IP Precedence value assigned to packets of conforming ingress traffic before transmitting on egress interfaces. This value is only relevant and will only be set in the running configuration of the device if the Policy Conform Action is Set Precedence. A value of 0 is returned on read if an explicit policer is not defined for the policy map class or the conform action is not Set Precedence.

Additional Notes Tab

Figure 6-105 shows the Additional Notes tab of the C6576M QoS Policy Map dialog box.

Figure 6-105 Additional Notes Tab of the C6576M QoS Policy Map Dialog Box



Notes Area

The Notes area is a text box that allows you to type in additional notes for the object.

Profiles

This chapter describes how to create and use the C65/76M profiles, and consists of these sections:

Profiles are used to apply the same configuration settings to multiple instances of the same object. This is useful in environments containing a large number of network elements.

Network Element Profile

The Network Element profile is used to set up a standard template for the Network Element object attributes listed below. These attributes are discussed in detail in the "C6576M Network Element Dialog Box" section on page 6-5.

- System Location
- System Contact
- Telnet Password
- Enable Password
- SNMP Trap Enabled

Creating a Network Element Profile

To create a Network Element Profile, follow these steps:

Step 1 Launch the Network Element Profile dialog box by choosing **Open NE Config/Mgmt Profile** from the pop-up menu of the Network Element object. The Network Element Profile dialog box is shown in Figure 7-1.

Figure 7-1 Network Element Profile Dialog Box

Step 2 Click the **Create Profile** button. A window appears asking for a profile name.

Step 3 Enter the name for the profile and click **Ok**. The newly created profile is displayed in the profile list on the left-hand side.

Step 4 Select the profile from the profile list.

Step 5 Specify the values for the profile attributes.

Step 6 Save your changes by clicking the **Save** tool from the toolbar or choosing the **File > Save** menu bar option.

Applying a Network Element Profile

To apply a Network Element Profile, follow these steps:

Step 1 Open the Network Element dialog box for the Network Element object to which you want to apply the profile.

Step 2 Choose **Edit > Apply Profile** and the name of the profile you want to apply from the menu bar. The profile is applied and the Network Element attributes are changed to match that of the profile.

Syslog Profile

The Syslog profile is used to create a standard template for the Syslog objects listed below. These objects are discussed in detail in the "C6576M Syslog Dialog Box" section on page 6-42.

- Max. Syslog Severity
- Max. Table Entries
- Enable Notification

Creating a Syslog Profile

To create a Syslog profile, follow these steps:

Step 1 Launch the Syslog Profile dialog box by choosing **Open Syslog Profile** from the pop-up menu of the Syslog object or Software object. The Syslog Configuration Profile dialog box, shown in Figure 7-2, appears.

Figure 7-2 Syslog Profile Dialog Box

Step 2 Click **Create Profile**. A window appears asking for a profile name.

Step 3 Enter the name for the profile and click **Ok**. The newly created profile is displayed in the profile list on the left-hand side.

Step 4 Select the profile from the profile list.

Step 5 Specify the values for the profile attributes.

Step 6 Save your changes by clicking the **Save** tool from the toolbar or choosing the **File > Save** menu bar option.

Applying a Syslog Profile

To apply a Syslog Profile, follow these steps:

Step 1 Open the Syslog dialog for the Syslog object to which you want to apply the profile.

Step 2 Choose **Edit > Apply Profile** and the name of the profile you want to apply from the menu bar. The profile is applied and the Syslog attributes are changed to match the profile attributes.

CHAPTER 8

Alarms and Alarm Management

This chapter describes the CEMF alarms generated by the C65/76M software and provides an overview of the CEMF Event Browser application. The chapter consists of these sections:

For more information on the CEMF Event Browser application, refer the *Cisco Element Management Framework User Guide v3.2*.

Viewing C65/76M Alarms

You can view all alarms generated by the C65/76M application by using the CEMF Event Browser application. The CEMF Event Browser application allows you to view all events generated by CEMF, including alarms generated by other event managers installed on the system.

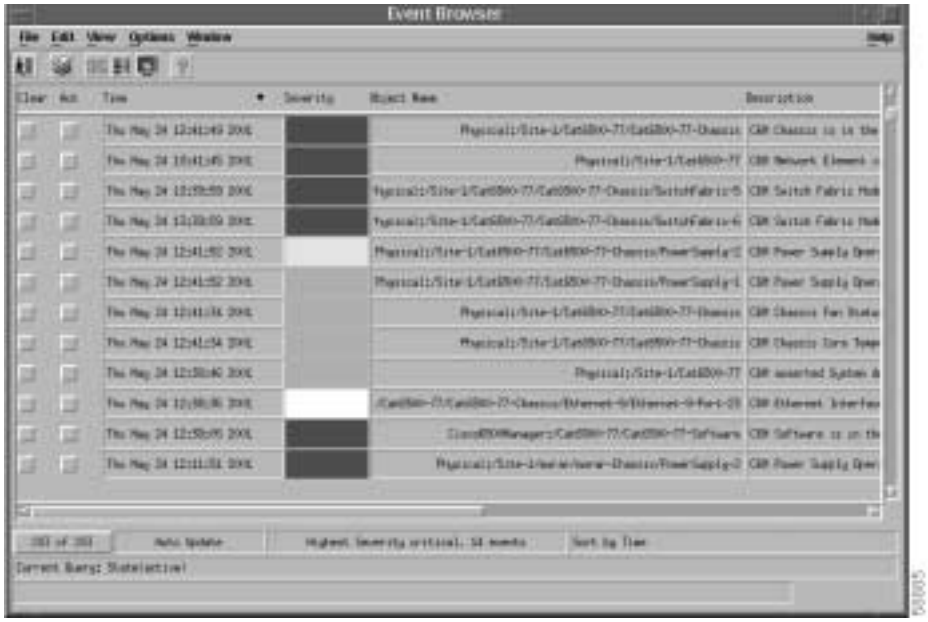
The Event Browser application can be started from the main CEMF Launchpad. From the CEMF Launchpad, click the **Events** icon to launch the Event Browser (see Figure 8-1).

Figure 8-1 Launching Event Browser

Event Browser

The Event Browser dialog box is shown in Figure 8-2.

Figure 8-2 CEMF Event Browser Application



The Event Browser dialog box displays the following information in a tabular format:

- Time and date when an event was reported
- Object name that was affected
- Description and severity of the event

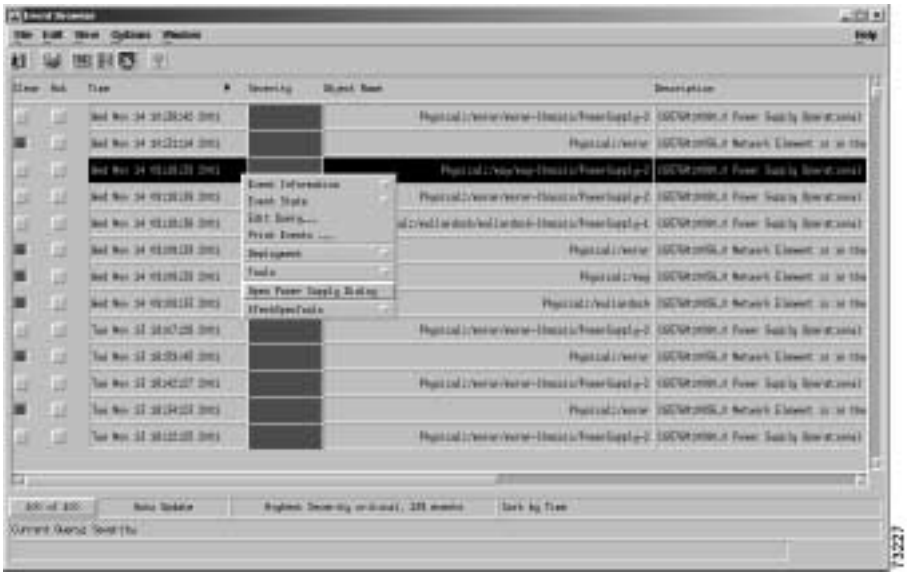
All CEMF events are saved within the Event Browser application, which displays current and historical data of events. All network objects are color-coded, indicating their operational status. Alarms are moved up the element hierarchy according to severity. Table 8-1 identifies the alarm types and their associated color codes.

Table 8-1 Alarm Color Codes

Alarm Type	Color
Critical	Red
Major	Orange
Minor	Yellow
Informational	White

You can launch a dialog box to the object that caused the alarm by choosing the **Open Dialog** option in the pop-up menu of the alarm entry, shown in Figure 8-3.

Figure 8-3 Launching the Dialog to the Affected Object From the Event Browser



Full Event Description Dialog

The Full Event Description dialog box, shown in Figure 8-4, displays full details of an alarm event listed in the Event Browser. Launch this dialog by double-clicking the event in the Event Browser.

Figure 8-4 Full Event Description Dialog Box

Note When the event has not been cleared, the Event State displays Active and the Clearing Method, User Responsible for Clearing, Clearing Time and Date, and Acknowledgement Details sections are disabled. You cannot alter the displayed information. When an event has been cleared, you can view the method used to clear it by clicking the **Clearing Event** button.

The Full Event Description dialog box displays the following information:

- Object name—Name of the CEMF-managed object the event was reported against.
- Time and Date—Time and date the event was reported.
- Severity—Severity of the reported event.
- Source Domain—Indicates from which Communications domain the event was reported.
- Management Domain—Indicates from which Management domain the event was reported.
- Event Description—Provides a brief description of the reported event.
- Event State—Indicates whether the event is active or cleared. When the event has been cleared, the Clearing Method, User Responsible for Clearing, and Clearing Time and Date sections become active.

Clearing Details Area

The Clearing Details area of the Full Event Description dialog box displays the following information:

- Clearing Method—Indicates when the event was cleared by the network or by a user.
- User Responsible for Clearing—Displays the user name responsible for clearing the event.
- Clearing Time and Date—Indicates the time and date the event was cleared.
- Clearing Reason—Displays the information that was entered in the Events Clearing dialog, which is completed when the Clear button is selected.

Clearing Details Area

The Acknowledgement Details area of the Full Event Description dialog box displays the following information:

- Acknowledgement User—Displays the name of the user that acknowledged the alarm.
- Acknowledgement Time and Date—Displays the time and date that the alarm was acknowledged.
- Acknowledgement Comment—Displays acknowledgement comments.

Click **Close** to exit the Full Event Description dialog. Click **Close** to exit the Event Browser dialog. Refer to the *Cisco Element Management Framework User Guide* for further information on Event Browser.

C65/76M Alarms

The C65/76M generates three types of alarms:

- SNMP Trap Alarms—CEMF alarms based on SNMP traps emitted by the Catalyst 6000 family switch or Cisco 7600 series Internet Router running IOS.
- Object State Alarms—CEMF alarms based on the state of the C65/76M objects.
- Attribute Value Alarms—CEMF alarms based on values of C65/76M object attributes.

SNMP Trap Alarms

Table 8-2 lists the SNMP traps supported by a Catalyst 6000 family switch or a Cisco 7600 series Internet Router and the corresponding CEMF alarm.

Table 8-2 CEMF Alarms Generated by SNMP Traps

Trap/Varbind	Message	Alarm Severity	Object	Alarms Cleared
coldStart	C6576M:0132_0 Cold Start: Agent reinitializing: configuration may have changed.	Major	Network Element	
warmStart	C6576M:0132_0 Warm Start: Agent reinitializing: configuration may have changed.	Major	Network Element	
authenticationFailure	C6576M:0133_0 Authentication Failure: Unauthorized SNMP access.	Minor	Network Element	None
ciscoFlashCopyCompletionTrap	N/A	N/A	N/A	N/A
ciscoFlashMiscOpCompletionTrap	N/A	N/A	N/A	N/A
clogMessageGenerated clogHistSeverity = emergency(1)	C6576M:0137_0 asserted <clogHistMsgText> by facility <clogHistFacility>, message name <clogHistMsgName> at <clogHistMsgTimestamp>	Critical	Syslog	None
clogMessageGenerated clogHistSeverity = alert(2)	C6576M:0138_0 asserted <clogHistMsgText> by facility <clogHistFacility>, message name <clogHistMsgName> at <clogHistMsgTimestamp>	Critical	Syslog	None
clogMessageGenerated clogHistSeverity = critical(3)	C6576M:0139_0 asserted <clogHistMsgText> by facility <clogHistFacility>, message name <clogHistMsgName> at <clogHistMsgTimestamp>	Critical	Syslog	None
clogMessageGenerated clogHistSeverity = error(4)	C6576M:0140_0 asserted <clogHistMsgText> by facility <clogHistFacility>, message name <clogHistMsgName> at <clogHistMsgTimestamp>	Major	Syslog	None
clogMessageGenerated clogHistSeverity = warning(5)	C6576M:0141_0 asserted <clogHistMsgText> by facility <clogHistFacility>, message name <clogHistMsgName> at <clogHistMsgTimestamp>	Minor	Syslog	None

Table 8-2 CEMF Alarms Generated by SNMP Traps (continued)

Trap/Varbind	Message	Alarm Severity	Object	Alarms Cleared
clogMessageGenerated clogHistSeverity = notice(6)	C6576M:0142_0 asserted <clogHistMsgText> by facility <clogHistFacility>, message name <clogHistMsgName> at <clogHistMsgTimestamp>	Minor	Syslog	None
clogMessageGenerated clogHistSeverity = info(7)	C6576M:0143_0 asserted <clogHistMsgText> by facility <clogHistFacility>, message name <clogHistMsgName> at <clogHistMsgTimestamp>	Informational	Syslog	None
clogMessageGenerated clogHistSeverity = debug(8)	C6576M:0144_0 asserted <clogHistMsgText> by facility <clogHistFacility>, message name <clogHistMsgName> at <clogHistMsgTimestamp>	Informational	Syslog	None
coldStart	C6576M:0132_0 Cold Start: Agent reinitializing; configuration may have changed.	Major	Network Element	None
ciscoConfigManEvent	N/A	N/A	N/A	N/A
linkDown	C6576M:0136_0 link <ifDescr> down.	Major	Ethernet Interface	None
linkUp	C6576M:0135_0 link <ifDescr> up.	Normal	Ethernet Interface	linkDown
newRoot	C6576M:0157_0 <ip> is the new Spanning Tree root.	Informational	STP	N/A
stpxInconsistency Update	N/A	N/A	N/A	N/A
tcpConnectionClose	N/A	N/A	N/A	N/A
topologyChange	C6576M:0158_0 Ports on <ip> have transitioned states.	Informational	STP	N/A
moduleUp	N/A, see module section for details on module status alarm	N/A	N/A	N/A
moduleDown	N/A, see module section for details on module status alarm	N/A	N/A	N/A
chassisAlarmOn	N/A, see chassis section for details on chassis status alarm	N/A	N/A	N/A
chassisAlarmOff	N/A, see chassis section for details on chassis status alarm	N/A	N/A	N/A
vlanTrunkPortDynamic StatChange	N/A	N/A	N/A	N/A

Table 8-2 CEMF Alarms Generated by SNMP Traps (continued)

Trap/Varbind	Message	Alarm Severity	Object	Alarms Cleared
vtpVersionOneDevice Detected	N/A	N/A	N/A	N/A
risingAlarm	N/A	N/A	N/A	N/A
fallingAlarm				
All other traps	C6576M:0134_0 Unknown trap received from switch. Check the controller log file for details.	Informational	Network Element	None

The following SNMP traps do not generate CEMF alarms:

- ciscoFlashCopyCompletionTrap
- ciscoFlashMiscOpCompletionTrap
- ciscoConfigManEvent
- tcpConnectionClose
- stpxInconsistencyUpdate
- moduleUp
- moduleDown
- chassisAlarmOn
- chassisAlarmOff
- vlanTrunkPortDynamicStatusChange
- vtpVersionOneDeviceDetected
- risingAlarm
- failingAlarm

If these traps are received by the C65/76M software, they are ignored.

Several C65/76M alarms are generated based on the clogMessageGenerated SNMP trap. This trap is generated by the CISCO-SYSLOG-MIB whenever a syslog message is recorded into the message table. The severity of the CEMF alarm is based on the clogHistSeverity varbind value in the trap.

If a coldStart trap is received by the C65/76M software whose IP address corresponds to the IP address of a Network Element object that is currently in the decommissioned state, then that object is automatically commissioned. When the Network Element is commissioned, a subchassis discovery is executed automatically. If the Network Element is populated with other C65/76M objects, and if there is a mismatch between the type of C65/76M object and the type that is discovered, the object is placed into the mismatched state and a corresponding alarm is raised against that object (see the "Object State Alarms" section on page 8-9).

The linkUp/linkDown SNMP traps signify that the operational status of a particular interface has transitioned into or out of the down state. If a linkUp trap is received, it will clear any linkDown alarm on the corresponding interface, if it exists.

If any other SNMP trap that is not listed in Table 8-2 is detected by the C65/76M software, then a general informational alarm is raised against the Network Element object. The details for this trap (enterprise and varbinds) is logged in the C6576MCntrllr.log file.

Object State Alarms

Most C65/76M objects have state alarms associated with them. These state alarms can be used to determine what tasks are being executed for the corresponding object or the status of network connectivity to the corresponding object from the CEMF server. There will only be one state alarm for each object at any time (corresponding to the current state of the object).

The following C65/76M objects have state alarms associated with them:

- Network Element
- Chassis
- Power Supplies
- All Modules
- Port Adapters
- Interfaces
- Software Object
- Logical Objects

Network Element

Table 8-3 describes the Network Element object state alarms.

Table 8-3 Network Element State Alarms

State	Message/Description	Severity	Alarms Cleared
discovery	"C6576M Network Element is in the discovery state."	Informational	discoverylostcomms normal mismatched
discoverylostcomms	"C6576M Network Element is in the discoverylostcomms state. Network connectivity to switch has been lost during discovery."	Critical	discovery
mismatched	"C6576M Network Element is in the mismatched state. IP address does not correspond to a Catalyst 6500 switch."	Major	discovery
normal	"C6576M Network Element is in the normal state."	Normal	discovery lostcomms
lostcomms	"C6576M Network Element is in the lostcomms state. Network connectivity to the switch has been lost."	Critical	normal

Chassis

Table 8-4 describes the Chassis object state alarms.

Table 8-4 Chassis State Alarms

State	Description	Severity	Alarms Cleared
discovery	"C6576M Chassis is in the discovery state. Chassis and subchassis discovery is being performed."	Informational	normal performance
discoverylostcomms	"C6576M Chassis is in the discoverylostcomms state. Network connectivity to switch has been lost during discovery."		
normal	"C6576M Chassis is in the normal state."	Normal	discovery performance
normallostcomms	"C6576M Chassis is in the normal state."	Normal	performance
performance	"C6576M Chassis is in the performance state."	Informational	discovery normal
perflostcomms	"C6576M Chassis is in the lostcomms state. Network connectivity to switch has been lost."	Informational	dicovery normal

Power Supply

Table 8-5 describes the Power Supply objects state alarms.

Table 8-5 Power Supply State Alarms

State	Description	Severity	Alarms Cleared
normal	"C6576M Power Supply is in the normal state."	Informational	lostcomms
lostcomms	"C6576M Power Supply is in the lostcomms state. Network connectivity to the power supply has been lost."	Critical	normal

All Modules

Table 8-6 describes all Module objects' state alarms.

Table 8-6 All Modules State Alarms

State	Description	Severity	Alarms Cleared
mismatched	"C6576M Module is in the mismatched state. The discovered Supervisor Module type is different from the pre-deployed or previously discovered type."	Major	performance lostcomms
normal	"C6576M Module is in the normal state."	Normal	performance lostcomms
normallostcomms	"C6576M Module is in the lostcomms state. Network connectivity to the supervisor card is lost."	Normal	performance
performance	"C6576M Module is in the performance state."		lostcomms
perflostcomms	"C6576M Module is in the lostcomms state. Network connectivity to the supervisor card is lost."		

Interfaces

Table 8-7 describes the Interface objects state alarms.

Table 8-7 Interface State Alarms

State	Description	Severity	Alarms Cleared
normal	"C6576M Interface is in the normal state."	Normal	performance
normallostcomms	"C6576M Interface is in the lostcomms state. Network connectivity to the supervisor card is lost."	Normal	performance
performance	"C6576M Interface is in the performance state."		
perflostcomms	"C6576M Interface is in the lostcomms state. Network connectivity to the supervisor card is lost."		

Note Because an Ethernet Interface object cannot enter the lostcomms state independent of the corresponding Ethernet module or supervisor engine module, no alarm is raised when the Ethernet Interface object enters the lostcomms state.

Port Adapters

Table 8-8 describes the Port Adapters state alarms.

Table 8-8 Port Adapters State Alarms

State	Description	Severity	Alarms Cleared
mismatched	"C6576M Port Adapter is in the mismatched state. The discovered SFM card is different from the pre-deployed or previously discovered type."	Major	performance lostcomms
normal	"C6576M Port Adapter is in the normal state."	Normal	performance lostcomm
normallostcomms	"C6576M Port Adapter is in the lostcomms state. Network connectivity to the supervisor card is lost."	Normal	performance
performance	"C6576M Port Adapter is in the performance state."		lostcomms
perflostcomms	"C6576M Port Adapter is in the lostcomms state. Network connectivity to the supervisor card is lost."		

Software

Table 8-9 describes the Software object state alarms.

Table 8-9 Software Object State Alarms

State	Description	Severity	Alarms Cleared
discovery	"C6576M Software is in the discovery state. Discovery of the logical software objects is being performed."	Informational	normal
discoverylostcomms	"C6576M Software is in the discoverylostcomms state. Network connectivity to the switch has been lost during discovery or the IOS passwords are incorrect."		discovery
normal	"C6576M Software object is in the normal state."	Normal	discovery
normallostcomms	"C6576M Software object is in the lostcomms state. Network connectivity to the supervisor card is lost."		

Note Because the Software object cannot enter the lostcomms state independently of the Network Element object, no alarm is raised when the Software object enters the lostcomms state.

Attribute Value Alarms

Because the Catalyst 6000 family switches and the Cisco 7600 series Internet Router running IOS do not support SNMP traps for hardware component failures or changes, the C65/76M software polls certain object attributes to determine hardware status. If the polled value indicates a failure, the C65/76M software raises an appropriate alarm. The following objects have one or more attributes polled for status information:

- Chassis
- Power Supply
- All Modules/Port Adapters
- Software

Chassis

Table 8-10 describes the Chassis object attribute alarms.

Table 8-10 Chassis Attribute Alarms

Attribute	Message/Description	Severity	Alarms Cleared
Core Temperature Status = ok	"C6576M Chassis Core Temperature Status is ok. Core temperature is within normal operation limits."	Normal	Core Temperature Status = error Core Temperature Status = critical
Core Temperature Status = error	"C6576M Chassis Core Temperature Status is error. The core chassis temperature is greater than the normal operating temperature range."	Major	Core Temperature Status = critical
Core Temperature Status = critical	"C6576M Chassis Core Temperature Status is critical. The switch is going to shutdown due to excessively high core temperature."	Critical	Core Temperature Status = error
Fan Status = ok	"C6576M Chassis Fan Status is ok."	Normal	Fan Status = other Fan Status = minorFault Fan Status = majorFault
Fan Status = other	"C6576M Chassis Fan Status is other."	Minor	Fan Status = minorFault Fan Status = majorFault
Fan Status = minorFault	"C6576M Chassis Fan Status is minorFault."	Major	Fan Status = other Fan Status = majorFault
Fan Status = majorFault	"C6576M Chassis Fan Status is majorFault."	Critical	Fan Status = other Fan Status = minorFault
Slots Used	"C6576M Chassis Used Slots has changed. The switch line card configuration has changed." A change in this value initiates a subchassis rediscovery.	Major	None

Power Supply

Table 8-11 describes the Power Supply objects attribute alarms.

Table 8-11 Power Supply Attribute Alarms

Attribute	Description	Severity	Alarms Cleared
Operational Status = ok	"C6576M Power Supply Operational Status is ok." The power supply is operating as expected.	Normal	Operational Status = other Operational Status = minorFault Operational Status = majorFault
Operational Status = other	"C6576M Power Supply Operational Status is other." The power supply's operational status is unknown.	Minor	Operational Status = minorFault Operational Status = majorFault
Operational Status = minorFault	"C6576M Power Supply Operational Status is minorFault." There is a minor fault with the power supply.	Major	Operational Status = other Operational Status = majorFault
Operational Status = majorFault	"C6576M Power Supply Operational Status is majorFault." There is a major fault with the power supply.	Critical	Operational Status = other Operational Status = minorFault

Modules/Port Adapters

The following table describes the Module object attribute alarms.

Table 8-12 Module Attribute Alarms

Attribute	Description	Severity	Alarms Cleared
Operational Status = ok	"C6576M Module Operational Status is ok"	Normal	Operational Status = other Operational Status = minorFault Operational Status = majorFault
Operational Status = other	"C6576M Module Operational Status is other"	Minor	Operational Status = minorFault Operational Status = majorFault
Operational Status = minorFault	"C6576M Module Operational Status is minorFault."	Major	Operational Status = other Operational Status = majorFault
Operational Status = majorFault	"C6576M Module Operational Status is majorFault."	Critical	Operational Status = other Operational Status = minorFault
Serial Number	"C6576M rModule Serial Number has changed. The Module has been replaced with a different card of the same type." A change in this value indicates that the Supervisor module was removed and replaced with another of the same time.	Critical	None

Port adapters do not support the operational status information, as a result the only attribute alarm raised by a port adapter is the final one - a serial number change has been detected.

SONET Interfaces

Table 8-13 describes the alarms raised due to changes in the SONET interface status fields. Note that these alarms are slightly different than those described elsewhere in this Chapter, as they are controlled by bit-fields in the attribute value. This table contains the attribute, the mask field bit and the alarm raised when the bit is set. There is a corresponding alarm (not listed) of normal severity for each alarm which clears the alarm when the bit is cleared.

Table 8-13 SONET Interface Attribute Alarms

Attribute	Bitmask Field	Description	Severity
sonetSectionCurrentStatus	2	C6576M:0157_0 SONET Section status is Loss of Signal.	Warning
sonetSectionCurrentStatus	4	6576M:0159_0 SONET Section status is Loss of Frame.	Warning
sonetLineCurrentStatus	2	C6576M:0161_0 SONET Line status is Alarm Indication Signal.	Warning
sonetLineCurrentStatus	4	C6576M:0163_0 SONET Line status is Remote Defect Indication.	Warning
sonetPathCurrentStatus	2	C6576M:0165_0 SONET Path status is STS-Path Loss of Pointer.	Warning
sonetPathCurrentStatus	4	C6576M:0167_0 SONET Path status is STS-Path Alarm Indication Signal.	Warning
sonetPathCurrentStatus	8	C6576M:0169_0 SONET Path status is STS-Path Remote Defect Indication.	Warning
sonetPathCurrentStatus	16	C6576M:0171_0 SONET Path status is Unequipped.	Warning
sonetPathCurrentStatus	32	C6576M:0173_0 SONET Path status is Signal Label Mismatch.	Warning

Port adapters do not support the operational status information, as a result the only attribute alarm raised by a port adapter is the final one - a serial number change has been detected.

Software

Table 8-14 describes the Software object attribute alarms.

Table 8-14 Software Attribute Alarms

Attribute	Description	Severity	Alarms Cleared
Image Backup Status = Ok	"C6576M Software Image Backup Status is ok. The backup was successful."	Normal	Image Backup Status = Error
Image Backup Status = Failed	"C6576M Software Image Backup Status is Failed. IOS image backup failed."	Major	
Image Restore Status = Ok	"C6576M Software Image Restore Status is ok. IOS image restoration was successful."	Normal	Image Restore Status = Error
Image Restore Status = Failed	"C6576M Software Image Restore Status is Failed. IOS image restoration failed." Do not restart the switch/router.	Critical	
Configuration Backup Status = Ok	"C6576M Software Configuration Backup Status is ok. Startup configuration backup was successful."	Normal	Configuration Backup Status = Error
Configuration Backup Status = Failed	"C6576M Software Configuration Backup Status is Failed. Startup configuration backup failed."	Major	
Configuration Restore Status = Ok	"C6576M Software Configuration Restore Status is ok. Startup configuration restoration was successful."	Normal	Configuration Restore Status = Error
Configuration Restore Status = Failed	"C6576M Software Configuration Restore Status is Failed. Startup configuration restoration failed." Do not restart the switch/router.	Critical	