Cisco ME 1200 Series Carrier Ethernet Access Devices NID Configuration Guide, Cisco IOS 15.6(1)SN and Later Releases

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Preface

This preface contains information about the Cisco ME 1200 Series Carrier Ethernet Access Device.

Audience

This guide is for the person configuring the Cisco ME 1200 Series Carrier Ethernet Access Devices, hereafter known as Cisco ME 1200 NID.

Document Conventions

This document uses the following conventions:

Convention	Description
^ or Ctrl	Both the ^ symbol and Ctrl represent the Control (Ctrl) key on a keyboard. For example, the key combination **^D** or **Ctrl-D** means that you hold down the Control key while you press the D key. (Keys are indicated in capital letters but are not case sensitive.)
bold font	Commands and keywords and user-entered text appear in **bold** font.
Italic font	Document titles, new or emphasized terms, and arguments for which you supply values are in *italic* font.
`Courier font`	Terminal sessions and information the system displays appear in `courier` font.
`Bold Courier font`	Bold Courier font indicates text that the user must enter.
[x]	Elements in square brackets are optional.

<table>
<tr><th>Convention</th><th>Description</th></tr>
<tr><td>...</td><td>An ellipsis (three consecutive nonbolded periods without spaces) after a syntax element indicates that the element can be repeated.</td></tr>
<tr><td>|</td><td>A vertical line, called a pipe, indicates a choice within a set of keywords or arguments.</td></tr>
<tr><td>[x | y]</td><td>Optional alternative keywords are grouped in brackets and separated by vertical bars.</td></tr>
<tr><td>{x | y}</td><td>Required alternative keywords are grouped in braces and separated by vertical bars.</td></tr>
<tr><td>[x {y | z}]</td><td>Nested set of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical bar within square brackets indicate a required choice within an optional element.</td></tr>
<tr><td>string</td><td>A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.</td></tr>
<tr><td>< ></td><td>Nonprinting characters such as passwords are in angle brackets.</td></tr>
<tr><td>[ ]</td><td>Default responses to system prompts are in square brackets.</td></tr>
<tr><td>!, #</td><td>An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.</td></tr>
</table>

Reader Alert Conventions

This document uses the following conventions for reader alerts:

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

Tip Means *the following information will help you solve a problem.*

Warning **Means *reader be warned.* In this situation, you might perform an action that could result in bodily injury.**

Related Documentation

These documents provide information about the switches and are available from this Cisco.com site:

http://www.cisco.com/c/en/us/support/switches/me-1200-series-carrier-ethernet-access-devices/tsd-products-support-general-information.html

- *Release Notes for the Cisco ME 1200 Series Carrier Ethernet Access Devices*

Note Before installing, configuring, or upgrading the switch, see the release notes on Cisco.com for the latest information.

- *Cisco ME 3800x and ME 3600x Switches Software Configuration Guide*
- *Cisco Regulatory Compliance and Safety Information for Cisco ME 1200 Series Carrier Ethernet Access Devices*

For information on supported MIBs, see ftp://ftp.cisco.com/pub/mibs/ME1200-MIBS/.

CHAPTER 1

Configuration Management

This chapter helps you to get started and describes how to configure the initial switch configuration for the Cisco ME 1200 NID. This chapter also describes how to manage Cisco ME 1200 NID configurations.

Restrictions for Managing Configurations

- The option **show run** command is not supported.

Information About Configuration Management

Configuration management on ME1200 stores the configurations in XML format. A startup-config.xml file is generated containing all relevant configuration to be applied on the ME1200. A current running-config.xml can also be generated and copied to a TFTP server. This complete XML configuration file can be viewed using a suitable XML editor.

Understanding the Boot Process

The Cisco ME 1200 NID device is not connected to any network soon after it is unpacked. To start your Cisco ME 1200 NID, you need to follow the procedures in the hardware installation guide about installing and powering on the switch. This document describes login and setting up the initial configuration (IP address, subnet mask, default gateway, secret and Telnet passwords, and so forth) of the Cisco ME 1200 NID.

The boot loader provides access to the flash file system before the operating system is loaded. Normally, the boot loader is used only to load, uncompress, and launch the operating system. After the boot loader gives the operating system control of the CPU, the boot loader is not active until the next system reset or power-on.

Before you can assign switch information, make sure you have connected a PC or terminal to the console port, and configured the PC or terminal-emulation software baud rate and character format to match these of the switch console port:

- Baud rate default is 115200.
- Data bits default is 8.
- Stop bits default is 1.
- Parity settings default is none.

When user connects to the console port using telnet or other means, following login detail will be needed:

- User Name: admin
- password: sandino

Table 1: Default Boot Configuration

Feature	Default Setting
Operating system software image	The device attempts to automatically boot the system using information in the BOOT environment variable. If the variable is not set, the Cisco ME 1200 NID attempts to load and execute the first executable image it can by performing a recursive, depth-first search throughout the flash file system. In a depth-first search of a directory, each encountered subdirectory is completely searched before continuing the search in the original directory.
Configuration file	Configured devices use the startup-config.xml file stored on the system board in flash memory. A new switch has no configuration file.

Getting Started

Initially, Cisco ME1200 NID does not have management VLAN or IP address configured. Execute initial configuration steps on Cisco ME1200 NID either statically via console cable or via auto-configuration through ZTP.

Perform the following steps to bring up the device in the network with required configuration, using console connection.

1. Create Layer 2 VLANs on the NID.

Note By default, VLAN interface is present for VLAN 1. If user wishes to use VLAN 1 as management VLAN, go to Step 3 to configure IP address. Else, proceed with following steps to create another L2 VLAN.

2. Modify switch port mode as Trunk on the NID.
3. Assign IP Address to VLAN interface.
4. Configure Default IP Route.
5. Create Startup-config.xml file.

After allocation of management IP address to the NID, it is available in the network for further provisioning. To further provision Cisco ME1200 NID, log into "SSH" network protocol followed by newly configured management IP.

- SSH <management-IP> Example: ssh 10.64.103.10
- Username: admin
- Password : sandino

Step 1—Creating Layer 2 VLANs on the NID

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createVlanCommand createVlanReqvlan-list** *vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 100-105`	Creates the VLAN list. The valid values are from 1 to 4095.
Step 3	**createVlanCommand review** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand review`	Displays the configuration.
Step 4	**createVlanCommand commit** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand commit`	Sends the configuration to the NID.

Step 5	**ProvisionPortVlanPortTypeshow**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# showVlans showVlanRequest vlan-id 1`
	`Switch(ProvisionPortVlanPortType)# showVlans review`
		Displays the Vlan lists.

Step 6	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionPortVlanPortType mode.

Configuration Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 100-105
Switch(ProvisionPortVlanPortType)# createVlanCommand review
```

```
Commands in queue: 1
     createVlanCommand createVlanReq vlan-list 100-105

Switch(ProvisionPortVlanPortType)# createVlanCommand commitCommands in queue: 1

        showVlans showVlanRequest vlan-id 1

Switch(ProvisionPortVlanPortType)# showVlans commit
ShowVlans_Output.showVlanResponse.vlan_list[0].Interfaces = 'Gi 1/1-6'
ShowVlans_Output.showVlanResponse.vlan_list[0].vlan_id = 1
Show Vlans Commit Success!!!

     Vlan Creation Commit Success!!!

Switch(ProvisionPortVlanPortType)# exit
```

Step 2—Modifying Switchport Mode as Trunk

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**modifySwPort modifySWPortConfig interface***interface-id* **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interaface 4`	Configure the switchport configuration on the defined interface.
Step 3	**modifySwPort modifySWPortConfig mode trunk** {**allowed vlan** {**add** {**all** | **vlan-list***vlan-list* } | **remove** {**all** |**vlan-list** *vlan-list*}} | {**native vlan***vlan-list* } **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list 100-105`	Sets the mode to TRUNK. • **allowed—**Sets the allowed VLAN characteristics when interface is in trunk mode. • **add—**Adds either all VLANs or specified VLANs to the current list. • **remove—**Rremoves either all VLANs or specified VLANs from the current list. • *vlan-id*—The VLAN ID. The valid values are from 0 to 4095.
Step 4	**modifySwPort review** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort review`	Displays the configuration.

	Command or Action	Purpose
Step 5	**modifySwPort commit** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort commit`	Sends the configuration to the NID.

Step 6	**ProvisionPortVlanPortTypeshow**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# showswPort showSwPortReq all`
	`Switch(ProvisionPortVlanPortType)# showswPort review`
		Displays the commit, flush or review commands in queue for switchport configurtion.

Step 7	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionPortVlanPortType mode.

Configuration Example

```
Example 1:
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interaface 4
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan
 add vlan-list 100-105
Switch(ProvisionPortVlanPortType)# modifySwPort review

Commands in queue:
   modifySwPort modifySWPortConfig interaface 4
   modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list 100-105

Switch(ProvisionPortVlanPortType)# modifySwPort commit

   ModifySwPort-Output.modifySwPortConfigResp = 0

   Modify SwitchPort Commit Success!!!

Switch(ProvisionPortVlanPortType)# exit
Example 2:
Commands in queue: 1

        showSwPort showSwPortReq all
Switch(ProvisionPortVlanPortType)# showswPort commit
ShowSwPort_Output.showSwPortResp.interface_list[0].name = 'GigabitEthernet 1/1'
ShowSwPort_Output.showSwPortResp.interface_list[0].admin_mode = 'access'
ShowSwPort_Output.showSwPortResp.interface_list[0].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[0].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[0].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[1].name = 'GigabitEthernet 1/2'
ShowSwPort_Output.showSwPortResp.interface_list[1].admin_mode = 'access'
ShowSwPort_Output.showSwPortResp.interface_list[1].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[1].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[1].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[2].name = 'GigabitEthernet 1/3'
ShowSwPort_Output.showSwPortResp.interface_list[2].admin_mode = 'access'
ShowSwPort_Output.showSwPortResp.interface_list[2].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[2].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[2].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[3].name = 'GigabitEthernet 1/4'
ShowSwPort_Output.showSwPortResp.interface_list[3].admin_mode = 'access'
```

```
ShowSwPort_Output.showSwPortResp.interface_list[3].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[3].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[3].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[4].name = 'GigabitEthernet 1/5'
ShowSwPort_Output.showSwPortResp.interface_list[4].admin_mode = 'access'
ShowSwPort_Output.showSwPortResp.interface_list[4].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[4].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[4].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[5].name = 'GigabitEthernet 1/6'
ShowSwPort_Output.showSwPortResp.interface_list[5].admin_mode = 'access'
ShowSwPort_Output.showSwPortResp.interface_list[5].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[5].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[5].trunk_members = '1-4095'

Show SwitchPort Commit Success!!!
```

Step 3— Assigning IP Address to VLAN Interface

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createIntVlan createIntVlanReq vlan-id** *vlan-id* **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq vlan-id 100`	Creates the interface VLAN list.

Step 3	**createIntVlan createIntVlanReq** {**address** {**ipv4** {**dhcp** | **ipv4-address**} | **ipv6 ipv6-address** *ipv6-address*} | **vlan-id** *vlan-id*}
	
	Example:
	`Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 ipv4-address address 22.22.22.3`
	
	`Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 ipv4-address mask 255.255.255.0`
	
	`Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv6 ipv6-address 2001:4::1/64`
		Creates the interface VLAN on the specified IPv4 or IPv6 address, or VLAN ID.

Step 4	**createIntVlan review** **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan review`	Displays the createIntVlan configuration.
Step 5	**createIntVlan commit** **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan commit`	Sends createIntVlan configuration to the Cisco ME 1200 NID .

	Command or Action	Purpose

Step 6	**ProvisionPortVlanPortTypeshow**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# showIntVlan showIntVlanReq vlan-list 1`
	`Switch(ProvisionPortVlanPortType)# showIntVlan review`
		Displays the commit, flush or review commands for VLAN interfaces.

Step 7	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionPortVlanPortType mode.

Configuration Example

```
Example 1: IPv4

Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq vlan-Id 100
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 ipv4-address
 address 22.22.22.3
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 ipv4-address
 mask 255.255.255.0
Switch(ProvisionPortVlanPortType)# createIntVlan review

Commands in queue:
   createIntVlan createIntVlanReq vlan-id 100
   createIntVlan createIntVlanReq address ipv4 ipv4-address address 22.22.22.3
   createIntVlan createIntVlanReq address ipv4 ipv4-address mask 255.255.255.0

Switch(ProvisionPortVlanPortType)# createIntVlan commit

   CreateIntVlan-Output.createIntVlanResp = 0

   Create Interface Vlan Commit Success!!!

Switch(ProvisionPortVlanPortType)# exit
Example 2: IPv6

Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq vlan-Id 100
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv6 ipv6-address
 2001:4::1/64
Switch(ProvisionPortVlanPortType)# createIntVlan review

Commands in queue:
   createIntVlan createIntVlanReq vlan-id 100
   createIntVlan createIntVlanReq address ipv6 ipv6-address 2001:4::1/64

Switch(ProvisionPortVlanPortType)# createIntVlan commit

   CreateIntVlan-Output.createIntVlanResp = 0

   Create Interface Vlan Commit Success!!!

Switch(ProvisionPortVlanPortType)# exit
Example 3:

Commands in queue: 1
showIntVlan showIntVlanReq vlan-list 1
Switch(ProvisionPortVlanPortType)# showIntVlan commit
ShowIntVlan_Output.showIntVlanResp.vlan_list[0].vlan_id = 1
ShowIntVlan_Output.showIntVlanResp.vlan_list[0].Link = 'LINK: 00-3a-99-fd-4a-38 Mtu:1500'
```

```
ShowIntVlan_Output.showIntVlanResp.vlan_list[0].dhcp = 'IPv4: 7.3.9.16/16  7.3.255.255'
ShowIntVlan_Output.showIntVlanResp.vlan_list[0].ipv6_address = 'IPv6:
fe80:2::23a:99ff:fefd:4a38/64'

Show Interface Vlan Commit Success!!!
Switch(ProvisionPortVlanPortType)# exit
```

Step 4—Configuring IP Route

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.

Step 2	**setiproute setIpRouteReq** {**gateway-ip** *WORD* |**ipv4-address** *WORD* |**ipv4-mask** *WORD*}
	
	Example:
	`Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq ipv4-address 22.22.22.0`
	
	`Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq ipv4-mask 255.255.255.0`
	
	`Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq gateway-ip 22.22.22.3`
		Configures the IP Route.
		• **gateway-ip—**Specifies the gateway IPv4 address.
		  ◦ *WORD*—IPv4 address.
		• **ipv4-address—**Specifies the IPv4 Network/Address.
		  ◦ *WORD*—IPv4 Network/Address.
		• **ipv4-mask—**Specifies the IPv4 mask.
		  ◦ *WORD*—IPv4 mask.

Step 3	**setiproute review** **Example:** `Switch(ProvisionNIDMgmtType)# setiproute review`	Displays the configuration.
Step 4	**getiproute commit** **Example:** `Switch(ProvisionNIDMgmtType)# setiproute commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq ipv4-address 22.22.22.0
Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq ipv4-mask 255.255.255.0
Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq gateway-ip 22.22.22.3

Switch(ProvisionNIDMgmtType)# setiproute review
Commands in Queue:
   setIpRoute setIpRouteReq ipv4-address 22.22.22.0
   setIpRoute setIpRouteReq ipv4-mask 255.255.255.0
   setIpRoute setIpRouteReq gateway-ip 22.22.22.3

Switch(ProvisionNIDMgmtType)# setiproute commit

   Setiproute Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Step 5—Creating Startup-config.xml File

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.

Step 2	**copyConfig copyConfigRequest** {**src** {**default-config** | **flash** *WORD* | **running-config** | **startup-config** | **tftp** *WORD*} | **dst** {**flash** *WORD* | **running-config** | **startup-config** | **tftp** *WORD*}}
	
	Example:
	`Switch(ProvisionConfigMGMTPortType)# copyConfig copyConfigRequest src running-config`
	
	`Switch(ProvisionConfigMGMTPortType)# copyConfig copyConfigRequest dst startup-config`
		For the purpose of creating a startup-config in XML format, src is specified as running-config and dst as startup-config. This creates a temporary running-config.xml file, applies it to startup-config.xml which is stored in flash. These can also be copied to a TFTP server.

Step 3	**copyConfig review** **Example:** `Switch(ProvisionConfigMGMTPortType)# copyConfig review`	Displays the configuration.
Step 4	**copyConfig commit** **Example:** `Switch(ProvisionConfigMGMTPortType)# copyConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionConfigMGMTPortType)# exit`	Exits the ProvisionConfigMGMTPortType mode.

Configuration Example

```
Switch# ProvisionConfigMGMTPortType
Switch(ProvisionConfigMGMTPortType)# copyConfig copyConfigRequest src running-config
Switch(ProvisionConfigMGMTPortType)# copyConfig copyConfigRequest dst startup-config

Switch(ProvisionConfigMGMTPortType)# copyConfig review
Commands in Queue:
   copyConfig copyConfigRequest src running-config
   copyConfig copyConfigRequest dst startup-config

Switch(ProvisionConfigMGMTPortType)# copyConfig commit

  CopyConfig Commit Success!!!

Switch(ProvisionConfigMGMTPortType)# exit
```

How to Manage Configurations

Listing Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**listConfigs listConfigsReq** **Example:** `Switch(ProvisionConfigMGMTPortType)# listConfigs listConfigsReq`	Lists the configuration.
Step 3	**listConfigs review** **Example:** `Switch(ProvisionConfigMGMTPortType)# listConfigs review`	Displays the configuration.
Step 4	**listConfigs commit** **Example:** `Switch(ProvisionConfigMGMTPortType)# listConfigs commit`	Fetches listing of flash configuration on the NID.
Step 5	**exit** **Example:** `Switch(ProvisionConfigMGMTPortType)# exit`	Exits the ProvisionConfigMGMTPortType mode.

Configuration Example

```
Switch# ProvisionConfigMGMTPortType
Switch(ProvisionConfigMGMTPortType)# listConfigs listConfigsReq
Switch(ProvisionConfigMGMTPortType)# listConfigs review

Commands in Queue:
   listConfigs listConfigsReq

Switch(ProvisionConfigMGMTPortType)# listConfigs commit

   ListConfigs_Output.configFiles.files[0].fileName = 'default-config'
   ListConfigs_Output.configFiles.files[0].fileSize = '    1100'
   ListConfigs_Output.configFiles.files[0].timeStamp = '1970-01-01 00:00:00'
   ListConfigs_Output.configFiles.files[0].permissions = 'r-'
   ListConfigs_Output.configFiles.files[1].fileName = 'startup-config'
   ListConfigs_Output.configFiles.files[1].fileSize = '    1552'
   ListConfigs_Output.configFiles.files[1].timeStamp = '1970-01-01 00:04:44'
   ListConfigs_Output.configFiles.files[1].permissions = 'rw'
   ListConfigs_Output.configFiles.files[2].fileName = 'startup-config.xml'
   ListConfigs_Output.configFiles.files[2].fileSize = '  149016'
   ListConfigs_Output.configFiles.files[2].timeStamp = '2014-03-25 10:15:58'
   ListConfigs_Output.configFiles.files[2].permissions = 'rw'
   ListConfigs_Output.configFiles.files[3].fileName = 'Totest'
   ListConfigs_Output.configFiles.files[3].fileSize = '  149016'
   ListConfigs_Output.configFiles.files[3].timeStamp = '2014-03-25 10:20:31'
   ListConfigs_Output.configFiles.files[3].permissions = 'rw'

   ListConfigs Commit Success!!!

Switch(ProvisionConfigMGMTPortType)# exit
```

Verifying Configuration Version

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionConfigMGMPortType** **Example:** `Switch# ProvisionConfigMGMPortType`	Enters the ProvisionConfigMGMPortType mode.
Step 2	**showVersion showVersionReq** **Example:** `Switch(ProvisionConfigMGMTPortType)# showVersion showVersionReq`	Displays the version.
Step 3	**showVersion review** **Example:** `Switch(ProvisionConfigMGMTPortType)# showVersion review`	Displays the configuration.
Step 4	**showVersion commit** **Example:** `Switch(ProvisionConfigMGMTPortType)# showVersion commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionConfigMGMTPortType)# exit`	Exits the ProvisionConfigMGMTPortType mode.

Configuration Example

Note

The Active.Image is the current image and Alternative.Image is the backup image. While upgrading the image, you can choose to swap Active.Image with Alternate.Image.

```
Switch# ProvisionConfigMGMTPortType
Switch(ProvisionConfigMGMTPortType)# showVersion showVersionReq
Switch(ProvisionConfigMGMTPortType)# showVersion review

Commands in Queue:
   showVersion showVersionReq

Switch(ProvisionConfigMGMTPortType)# showVersion commit

   ShowVersion-Output.showVersionResp.Active.Image = 'me1200-universal-mz.154-2.SN.dat'
   ShowVersion-Output.showVersionResp.Active.Version = 'ME1200 OS Software Build 15.4-2.SN'

   ShowVersion-Output.showVersionResp.Active.Date = 'Fri Mar 21 10:08:34 PDT 2014'
   ShowVersion-Output.showVersionResp.Alternative.Image = 'me1200-universal-mz.dat'
   ShowVersion-Output.showVersionResp.Alternative.Version = 'ME1200 OS Software Build
15.4-2.SN'
   ShowVersion-utput.showVersionResp.Alternative.Date = 'Fri Mar 21 05:56:50 PDT 2014'

   ShowVersion Commit Success!!!

Switch(ProvisionConfigMGMTPortType)# exit
```

Copying Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionConfigMGMPortType** **Example:** `Switch# ProvisionConfigMGMPortType`	Enters the ProvisionConfigMGMPortType mode.
Step 2	**copyConfig copyConfigRequest** {**src** {**default-config** | **flash** *WORD* | **running-config** | **startup-config** | **tftp** *WORD*} | **dst** {**flash** *WORD* | **running-config** | **startup-config** | **tftp** *WORD*}}	Copies the configuration. • **src**—Specifies the source location. ◦ **default**—Copies to the default-config file.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionConfigMGMTPortType)# copyConfig copyConfigRequest src running-config`
	`Switch(ProvisionConfigMGMTPortType)# copyConfig copyConfigRequest dst startup-config`
	In this example, the Source is the running-config, and the Destination is the startup-config. When you use these commands for the first time on the Cisco ME 1200 NID, the NID creates the startup-config.xml file in the flash, which is used during the device boot-up. When the device reloads for the first time, it uses the startup-config.xml file.
		◦ **flash—**Copies onto the flash.
		◦ *WORD***—**Filename. The format is flash:<filename>. For example, flash:ToTest.
		◦ **running-config—**Copies to the running-config file.
		◦ **startup-config—**Copies to the startup-config file.
		◦ **tftp—**Copies to the TFTP server.
		◦ *WORD***—**TFTP filename. The format is tftp://server/path-and-filename. For example, tftp://10.0.0.221/ToTest.
		• **dst—**Specifies the destination location.
		◦ **flash—**Copies onto the flash.
		◦ *WORD***—**Filename. The format is flash:<filename>. For example, flash:ToTest.
		◦ **running-config—**Copies to the running-config file.
		◦ **startup-config—**Copies to the startup-config file.
		◦ **tftp—**Copies to the TFTP server.
		◦ *WORD***—**TFTP filename. The format is tftp://server/path-and-filename. For example, tftp://10.0.0.221/ToTest.

Step 3	**copyConfig review** **Example:** `Switch(ProvisionConfigMGMTPortType)# copyConfig review`	Displays the configuration.
Step 4	**copyConfig commit** **Example:** `Switch(ProvisionConfigMGMTPortType)# copyConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionConfigMGMTPortType)# exit`	Exits the ProvisionConfigMGMTPortType mode.

Configuration Example

```
Switch# ProvisionConfigMGMTPortType
Switch(ProvisionConfigMGMTPortType)# copyConfig copyConfigRequest src running-config
Switch(ProvisionConfigMGMTPortType)# copyConfig copyConfigRequest dst startup-config
Switch(ProvisionConfigMGMTPortType)# copyConfig review

Commands in Queue:
   copyConfig copyConfigRequest src running-config
   copyConfig copyConfigRequest dst startup-config

Switch(ProvisionConfigMGMTPortType)# copyConfig commit

   CopyConfig Commit Success!!!

Switch(ProvisionConfigMGMTPortType)# exit
```

Note When the running-config file is copied to the TFTP server, by default, it stores the file in the XML format. You need not mention the XML extension explicitly. This hold good vice versa as well.

Note When the Source is TFTP and the Destination is running-config, the TFTP file *appends* to the existing running-config, and does not overwrite the running-config file.

Deleting Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionConfigMGMPortType** **Example:** `Switch# ProvisionConfigMGMPortType`	Enters the ProvisionConfigMGMPortType mode.
Step 2	**deleteConfFile configName** {**configFile***WORD*} **Example:** `Switch(ProvisionConfigMGMTPortType)# deleteConfFile configName configFile flash:ToTest`	Deletes the configuration. • **configFile—**Specifies the configuration file to be deleted. ◦ *WORD***—**File name. The format is **flash:filename**.
Step 3	**deleteConfFile review** **Example:** `Switch(ProvisionConfigMGMTPortType)# deleteConfFile review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**deleteConfFile commit** **Example:** `Switch(ProvisionConfigMGMTPortType)# deleteConfFile commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionConfigMGMTPortType)# exit`	Exits the ProvisionConfigMGMTPortType mode.

Configuration Example

```
Switch# ProvisionConfigMGMTPortType
Switch(ProvisionConfigMGMTPortType)# deleteConfFile configName configFile flash:ToTest
Switch(ProvisionConfigMGMTPortType)# deleteConfFile review

Commands in Queue:
   deleteConfFile configName configFile flash:ToTest

Switch(ProvisionConfigMGMTPortType)# deleteConfFile commit

   DeleteConfFile Commit Success!!!

Switch(ProvisionConfigMGMTPortType)# exit
```

What to Do Next

Use the **listConfigs listConfigsReq** command to verify the delete action.

```
Switch(ProvisionConfigMGMTPortType)# listConfigs listConfigsReq
Switch(ProvisionConfigMGMTPortType)# listConfigs review
Switch(ProvisionConfigMGMTPortType)# listConfigs commit
```

Reloading the System

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**reloadSystem reloadSystemReq** {**last-saved**} **Example:** `Switch(ProvisionConfigMGMTPortType)# reloadSystem reloadSystemReq last-saved`	Reloads the configuration. • **last-saved—**Reloads from the last saved configuration.

	Command or Action	Purpose
Step 3	**reloadSystem review** **Example:** `Switch(ProvisionConfigMGMTPortType)# reloadSystem review`	Displays the configuration.
Step 4	**reloadSystem commit** **Example:** `Switch(ProvisionConfigMGMTPortType)# reloadSystem commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionConfigMGMTPortType)# exit`	Exits the ProvisionConfigMGMTPortType mode.

Configuration Example

```
Switch# ProvisionConfigMGMTPortType
Switch(ProvisionConfigMGMTPortType)# reloadSystem reloadSystemReq last-saved
Switch(ProvisionConfigMGMTPortType)# reloadSystem review

Commands in Queue:
   reloadSystem reloadSystemReq last-saved

Switch(ProvisionConfigMGMTPortType)# reloadSystem commit

   ReloadSystem Commit Success!!!

Switch(ProvisionConfigMGMTPortType)# exit
```

Note To reboot the system with the last saved changes, copy the configurations from running-config (source) to startup-config.xml (destination) file before you reload the system. This ensures the system boots-up with the latest configuration.

Upgrading Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionConfigMGMPortType** **Example:** `Switch# ProvisionConfigMGMPortType`	Enters the ProvisionConfigMGMPortType mode.

	Command or Action	Purpose
Step 2	**upgradeImage upgradeImageRequest** {**swap** | **upgrade** {**tftp** *WORD*}} **Example:** `Switch(ProvisionConfigMGMTPortType)# upgradeImage upgradeImageRequest upgrade tftp tftp://<TFTP Server address>/<Path and file name>`	Upgrades the configuration. • **swap**—Swaps the configuration between Active and Alternate firmware images. **Note** When the Cisco ME1200 NID is upgraded, the previous image is stored as a Backup image in the flash. Use the **upgradeImage upgradeImageRequest swap** command to load the system with the old image. To view the Active and Alternative (backup) firmware images, see the Verifying Configuration Version. • **upgrade**—Upgrades the image. ◦ **tftp**—Specifies the TFTP location. ◦ *WORD*—TFTP details. Enter the tftp://server/path-and-filename.
Step 3	**upgradeImage review** **Example:** `Switch(ProvisionConfigMGMTPortType)# upgradeImage review`	Displays the configuration.
Step 4	**upgradeImage commit** **Example:** `Switch(ProvisionConfigMGMTPortType)# upgradeImage commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionConfigMGMTPortType)# exit`	Exits the ProvisionConfigMGMTPortType mode.

Configuration Example

```
Example 1: Upgrade

Switch# ProvisionConfigMGMTPortType
Switch(ProvisionConfigMGMTPortType)# upgradeImage upgradeImageRequest upgrade tftp
tftp://<TFTP Server address>/<Path and file name>
Switch(ProvisionConfigMGMTPortType)# upgradeImage review

Commands in Queue:
   upgradeImage upgradeImageRequest upgrade tftp tftp://<TFTP Server add>/<Path and file
name>

Switch(ProvisionConfigMGMTPortType)# upgradeImage commit

   UpgradeImage Commit Success!!!

Switch(ProvisionConfigMGMTPortType)# exit
```

```
Example 2: Swap


Switch# ProvisionConfigMGMTPortType
Switch(ProvisionConfigMGMTPortType)# upgradeImage upgradeImageRequest swap
Switch(ProvisionConfigMGMTPortType)# upgradeImage review

Commands in Queue:
   upgradeImage upgradeImageRequest swap

Switch(ProvisionConfigMGMTPortType)# upgradeImage commit

   UpgradeSwap commit success !!!!

Switch(ProvisionConfigMGMTPortType)# exit
```

CHAPTER 2

Administering the Cisco ME 1200 NID

This chapter describes how to perform one-time operations to administer the Cisco ME 1200 NID.

For more information, see Administering the Switch.

Prerequisites for Administering the NID

- NID must have an IP address.

How to Administer the Cisco ME 1200 NID

Configuring the System Clock

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**setclockConfig clockConfig** {**summerTime** {**endDate** *WORD* | **mode** {**disabled** | **nonRecurring** | **recurring**} | **name** *WORD* | **offSet** *Offset* | **startDate** *WORD*} | **timeZone** {**acronym** *WORD* | **hrOffSet** *hours* | **minOffSet** *mins*}}	Configures the Cisco ME 1200 NID clock. • **summerTime**—Configures the summer (daylight savings) time. ◦ **endDate**—Specifies the end date format. ◦ *WORD*—end date depends on the mode.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime endDate 3-31-2016-23-59`
	`Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime mode nonRecurring`
	`Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime name MyClock`
	`Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime offSet 3`
	`Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime startDate 3-31-2014-23-59`
	`Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig timeZone acronym IST`
	`Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig timeZone hrOffSet 5`
	`Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig timeZone minOffSet 30`
		For recurring mode, the format is **week-day-month-hrs:min**.Where,
		• week ranges from 1 to 5.
		• day ranges from 1 to 7.
		• month ranges from 1 to 12.
		• hrs ranges from 0-23.
		• min ranges from 0-59.
		For nonrecurring mode, the format is **month-day-year-hrs:min**.
		• month ranges from 1 to 12.
		• day ranges from 1 to 31.
		• year ranges from 2000-2097.
		• hrs ranges from 0-23.
		• min ranges from 0-59.
		◦ **mode—**Specifies the day light saving time mode.
		◦ **disabled—**Disables the day light saving time.
		◦ **nonRecurring—**Specifies the standard mode.
		◦ **recurring—**Specifies the recurring mode.
		◦ **name—**Specifies the name of time zone in summer.
		◦ *WORD*—Clock name.
		◦ **offSet—**Specifies the Offset to add in minutes.
		◦ *Offset*—offset time. The range is from 1 to 1440 minutes.
		◦ **startDate—**Specifies the start date format.
		◦ *WORD*—start date depends on the mode. For recurring mode, the format is **week-day-month-hrs:min**.Where,
		• week ranges from 1 to 5.
		• day ranges from 1 to 7.
		• month ranges from 1 to 12.
		• hrs ranges from 0-23.

	Command or Action	Purpose
		• min ranges from 0-59. For nonrecurring mode, the format is **month-day-year-hrs:min**. Where, • month ranges from 1 to 12. • day ranges from 1 to 31. • year ranges from 2000-2097. • hrs ranges from 0-23. • min ranges from 0-59. • **timeZone**—Configures the time zone. ◦ **acronym**—Specifies the name of time zone. ◦ *WORD*—time zone name. ◦ **hrOffSet**—Specifies the off set hours from Universal Time Coordinated (UTC). ◦ *hours*—off set hour from UTC. The range is from minus(-) 23 to 23. ◦ **minOffSet**—Specifies the offset minutes from UTC. ◦ *mins*—off set minutes from UTC. The range is from 0-59.
Step 3	**setclockConfig review** **Example:** `Switch(ProvisionNIDMgmtType)# setclockConfig review`	Displays the configuration.
Step 4	**setclockConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# setclockConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime endDate 3-31-2016-23-59

Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime mode nonRecurring
Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime name MyClock
Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime offSet 3
Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig summerTime startDate 3-31-2014-23-59

Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig timeZone acronym IST
Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig timeZone hrOffSet 5
Switch(ProvisionNIDMgmtType)# setClockConfig clockConfig timeZone minOffSet 30

Switch(ProvisionNIDMgmtType)# setclockConfig review
Commands in queue:
    setClockConfig clockConfig summerTime endDate 3-31-2016-23-59
    setClockConfig clockConfig summerTime mode nonRecurring
    setClockConfig clockConfig summerTime name MyClock
    setClockConfig clockConfig summerTime offSet 3
    setClockConfig clockConfig summerTime startDate 3-31-2014-23-59
    setClockConfig clockConfig timeZone acronym IST
    setClockConfig clockConfig timeZone hrOffSet 5
    setClockConfig clockConfig timeZone minOffSet 30

Switch(ProvisionNIDMgmtType)# setclockConfig commit
    SetClockConfig Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Viewing the System Clock

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**getClockConfig detailClock** **Example:** `Switch(ProvisionNIDMgmtType)# getClockConfig detailClock`	Displays the clock details.
Step 3	**getClockConfig review** **Example:** `Switch(ProvisionNIDMgmtType)# getClockConfig review`	Displays the configuration.
Step 4	**getClockConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# getClockConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDmgmt Type mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# getClockConfig detailClock
Switch(ProvisionNIDMgmtType)# getClockConfig review

Commands in queue:
    getClockConfig detailClock

Switch(ProvisionNIDMgmtType)# getClockConfig commit

    GetClockConfig-Output.clockConfig.timeZone.hrOffSet = 5
    GetClockConfig-Output.clockConfig.timeZone.minOffSet = 30
    GetClockConfig-Output.clockConfig.timeZone.acronym = 'IST'
    GetClockConfig-Output.clockConfig.summerTime.name = ''
    GetClockConfig-Output.clockConfig.summerTime.mode.t = 1
    GetClockConfig-Output.clockConfig.summerTime.mode.u.disabled = ''
    GetClockConfig-Output.clockConfig.summerTime.startDate = ''
    GetClockConfig-Output.clockConfig.summerTime.endDate = ''
    GetClockConfig-Output.clockConfig.summerTime.offSet = 1

    GetClockConfig Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Verifying System Clock Settings

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**showclock showClockReq** {**show-clock**} **Example:** `Switch(ProvisionNIDMgmtType)# showclock showClockReq show-clock`	Displays the clock details.
Step 3	**showclock review** **Example:** `Switch(ProvisionNIDMgmtType)# showclock review`	Displays the configuration.
Step 4	**showclock commit** **Example:** `Switch(ProvisionNIDMgmtType)# showclock commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# showclock showClockReq show-clock
Switch(ProvisionNIDMgmtType)# showclock review

Commands in queue:
    showClock showClockReq show-clock

Switch(ProvisionNIDMgmtType)# showclock commit
    ShowClock-Output.showClockResp.clock-info = 'System Time   : 1970-01-02T19:17:07+05:30'


    ShowClock Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Clearing IP ARP Entries

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**clearIpArpEntries clearIpArpEntriesReq** {**all**} **Example:** `Switch(ProvisionNIDMgmtType)# clearIpArpEntries clearIpArpEntriesReq all`	Clears the IP ARP entries.
Step 3	**clearIpArpEntries review** **Example:** `Switch(ProvisionNIDMgmtType)# clearIpArpEntries review`	Displays the configuration.
Step 4	**clearIpArpEntries commit** **Example:** `Switch(ProvisionNIDMgmtType)# clearIpArpEntries commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# clearIpArpEntries clearIpArpEntriesReq all
Switch(ProvisionNIDMgmtType)# clearIpArpEntries review

Commands in queue:
    clearIpArpEntries clearIpArpEntriesReq all

Switch(ProvisionNIDMgmtType)# clearIpArpEntries commit

    ClearIpArpEntries-Output.clearIpArpEntriesResp = 0

    ClearIpArpEntries Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Verifying IP ARP Entries

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**showIpArp showIpArpEntriesReq** {**all**} **Example:** `Switch(ProvisionNIDMgmtType)# showIpArp showIpArpEntriesReq all`	Displays the IP ARP details.
Step 3	**showIpArp review** **Example:** `Switch(ProvisionNIDMgmtType)# showIpArp review`	Displays the configuration.
Step 4	**showIpArp commit** **Example:** `Switch(ProvisionNIDMgmtType)# showIpArp commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmt Type mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# showIpArp showIpArpEntriesReq all
Switch(ProvisionNIDMgmtType)# showIpArp review

Commands in queue:
    showIpArpEntriesReq all

Switch(ProvisionNIDMgmtType)# showIpArp commit

    ShowIpArp-Output.showIpArpEntriesResp.arp-entry[0] = '10.0.0.1 via
VLAN10:00-00-0c-07-ac-03'
    ShowIpArp-Output.showIpArpEntriesResp.arp-entry[1] = '10.0.10.21 via
VLAN10:e9-ed-f3-78-27-c0'

    ShowIpArp Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Configuring IP Route Global Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**ipRoutingGlobalConfig ipRoutingGlobalConfigReq** {**disable** | **enable**} **Example:** `Switch(ProvisionNIDMgmtType)# ipRoutingGlobalConfig ipRoutingGlobalConfigReq enable`	Configures the IP routing global configuration. • **disable—**Disables the IP Routing. • **enable—**Enables the IP Routing.
Step 3	**ipRoutingGlobalConfig review** **Example:** `Switch(ProvisionNIDMgmtType)# ipRoutingGlobalConfig review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**ipRoutingGlobalConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# ipRoutingGlobalConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmt Type mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# ipRoutingGlobalConfig ipRoutingGlobalConfigReq enable
Switch(ProvisionNIDMgmtType)# ipRoutingGlobalConfig review

Commands in queue:
    ipRoutingGlobalConfig ipRoutingGlobalConfigReq enable

Switch(ProvisionNIDMgmtType)# ipRoutingGlobalConfig commit

    IpRoutingGlobalConfig Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Configuring IP Route

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.

Step 2	**setiproute setIpRouteReq** {**gateway-ip** *WORD* | **ipv4-address** *WORD* | **ipv4-mask** *WORD*}
	
	Example:
	`Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq ipv4-address 10.0.144.0`
	
	`Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq ipv4-mask 255.255.255.0`
	
	`Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq gateway-ip 10.0.0.1`
		Configures the IP Route.
		• **gateway-ip—**Specifies the gateway IPv4 address.
		　◦ *WORD*—IPv4 address.
		• **ipv4-address—**Specifies the IPv4 Network/Address.
		　◦ *WORD*—IPv4 Network/Address.
		• **ipv4-mask—**Specifies the IPv4 mask.

	Command or Action	Purpose
		◦ *WORD*—IPv4 mask.
Step 3	**setiproute review** **Example:** `Switch(ProvisionNIDMgmtType)# setiproute review`	Displays the configuration.
Step 4	**getClockConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# setiproute commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq ipv4-address 10.0.144.0
Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq ipv4-mask 255.255.255.0
Switch(ProvisionNIDMgmtType)# setIpRoute setIpRouteReq gateway-ip 10.0.0.1

Switch(ProvisionNIDMgmtType)# setiproute review
Commands in Queue:
   setIpRoute setIpRouteReq ipv4-address 10.0.144.0
   setIpRoute setIpRouteReq ipv4-mask 255.255.255.0
   setIpRoute setIpRouteReq gateway-ip 10.0.0.1

Switch(ProvisionNIDMgmtType)# setiproute commit

   Setiproute Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Viewing IP Route

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.

	Command or Action	Purpose
Step 2	**showiproute showIpRouteReq** {**all**} **Example:** `Switch(ProvisionNIDMgmtType)# showiproute showIpRouteReq all`	Displays the IP route details. • **all—**Specifies the IP route entries.
Step 3	**showiproute review** **Example:** `Switch(ProvisionNIDMgmtType)# showiproute review`	Displays the configuration.
Step 4	**showiproute commit** **Example:** `Switch(ProvisionNIDMgmtType)# showiproute commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# showiproute showIpRouteReq all
Switch(ProvisionNIDMgmtType)# showiproute review

Commands in queue:
    showIpRoute showIpRouteReq all

Switch(ProvisionNIDMgmtType)# showiproute commit

    ShowIpRoute_Output.showIpRouteResp.ip_route-entry[0] = '0.0.0.0/0 via 10.25.0.1 [UP
GATEWAY HW_RT]'
    ShowIpRoute_Output.showIpRouteResp.ip_route-entry[1] = '10.25.0.0/16 via  [UP HW_RT]'
    ShowIpRoute_Output.showIpRouteResp.ip_route-entry[2] = '127.0.0.1/32 via 127.0.0.1 [UP
 HOST]'
   ShowIpRoute_Output.showIpRouteResp.ip_route-entry[3] = '202.153.0.0/16 via 7.25.0.1 [UP
 GATEWAY HW_RT]'
   ShowIpRoute_Output.showIpRouteResp.ip_route-entry[4] = '224.0.0.0/4 via 127.0.0.1 [UP]'


    ShowIpRoute Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Removing IP Route

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.

Step 2	**removeiproute removeIpRouteReq** {**gateway-ip** *WORD* | **ipv4-address** *WORD* | **ipv4-mask** *WORD*}
	
	Example:
	`Switch(ProvisionNIDMgmtType)# removeiproute removeIpRouteReq ipv4-address 10.0.144.0`
	
	`Switch(ProvisionNIDMgmtType)# removeiproute removeIpRouteReq ipv4-mask 255.255.255.0`
	
	`Switch(ProvisionNIDMgmtType)# removeiproute removeIpRouteReq gateway-ip 10.0.0.1`
		Removes the IP Route.
		• **gateway-ip—**Specifies the gateway IPv4 address.
		  ◦ *WORD*—IPv4 address.
		• **ipv4-address—**Specifies the IPv4 Network/Address.
		  ◦ *WORD*—IPv4 Network/Address.
		• **ipv4-mask—**Specifies the IPv4 mask.
		  ◦ *WORD*—IPv4 mask.

Step 3	**removeIpRoute review** **Example:** `Switch(ProvisionNIDMgmtType)# removeIpRoute review`	Displays the configuration.
Step 4	**removeIpRoute commit** **Example:** `Switch(ProvisionNIDMgmtType)# removeIpRoute commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# removeiproute removeIpRouteReq ipv4-address 10.0.144.0
Switch(ProvisionNIDMgmtType)# removeiproute removeIpRouteReq ipv4-mask 255.255.255.0
Switch(ProvisionNIDMgmtType)# removeiproute removeIpRouteReq gateway-ip 10.0.0.1

Switch(ProvisionNIDMgmtType)#removeIpRoute review
```

```
Commands in queue:
    removeiproute removeIpRouteReq ipv4-address 10.0.144.0
    removeiproute removeIpRouteReq ipv4-mask 255.255.255.0
    removeiproute removeIpRouteReq gateway-ip 10.0.0.1

Switch(ProvisionNIDMgmtType)# removeIpRoute commit

    Removeiproute Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Configuring IP DNS Proxy Request

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**setipdnsProxyConfig setIpDNSProxyConfigReq** {**dns-proxy**} **Example:** `Switch(ProvisionNIDMgmtType)# setipdnsProxyConfig setIpDNSProxyConfigReq dns-proxy`	Configures the IP DNS proxy request. • **dns_proxy—**Configures the DNS proxy service.
Step 3	**setipdnsProxyConfig review** **Example:** `Switch(ProvisionNIDMgmtType)# setipdnsProxyConfig review`	Displays the configuration.
Step 4	**setipdnsProxyConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# setipdnsProxyConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# setipdnsProxyConfig setIpDNSProxyConfigReq dns-proxy
Switch(ProvisionNIDMgmtType)# setipdnsProxyConfig review

Commands in queue:
    setIpDnsProxyConfig setIpDNSProxyConfigReq dns-proxy

Switch(ProvisionNIDMgmtType)# setipdnsProxyConfig commit

    SetIpDnsProxyConfig Commit Success!!!
```

```
Switch(ProvisionNIDMgmtType)# exit
```

Removing IP DNS Proxy Request Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**removeipdnsProxyConfig removeIpDnsProxyConfigReq** {**dns_proxy**} **Example:** `Switch(ProvisionNIDMgmtType)# removeipdnsProxyConfig removeIpDnsProxyConfigReq dns-proxy`	Removes the IP DNS proxy configuration.
Step 3	**removeipdnsProxyConfig review** **Example:** `Switch(ProvisionNIDMgmtType)# removeipdnsProxyConfig review`	Displays the configuration.
Step 4	**removeipdnsProxyConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# removeipdnsProxyConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmtType mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# removeipdnsProxyConfig removeIpDnsProxyConfigReq dns-proxy
Switch(ProvisionNIDMgmtType)# removeipdnsProxyConfig review

Commands in queue:
   removeIpDnsProxyConfig removeIpDnsProxyConfigReq dns-proxy

Switch(ProvisionNIDMgmtType)# removeipdnsProxyConfig commit

   RemoveIpDnsProxyConfig Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Configuring the Name Server

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**setnameServerConfig setNameServerConfigReq** {**dhcp** {**vlan-interface** *vlan-id*} | **ipv4-address** *WORD*} **Example:** `Switch(ProvisionNIDMgmtType)# setNameServerConfig setNameServerConfigReq ipv4-address 10.0.0.5`	Configures the name server. • **dhcp—**Specifies the Dynamic Host Configuration Protocol. ◦ **vlan-interface—**Select an VLAN interface to configure. ◦ *vlan_id*—Vlan ID. The range is from 1 to 4093. • **ipv4-address—**Specifies IPv4 unicast address. ◦ *WORD* —IPv4 unicast address.
Step 3	**setnameServerConfig review** **Example:** `Switch(ProvisionNIDMgmtType)# setnameServerConfig review`	Displays the configuration.
Step 4	**setnameServerConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# setnameServerConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmt Type mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# setNameServerConfig setNameServerConfigReq ipv4-address
10.0.0.5
Switch(ProvisionNIDMgmtType)# setNameServerConfig review

Commands in queue:
```

```
    setNameServerConfig setNameServerConfigReq ipv4-address 10.0.0.5
Switch(ProvisionNIDMgmtType)# setNameServerConfig commit
    nid-create-SetNameServerConfig-req-file 7421
    SetNameServerConfig Commit Success!!!
Switch(ProvisionNIDMgmtType)# exit
```

Verifying the Name Server

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**shownameServerConfig showNameSeverConfigReq** {**config**} **Example:** `Switch(ProvisionNIDMgmtType)# shownameServerConfig showNameSeverConfigReq config`	Displays the name server details. • **config—**Displays the name server configuration.
Step 3	**shownameServerConfig review** **Example:** `Switch(ProvisionNIDMgmtType)# shownameServerConfig review`	Displays the configuration.
Step 4	**shownameServerConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# shownameServerConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmt Type mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# shownameServerConfig showNameSeverConfigReq config
Switch(ProvisionNIDMgmtType)# shownameServerConfig review

Commands in queue:
   shownameServerConfig showNameSeverConfigReq config

Switch(ProvisionNIDMgmtType)# shownameServerConfig commit
ShowNameServerConfig-Output.showNameServerConfigResp.name-server-config = 'Current DNS
server is 7.0.0.3 set by STATIC.'
```

```
  ShowNameServerConfig Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Removing the Name Server

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**removenameServerConfig removeNameServerConfigReq** {**name-server**} **Example:** `Switch(ProvisionNIDMgmtType)# removenameServerConfig removeNameServerConfigReq name-server`	Removes the name server. • **name-server—**Specifies the domain name system removal.
Step 3	**removenameServerConfig review** **Example:** `Switch(ProvisionNIDMgmtType)# removenameServerConfig review`	Displays the configuration.
Step 4	**getClockConfig commit** **Example:** `Switch(ProvisionNIDMgmtType)# removenameServerConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exits the ProvisionNIDMgmt Type mode.

Configuration Example

```
Switch# ProvisionNIDMgmtType
Switch(ProvisionNIDMgmtType)# removenameServerConfig removeNameServerConfigReq name-server
Switch(ProvisionNIDMgmtType)# removenameServerConfig review

Commands in queue:
    removenameServerConfig removeNameServerConfigReq name-server

Switch(ProvisionNIDMgmtType)# removenameServerConfig commit

    RemoveNameServerConfig Commit Success!!!

Switch(ProvisionNIDMgmtType)# exit
```

Adding User

SUMMARY STEPS

1. **ProvisionNIDMgmtType**
2. **addUser**
3. **addUser addUserReq** { **username** | **password**{ **encrypted** | **none** | **unencrypted** } | **privilege** }
4. **addUser review**
5. **addUser commit**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch(ProvisionNIDMgmtType)# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**addUser** **Example:** `Switch(ProvisionNIDMgmtType)# addUser`	Enters the addUser mode. You can add a user and assign rights from this mode.

Step 3	**addUser addUserReq** { **username** | **password**{ **encrypted** | **none** | **unencrypted** } | **privilege** }
	
	Example:
	`Switch(ProvisionNIDMgmtType)# addUser`
	`Switch(ProvisionNIDMgmtType)# addUser addUserReq username niduser1_p`
	`Switch(ProvisionNIDMgmtType)# addUser addUserReq password encrypted me1200vbox`
	`Switch(ProvisionNIDMgmtType)# addUser addUserReq privilege 15`
		Configures user for the Cisco ME 1200 NID.
		
		• **username—**Configures the username . The length of the username must be within 31 character. You can include letters, numbers and underscore to assign a username.
		
		• **password—**Configures the password for the username.
		◦ **encrypted—** Configures an encrypted password. The length of the password must be within 31 character.
		◦ **unencrypted—** Configures an unencrypted password. The length of the password must be within 31 character.
		◦ **none—** Configures without a password.
		
		• **privilege—**Configures the privilege level for a user. You can assign a value from 0 to 15.

	Command or Action	Purpose
Step 4	**addUser review** **Example:** `Switch(ProvisionNIDMgmtType)# addUser review`	Displays the configuration of the user.
Step 5	**addUser commit** **Example:** `Switch(ProvisionNIDMgmtType)# addUser commit`	Sends the configuration of the user to the NID.
Step 6	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exist the provisionNIDmgmt Type mode.

Remove User

SUMMARY STEPS

1. **ProvisionNIDMgmtType**
2. **removeUser**
3. **removeUser removeUserReq username**
4. **removeUser review**
5. **addUser commit**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**removeUser** **Example:** `Switch(ProvisionNIDMgmtType)# removeUser`	Enters the addUser mode. You can add a user and assign rights from this mode.

Step 3	**removeUser removeUserReq username**
	
	Example:
	`Switch(ProvisionNIDMgmtType)# removeUser`
	`Switch(ProvisionNIDMgmtType)# removeUser removeUserReq username niduser1_p`
		• **username**—Removes the username from the username list .

	Command or Action	Purpose
Step 4	**removeUser review** **Example:** `Switch(ProvisionNIDMgmtType)# removeUser review`	Displays the configuration of the user.
Step 5	**addUser commit** **Example:** `Switch(ProvisionNIDMgmtType)# removeUser commit`	Sends the configuration of the user to the Cisco ME 1200 NID.
Step 6	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exist the provisionNIDmgmt Type mode.

Viewing User Information

SUMMARY STEPS

1. **ProvisionNIDMgmtType**
2. **showUsersConfigured**
3. **showUsersConfigured showUsersConfiguredReq all**
4. **showUsersConfigured review**
5. **showUsersConfigured commit**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**showUsersConfigured** **Example:** `Switch(ProvisionNIDMgmtType)# showUsersConfigured`	Enters the showUsersConfigured mode. You can view all users information.

Step 3	**showUsersConfigured showUsersConfiguredReq all**
	
	Example:
	`Switch(ProvisionNIDMgmtType)# showUsersConfigured`
	`Switch(ProvisionNIDMgmtType)# showUsersConfigured showUsersConfiguredReq all`
		• **all—**Displays all IP routes .

	Command or Action	Purpose
Step 4	**showUsersConfigured review** **Example:** `Switch(ProvisionNIDMgmtType)# showUsersConfigured review`	Displays the configuration of the user.
Step 5	**showUsersConfigured commit** **Example:** `Switch(ProvisionNIDMgmtType)# showUsersConfigured commit`	Sends the configuration of the user to the Cisco ME 1200 NID.
Step 6	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exist the provisionNIDmgmt Type mode.

Viewing Logged In User Information

SUMMARY STEPS

1. **ProvisionNIDMgmtType**
2. **removeUser**
3. **showUsersLoggedIn showUsersLoggedInReq all**
4. **showUsersLoggedIn review**
5. **showUsersLoggedIn commit**
6. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNIDMgmtType** **Example:** `Switch# ProvisionNIDMgmtType`	Enters the ProvisionNIDMgmtType mode.
Step 2	**removeUser** **Example:** `Switch(ProvisionNIDMgmtType)# showUsersLoggedIn`	Enters the showUsersLoggedInReq mode. You can view all logged in users and their information.

Step 3	**showUsersLoggedIn showUsersLoggedInReq all**
	
	Example:
	`Switch(ProvisionNIDMgmtType)# showUsersLoggedIn`
	`Switch(ProvisionNIDMgmtType)# showUsersLoggedIn showUsersLoggedInReq all`
		• **all**—Displays all IP routes .

	Command or Action	Purpose
Step 4	**showUsersLoggedIn review** **Example:** `Switch(ProvisionNIDMgmtType)# showUsersLoggedIn review`	Displays the configuration of the user.
Step 5	**showUsersLoggedIn commit** **Example:** `Switch(ProvisionNIDMgmtType)# showUsersLoggedIn commit`	Sends the configuration of the user to the Cisco ME 1200 NID.
Step 6	**exit** **Example:** `Switch(ProvisionNIDMgmtType)# exit`	Exist the provisionNIDmgmt Type mode.

CHAPTER 3

Configuring Notifications

This chapter describes how to configure notifications on Cisco ME 1200 NID.

Prerequisites for Configuring Notifications

- NID must have an IP address.

Restrictions for Configuring Notifications

- Only the first three notification lists are supported. They are:
    - Notifications_list 1 for HeartBeat notifications.
    - Notifications_list 2 for Config Change Trap notifications.
    - Notifications_list 3 for Asynchronous failure notifications.

Note In case, the other notification lists are configured, the configuration does not get applied.

Information About Notifications

Notifications are asynchronous messages generated by NID based on the events. The notifications are transported over HTTP POST request. The NID acts as an HTTP client and server.

Types of Notifications

The Cisco ME 1200 NID supports three types of notifications:

- HeartBeat Notifications
- Config Change Trap Notifications
- Asynchronous Failure Notifications

HeartBeat Notifications

Heartbeat notifications are used to check the liveliness of the NID. This corresponds to the module_id = 1, and the notification_id = 1. You can use the **setNotificationReceiver setNotificationReceiver_req heartbeat 30** command to configure the HeartBeat to 30 seconds. If theNID does not receive the heartbeat notification within 30 seconds, the NID waits for an additional 60 seconds before announcing Cisco ME 1200 NID as DOWN.

Config Change Trap Notifications

The registered server receives configuration change notifications when any other controller does prime changes or accesses the NID through XML. This corresponds to the module_id = 2, and the notification_id = 1.

Asynchronous Failure Notifications (ICLI failures)

The NID receives asynchronous failure notifications, when there are ICLI failures. Every commit action (SOAP action) on the NID is translated into multiple ICLI commands on NID, and if there are failures during the ICLI command execution, an asynchronous failure notification is sent to theNID that has registered to receive the asynchronous failure notification. This corresponds to the module_id = 3 , and the notification_id = 1.

How to Configure Notifications

Viewing Notifications

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNotifications** **Example:** `Switch# ProvisionNotifications`	Enters the Notifications mode.

	Command or Action	Purpose
Step 2	**getNotificationList listAllNotifications-req** **Example:** `Switch(ProvisionNotifications)# getNotificationList listAllNotifications-req`	Displays the supported notifications list for that module.
Step 3	**getNotificationList review** **Example:** `Switch(ProvisionNotifications)# getNotificationList review`	Displays the configuration.
Step 4	**getNotificationList commit** **Example:** `Switch(ProvisionNotifications)# getNotificationList commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNotifications)# exit`	Exits the Notifications mode.

Configuration Example

```
Switch# ProvisionNotifications
Switch(ProvisionNotifications)# getNotificationList  listAllNotifications-req
Switch(ProvisionNotifications)# getNotificationList review

Commands in queue:
    getNotificationList listAllNotifications-req

Switch(ProvisionNotifications)# getNotificationList commit

    GetNotificationList-Output.listAllNotifications-resp.notification[0].module-id = 1
   GetNotificationList-Output.listAllNotifications-resp.notification[0].module-description
 = 'HeartBeat'
    GetNotificationList-Output.listAllNotifications-resp.notification[0].notification-id =
 1

GetNotificationList-Output.listAllNotifications-resp.notification[0].notification-description
 = 'Heartbeat Notifications'
    GetNotificationList-Output.listAllNotifications-resp.notification[1].module-id = 2
   GetNotificationList-Output.listAllNotifications-resp.notification[1].module-description
 = 'ConfigChangeTrap'
    GetNotificationList-Output.listAllNotifications-resp.notification[1].notification-id =
 1

GetNotificationList-Output.listAllNotifications-resp.notification[1].notification-description
 = 'Config Change Notifications'
    GetNotificationList-Output.listAllNotifications-resp.notification[2].module-id = 3
   GetNotificationList-Output.listAllNotifications-resp.notification[2].module-description
 = 'AsyncNotification'
    GetNotificationList-Output.listAllNotifications-resp.notification[2].notification-id =
 1

GetNotificationList-Output.listAllNotifications-resp.notification[2].notification-description
 = 'ICLI command failure'

    GetNotificationList Commit Success!!!
```

```
Switch(ProvisionNotifications)# exit
```

Configuring Notifications

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNotifications** **Example:** `Switch# ProvisionNotifications`	Enters the Notifications mode.

Step 2	**setNotificationReceiver setNotificationReceiver-req** {**heartbeat** *heartbeat* | **http-BA-password** *WORD* | **http-BA-user** *WORD* | **http-file-path** *WORD* |**http-server-address** *WORD*}
	
	Example:
	`Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req heartbeat 30`
	`Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req http-B-password lab123`
	`Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req http-BA-user guest123`
	`Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req http-file-path myfiles/nid-notification`
	`Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req http-server-address 10.20.30.40`
		Configures the values for receiving the notifications.
		• **heartbeat—**Specifies the rate at which keepalive packets are expected (in seconds).
		• *heartbeat*—Heartbeat rate. The range is from 1 to 65535.
		• **http-BA-password—**Specifies the HTTP basic authentication password.
		• *WORD*—Password.
		• **http-BA-user—**Specifies the HTTP basic authentication user.
		• *WORD*—user.
		• **http-file-path—**Specifies the name of a document/resource. For example: /nid-notification.
		• *WORD*—name of a document.
		• **http-server-address—**Specifies the HTTP server IP address.
		• *WORD*—HTTP Server IP address.

Step 3	**setNotificationReceiver review** **Example:** `Switch(ProvisionNotifications)# setNotificationReceiver review`	Displays the configuration.
Step 4	**setNotificationReceiver commit** **Example:** `Switch(ProvisionNotifications)# setNotificationReceiver commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionNotifications)# exit`	Exits the Notifications mode.

Configuration Example

```
Switch# ProvisionNotifications
Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req heartbeat
 30
Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req
http-BA-password lab123
Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req
http-BA-user guest123
Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req
http-file-path myfiles/nid-notification
Switch(ProvisionNotifications)# setNotificationReceiver setNotificationReceiver-req
http-server-address 10.20.30.40
Switch(ProvisionNotifications)# setNotificationReceiver review

Commands in queue:
    setNotificationReceiver setNotificationReceiver-req heartbeat 30
    setNotificationReceiver setNotificationReceiver-req http-BA-password lab123
    setNotificationReceiver setNotificationReceiver-req http-BA-user guest123
    setNotificationReceiver setNotificationReceiver-req http-file-path
myfiles/nid-notification
    setNotificationReceiver setNotificationReceiver-req http-server-address 10.20.30.40

Switch(ProvisionNotifications)# setNotificationReceiver commit

    SetNotificationReceiver-Output.setNotificationReceiver-resp.registerOK = true
    SetNotificationReceiver-Output.setNotificationReceiver-resp.cookie = 5120

    SetNotificationReceiver Commit Success!!!!

Switch(ProvisionNotifications)# exit
```

Note Use this procedure to generate multiple cookies. In the above mentioned example, 5120 is the cookie value.

Registering for HeartBeat Notification

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNotifications** **Example:** `Switch# ProvisionNotifications`	Enters the Notifications mode.

	Command or Action	Purpose

Step 2	**registerForNotification regForNotification_req** {**cookie** *cookie value* |**notifications-list** *List of notifications* {**enable** {**enable** | **disable**} | **module-id** *Module ID* | **notification-id** *Notification ID* }}
	
	Example:
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req cookie 5120`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 1 enable enable`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 1 module-id 1`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 1 notification-id 1`
	Note For the Heartbeat notification, the notification-list is 1, the module-id is 1, and the notification-id is 1.
		Lists all the registered notifications under the generated cookie.
		• **cookie—**Specifies the notification cookie with unique cookie value.
		• *cookie value*—cookie value. The range is from 1 to 65535.
		• **notifications-list—**Specifies the list of notifications.
		• *List of notifications*—list of notification ranges from 1 to 10, where, the supported lists are from 1 to 3.
		• **enable—**Enables or disables the notification.
		• **module-id—**Specifies the module ID from which notifications are desired.
		• *Module ID*—Module ID. The range is from 1 to 65536.
		• **notification-id—**Specifies the notification ID.
		• *Notification ID*—list of notification ranges from 1 to 10, wherein the supported lists are from 1 to 3.

Step 3	**registerForNotification review** **Example:** `Switch(ProvisionNotifications)# registerForNotification review`	Displays the configuration.
Step 4	**registerForNotification commit** **Example:** `Switch(ProvisionNotifications)# registerForNotification commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNotifications)# exit`	Exits the Notifications mode.

Configuration Example

```
Switch# ProvisionNotifications
Switch(ProvisionNotifications)# registerForNotification regForNotification_req cookie 5120
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 1 enable enable
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 1 module-id 1
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 1 notification-id 1
Switch(ProvisionNotifications)# registerForNotification review
```

```
Commands in queue:
    registerForNotification regForNotification_req cookie 5120
    registerForNotification regForNotification_req notifications-list 1 enable enable
    registerForNotification regForNotification_req notifications-list 1 module-id 1
    registerForNotification regForNotification_req notifications-list 1 notification-id 1

Switch(ProvisionNotifications)# registerForNotification commit

    RegisterForNotification-Output.regForNotification-resp = 0
    RegisterForNotification Commit Success!!!

Switch(ProvisionNotifications)# exit
```

Registering for Config Change Trap Notification

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNotifications** **Example:** `Switch# ProvisionNotifications`	Enters the Notifications mode.

Step 2	**registerForNotification regForNotification_req** {**cookie** *cookie value* | **notifications-list** *List of notifications* {**enable** {**enable** | **disable**} |**module-id** *Module ID* |**notification-id** *Notification ID* }}
	
	Example:
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req cookie 5120`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 2 enable enable`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 2 module-id 2`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 2 notification-id 1`
	Note For the ConfigChangeTrap notification, the notification-list is 2, the module-id is 2, and the notification-id is 1.
		Lists all the registered notifications under the generated cookie.
		• **cookie—**Specifies the notification cookie with unique cookie value.
		• *cookie value*—cookie value. The range is from 1 to 65535.
		• **notifications-list—**Specifies the list of notifications.
		• *List of notifications*—list of notification ranges from 1 to 10, where, the supported lists are from 1 to 3.
		• **enable—**Enables or disables the notification.
		• **module-id—**Specifies the module ID from which notifications are desired.
		• *Module ID*—Module ID. The range is from 1 to 65536.
		• **notification-id—**Specifies the notification ID.
		• *Notification ID*—list of notification ranges from 1 to 10, wherein the supported lists are from 1 to 3.

Step 3	**registerForNotification review** **Example:** `Switch(ProvisionNotifications)# registerForNotification review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**registerForNotification commit** **Example:** `Switch(ProvisionNotifications)# registerForNotification commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNotifications)# exit`	Exits the Notifications mode.

Configuration Example

```
Switch# ProvisionNotifications
Switch(ProvisionNotifications)# registerForNotification regForNotification_req cookie 5120
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 2 enable enable
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 2 module-id 2
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 2 notification-id 1
Switch(ProvisionNotifications)# registerForNotification review

Commands in queue:
    registerForNotification regForNotification_req cookie 5120
    registerForNotification regForNotification_req notifications-list 2 enable enable
    registerForNotification regForNotification_req notifications-list 2 module-id 2
    registerForNotification regForNotification_req notifications-list 2 notification-id 1

Switch(ProvisionNotifications)# registerForNotification commit

    RegisterForNotification-Output.regForNotification-resp = 0
    RegisterForNotification Commit Success!!!

Switch(ProvisionNotifications)# exit
```

Registering for Asynchronous Failure Notification

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNotifications** **Example:** `Switch# ProvisionNotifications`	Enters the Notifications mode.
Step 2	**registerForNotification regForNotification_req** {**cookie** *cookie value* |**notifications-list** *List of notifications* {**enable** {**enable** | **disable**} |**module-id** *Module ID* | **notification-id** *Notification ID* }}	Lists all the registered notifications under the generated cookie. • **cookie—**Specifies the notification cookie with unique cookie value.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req cookie 5120`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 3 enable enable`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 3 module-id 3`
	`Switch(ProvisionNotifications)# registerForNotification regForNotification_req notifications-list 3 notification-id 1`
	Note For the Asynchronous failure notification, the notification-list is 3, the module-id is 3, and the notification-id is 1.
		• *cookie value*—cookie value. The range is from 1 to 65535.
		• **notifications_list—**Specifies the list of notifications.
		• *List of notifications*—list of notification ranges from 1 to 10, where, the supported lists are from 1 to 3.
		• **enable—**Enables or disables the notification.
		• **module-id—**Specifies the module ID from which notifications are desired.
		• *Module ID*—Module ID. The range is from 1 to 65536.
		• **notification-id—**Specifies the notification ID.
		• *Notification ID*—list of notification ranges from 1 to 10, wherein the supported lists are from 1 to 3.

Step 3	**registerForNotification review** **Example:** `Switch(ProvisionNotifications)# registerForNotification review`	Displays the configuration.
Step 4	**registerForNotification commit** **Example:** `Switch(ProvisionNotifications)# registerForNotification commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNotifications)# exit`	Exits the Notifications mode.

Configuration Example

```
Switch# ProvisionNotifications
Switch(ProvisionNotifications)# registerForNotification regForNotification_req cookie 5120
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 3 enable enable
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 3 module-id 3
Switch(ProvisionNotifications)# registerForNotification regForNotification_req
notifications-list 3 notification-id 1
Switch(ProvisionNotifications)# registerForNotification review

Commands in queue:
    registerForNotification regForNotification_req cookie 5120
    registerForNotification regForNotification_req notifications-list 3 enable enable
    registerForNotification regForNotification_req notifications-list 3 module-id 3
    registerForNotification regForNotification_req notifications-list 3 notification-id 1
```

```
Switch(ProvisionNotifications)# registerForNotification commit

    RegisterForNotification-Output.regForNotification-resp = 0
    RegisterForNotification Commit Success!!!

Switch(ProvisionNotifications)# exit
```

Listing Notifications

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNotifications** **Example:** `Switch# ProvisionNotifications`	Enters the Notifications mode.
Step 2	**listRegisteredNotification listNotificationsRegistered** {**cookie** *cookie value*} **Example:** `Switch(ProvisionNotifications)# listRegisteredNotification listNotificationsRegistered cookie 5120`	Lists all the registered notifications under the generated cookie. • **cookie**—Specifies the notification cookie with unique cookie value. • *cookie value*—cookie value. The range is from 1 to 65535.
Step 3	**listRegisteredNotification review** **Example:** `Switch(ProvisionNotifications)# listRegisteredNotification review`	Displays the configuration.
Step 4	**listRegisteredNotification commit** **Example:** `Switch(ProvisionNotifications)# listRegisteredNotification commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionNotifications)# exit`	Exits the Notifications mode.

Configuration Example

```
Switch# ProvisionNotifications
Switch(ProvisionNotifications)# listRegisteredNotification listNotificationsRegistered
cookie 5120
Switch(ProvisionNotifications)# listRegisteredNotification review

Commands in queue:
    listRegisteredNotification listNotificationsRegistered cookie 5120
```

```
Switch(ProvisionNotifications)# listRegisteredNotification commit

   ListRegisteredNotification-Output.regForNotification-req.notifications-list[0].module-id
 = 1

ListRegisteredNotification-Output.regForNotification-req.notifications-list[0].notification-id
 = 1
    ListRegisteredNotification-Output.regForNotification-req.notifications-list[0].enable
= true
   ListRegisteredNotification-Output.regForNotification-req.notifications-list[1].module-id
 = 2

ListRegisteredNotification-Output.regForNotification-req.notifications-list[1].notification-id
 = 1
    ListRegisteredNotification-Output.regForNotification-req.notifications-list[1].enable
= true
   ListRegisteredNotification-Output.regForNotification-req.notifications-list[2].module-id
 = 3

ListRegisteredNotification-Output.regForNotification-req.notifications-list[2].notification-id
 = 1
    ListRegisteredNotification-Output.regForNotification-req.notifications-list[2].enable
= true
    ListRegisteredNotification-Output.regForNotification-req.cookie = 5120

    ListRegisteredNotification Commit Success!!!

Switch(ProvisionNotifications)# exit
```

Deleting Notifications

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionNotifications** **Example:** `Switch# ProvisionNotifications`	Enters the Notifications mode.
Step 2	**delNotificationReceiver delNotifReceiver-req** {**cookie** *cookie value*} **Example:** `Switch(ProvisionNotifications)# delNotificationReceiver delNotifReceiver-req cookie 5120`	Deletes the notifications under the cookie. • **cookie**—Specifies the notification cookie with unique cookie value. • *cookie value*—cookie value.
Step 3	**delNotificationReceiver review** **Example:** `Switch(ProvisionNotifications)# delNotificationReceiver review`	Displays the configuration.
Step 4	**delNotificationReceiver commit** **Example:** `Switch(ProvisionNotifications)# delNotificationReceiver commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionNotifications)# exit`	Exits the Notifications mode.

Configuration Example

```
Switch# ProvisionNotifications
Switch(ProvisionNotifications)# delNotificationReceiver delNotifReceiver-req cookie 5120
Switch(ProvisionNotifications)# delNotificationReceiver review

Commands in queue:
    delNotificationReceiver delNotifReceiver-req cookie 5120

Switch(ProvisionNotifications)# delNotificationReceiver commit

    DelNotificationReceiver-Output.delNotifReceiver-resp = false

    DelNotificationReceiver Commit Success!!!

Switch(ProvisionNotifications)# exit
```

What to Do Next

After deleting the notification, use the **listRegisteredNotification listNotificationsRegistered** {**cookie** *cookie value*} command to verify if the delete operation is successful.

```
Switch(ProvisionNotifications)# listRegisteredNotification listNotificationsRegistered
cookie cookie value
Switch(ProvisionNotifications)# listRegisteredNotification review
Switch(ProvisionNotifications)# listRegisteredNotification commit
```

CHAPTER 4

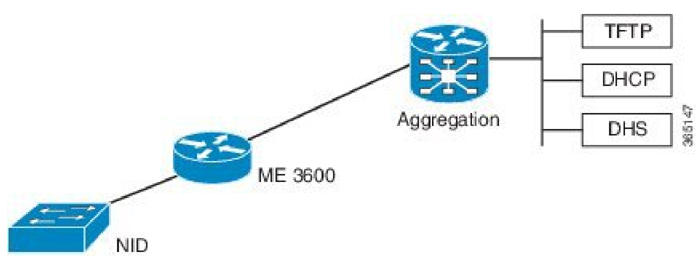
Zero Touch Provisioning

Zero Touch Provisioning (ZTP) automates configuration of Cisco ME 1200 Series Carrier Ethernet Access Device (hereafter known as Cisco ME 1200 NID) when it is deployed either in standalone operating mode or through a directly connected upstream user premise equipment such as Cisco ME3600/ME3800 or Cisco ASR920. When connected through a Cisco ME3600/ME3800 , provisioning of CE Services can be done from the remote controller mode. Otherwise, CLI on Cisco ME1200 NID can be accessed using SSH to provision CE Services once ZTP process is completed .

The ZTP process is activated by pressing the ZTP pinhole reset button found on the front of the Cisco ME 1200 NID. This minimizes manual operator intervention and helps reduce customers' initial deployment costs.

Note The only interface for the ZTP is the ZTP button and the status LED, both found on the front of the Cisco ME 1200 NID.

Figure 1: Cisco ME 1200 Topology-Typical Deployment



Restrictions for ZTP

- ZTP inherits the security levels of the protocols it uses. Therefore, ZTP must be used in a trusted environment, where all security concerns are handled by protocols or technologies it uses.

- ZTP is not supported over IPv6.

ZTP Activation

Pressing the ZTP reset button triggers a series of steps that result in provisioning the Cisco ME 1200 NID with a complete, operational configuration.

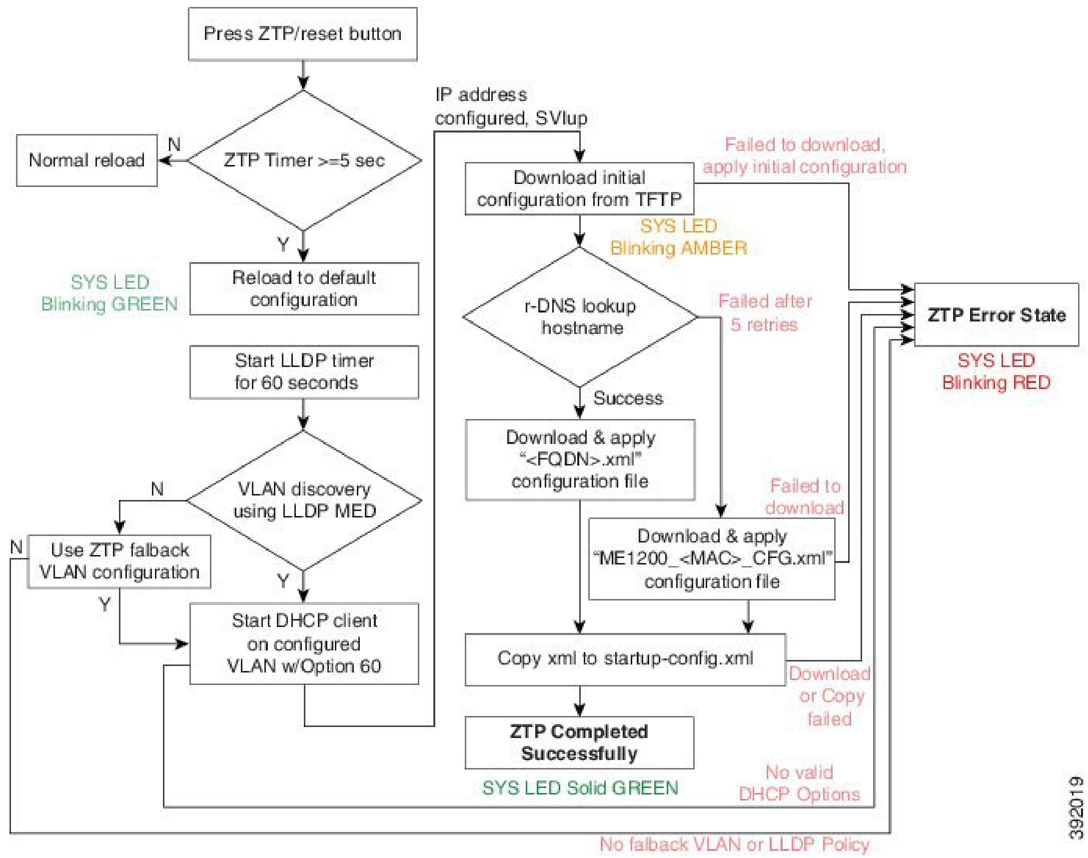
1. Step 1—Start ZTP.
2. Step 2—Reload Defaults.
3. Step 3—Get Management VLAN Configuration.
4. Step 4—Start the DHCP Client on the VLAN Interface.
5. Step 5—Download and Apply the Initial Configuration.
6. Step 6—Reverse DNS Lookup to Obtain Hostname.
7. Step 7—Download and Apply Specific Configuration.

Note Ensure that initial and specific configuration files are present on the TFTP server before starting the ZTP process.

8. Step 8—Copy Running Configuration to Startup Configuration.

The following figure depicts the process pictorially:

Figure 2: ZTP Activation Process



This process is explained in detail in the following sections.

ME 3600/ME 3800 Configuration

On the Cisco ME 3600X Series Ethernet Access Switch, following DHCP server, management VLAN configuration is required:

- Configure the DHCP pool and add the TFTP and DNS configurations through DHCP options. The following is a sample DHCP pool:

```
ip dhcp excluded-address 7.6.0.1 7.6.19.51
ip dhcp excluded-address 7.6.19.64 7.6.255.255
ip dhcp pool ztp-test
 network 7.6.0.0 255.255.255.0
 default-router 7.6.0.10                     -> Adding local SVI IP as default gateway
 for Cisco ME 1200 NID
 option 60 ascii ME1200-00-3A-99-FD-45-34     -> Adding Cisco ME 1200 NID MAC
 option 43 ip 7.0.0.221                       -> Adding TFTP server
 option 67 ascii "ME1200_CFG"                 -> Adding initial configuration-file
 dns-server 7.0.0.217
```

- Enable LLDP-MED network Policy TLV on the Cisco ME 3600X Series Ethernet Access Switch.

```
Switch# interface gigabit 0/1          -> Physical port  connected to Cisco ME 1200
```

```
NID
Switch# lldp med-tlv-select network-policy
Switch# lldp transmit
Switch# lldp receive
Switch# exit
```

- Run LLDP.

```
Switch# lldp run
```

- Configure an interface connecting to the 7.6.x.x switch and allowing VLAN (e.g. VLAN 10) to be used as management VLAN to ensure reachability to network gateway, or DHCP, TFTP, and DNS servers.
- Configure the interface connecting to Cisco ME 1200 NID as trunk.
- Assign management VLAN with the interface connecting to Cisco ME 1200 NID using the following command in global config mode

```
Switch# platform nid-controller assign vlan 10 gigabitEthernet 1/1
```

Step 1—Start ZTP

The ZTP activation is started by pressing the ZTP reset button for five seconds or more.

Note If the ZTP reset button is pressed for less than five seconds, a cold reload is issued.

Note When one instance of the ZTP activation is active, another instance cannot be started. Wait for the ZTP activation to complete (check ZTP status using LED to determine if it was successful or moved to error state) before starting the process again.

Step 2—Reload Defaults

When ZTP activation is triggered, it causes the Cisco ME 1200 NID to reload with a default configuration that includes LLDP MED endpoint connectivity mode on all ports.

The Cisco ME 1200 NID may have links on several ports when the ZTP activation is started. All such ports are candidates for being used for the ZTP activation, and must be ready to receive the LLDP-MED TLV, where a packet is sent on a point-to-point link with a well-known multicast destination MAC.

The LLDP-MED information is sent every 30 seconds. To ensure that all ports receive the LLDP-MED TLV, a 60-second timer starts the count down for LLDP initialization on all ports.

Step 3—Get Management VLAN Configuration

VLAN Discovery using remote ME 3600x device

The first step after ZTP reload is the discovery of a management VLAN between the User-Facing Premise Equipment such as the Cisco ME 3600X Series Ethernet Access Switch, and one or more Cisco ME 1200 NIDs. In this step, the LLDP-MED is used to acquire the management VLAN configuration.

The Cisco ME 1200 NID can be configured to act either as an end-point or a connectivity link. The default configuration type is an end-point, where all ports are scanned for received LLDP-MED broadcast. However, only those ports that have received a network policy with voice application type are considered. These ports are configured accordingly, and a VLAN interface is created on the defined VLAN.

If If none of the ports received LLDP-MED TLVs after 60 seconds, or interface on ME 3600x is not configured to allow a specific management VLAN, ZTP process tries to configure a fallback VLAN as described below. Hence it is better to check configurations and ensure there is no network connectivity issue while in this step.

VLAN Discovery in standalone operating mode

If Cisco ME1200 NID is deployed without ME 3600x or directly connected switch upstream, which does not support LLDP-MED Network Policy TLV, a fallback mechanism is used to complete VLAN discovery. This assumes that an external DHCP server is present on the network, which can support DHCP Option 60 and 43, and allocate IP address to ME1200 (Note: Option 60 unique identifier string will be of the form "ME1200-00-3A-99-FD-45-34", where 00:3a:99:fd:45:34 is a sample MAC address of the Cisco ME1200.

The fallback VLAN discovery can be described as follows:

1. When ZTP is triggered using the push button on Cisco ME 1200 NID, a special, default configuration is loaded , which includes the following commands:
   ```
   ztp fallback vlan 1-4095 frame-type tagged interface Gi 1/1-6
   ztp fallback vlan 1 frame-type untagged interface Gi 1/1-6
   ```
   This causes DHCP replies coming from an external DHCP server to be processed by Cisco ME1200 NID.
2. If a DHCP OFFER containing a VLAN tag in the range of 1-4095, or DHCP OFFER on VLAN 1 (untagged) is received on any one of the ports 1-6, it is used to determine management VLAN.
3. To avoid a flood of DHCP messages from being intercepted by ME1200, only DHCP replies containing DHCP Option 60 & 43 are intercepted.

The VLAN that is determined from this fallback mechanism is used in subsequent steps of the ZTP process.

Note The default fallback VLAN configuration can also be modified by user and the modified configuration allowed to persist across reloads. From the DHCP pool network range and deployment, user may know *a priori* of the VLAN or range of VLANs from which OFFERs are sent by DHCP server. Hence it is recommended to modify fallback VLAN configuration from default to a reasonable VLAN range. Example 1:

If DHCP server is on VLAN 400 and it's connecting port type is tagged, following configuration change during initial Cisco ME1200 NID configuration will cause DHCP OFFERs on VLAN 400 to be processed when ZTP is triggered in standalone mode.
```
ztp fallback vlan 400 frame-type tagged interface Gi 1/1-6
```
If DHCP server is directly connected to one of the interfaces (say, interface 5), this configuration can be modified further as:
```
ztp fallback vlan 400 frame-type tagged interface Gi 1/5
```

Example 2:

If DHCP server is on VLAN 100 and it's connecting port type is untagged, following configuration change during initial Cisco ME1200 NID configuration causes DHCP OFFERs on VLAN 100 to be processed when ZTP is triggered in standalone mode.
```
ztp fallback vlan 100 frame-type untagged interface Gi 1/1-6
```

Note Only a single VLAN can be configured if port-type is untagged.

If user wishes to disable fallback VLAN configuration, following command can be configured.
```
no ztp fallback vlan
```

Once configuration is modified for above steps, user can copy running-config to startup-config prior to ZTP reset. This will cause modified fallback configuration to be present when ZTP process is restarted.

ZTP for Cisco ME 1200 NIDs in Linear Topology

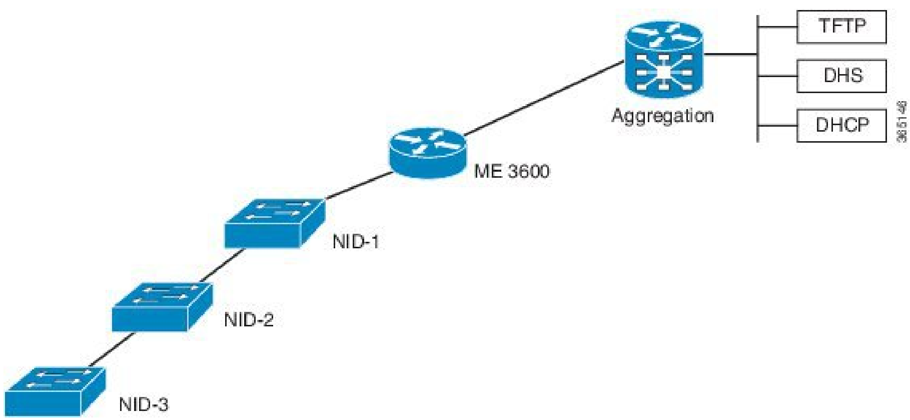
If the network topology involves one or more Cisco ME 1200 NID downstream from the Cisco ME 1200 NID connected to ME 3600 , the following steps are required to ensure ZTP works as expected. In this case, each Cisco ME 1200 NID is connected to the upstream Cisco ME 1200 NID through a point-to-point link.

For ZTP to work in this topology, you must trigger ZTP reset on the downstream Cisco ME 1200 NID after ZTP has successfully completed on the upstream Cisco ME 1200 NID.

In addition, before ZTP button is pressed on the downstream Cisco ME 1200 NID, the upstream Cisco ME 1200 NID which has just completed ZTP successfully requires a change in LLDP-MED device type—from endpoint to network connectivity. This single manual step is required to further propagate LLDP towards the downstream Cisco ME 1200 NID.

Consider the following topology:

Figure 3: Cisco ME 1200 NID in a Linear Topology



Configuration on Cisco ME 1200 NID1 Before Starting the ZTP Process on Cisco ME 1200 NID2:

First, on Cisco ME 1200 NID2, configure a LLDP MED media VLAN policy for voice application-type, with frame-type and VLAN set to the same value as the upstream Cisco ME 1200 NID on which ZTP has completed. For example,

```
Switch# lldp med media-vlan-policy 1 voice tagged 10 l2-priority 0 dscp 0
```

Second, on the upstream ME1200 NID1, modify the interface connected to Cisco ME 1200 NID2, in this case GigabitEthernet 1/4, to LLDP MED connectivity type. Also, associate this interface to the same media VLAN policy configured on Cisco ME 1200 NID2. A sample configuration is provided below.

```
interface GigabitEthernet 1/4
 switchport mode trunk
 lldp med media-vlan policy-list 1   -> Assigning media VLAN policy
 lldp med type connectivity          -> Configuring NID1 as network device
 no spanning-tree
 lldp transmit                       -> LLDP transmission is enabled
 lldp receive                        -> LLDP reception is enabled
```

Tip The above configuration can be included in the Cisco ME 1200 NID1 final configuration file to avoid manual configuration after ZTP on Cisco ME 1200 NID1.

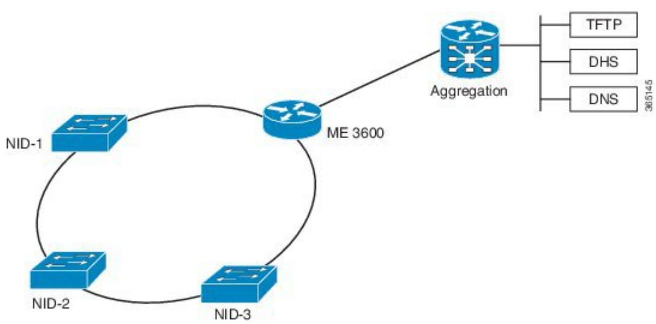
Next Steps

1. Start ZTP on Cisco ME 1200 NID1.
2. When ZTP is finished on Cisco ME 1200 NID-1, start ZTP on Cisco ME 1200 NID2.

ZTP for Cisco ME 1200 NIDs in a Ring Topology

Consider the following topology:

Figure 4: LLDP-MED in a G.8032 Ring Topology



In this deployment, while Cisco ME 1200 NID-1 receives VLAN through LLDP-MED Network Policy TLV and initiates DHCP Discovery, the Cisco ME 1200 NIDs that are downstream to Cisco ME 1200 NID-1 do not receive LLDP-MED TLVs. This is because LLDP-MED TLVs are sent only between endpoint devices and are not propagated beyond Cisco ME 1200 NID-1.

To allow LLDP-MED TLVs to be propagated to all downstream Cisco ME 1200 NIDs once Cisco ME 1200 NID-1 completes VLAN discovery, modify the port configuration in the same manner as the linear chain topology deployment.

Step 4—Start the DHCP Client on the VLAN Interface

A DHCP client is started on all the VLAN interfaces created in the previous step. To identify itself as a device undergoing ZTP, the DHCP client on Cisco ME 1200 NID adds DHCP Option 60 to the DHCPDISCOVER/DHCPREQUEST messages on the newly-discovered management VLAN, that it sends to the DHCP server.

The Option 60 Vendor Class Identifier in DHCPDISCOVER/DHCPREQUEST message is encoded as a unique ASCII string formed by concatenating the string "*ME1200*" with the complete Cisco ME 1200 NID MAC address in the form similar to ME1200-XX- XX-XX-XX-XX-XX, for example, ME1200-00-01-C1-00-00-00. In addition, as part of the parameters list sent in DHCPREQUEST, Cisco ME 1200 NID also requests the DHCP server to send following options:

- Option 43—This option is used by client to accept the DHCP ACK only from DHCP server or the ME 3600x devicespecifically configured for it. The Vendor Specific Information in Option 43 is the IP address of the TFTP server that contains the configuration file.

- Option 67—This is the startup configuration filename.
- Option 3—Default gateway
- Option 6—DNS Server

Note Options 60, 43, and 67 are not used when the DHCP client is used in a non-ZTP mode.

Wait for the DHCP Client(s) to Enter the Bound State

When multiple DHCP clients have been started, the first client to reach bound state with requested DHCP options is used further in the ZTP activation process.

Note If no DHCP client reaches bound state with the requested options within 120 seconds, ZTP activation process enters error state.

Once the connectivity is established between the Cisco ME 1200 NID and the ME 3600x device, the Cisco ME 1200 NID can be remotely managed from the ME 3600x device.

A database of NID instances, MAC addresses, IP addresses, TFTP server, attached physical ports is maintained on the ME 3600x device. This information can be used for management of selected Cisco ME 1200 NIDs.

The association between the Cisco ME 1200 NID and ME 3600x device is maintained by sending and receiving periodic IP-based heartbeat messages.

Step 5—Download and Apply the Initial Configuration

When the DHCP client on the Cisco ME 1200 NID receives the DHCPACK, it uses the information from Option 43 and Option 67 from the DHCP client to download the initial configuration file. This configuration file is intended as a pre-staging configuration, containing basic reachability information such as the gateway, TFTP, DNS server, or the default VLAN configuration so that one or more NIDs can be added to network prior to ZTP auto-configuration. But if there is no requirement, this can be an empty configuration file. The intention of this step is to ensure that ME1200 NID can be reachable to gateway, TFTP, DNS servers. The filename should be specified as an ASCII string using Option 67 in DHCP pool configuration on UPE.

If the download operation fails or if the configuration could not be applied, the ZTP process enters the error state.

Note The value of the Option 67 field will be taken as the configuration filename, including any file extension.

Step 6—Reverse DNS Lookup to Obtain Hostname

Using the IP address of the DHCP client and the DNS server provided by the DHCP client the Cisco ME 1200 NID performs a reverse DNS query to derive its host name. When the host name is derived, it is added to the current running configuration.

In case of failure, the reverse DNS process is retried five times. After five retries, the host name is configured with the MAC address of the device encoded in the format as: 00_01_C1_00_00_00 (hex string values in uppercase), where 00:01:C1:00:00:00 is a sample ME1200 NID MAC address. This allows ZTP process to continue.

Step 7—Download and Apply Specific Configuration

To perform Reverse DNS lookup, the DNS server must include the definition for a forward zone and a reverse zone. Specifically, the forward zone must include definitions for:

- Authoritative name server (NS record) containing fully-qualified domain name (FQDN) to be used for response.
- Address (A) record with hostname-IP address mapping.

The reverse zone must include the PTR record with IP address-name mapping.

Note FQDN is set as hostname at the end of this step.

The following is a sample DNS configuration:

```
NS    nid1.example.com
A    192.168.2.100
nid1    IN    A 192.168.2.100
nid2    IN    A 192.168.2.101
nid3    IN    A 192.168.2.102
nid4    IN    A 192.168.2.103
...

2.168.192.in-addr.arpa.
PTR    server.example.com.
101    IN    PTR    nid2.example.com.
102    IN    PTR    nid3.example.com.
103    IN    PTR    nid4.example.com.
```

The specific configuration of the device is downloaded from the same TFTP server as the initial configuration. If reverse DNS lookup fails to retrieve a hostname, then ZTP activation process looks for a filename with the following format on TFTP server:

```
NID_MAC_ADDR_CFG.xml
```

For example, 00_3B_99_FE_5E_00_CFG.xml(hex string values in uppercase)

If there is no file stored in .xml format, then ZTP process enters the error state. In the error state, status LED is set to blinking red.

Note It is recommended that user makes 2 file copies of the saved, intended configuration - one named as per the FQDN, such as nid2.example.com.xml, and the other based on the MAC address, such as 00_3B_99_FE_5E_00_CFG.xml.

Step 8—Copy Running Configuration to Startup Configuration

The first time ZTP is performed, you must store a default xml configuration in the fqdn.xml derived from rDNS and in NID_MAC_ADDR_CFG.xml. The following is the content of this default xml file:

```
<?xml version="1.0" encoding="UTF-8"?>
<SOAP-ENV:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:ns0="http://new.webservice.namespace" xmlns:SOAP-ENV="http
```

```
://schemas.xmlsoap.org/soap/envelope/">
   <SOAP-ENV:Body>
      <run_cfg_resp>
      </run_cfg_resp>
   </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Only after this configuration is applied on Cisco ME 1200 NID, Step 8 will generate a complete XML configuration and store the file as flash:startup-config.xml. This file can be used to replace the default configuration in fqdn.xml and NID_MAC_ADDR_CFG.xml as required.

As a last step in ZTP activation, the running configuration (which was the result of Cisco ME 1200 NID-specific configuration applied after reverse DNS and TFTP download) is copied to startup configuration (flash:startup-config.xml). This ensures that running configuration is persistent.

If there is an error in copying the configuration, the ZTP process enters the error state.

The ZTP process has completed, the status LED is set to solid green.

CHAPTER 5

Configuring Synchronous Ethernet

The Cisco ME 1200 NID support Synchronous Ethernet (SyncE), which is the PHY-layer frequency-synchronization solution for IEEE 802.3 links. It is an evolution of the conventional Ethernet and Ethernet + SDH and SONET-based synchronization. SyncE is used to synchronize and send clock information to remote sites on the network. Each network element along the synchronization path must support SyncE. SyncE provides only frequency synchronization, not related to time or space.

Prerequisites for Configuring SyncE

- NID must have an IP address.

Restrictions for Configuring SyncE

- The port number three (3) cannot be nominated to source number one (1).

Information About Synchronous Ethernet

This chapter describes the Synchronous Ethernet features, standards, and limitations in the Cisco ME 1200 Series Carrier Ethernet Access Device. This chapter also describes procedures to configure Synchronous Ethernet.

Synchronous Ethernet Overview

A separate external time-division multiplexing (TDM) circuit is required to provide synchronized timing to multiple remote network elements (NEs) for packet transport networks like Cisco Carrier Packet Transport system. The Synchronous Ethernet (SycnE) feature addresses this requirement by providing effective timing to the remote NEs through a packet network without using an external circuit for timing.

With Ethernet equipment gradually replacing existing Synchronous Optical Networking (SONET) and Synchronous Digital Hierarchy (SDH) equipment in service-provider networks, frequency synchronization is required to provide high-quality clock synchronization over Ethernet ports. The SyncE feature provides the required synchronization at the physical level. Operation messages maintain SyncE links and ensure that a node always derives timing from the most reliable source. SyncE uses the Ethernet Synchronization Message Channel (ESMC) to enable traceability of the best clock source to correctly define the timing source and prevent a timing loop.

The Cisco ME 1200 Series Carrier Ethernet Access Device supports Synchronous Ethernet (SyncE), which is the physical layer frequency-synchronization solution for IEEE 802.3 links. SyncE is defined by the ITU-T standards such as G.8261, G.8262, G.8264, and G.781. It is an evolution of the conventional Ethernet and Ethernet + SDH and SONET-based synchronization. SyncE is used to synchronize and send clock information to remote sites on the network. For SyncE to work, each network element along the synchronization path must support SyncE. SyncE provides only frequency synchronization, not related to time or space.

Understanding SyncE

SyncE provides the Ethernet physical layer network (PHY) level frequency distribution of known common precision frequency references. Clocks for use in SyncE are compatible with the clocks used in the SONET/SDH synchronization network. To achieve network synchronization, synchronization information is transmitted through the network via synchronous network connections with performance of egress clock. In SONET/SDH the communication channel for conveying clock information is SSM, and in SyncE it is the ESMC.

SyncE is a standard for distribution of frequency over Ethernet links. Other standards (IEEE Std. 1588 Precision Time Protocol [PTP], IETF Network Time Protocol [NTP], and so on) have been and are being developed or enhanced for high-quality time distribution and Adaptive Clock Recovery (ACR) requirements.

To maintain the timing chain in SONET/SDH, operators often use SSM. Information provided by SSM Quality Levels (SSM-QL) helps a node derive timing from the most reliable source and prevent timing loops. The SONET/SDH header has a QL information present in the S1 bytes of its header. Hence, the SONET/SDH does not require any specific channel for QL information exchange. As the Ethernet does not have the QL information in its header, it requires ESMC for QL information. Because Ethernet networks are not required to be synchronous on all links or in all locations, a specific channel, the ESMC channel defined in G.8264, provides this service. ESMC is composed of the standard Ethernet header for an organization-specific slow protocol, the ITU-T OUI; a specific ITU-T subtype; an ESMC-specific header; a flag field; and a type, length, value (TLV) structure: the use of flags and TLVs aimed at improving the management of Synchronous Ethernet links and the associated timing change.

For more information, see Configuring Synchronous Ethernet.

SyncE Standards

- ITU-T G.8261: Timing and synchronization aspects in packet network

- ITU-T G.8262: Timing characteristics of Synchronous Ethernet equipment slave clock
- ITU-T G.8264: Distribution of timing through packet networks
- ITU-T G.781: Synchronization layer functions

Understanding SyncE Protocols

Network clocking uses the Synchronization Status Messages (SSM) mechanism to exchange the Quality Level (QL) of the clock between the network elements. In Ethernet, Ethernet Synchronization Message Channel (ESMC) is used for SSM exchange.

The two important protocols used for SyncE are:

- Synchronization Status Messages (SSM)
- Ethernet Synchronization Messaging Channel (ESMC)

Synchronization Status Messages (SSM)

Network elements use Synchronization Status Messages (SSM) to inform the neighboring elements about the Quality Level (QL) of the clock. The non-ethernet interfaces such as optical interfaces and SONET/T1/E1 SPA framers uses SSM. The key benefits of the SSM functionality:

- Prevents timing loops.
- Provides fast recovery when a part of the network fails.
- Ensures that a node derives timing from the most reliable clock source.

Ethernet Synchronization Messaging Channel (ESMC)

To maintain a logical communication channel in synchronous network connections, ethernet relies on a channel called Ethernet synchronization Messaging Channel (ESMC). This is based on IEEE 802.3 Organization Specific Slow Protocol standards. ESMC relays the SSM code that represents the Quality Level (QL) of the Ethernet Equipment Clock (EEC) in a physical layer.

The ESMC packets are received only for those ports configured as clock sources and transmitted on all the SyncE interfaces in the system. These packets are then processed by the Clock selection algorithm and are used to select the best clock. The Tx frame is generated based on the QL value of the selected clock source and sent to all the enabled SyncE ports.

Understanding SyncE Clocks

Clock Selection Algorithm

The clock selection algorithm selects the best available synchronization source from the nominated sources. This algorithm exhibits nonrevertive behavior among the clock sources with the same QL value, and always selects the signal with the best QL value. For clock option SDH, the default is revertive, and for clock option SONET, the default is nonrevertive.

The following parameters contribute to the selection process:

- Quality level (QL)
- Signal fail through QL-FAILED

- Priority
- External commands (Manual, Auto-revertive and so on)

Clock Selection Modes

A clock selection is said to be the best, when the clock source is configured with the highest QL and with the highest priority (for the ones with equal QL).

The following are different clock selection modes:

- **Manual—**the clock selector is manually set to the chosen clock source. If the manually selected clock source fails, then, the clock selector goes to the holdover state.
- **Selected—**the clock selector selects the clock manually, however, the highest priority selected clock source becomes the Source.
- **NonRevertive—**the clock selector selects the best clock source only done when the selected clock fails.
- **Revertive—**the selection of the best clock source is constantly searched for.
- **Holdover—**the clock selector is forced to the holdover state.
- **Freerun—**the clock selector is forced to the free run state.

Manual mode is used to force selection of a specific source. It is also used to switch back to the primary source if auto-nonrevertive mode is selected and the failure is cleared. Selected mode is used to freeze the current clock source, in case of a failure on switchover.

How to Configure SyncE

Configuring SyncE Global Defaults

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**setSyncEglobalDefaultConfig set-global-default-config** **Example:** `Switch(SyncE)# setSyncEglobalDefaultConfig set-global-default-config`	Sets the global configuration to defaults. This means that the SyncE feature is not configured on the device.
Step 3	**setSyncEglobalDefaultConfig review** **Example:** `Switch(SyncE)# setSyncEglobalDefaultConfig review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**setSyncEglobalDefaultConfig commit** **Example:** `Switch(SyncE)# setSyncEglobalDefaultConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# setSyncEglobalDefaultConfig set-global-default-config
Switch(SyncE)# setSyncEglobalDefaultConfig review

Commands in queue:
    setSyncEglobalDefaultConfig set-global-default-config

Switch(SyncE)# setSyncEglobalDefaultConfig commit

    SetSyncEglobalDefaultConfig Commit Success!!!

Switch(SyncE)# exit
```

Viewing SyncE Global Defaults

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**getSyncEglobalconfig get-global-config** **Example:** `Switch(SyncE)# getSyncEglobalconfig get-global-config`	Displays the SyncE global configuration details.
Step 3	**getSyncEglobalconfig review** **Example:** `Switch(SyncE)# getSyncEglobalconfig review`	Displays the configuration that are in queue.
Step 4	**getSyncEglobalconfig commit** **Example:** `Switch(SyncE)# getSyncEglobalconfig commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# getSyncEglobalconfig get-global-config
Switch(SyncE)# getSyncEglobalconfig review

Commands in queue:
    getSyncEglobalConfig get-global-config

Switch(SyncE)# getSyncEglobalconfig commit

   GetSyncEglobalConfig_Output.synce_global_conf.clock_select_config.t = 5
   GetSyncEglobalConfig_Output.synce_global_conf.clock_select_config.u.revertive = ''
   GetSyncEglobalConfig_Output.synce_global_conf.wait_to_restore = 5
   GetSyncEglobalConfig_Output.synce_global_conf.SSM_QL_for_holdover.t = 1
   GetSyncEglobalConfig_Output.synce_global_conf.SSM_QL_for_holdover.u.QL_NONE = ''
   GetSyncEglobalConfig_Output.synce_global_conf.SSM_QL_for_freerun.t = 1
   GetSyncEglobalConfig_Output.synce_global_conf.SSM_QL_for_freerun.u.QL_NONE = ''
   GetSyncEglobalConfig_Output.synce_global_conf.EEC_Option.t = 1
   GetSyncEglobalConfig_Output.synce_global_conf.EEC_Option.u.EEC1 = ''

   GetSyncEglobalConfig Commit Success!!!

Switch(SyncE)# exit
```

Configuring SyncE Clock Defaults

This task configures the SyncE configurations to defaults.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**setSyncEclockDefaultConfig set-synce-clock-config-defaults-req** **Example:** `Switch(SyncE)# setSyncEclockDefaultConfig set-synce-clock-config-defaults-req`	Set SyncE default Clock configurations.
Step 3	**setSyncEclockDefaultConfig review** **Example:** `Switch(SyncE)# setSyncEclockDefaultConfig review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**setSyncEclockDefaultConfig commit** **Example:** `Switch(SyncE)# setSyncEclockDefaultConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# setSyncEclockDefaultConfig set-synce-clock-config-defaults-req
Switch(SyncE)# setSyncEclockDefaultConfig review

Commands in queue:
    setSyncEclockDefaultConfig set-synce-clock-config-defaults-req

Switch(SyncE)# setSyncEclockDefaultConfig commit

    SetSyncEclockDefaultConfig Commit Success!!!

Switch(SyncE)# exit
```

Viewing SyncE Clock Defaults

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**getSyncEclockdefaultConfig get-synce-clock-config-defaults-req** **Example:** `Switch(SyncE)# getSyncEclockdefaultConfig get-synce-clock-config-defaults-req`	Displays the SyncE default Clock configurations.
Step 3	**getSyncEclockdefaultConfig review** **Example:** `Switch(SyncE)# getSyncEclockdefaultConfig review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**getSyncEclockdefaultConfig commit** **Example:** `Switch(SyncE)# getSyncEclockdefaultConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# getSyncEclockdefaultConfig get-synce-clock-config-defaults-req
Switch(SyncE)# getSyncEclockdefaultConfig review

Commands in queue:
getSyncEclockDefaultConfig get-synce-clock-config-defaults-req

Switch(SyncE)# getSyncEclockdefaultConfig commit

  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].state = false
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].port = 1
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].priority = 0
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].SSM_overwrite.t = 1
 GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].SSM_overwrite.u.QL_NONE
 = ''
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].hold_off.t = 1
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].hold_off.u.disabled
 = ''
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].aneg_mode.t = 1
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[0].aneg_mode.u.none =
''
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].state = false
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].port = 2
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].priority = 0
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].SSM_overwrite.t = 1
 GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].SSM_overwrite.u.QL_NONE
 = ''
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].hold_off.t = 1
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].hold_off.u.disabled
 = ''
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].aneg_mode.t = 1
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[1].aneg_mode.u.none =
''
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].state = false
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].port = 3
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].priority = 0
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].SSM_overwrite.t = 1
 GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].SSM_overwrite.u.QL_NONE
 = ''
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].hold_off.t = 1
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].hold_off.u.disabled
 = ''
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].aneg_mode.t = 1
  GetSyncEclockDefaultConfig_Output.clock_sel_config.source_configs[2].aneg_mode.u.none =
''
 GetSyncEclockDefaultConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_1_UNI
 = false
 GetSyncEclockDefaultConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_2_UNI
 = false
 GetSyncEclockDefaultConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_3_UNI
```

```
 = false
  GetSyncEclockDefaultConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_4_UNI
 = false
  GetSyncEclockDefaultConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_5_UNI
 = false
  GetSyncEclockDefaultConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_6_UNI
 = false

  GetSyncEclockDefaultConfig Commit Success!!!

Switch(SyncE)# exit
```

Configuring Clock Source

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **port** *Physical port* } **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 setSyncEclockConfig clock-sel-config occur source-configs port 2`	Configures the clock source on the port. • **source-configs—**Specifies the source configurations. ◦ *Physical port*—Physical port. The range is from 1 to 6. • **port—**Specifies the physical port. ◦ *source_configs*—nominate a port number to be the clock source. The range is from 1 to 2.
Step 3	**setSyncEclockConfig review** **Example:** `Switch(SyncE)# setSyncEclockConfig review`	Displays the configuration.
Step 4	**setSyncEclockConfig commit** **Example:** `Switch(SyncE)# setSyncEclockConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(syncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2
Switch(SyncE)# setSyncEclockConfig review

Commands in queue:
  setSyncEclockConfig clock-sel-config source-configs 1
clock-sel-config occur source-configs port 2

Switch(SyncE)# setSyncEclockConfig commit

  SetSyncEclockConfig Commit Success!!!

Switch(SyncE)# exit
```

Viewing Clock Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**getSyncEclockConfig get-clock-config** **Example:** `Switch(SyncE)# getSyncEclockConfig get-clock-config`	Displays clock configuration.
Step 3	**setSyncEclockConfig review** **Example:** `Switch(SyncE)# setSyncEclockConfig review`	Displays the configuration.
Step 4	**getSyncEclockConfig commit** **Example:** `Switch(SyncE)# getSyncEclockConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# getSyncEclockConfig get-clock-config
Switch(SyncE)# setSyncEclockConfig review

Commands in queue:
 getSyncEclockConfig get-clock-config
```

```
Switch(SyncE)# getSyncEclockConfig commit

   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].state = true
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].port = 4
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].priority = 1
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].SSM_overwrite.t = 2
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].SSM_overwrite.u.QL_PRC =
'0'
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].hold_off.t = 2
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].hold_off.u.value = 800
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].aneg_mode.t = 1
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[0].aneg_mode.u.none = ''
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].state = true
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].port = 3
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].priority = 0
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].SSM_overwrite.t = 2
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].SSM_overwrite.u.QL_PRC =
'0'
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].hold_off.t = 2
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].hold_off.u.value = 1000
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].aneg_mode.t = 1
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[1].aneg_mode.u.none = ''
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].state = false
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].port = 3
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].priority = 0
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].SSM_overwrite.t = 1
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].SSM_overwrite.u.QL_NONE =
 ''
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].hold_off.t = 1
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].hold_off.u.disabled = ''
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].aneg_mode.t = 1
   GetSyncEClockConfig_Output.clock_sel_config.source_configs[2].aneg_mode.u.none = ''
   GetSyncEClockConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_1_UNI =
false
   GetSyncEClockConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_2_UNI =
false
   GetSyncEClockConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_3_UNI =
true
   GetSyncEClockConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_4_UNI =
true
   GetSyncEClockConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_5_UNI =
false
   GetSyncEClockConfig_Output.clock_sel_config.ssm_enable_ports.GigabitEthernet_6_UNI =
false

   GetSyncEClockConfig Commit Success!!!

Switch(SyncE)# exit
```

Overwriting the Quality Level (QL)

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**setSyncEclockConfig clock-sel-config** {**source-configs** | **ssm-enable-ports** {**GigabitEthernet-1-UNI** | **GigabitEthernet-2-UNI** | **GigabitEthernet-3-UNI** |	Enters the SyncE clock configuration to select the UNI ports. Here selecting the physical port 4: • **GigabitEthernet-1-UNI—**Physical port 1.

	Command or Action	Purpose
	GigabitEthernet-4-UNI | GigabitEthernet-5-UNI | GigabitEthernet-6-UNI} {**disable | enable**}}} **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config ssm-enable-ports GigabitEthernet-4-UNI enable`	• **GigabitEthernet-2-UNI—**Physical port 2. • **GigabitEthernet-3-UNI—**Physical port 3. • **GigabitEthernet-4-UNI—**Physical port 4. • **GigabitEthernet-5-UNI—**Physical port 5. • **GigabitEthernet-6-UNI—**Physical port 6. • **disable—**Disables the SSM on the configured port. • **enable—**Enables the SSM on the configured port.
Step 3	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **port** *Physical port* } **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 port 4`	Configures the clock source on the port: • *source-configs***—**Nominates a clock source, either 1 or 2. • *Physical port***—**Physical port. The range is from 1 to 6.
Step 4	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **SSM-overwrite** {**QL-DNU | QL-EEC1 | QL-EEC2 | QL-INV | QL-NONE | QL-PRC | QL-SSUA QL-SSUB**}} **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 SSM-overwrite QL-PRC`	Selects QL value to overwrite any received QL in an SSM message • *source-configs***—**Nominate a port number to be the clock source. The range is from 1 to 2.
Step 5	**setSyncEclockConfig review** **Example:** `Switch(SyncE)# setSyncEclockConfig review`	Displays the configuration.
Step 6	**setSyncEclockConfig commit** **Example:** `Switch(SyncE)# setSyncEclockConfig commit`	Sends the configuration to the NID.
Step 7	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# setSyncEclockConfig clock-sel-config ssm-enable_ports GigabitEthernet-4-UNI
 enable
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 port 4
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 SSM-overwrite QL-PRC
```

```
Switch(SyncE)# setSyncEclockConfig review

Commands in queue:
   setSyncEclockConfig clock-sel-config ssm-enable_ports GigabitEthernet-4-UNI enable
   setSyncEclockConfig clock-sel-config source-configs 1 port 4
   setSyncEclockConfig clock-sel-config source-configs 0 SSM-overwrite QL-PRC

Switch(SyncE)# setSyncEclockConfig commit

   SetSyncEclockConfig Commit Success!!!

Switch(SyncE)# exit
```

Understanding Clock Redundancy

On the Cisco ME 1200 NID, it is possible to configure up to two clock sources. Any Ethernet port can act as a clock source. For the Cisco ME 1200 NID, external clock input does not exit. Based on the priority and Quality level (QL) of the clock sources, the best source is selected.

To select the best source, nominate the clock sources, and then set priorities for each of them. Enable SSM on ports used for synchronization. Note that QL overwrites the priority. That means, if port 2 receives QL-PRC and port 1 receives only QL-EEC1, and even though port 1 has higher priority than port 2, the port 2 is selected as QL overwrites.

Configuring Clock Redundancy

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**setSyncEclockConfig clock-sel-config** {**source-configs** | **ssm-enable-ports** {**GigabitEthernet-1-UNI** | **GigabitEthernet-2-UNI** | **GigabitEthernet-3-UNI** | **GigabitEthernet-4-UNI** | **GigabitEthernet-5-UNI** | **GigabitEthernet-6-UNI**}{**enable** | **disable**}}} **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config ssm-enable-ports GigabitEthernet-5-UNI enable`	Enters the SyncE clock configuration to select the UNI ports. Here selecting the physical port 5. • **GigabitEthernet-1-UNI**—Physical port 1. • **GigabitEthernet-2-UNI**—Physical port 2. • **GigabitEthernet-3-UNI**—Physical port 3. • **GigabitEthernet-4-UNI**—Physical port 4. • **GigabitEthernet-5-UNI**—Physical port 5. • **GigabitEthernet-6-UNI**—Physical port 6. • **disable**—Disables the SSM on the configured port. • **enable**—Enables the SSM on the configured port.

	Command or Action	Purpose
Step 3	**setSyncEclockConfig clock-sel-config** {**source-configs** | **ssm-enable-ports** {**GigabitEthernet-1-UNI** | **GigabitEthernet-2-UNI** | **GigabitEthernet-3-UNI** | **GigabitEthernet-4-UNI** | **GigabitEthernet-5-UNI** | **GigabitEtherne-6-UNI**} {**enable** | **disable**}}} **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config ssm-enable-ports GigabitEthernet-6-UNI enable`	Enters the SyncE clock configuration to select the UNI ports. Here selecting the physical port 6. • **GigabitEthernet-1-UNI—**Physical port 1. • **GigabitEthernet-2-UNI—**Physical port 2. • **GigabitEthernet-3-UNI—**Physical port 3. • **GigabitEthernet-4-UNI—**Physical port 4. • **GigabitEthernet-5-UNI—**Physical port 5. • **GigabitEthernet-6-UNI—**Physical port 6. • **disable—**Disables the SSM on the configured port. • **enable—**Enables the SSM on the configured port.
Step 4	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **port** *Physical port*} **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 port 5`	Configures the clock source on the port. Here the configuration is done on port 5, and the *source-config* is set to 1. • *source-configs***—**Nominate a port number to be the clock source. The range is from 1 to 2. • *Physical port***—**Physical port. The range is from 1 to 6.

Step 5	**setSyncEclockConfig clock-sel-config** {**source-configs** {**priority** *priority*}}
	
	Example:
	`Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1`
	`setSyncEclockConfig clock-sel-config occur source-configs port 2 priority 0`
		Sets the clock priority. Here the clock priority is set to 0.
		• *priority***—**Clock priority value. Either 0 or 1.

Step 6	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **state** {**enable** | **disable**}}
	
	Example:
	`Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1`
	`setSyncEclockConfig clock-sel-config occur source-configs port 2 state enable`
		Enables or Disables the clock source.
		• *source-configs***—**nominate a port number to be the clock source. The range is from 1 to 2.

Step 7	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **hold-off** {**disabled** | | **value** {**300 msec to 1800 msec**}}} **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1`	Sets the Hold-off timer value. Active loss of clock source is delayed by the selected amount of time. The clock selector changes the clock source if the loss of clock condition is cleared within this time. • *source-configs***—**nominate a port number to be the clock source. The range is from 1 to 2.

	Command or Action	Purpose
	`setSyncEclockConfig clock-sel-config occur source-configs port 2  hold-off value 1000`	

Step 8	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **port** *Physical port*}
	
	Example:
	`Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1`
	`setSyncEclockConfig clock-sel-config occur source-configs port 2`
		Configures the clock source on the port. Here the configuration is done on port 6, and the source_config is set to 0.
		• *source-configs*—Nominate a port number to be the clock source. The range is from 1 to 2.
		• *Physical port*—Physical port. The range is from 1 to 6.

Step 9	**setSyncEclockConfig clock-sel-config** {**source-configs** {**priority** *priority* }}
	
	Example:
	`Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1`
	`setSyncEclockConfig clock-sel-config occur source-configs port 2 priority 1`
		Sets the clock priority. Here the clock priority is set to 1.
		• *priority*—Clock priority value. Either 0 or 1.

Step 10	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **state** {**enable** | **disable**}}
	
	Example:
	`Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1`
	`setSyncEclockConfig clock-sel-config occur source-configs port 2 state enable`
		Enables or Disables the clock source.
		• *source-configs*—Nominate a port number to be the clock source. The range is from 1 to 2.

Step 11	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs***hold-off** {**disabled** | **value** {**300 msec to 1800 msec**}}}
	
	Example:
	`Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1`
	`setSyncEclockConfig clock-sel-config occur source-configs port 2 hold-off value 800`
		Sets the Hold-off timer value. Active loss of clock source is delayed by the selected amount of time. The clock selector changes the clock source if the loss of clock condition is cleared within this time.
		• *source-configs*—Nominate a port number to be the clock source. The range is from 1 to 2.

Step 12	**setSyncEclockConfig review** **Example:** `Switch(SyncE)# setSyncEclockConfig review`	Displays the configuration.
Step 13	**setSyncEclockConfig commit** **Example:** `Switch(SyncE)# setSyncEclockConfig commit`	Sends the configuration to the NID.
Step 14	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# setSyncEclockConfig clock-sel-config ssm-enable-ports GigabitEthernet-5-UNI
 enable
Switch(SyncE)# setSyncEclockConfig clock-sel-config ssm-enable-ports GigabitEthernet-6-UNI
 enable
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2 priority 0
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2 state enable
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2 hold-off value 1000
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2 priority 1
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2 state enable
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
setSyncEclockConfig clock-sel-config occur source-configs port 2 hold-off value 800

Switch(SyncE)# setSyncEclockConfig review

Commands in queue:
 setSyncEclockConfig clock-sel-config ssm-enable-ports GigabitEthernet-5-UNI enable
 setSyncEclockConfig clock-sel-config ssm-enable-ports GigabitEthernet-6-UNI enable
 setSyncEclockConfig clock-sel-config source-configs 1 port 2
 setSyncEclockConfig clock-sel-config source-configs 1 priority 0
 setSyncEclockConfig clock-sel-config source-configs 1 state enable
 setSyncEclockConfig clock-sel-config source-configs 1 hold-off value 1000
 setSyncEclockConfig clock-sel-config source-configs 1 port 2
 setSyncEclockConfig clock-sel-config source-configs 1 priority 1
 setSyncEclockConfig clock-sel-config source-configs 1 state enable
 setSyncEclockConfig clock-sel-config source-configs 1 hold_off value 800

Switch(SyncE)# setSyncEclockConfig commit

 SetSyncEclockConfig Commit Success!!!

Switch(SyncE)# exit
```

Understanding SyncE Timers

You can manage syncE timers by changing the priority of the clock sources. You can also influence selection by modifying the following timers:

- WTR (Wait to restore) Timer
- Hold-off Timer

WTR Timer

The WTR time is activated on the falling edge of a clock source failure (in Revertive mode). This means that the clock source is first available for clock selection after WTR Time (can be cleared).

Hold-off Timer

In the Hold-off timer, the active loss of clock source is delayed by the selected amount of time. The clock selector does not change the clock source if the loss of clock condition is cleared within this time.

Configuring SyncE Timers

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**setSyncEglobalConfig synce-global-conf** {**EEC-Option** | **SSM-QL-for-freerun** | **SSM-QL-for-holdover** | **clock-select-config** | **wait-to-restore**}	Enters the SyncE global configuration. • **EEC-Option**—Selects PLL EEC option. • **SSM-QL-for-freerun**—Transmits SSM QL value when clock selector is in Free Run Mode. • **SSM-QL-for-holdover**—Transmits SSM QL value when clock selector is in Hold Over State. • **clock-select-config**—Selection mode of nominated clock sources. • **wait-to-restore**—Select the wait to restore time.
Step 3	**setSyncEglobalConfig synce-global-conf wait-to-restore** *wait to restore time* **Example:** `Switch(SyncE)# setSyncEglobalConfig synce-global-conf wait-to-restore 1`	Enters the wait to restore time. • *wait to restore time*—Restore time. The range is from 0 to 12 minutes; enter the value zero to disable.
Step 4	**setSyncEglobalConfig synce-global-conf clock-select-config** {**freerun** | **holdover** | **manual** *manually set* | **nonrevertive** | **revertive** | **selected**} **Example:** `Switch(SyncE)# setSyncEglobalConfig synce-global-conf clock-select-config revertive`	Enters the selection mode of nominated clock sources. • **freerun**—Selector is forced in free run. • **holdover**—Selector is forced in holdover. • **manual**—Selector is manually set to chosen clock source. ◦ *manually set*—Clock source.The range is from 1 to 2. • **nonrevertive**—Automatic clock selection, selecting best clock source nonrevertively. • **revertive**—Automatic clock selection, selecting best clock source revertively. • **selected**—Manual clock selection, selecting pt selected clock source.
Step 5	**setSyncEglobalConfig synce-global-conf SSM-QL-for_holdover** {**QL-DNU** | **QL-EEC1** |	Transmits SSM QL value when clock selector is in Hold Over State.

	Command or Action	Purpose
	QL-EEC2 | QL-INV | QL-NONE | QL-PRC | QL-SSUA QL-SSUB} **Example:** `Switch(SyncE)# setSyncEglobalConfig synce-global-conf SSM-QL-for-holdover QL-EEC1`	• **QL-DNU—**SSM QL value is QL-DNU. • **QL-EEC1—**SSM QL value is QL-EEC1. • **QL-EEC2—** SSM QL value is QL-EEC2. • **QL-INV—**SSM QL value is QL-INV. • **QL-NONE—**SSM QL value is QL-NONE. • **QL-PRC—**SSM QL value is QL-PRC. • **QL-SSUA—**SSM QL value is QL-SSUA. • **QL-SSUB—**SSM QL value is QL-SSUB.
Step 6	**setSyncEglobalConfig synce-global-conf SSM-QL-for-freerun** {**QL-DNU | QL-EEC1 | QL-EEC2 | QL-INV | QL-NONE | QL-PRC | QL-SSUA QL-SSUB**} **Example:** `Switch(SyncE)# setSyncEglobalConfig synce-global-conf SSM-QL-for-freerun QL-EEC2`	Transmits SSM QL value when clock selector is in Free Run Mode. • **QL-DNU—**SSM QL value is QL_DNU. • **QL-EEC1—**SSM QL value is QL_EEC1. • **QL-EEC2—** SSM QL value is QL_EEC2. • **QL-INV—**SSM QL value is QL_INV. • **QL-NONE—**SSM QL value is QL_NONE. • **QL-PRC—**SSM QL value is QL_PRC. • **QL-SSUA—**SSM QL value is QL_SSUA. • **QL-SSUB—**SSM QL value is QL_SSUB.
Step 7	**setSyncEglobalConfig synce-global-conf EEC-Option**{**EEC1 | EEC2**} **Example:** `Switch(SyncE)# setSyncEglobalConfig synce-global-conf EEC-Option EEC2`	Selects PLL EEC option. • **EEC1—**DPLL bandwidth is 3.5 Hz. • **EEC2—**DPLL bandwidth is 0.1 Hz.
Step 8	**setSyncEglobalConfig review** **Example:** `Switch(SyncE)# setSyncEglobalConfig review`	Displays the configuration.
Step 9	**setSyncEglobalConfig commit** **Example:** `Switch(SyncE)# setSyncEglobalConfig commit`	Sends the configuration to the NID.
Step 10	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# setSyncEglobalConfig synce-global-conf wait-to-restore 1
Switch(SyncE)# setSyncEglobalConfig synce-global-conf clock-select-config revertive
Switch(SyncE)# setSyncEglobalConfig synce-global-conf SSM-QL-for-holdover QL-EEC1
Switch(SyncE)# setSyncEglobalConfig synce-global-conf SSM-QL-for-freerun QL-EEC2
Switch(SyncE)# setSyncEglobalConfig synce-global-conf EEC-Option EEC2
Switch(SyncE)# setSyncEglobalConfig review

Commands in queue:
    setSyncEglobalConfig synce-global-conf wait-to-restore 1
    setSyncEglobalConfig synce-global-conf clock-select-config revertive
    setSyncEglobalConfig synce-global-conf SSM-QL-for-holdover QL-EEC1
    setSyncEglobalConfig synce-global-conf SSM-QL-for-freerun QL-EEC2
    setSyncEglobalConfig synce-global-conf EEC-Option EEC2

Switch(SyncE)# setSyncEglobalConfig commit

    SetSyncEglobalConfig Commit Success!!!

Switch(SyncE)# exit
```

Viewing SyncE Timers

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**getSyncEglobalConfig get-global-config** **Example:** `Switch(SyncE)# getSyncEglobalConfig get-global-config`	Displays the SyncE global configuration.
Step 3	**getSyncEglobalConfig review** **Example:** `Switch(SyncE)# getSyncEglobalConfig review`	Sends the configuration to the NID.
Step 4	**getSyncEglobalConfig commit** **Example:** `Switch(SyncE)# getSyncEglobalConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# getSyncEglobalConfig get-global-config
Switch(SyncE)# getSyncEglobalConfig review

Commands in queue:
  getSyncEglobalConfig get-global-config

Switch(SyncE)# getSyncEglobalConfig commit

  GetSyncEglobalConfig_Output.synce_global_conf.clock_select_config.u.revertive = '0'
  GetSyncEglobalConfig_Output.synce_global_conf.wait_to_restore = 1
  GetSyncEglobalConfig_Output.synce_global_conf.SSM_QL_for_holdover.t = 6
  GetSyncEglobalConfig_Output.synce_global_conf.SSM_QL_for_holdover.u.QL_EEC1 = '0'
  GetSyncEglobalConfig_Output.synce_global_conf.SSM_QL_for_freerun.t = 1
  GetSyncEglobalConfig_Output.synce_global_conf.SSM_QL_for_freerun.u.QL_NONE = ''
  GetSyncEglobalConfig_Output.synce_global_conf.EEC_Option.t = 1
  GetSyncEglobalConfig_Output.synce_global_conf.EEC_Option.u.EEC1 = ''

  GetSyncEglobalConfig Commit Success!!!

Switch(SyncE)# exit
```

Understanding ANEG Mode

The Auto-negotiation (ANEG) mode is relevant for 1000BaseT ports only. To recover the clock from a port, the clock must be negotiated to the Slave mode. To distribute the clock, the port must be negotiated to the Master mode.

Following are the different ANEG modes that can be activated on a clock source port:

- **Prefer Slave—**the port negotiates to the Slave mode.
- **Prefer Master—**the port negotiates to the Master mode.
- **Forced Slave—**the port is forced to the Master mode.

Note The port in the **Locked** state always remains negotiated to the **Slave**.

Configuring ANEG mode

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the syncE mode.

	Command or Action	Purpose
Step 2	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **port** *Physical port*} **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 setSyncEclockConfig clock-sel-config occure source-configs 2`	Configures the clock source on the port. • *source_configs*—Nominate a port number to be the clock source. The range is from 1 to 2. • *Physical port*—Physical port. The range is from 1 to 6.
Step 3	**setSyncEclockConfig clock-sel-config** {**source-configs** *source-configs* **aneg-mode** {**forced-slave** | **none** | **prefer-master** | **prefer-slave**}} **Example:** `Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 aneg-mode prefer-master setSyncEclockConfig clock-sel-config occure source-configs 2 aneg-mode prefer-master`	Configures the ANEG mode that is relevant to ports1 and 2, which are 1000 base T.
Step 4	**setSyncEclockConfig review** **Example:** `Switch(SyncE)# setSyncEclockConfig review`	Displays the configuration.
Step 5	**setSyncEclockConfig commit** **Example:** `Switch(SyncE)# setSyncEclockConfig commit`	Sends the configuration to the NID.
Step 6	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1
    setSyncEclockConfig clock-sel-config occur source-configs port 2
Switch(SyncE)# setSyncEclockConfig clock-sel-config source-configs 1 aneg-mode prefer-master

   setSyncEclockConfig clock-sel-config occur source-configs port 2 aneg-mode prefer-master
Switch(SyncE)# setSyncEclockConfig review

Commands in queue:
  setSyncEclockConfig clock-sel-config source-configs 1
    setSyncEclockConfig clock-sel-config occur source-configs port 2
  ssetSyncEclockConfig clock-sel-config source-configs 1 aneg-mode prefer-master
   setSyncEclockConfig clock-sel-config occur source-configs port 2 aneg-mode prefer-master


Switch(SyncE)# setSyncEclockConfig commit

 SetSyncEclockConfig Commit Success!!!
```

```
Switch(SyncE)# exit
```

Verifying SyncE Status

DETAILED STEPS

	Command or Action	Purpose
Step 1	**syncE** **Example:** `Switch# SyncE`	Enters the SyncE mode.
Step 2	**showNetworkClock show-synce-status** **Example:** `Switch(SyncE)# showNetworkClock show-synce-status`	Displays the SyncE status.
Step 3	**exit** **Example:** `Switch(SyncE)# exit`	Exits the SyncE mode.

Configuration Example

```
Switch# SyncE
Switch(SyncE)# showNetworkClock show-synce-status

  ShowNetworkClock_Output.show_network_clock.selector_state.t = 2
  ShowNetworkClock_Output.show_network_clock.selector_state.u.holdover = ''
  ShowNetworkClock_Output.show_network_clock.alarm_state[0].clock_source = 1
  ShowNetworkClock_Output.show_network_clock.alarm_state[0].LOCS = false
  ShowNetworkClock_Output.show_network_clock.alarm_state[0].SSM = false
  ShowNetworkClock_Output.show_network_clock.alarm_state[0].WTR = false
  ShowNetworkClock_Output.show_network_clock.alarm_state[1].clock_source = 2
  ShowNetworkClock_Output.show_network_clock.alarm_state[1].LOCS = true
  ShowNetworkClock_Output.show_network_clock.alarm_state[1].SSM = false
  ShowNetworkClock_Output.show_network_clock.alarm_state[1].WTR = false
  ShowNetworkClock_Output.show_network_clock.alarm_state[2].clock_source = 3
  ShowNetworkClock_Output.show_network_clock.alarm_state[2].LOCS = true
  ShowNetworkClock_Output.show_network_clock.alarm_state[2].SSM = false
  ShowNetworkClock_Output.show_network_clock.alarm_state[2].WTR = false

  ShowNetworkClock Commit Success!!!

Switch(SyncE)# exit
```

CHAPTER 6

Configuring Ethernet Virtual Connections

Ethernet Virtual Connection (EVC) as an association between two or more user network interfaces that identifies a point-to-point or multipoint-to-multipoint path within the service provider network. An EVC is a conceptual service pipe within the service provider network. A bridge domain is a local broadcast domain that is VLAN-ID-agnostic. An ethernet flow point (EFP) service instance is a logical interface that connects a bridge domain to a physical port or to an EtherChannel group in a router.

The Cisco ME 1200 NID supports the application software control modules and interfaces related to EVC.

How to Configure Ethernet Virtual Circuit

Configuring Ethernet Virtual Circuit

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionEVC** **Example:** `Switch# ProvisionEVC`	Enters the ProvisionEVC mode.

	Command or Action	Purpose

Step 2	**addEVC evcConfiguration** {**instance***evc-nstance-id* | **learning** {**enable** | **disable**} |**nni-ports** | **nni-vid***nni-vid-outer-tag* | **policer-id** *policer-id*}
	
	Example:
	`Switch(ProvisionEVC)# addEVC evcConfiguration nni-vid 101`
	`Switch(ProvisionEVC)# addEVC evcConfiguration learning enable`
	`Switch(ProvisionEVC)# addEVC evcConfiguration nni-ports GigabitEthernet-6-NNI enable`
	`Switch(ProvisionEVC)# addEVC evcConfiguration policer-id 1`
		Adds the EVE configuration.

Step 3	**addEVC review** **Example:** `Switch(ProvisionEVC)# addEVC review`	Reviews the addEVC configuration.
Step 4	**addEVC commit** **Example:** `Switch(ProvisionEVC)# addEVC commit`	Sends the addEVC configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionEVC)# exit`
	`Switch#`
		Exits the ProvisionEVC mode.

Example

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addEVC evcConfiguration instance 7
Switch(ProvisionEVC)# addEVC evcConfiguration nni-vid 101
Switch(ProvisionEVC)# addEVC evcConfiguration learning enable
Switch(ProvisionEVC)# addEVC evcConfiguration nni-ports GigabitEthernet-6-NNI enable
Switch(ProvisionEVC)# addEVC evcConfiguration policer-id 1
Switch(ProvisionEVC)# addEVC review
Switch(ProvisionEVC)# addEVC commit

  AddEVC Commit Success!!!
```

Creating a Policer

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionEVC** **Example:** `Switch# ProvisionEVC`	Enters the ProvisionEVC mode.

	Command or Action	Purpose

Step 2	**addPolicerEVC evc-policer** {**cbs** *cbs-id* | **cir** *committed-information-rate* | **ebs** *excess-burst-size*| **eir** *excess-information-rate* |**policer-id** *policer-id* | **policer mode** {**color-aware** | **coupled**} |**policer-type** {**mef** | **single**} | **rate-type** {**data** | **line**} | **state** {**enabled** | **disabled**}}
	
	Example:
	`Switch(ProvisionEVC)# addPolicerEVC evc-policer cir 20000`
	`Switch(ProvisionEVC)# addPolicerEVC evc-policer ebs 30000`
	`Switch(ProvisionEVC)# addPolicerEVC evc-policer eir 40000`
	`Switch(ProvisionEVC)# addPolicerEVC evc-policer policer-id 1`
	`Switch(ProvisionEVC)# addPolicerEVC evc-policer state enabled`
		Adds the EVC Policer.
		• **cbs—**Specifies the committed burst size in bytes.
		• **cir—**Specifies the committed information rate. Multiply by 1000 to get rate in BPS.
		• **ebs—**Specifies the excess burst size in bytes.
		• **eir—**Specifies the excess information rate.
		• **policer-id—**Specifies the Policer ID. The valid values are from 1 to 1022.
		• **policer-mode—**Specifies the Policer mode**—**whether **color-aware** or **coupled**.
		• **policer-type—**Specifies the Policer mode**—**whether **mef** or **single**.
		• **rate-type—**Specifies the rate type policing**—**whether **data** or **line**.
		• **state—**Specifies the policer state**—**whether **enabled** or **disabled**.

Step 3	**addPolicerEVC review** **Example:** `Switch(ProvisionEVC)# addPolicerEVC review`	Displays the addPolicerEVC configuration.

Step 4	**addPolicerEVC commit**
	
	Example:
	`Switch(ProvisionEVC)# addPolicerEVC commit`
	`AddPolicerEVC Commit Success!!!`
		Sends the configuration to the NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionEVC)# exit`
	`Switch#`
		Exits the ProvisionEVC mode.

Number of policers allowed are 1022. Use the following scale numbers for the ECE or EVC configuration with or without configuring QoS with tag pop 0, 1, or 2:

- Maximum 510 ECEs can be configured with or without configuring QoS (0-7 COS) with one NNI port to one UNI port.

- Maximum of 340 ECEs can be configured with or without configuring QoS (0-7 COS) with two NNI ports to one UNI or one NNI port to two UNI ports.
- Maximum of 255 ECEs can be configured with or without configuring QoS (0-7 COS) with three NNI ports to one UNI port or one NNI port to three UNI ports.
- Maximum of 170 ECEs can be configured with or without configuring QoS (0-7 COS) with four NNI ports to one UNI port or one NNI port to four UNI ports.
- Maximum of 128 ECEs can be configured with or without configuring QoS (0-7 COS) with five NNI ports to one UNI port or one NNI port to five UNI ports.

If OAM, HQoS, or EFP is configured on the Cisco ME 1200 NID, you can configure the following maximum service instances on every UNI interface:

- 64 ECE or EVC with eight COS classes.
- 104 ECE or EVC with four COS classes.
- 104 ECE or EVC with two COS classes.

EVC Control Entry (ECE) Configuration

ECE rules are used to divide the UNI traffic into two service classes.

This division of UNI traffic is achieved through:

- Simple NNI: All EVCs on the NNI port use the same QoS mapping and statistics.

  Note This method requires fewer resources.

- Advanced NNI: Each EVC on the NNI port has separate QoS mapping and statistics.

In the following example, multiple ECE rules are created:

Configuring ECE Sample Rule 1

For rule 1, frames received on the UNI port with PCP 4-7 values are mapped to class 4 and sent with PCP 4 in the outer tag on the NNI port.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionEVC** **Example:** `Switch# ProvisionEVC`	Enters the ProvisionEVC mode.

	Command or Action	Purpose
Step 2	**addECE ece-configuration ece-id** *ece-id* **Example:** `Switch(ProvisionEVC)# addECE ece-configuration ece-id 2`	Adds ECE configuration.

Step 3	**addECE ece-configuration control actions** {**class** {**disabled** | **specific** *specific-id*} | **direction** {**bothnni-to-uni** |**uni-to-nni**} | **drop-precedence** {**disabled** | **one** | **zero**} | **evc-id** {**none** | **specific** *specific-eve-id*} | **policer-id** {**discard** | **evc** | **none** | **specific** *specific-id*} | **policy-id** *acl-policy-id* | **tag-pop-count** *tag-pop-count*}
	
	Example:
	
	`Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 7`
	`Switch(ProvisionEVC)# addECE ece-configuration control actions tag-pop-count 1`
	`Switch(ProvisionEVC)# addECE ece-configuration control actions policer-id specific 1`
	`Switch(ProvisionEVC)# addECE ece-configuration control actions class specific 4`
		Adds the ECE control action configuration.
		• **class—**Specifies the ECE class.
		• **direction—**Specifies the direction of flow of traffic.
		• **drop-precedence—**Specifies the drop precedence (higher value means more dropping).
		• **evc-id—**Specifies the EVC ID. The valid **specific** values are from 1 to 1024.
		• **policer-id—**Specifies the policer ID. The valid **specific** values are from 1 to 1022.
		• **policy-id—**Specifies the ACL policy ID. The valid values are from 0 to 63.
		• **tag-pop-count—**Specifies the tagged VLAN count to be removed (either one or two outermost tags).

Step 4	**addECE ece-configuration control egress-inner-tagaddECE ece-configuration control egress-inner-tag** {**dei-mode** {**classified** | **drop-prec** | **fixed**} | **dei-value** *dei* | **pcp-mode** {**classified** | **fixed** | **mapped**} | **pcp-value** *pcp-value* | **type** *type* | **vlan-id** *vlan-id*}
	
	Example:
	
	`Switch(ProvisionEVC)# addECE ece-configuration control egress-inner-tag dei-mode classified`
	`Switch(ProvisionEVC)# addECE ece-configuration control egress-inner-tag type none`
	`Switch(ProvisionEVC)# addECE ece-configuration control egress-inner-tag vlan-id 3`
		Adds the ECE control egress inner tag rewrite configuration.
		• **dei-mode—**Specifies the DEI mode**—**whether **classified**, **drop precedence**, or **fixed**.
		• **dei-value—**Specifies the DEI value. The valid values are 0 and 1.
		• **pcp-mode—**Specifies the PCP mode**—**whether **classified**, **fixed**, or **mapped**.
		• **pcp-value—**Specifies the PCP value. The valid values are from 1 to 7.
		• **type—**Specifies the type**—**whether **c-tagged**, **none**, **s-custom**, or **s-tagged**.
		• **vlan-id—**Specifies the VLAN ID. The valid values are from 1 to 4095.

Step 5	**addECE ece_configuration control egress-outer-tag** {**dei-mode** {**classified** | **drop-prec** | **fixed**} | **dei-value** *dei-value* | **mode** {**enabled** | **disabled**} | **pcp-mode** {**classified** | **fixed** | **mapped**} | **pcp-value** *pcp-value* | **vlan-id** *vlan-id*	Adds the ECE control egress outer tag rewrite configuration. • **dei-mode—**Specifies the DEI mode**—**whether **classified**, **drop precedence**, or **fixed**.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionEVC)# addECE ece-configuration control egress-outer-tag pcp-mode fixed`
	`Switch(ProvisionEVC)# addECE ece-configuration control egress-outer-tag pcp-value 4`
		• **dei-value—**Specifies the DEI value. The valid values are 0 and 1.
		• **mode—**Specifies the mode**—**whether **enabled** or **disabled**.
		• **pcp-mode—**Specifies the PCP mode**—**whether **classified**, **fixed**, or **mapped**.
		• **pcp-value—**Specifies the PCP value. The valid values are from 1 to 7.
		• **vlan-id—**Specifies the VLAN ID. The valid values are from 1 to 4095.

Step 6	**addECE ece-configuration control ingress-match** {**frame-type** {**any** | **ipv4** {**dest-ip-filter** | **source-ip-filter**} | **ipv6** {**dest-ip-filter** | **source-ip-filter**}} | **inner-tag-match** {**match-fields** | **match-type**} | **mac-params** {**dmac-filer** | **smac-filter**} | **outer-tag-match** {**match-fields** | **match-type**} | **uni-ports** {**GigabitEthernet-1-UNI** | **GigabitEthernet-2-UNI** | **GigabitEthernet-3-UNI** | **GigabitEthernet-4-UNI** | **GigabitEthernet-5-UNI** | **GigabitEthernet-6-UNI**}}
	Example:
	`Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports GigabitEthernet-2-UNI enable`
	`Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match match-type c-tagged`
	`Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match match-fields vlan-id-filter specific 100`
	`Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match match-fields inner-pcp val-4-7`
		Adds the ECE control ingress inner tag rewrite configuration.
		• **frame-type—**Specifies the type of frame relay.
		• **inner-tag-match—**Specifies the inner tag match value.
		• **mac-params—**Specifies the DMAC and SMAC default values.
		• **outer-tag-match—**Specifies the outer tag match value.
		• **uni-ports—**Specifies the GigabitEthernet UNI ports.

Step 7	**addECE review** **Example:** `Switch(ProvisionEVC)# addECE review`	Reviews the addECE configuration.
Step 8	**addECE commit** **Example:** `Switch(ProvisionEVC)# addECE commit`	Sends the configuration to the NID.
Step 9	**exit** **Example:** `Switch(ProvisionEVE)# exit`	Exits the ProvisionEVE mode.

Example

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addECE ece-configuration ece-id 1
Switch(ProvisionEVC)# addECE ece-configuration ece-id 1
Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 777
Switch(ProvisionEVC)# addECE ece-configuration control actions tag-pop-count 1
Switch(ProvisionEVC)# addECE ece-configuration control actions policer-id none
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports
GigabitEthernet-2-UNI enable
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag_match
match-type c-tagged
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag_match
match-fields vlan-id-filter specific 100
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag_match
match-fields inner-dei any
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag_match
match-fields inner-pcp val-any
Switch(ProvisionEVC)# addECE review
Commands in queue:
 addECE ece-configuration ece-id 1
 addECE ece-configuration ece-id 1
 addECE ece-configuration control actions evc-id specific 777
 addECE ece-configuration control actions tag-pop-count 1
 addECE ece-configuration control actions policer-id none
 addECE ece-configuration control ingress-match uni-ports GigabitEthernet-2-UNI enable
 addECE ece-configuration control ingress-match outer-tag-match match-type c-tagged
 addECE ece-configuration control ingress-match outer-tag-match match-fields vlan-id-filter
 specific 100
 addECE ece-configuration control ingress-match outer-tag-match match-fields inner-dei any

 addECE ece-configuration control ingress-match outer-tag-match match-fields inner-pcp
val-any

Switch(ProvisionEVC)# addECE commit

Clearing Socket 4 Clearing Socket 4
 AddECE Commit Success!!!
```

Configuring ECE-v3

SUMMARY STEPS

1. **ProvisionEVC**
2. **addECE-v3 eceConfiguration-v3 ece-id** *ece-id*
3. **addECE-v3 eceConfiguration-v3 control action** {**class** {**disabled** | **specific** *specific-id*} | **direction** {**bothnni-to-uni** |**uni-to-nni**} | **drop-precedence** {**disabled** | **one** | **zero**} | **evc-id** {**none** | **specific** *specific-eve-id*} | **l2cp-dmac** { **cisco** | **custom**} | **l2cp-mode** { **discard** | **forward** | **peer** | **tunnel** } |**policer-id** {**discard** | **evc** | **none** | **specific** *specific-id*} | **policy-id** *acl-policy-id* | **rule-type** { **both** | **rx** | **tx**}| **tag-pop-count** {*tag-pop-count*} | **tx-lookup** { **isdx** | **vid-only** | **vid-pcp**}
4. **addECE-v3 eceConfiguration-v3 control egress-inner-tag** {**dei-mode** {**classified** | **drop-prec** | **fixed**} | **dei-value** *dei* | **pcp-mode** {**classified** | **fixed** | **mapped**} | **pcp-value** *pcp-value* | **type** *type* | **vlan-id** *vlan-id*}
5. **addECE-v3 eceConfiguration-v3 control egress-outer-tag** {**dei-mode** {**classified** | **drop-prec** | **fixed**} | **dei-value** *dei-value* | **mode** {**enabled** | **disabled**} | **pcp-mode** {**classified** | **fixed** | **mapped**} | **pcp-value** *pcp-value* | **vlan-id** *vlan-id*
6. **addECE-v3 eceConfiguration-v3 control ingress-match** {**frame-type** {**any** | **ipv4** {**dest-ip-filter** | **source-ip-filter**} | **ipv6** {**dest-ip-filter** | **source-ip-filter**}} | **inner-tag-match** {**match-fields** | **match-type**} | **mac-params** {**dmac-filer** | **smac-filter**} | **outer-tag-match** {**match-fields** | **match-type**} | **uni-ports** {**GigabitEthernet-1-UNI** | **GigabitEthernet-2-UNI** | **GigabitEthernet-3-UNI** | **GigabitEthernet-4-UNI** | **GigabitEthernet-5-UNI** | **GigabitEthernet-6-UNI**}}
7. **addECE-v3 eceConfiguration-v3 control l2cp-parameters** { **cdp** | **cisco-cfm** | **cisco-stp** | **cisco-vlan** | **dot1x** | **dtp** | **elmi** | **gmrp** | **gvrp** | **lacp** | **lamp** | **lldp** | **loam** | **pagp** | **pause** | **pb** | **pb-gvrp** | **pvst** | **stp** | **uld** | **vtp**}
8. **addECE-v3 review**
9. **addECE-v3 commit**
10. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionEVC** **Example:** Switch# ProvisionEVC	Enters the ProvisionEVC mode.
Step 2	**addECE-v3 eceConfiguration-v3 ece-id** *ece-id* **Example:** `Switch(ProvisionEVC)# addECE ece-configuration ece-id 2`	Adds ECE configuration.
Step 3	**addECE-v3 eceConfiguration-v3 control action** {**class** {**disabled** | **specific** *specific-id*} | **direction** {**bothnni-to-uni** |**uni-to-nni**} | **drop-precedence** {**disabled** | **one** | **zero**} |	Adds the ECE control action configuration. • **class—**Specifies the ECE class.

	Command or Action	Purpose

	evc-id {**none** | **specific** *specific-eve-id*} | **l2cp-dmac** { **cisco** | **custom**} | **l2cp-mode** { **discard** | **forward** | **peer** | **tunnel** } |**policer-id** {**discard** | **evc** | **none** | **specific** *specific-id*} | **policy-id** *acl-policy-id* | **rule-type** { **both** | **rx** | **tx**}| **tag-pop-count** {*tag-pop-count*} | **tx-lookup** { **isdx** | **vid-only** | **vid-pcp**}
	
	Example:
	
	`Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 7`
	`Switch(ProvisionEVC)# addECE ece-configuration control actions tag-pop-count 1`
	`Switch(ProvisionEVC)# addECE ece-configuration control actions policer-id specific 1`
	`Switch(ProvisionEVC)# addECE ece-configuration control actions class specific 4`
		• **direction—**Specifies the direction of flow of traffic.
		• **drop-precedence—**Specifies the drop precedence (higher value means more dropping).
		• **evc-id—**Specifies the EVC ID. The valid **specific** values are from 1 to 1024.
		• **policer-id—**Specifies the policer ID. The valid **specific** values are from 1 to 1022.
		• **policy-id—**Specifies the ACL policy ID. The valid values are from 0 to 63.
		• **tag-pop-count—**Specifies the tagged VLAN count to be removed (either one or two outermost tags).
		• **l2cp-dmac—**Specifies the L2CP tunnel DMAC.
		◦ **cisco—**Specifies Cisco Generic BPDU Tunneling DMAC.
		◦ **custom—**Specifies custom DMAC.
		• **l2cp-mode—**Specifies the L2CP mode.
		◦ **discard—**Discard L2CP frames.
		◦ **forward—**Forward L2CP frames.
		◦ **peer—**Peer L2CP frames.
		◦ **tunnel—**Tunnel L2CP frames.
		• **rule-type—**Specifies the rule type.
		◦ **both—**Specifies both rule type.
		◦ **rx—**Specifies rx rule type .
		◦ **tx—**Specifies tx rule type .
		• **tx-lookup—**Specifies tx-lookup.
		◦ **isdx—**Specifies isdx lookup.
		◦ **vid-only—**Specifies vid-only lookup .
		◦ **vid-pcp—**Specifies vid-pcp lookup .

Step 4	**addECE-v3 eceConfiguration-v3 control egress-inner-tag** {**dei-mode** {**classified** | **drop-prec** | **fixed**} | **dei-value** *dei* | **pcp-mode** {**classified** | **fixed** |	Adds the ECE control egress inner tag rewrite configuration. • **dei-mode—**Specifies the DEI mode**—**whether **classified**, **drop precedence**, or **fixed**.

	Command or Action	Purpose

	mapped} | **pcp-value** *pcp-value* | **type** *type* | **vlan-id** *vlan-id*}
	
	Example:
	
	`Switch(ProvisionEVC)# addECE-v3 ece-configuration control egress-inner-tag dei-mode classified`
	`Switch(ProvisionEVC)# addECE-v3 ece-configuration control egress-inner-tag type none`
	`Switch(ProvisionEVC)# addECE-v3 ece-configuration control egress-inner-tag vlan-id 3`
		• **dei-value**—Specifies the DEI value. The valid values are 0 and 1.
		• **pcp-mode**—Specifies the PCP mode—whether **classified**, **fixed**, or **mapped**.
		• **pcp-value**—Specifies the PCP value. The valid values are from 1 to 7.
		• **type**—Specifies the type—whether **c-tagged**, **none**, **s-custom**, or **s-tagged**.
		• **vlan-id**—Specifies the VLAN ID. The valid values are from 1 to 4095.

Step 5	**addECE-v3 eceConfiguration-v3 control egress-outer-tag** {**dei-mode** {**classified** | **drop-prec** | **fixed**} | **dei-value** *dei-value* | **mode** {**enabled** | **disabled**} | **pcp-mode** {**classified** | **fixed** | **mapped**} | **pcp-value** *pcp-value* | **vlan-id** *vlan-id*
	
	Example:
	
	`Switch(ProvisionEVC)# addECE-v3 ece-configuration control egress-outer-tag pcp-mode fixed`
	`Switch(ProvisionEVC)# addECE-v3 ece-configuration control egress-outer-tag pcp-value 4`
		Adds the ECE control egress outer tag rewrite configuration.
		• **dei-mode**—Specifies the DEI mode—whether **classified**, **drop precedence**, or **fixed**.
		• **dei-value**—Specifies the DEI value. The valid values are 0 and 1.
		• **mode**—Specifies the mode—whether **enabled** or **disabled**.
		• **pcp-mode**—Specifies the PCP mode—whether **classified**, **fixed**, or **mapped**.
		• **pcp-value**—Specifies the PCP value. The valid values are from 1 to 7.
		• **vlan-id**—Specifies the VLAN ID. The valid values are from 1 to 4095.

Step 6	**addECE-v3 eceConfiguration-v3 control ingress-match** {**frame-type** {**any** | **ipv4** {**dest-ip-filter** | **source-ip-filter**} | **ipv6** {**dest-ip-filter** | **source-ip-filter**}} | **inner-tag-match** {**match-fields** | **match-type**} | **mac-params** {**dmac-filer** | **smac-filter**} | **outer-tag-match** {**match-fields** | **match-type**} | **uni-ports** {**GigabitEthernet-1-UNI** | **GigabitEthernet-2-UNI** | **GigabitEthernet-3-UNI** | **GigabitEthernet-4-UNI** | **GigabitEthernet-5-UNI** | **GigabitEthernet-6-UNI**}}
	
	Example:
	
	`Switch(ProvisionEVC)# addECE-v3 ece-configuration control ingress-match uni-ports GigabitEthernet-2-UNI enable`
	`Switch(ProvisionEVC)# addECE-v3 ece-configuration control ingress-match outer-tag-match match-type c-tagged`
	`Switch(ProvisionEVC)# addECE-v3 ece-configuration control ingress-match outer-tag-match match-fields`
		Adds the ECE control ingress inner tag rewrite configuration.
		• **frame-type**—Specifies the type of frame relay.
		• **inner-tag-match**—Specifies the inner tag match value.
		• **mac-params**—Specifies the DMAC and SMAC default values.
		• **outer-tag-match**—Specifies the outer tag match value.
		• **uni-ports**—Specifies the GigabitEthernet UNI ports.

	Command or Action	Purpose
	`vlan-id-filter specific 100` `Switch(ProvisionEVC)# addECE-v3 ece-configuration control ingress-match outer-tag-match match-fields inner-pcp val-4-7`	
Step 7	**addECE-v3 eceConfiguration-v3 control l2cp-parameters** { **cdp** | **cisco-cfm** | **cisco-stp** | **cisco-vlan** | **dot1x** | **dtp** | **elmi** | **gmrp** | **gvrp** | **lacp** | **lamp** | **lldp** | **loam** | **pagp** | **pause** | **pb** | **pb-gvrp** | **pvst** | **stp** | **uld** | **vtp**} **Example:** `Switch(ProvisionEVC)# addECE-v3 ece-configuration control l2cp-parameters dot1x`	Adds the ECE control ingress inner tag rewrite configuration. • **cdp—**Specifies cdp frames. • **cisco-cfm —**Specifies Cisco CFM frames. • **cisco-stp—**Specifies the Cisco STP Uplink Fast frames. • **cisco-vlan —**Specifies Cisco VLAN bridge frames. • **dot1x —**Specifies the 802.1X frames. • **dtp—**Specifies the DTP frames. • **elmi—**Specifies the E-LMI frames. • **gmrp —**Specifies the GMRP frames. • **gvrp —**Specifies the GVRP frames. • **lacp —**Specifies the LACP frames. • **lamp —**Specifies the LAMP frames. • **lldp —**Specifies the LLDP frames. • **loam —**Specifies the Link OAM frames. • **pagp—**Specifies the PAgP frames. • **pause —**Specifies the Pause frames. • **pb—**Specifies the PB frames. • **pb-gvrp —**Specifies the PB GVRP frames. • **pvst—**Specifies the PVST frames. • **stp —**Specifies the STP frames. • **uld —**Specifies the ULD frames. • **vtp —**Specifies the VTP frames.
Step 8	**addECE-v3 review** **Example:** `Switch(ProvisionEVC)# addECE-v3 review`	Reviews the addECE configuration.
Step 9	**addECE-v3 commit** **Example:** `Switch(ProvisionEVC)# addECE-v3 commit`	Sends the configuration to the NID.

	Command or Action	Purpose

Step 10	**exit**
	
	Example:
	
	`Switch(ProvisionEVE)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Example

```
(ProvisionEVE)# addece-v3 review

Commands in queue: 7

        addECE-v3 eceConfiguration-v3 ece-id 98

        addECE-v3 eceConfiguration-v3 control actions evc-id specific 97

        addECE-v3 eceConfiguration-v3 control ingress-match uni-ports 6-4

        addECE-v3 eceConfiguration-v3 control ingress-match frame-type l2cp

        addECE-v3 eceConfiguration-v3 control actions l2cp-mode tunnel

        addECE-v3 eceConfiguration-v3 control actions l2cp-dmac cisco

        addECE-v3 eceConfiguration-v3 control l2cp-parameters dot1x

(ProvisionEVC)# addece-v3 commit


 AddECE-v3 Commit Success!!!(ProvisionEVC)#
```

Configuring the ECE Sample Rule 2

For rule 2, other frames received on the UNI port are mapped to class 0 and sent with PCP 0 in the outer tag on the NNI port.

Note The configuration steps are similar to the ones mentioned in the Configuring ECE Sample Rule 1 section.

Example

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 7

Switch(ProvisionEVC)# addECE ece-configuration control actions tag-pop-count 1
```

```
Switch(ProvisionEVC)# addECE ece-configuration control actions policer-id specific 1
Switch(ProvisionEVC)# addECE ece-configuration control actions class specific 0
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports
GigabitEthernet-2-UNI enable
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-type c-tagged
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-fields vlan-id-filter specific 99
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-fields inner-pcp val-0-3
Switch(ProvisionEVC)# addECE ece-configuration control egress-outer-tag pcp-mode fixed
Switch(ProvisionEVC)# addECE ece-configuration control egress-outer-tag pcp-value 0
Switch(ProvisionEVC)# addECE commit
```

Configuring ECE Sample Rule 3

For rule 3, frames received on the NNI port 6 with S-tag 101 and C-tag 100 with any PCP values can be mapped to class 4 and sent with PCP 4 on the UNI port.

Note The configuration steps are similar to the ones mentioned in the Configuring ECE Sample Rule 1 section.

Example

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addECE ece-configuration ece-id 3
Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 7
Switch(ProvisionEVC)# addECE ece-configuration control actions class specific 4
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports
GigabitEthernet-2-UNI enable
Switch(ProvisionEVC)# addECE ece-configuration control egress-inner-tag pcp-mode fixed
Switch(ProvisionEVC)# addECE ece-configuration control egress-inner-tag pcp-value 4
Switch(ProvisionEVC)# addECE commit
```

Configuring ECE Sample Rule 4

For rule 4, insert a new c-tag in frames forwarding to the NNI port.

Note The configuration steps are similar to the ones mentioned in the Configuring ECE Sample Rule 1 section.

Example

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addECE ece-configuration ece-id 4
Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 7
Switch(ProvisionEVC)# addECE ece-configuration control actions tag-pop-count 1
Switch(ProvisionEVC)# addECE ece-configuration control actions policer-id specific 1
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports
GigabitEthernet-2-UNI enable
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-type c-tagged
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-fields vlan-id-filter specific 99
Switch(ProvisionEVC)# addECE ece-configuration control egress-inner-tag type c-tagged
Switch(ProvisionEVC)# addECE ece-configuration control egress-inner-tag vlan-id 77
Switch(ProvisionEVC)# addECE commit
```

Configuring ECE Sample Rule 5

For rule 5, insert a new tag in frames forwarding to the UNI port, the outer tag for NNI - UNI direction for the ECE.

Note The configuration steps are similar to the ones mentioned in the Configuring ECE Sample Rule 1 section.

Example

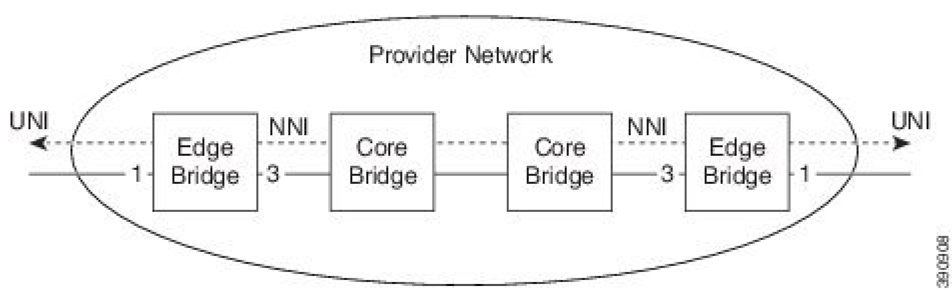
```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addECE ece-configuration ece-id 5
Switch(ProvisionEVC)# addECE ece-configuration control actions direction nni-to-uni
                                               ---> This field is mandatory to pass
Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 7
                                               ---> Map this ECE rule to an EVC configured
 above.
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports
GigabitEthernet-2-UNI enable
Switch(ProvisionEVC)# addECE ece-configuration control egress-outer-tag enabled
Switch(ProvisionEVC)# addECE ece-configuration control egress-outer-tag vlan-id 78
Switch(ProvisionEVC)# addECE commit
```

Ethernet Private Line or E-LAN

Ethernet Private Line (EPL) or E-LAN and Ethernet Virtual Private Line (EVPL) are Carrier Ethernet data services defined by the Metro Ethernet Forum. E-LAN provides a point-to-point Ethernet virtual connection (EVC) between a pair of dedicated user–network interfaces (UNIs), with a high degree of transparency.

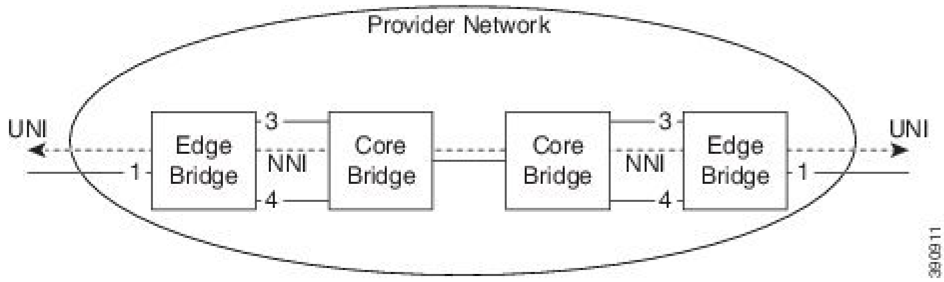
The following diagrams show a Provider Network offering various types of E-LAN between two UNIs.

Figure 5: An Unprotected Ethernet-LAN



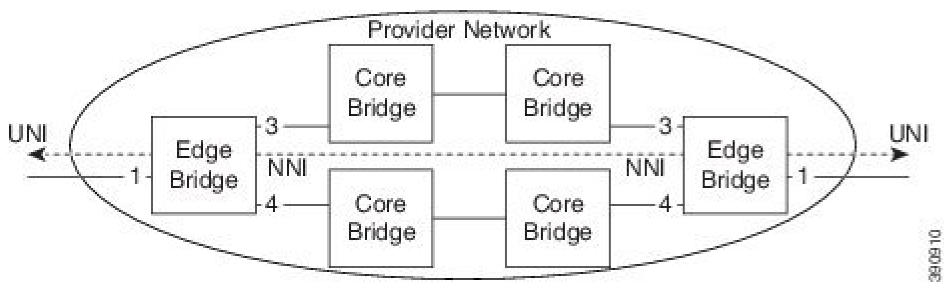
The following diagram shows an ethernet private (EP) line with 1-to-1 port protection on the network-network interface (NNI) side. This setup requires more resources compared to the unprotected EP-Line, because rules must be added for both NNI ports.

Figure 6: Port Protected E-LAN



The following diagram shows an ethernet LAN with ring protection on the network-network interface (NNI) side. The resource consumption is similar to the port protection scenario, because rules are added for each NNI port.

Figure 7: Ring-Protected E-LAN



The following sections describe how to configure the Edge Bridges.

Configuring ECE for E-LAN Between Two UNI and NNI Ports

For more information on configuring ECE, see the EVC Control Entry (ECE) Configuration section.

ECE Rule 1 on UNI Interface 3

```
Switch # ProvisionEVC
Switch(ProvisionEVC)# addECE ece-configuration ece-id 6
Switch(ProvisionEVC)# addECE ece-configuration control actions tag-pop-count 1
Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 9

Switch(ProvisionEVC)# addECE ece-configuration control actions policer-id specific 1
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports
GigabitEthernet-3-UNI enable
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag_match
match-type c-tagged
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-fields vlan-id-filter specific 500
Switch(ProvisionEVC)# addECE review
Switch(ProvisionEVC)# addECE commit
```

ECE Rule 1 on UNI Interface 2

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addECE ece-configuration ece-id 6
Switch(ProvisionEVC)# addECE ece-configuration control actions tag-pop-count 1
Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 9

Switch(ProvisionEVC)# addECE ece-configuration control actions policer-id specific 1
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports
GigabitEthernet-2-UNI enable
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-type c-tagged
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-fields vlan-id-filter specific 600
Switch(ProvisionEVC)# addECE review
Switch(ProvisionEVC)# addECE commit
```

Note Tag POP count is 1 for E-LAN service, that is, all frames are passed to the EVC popping one tag in the direction from UNI to NNI and pushing one tag in the other direction.

Configuring EVC for E-LAN

For more information on configuring EVC, see the Configuring Ethernet Virtual Circuitsection.

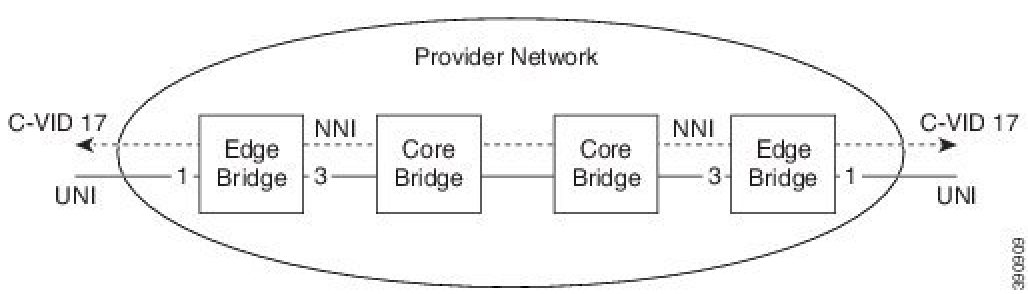
Example

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addEVC evcConfiguration instance 9
Switch(ProvisionEVC)# addEVC evcConfiguration internal-vid 400
Switch(ProvisionEVC)# addEVC evcConfiguration nni-vid 400
Switch(ProvisionEVC)# addEVC evcConfiguration learning enable
Switch(ProvisionEVC)# addEVC evcConfiguration nni-ports GigabitEthernet-6-NNI enable
Switch(ProvisionEVC)# addEVC evcConfiguration policer-id 1
Switch(ProvisionEVC)# addEVC review
Switch(ProvisionEVC)# addEVC commit
```

Ethernet Virtual Private Line

The following diagram shows an unprotected ethernet virtual private line (EVP-Line) forwarding frames with C-VID = 17 between the user-network interface (UNI) ports.

Figure 8: Unprotected EVP-Line



Thie following section describes the configuration of the EVPL service between the UNI and NNI ports.

Configuring ECE For EVPL Service

For more information on configuring ECE, see the EVC Control Entry (ECE) Configuration section.

Example

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addECE ece-configuration ece-id 6
Switch(ProvisionEVC)# addECE ece-configuration control actions evc-id specific 8

Switch(ProvisionEVC)# addECE ece-configuration control actions policer-id specific 1
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match uni-ports
GigabitEthernet-3-UNI enable
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-type c-tagged
Switch(ProvisionEVC)# addECE ece-configuration control ingress-match outer-tag-match
match-fields vlan-id-filter range 300-350
Switch(ProvisionEVC)# addECE review
Switch(ProvisionEVC)# addECE commit
```

Note The above ECE rule allows all VLANs ranging from 300 to 350. However, if you need to filter specific VLANs then you must create individual ECE rules. For more information, see Configuring ECE Sample Rule 1 .

Configuring EVC For EVPL Service

For more information on configuring EVC, see the Configuring Ethernet Virtual Circuit section.

Example

```
Switch# ProvisionEVC
Switch(ProvisionEVC)# addEVC evcConfiguration instance 8
Switch(ProvisionEVC)# addEVC evcConfiguration internal-vid 200
Switch(ProvisionEVC)# addEVC evcConfiguration nni-vid 200
Switch(ProvisionEVC)# addEVC evcConfiguration learning enable
Switch(ProvisionEVC)# addEVC evcConfiguration nni-ports GigabitEthernet-5-NNI enable
Switch(ProvisionEVC)# addEVC evcConfiguration policer-id 1
Switch(ProvisionEVC)# addEVC review
Switch(ProvisionEVC)# addEVC commit
```

Other Commands For EVC Configuration

Clearing EVC Statistics

clearEVCStatistics clear-evc-stats {**all** | **ece** | **evc-id** | **physical-port**}

```
Switch(ProvisionEVC)# clearEVCStatistics clear-evc-stats all
Switch(ProvisionEVC)# clearEVCStatistics clear-evc-stats ece ece-id <1-1024>
Switch(ProvisionEVC)# clearEVCStatistics clear-evc-stats ece physical-port <1-6>
Switch(ProvisionEVC)# clearEVCStatistics clear-evc-stats evc-id <1-1024>
Switch(ProvisionEVC)# clearEVCStatistics clear-evc-stats physical-port <1-6>
Switch(ProvisionEVC)# clearEVCStatistics review
Switch(ProvisionEVC)# clearEVCStatistics commit
```

Using the Default Configuration

default

```
Switch(ProvisionEVC)# default
```

Note This command resets all configuration to default values.

Deleting Configuration

Use this command to delete the ECE configuration.

deleteECE delete-ece-request *ece-id*

```
Switch(ProvisionEVC)# deleteECE delete-ece-request <1-1024>
Switch(ProvisionEVC)# deleteECE review
Switch(ProvisionEVC)# deleteECE commit
```

Use this command to delete the EVC configuration.

deleteEVC deleteEVCrequest *evc-id*

```
Switch(ProvisionEVC)# deleteEVC deleteEVCrequest <1-1024>
Switch(ProvisionEVC)# deleteEVC review
Switch(ProvisionEVC)# deleteEVC commit
```

Use this command to delete the EVC Policer request.

deletePolicerEVC evc-policer-id *evc-policer-id*

```
Switch(ProvisionEVC)# deletePolicerEVC evc-policer-id <1-1024>
Switch(ProvisionEVC)# deletePolicerEVC review
Switch(ProvisionEVC)# deletePolicerEVC commit
```

Editing Configuration

Use this command to edit the ECE configuration.

editECEConfiguration ece-update-configuration {**ece-id** *ece-id* | **update** {**class** | **direction** | **drop-precedence** |**evc-id** |**policer-id** |**rule-type** | **tag-pop-count** |**tx-lookup** }}

```
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration ece-id <1-1024>
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update class disabled
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update class specific
<0-7>
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update direction both
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update direction
nni-to-uni
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update direction
uni-to-nni
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update drop-precedence
 disabled
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update drop-precedence
 one
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update drop-precedence
 zero
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update evc-id none
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update evc-id specific
 <1-1024>
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update policer-id discard
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update policer-id evc
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update policer-id none
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update policer-id
specific
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update policy-id <0-63>
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update rule-type both
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update rule-type rx
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update rule-type tx
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update tag-pop-count
<0-2>
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update tx-lookup isdx
```

```
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update tx-lookup vid-only
Switch(ProvisionEVC)# editECEConfiguration ece-update-configuration update tx-lookup vid-pcp
Switch(ProvisionEVC)# editECEConfiguration review
Switch(ProvisionEVC)# editECEConfiguration commit
```

Use this command to edit the EVC configuration.

editEVCConfiguration evcupdateConfiguration {**instance** *instance_id* | **update** {**internal-vid** | **learning** |**nni-ports** | **nni-vid** | **policer-id**}}

```
Switch(ProvisionEVC)# editEVCConfiguration evcupdateConfiguration instance <1-1024>
Switch(ProvisionEVC)# editEVCConfiguration evcupdateConfiguration update internal-vid
<1-4095>
Switch(ProvisionEVC)# editEVCConfiguration evcupdateConfiguration update learning
Switch(ProvisionEVC)# editEVCConfiguration evcupdateConfiguration update nni-ports
Switch(ProvisionEVC)# editEVCConfiguration evcupdateConfiguration update nni-vid
Switch(ProvisionEVC)# editEVCConfiguration evcupdateConfiguration update policer-id
Switch(ProvisionEVC)# editEVCConfiguration review
Switch(ProvisionEVC)# editEVCConfiguration commit
```

Enabling/Disabling/Modifying EVC Policer

Use this command to enable the EVC Policer.

enableEVCpolicer evc-policer-enable*policer-id*

```
Switch(ProvisionEVC)# enableEVCpolicer evc-policer-enable <1-1024>
Switch(ProvisionEVC)# enableEVCpolicer review
Switch(ProvisionEVC)# enableEVCpolicer commit
```

Use this command to disable the EVC Policer.

disableEVCpolicer evc-policer-enable *policer-id*

```
Switch(ProvisionEVC)# disableEVCpolicer evc-policer-enable <1-1024>
Switch(ProvisionEVC)# disableEVCpolicer review
Switch(ProvisionEVC)# disableEVCpolicer commit
```

Use this command to modify the EVC Policer.

modifyEVCpolicer evc-policer-enable *policer-id*

```
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify cbs <0-100000>
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify cir <0-10000000>
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify ebs <0-100000>
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify eir <0-10000000>
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify policer-mode colour-aware
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify policer-mode coupled
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify policer-type mef
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify policer-type single
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify rate-type data
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify rate-type line
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify modify state
Switch(ProvisionEVC)# modifyEVCpolicer evc-policer-modify policer-id <1-1022>
Switch(ProvisionEVC)# modifyEVCpolicer review
Switch(ProvisionEVC)# modifyEVCpolicer commit
```

Fetching EVC and ECE Configuration

Use the following commands to fetch the ECE configuration:

- **getECEBlankForm getECEForm**
  ```
  Switch(ProvisionEVC)# getECEBlankForm getECEForm
  Switch(ProvisionEVC)# getECEBlankForm review
  Switch(ProvisionEVC)# getECEBlankForm commit
  ```
- **getECECounters ece-statistics-req** *ece-statistics-request*
  ```
  Switch(ProvisionEVC)# getECECounters ece-statistics-req <1-1024>
  Switch(ProvisionEVC)# getECECounters review
  Switch(ProvisionEVC)# getECECounters commit
  ```

- **getECEConfiguration getECEconfig** *ece-configuration*

```
Switch(ProvisionEVC)# getECEConfiguration getECEconfig <1-1024>
Switch(ProvisionEVC)# getECEConfiguration review
Switch(ProvisionEVC)# getECEConfiguration commit
```

Use the following commands to fetch the EVC configuration:

- **getEVCBlankForm getEVCForm**

```
Switch(ProvisionEVC)# getEVCBlankForm getEVCForm
Switch(ProvisionEVC)# getEVCBlankForm review
Switch(ProvisionEVC)# getEVCBlankForm commit
```

- **getEVC-Counters evc-statistics-req** *evc-statistics-request*

```
Switch(ProvisionEVC)# getEVCCounters evc-statistics-req <1-1024>
Switch(ProvisionEVC)# getEVCCounters review
Switch(ProvisionEVC)# getEVCCounters commit
```

- **getEVCConfiguration getEVCconfig***evc-configuration*

```
Switch(ProvisionEVC)# getEVCConfiguration getEVCconfig <1-1024>
Switch(ProvisionEVC)# getEVCConfiguration review
Switch(ProvisionEVC)# getEVCConfiguration commit
```

CHAPTER 7

Configuring Switch Ports

This document describes various virtual LAN (VLAN) configuration you can perform on the switch ports, such as creating layer 2 and layer 3 VLANs, creating VLAN mapping, VLAN translation groups, and modifying software ports.

How To Configure Switch Ports

Creating Layer 2 VLANs

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createVlanCommand createVlanReq vlan-list** *vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 100-4095`	Creates the VLAN list. The valid values are from 1 to 4095.
Step 3	**createVlanCommand review** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand review`	Displays the createVlanCommand configuration.

	Command or Action	Purpose
Step 4	**createVlanCommand commit** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand commit`	Sends the createVlanCommand configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch#`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 100-4095
Switch(ProvisionPortVlanPortType)# createVlanCommand review
Commands in queue:
 createVlanCommand createVlanReq vlan-list 100-4095
Switch(ProvisionPortVlanPortType)# createVlanCommand commit
 Vlan Creation Commit Success!!!
```

Verifying Layer 2 VLAN Configuration

The following is a sample output of the command that displays in brief the configured layer 2 VLAN list:

```
Switch(ProvisionPortVlanPortType)# showVlans showVlanRequest brief
```

```
Commands in queue:

showVlans showVlanRequest brief
```

```
Switch(ProvisionPortVlanPortType)# showVlans commit
```

```

Configured Vlan List:
    1

 Show Vlans Commit Success!!!
```

Deleting Layer 2 VLANs

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**deleteVlanCommand deleteVlanReq vlan-list***vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanCommand deleteVlanReq vlan-list 100-4095`	Deletes the VLAN list.
Step 3	**deleteVlanCommand review** **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanCommand review`	Displays the deleteVlanCommand configuration.
Step 4	**deleteVlanCommand commit** **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanCommand commit`	Sends the deleteVlanCommand configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch#`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# deleteVlanCommand deleteVlanReq vlan-list 100-4095
Switch(ProvisionPortVlanPortType)# deleteVlanCommand review
Commands in queue:
 deleteVlanCommand deleteVlanReq vlan-list 100-4095
Switch(ProvisionPortVlanPortType)# deleteVlanCommand commit
DeleteVlanCommand_Output.deleteVlanResp = 0

 Vlan Deletion Commit Success!!!
```

Creating Layer 3 VLANs

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createIntVlan createIntVlanReq vlan-id** *vlan-id* **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq vlan-id 22`	Creates the interface VLAN list.

Step 3	**createIntVlan createIntVlanReq** {**address** {**ipv4** {**dhcp** |**ipv4-address**} | **ipv6 ipv6-address** } | **vlan -id**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 ipv4-address address 22.22.22.3`
	`Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 ipv4-address mask 255.255.255.0`
	`Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv6 ipv6-address 2001:4::1/64`
		Creates the interface VLAN on the specified IPv4 or IPv6 address, or VLAN ID.

Step 4	**createIntVlan review** **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan review`	Displays the createIntVlan configuration.
Step 5	**createIntVlan commit** **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan commit`	Sends the createIntVlan configuration to the Cisco ME 1200 NID.

Step 6	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq vlan-Id 22
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 ipv4-address
 address 22.22.22.3
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 ipv4-address
 mask 255.255.255.0
Switch(ProvisionPortVlanPortType)# createIntVlan review

Commands in queue:
 createIntVlan createIntVlanReq vlan-id 22
```

```
 createIntVlan createIntVlanReq address ipv4 ipv4-address address 22.22.22.3
 createIntVlan createIntVlanReq address ipv4 ipv4-address mask 255.255.255.0
Switch(ProvisionPortVlanPortType)# createIntVlan commit

CreateIntVlan-Output.createIntVlanResp = 0

Create Interface Vlan Commit Success!!!
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq vlan_Id 22
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv6 ipv6-address
 2001:4::1/64
Switch(ProvisionPortVlanPortType)# createIntVlan review

Commands in queue:
 createIntVlan createIntVlanReq vlan-id 22
 createIntVlan createIntVlanReq address ipv6 ipv6-address 2001:4::1/64

Switch(ProvisionPortVlanPortType)# createIntVlan commit

CreateIntVlan-Output.createIntVlanResp = 0

 Create Interface Vlan Commit Success!!!
```

Creating Layer 3 VLANs With Dynamic IP Address

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createIntVlan createIntVlanReq deleteVlanReq vlan-list***vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq vlan-id 23`	Creates the interface VLAN on the specified VLAN.
Step 3	**createIntVlan createIntVlanReq address ipv4 dhcp** **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 dhcp`	Creates the interface VLAN on the specified address.
Step 4	**createIntVlan review** **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan review`	Displays the createIntVlan configuration.
Step 5	**createIntVlan commit** **Example:** `Switch(ProvisionPortVlanPortType)# createIntVlan commit`	Sends the createIntVlan configuration to the Cisco ME 1200 NID.

	Command or Action	Purpose

Step 6	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq vlan-Id 23
Switch(ProvisionPortVlanPortType)# createIntVlan createIntVlanReq address ipv4 dhcp
Switch(ProvisionPortVlanPortType)# createIntVlan review

Commands in queue:
 createIntVlan createIntVlanReq vlan-id 23
 createIntVlan createIntVlanReq address ipv4 dhcp

Switch(ProvisionPortVlanPortType)# createIntVlan commit

CreateIntVlan-Output.createIntVlanResp = 0

 Create Interface Vlan Commit Success!!!
```

Verifying Layer 3 VLANs With Dynamic IP Address

The following is a sample output to display the layer 3 VLANs configured with a dynamic IP address:

```
Switch(ProvisionPortVlanPortType)# showIntVlan showIntVlanReq vlan_list 23
```

```
Commands in queue:

showIntVlan showIntVlanReq vlan_list 23
```

```
Switch(ProvisionPortVlanPortType)# showIntVlan commit
```

```
ShowIntVlan_Output.showIntVlanResp.vlan_list[0].vlan_id = 23
ShowIntVlan_Output.showIntVlanResp.vlan_list[0].Link = 'LINK:
00-3a-99-fd-4d-05 Mtu:1500'
ShowIntVlan_Output.showIntVlanResp.vlan_list[0].dhcp = 'DHCP'
ShowIntVlan_Output.showIntVlanResp.vlan_list[0].ipv6_address = 'IPv6
Address not configured'

 Show Interface Vlan Commit Success!!!
```

Deleting Layer 3 VLANs

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**deleteIntVlan deleteIntVlanReq vlan-list***vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# deleteIntVlan deleteIntVlanReq vlan-list 23`	Deletes the VLAN list on the interface.
Step 3	**deleteIntVlan review** **Example:** `Switch(ProvisionPortVlanPortType)# deleteIntVlan review`	Displays the deleteIntVlan configuration.
Step 4	**deleteIntVlan commit** **Example:** `Switch(ProvisionPortVlanPortType)# deleteIntVlan commit`	Sends the deleteIntVlan configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch#`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# deleteIntVlan deleteIntVlanReq vlan-list 23
Switch(ProvisionPortVlanPortType)# deleteIntVlan review

Commands in queue:
 deleteIntVlan deleteIntVlanReq vlan-list 23

Switch(ProvisionPortVlanPortType)# deleteIntVlan commit
DeleteIntVlan_Output.deleteIntVlanResp = 0

 Delete Interface Vlan Commit Success!!!
```

Creating a VLAN Translation Group

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createVlanTranslationGroup createVlanTranslationGroupReq group-id** *group-id* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup createVlanTranslationGroupReq group-Id 3`	Creates the VLAN Translation group ID.
Step 3	**createVlanTranslationGroup createVlanTranslationGroupReq** {**vlan-id***vlan-id* | **vlan-list** *vlan-list*} **Example:** `Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup createVlanTranslationGroupReq vlan-id 22`	Creates the VLAN translation • **vlan-id—**Sets the VLAN ID on which translation occurs. • **vlan-list—**Sets the VLAN list that needs to be translated.
Step 4	**createVlanTranslationGroup review** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup review`	Displays the createVlanTranslationGroup configuration.
Step 5	**createVlanTranslationGroup commit** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup commit`	Sends the createVlanTranslationGroup configuration to the Cisco ME 1200 NID.

Step 6	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup createVlanTranslationGroupReq
 group-Id 3
Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup createVlanTranslationGroupReq
 vlan-id 22
Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup createVlanTranslationGroupReq
 vlan-list 100,101,102
```

```
Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup review

Commands in queue:
 createVlanTranslationGroup createVlanTranslationGroupReq group-Id 3
 createVlanTranslationGroup createVlanTranslationGroupReq vlan-id 22
 createVlanTranslationGroup createVlanTranslationGroupReq vlan-list 100,101,102

Switch(ProvisionPortVlanPortType)# createVlanTranslationGroup commit

CreateVlanTranslationGroup-Output.createVlanTranslationGroupResp = 0

 Create VlanTranslation Commit Success!!!
```

Deleting VLAN Translation Groups

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**deleteVlanTranslation deleteVlanTranslationGroupReq group-id***group-id* **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanTranslation deleteVlanTranslationGroupReq group-id 3`	Deletes the specified VLAN Translation group id.
Step 3	**deleteVlanTranslation deleteVlanTranslationGroupReq deleteVlanReq vlan-list** *vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanTranslation deleteVlanTranslationGroupReq vlan-list 2,3`	Deletes the specified VLAN Translation VLAN list.
Step 4	**deleteVlanTranslation review** **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanTranslation review`	Displays the deleteVlanTranslation configuration.
Step 5	**deleteVlanTranslation commit** **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanTranslation commit`	Sends the deleteVlanTranslation configuration to the Cisco ME 1200 NID.

Step 6	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch#`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# deleteVlanTranslation deleteVlanTranslationGroupReq
group-id 3
Switch(ProvisionPortVlanPortType)# deleteVlanTranslation deleteVlanTranslationGroupReq
vlan-list 100,101,102
Switch(ProvisionPortVlanPortType)# deleteVlanTranslation review

Commands in queue:
 deleteVlanTranslation deleteVlanTranslationGroupReq group-id 3
 deleteVlanTranslation deleteVlanTranslationGroupReq vlan-list 100,101,102

Switch(ProvisionPortVlanPortType)# deleteVlanTranslation commit

DeleteVlanTranslation_Output.deleteVlanTranslationGroupResp = 0

 Delete VlanTranslation Commit Success!!!
```

Verifying VLAN Translation Group

The following is a sample output of the command to verify the VLAN translation group configuration:

```
Switch(ProvisionPortVlanPortType)# showVlanTranslation showVlanTranslationGroupReq
      all
```

```
Commands in queue:

showVlanTranslation showVlanTranslationGroupReq all
```

```
Switch(ProvisionPortVlanPortType)# showVlanTranslation commit
```

```

ShowVlanTranslation_Output.showVlanTranslationGroupResp[0].group_id = 3
ShowVlanTranslation_Output.showVlanTranslationGroupResp[0].vlan_list =
100
ShowVlanTranslation_Output.showVlanTranslationGroupResp[0].transvlan_id
= 22
ShowVlanTranslation_Output.showVlanTranslationGroupResp[1].group_id = 3
ShowVlanTranslation_Output.showVlanTranslationGroupResp[1].vlan_list =
101
ShowVlanTranslation_Output.showVlanTranslationGroupResp[1].transvlan_id
= 22
ShowVlanTranslation_Output.showVlanTranslationGroupResp[2].group_id = 3
ShowVlanTranslation_Output.showVlanTranslationGroupResp[2].vlan_list =
102
ShowVlanTranslation_Output.showVlanTranslationGroupResp[2].transvlan_id
= 22

 Show VlanTranslation Commit Success!!!
```

Creating VLAN Mapping

Before You Begin

VLAN Mapping should be created for the VLAN translation group, and the mapping interface should be bound to that translation group.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createVlanMapping createVlanMappingReq group-id***group-id* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanMapping createVlanMappingReq group-id 3`	Creates the VLAN mapping group ID.
Step 3	**createVlanMapping createVlanMappingReq interface** *interface-id* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanMapping createVlanMappingReq interface 5`	Creates the VLAN mapping on the specified interface.
Step 4	**createVlanMapping review** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanMapping review`	Displays the createVlanMapping configuration.
Step 5	**createVlanMapping commit** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanMapping commit`	Sends the createVlanMapping configuration to the Cisco ME 1200 NID.

Step 6	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createVlanMapping createVlanMappingReq group-id 3
Switch(ProvisionPortVlanPortType)# createVlanMapping createVlanMappingReq interface 5
Switch(ProvisionPortVlanPortType)# createVlanMapping review

Commands in queue:
 createVlanMapping createVlanMappingReq group-id 3
 createVlanMapping createVlanMappingReq interface 5

Switch(ProvisionPortVlanPortType)# createVlanMapping commit
CreateVlanMapping-Output.createVlanMappingResp = 0

 Create VlanMapping Commit Success!!!
```

Deleting VLAN Mapping

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**deleteVlanMapping deleteVlanMappingReq interface** *interface_id* **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanMapping deleteVlanMappingReq interface 5`	Deleted VLAN mapping for the specified interface.
Step 3	**deleteVlanMapping review** **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanMapping review`	Displays the deleteVlanMapping configuration.
Step 4	**deleteVlanMapping commit** **Example:** `Switch(ProvisionPortVlanPortType)# deleteVlanMapping commit`	Sends the deleteVlanMapping configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch#`
		Exits from the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# deleteVlanMapping deleteVlanMappingReq interface 5
Switch(ProvisionPortVlanPortType)# deleteVlanMapping review

Commands in queue:
 deleteVlanMapping deleteVlanMappingReq interface 5

Switch(ProvisionPortVlanPortType)# deleteVlanMapping commit
DeleteVlanMapping_Output.deleteVlanMappingResp = 0

 Delete Vlan Mapping Commit Success!!!
```

Modifying Switch Ports

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**modifySwPort modifySWPortConfig interface** *-v2* **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interaface 4`	Modifies the switchport configuration on the defined interface.

Step 3	**modifySwPort modifySWConfig** { **interface** | **intf-description** | **mode**}
	
	Example:
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 4`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig intf-description`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode`
		• **interface**—Selects the interface to be configured.
		• **intf-description**—Specifies the description of the interface.
		• **mode**—Displays the mode of operation.

Step 4	**modifySwPort modifySWPortConfig mode access vlan** *vlan_id* **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 2`	Sets the mode to ACCESS, and assigns a VLAN.
Step 5	**modifySwPort modifySWPortConfig mode trunk** {**allowed vlan** {**add** {**all** | **vlan-list** *vlan-list* } | **remove** {**all** | **vlan-list***vlan-list* }} | {**native vlan** *vlan-list* } **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan_list 1-5`	Sets the mode to TRUNK. • **allowed**—Sets the allowed VLAN characteristics when interface is in trunk mode. • **add**—Adds either all VLANs or specified VLANs to the current list. • **remove**—Removes either all VLANs or specified VLANs from the current list. • *vlan-id*—The VLAN ID. The valid values are from 0 to 4095.
Step 6	**modifySwPort review** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort review`	Displays the modifySwPort configuration.

	Command or Action	Purpose
Step 7	**modifySwPort commit** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort commit`	Sends the modifySwPort configuration to the Cisco ME 1200 NID.

Step 8	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch#`
		Exits the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interaface 4
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan
2
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan
 add vlan_list 200-225
Switch(ProvisionPortVlanPortType)# modifySwPort review

Commands in queue:
 modifySwPort modifySWPortConfig interaface 4
 modifySwPort modifySWPortConfig mode trunk native vlan 2
 modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan_list 200-225

Switch(ProvisionPortVlanPortType)# modifySwPort commit

ModifySwPort_Output.modifySwPortConfigResp = 0
 Modify SwitchPort Commit Success!!!
```

Note To configure the Switch Port mode as hybrid and the Port description, use **modifySwPort**-*v2*. In addition to the available parameters for **modifySwPort**, the following are the new parameters available:

- *hybrid* - Sets mode to HYBRID unconditionally.
- *intf-description description* - Configures interface description.

Example

The following example shows how to configure Switch Port mode as hybrid using **modifySwPort**-*v2*.

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig interaface 1
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig mode hybrid allowed vlan
 remove vlan_list 1-100
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig mode hybrid port_type
c_port
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig mode hybrid
ingress_filtering enable
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig mode hybrid
ingress_acceptance tagged
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig mode hybrid egress_tag
all
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig mode hybrid native vlan
10
```

```
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 review

Commands in queue:
        modifySwPort-v2 modifySWConfig interaface 1
        modifySwPort-v2 modifySWConfig mode hybrid allowed vlan remove vlan_list 1-100
        modifySwPort-v2 modifySWConfig mode hybrid port_type c_port
        modifySwPort-v2 modifySWConfig mode hybrid ingress_filtering enable
        modifySwPort-v2 modifySWConfig mode hybrid ingress_acceptance tagged
        modifySwPort-v2 modifySWConfig mode hybrid egress_tag all
        modifySwPort-v2 modifySWConfig mode hybrid native vlan 10

Switch(ProvisionPortVlanPortType)# modifySwPort-v2 commit
```

Example

The following example shows how to configure interface description using **modifySwPort**-*v2*.

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig interaface 1
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 modifySWConfig intf-description description
 connected_to_r1
Switch(ProvisionPortVlanPortType)# modifySwPort-v2 review

Commands in queue:
modifySwPort-v2 modifySWConfig interaface 1
modifySwPort-v2 modifySWConfig intf-description description connected_to_r1

Switch(ProvisionPortVlanPortType)# modifySwPort-v2 commit
```

Deleting Switch Ports

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**deleteSwPort deleteSwPortReq interface** *interface-id* **Example:** `Switch(ProvisionPortVlanPortType)# deleteSwPort deleteSwPortReq interaface 5`	Deletes the switchport on the specified interface.
Step 3	**deleteSwPort deleteSwPortReq mode** {**access** | **trunk**} **Example:** `Switch(ProvisionPortVlanPortType)# deleteSwPort deleteSwPortReq mode access`	Deletes the switchport on the specified mode.
Step 4	**deleteSwPort review** **Example:** `Switch(ProvisionPortVlanPortType)# deleteSwPort review`	Displays the deleteSwPort configuration.

	Command or Action	Purpose
Step 5	**deleteSwPort commit** **Example:** `Switch(ProvisionPortVlanPortType)# deleteSwPort commit`	Sends the deleteSwPort configuration to the Cisco ME 1200 NID.

Step 6	**exit**
	
	Example:
	`Switch(ProvisionPortVlanPortType)# exit`
	`Switch#`
		Exits from the ProvisionPortVlanPortType mode.

Example

```
Switch# ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# deleteSwPort deleteSwPortReq interaface 5
Switch(ProvisionPortVlanPortType)# deleteSwPort deleteSwPortReq mode access
Switch(ProvisionPortVlanPortType)# deleteSwPort review

Commands in queue:
 deleteSwPort deleteSwPortReq interaface 5
 deleteSwPort deleteSwPortReq mode access

Switch(ProvisionPortVlanPortType)# deleteSwPort commit
DeleteSwPort_Output.deleteSwPortResp = 0

 Delete SwitchPort Commit Success!!!
```

Verifying Switch Port Details

The following is a sample output to verify all details of the switch ports:

```
Switch(ProvisionPortVlanPortType)# showSwPort showSwPortReq all all
```

```
Commands in queue:

showSwPort showSwPortReq all all
```

```
Switch(ProvisionPortVlanPortType)# showSwPort commit
```

```
ShowSwPort_Output.showSwPortResp.interface_list[0].name = 'GigabitEthernet
 1/1'
ShowSwPort_Output.showSwPortResp.interface_list[0].admin_mode = 'trunk'
ShowSwPort_Output.showSwPortResp.interface_list[0].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[0].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[0].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[1].name = 'GigabitEthernet
 1/2'
ShowSwPort_Output.showSwPortResp.interface_list[1].admin_mode = 'trunk'
ShowSwPort_Output.showSwPortResp.interface_list[1].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[1].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[1].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[2].name = 'GigabitEthernet
 1/3'
ShowSwPort_Output.showSwPortResp.interface_list[2].admin_mode = 'trunk'
```

```
ShowSwPort_Output.showSwPortResp.interface_list[2].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[2].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[2].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[3].name = 'GigabitEthernet
 1/4'
ShowSwPort_Output.showSwPortResp.interface_list[3].admin_mode = 'trunk'
ShowSwPort_Output.showSwPortResp.interface_list[3].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[3].trunk_mode = 2
ShowSwPort_Output.showSwPortResp.interface_list[3].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[4].name = 'GigabitEthernet
 1/5'
ShowSwPort_Output.showSwPortResp.interface_list[4].admin_mode = 'access'
ShowSwPort_Output.showSwPortResp.interface_list[4].access_mode = 120
ShowSwPort_Output.showSwPortResp.interface_list[4].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[4].trunk_members = '1-4095'
ShowSwPort_Output.showSwPortResp.interface_list[5].name = 'GigabitEthernet
 1/6'
ShowSwPort_Output.showSwPortResp.interface_list[5].admin_mode = 'access'
ShowSwPort_Output.showSwPortResp.interface_list[5].access_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[5].trunk_mode = 1
ShowSwPort_Output.showSwPortResp.interface_list[5].trunk_members = '1-4095'


 Show SwitchPort Commit Success!!!
```

CHAPTER 8

Configuring Spanning-Tree Protocol

The Cisco ME 1200 Series Carrier Ethernet Access Device supports Spanning-Tree Protocol (STP), and this chapter describes how to configure the STP on port-based VLANs. On the Cisco ME 1200 NID, the STP is enabled by default on physical interfaces.

Prerequisites for Configuring Spanning-Tree Protocol

- NID must have an IP address.

Information About Spanning-Tree Protocol

STP is a Layer 2 link management protocol that provides path redundancy while preventing loops in the network.

For a Layer 2 Ethernet network to function properly, only one active path can exist between any two stations. Multiple active paths among end stations cause loops in the network. If a loop exists in the network, end stations might receive duplicate messages. Devices might also learn end-station MAC addresses on multiple Layer 2 interfaces. These conditions result in an unstable network. Spanning-tree operation is transparent to end stations, which cannot detect whether they are connected to a single LAN segment or a switched LAN of multiple segments.

The STP uses a spanning-tree algorithm to select one switch of a redundantly connected network as the root of the spanning tree. The algorithm calculates the best loop-free path through a switched Layer 2 network by assigning a role to each port based on the role of the port in the active topology:

- Root—A forwarding port elected for the spanning-tree topology
- Designated—A forwarding port elected for every switched LAN segment
- Alternate—A blocked port providing an alternate path to the root bridge in the spanning tree
- Backup—A blocked port in a loopback configuration

The switch that has *all* of its ports as the designated role or the backup role is the root switch. The switch that has at least *one* of its ports in the designated role is called the designated switch.

Spanning tree forces redundant data paths into a standby (blocked) state. If a network segment in the spanning tree fails and a redundant path exists, the spanning-tree algorithm recalculates the spanning-tree topology and activates the standby path. Switches send and receive spanning-tree frames, called bridge protocol data units (BPDUs), at regular intervals. The switches do not forward these frames but use them to construct a loop-free path. BPDUs contain information about the sending switch and its ports, including switch and MAC addresses, switch priority, port priority, and path cost. Spanning tree uses this information to elect the root switch and root port for the switched network and the root port and designated port for each switched segment.

When two ports on a switch are part of a loop, the spanning-tree port priority and path cost settings control which port is put in the forwarding state and which is put in the blocking state. The spanning-tree port priority value represents the location of a port in the network topology and how well it is located to pass traffic. The path cost value represents the media speed.

Note The switch sends keepalive messages (to ensure the connection is up) only on interfaces that do not have small form-factor pluggable (SFP) modules.

Spanning-Tree Topology and BPDUs

The stable, active spanning-tree topology of a switched network is controlled by these elements:

- The unique bridge ID (switch priority and MAC address) associated with each VLAN on each switch.
- The spanning-tree path cost to the root switch.
- The port identifier (port priority and MAC address) associated with each Layer 2 STP-enabled interface.

When the switches in a network are powered up, each functions as the root switch. Each switch sends a configuration BPDU through all of its ports, or on the Cisco ME device, only through the STP-enabled ports. The BPDUs communicate and compute the spanning-tree topology. Each configuration BPDU contains this information:

- The unique bridge ID of the switch that the sending switch identifies as the root switch
- The spanning-tree path cost to the root
- The bridge ID of the sending switch
- Message age
- The identifier of the sending interface
- Values for the hello, forward delay, and max-age protocol timers

When a switch receives a configuration BPDU that contains superior information (lower bridge ID, lower path cost, and so forth), it stores the information for that port. If this BPDU is received on the root port of the switch, the switch also forwards it with an updated message to all attached LANs for which it is the designated switch.

If a switch receives a configuration BPDU that contains inferior information to that currently stored for that port, it discards the BPDU. If the switch is a designated switch for the LAN from which the inferior BPDU was received, it sends that LAN a BPDU containing the up-to-date information stored for that port. In this way, inferior information is discarded, and superior information is propagated on the network

For more information on BPDUs, see Configuring Optional Spanning-Tree features.

Spanning-Tree Interface States

Propagation delays can occur when protocol information passes through a switched LAN. As a result, topology changes can take place at different times and at different places in a switched network. When an STP port transitions directly from nonparticipation in the spanning-tree topology to the forwarding state, it can create temporary data loops. Interfaces must wait for new topology information to propagate through the switched LAN before starting to forward frames. They must allow the frame lifetime to expire for forwarded frames that have used the old topology.

Each Layer 2 interface on a switch using spanning tree exists in one of these states:

- Blocking—The interface does not participate in frame forwarding.
- Listening—The first transitional state after the blocking state when the spanning tree determines that the interface should participate in frame forwarding.
- Learning—The interface prepares to participate in frame forwarding.
- Forwarding—The interface forwards frames.
- Disabled—The interface is not participating in spanning tree because of a shutdown port, no link on the port, or no spanning-tree instance running on the port.

Configuring Port Priority

If a loop occurs, spanning tree uses the port priority when selecting a spanning-tree port to put into the forwarding state. You can assign higher priority values (lower numerical values) to ports that you want selected first and lower priority values (higher numerical values) to ones that you want selected last. If all spanning-tree ports have the same priority value, spanning tree puts the port with the lowest interface number in the forwarding state and blocks the other interfaces.

Configuring Path Cost

The spanning-tree path cost default value is derived from the media speed of an interface (port running spanning tree or port channel of multiple ports running spanning tree). If a loop occurs, spanning tree uses cost when selecting an interface to put in the forwarding state. You can assign lower cost values to interfaces that you want selected first and higher cost values that you want selected last. If all NNIs (or port channels) have the same cost value, spanning tree puts the interface with the lowest interface number in the forwarding state and blocks the other interfaces.

Configuring the Switch Priority of a VLAN

You can configure the switch priority and make it more likely that the switch is chosen as the root switch.

Admin Edge and Auto Edge

These two values control how a port is declared to be an edge port or not. An edge port, is a port which is not connected to a bridge. If auto edge is enabled, then the port determine whether a port is an edge port by registering for BPDUs, and if BPDUs are received on that port.

The admin edge determines what the port should start as being – edge or not.

Restricted Role and Restricted TCN

If restricted role is enabled, it causes the port not to be selected as Root Port for the Common and Internal Spanning Tree (CIST) or any Multiple Spanning Tree Instance (MSTI), even if it has the best spanning tree priority vector. Such a port is selected as an Alternate Port after the Root Port has been selected. If set, it can cause lack of spanning tree connectivity. It can be set by a network administrator to prevent bridges external to a core region of the network influence the spanning tree active topology, possibly because those bridges are not under the full control of the administrator. This feature is also known as Root Guard.

If restricted TCN is enabled, it causes the port not to propagate received topology change notifications and topology changes to other ports. If set it can cause temporary loss of connectivity after changes in a spanning tree's active topology as a result of persistently incorrect learned station location information. It is set by a network administrator to prevent bridges external to a core region of the network, causing address flushing in that region, possibly because those bridges are not under the full control of the administrator or the physical link state of the attached LANs transits frequently.

Understanding Spanning-Tree Modes and Protocols

The switch ports support the following spanning-tree modes and protocols:

- MSTP—This spanning-tree mode is based on the IEEE 802.1s standard. You can map multiple VLANs to the same spanning-tree instance, which reduces the number of spanning-tree instances required to support a large number of VLANs. The MSTP runs on top of the RSTP (based on IEEE802.1w), which provides for rapid convergence of the spanning tree by eliminating the forward delay and by quickly transitioning root ports and designated ports to the forwarding state. You cannot run MSTP without RSTP.
  The most common initial deployment of MSTP is in the backbone and distribution layers of a Layer 2 switched network. For more information, see Configuring MSTP.

Understanding MSTP Configuration

This section describes how to configure the Cisco implementation of the IEEE 802.1s Multiple STP (MSTP) on the Cisco ME 1200 NID. STP is enabled by default on switch ports.

Note The multiple spanning-tree (MST) implementation is a pre-standard implementation. It is based on the draft version of the IEEE standard.

The MSTP enables multiple VLANs to be mapped to the same spanning-tree instance, thereby reducing the number of spanning-tree instances needed to support a large number of VLANs. The MSTP provides for multiple forwarding paths for data traffic and enables load balancing. It improves the fault tolerance of the network because a failure in one instance (forwarding path) does not affect other instances (forwarding paths). The most common initial deployment of MSTP is in the backbone and distribution layers of a Layer 2 switched network. This deployment provides the highly available network required in a service-provider environment.

Both MSTP and RSTP improve the spanning-tree operation and maintain backward compatibility with equipment that is based on the (original) 802.1D spanning tree, with existing Cisco-proprietary Multiple Instance STP (MISTP).

Understanding MSTP

MSTP, which uses RSTP for rapid convergence, enables VLANs to be grouped into a spanning-tree instance, with each instance having a spanning-tree topology independent of other spanning-tree instances. This architecture provides multiple forwarding paths for data traffic, enables load balancing, and reduces the number of spanning-tree instances required to support a large number of VLANs.

Multiple Spanning-Tree Regions

For the NID to participate in multiple spanning-tree (MST) instances, you must consistently configure the switches with the same MST configuration information. A collection of interconnected NIDs that have the same MST configuration comprises an MST region. The MST configuration controls to which MST region each switch belongs. The configuration includes the name of the region, the revision number, and the MST VLAN-to-instance assignment map. You configure the NID for a region by using the global configuration command, after which the NID enters the MST configuration mode. From this mode, you can map VLANs to an MST instance by using the instance MST configuration command, specify the region name by using the name MST configuration command, and set the revision number by using the revision MST configuration command. A region can have one member or multiple members with the same MST configuration; each member must be capable of processing RSTP bridge protocol data units (BPDUs). There is no limit to the number of MST regions in a network, but each region can support up to 65 spanning-tree instances. You can assign a VLAN to only one spanning-tree instance at a time.

IST, CIST, and CST

The MSTP establishes and maintains two types of spanning trees, IST and CIST:

- An internal spanning tree (IST), which is the spanning tree that runs in an MST region. Within each MST region, the MSTP maintains multiple spanning-tree instances. Instance 0 is a special instance for a region, known as the internal spanning tree (IST). All other MST instances are numbered from 1 to 4094.The IST is the only spanning-tree instance that sends and receives BPDUs; all of the other spanning-tree instance information is contained in M-records, which are encapsulated within MSTP BPDUs. Because the MSTP BPDU carries information for all instances, the number of BPDUs that need to be processed by a switch to support multiple spanning-tree instances is significantly reduced.
  All MST instances within the same region share the same protocol timers, but each MST instance has its own topology parameters, such as root switch ID, root path cost, and so forth. By default, all VLANs are assigned to the IST. An MST instance is local to the region; for example, MST instance 1 in region A is independent of MST instance 1 in region B, even if regions A and B are interconnected.
- A common and internal spanning tree (CIST), which is a collection of the ISTs in each MST region, and the common spanning tree (CST) that interconnects the MST regions and single spanning trees. The spanning tree computed in a region appears as a subtree in the CST that encompasses the entire switched domain. The CIST is formed as a result of the spanning-tree algorithm running between switches that support the IEEE 802.1w, IEEE 802.1s, and IEEE 802.1D protocols. The CIST inside an MST region is the same as the CST outside a region.

For information regarding *Operations Within an MST Region*, *Operations Between MST Regions*, *IEEE 802.1s Terminology*, see Configuring MSTP.

Hop Count

The IST and MST instances do not use the message-age and maximum-age information in the configuration BPDU to compute the spanning-tree topology. Instead, they use the path cost to the root and a hop-count mechanism similar to the IP time-to-live (TTL) mechanism.

By using the global configuration command, you can configure the maximum hops inside the region and apply it to the IST and all MST instances in that region. The hopcount achieves the same result as the message-age information (trigger a reconfiguration). The root switch of the instance always sends a BPDU (or M-record) with a cost of 0 and the hop count set to the maximum value. When a switch receives this

BPDU, it decrements the received remaining hop count by one and propagates this value as the remaining hop count in the BPDUs it generates. When the count reaches zero, the switch discards the BPDU and ages the information held for the port. The message-age and maximum-age information in the RSTP portion of the BPDU remain the same throughout the region, and the same values are propagated by the region's designated ports at the boundary.

Understanding RSTP

The RSTP takes advantage of point-to-point wiring and provides rapid convergence of the spanning tree. Reconfiguration of the spanning tree can occur in less than 1 second (in contrast to 50 seconds with the default settings in the IEEE 802.1D spanning tree), which is critical for networks carrying delay-sensitive traffic such as voice and video.

Understanding BPDU Guard and BPDU Filtering

BPDU Guard

The BPDU guard feature can be globally enabled on the switch or can be enabled per interface, but the feature operates with some differences.

At the global level, you enable BPDU guard on Port Fast-enabled STP ports by using the default global configuration command. Spanning tree shuts down STP ports that are in a Port Fast-operational state if any BPDU is received on those ports. In a valid configuration, Port Fast-enabled STP ports do not receive BPDUs. Receiving a BPDU on a Port Fast-enabled port signals an invalid configuration, such as the connection of an unauthorized device, and the BPDU guard feature puts the interface in the error-disabled state.

At the interface level, you enable BPDU guard on any STP port by using the interface configuration command without also enabling the Port Fast feature. When the STP port receives a BPDU, it is put in the error-disabled state. The BPDU guard feature provides a secure response to invalid configurations because you must manually put the interface back in service. Use the BPDU guard feature in a service-provider network to prevent an access port from participating in the spanning tree. You can enable the BPDU guard feature for the entire switch or for an interface.

BPDU Filtering

The BPDU filtering feature can be globally enabled on the switch or can be enabled per interface, but the feature operates with some differences.

At the global level, you can enable BPDU filtering on Port Fast-enabled STP ports by using the default global configuration command. This command prevents interfaces that are in a Port Fast-operational state from sending or receiving BPDUs. The interfaces still send a few BPDUs at link-up before the switch begins to filter outbound BPDUs. You should globally enable BPDU filtering on a switch so that hosts connected to these ports do not receive BPDUs. If a BPDU is received on a Port Fast-enabled STP port, the interface loses its Port Fast-operational status, and BPDU filtering is disabled.

At the interface level, you can enable BPDU filtering on any STP port by using the interface configuration command without also enabling the Port Fast feature. This command prevents the interface from sending or receiving BPDUs.

Note Enabling BPDU filtering on an STP port is the same as disabling spanning tree on it and can result in spanning-tree loops.

You can enable the BPDU filtering feature for the entire NID or for an STP port.

For more information on BPDUs, see Understanding BPDUs.

How to Configure Spanning-Tree Protocol

Configuring Spanning-tree Aggregation Port Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.

Step 2	**setStpaggConfig stpAggrConfig** {**auto-edge** {**enable** | **disable**} | **bpdu-guardbpdu-guard** {**enable** | **disable**} | **edge** {**enable** | **disable**} | **link-type** {**auto** | **point-to** | **shared**} {**enable** | **disable**} | **mst instance** *instance-id* {**active** {**enable** | **disable**} | **cost** {**auto** | **cost-range** *cost-rangecost_range*} | **port-priority** *port-priority* } |**restricted-role** {**enable** | **disable**} | **restricted-tcn** {**enable** | **disable**}}
	
	Example:
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig auto-edge enable`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig bpdu-guard disable`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig edge disable`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type auto enable`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type point-to disable`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type shared disable`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance instance-id 1`
	
	`setStpAggConfig stpAggrConfig mst occur instance active enable`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance port-priority 2`
	
	`setStpAggConfig stpAggrConfig mst occur`
		Configures the spanning-tree port configuration:
		• **stpPortConfig**—Sets the spanning-tree port configuration.
		• **auto-edge**—Detects the auto-edge status.
		◦ **enable**—Enables the auto-edge
		◦ **disable**—Disables the auto-edge
		• **bpdu-guard**—Configures the BPDU guard.
		◦ **enable**—Enables the bpdu-guard
		◦ **disable**—Disables the bpdu-guard
		• **edge**—Configures the edge port.
		◦ **enable**—Enables the edge.
		◦ **disable**—Disables the edge.
		• **link-type**—Configures the port link-type.
		◦ **auto**—Configures the link-type as auto.
		◦ **enable**—Enables the link-type as auto.
		◦ **disable**—Disables the link-type as auto.
		◦ **point-to**—Forces the link-type as point-to-point.
		◦ **enable**—Enables the link-type as point-to.
		◦ **disable**—Disables the link-type as point-to.

	Command or Action	Purpose

	`instance cost auto`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig restricted-role enable`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig restricted-tcn disable`
		◦ **shared**—Forces the link-type as shared.
		    ◦ **enable**—Enables the link-type as shared.
		    ◦ **disable**—Disables the link-type as shared.
		
		• **mst**—Configures the STP bridge instance.
		  ◦ *instance*—Instance. The range is from 0 to 7 where CIST=0, MST2=1 and so on.
		  ◦ **active**—Adds or removes an instance.
		    ◦ **enable**—Enables the mst instance as active.
		    ◦ **disable**—Disables the mst instance as active.
		  ◦ **cost**—Configures the STP cost for the port.
		    ◦ **auto**—Uses auto cost.
		    ◦ *cost-range*—Cost. The range is from 1-200000000.
		  ◦ *port-priority*—STP priority of the port. The range is from 0 to 240.
		
		• **restricted-role**—Configures the port role. It is restricted (and never a root port).
		  ◦ **enable**—Enables the port as having restricted role.
		  ◦ **disable**—Disables the port as having restricted role.
		
		• **restricted-tcn**—Restricts the topology change notifications.
		  ◦ **enable**—Enables the restricted TCN.
		  ◦ **disable**—Disables the restricted TCN.

Step 3	**setStpAggConfig review** **Example:** `Switch(ProvisionStpPortType)# setStpAggConfig review`	Displays the configuration.
Step 4	**setstpPortConfig commit** **Example:** `Switch(ProvisionStpPortType)# setStpAggConfig commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig auto-edge enable
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig bpdu-guard disable
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig edge disable
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type auto enable
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type point-to disable
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig link-type shared disable
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance instance-id
 1

        setStpAggConfig stpAggrConfig mst occur instance active enable
Switch(ProvisionStpPortType)#         setStpAggConfig stpAggrConfig mst occur instance
port-priority 2

        setStpAggConfig stpAggrConfig mst occur instance cost auto
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst instance 0 cost cost-range
 1
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst instance 0 port-priority 1
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig restricted-role enable
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig restricted-tcn disable
Switch(ProvisionStpPortType)# setStpAggConfig review

Commands in queue:

    setStpAggConfig stpAggrConfig auto-edge enable
    setStpAggConfig stpAggrConfig bpdu-guard disable
    setStpAggConfig stpAggrConfig edge disable
    setStpAggConfig stpAggrConfig link-type auto enable
    setStpAggConfig stpAggrConfig link-type point-to disable
    setStpAggConfig stpAggrConfig link-type shared disable
    setStpAggConfig stpAggrConfig mst occur instance instance-id 1
    setStpAggConfig stpAggrConfig mst occur instance active enable
    setStpAggConfig stpAggrConfig mst occur instance port-priority 2
    setStpAggConfig stpAggrConfig mst occur instance cost auto
    setStpAggConfig stpAggrConfig mst instance 0 cost cost-range 1
    setStpAggConfig stpAggrConfig mst instance 0 port-priority 1
    setStpAggConfig stpAggrConfig restricted-role enable
    setStpAggConfig stpAggrConfig restricted-tcn disable

Switch(ProvisionStpPortType)# setStpAggConfig commit

    SetStpAggConfig Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Viewing Spanning-Tree Aggregation Port Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.
Step 2	**getstpaggConfig getStpAggConfigRequest** **Example:** `Switch(ProvisionStpPortType)# getstpaggConfig getStpAggConfigRequest`	Displays the configuration.
Step 3	**getstpaggConfig commit** **Example:** `Switch(ProvisionStpPortType)# setStpAggConfig commit`	Sends the configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# getstpaggConfig getStpAggConfigRequest

    stpAggrConfig.auto_edge = false
    stpAggrConfig.bpdu_guard = true
    stpAggrConfig.edge = false
    stpAggrConfig.link_type.t = 1
    stpAggrConfig.link_type.u.auto_ = false
    stpAggrConfig.mst.instance[0].active = true
    stpAggrConfig.mst.instance[0].cost.t = 1
    stpAggrConfig.mst.instance[0].cost.u.cost_range = 1
    stpAggrConfig.mst.instance[0].port_priority = 1
    stpAggrConfig.restricted_role = false
    stpAggrConfig.restricted_tcn = true

Switch(ProvisionStpPortType)# getstpaggConfig commit

    GetstpaggConfig Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Configuring Spanning-Tree Global Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.

Step 2	**setStpglobalConfig stpGlobalConfig** {**edge** {**bpdu-filter** | **bpdu-guard**} {**enable** | **disable**} | **mode** {**mstp** | **rstp** | **stp**} {**enable** | **disable**} | **mst** {**forward-time** *Fwdtime* | **instance** *instance* {**active** {**enable** | **disable**} | **priority** *Prio* | **vlan** *WORD*} | **max-age** *Maxage* | **max-hops** *Maxhops* | **name** *Name* | **revision** *Revision* } | **port-number** *Port number* {**enable** | **disable**} | **recovery** *Interval* | **transmit** *hold-count* }
	
	Example:
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig edge bpdu-guard enable`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mode mstp enable`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst forward-time 4`
	
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance instance-id 1 setStpAggConfig stpAggrConfig mst occur instance active enable`
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance port-priority 2 setStpAggConfig stpAggrConfig mst occur instance cost auto`
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst instance 0 vlan 1`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst max-age 30`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst max-hops 30`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst name ciscoNID123`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst revision 1111`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig port-number 1 enable`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig recovery interval 3000`
	
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig transmit hold-count 10`
		Configures the spanning-tree global configuration.
		• **stpGlobalConfig—**Sets the spanning-tree global configuration.
		• **edge—**Configures the edge ports.
		◦ **bpdu-filter—**Enables or disables the BPDU filter (stop BPDU tx/rx).
		◦ **bpdu-guard—**Enables or disables the BPDU guard.
		• **mode—**Configures the STP protocol mode.
		◦ **mstp—**Enables or disables the Multiple Spanning Tree (802.1s).
		◦ **rstp—**Enables or disables the Rapid Spanning Tree (802.1w)
		◦ **stp—**Enables or disables the Spanning Tree (802.1D).
		• **mst—**Configures the STP bridge instance.
		◦ *Fwdtime***—**Forward time. The range is from 4 to 30 seconds.
		◦ *instance***—**Instance. The range is from 0 to 7 where CIST=0, MST2=1 and so on.
		◦ **active—**Enables or disables the instance.
		◦ *Prio* **—**Specifies the priority. The range is from 0 to 61440 seconds. The range should be given in the sets of (0, 4096, 8192...) and so on.
		◦ *WORD***—**VLAN range.
		◦ *Maxage***—**Maximum age. The range is from 6 to 40 seconds.

	Command or Action	Purpose
	Note If the spanning-tree mode is STP or RSTP, and if the priority for the software needs to be changed, you can change using mst instance 0 and priority.	◦ *Maxhops*—Maximum hops. The range is from 6 to 40 hop counts. ◦ *Name*—Name of the bridge. You can use 32 characters to define. ◦ *Revision*—Revision. The range is from 0-65535 revisions. • **port-number**—Configures the port number in the range from 1 to 6. ◦ *Port number*—Port number. The range is from 1 to 6. ◦ **disable**—Disables the port-number. ◦ **enable**—Enables the port-number. • **recovery**—Configures the error recovery timeout. ◦ *Interval*—Interval. The range is from 30-86400 seconds. • **transmit**—Configures the BPDUs to transmit. ◦ *hold-count*—Maximum number of transmit BPDUs per second. The range is from 1 to 10 seconds.
Step 3	**setStpGlobalConfig review** **Example:** `Switch(ProvisionStpPortType)# setStpGlobalConfig review`	Displays the configuration.
Step 4	**setStpGlobalConfig commit** **Example:** `Switch(ProvisionStpPortType)# setStpGlobalConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig edge bpdu-guard enable
```

```
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mode mstp enable
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst forward-time 4
Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance instance-id
 1

        setStpAggConfig stpAggrConfig mst occur instance active enable

Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance port-priority
 2

        setStpAggConfig stpAggrConfig mst occur instance cost auto

Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst instance 0 vlan 1
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst max-age 30
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst max-hops 30
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst name myNID123
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig mst revision 1111
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig port-number 1 enable
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig recovery interval 3000
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig transmit hold-count 10
Switch(ProvisionStpPortType)# setStpGlobalConfig review

Commands in queue:

    setStpGlobalConfig stpGlobalConfig edge bpdu-guard enable
    setStpGlobalConfig stpGlobalConfig mode mstp enable
    setStpGlobalConfig stpGlobalConfig mst forward-time 4
    setStpAggConfig stpAggrConfig mst occur instance instance-id 1
    setStpAggConfig stpAggrConfig mst occur instance active enable
    setStpAggConfig stpAggrConfig mst occur instance port-priority 2
    setStpAggConfig stpAggrConfig mst occur instance cost auto
    setStpGlobalConfig stpGlobalConfig mst instance 0 vlan 1
    setStpGlobalConfig stpGlobalConfig mst max-age 30
    setStpGlobalConfig stpGlobalConfig mst max-hops 30
    setStpGlobalConfig stpGlobalConfig mst name myNID123
    setStpGlobalConfig stpGlobalConfig mst revision 1111
    setStpGlobalConfig stpGlobalConfig port-number 1 enable
    setStpGlobalConfig stpGlobalConfig recovery interval 3000
    setStpGlobalConfig stpGlobalConfig transmit hold-count 10

Switch(ProvisionStpPortType)# setStpGlobalConfig commit

    SetStpGlobalConfig Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Viewing Spanning-Tree Global Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.
Step 2	**getStpglobalConfig getStpGlobalConfigRequest** **Example:** `Switch(ProvisionStpPortType)# getStpglobalConfig getStpGlobalConfigRequest`	Displays the configuration.

	Command or Action	Purpose
Step 3	**getStpglobalConfig commit** **Example:** `Switch(ProvisionStpPortType)# getStpglobalConfig commit`	Sends the configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# getStpglobalConfig getStpGlobalConfigRequest

   stpGlobalConfig.edge.bpdu_filter = false
   stpGlobalConfig.edge.bpdu_guard = true
   stpGlobalConfig.mode.t = 1
   stpGlobalConfig.mode.u.mstp = false
   stpGlobalConfig.mst.instance[0].active = true
   stpGlobalConfig.mst.instance[0].priority = 0
   stpGlobalConfig.mst.instance[0].vlan = '1'
   stpGlobalConfig.mst.forward_time = 4
   stpGlobalConfig.mst.max_age = 30
   stpGlobalConfig.mst.max_hops = 30
   stpGlobalConfig.mst.name = 'sandino123'
   stpGlobalConfig.mst.revision = 1111
   stpGlobalConfig.recovery.interval = 3000
   stpGlobalConfig.transmit.hold_count = 10
   stpGlobalConfig.port_number[0] = true
   stpGlobalConfig.port_number[1] = true
   stpGlobalConfig.port_number[2] = true
   stpGlobalConfig.port_number[3] = true
   stpGlobalConfig.port_number[4] = true
   stpGlobalConfig.port_number[5] = true

Switch(ProvisionStpPortType)# getStpglobalConfig commit

   GetStpglobalConfig Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Configuring Spanning-Tree Port Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.
Step 2	**setStpportConfig stpPortConfig** {**auto-edge** {**enable** | **disable**} |**bpdu-guard** {**enable** | **disable**} | **edge** {**enable** |	Configures the spanning-tree port configuration. • **stpPortConfig—**Sets the spanning-tree port configuration.

	Command or Action	Purpose

	disable} | **link-type** {**auto** |**point-to** | **shared**} {**enable** | **disable**} | **mst instance** *instance-id* {**active** {**enable** | **disable**} | **cost** {**auto** | **cost-range** *cost-range*} | **port-priority** *port-priority*} | **port-number** *Port -number* |**restricted-role** {**enable** | **disable**} | **restricted-tcn** {**enable** | **disable**}}
	
	Example:
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig auto-edge enable`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig bpdu-guard disable`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig edge disable`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type auto enable`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type point-to disable`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type shared disable`
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance instance-id 1`
	`setStpAggConfig stpAggrConfig mst occur instance active enable`
	`Switch(ProvisionStpPortType)# setStpAggConfig stpAggrConfig mst occur instance port-priority 2`
	`setStpAggConfig stpAggrConfig mst occur instance cost auto`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 cost cost-range 1`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 port-priority 1`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig restricted-role enable`
	`Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig restricted-tcn disable`
		• **auto-edge**—Detects the auto-edge status.
		◦ **enable**—Enables the auto-edge
		◦ **disable**—Disables the auto-edge
		• **bpdu-guard**—Configures the BPDU guard.
		◦ **enable**—Enables the bpdu-guard
		◦ **disable**—Disables the bpdu-guard
		• **edge**—Configures the edge port.
		◦ **enable**—Enables the edge.
		◦ **disable**—Disables the edge.
		• **link-type**—Configures the port link-type.
		◦ **auto**—Configures the link-type as auto.
		◦ **enable**—Enables the link-type as auto.
		◦ **disable**—Disables the link-type as auto.
		◦ **point-to**—Forces the link-type as point-to-point.
		◦ **enable**—Enables the link-type as point-to.
		◦ **disable**—Disables the link-type as point-to.
		◦ **shared**—Forces the link-type as shared.
		◦ **enable**—Enables the link-type as shared.
		◦ **disable**—Disables the link-type as shared.
		• **mst**—Configures the STP bridge instance.
		◦ *instance*—Instance. The range is from 0 to 7 where CIST=0, MST2=1 and so on.
		◦ **active**—Adds or removes an instance.
		◦ **enable**—Enables the mst instance as active.
		◦ **disable**—Disables the mst instance as active.
		◦ **cost**—Configures the STP cost for the port.
		◦ **auto**—Uses auto cost.

	Command or Action	Purpose
		◦ *cost-range*—Cost range. The range is from 1-200000000. ◦ *port-priority*—STP priority of the port. The range is from 0 to 240. • **port-number**—Configures the port number. ◦ *Port number*—Port number. The range is from 1 to 6. • **restricted-role**—Configures the port role. It is restricted (and never a root port). ◦ **enable**—Enables the port as having restricted role. ◦ **disable**—Disables the port as having restricted role. • **restricted-tcn**—Restricts the topology change notifications. ◦ **enable**—Enables the restricted TCN. ◦ **disable**—Disables the restricted TCN.
Step 3	**setstpPortConfig review** **Example:** `Switch(ProvisionStpPortType)# setstpPortConfig review`	Displays the configuration.
Step 4	**setstpPortConfig commit** **Example:** `Switch(ProvisionStpPortType)# setstpPortConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig auto-edge enable
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig bpdu-guard disable
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig edge disable
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type auto enable
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type point-to disable
```

```
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig link-type shared disable
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 active enable
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 cost auto
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 cost cost-range
 1
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig mst instance 0 port-priority
1
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig restricted-role enable
Switch(ProvisionStpPortType)# setstpPortConfig stpPortConfig restricted-tcn disable
Switch(ProvisionStpPortType)# setstpPortConfig review

Commands in queue:

    setstpPortConfig stpPortConfig auto-edge enable
    setstpPortConfig stpPortConfig bpdu-guard disable
    setstpPortConfig stpPortConfig edge disable
    setstpPortConfig stpPortConfig link-type auto enable
    setstpPortConfig stpPortConfig link-type point-to disable
    setstpPortConfig stpPortConfig link-type shared disable
    setstpPortConfig stpPortConfig mst instance 0 active enable
    setstpPortConfig stpPortConfig mst instance 0 cost auto
    setstpPortConfig stpPortConfig mst instance 0 cost cost-range 1
    setstpPortConfig stpPortConfig mst instance 0 port-priority 1
    setstpPortConfig stpPortConfig restricted-role enable
    setstpPortConfig stpPortConfig restricted-tcn disable

Switch(ProvisionStpPortType)# setstpPortConfig commit

    SetStpAggConfig Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Viewing Spanning-Tree Protocol Port Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.
Step 2	**getStpportConfig getstpPortConfigRequest** {**port-number** *port-number*} **Example:** `Switch(ProvisionStpPortType)# getStpportConfig getstpPortConfigRequest port-number 1`	Displays the configuration. • *port-number*—Port number. The range is from 1 to 6.
Step 3	**getStpportConfig commit** **Example:** `Switch(ProvisionStpPortType)# getStpportConfig commit`	Sends the configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# getStpportConfig getstpPortConfigRequest port-number 1

   stpPortConfig.port_number = 1
   stpPortConfig.auto_edge = false
   stpPortConfig.bpdu_guard = false
   stpPortConfig.edge = false
   stpPortConfig.link_type.t = 1
   stpPortConfig.link_type.u.auto_ = false
   stpPortConfig.restricted_role = false
   stpPortConfig.restricted_tcn = false

Switch(ProvisionStpPortType)# getStpportConfig commit

   GetStpPortConfig Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Verifying Spanning-Tree Status

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.
Step 2	**showStpdetail showStpDetailRequest** **Example:** `Switch(ProvisionStpPortType)# showStpdetail showStpDetailRequest`	Displays the STP status.
Step 3	**showStpdetail commit** **Example:** `Switch(ProvisionStpPortType)# showStpdetail commit`	Sends the configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# showStpdetail showStpDetailRequest

   stpinfo.instance[0].instance_id = 0
   stpinfo.instance[0].name = 'CIST'
   stpinfo.instance[0].bridgeId = '32768.00-3A-99-FD-4B-1C'
   stpinfo.instance[0].designatedRoot = '8192.00-14-1B-EC-1A-BF'
```

```
   stpinfo.instance[0].rootport = '1'
   stpinfo.instance[0].rootPathCost = 200022
   stpinfo.instance[0].RegionalRoot = '32768.00-3A-99-FD-4B-1C'
   stpinfo.instance[0].InternalPathCost = 0
   stpinfo.instance[0].maxHops = 20
   stpinfo.instance[0].topologyChange = 'Steady'
   stpinfo.instance[0].topologyChangeCount = 31
   stpinfo.instance[0].timeSinceTopologyChange = '  0d 00:04:49'
   stpinfo.instance[0].port_status[0].active = true
   stpinfo.instance[0].port_status[0].name = 'CIST'
   stpinfo.instance[0].port_status[0].port = '1'
   stpinfo.instance[0].port_status[0].port_role = 'RootPort'
   stpinfo.instance[0].port_status[0].state = 'Forwarding'
   stpinfo.instance[0].port_status[0].priority = 128
   stpinfo.instance[0].port_status[0].pathcost = 3392
   stpinfo.instance[0].port_status[0].edge = false
   stpinfo.instance[0].port_status[0].ptp = true
   stpinfo.instance[0].port_status[0].uptime = '  0d 00:05:10'

Switch(ProvisionStpPortType)# showStpdetail commit

   ShowStpDetail Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Verifying Spanning-Tree Summary

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.
Step 2	**showStpsummary showstpSummaryRequest** **Example:** `Switch(ProvisionStpPortType)# showStpsummary showstpSummaryRequest`	Displays the STP summary.
Step 3	**showStpdetail commit** **Example:** `Switch(ProvisionStpPortType)# showStpsummary commit`	Sends the configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# showStpdetail showStpDetailRequest

    StpSummaryinfo.Protocol = 'MSTP'
```

```
    StpSummaryinfo.MaxAge = 20
    StpSummaryinfo.ForwardDelay = 15
    StpSummaryinfo.txHoldCount = 6
    StpSummaryinfo.MaxHops = 20
    StpSummaryinfo.bpduFiltering = false
    StpSummaryinfo.bpduGuard = false
    StpSummaryinfo.errRecoveryDelay = 0
    StpSummaryinfo.mstp_bridge[0].instance_id = 0
    StpSummaryinfo.mstp_bridge[0].name = 'CIST'
    StpSummaryinfo.mstp_bridge[0].status = true
    StpSummaryinfo.mstp_bridge[1].instance_id = 1
    StpSummaryinfo.mstp_bridge[1].name = 'MSTI1'
    StpSummaryinfo.mstp_bridge[1].status = false
    StpSummaryinfo.mstp_bridge[2].instance_id = 2
    StpSummaryinfo.mstp_bridge[2].name = 'MSTI2'
    StpSummaryinfo.mstp_bridge[2].status = false
    StpSummaryinfo.mstp_bridge[3].instance_id = 3
    StpSummaryinfo.mstp_bridge[3].name = 'MSTI3'
    StpSummaryinfo.mstp_bridge[3].status = false
    StpSummaryinfo.mstp_bridge[4].instance_id = 4
    StpSummaryinfo.mstp_bridge[4].name = 'MSTI4'
    StpSummaryinfo.mstp_bridge[4].status = false
    StpSummaryinfo.mstp_bridge[5].instance_id = 5
    StpSummaryinfo.mstp_bridge[5].name = 'MSTI5'
    StpSummaryinfo.mstp_bridge[5].status = false
    StpSummaryinfo.mstp_bridge[6].instance_id = 6
    StpSummaryinfo.mstp_bridge[6].name = 'MSTI6'
    StpSummaryinfo.mstp_bridge[6].status = false
    StpSummaryinfo.mstp_bridge[7].instance_id = 7
    StpSummaryinfo.mstp_bridge[7].name = 'MSTI7'
    StpSummaryinfo.mstp_bridge[7].status = false
    StpSummaryinfo.portcounters[0].port_number = 0
    StpSummaryinfo.portcounters[0].rxMstp = 0
    StpSummaryinfo.portcounters[0].txMstp = 4
    StpSummaryinfo.portcounters[0].rxRstp = 0
    StpSummaryinfo.portcounters[0].txRstp = 0
    StpSummaryinfo.portcounters[0].rxstp = 144
    StpSummaryinfo.portcounters[0].txstp = 122790
    StpSummaryinfo.portcounters[0].rxtcn = 29
    StpSummaryinfo.portcounters[0].txtcn = 2
    StpSummaryinfo.portcounters[0].rxIllegalFrames = 0
    StpSummaryinfo.portcounters[0].unknownFrames = 0

Switch(ProvisionStpPortType)# showStpsummary commit

    ShowStpSummary Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Clearing Spanning-Tree Statistics

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.

	Command or Action	Purpose
Step 2	**clearStpstatistics stpPortSelect** {**all** | **port** {*port-number*}} **Example:** `Switch(ProvisionStpPortType)# clearStpstatistics stpPortSelect port-number 1`	Clears the spanning-tree statistics. • **all—**Clears the statistics from all the ports. • **port—**Clears the statistics from a specified port number. ◦ *port-number***—**Port number. The range is from 1 to 6.
Step 3	**ClearStpStatistics review** **Example:** `Switch(ProvisionStpPortType)# ClearStpStatistics review`	Displays the configuration.
Step 4	**ClearStpStatistics Commit** **Example:** `Switch(ProvisionStpPortType)# ClearStpStatistics Commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# clearStpstatistics stpPortSelect port-number 1
Switch(ProvisionStpPortType)# ClearStpStatistics Review

Commands in queue:
      clearStpstatistics stpPortSelect port-number 1

Switch(ProvisionStpPortType)# ClearStpStatistics Commit

      ClearStpStatistics Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

Clearing Spanning-Tree Detected Protocols

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.
Step 2	**clearStpdetected stpPortSelect** {**all** | **port** {*port-number*}} **Example:** `Switch(ProvisionStpPortType)# clearStpdetected stpPortSelect port-number 1`	Clear spanning-tree detected-protocols. • **all**—Clears from all the ports. • **port**—Clears from a specified port number. ◦ *port-number*—Port number. The range is from 1 to 6.
Step 3	**clearStpdetected review** **Example:** `Switch(ProvisionStpPortType)# clearStpdetected review`	Displays the configuration.
Step 4	**clearStpdetected commit** **Example:** `Switch(ProvisionStpPortType)# clearStpdetected commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

```
Switch# ProvisionStpPortType
Switch(ProvisionStpPortType)# clearStpdetected stpPortSelect port-number 1
Switch(ProvisionStpPortType)# clearStpdetected review
Commands in queue:
    clearStpdetected stpPortSelect port-number 1

Switch(ProvisionStpPortType)# clearStpdetected commit

    clearStpdetected Commit Success!!!

Switch(ProvisionStpPortType)# exit
```

CHAPTER 9

Configuring Link Aggregation Control Protocol (LACP)

LACP is defined in IEEE 802.3ad standard and enables Cisco switches to manage Ethernet channels between switches that conform to the standard. LACP facilitates the automatic creation of EtherChannels by exchanging LACP packets between Ethernet ports.

By using LACP, the switch learns the identity of partners capable of supporting LACP and the capabilities of each port. It then dynamically groups similarly configured port s into a single logical link (channel or aggregate port). Similarly configured ports are grouped based on key value. For example, LACP groups the ports with the same speed, duplex mode, native VLAN, VLAN range, and trunking status and type.

Information About LACP

IEEE 802.3ad Link Bundling

The IEEE 802.3ad Link Bundling feature provides a method for aggregating multiple Ethernet links into a single logical channel based on the IEEE 802.3ad standard. This feature helps improve the cost effectiveness of a device by increasing cumulative bandwidth without necessarily requiring hardware upgrades. In addition, IEEE 802.3ad link bundling provides a capability to dynamically provision, manage, and monitor various aggregated links and enables interoperability between various Cisco devices and devices of third-party vendors.

LACP forms an aggregate port when atleast 2 or more ports are connected to the same LACP partner/neighbor.

Both the passive and active modes allow LACP to negotiate between LAN ports to determine if they can form an EtherChannel, based on criteria such as key and trunking state. LAN ports can form an EtherChannel when they are in compatible LACP modes, as in the following examples:

- One of the LAN ports used to form the Etherchannel is in active mode with the neighboring LAN port in active.

- One of the LAN ports used to form the Etherchannel is in active mode with the neighboring LAN port in passive.
- A LAN port in passive mode cannot form an EtherChannel with another LAN port that is also in passive mode because neither port will initiate negotiation.

LACP uses the following parameters:

- LACP enable/disable: By default, LACP is configured as disabled on the port. This needs to be enabled before setting other parameters.
- LACP system priority—You must configure an LACP system priority on each device running LACP. The system priority can be configured through setLacpConfig XML operation. The default value is automatically set to 32768.
- LACP port priority—You must configure an LACP port priority on each port configured to use LACP. The port priority can be configured automatically or through the CLI. LACP uses the port priority to decide which ports should be put in standby mode when there is a hardware limitation that prevents all compatible ports from aggregating. LACP also uses the port priority with the port number to form the port identifier.

Note The default value is automatically set to 32768.

- LACP key—The LACP key defines the ability of a port to aggregate with other ports. You must configure a key on each port running LACP. When 2 or more ports with the same key are configured, a LACP Etherchannel is established. The maximum recommended key value is 4, indicating the maximum channel groups.
- LACP timeout—LACP automatically configures a timeout value of 1 second (fast timeout) for transmission of BPDUs. This can be modified to a slow timeout of 30 seconds.
- LACP activity or role—LACP automatically configures an active role to allow the switch to transmit LACP PDUs. This can be modified to passive role.

How to Configure LACP

Provisioning the ME 1200 NID to Configure LACP

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLacpPortType** **Example:** `Switch# ProvisionLacpPortType`	Enters LACP provisioning mode.

	Command or Action	Purpose

Step 2	**ProvisionLacpPortType** {**clearLacpStats** | **default** | **exit** | **getLacpConfig** | **getLacpDefaults** | **getLacpPortConfig** | **getLacpPortDefaults** | **no** | **setLacpConfig** | **setLacpDefaults** | **setLacpPortConfig** | **setLacpPortDefaults** | **showLacpAggLB** | **showLacpInternal** | **showLacpNeighbors** | **showLacpStats** | **showLacpSysId**}
	
	Example:
	`Switch(ProvisionLacpPortType)# ?`
	`ProvisionLacpPortType sub-mode commands:`
	`clearLacpStats       Clear LACP statistics request`
	`default              Set a command to its defaults`
	`exit                 Exit from ProvisionLacpPortType sub configuration mode`
	
	`getLacpConfig        Get LACP configuration request`
	`getLacpDefaults      Get LACP default configuration request`
	`getLacpPortConfig    Get LACP port configuration request`
	`getLacpPortDefaults  Get LACP port default configuration request`
	`no                   Negate a command or set its defaults`
	`setLacpConfig        Set LACP configuration request`
	`setLacpDefaults      Set LACP default configuration request`
	`setLacpPortConfig    Set LACP port configuration request`
	`setLacpPortDefaults  Set LACP port default configuration request`
	`showLacpAggLB        Show LACP load balance request`
	`showLacpInternal     Show LACP internal request`
	`showLacpNeighbors    Show LACP neighbor status request`
	`showLacpStats        Show LACP statistics request`
	`showLacpSysId        Show LACP system-id request`
		Displays the supported configurations for LACP.

Step 3	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The following example shows the supported LACP configuration:

```
Switch(ProvisionLacpPortType)# ?
ProvisionLacpPortType sub-mode commands:
  clearLacpStats       Clear LACP statistics request
  default              Set a command to its defaults
  exit                 Exit from ProvisionLacpPortType sub configuration mode
  getLacpConfig        Get LACP configuration request
  getLacpDefaults      Get LACP default configuration request
  getLacpPortConfig    Get LACP port configuration request
  getLacpPortDefaults  Get LACP port default configuration request
  no                   Negate a command or set its defaults
  setLacpConfig        Set LACP configuration request
  setLacpDefaults      Set LACP default configuration request
  setLacpPortConfig    Set LACP port configuration request
  setLacpPortDefaults  Set LACP port default configuration request
  showLacpAggLB        Show LACP load balance request
  showLacpInternal     Show LACP internal request
  showLacpNeighbors    Show LACP neighbor status request
  showLacpStats        Show LACP statistics request
  showLacpSysId        Show LACP system-id request
```

Configuring LACP Globally on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setLacpConfig** {**commit** | **flush** | **lacpGlobalConfiguration** | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# setLacpConfig ?`
	` commit                    commit setLacpConfig`
	` flush                     flush all setLacpConfig`
	`commands from queue`
	` lacpGlobalConfiguration   Set LACP configuration`
	`request`
	` review                    review setLacpConfig`
	`commands`
		Configures global LACP.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpGlobalConfiguration**—Sets LACP configuration globally on the ME 1200 NID.
		• **review**—Displays the configuration on the ME 1200 NID.

Step 2	**setLacpConfig lacpGlobalConfiguration** {**lacpGlobalState** {**enable**} | **systemPrio***priority-value*}
	
	Example:
	`Switch(ProvisionLacpPortType)# setLacpConfig lacpGlobalConfiguration lacpGlobalState enable`
	`Switch(ProvisionLacpPortType)# setLacpConfig lacpGlobalConfiguration systemPrio 2`
		Sets global LACP configuration.
		• **lacpGlobalState**—Enables the LACP configuration globally on the ME 1200 NID.
		Note LACP is always enabled globally. Disable is not supported.
		• **enable**—Enables global LACP configuration.
		• **systemPrio** *priority_value*—Sets priority value. The valid range is from 1 to 65535.

Step 3	**setLacpConfig review**
	
	Example:
	`Switch(ProvisionLacpPortType)# setLacpConfig review`
	`Commands in queue:`
	`        setLacpConfig lacpGlobalConfiguration`
	`lacpGlobalState enable`
	`        setLacpConfig lacpGlobalConfiguration`
	`systemPrio 2`
		Displays the LACP configuration on the ME 1200 NID.

Step 4	**setLacpConfig commit** **Example:** `Switch(ProvisionLacpPortType)# setLacpConfig commit`	Sends the LACP configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example shows global LACP configuration on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# setLacpConfig lacpGlobalConfiguration lacpGlobalState enable
Switch(ProvisionLacpPortType)# setLacpConfig lacpGlobalConfiguration systemPrio 2
Switch(ProvisionLacpPortType)# setLacpConfig review
Commands in queue:
        setLacpConfig lacpGlobalConfiguration lacpGlobalState enable
        setLacpConfig lacpGlobalConfiguration systemPrio 2
Switch(ProvisionLacpPortType)# setLacpConfig commit
 SetLacpConfig Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Configuring LACP Defaults Globally on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setLacpDefaults** {**commit** | **flush** | **setLacpDefaultsRequest** | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# setLacpDefaults ?`
	` commit                    commit setLacpDefaults`
	` flush                     flush all setLacpDefaults`
	`commands from queue`
	` review                    review setLacpDefaults`
	`commands`
	` setLacpDefaultsRequest  Set LACP default configuration`
	` request`
	`Switch(ProvisionLacpPortType)# setLacpDefaults`
	`setLacpDefaultsRequest`
		Configures default LACP globally.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **setLacpDefaultsRequest**—Sets LACP default configuration globally on the ME 1200 NID.
		• **review**—Displays the configuration on the ME 1200 NID.

Step 2	**setLacpDefaults review** **Example:** `Switch(ProvisionLacpPortType)# setLacpDefaults review`	Displays the default LACP configuration on the NID. **Note** The default system priority value is set to 32768.

	Command or Action	Purpose

	`Commands in queue:`
	`        setLacpDefaults setLacpDefaultsRequest`
	`        setLacpDefaults setLacpDefaultsRequest`	

Step 3	**setLacpDefaults commit** **Example:** `Switch(ProvisionLacpPortType)# `**`setLacpDefaults commit`**	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# `**`exit`**	Exits the LACP provisioning mode.

Configuration Example

The example how to configure default LACP configuration on the NID:

```
Switch(ProvisionLacpPortType)# setLacpDefaults setLacpDefaultsRequest
Switch(ProvisionLacpPortType)# setLacpDefaults review
Commands in queue:
        setLacpDefaults setLacpDefaultsRequest
Switch(ProvisionLacpPortType)# setLacpDefaults commit
 SetLacpConfig Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Configuring LACP at Port level on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setLacpPortConfig** {**commit** | **flush** | **lacpPortConfiguration** | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# `**`setLacpPortConfig ?`**
	` commit                    commit setLacpPortConfig`
	` flush                     flush all setLacpPortConfig`
	`commands from queue`
	` lacpPortConfiguration  Set LACP port configuration`
	`request`
		Configures LACP at port level.
		• **commit**—Sends the LACP configuration to the NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpPortConfiguration**—Sets LACP configuration at port level on the NID.

	Command or Action	Purpose
	`review review setLacpPortConfig commands`	• **review**—Displays the configuration on the NID.

Step 2	**setLacpPortConfig lacpPortConfiguration** {**key** *key-group* | **lacpEnable** {**enable** | **disable**} | **portNumber** *port-num* | **portPriority** *priority-value* | **role** {**active** | **passive**} {**enable** | **disable**} | **timeout** {**fast** | **slow**} {**enable** | **disable**}}
	
	Example:
	
	`Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration key 1`
	`Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration lacpEnable enable`
	`Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration portNumber 2`
	`Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration role active enable`
	`Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration portPriority 23`
	`Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration timeout fast enable`
		Configures LACP port configuration.
		
		• **key** *key_group*—Specifies the key or channel group for LACP aggregation. The valid range is 0 to 65535.
		• **lacpEnable** —Enables LACP on the interface.
		• **enable**—Enables LACP configuration.
		• **disable**—Disables LACP configuration.
		• **portNumber** *port-num*—Specifies the targeted port. The valid range is from 1 to 6.
		• **portPriority** *priority-value*—Specifies the LACP priority. The valid range is from 1 to 65535.
		• **role**—Sets the activity mode.
		• **active**—Transmits the LACP BPDUs actively.
		• **passive**—Waits for the neighbor before transmitting.
		• **timeout**—Sets period between BPDU transmissions.
		• **fast**—Transmits BPDUs every second.
		• **slow**—Transmits BPDUs every 30th second.

Step 3	**setLacpPortConfig review**
	
	Example:
	
	`Switch(ProvisionLacpPortType)# setLacpPortConfig review`
	`Commands in queue:`
	`setLacpPortConfig lacpPortConfiguration key 3`
	`setLacpPortConfig lacpPortConfiguration lacpEnable enable`
	`setLacpPortConfig lacpPortConfiguration portNumber 2`
	`setLacpPortConfig lacpPortConfiguration portPriority 2`
	`setLacpPortConfig lacpPortConfiguration role active enable`
	`setLacpPortConfig lacpPortConfiguration timeout fast enable`
	`setLacpPortConfig lacpPortConfiguration key 2`
	`setLacpPortConfig lacpPortConfiguration lacpEnable enable`
	`setLacpPortConfig lacpPortConfiguration portNumber 2`
	`setLacpPortConfig lacpPortConfiguration role active enable`
		Displays the LACP configuration on the NID.

	Command or Action	Purpose
	`setLacpPortConfig lacpPortConfiguration timeout fast enable`	
Step 4	**setLacpPortConfigcommit** **Example:** `Switch(ProvisionLacpPortType)# ` **`setLacpPortConfig commit`**	Sends the LACP configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionLacpPortType)# ` **`exit`**	Exits the LACP provisioning mode.

Configuration Example

The example shows LACP port configuration on the NID:

```
Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration key 1
Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration lacpEnable enable
Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration portNumber 2
Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration role active enable
Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration portPriority 23
Switch(ProvisionLacpPortType)# setLacpPortConfig lacpPortConfiguration timeout fast enable
Switch(ProvisionLacpPortType)# setLacpPortConfig review
Commands in queue:
        setLacpPortConfig lacpPortConfiguration key 3
        setLacpPortConfig lacpPortConfiguration lacpEnable enable
        setLacpPortConfig lacpPortConfiguration portNumber 2
        setLacpPortConfig lacpPortConfiguration portPriority 2
        setLacpPortConfig lacpPortConfiguration role active enable
        setLacpPortConfig lacpPortConfiguration timeout fast enable
        setLacpPortConfig lacpPortConfiguration key 2
        setLacpPortConfig lacpPortConfiguration lacpEnable enable
        setLacpPortConfig lacpPortConfiguration portNumber 2
        setLacpPortConfig lacpPortConfiguration role active enable
        setLacpPortConfig lacpPortConfiguration timeout fast enable
Switch(ProvisionLacpPortType)# setLacpPortConfig commit
 SetLacpPortConfig Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Configuring Default LACP Configuration at Port level on the ME 1200 NID

The default values for LACP port parameters are:

- lacpEnable: false
- portPriority 32768
- role: active
- timeout: fast

There is no default value for key. Configure a valid value to identify the LACP channel aggregation group. If no value is set, key value is displayed as 0.

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setLacpPortDefaults** {**commit** | **flush** | **lacpPhysicalPort** *port-num*| **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# setLacpPortDefaults ?`
	` commit            commit setLacpPortDefaults`
	` flush             flush all setLacpPortDefaults`
	`commands from queue`
	` lacpPhysicalPort  Set LACP port default configuration`
	` request`
	` review            review setLacpPortDefaults commands`
	`Switch(ProvisionLacpPortType)# setLacpPortDefaults`
	`lacpPhysicalPort 2`
		Configures default LACP at port level.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpPhysicalPort** *port_num*—Sets LACP default configuration at port level on the ME 1200 NID. The valid ports are 1 to 6.
		• **review**—Displays the configuration on the ME 1200 NID.

Step 2	**setLacpPortDefaults review**
	
	Example:
	`Switch(ProvisionLacpPortType)# setLacpPortDefaults`
	`review`
	`Commands in queue:`
	`        setLacpPortDefaults lacpPhysicalPort 2`
		Displays the LACP configuration on the ME 1200 NID.

Step 3	**setLacpPortDefaults commit**
	
	Example:
	`Switch(ProvisionLacpPortType)# setLacpPortDefaults`
	`commit`
		Sends the LACP configuration to the NID.

Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example shows default LACP port configuration on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# setLacpPortDefaults lacpPhysicalPort 2
Switch(ProvisionLacpPortType)# setLacpPortDefaults review
Commands in queue:
        setLacpPortDefaults lacpPhysicalPort 2
witch(ProvisionLacpPortType)# setLacpPortDefaults commit
SetLacpPortDefaults Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Clearing LACP Statistics on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**clearLacpStats** {**commit** | **flush** | **lacpPhysicalPort** *port-num* | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# `**`clearLacpStats ?`**
	`  commit             commit clearLacpStats`
	`  flush             flush all clearLacpStats commands`
	` from queue`
	`  lacpPhysicalPort  Clear LACP statistics request`
	`  review             review clearLacpStats commands`
	`Switch(ProvisionLacpPortType)# `**`clearLacpStats lacpPhysicalPort 3`**
		Clears LACP statistics.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpPhysicalPort** *port_num*—Clears the LACP statistics on a specified port on the NID. The valid values are 1 to 6.
		• **review**—Displays the configuration on the NID.

Step 2	**clearLacpStats review**
	
	Example:
	`Switch(ProvisionLacpPortType)# `**`clearLacpStats review`**
	`Commands in queue:`
	`        clearLacpStats lacpPhysicalPort 3`
		Displays the LACP configuration on the NID.

Step 3	**clearLacpStats commit** **Example:** `Switch(ProvisionLacpPortType)# `**`clearLacpStats commit`**	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# `**`exit`**	Exits the LACP provisioning mode.

Configuration Example

The example clears the LACP statistics on port 3 on the NID:

```
Switch(ProvisionLacpPortType)# clearLacpStats lacpPhysicalPort 3
Switch(ProvisionLacpPortType)# clearLacpStats review
Commands in queue:
        clearLacpStats lacpPhysicalPort 3
Switch(ProvisionLacpPortType)# clearLacpStats commit
ClearLacpStats_Output.clearLacpStatsResponse = 0
```

```
 ClearLacpStats Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Negating LACP Configuration and Restoring Defaults

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**no ?**
	
	Example:
	`Switch(ProvisionLacpPortType)# no ?`
	
	`clearLacpStats       Clear LACP statistics request`
	`exit                 Exit from ProvisionLacpPortType sub configuration mode`
	`getLacpConfig        Get LACP configuration request`
	`getLacpDefaults      Get LACP default configuration request`
	`getLacpPortConfig    Get LACP port configuration request`
	`getLacpPortDefaults  Get LACP port default configuration request`
	`setLacpConfig        Set LACP configuration request`
	`setLacpDefaults      Set LACP default configuration request`
	`setLacpPortConfig    Set LACP port configuration request`
	`setLacpPortDefaults  Set LACP port default configuration request`
	`showLacpAggLB        Show LACP load balance request`
	`showLacpInternal     Show LACP internal request`
	`showLacpNeighbors    Show LACP neighbor status request`
	`showLacpStats        Show LACP statistics request`
	`showLacpSysId        Show LACP system-id request`
		Negates the commands and sets the default configuration.

Step 2	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Viewing the Global LACP Configuration on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getLacpConfig** {**commit** | **flush** | **getLacpConfigRequest** | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# getLacpConfig ?`
	` commit                commit getLacpConfig`
	` flush               flush all getLacpConfig commands`
	` from queue`
	` getLacpConfigRequest  Get LACP configuration request`
	` review                review getLacpConfig commands`
	` commit                commit getLacpConfig`
	`Switch(ProvisionLacpPortType)# getLacpConfig getLacpConfigRequest`
		Retrieve the global LACP configuration.
		• **commit—**Sends the LACP configuration to NID.
		• **flush—**Flushes all LACP configuration from the queue.
		• **getLacpConfigRequest—**Retrieves the configured global LACP configuration on the ME 1200 NID.
		• **review—**Displays the configuration on the ME 1200 NID.

Step 2	**getLacpConfig review**
	
	Example:
	`Switch(ProvisionLacpPortType)# getLacpConfig review`
	`Commands in queue:`
	`        getLacpConfig getLacpConfigRequest`
	`        getLacpConfig getLacpConfigRequest`
		Displays the LACP configuration on the ME 1200 NID.

Step 3	**getLacpConfig commit** **Example:** `Switch(ProvisionLacpPortType)# getLacpConfig commit`	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example retrieves the global LACP configuration on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# getLacpConfig getLacpConfigRequest
Switch(ProvisionLacpPortType)# getLacpConfig review
Commands in queue:
        getLacpConfig getLacpConfigRequest
        getLacpConfig getLacpConfigRequest
Switch(ProvisionLacpPortType)# getLacpConfig commit
GetLacpConfig_Output.lacpGlobalConfiguration.systemPrio = 32768
GetLacpConfig_Output.lacpGlobalConfiguration.lacpGlobalState = true
 GetLacpConfig Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Viewing the Default LACP Configuration on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getLacpDefaults** {**commit** | **flush** | **getLacpDefaultsRequest** | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# getLacpDefaults ?`
	`commit                  commit getLacpDefaults`
	`flush                   flush all getLacpDefaults commands from queue`
	`getLacpDefaultsRequest  Get LACP default configuration request`
	`review                  review getLacpDefaults commands`
	`Switch(ProvisionLacpPortType)# getLacpDefaults getLacpDefaultsRequest`
		Retrieves the default LACP configuration.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **getLacpDefaultsRequest**—Retrieves the default LACP configuration on the ME 1200 NID.
		• **review**—Displays the configuration on the ME 1200 NID.

Step 2	**getLacpDefaults review**
	
	Example:
	`Switch(ProvisionLacpPortType)# getLacpDefaults review`
	`Commands in queue:`
	`        getLacpDefaults getLacpDefaultsRequest`
		Displays the LACP configuration on the ME 1200 NID.

Step 3	**getLacpDefaults commit** **Example:** `Switch(ProvisionLacpPortType)# getLacpDefaults commit`	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example retrieves the default LACP configuration on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# getLacpDefaults getLacpDefaultsRequest
Switch(ProvisionLacpPortType)# getLacpDefaults review
Commands in queue:
        getLacpDefaults getLacpDefaultsRequest
Switch(ProvisionLacpPortType)# getLacpDefaults commit
```

```
GetLacpDefaults_Output.lacpGlobalConfiguration.systemPrio = 32768
GetLacpDefaults_Output.lacpGlobalConfiguration.lacpGlobalState = true

 GetLacpDefaults Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Viewing the LACP Configuration at Port Level on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getLacpPortConfig** {**commit** | **flush** | **lacpPhysicalPort** *port-num* | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# getLacpPortConfig ?`
	` commit            commit getLacpPortConfig`
	` flush            flush all getLacpPortConfig commands from queue`
	` lacpPhysicalPort  Get LACP port configuration request`
	
	` review            review getLacpPortConfig commands`
	`Switch(ProvisionLacpPortType)# getLacpPortConfig lacpPhysicalPort 1`
		Retrieves the LACP configuration at port.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpPhysicalPort** *port_num*—Retrieves the LACP configuration for specified port on the NID. The valid values are 1 to 6.
		• **review**—Displays the configuration on the NID.

Step 2	**getLacpPortConfig review**
	
	Example:
	`Switch(ProvisionLacpPortType)# getLacpPortConfig review`
	`Commands in queue:`
	`        getLacpPortConfig lacpPhysicalPort 1`
		Displays the LACP configuration on the NID.

Step 3	**getLacpPortConfig commit** **Example:** `Switch(ProvisionLacpPortType)# getLacpPortConfig commit`	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example retrieves the LACP configuration for port 1 on the NID:

```
Switch(ProvisionLacpPortType)# getLacpPortConfig lacpPhysicalPort 1
Switch(ProvisionLacpPortType)# getLacpPortConfig review
Commands in queue:
        getLacpPortConfig lacpPhysicalPort 1
Switch(ProvisionLacpPortType)# getLacpPortConfig commit
GetLacpPortConfig_Output.lacpPortConfiguration.portNumber = 1
GetLacpPortConfig_Output.lacpPortConfiguration.lacpEnable = false
GetLacpPortConfig_Output.lacpPortConfiguration.key = 1
GetLacpPortConfig_Output.lacpPortConfiguration.role.t = 1
GetLacpPortConfig_Output.lacpPortConfiguration.role.u.active = true
GetLacpPortConfig_Output.lacpPortConfiguration.portPriority = 32768
GetLacpPortConfig_Output.lacpPortConfiguration.timeout.t = 1
GetLacpPortConfig_Output.lacpPortConfiguration.timeout.u.fast = true

 GetLacpPortConfig Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Viewing the Default LACP Configuration at Port Level on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getLacpPortDefaults** {**commit** | **flush** | **lacpPhysicalPort** *port-num* | **review**}
	
	Example:
	
	`Switch(ProvisionLacpPortType)# getLacpPortDefaults ?`
	` commit             commit getLacpPortDefaults`
	` flush              flush all getLacpPortDefaults commands from queue`
	` lacpPhysicalPort  Get LACP port default configuration request`
	` review            review getLacpPortDefaults commands`
	`Switch(ProvisionLacpPortType)# getLacpPortDefaults lacpPhysicalPort 1`
		Retrieve the LACP configuration at port.
		
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpPhysicalPort** *port_num*—Retrieves the default LACP configuration for specified port on the ME 1200 NID. The valid values are 1 to 6.
		• **review**—Displays the configuration on the ME 1200 NID.

Step 2	**getLacpPortDefaults review**
	
	Example:
	
	`Switch(ProvisionLacpPortType)# getLacpPortDefaults review`
	`Commands in queue:`
	`        getLacpPortDefaults lacpPhysicalPort 1`
		Displays the LACP configuration on the ME 1200 NID.

	Command or Action	Purpose
Step 3	**getLacpPortDefaults commit** **Example:** `Switch(ProvisionLacpPortType)#` **`getLacpPortDefaults commit`**	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)#` **`exit`**	Exits the LACP provisioning mode.

Configuration Example

The example retrieves the default LACP configuration for port 1 on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# getLacpPortDefaults lacpPhysicalPort 1
Switch(ProvisionLacpPortType)# getLacpPortDefaults review
Commands in queue:
        getLacpPortDefaults lacpPhysicalPort 1
Switch(ProvisionLacpPortType)# getLacpPortDefaults commit
GetLacpPortDefaults_Output.lacpPortConfiguration.portNumber = 1
GetLacpPortDefaults_Output.lacpPortConfiguration.lacpEnable = false
GetLacpPortDefaults_Output.lacpPortConfiguration.key = 0
GetLacpPortDefaults_Output.lacpPortConfiguration.role.t = 1
GetLacpPortDefaults_Output.lacpPortConfiguration.role.u.active = true
GetLacpPortDefaults_Output.lacpPortConfiguration.portPriority = 32768
GetLacpPortDefaults_Output.lacpPortConfiguration.timeout.t = 1
GetLacpPortDefaults_Output.lacpPortConfiguration.timeout.u.fast = true

 GetLacpPortDefaults Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Note NOTE: You must explicitly configure a key value. The default value for key retrieved is 0 until it is set to a value using the setLacpPortConfig operation.

Verifying LACP

Viewing the LACP System ID Information on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showLacpSysId** {**commit** | **flush** | **showLacpSysIdRequest** | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# showLacpSysId ?`
	` commit                commit showLacpSysId`
	` flush                flush all showLacpSysId commands`
	` from queue`
	` review                review showLacpSysId commands`
	` showLacpSysIdRequest  Show LACP system-id request`
	`Switch(ProvisionLacpPortType)# showLacpSysId showLacpSysIdRequest`
		Displays the LACP system ID information.
		• **commit—**Sends the LACP configuration to NID.
		• **flush—**Flushes all LACP configuration from the queue.
		• **showLacpSysIdRequest—**Displays the LACP system ID information on the ME 1200 NID.
		• **review—**Displays the configuration on the ME 1200 NID.

Step 2	**showLacpSysId review**
	
	Example:
	`Switch(ProvisionLacpPortType)# showLacpSysId review`
	`Commands in queue:`
	`        showLacpSysId showLacpSysIdRequest`
	`        showLacpSysId showLacpSysIdRequest`
		Displays the LACP configuration on the ME 1200 NID.

Step 3	**showLacpSysId commit** **Example:** `Switch(ProvisionLacpPortType)# showLacpAggLB commit`	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example displays the LACP system ID information on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# showLacpSysId showLacpSysIdRequest
Commands in queue:
        showLacpSysId showLacpSysIdRequest
        showLacpSysId showLacpSysIdRequest
Switch(ProvisionLacpPortType)# showLacpSysId commit
ShowLacpSysId_Output.showLacpSysIdResponse.systemId = 'b8-38-61-68-7b-bc'
ShowLacpSysId_Output.showLacpSysIdResponse.systemPriority = 32768

 ShowLacpSysId Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Viewing the LACP Load Balance Information on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showLacpAggLB** {**commit** | **flush** | **showLacpAggLBRequest** | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# showLacpAggLB ?`
	` commit                 commit showLacpAggLB`
	` flush                  flush all showLacpAggLB`
	`commands from queue`
	` review                 review showLacpAggLB commands`
	` showLacpAggLBRequest  Show LACP load balance request`
	`Switch(ProvisionLacpPortType)# showLacpAggLB`
	`showLacpAggLBRequest`
		Displays LACP load balance information.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **showLacpAggLBRequest**—Displays the LACP load balance information on the ME 1200 NID.
		• **review**—Displays the configuration on the ME 1200 NID.

Step 2	**showLacpAggLB review**
	
	Example:
	`Switch(ProvisionLacpPortType)# showLacpAggLB review`
	`Commands in queue:`
	`        showLacpAggLB showLacpAggLBRequest`
		Displays the LACP configuration on the ME 1200 NID.

Step 3	**showLacpAggLB commit** **Example:** `Switch(ProvisionLacpPortType)# showLacpAggLB commit`	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example displays the LACP load balance information on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# showLacpAggLB showLacpAggLBRequest
Switch(ProvisionLacpPortType)# showLacpAggLB review
Commands in queue:
        showLacpAggLB showLacpAggLBRequest
Switch(ProvisionLacpPortType)# showLacpAggLB commit
ShowLacpAggLB_Output.lacpAggLBMode.smac_enable = true
```

```
ShowLacpAggLB_Output.lacpAggLBMode.dmac_enable = false
ShowLacpAggLB_Output.lacpAggLBMode.ip_enable = true
ShowLacpAggLB_Output.lacpAggLBMode.port_enable = true

 ShowLacpAggLB Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Viewing the LACP Internal State Information on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showLacpInternal** {**commit** | **flush** | **lacpPhysicalPort** *port-num* | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# showLacpInternal ?`
	` commit             commit showLacpInternal`
	` flush             flush all showLacpInternal commands`
	` from queue`
	` lacpPhysicalPort  Show LACP internal request`
	` review             review showLacpInternal commands`
	`Switch(ProvisionLacpPortType)# showLacpInternal lacpPhysicalPort 2`
		Displays LACP internal state information.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpPhysicalPort***port_num*—Displays the LACP internal state information for specified port on the ME 1200 NID.
		• **review**—Displays the configuration on the ME 1200 NID.

Step 2	**showLacpInternal review**
	
	Example:
	`Switch(ProvisionLacpPortType)# showLacpInternal review`
	`Commands in queue:`
	`        showLacpNeighbors lacpPhysicalPort 1`
	`        showLacpInternal lacpPhysicalPort 1`
		Displays the LACP configuration on the ME 1200 NID.

Step 3	**showLacpInternal commit** **Example:** `Switch(ProvisionLacpPortType)# showLacpInternal commit`	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example displays the LACP internal state information on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# showLacpInternal lacpPhysicalPort 2
Switch(ProvisionLacpPortType)# showLacpInternal review
Commands in queue:
        showLacpNeighbors lacpPhysicalPort 1
        showLacpInternal lacpPhysicalPort 1
Switch(ProvisionLacpPortType)# showLacpInternal commit
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].portNumber =1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].mode = false
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].key = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].role = true
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].timeout = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].portPriority= 32768
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].adminKey = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].operKey = 3
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[0].collectorMaxDelay = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].portNumber =2
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].mode = false
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].key = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].role = true
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].timeout = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].portPriority= 26733
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].adminKey = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].operKey = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[1].collectorMaxDelay = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].portNumber =3
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].mode = false
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].key = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].role = true
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].timeout = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].portPriority= 32768
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].adminKey = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].operKey = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[2].collectorMaxDelay = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].portNumber =4
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].mode = false
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].key = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].role = true
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].timeout = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].portPriority= 32768
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].adminKey = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].operKey = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[3].collectorMaxDelay = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].portNumber =5
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].mode = false
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].key = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].role = true
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].timeout = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].portPriority= 32768
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].adminKey = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].operKey = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[4].collectorMaxDelay = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].portNumber =6
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].mode = false
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].key = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].role = true
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].timeout = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].portPriority= 32768
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].adminKey = 0
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].operKey = 1
ShowLacpInternal_Output.lacpPortInternals.lacpPortInternalslist[5].collectorMaxDelay = 0

 ShowLacpInternal Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Viewing the LACP Neighbors Status Information on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showLacpNeighbors** {**commit** | **flush** | **lacpPhysicalPort** *port-number* | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# `**`showLacpNeighbors ?`**
	` commit            commit showLacpNeighbors`
	` flush            flush all showLacpNeighbors commands`
	` from queue`
	` lacpPhysicalPort  Show LACP neighbor status request`
	` review            review showLacpNeighbors commands`
	`Switch(ProvisionLacpPortType)# `**`showLacpNeighbors lacpPhysicalPort 2`**
		Displays LACP neighbor state information.
		• **commit**—Sends the LACP configuration to NID.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpPhysicalPort***port_num*—Displays the LACP neighbors information for specified port on the ME 1200 NID.
		• **review**—Displays the configuration on the ME 1200 NID.

Step 2	**showLacpNeighbors review**
	
	Example:
	`Switch(ProvisionLacpPortType)# `**`showLacpNeighbors review`**
	`Commands in queue:`
	`        showLacpNeighbors lacpPhysicalPort 2`
		Displays the LACP configuration on the ME 1200 NID.

Step 3	**showLacpNeighbors commit** **Example:** `Switch(ProvisionLacpPortType)# `**`showLacpNeighbors commit`**	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# `**`exit`**	Exits the LACP provisioning mode.

Configuration Example

The example displays the LACP neighbors status information on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# showLacpNeighbors lacpPhysicalPort 2
Switch(ProvisionLacpPortType)# showLacpNeighbors review
Commands in queue:
```

```
        showLacpNeighbors lacpPhysicalPort 2
Switch(ProvisionLacpPortType)# showLacpNeighbors commit
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].aggrID = 1
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].partnerSysId =
'00-3a-99-fd-4a-44'
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].partnerPort = 3
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].partnerPortPriority
= 32768
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].partnerSysPriority =
 32768
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].partnerOperKey = 3
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].aggrProtocolType =
'LACP'
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].bandwidth = 0
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[0].aggrMacAddr =
'00-3a-99-fd-4a-3b'
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].aggrID = 1
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].partnerSysId =
'00-3a-99-fd-4a-44'
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].partnerPort = 6
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].partnerPortPriority
= 32768
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].partnerSysPriority =
 32768
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].partnerOperKey = 3
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].aggrProtocolType =
'LACP'
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].bandwidth = 0
ShowLacpNeighbors_Output.lacpNeighborStatus.lacpNeighborStatusList[1].aggrMacAddr =
'00-3a-99-fd-4a-3e'

ShowLacpNeighbors Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

Viewing the LACP Statistics on the ME 1200 NID

Before You Begin

- Perform the steps to provision LACP on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure LACP, on page 146.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showLacpStats** {**commit** | **flush** | **lacpPhysicalPort** *port-num* | **review**}
	
	Example:
	`Switch(ProvisionLacpPortType)# showLacpStats ?`
	`commit              commit showLacpStats`
	`flush               flush all showLacpStats commands from queue`
	`lacpPhysicalPort    Show LACP statistics request`
	`review              review showLacpStats commands`
	`Switch(ProvisionLacpPortType)# showLacpStats lacpPhysicalPort 2`
		Displays the LACP statistics.
		• **commit**—Sends the LACP configuration.
		• **flush**—Flushes all LACP configuration from the queue.
		• **lacpPhysicalPort***port_num*—Displays the LACP statistics for specified port on the ME 1200 NID.
		• **review**—Displays the configuration on the ME 1200 NID.

	Command or Action	Purpose

Step 2	**showLacpStats review**
	
	Example:
	
	`Switch(ProvisionLacpPortType)# showLacpStats review`
	`Commands in queue:`
	`        showLacpStats lacpPhysicalPort 1`
	`        showLacpStats lacpPhysicalPort 2`
		Displays the LACP configuration on the ME 1200 NID.

Step 3	**showLacpStats commit** **Example:** `Switch(ProvisionLacpPortType)# showLacpStats commit`	Sends the LACP configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionLacpPortType)# exit`	Exits the LACP provisioning mode.

Configuration Example

The example displays the LACP statistics on the ME 1200 NID:

```
Switch(ProvisionLacpPortType)# showLacpStats lacpPhysicalPort 2
Switch(ProvisionLacpPortType)# showLacpStats review
Commands in queue:
        showLacpStats lacpPhysicalPort 1
        showLacpStats lacpPhysicalPort 2
Switch(ProvisionLacpPortType)# showLacpStats commit
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[0].rxUnknown = 0
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[0].port = 3
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[0].rxFrames = 17866
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[0].txFrames = 12527
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[0].rxIllegal = 0
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[1].rxUnknown = 0
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[1].port = 6
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[1].rxFrames = 17244
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[1].txFrames = 12132
ShowLacpStats_Output.lacpPortStatistics.lacpPortStatsList[1].rxIllegal = 0

 ShowLacpStats Commit Success!!!
Switch(ProvisionLacpPortType)# exit
```

CHAPTER 10

Provisioning Link Layer Discovery Protocol

The Cisco Discovery Protocol (CDP) is a device discovery protocol that runs over Layer 2 (the data link layer) on all Cisco-manufactured devices (routers, bridges, access servers, and switches). CDP allows network management applications to automatically discover and learn about other Cisco devices connected to the network.

To support non-Cisco devices and to allow for interoperability between other devices, the switch supports the IEEE 802.1AB Link Layer Discovery Protocol (LLDP). LLDP is a neighbor discovery protocol that is used for network devices to advertise information about themselves to other devices on the network. This protocol runs over the data link layer, which allows two systems running different network layer protocols to learn about each other.

LLDP supports a set of attributes that it uses to discover neighbor devices. These attributes contain type, length, and value descriptions and are referred to as TLVs. LLDP supported devices can use TLVs to receive and send information to their neighbors. Details such as configuration information, device capabilities, and device identity can be advertised using this protocol.

By default, LLDP is disabled globally and on interfaces.

The switch supports these basic management TLVs. These are mandatory LLDP TLVs.

- Port description TLV
- System name TLV
- System description
- System capabilities TLV
- Management address TLV

These organizationally-specific LLDP TLVs are also advertised to support LLDP-MED.

- Port VLAN ID TLV (IEEE 802.1 organizationally specific TLVs)
- MAC/PHY configuration/status TLV (IEEE 802.3 organizationally specific TLVs)

How To Configure LLDP

Setting LLDP Global Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.

Step 2	**setLldpConfig lldpGlobalConfiguration** {**global-state** {**enable** | **disable**} | **hold-time** *lldp-hold-time* | **lldp-transmission-delay** *value* |**reinit-delay** *tx-reinit-value* **timer** *tx-value* | **tlv-selecttlv-select** {**mgmt-address** | **port-description** | **system-capabilities** | **system-description** | **system-name**}
	
	Example:
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration global-state enable`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration hold-time 5`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration lldp-transmission-delay 10`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration timer 10`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration reinit-delay 10`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration tlv-select system-description enable`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration tlv-select port-description enable`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration tlv-select management-address enable`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration tlv-select system-capabilities enable`
	`Switch(ProvisionLldpPortType)# setLldpConfig lldpGlobalConfiguration tlv-select system-name enable`
		Sets the LLDP global configuration.
		
		• **global-state—**LLDP global state. This state is either *enabled* or *disabled*.
		• **hold-time—**LLDP hold time before discarding the configuration. The valid values are from 2 to 10 seconds. The default value is 4 seconds.
		• **lldp-transmission-delay—**LLD Transmission delay value. The valid values are from 1 to 8192. The default value is 2 seconds.
		• **reinit-delay—**LLDP transmission re-initialization delay. The valid values are from 1 to 10 seconds. The default value is 2 seconds.
		• **timer—**Time between each LLDP frame transmitted in seconds. The valid values are from 5 to 32768. The default value is 30 seconds.
		• **tlv-select—**Transmission TLV.

Step 3	**setLldpConfig review** **Example:** `Switch(ProvisionLldpPortType)# setLldpConfig review`	Reviews the setLldpConfig.
Step 4	**setLldpConfig commit** **Example:** `Switch(ProvisionLldpPortType)# setLldpConfig commit`	Sends the setLldpConfig configuration to the Cisco ME 1200 NID.

	Command or Action	Purpose

Step 5	**exit**
	
	Example:
	`Switch(ProvisionLldpPortType)# exit`
	`Switch#`
		Exits the provisionLldpPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setLldpConfig configuration.

```
Switch(ProvisionLldpPortType)# getLldpConfig getLldpConfigRequest
Switch(ProvisionLldpPortType)# getLldpConfig review
```

```
Commands in queue:
                getLldpConfig getLldpConfigRequest
```

```
Switch(ProvisionLldpPortType)# getLldpConfig commit
```

```
GetLldpConfig_Output.lldpGlobalConfiguration.global_state = true
GetLldpConfig_Output.lldpGlobalConfiguration.hold_time = 5
GetLldpConfig_Output.lldpGlobalConfiguration.timer = 10
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.system_name =
true
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.system_description
 = true
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.port_description
 = true
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.management_address
 = true
GetLldpConfig_Output.lldpGlobalConfiguration.tlv_select.system_capabilities
 = true
GetLldpConfig_Output.lldpGlobalConfiguration.reinit_delay = 10
GetLldpConfig_Output.lldpGlobalConfiguration.lldp_transmission_delay =
10

GetLldpConfig Commit Success!!!
```

Setting LLDP Configuration to Default

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.

	Command or Action	Purpose
Step 2	**setLldpDefaults setLldpDefaultsRequest** **Example:** `Switch(ProvisionLldpPortType)# setLldpDefaults setLldpDefaultsRequest`	Sets the LLDP configuration to default values.
Step 3	**setLldpDefaults commit** **Example:** `Switch(ProvisionLldpPortType)# setLldpDefaults commit`	Sends the setLldpDefaults configuration to the Cisco ME 1200 NID.

Step 4	**exit**
	
	Example:
	`Switch(ProvisionLldpPortType)# exit`
	`Switch#`
		Exits the ProvisionLldpPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setLldpDefaults configuration.

```
Switch(ProvisionLldpPortType)# getLldpDefaults getLldpDefaultsRequest
Switch(ProvisionLldpPortType)# getLldpDefaults review
```

```
Commands in queue:
                getLldpDefaults getLldpDefaultsRequest
```

```
Switch(ProvisionLldpPortType)# getLldpDefaults commit
```

```
GetLldpDefaults_Output.lldpGlobalConfiguration.global_state = true
GetLldpDefaults_Output.lldpGlobalConfiguration.hold_time = 5
GetLldpDefaults_Output.lldpGlobalConfiguration.timer = 30
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.system_name =
true
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.system_description
 = true
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.port_description
 = true
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.management_address
 = true
GetLldpDefaults_Output.lldpGlobalConfiguration.tlv_select.system_capabilities
 = true
GetLldpDefaults_Output.lldpGlobalConfiguration.reinit_delay = 2
GetLldpDefaults_Output.lldpGlobalConfiguration.lldp_transmission_delay =
 10

GetLldpDefaults Commit Success!!!
```

Setting LLDP Port Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.

Step 2	**setLldpportconfig lldpPortConfiguration** {**lldp-receive-enable** {**disable** | **enable**} |**lldp-transmit-enable** {**disable** | **enable**} | **port-number** *port-number*}
	
	Example:
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration port-number 3`
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-receive-enable disable`
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-transmit-enable disable`
		Sets the LLDP port configuration.
		• **lldp-receive-enable—**Whether LLDP receive is enabled or disabled.
		• **lldp-transmit-enable—**Whether LLDP transmit is enabled or disabled.
		• **port-number—**The target interface number. The valid values are from 1 to 6.

Step 3	**setLldpPortConfig review** **Example:** `Switch(ProvisionLldpPortType)# setLldpPortConfig review`	Reviews the setLldpPortConfig.
Step 4	**setLldpPortConfig commit** **Example:** `Switch(ProvisionLldpPortType)# setLldpConfig commit`	Sends the setLldpConfig configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionLldpPortType)# exit`
	`Switch#`
		Exits the ProvisionLldpPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setLldpPortConfig configuration.

```
Switch(ProvisionLldpPortType)# getLldpportConfig physicalPortNum 3
Switch(ProvisionLldpPortType)# getLldpportConfig review
```

```
Commands in queue:
                getLldpConfig physicalPortNum 3
```

```
Switch(ProvisionLldpPortType)# getLldpportConfig commit
```

```
GetLldpPortConfig_Output.lldpPortConfiguration.port_number = 3
GetLldpPortConfig_Output.lldpPortConfiguration.lldp_transmit_enable =
false
GetLldpPortConfig_Output.lldpPortConfiguration.lldp_receive_enable = false


GetLldpPortConfig Commit Success!!!
```

Setting LLDP Port Configuration to Default

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.
Step 2	**setlldpportdefaults physicalPortNum***port-number* **Example:** `Switch(ProvisionLldpPortType)# setlldpportdefaults physicalPortNum 3`	Sets the LLDP port configuration to default values. • **physicalPortNum—**Port number for which the LLDP configuration is set to default. The valid values are from 1 to 6.
Step 3	**setlldpportdefaults commit** **Example:** `Switch(ProvisionLldpPortType)# setlldpportdefaults commit`	Sends the setlldpportdefaults configuration to the Cisco ME 1200 NID.

Step 4	**exit**
	
	Example:
	`Switch(ProvisionLldpPortType)# exit`
	`Switch#`
		Exits the ProvisionLldpPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setlldpportdefaults configuration.

```
Switch(ProvisionLldpPortType)# getLldpportdefaults physicalPortNum 3
Switch(ProvisionLldpPortType)# getLldpportdefaults review
```

```
Commands in queue:
                getLldpportdefaults physicalPortNum 3
```

```
Switch(ProvisionLldpPortType)# getLldpportdefaults commit
```

```
GetLldpPortDefaults_Output.lldpPortConfiguration.port_number = 3
GetLldpPortDefaults_Output.lldpPortConfiguration.lldp_transmit_enable =
true
```

```
GetLldpPortDefaults_Output.lldpPortConfiguration.lldp_receive_enable =
true

GetLldpPortDefaults Commit Success!!!
```

Other Commands For LLDP Configuration

Clearing LLDP Counters

clearLldpCounters

```
Switch(ProvisionLldpPortType)# clearLldpCounters physicalPortNum 3
```

Displaying LLDP Neighbors

showlldpneighbors physicalPortNum *physical-port-number*

```
Switch(ProvisionLldpPortType)# showlldpneighbors physicalPortNum 3
Switch(ProvisionLldpPortType)# showlldpneighbors commit
```

```
ShowLldpNeighbors_Output.lldpNeighborInformation.local_port_id = 3
ShowLldpNeighbors_Output.lldpNeighborInformation.chassis_id =
'18-9C-5D-A7-F4-1C'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_port_id = 'Gi0/3'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_port_description
 = 'GigabitEthernet0/3'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_system_name =
'IRF-Whales-1'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_system_capabilities
 = 'Bridge(+), Router(+)'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_system_description
 = 'Cisco IOS Software, ME360x Software (ME360x-UNIVERSAL-M), Version
15.4(2)SN, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2014 by Cisco Systems, Inc.
Compiled Fri 21-Mar-14 09:12 by prod_rel_team'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_management_IP =
'7.3.9.13 (IPv4)'
ShowLldpNeighbors_Output.lldpNeighborInformation.remote_management_IPv6
= ''

ShowLldpNeighbors Commit Success!!!
```

Displaying LLDP Statistics

showlldpstatistics physicalPortNum *physical-port-number*

```
Switch(ProvisionLldpPortType)# showlldpstatistics physicalPortNum 3
Switch(ProvisionLldpPortType)# showlldpstatistics commit
```

```
ShowLldpStatistics_Output.lldpPortStatistics.global_counters.total_neighbor_entries_added
 = 1
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Tx_Frames =
17
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Rx_Frames =
0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Rx_Errors =
0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Rx_Frames_Discarded
```

```
 = 0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.TLVs_Discarded
 = 0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.TLVs_Unrecognized
 = 0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Org_Discarded
 = 0
ShowLldpStatistics_Output.lldpPortStatistics.local_counters.Age_Outs = 0

ShowLldpStatistics Commit Success!!!
```

CHAPTER 11

Configuring SNMP

This document describes the Simple Network Management Protocol (SNMP) feature and configuration steps to implement network management using SNMP.

Information About SNMP

SNMP is an application layer protocol that facilitates the exchange of management information among network devices, such as nodes and routers. It comprises part of the TCP/IP suite. System administrators can remotely manage network performance, find and solve network problems, and plan for network growth by using SNMP.

How to Provision SNMP

Configuring and Retrieving Default SNMP Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionSnmpConf** **Example:** `Switch# ProvisionSnmpConf`	Enters the ProvisionSnmpConf mode.
Step 2	**setSnmpDefaultConf setSnmpDefaultConfigRequest** *request-id* **Example:** `Switch(ProvisionSnmpConf)# setSnmpDefaultConf setSnmpDefaultConfigRequest 1`	Configures SNMP default configuration status. • **setSnmpDefaultConfigRequest**—Specifies SNMP default configuration. • *request_id*—Request ID. The default value is 1.

	Command or Action	Purpose
Step 3	**getSnmpDefaultConf getSnmpDefaultConfRequest** **Example:** `Switch(ProvisionSnmpConf)# getSnmpDefaultConf getSnmpDefaultConfRequest`	Retrieves SNMP default configuration status. • **getSnmpDefaultConfRequest—**Retrieves SNMP default configuration.
Step 4	**getSnmpDefaultConf review** **Example:** `Switch(ProvisionSnmpConf)# getSnmpDefaultConf review`	Displays the configuration.
Step 5	**getSnmpDefaultConf commit** **Example:** `Switch(ProvisionSnmpConf)# getSnmpDefaultConf commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(ProvisionSnmpConf)# exit`	Exits the ProvisionSnmpConf mode.

Configuration Example

The example shows how to configure and retrieve Default SNMP Configurations:

```
Switch(ProvisionSnmpConf)# setSnmpDefaultConf  setSnmpDefaultConfigRequest 1
Switch(ProvisionSnmpConf)# getSnmpDefaultConf  getSnmpDefaultConfRequest

Switch(ProvisionSnmpConf)# getSnmpDefaultConf review
Switch(ProvisionSnmpConf)# getSnmpDefaultConf commit
Switch(ProvisionSnmpConf)# exit
```

The following is a sample output on the NID.

```
Switch(ProvisionSnmpConf)#getSnmpDefaultConf  getSnmpDefaultConfRequest
Switch(ProvisionSnmpConf)#
Switch(ProvisionSnmpConf)#getSnmpDefaultConf  review
Commands in queue:
getSnmpDefaultConf getSnmpDefaultConfRequest
Switch(ProvisionSnmpConf)#getSnmpDefaultConf  commit
GetSnmpDefaultConf-Output.getSnmpDefaultResponse.trap = false
GetSnmpDefaultConf-Output.getSnmpDefaultResponse.version = 'v2c'
GetSnmpDefaultConf-Output.getSnmpDefaultResponse.snmp_server = 'disable'

GetSnmpDefaultConf Commit Success!!!
```

Configuring SNMPv2c Community Parameters

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionSnmpConf** **Example:** `Switch# ProvisionSnmpConf`	Enters the ProvisionSnmpConf mode.

Step 2	**setSnmpServerConf snmsnp-server-conf** { **trap** {**true** | **false**} | **version** {**v1** | **v2c** | **v3**} |**snmp-server** {**enable** | **disable**} |**community-v2c** {**comm-name** *comm-name* | **mode** {**ro** | **rw**}}}
	
	Example:
	`Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf  snmp-server  enable`
	`Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf version  v2c`
	`Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf trap true`
	`Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf community-v2c comm_name Public`
	`Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf community-v2c mode ro`
		Configures SNMP server.
		• **trap—**Specifies SNMP traps.
		• **true—**Enables SNMP trap.
		• **false—**Disables SNMP trap.
		• **version—**Specifies SNMP host version.
		• **v1—**Specifies SNMP version v1.
		• **v2c—**Specifies SNMP version v2c.
		• **v3—**Specifies SNMP version v3.
		• **snmp-server—**Specifies the SNMP server.
		• **Enable—**Enables the SNMP server.
		• **Disable—**Disables the SNMP server.
		• **community-v2c—**Specifies the v2c community.
		• **comm_name—**Specifies the v2c community name.
		• *comm-name*—v2c community name.
		• **mode—**Specifies read or write mode.
		• **ro—**Read mode.
		• **rw—**Write mode.

Step 3	**setSnmpServerConf review** **Example:** `Switch(ProvisionSnmpConf)# setSnmpServerConf review`	Displays the configuration.
Step 4	**setSnmpServerConf commit** **Example:** `Switch(ProvisionSnmpConf)# setSnmpServerConf commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 5	**getSnmpServerConf getSnmpServerConfigRequest** **Example:** `Switch(ProvisionSnmpConf)# getSnmpServerConf getSnmpServerConfigRequest`	Retrieves SNMP server configuration.
Step 6	**getSnmpServerConf review** **Example:** `Switch(ProvisionSnmpConf)# getSnmpServerConf review`	Displays the configuration.
Step 7	**getSnmpServerConf commit** **Example:** `Switch(ProvisionSnmpConf)# getSnmpServerConf commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(ProvisionSnmpConf)# exit`	Exits the ProvisionSnmpConf mode.

Configuration Example

The example shows how to configure and retrieve SNMPv2c community parameters:

```
Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf snmp-server  enable
Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf version  v2c
Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf trap true
Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf community-v2c comm_name Public
Switch(ProvisionSnmpConf)# setSnmpServerConf snmp-server-conf community-v2c mode ro
Switch(ProvisionSnmpConf)# setSnmpServerConf review
Switch(ProvisionSnmpConf)# setSnmpServerConf commit

Switch(ProvisionSnmpConf)# getSnmpServerConf getSnmpServerConfigRequest
Switch(ProvisionSnmpConf)# getSnmpServerConf review
Switch(ProvisionSnmpConf)# getSnmpServerConf commit
Switch(ProvisionSnmpConf)# exit
```

The following is a sample output on the NID.

```
Switch(ProvisionSnmpConf)#getSnmpServerConf commit
GetSnmpServerConf-Output.snmp-server-conf.trap = true
GetSnmpServerConf-Output.snmp-server-conf.version.t = 2
GetSnmpServerConf-Output.snmp-server-conf.version.u.v2c = 'v2c'
GetSnmpServerConf-Output.snmp-server-conf.snmp_server.t = 1
GetSnmpServerConf-Output.snmp-server-conf.snmp_server.u.enable = 'enabled
GetSnmpServerConf-Output.snmp-server-conf.community-v2c.comm_name =
'Public'
GetSnmpServerConf-Output.snmp-server-conf.community-v2c.mode.t = 1
GetSnmpServerConf-Output.snmp-server-conf.community-v2c.mode.u.ro = 'RO'

GetSnmpServerConf Commit Success!!!
```

Configuring SNMPv3 Community

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionSnmpConf** **Example:** `Switch# ProvisionSnmpConf`	Enters the ProvisionSnmpConf mode.

Step 2	**setSnmpCommunity snmp-community-conf** { *name* | **community-ip** *ip-address* | **community-mask** *mask*}
	
	Example:
	`Switch(ProvisionSnmpConf)# setSnmpCommunity snmp-community_conf  community-ip 10.10.10.1`
	`Switch(ProvisionSnmpConf)# setSnmpCommunity snmp-community-conf  community-mask 255.255.255.0`
	`Switch(ProvisionSnmpConf)# setSnmpCommunity snmp-community-conf  community-name user12`
		Configures SNMP default configuration status.
		• **community-name—**Configures SNMP community string.
		• *name*—Name of the community.
		• **community-ip—**Specifies community IP.
		• *ip_address*—IP address.
		• **community-mask—**Specifies community mask.
		• *mask*—Mask address.

Step 3	**getSnmpCommunity getSnmpCommunityConfRequest** **Example:** `Switch(ProvisionSnmpConf)# getSnmpCommunity getSnmpCommunityConfRequest`	Configures SNMP default configuration status. • **getSnmpCommunityConfRequest—**Retrieves SNMP configuration information.
Step 4	**getSnmpCommunity review** **Example:** `Switch(ProvisionSnmpConf)# getSnmpCommunity review`	Displays the configuration.
Step 5	**getSnmpCommunity commit** **Example:** `Switch(ProvisionSnmpConf)# getSnmpCommunity commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(ProvisionSnmpConf)# exit`	Exits from the ProvisionSnmpConf mode.

Configuration Example

The example shows how to configure and retrieve SNMPv3 Community:

```
Switch(ProvisionSnmpConf)# setSnmpCommunity  snmp-community-conf  community-ip 10.10.10.1
Switch(ProvisionSnmpConf)# setSnmpCommunity  snmp-community-conf  community-mask 255.255.255.0
Switch(ProvisionSnmpConf)# setSnmpCommunity  snmp-community-conf  community-name user12
```

```
Switch(ProvisionSnmpConf)# getSnmpCommunity  getSnmpCommunityConfReques

Switch(ProvisionSnmpConf)# getSnmpCommunity review
Switch(ProvisionSnmpConf)# getSnmpCommunity commit
Switch(ProvisionSnmpConf)# exit
```

The following is a sample output on the NID.

```
Switch(ProvisionSnmpConf)#$SnmpCommunityConfReques
Switch(ProvisionSnmpConf)#
Switch(ProvisionSnmpConf)#getSnmpCommunity review
Commands in queue:
getSnmpCommunity getSnmpCommunityConfRequest
Switch(ProvisionSnmpConf)#
Switch(ProvisionSnmpConf)#getSnmpCommunity com
Switch(ProvisionSnmpConf)#getSnmpCommunity commit
GetSnmpCommunity-Output.getSnmpCommunityResponse[0].community-name =
'public'
GetSnmpCommunity-Output.getSnmpCommunityResponse[0].community-ip =
'0.0.0.0'
GetSnmpCommunity-Output.getSnmpCommunityResponse[0].community-mask =
'0.0.0.0'
GetSnmpCommunity-Output.getSnmpCommunityResponse[1].community-name =
'private'
GetSnmpCommunity-Output.getSnmpCommunityResponse[1].community-ip =
'0.0.0.0'
GetSnmpCommunity-Output.getSnmpCommunityResponse[1].community-mask =
'0.0.0.0'
GetSnmpCommunity-Output.getSnmpCommunityResponse[2].community-name =
'user12'
GetSnmpCommunity-Output.getSnmpCommunityResponse[2].community-ip =
'10.10.10.1'
GetSnmpCommunity-Output.getSnmpCommunityResponse[2].community-mask =
'255.255.255.0'

GetSnmpCommunity Commit Success!!!
```

Configuring Trap Destination

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionSnmpConf** **Example:** `Switch# ProvisionSnmpConf`	Enters the ProvisionSnmpConf mode.
Step 2	**setSnmpHost snmp-host-config** {**host-id** *host-id* |**set-trap** {**enable** | **disable**} | **version** {**v1** | **v2c** | **v3**} **udp-port-no** *udp-port-no* | **address** {**ipv4** *ipv4-address* | **ipv6** *ipv6-address*} | **inform-mode** {**enable** | **disable**} | **inf-retries** *retry-instances* | **timeout-inform** *timeout-inform-value*}	Configures SNMP host. • **host-id—**Specifies the host name. • *host-id*—Host name. • **set-trap—**Specifies the trap.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config address ipv4 10.106.212.248`
	`Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config host-id trap-config`
	`Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config inf-retries 255`
	`Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config inform_mode enable`
	`Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config set-trap enable`
	`Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config timeout-inform 2147`
	`Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config udp-port-no 162`
	`Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config version v2c`
		• **enable—**Enables the trap.
		• **disable—**Disables the trap.
		• **version—**Specifies SNMP host version.
		• **v1—**Specifies SNMP version v1.
		• **v2c—**Specifies SNMP version v2c.
		• **v3—**Specifies SNMP version v3.
		• **udp-port-no—**Specifies the host port number.
		• *udp-port-no*—Host port number.
		• **address—**Specifies the IP address.
		• **ipv4—**Specifies IPv4 address.
		• *ipv4-address*— IPv4 address.
		• **ipv6—**Specifies IPv6 address.
		• *ipv6-address*—IPv6 address.
		• **inform-mode—**Specifies inform mode.
		• **enable—**Enables inform mode.
		• **disable—**Disables inform mode.
		• **inf-retries—**Specifies inform retries.
		• *retry-instances*—Inform retry number.
		• **timeout-inform—**Specifies timeout inform.
		• *timeout-inform-value*—Timeout inform value.

Step 3	**setSnmpHost review** **Example:** `Switch(ProvisionSnmpConf)# setSnmpHost review`	Displays the configuration.
Step 4	**setSnmpHost commit** **Example:** `Switch(ProvisionSnmpConf)# setSnmpHost commit`	Sends the configuration to NID.
Step 5	**getSnmpHost getSnmpHostRequest** **Example:** `Switch(ProvisionSnmpConf)# getSnmpHost getSnmpHostRequest`	Retrieves SNMP host configuration information.

	Command or Action	Purpose
Step 6	**getSnmpHost review** **Example:** `Switch(ProvisionSnmpConf)# getSnmpHost review`	Displays the configuration.
Step 7	**getSnmpHost commit** **Example:** `Switch(ProvisionSnmpConf)# getSnmpHost commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(ProvisionSnmpConf)# exit`	Exits the ProvisionSnmpConf mode.

Configuration Example

The example shows how to configure and retrieve trap destination:

```
Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config address ipv4 10.106.212.248
Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config host-id trap-config
Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config inf-retries 255
Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config inform-mode enable
Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config set-trap enable
Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config timeout-inform 2147
Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config udp-port-no 162
Switch(ProvisionSnmpConf)# setSnmpHost snmp-host-config version v2c
Switch(ProvisionSnmpConf)# setSnmpHost review
Switch(ProvisionSnmpConf)# setSnmpHost commit

Switch(ProvisionSnmpConf)# getSnmpHost getSnmpHostRequest
Switch(ProvisionSnmpConf)# getSnmpHost review
Switch(ProvisionSnmpConf)# getSnmpHost commit
Switch(ProvisionSnmpConf)# exit
```

Configuring an Entry in SNMP View List

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionSnmpConf** **Example:** `Switch# ProvisionSnmpConf`	Enters the ProvisionSnmpConf mode.
Step 2	**setSnmpView setSnmpViewRequest** {**view-name** | **view-old** *oid-value* |**view-type** {**included** | **excluded**}} **Example:** `Switch(ProvisionSnmpConf)# setSnmpView setSnmpViewRequest  view_type  included`	Configures SNMP view. • **view-nameview_name**—Specifies view name. • **view-oid**—Specifies object identifier. • *oid-value*—Object identifier value.

	Command or Action	Purpose
	`Switch(ProvisionSnmpConf)# setSnmpView setSnmpViewRequest view-oid .1.3.6.1.2.1.31` `Switch(ProvisionSnmpConf)# setSnmpView setSnmpViewRequest view-name ifMIB`	• **view-type—**Specifies view type. • **included—**Includes view type. • **excluded—**Excludes view type.
Step 3	**setSnmpView review** **Example:** `Switch(ProvisionSnmpConf)# setSnmpView review`	Displays the configuration.
Step 4	**setSnmpView commit** **Example:** `Switch(ProvisionSnmpConf)# setSnmpView commit`	Sends the configuration to NID.
Step 5	**getSnmpView getSnmpViewRequest** **Example:** `Switch(ProvisionSnmpConf)# getSnmpView getSnmpViewRequest`	Retrieves SNMP default configuration status. • **getSnmpViewRequest—**Retrieves SNMP default configuration.
Step 6	**getSnmpView review** **Example:** `Switch(ProvisionSnmpConf)# getSnmpView review`	Displays the configuration.
Step 7	**getSnmpView commit** **Example:** `Switch(ProvisionSnmpConf)# getSnmpView commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(ProvisionSnmpConf)# exit`	Exits the ProvisionSnmpConf mode.

Configuration Example

The example shows how to configure and retrieve an entry in SNMP view list:

```
Switch(ProvisionSnmpConf)# setSnmpView  setSnmpViewRequest  view-type  included
Switch(ProvisionSnmpConf)# setSnmpView  setSnmpViewRequest  view-oid .1.3.6.1.2.1.31
Switch(ProvisionSnmpConf)# setSnmpView  setSnmpViewRequest  view-name ifMIB
Switch(ProvisionSnmpConf)# setSnmpView  review
Switch(ProvisionSnmpConf)# setSnmpView  commit

Switch(ProvisionSnmpConf)# getSnmpView  getSnmpViewRequest
Switch(ProvisionSnmpConf)# getSnmpView  review
Switch(ProvisionSnmpConf)# getSnmpView  commit
Switch(ProvisionSnmpConf)# exit
```

The following is a sample output on the NID.

```
Switch(ProvisionSnmpConf)#
Switch(ProvisionSnmpConf)#getSnmpView  getSnmpViewRequest
```

```
Switch(ProvisionSnmpConf)#getSnmpView  review
Commands in queue:
getSnmpView getSnmpViewRequest
Switch(ProvisionSnmpConf)#getSnmpView  commit
GetSnmpView-Output.getSnmpViewResponse[0].view-name = 'ifMIB'
GetSnmpView-Output.getSnmpViewResponse[0].view-oid = '.1.3.6.1.2.1.31'
GetSnmpView-Output.getSnmpViewResponse[0].view-type = 'included'
GetSnmpView-Output.getSnmpViewResponse[1].view-name = 'default_view'
GetSnmpView-Output.getSnmpViewResponse[1].view-oid = '.1'
GetSnmpView-Output.getSnmpViewResponse[1].view-type = 'included'
```

Creating an SNMPv3 User

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionSnmpConf** **Example:** `Switch# ProvisionSnmpConf`	Enters the ProvisionSnmpConf mode.

Step 2	**setSnmpUserConf setSnmpUsersRequest** {**user-name** *user-name* | **user-engine-id** *user-engine-id* | **protocolauth** {**md5** | **sha**} | **protocol-passwd** *protocol-passwd* | **priviledgeauth** {**aes** | **des**} | **priv_passwd***priv-passwd* }
	
	Example:
	`Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest  priv-passwd 12345678`
	`Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest priviledgeauth aes`
	`Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest protocol-passwd 12345678`
	`Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest protocolauth  md5`
	`Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest user-engine-id 800007e5017f000001`
	`Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest user-name user1`
		Configures an SNMP user.
		• **user-name—**Specifies user name.
		• *user-name*—User name.
		• **user-engine-id—**Specifies user engine ID.
		• *user-engine-id*—User engine ID.
		• **protocolauth—**Specifies authentication protocol.
		• **md5—**Specifies MD5 authentication protocol.
		• **sha—**Specifies SHA authentication protocol.
		• **protocol-passwd—**Specifies protocol password.
		• *protocol-passwd*—Protocol password.
		• **priviledgeauth—**Specifies privilege authentication type.
		• **aes—**Specifies AES authentication.
		• **des—**Specifies DES authentication.
		• **priv-passwd—**Specifies privacy password.
		• *priv-passwd*—Privacy password.

Step 3	**setSnmpUserConf review** **Example:** `Switch(ProvisionSnmpConf)# setSnmpUserConf review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**setSnmpUserConf commit** **Example:** `Switch(ProvisionSnmpConf)# setSnmpUserConf commit`	Sends the configuration to NID.
Step 5	**getSnmpUserConf getSnmpUserConfRequest** **Example:** `Switch(ProvisionSnmpConf)#  getSnmpUserConf getSnmpUserConfRequest`	Retrieves SNMP user configuration.
Step 6	**getSnmpUserConf review** **Example:** `Switch(ProvisionSnmpConf)# getSnmpUserConf review`	Displays the configuration.
Step 7	**getSnmpUserConf commit** **Example:** `Switch(ProvisionSnmpConf)# getSnmpUserConf commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(ProvisionSnmpConf)# exit`	Exits the ProvisionSnmpConf mode.

Configuration Example

The example shows how to create and retrieve an SNMPv3 user:

```
Switch(ProvisionSnmpConf)# setSnmpUserConf  setSnmpUsersRequest  priv-passwd 12345678
Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest priviledgeauth aes
Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest protocol-passwd 12345678
Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest protocolauth  md5
Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest user-engine-id
800007e5017f000001
Switch(ProvisionSnmpConf)# setSnmpUserConf setSnmpUsersRequest user-name user1
Switch(ProvisionSnmpConf)# setSnmpUserConf review
Switch(ProvisionSnmpConf)# setSnmpUserConf commit

Switch(ProvisionSnmpConf)# getSnmpUserConf getSnmpUserConfRequest
Switch(ProvisionSnmpConf)# getSnmpUserConf review
Switch(ProvisionSnmpConf)# getSnmpUserConf commit
Switch(ProvisionSnmpConf)# exit
```

The following is a sample output on the NID.

```
Switch(ProvisionSnmpConf)#$  getSnmpUserConfRequest
Switch(ProvisionSnmpConf)#getSnmpUserConf  review
Commands in queue:
getSnmpUserConf getSnmpUserConfRequest
Switch(ProvisionSnmpConf)#getSnmpUserConf  commit
GetSnmpUserConf-Output.getSnmpUserConfResponse[0].user-name = 'user1'
GetSnmpUserConf-Output.getSnmpUserConfResponse[0].engine-id =
'800007e5017f000001'
GetSnmpUserConf-Output.getSnmpUserConfResponse[0].protocol = 'MD5'
```

```
GetSnmpUserConf-Output.getSnmpUserConfResponse[0].priv = 'DES'
GetSnmpUserConf-Output.getSnmpUserConfResponse[1].user-name =
'default-user'
GetSnmpUserConf-Output.getSnmpUserConfResponse[1].engine-id =
'800007e5017f000001'
GetSnmpUserConf-Output.getSnmpUserConfResponse[1].protocol = 'None'
GetSnmpUserConf-Output.getSnmpUserConfResponse[1].priv = 'None'

GetSnmpUserConf Commit Success!!!
```

Creating an SNMP User

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionSnmpConf** **Example:** `Switch# ProvisionSnmpConf`	Enters the ProvisionSnmpConf mode.

Step 2	**setSnmpConfig snmp-config** {**location** *location-name* | **contact** *contact-name* | **engine-id***engine-id* }
	
	Example:
	`Switch(ProvisionSnmpConf)# setSnmpConfig  snmp-config engine-id 800007e5017f000001`
	`Switch(ProvisionSnmpConf)# setSnmpConfig  snmp-config contact user2`
	`Switch(ProvisionSnmpConf)# setSnmpConfig  snmp-config location Bangalore`
		Configures an SNMP user.
		• **location—**Specifies SNMP location.
		• *location-name*—SNMP location name.
		• **contact—**Specifies SNMP contact.
		• *contact-name*—SNMP contact name.
		• **engine-id—**Specifies engine ID.
		• *engine-id*—Engine ID.

Step 3	**setSnmpConfig review** **Example:** `Switch(ProvisionSnmpConf)# setSnmpConfig review`	Displays the configuration.
Step 4	**setSnmpConfig commit** **Example:** `Switch(ProvisionSnmpConf)# setSnmpConfig commit`	Sends the configuration to NID.
Step 5	**getSnmpConfig getSnmpConfigRequest** **Example:** `Switch(ProvisionSnmpConf)# getSnmpConfig getSnmpConfigRequest`	Retrieves SNMP user configuration.
Step 6	**getSnmpConfig review** **Example:** `Switch(ProvisionSnmpConf)# getSnmpConfig review`	Displays the configuration.

	Command or Action	Purpose
Step 7	**getSnmpConfig commit** **Example:** `Switch(ProvisionSnmpConf)# getSnmpConfig commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(ProvisionSnmpConf)# exit`	Exits the ProvisionSnmpConf mode.

Configuration Example

The example shows how to create and retrieve an SNMP user:

```
Switch(ProvisionSnmpConf)# setSnmpUserConf  setSnmpUsersRequest  priv-passwd 12345678
Switch(ProvisionSnmpConf)# setSnmpConfig  snmp-config  engine-id 800007e5017f000001
Switch(ProvisionSnmpConf)# setSnmpConfig  snmp-config  contact user2
Switch(ProvisionSnmpConf)# setSnmpConfig  snmp-config  location Bangalore
Switch(ProvisionSnmpConf)# setSnmpConfig  review
Switch(ProvisionSnmpConf)# setSnmpConfig  commit

Switch(ProvisionSnmpConf)# getSnmpConfig  getSnmpConfigRequest
Switch(ProvisionSnmpConf)# getSnmpConfig review
Switch(ProvisionSnmpConf)# getSnmpConfig commit
Switch(ProvisionSnmpConf)# exit
```

The following is a sample output on the NID.

```
Switch(ProvisionSnmpConf)#$getSnmpConfigRequest
Switch(ProvisionSnmpConf)# getSnmpConfig  commit
GetSnmpConfig-Output.getSnmpConfigResponse.location = 'Bangalore'
GetSnmpConfig-Output.getSnmpConfigResponse.contact = 'user2'
GetSnmpConfig-Output.getSnmpConfigResponse.engine-id = '800007e5017f000001'
```

CHAPTER 12

Configuring PTP

This document describes the Precision Time Protocol (PTP) feature and configuration steps to implement PTP.

Prerequisites for Configuring PTP

- NID must have an IP address.

Information About PTP

PTP, as defined in the IEEE 1588 standard, synchronizes with nanosecond accuracy the real-time clocks of the devices in a network. The clocks are organized into a master-member hierarchy. PTP identifies the switch port that is connected to a device with the most precise clock. This clock is referred to as the master clock. All the other devices on the network synchronize their clocks with the master and are referred to as members. Constantly exchanged timing messages ensure continued synchronization.

How to Provision PTP

Configuring Slave IPv4

To configure slave IPv4, unicast, one step on VLAN 7 with domain number 0, perform the following steps:

DETAILED STEPS

	Command or Action	Purpose
Step 1	**PTPPortType** **Example:** `Switch# PTPPortType`	Enters the PTPPortType mode.

Step 2	**setPTPclockInstance-v3 ptpClkConfig** {**clk-inst-domain** | **clk-slave** | **clock-enable** | **clock-instance** *clock-instance-number* |**dscp** | **mode** {**boundary** | **e2etransparent** | **master** | **p2ptransparent** | **slave**} | **two-step-flag** | **one-way** | **protocol** {**disable ethernet** | **unicast-ipv4** | **multicast-ipv4**} |**servo** | **slave-cfg** | **vlan** {**disable** | **vlan-id** *vlan-id-number*} | **pcp** {**disable** | **pcp-value**} | **enabled-ports** {**port1** | **port2** | **port3** | **port4** | **port5** | **port6**} | **filter** | **ho** | **identifier** | **localpriority** | **priority1** | **priority2**{ **profile** | **disable** | **g8265dot1** | **g8275dot1** | **ieee1588**} | **clock-domain** *clock-domain-number*}
	
	Example:
	`Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config clock-instance 1`
	`Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config clock-domain 0`
	`Switch(PTPPortType)# setPTPclockInstance_v3 ptp-clock-config clock-enable enable`
	`Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config mode slave`
	`Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config one-way disable`
	`Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock_config protocol unicast-ipv4`
	`Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config two-step-flag disable`
	`Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config vlan vlan-id 7`
		Configures slave IPV4, unicast, one step on VLAN 7 with domain number 0.
		• **clk-inst-domain—**HW based or SW based Clock domain.
		• **clk-slave—**Set PTP slave clock options.
		• **clock-enable—**Enables or disables clock.
		• **clock-instance—** Specifies PTP clock instance.
		• *clock-instance-number*— Clock instance number.
		• **dscp—** Dscp value.
		• **mode—**Specifies clock mode.
		• **boundary—**Specifies ordinary boundary clock.
		• **e2etransparent—** Specifies end to end transparent clock.
		• **master—**Specifies master only clock.
		• **p2ptransparent—**Specifies peer to peer transparent clock.
		• **slave—** Specifies slave only clock.
		• **two-step_flag—**Specifies two step flag.
		• **one-way—**Specifies one way.
		• **protocol—** Specifies the protocol.
		• **servo—** Set servo parameters.
		• **slave-cfg—** Specifies Unicast Slave configuration Entry.
		• **disable—**Disables protocol.
		• **ethernet—**Specifies EPS Ethernet protocol.
		• **unicast-ipv4—**Specifies unicast protocol.
		• **multicast-ipv4—** Specifies multicast protocol.
		• **vlan—**Specifies the VLAN ID.
		• **disable—**Disables VLAN tag.
		• **vlan-id—** Specifies the VLAN tag.
		• *vlan-id-number*— VLAN tag number.

	Command or Action	Purpose
		• **pcp—**Specifies VLAN PCP. • **disable—**Disables VLAN PCP. • **pcp-value—**Specifies the PCP value. • **enabled-ports—**Specifies UNI ports. • **port1—** Specifies physical port 1. • **port2—**Specifies physical port 2. • **port3—**Specifies physical port 3. • **port4—** Specifies physical port 4. • **port5—**Specifies physical port 5. • **port6—**Specifies physical port 6. • **filter—**Specifies filter parameters. • **ho—** Set PTP Servo holdover parameters. • **identifier—** Defines PTP clock instance identifier. • **localpriority—** Set Local priority for the port. • **priority1—**Specifies clock priority 1 for PTP BMC algorithm, 0 is highest priority. • **priority2—**Specifies clock priority 2 for PTP BMC algorithm. • **profile—** Specifies Clock's associated profile. • **clock_domain—**Specifies PTP domain. • *clock-domain-number***—**PTP domain number.
Step 3	**setPTPclockInstance-v3 review** **Example:** `Switch(PTPPortType)# setPTPclockInstance-v3 review`	Displays the configuration.
Step 4	**setPTPclockInstance-v3 commit** **Example:** `Switch(PTPPortType)# setPTPclockInstance-v3 commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(PTPPortType)# exit`	Exits PTPPortType mode.

Configuration Example

The example shows how to configure slave IPv4, unicast, one step on VLAN 7 with domain number 0:

```
Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config clock-instance 1
Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config clock-domain 0
Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config clock_enable enable
Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config mode slave
Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config one-way disable
Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config protocol unicast-ipv4
Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config two-step-flag disable
Switch(PTPPortType)# setPTPclockInstance-v3 ptp-clock-config vlan vlan-id 7

Switch(PTPPortType)# setPTPclockInstance-v3 review
Switch(PTPPortType)# setPTPclockInstance-v3 commit
Switch(PTPPortType)# exit
```

Enabling PTP on a Port

To enable PTP on port 1/4 with PTP instance 1, perform the following steps:

DETAILED STEPS

	Command or Action	Purpose
Step 1	**PTPPortType** **Example:** `Switch# PTPPortType`	Enters the PTPPortType mode.

Step 2	**setPTPportProperties ptp-port-conf** {**ptp-run** | **clock-inst** *clock-inst-number* | **port-id** *port-id-number* | **announce-interval** {**disable** | **value**} | **announce-timeout** {**disable** | **value**} | **delay-asymmetry** {**disable** | **value**} | **delay-mechanism** {**disable** | **e2e** | **p2p**} | **delay-req** {**disable** | **interval** *interval-value* } | **egress-latency** {**disable** | **value**} | **ingress-latency** {**disable** | **value**} | **internal** | **sync-interval** {**disable** | **value** *value*}}
	
	Example:
	`Switch(PTPPortType)# setPTPportProperties ptp-port-conf port-id 4`
	`Switch(PTPPortType)# setPTPportProperties ptp-port-conf clock-inst 1`
	`Switch(PTPPortType)# setPTPportProperties ptp-port-conf sync-interval value -4`
	`Switch(PTPPortType)# setPTPportProperties ptp-port-conf delay-req interval -6`
	`Switch(PTPPortType)# setPTPportProperties ptp-port-conf ptp-run enable`
		Enables PTP on port 1/4, instance: 1.
		• **ptp-run—**Enables PTP on the specified port.
		• **clock-inst—** Specifies the PTP clock number.
		• *clock-inst-number*— PTP clock number.
		• **port-id—**Specifies the physical port number.
		• *port-id-number*—Physical port number.
		• **announce-interval—**Specifies the time interval for sending announce messages.
		• **disable—** Disables announce interval.
		• **value—**Specifies announce interval value.
		• **announce-timeout—**Sets announce timeout.
		• **disable—** Disables announce timeout.
		• **value—**Specifies announce timeout value.
		• **delay-asymmetry—**Sets path delay asymmetry.
		• **disable—** Disables delay asymmetry.
		• **value—**Specifies delay asymmetry in nano seconds.

	Command or Action	Purpose
		• **delay-mechanism—**Sets delay mechanism. • **disable—** Disables delay mechanism. • **e2e—**Specifies end to end delay mechanism. • **p2p—**Specifies peer to peer delay mechanism. • **delay-req—**Sets delay request interval. • **disable—** Disables delay request mechanism. • **interval—**Specifies peer to peer delay mechanism. • *interval-value*—Peer to peer delay value. • **egress-latency—**Sets port egress latency. • **disable—** Disables delay asymmetry. • **value—** Specifies egress latency in nano seconds. • **ingress-latency—**Sets port ingress latency. • **disable—** Disables delay asymmetry. • **value—** Specifies ingress latency in nano seconds. • **internal—** Enables as an internal interface. • **sync-interval—**Sets sync interval. • **disable—** Disables sync interval. • **value—** Specifies sync interval value. • *value*—Sync interval value.
Step 3	**setPTPportProperties review** **Example:** `Switch(PTPPortType)# setPTPportProperties review`	Displays the configuration.
Step 4	**setPTPportProperties commit** **Example:** `Switch(PTPPortType)# setPTPportProperties commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(PTPPortType)# exit`	Exits to the PTPPortType mode.

Configuration Example

The following example shows how to enable PTP on a port.

```
Switch(PTPPortType)# setPTPportProperties ptp-port-conf port-id 4
Switch(PTPPortType)# setPTPportProperties ptp-port-conf clock-inst 1
Switch(PTPPortType)# setPTPportProperties ptp-port-conf sync-interval value -4
Switch(PTPPortType)# setPTPportProperties ptp-port-conf delay-req interval -6
Switch(PTPPortType)# setPTPportProperties ptp-port-conf ptp-run enable

Switch(PTPPortType)# setPTPportProperties review
Switch(PTPPortType)# setPTPportProperties commit
Switch(PTPPortType)# exit
```

Note For G.8275.1 profile, there are a few additional parameters that have been added under **setPTPportProperties-v2**. In addition to the available parameters for **setPTPportProperties**, the following are the new parameters available:

- *localpriority* - Sets Local priority for the port.
- *mcast-dest* - Sets multicast destination address type for the port for G.8275.1 profile.
- *not-slave* - Sets not-slave attribute for the port for G8275.1 BMC algorithm.

Configuration Example

The following example shows how to enable PTP on a port using **setPTPportProperties-v2**.

```
Switch(PTPPortType)# setPTPportProperties-v2 ptp-port-config ptp-run enable
Switch(PTPPortType)# setPTPportProperties-v2 ptp-port-config clock-inst 1
Switch(PTPPortType)# setPTPportProperties-v2 ptp-port-config port-id 2
Switch(PTPPortType)# setPTPportProperties-v2 ptp-port-config localpriority value 12
Switch(PTPPortType)# setPTPportProperties-v2 ptp-port-config not-slave enable
Switch(PTPPortType)# setPTPportProperties-v2 ptp-port-config mcast-dest default
Switch(PTPPortType)# setPTPportProperties-v2 ptp-port-config sync-interval value -4
Switch(PTPPortType)# setPTPportProperties-v2 ptp-port-config delay-req interval -6

Switch(PTPPortType)# setPTPportProperties-v2 review

Commands in queue:
        setPTPportProperties-v2 ptp-port-config ptp-run enable
        setPTPportProperties-v2 ptp-port-config clock-inst 1
        setPTPportProperties-v2 ptp-port-config port-id 2
        setPTPportProperties-v2 ptp-port-config localpriority value 12
        setPTPportProperties-v2 ptp-port-config not-slave enable
        setPTPportProperties-v2 ptp-port-config mcast-dest default
        setPTPportProperties-v2 ptp-port-config sync-interval value -4
        setPTPportProperties-v2 ptp-port-config delay-req interval -6

Switch(PTPPortType)# setPTPportProperties-v2 commit
Switch(PTPPortType)# exit
```

Enabling or Disabling Microsemi APR

To enable or disable Microsemi APR, perform the following steps:

DETAILED STEPS

	Command or Action	Purpose
Step 1	**PTPPortType** **Example:** `Switch# PTPPortType`	Enters the PTPPortType mode.

Step 2	**setPTPexternalProperties ptp-external-conf** {**clock-output-freq** | **one-pps-output** | **one-pps-input** | **vcxo-freq-control** | **algorithm** {**enable** | **one-hertz** | **min-phase**}}
	
	Example:
	`Switch(PTPPortType)# setPTPexternalProperties ptp-external-conf algorithm enable enable`
	`Switch(PTPPortType)# setPTPexternalProperties ptp-external-conf algorithm one-hertz enable`
		Enables Microsemi APR.
		• **clock-output-freq—**Specifies external clock output frequency in Hz.
		• **one-pps-output—** Enables 1 PPS output.
		• **one-pps-input—** Enables 1 PPS input.
		• **vcxo-freq-control—**Specifies APR settings.
		• **enable—**Enables or disables the APR.
		• **one-hertz—** Enables or disables 1 Hz.
		• **min-phase—**Specifies phase correction begin threshold.

Step 3	**setPTPexternalProperties ptp-external-conf** {**clock-output-freq** | **one-pps-output** | **one-pps-input** | **vcxo-freq-control** | **algorithm** {**enable** | **one-hertz** | **min-phase**}} **Example:** `Switch(PTPPortType)# setPTPexternalProperties ptp-external-conf algorithm enable disable`	Disables Microsemi APR and returns to default VTSS APR. • **clock-output-freq—**Specifies external clock output frequency in Hz. • **one-pps-output—** Enables 1 PPS output. • **one-pps-input—** Enables 1 PPS input. • **vcxo-freq-control—**Specifies APR settings. • **enable—**Enables or disables the APR. • **one-hertz—** Enables or disables 1 Hz. • **min-phase—**Specifies phase correction begin threshold.
Step 4	**setPTPexternalProperties review** **Example:** `Switch(PTPPortType)# setPTPexternalProperties review`	Displays the configuration.
Step 5	**setPTPclockInstance commit** **Example:** `Switch(PTPPortType)# setPTPexternalProperties commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 6	**exit** **Example:** `Switch(PTPPortType)# exit`	Exits the PTPPortType mode.

Configuration Example

The following example shows how to enable Microsemi APR.

```
Switch(PTPPortType)# setPTPexternalProperties ptp-external-conf algorithm enable enable
Switch(PTPPortType)# setPTPexternalProperties ptp-external-conf algorithm one-hertz enable

Switch(PTPPortType)# setPTPexternalProperties review
Switch(PTPPortType)# setPTPexternalProperties commit
Switch(PTPPortType)# exit
```

The following example shows how to disable Microsemi APR and return to default VTSS APR.

```
Switch(PTPPortType)# setPTPexternalProperties ptp-external-conf algorithm enable disable

Switch(PTPPortType)# setPTPexternalProperties review
Switch(PTPPortType)# setPTPexternalProperties commit
Switch(PTPPortType)# exit
```

Note For G.8275.1 profile, there are a few additional parameters that have been added under **setPTPexternalProperties-v2**. In addition to the available parameters for **setPTPexternalProperties**, the following are the new parameters available:

- *ho-spec* - Holdover specification for G.8275 PTP clocks.
- *adjustment-method* - Adjustment method.

Configuration Example

The following example shows how to set holdover specification and adjustment method for G.8275.1 profile.

```
Switch(PTPPortType)# setPTPexternalProperties-v2 ptp-external-config ho-spec enable enable
Switch(PTPPortType)# setPTPexternalProperties-v2 ptp-external-config ho-spec cat1-value 11
Switch(PTPPortType)# setPTPexternalProperties-v2 ptp-external-config ho-spec cat2-value 12
Switch(PTPPortType)# setPTPexternalProperties-v2 ptp-external-config ho-spec cat3-value 13
Switch(PTPPortType)# setPTPexternalProperties-v2 ptp-external-config one-pps-mode
one-pps-input enable
Switch(PTPPortType)# setPTPexternalProperties-v2 ptp-external-config adjustment-method
ltc-phase enable

Switch(PTPPortType)# setPTPexternalProperties-v2 review

Commands in queue:
        setPTPexternalProperties-v2 ptp-external-config ho-spec enable enable
        setPTPexternalProperties-v2 ptp-external-config ho-spec cat1-value 11
        setPTPexternalProperties-v2 ptp-external-config ho-spec cat2-value 12
        setPTPexternalProperties-v2 ptp-external-config ho-spec cat3-value 13
        setPTPexternalProperties-v2 ptp-external-config one-pps-mode one-pps-input enable
        setPTPexternalProperties-v2 ptp-external-config adjustment-method ltc-phase enable

Switch(PTPPortType)# setPTPexternalProperties-v2 commit
Switch(PTPPortType)# exit
```

Verifying PTP

Use the following commands to verify the PTP status on the Cisco ME 1200 NID:

```
Switch(PTPPortType)# showPTPall ptp-show-req 1
Switch(PTPPortType)# showPTPall commit
```

This command displays the PTP configuration status on the NID.

Note To view the values of the parameters that have been added as part of G.8275.1 profile, use the **showPTPall-v2** command.

The following is a sample output from the **showPTPall** command:

```
ShowPTPall_Output.ptp_show_response[0].local_current_time.ptp_time =
'local time not implemented for clk_inst = 1 '
ShowPTPall_Output.ptp_show_response[0].local_current_time.clock_adjustment_method.t
 = 4
ShowPTPall_Output.ptp_show_response[0].local_current_time.clock_adjustment_method.u.software
 = ''
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.clock_id =
1
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.mode.t = 5
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.mode.u.slave
 = ''
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.two_step_flag
 = false
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.ports = '255'
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.clock_identity
 = '4348018d07000075'
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.clock_quality
 = 'Cl:255 Ac:128 Va:00004'
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.properties.priority1
 = 0
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.properties.priority2
 = 0
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.properties.clock_domain
 = 127
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.protocol.t
= 1
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.protocol.u.ethernet
 = ''
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.one_way =
true
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.vlan.t = 1
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.vlan.u.disable
 = ''
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.pcp.t = 1
ShowPTPall_Output.ptp_show_response[0].clock_default_dataset.pcp.u.disable
 = ''
ShowPTPall_Output.ptp_show_response[0].time_property.UTC_offset.t = 2
ShowPTPall_Output.ptp_show_response[0].time_property.UTC_offset.u.value
= 34
ShowPTPall_Output.ptp_show_response[0].time_property.frequency_traceable
 = true
```

```
ShowPTPall_Output.ptp_show_response[0].time_property.leap59 = true
ShowPTPall_Output.ptp_show_response[0].time_property.leap61 = true
ShowPTPall_Output.ptp_show_response[0].time_property.timing_traceable =
true
ShowPTPall_Output.ptp_show_response[0].time_property.ptp_timescale = true
ShowPTPall_Output.ptp_show_response[0].time_property.ptp_timesource = 0
ShowPTPall_Output.ptp_show_response[0].clock_parent_dataset =
'ParentPortIdentity port Pstat Var ChangeRate d0c282fffe17dfbf 1 0
65170-8207664

GrandmasterIdentity GrandmasterClockQuality Pri1 Pri2fe17dfbf68fe70cd
Cl:128 Ac:128 Va:33914 92 145
'
ShowPTPall_Output.ptp_show_response[0].clock_current_dataset.stpRm = 1
ShowPTPall_Output.ptp_show_response[0].clock_current_dataset.offset_from_master
 = ' 0.000.000.003'
ShowPTPall_Output.ptp_show_response[0].clock_current_dataset.mean_path_delay
 = ' 0.000.000.067'
ShowPTPall_Output.ptp_show_response[0].clock_current_dataset.slave_port
= 4
ShowPTPall_Output.ptp_show_response[0].clock_current_dataset.slave_state.t
 = 4
ShowPTPall_Output.ptp_show_response[0].clock_current_dataset.slave_state.u.LOCKED
 = ''
ShowPTPall_Output.ptp_show_response[0].clock_current_dataset.holdover =
'TRUE -368.3
'
ShowPTPall_Output.ptp_show_response[0].slave_cfg[0].index_ = 0
ShowPTPall_Output.ptp_show_response[0].slave_cfg[0].duration = 100
ShowPTPall_Output.ptp_show_response[0].slave_cfg[0].peer_ip_addr =
'7.7.7.7'
ShowPTPall_Output.ptp_show_response[0].slave_cfg[1].index_ = 1
ShowPTPall_Output.ptp_show_response[0].slave_cfg[1].duration = 100
ShowPTPall_Output.ptp_show_response[0].slave_cfg[1].peer_ip_addr =
'0.0.0.0'
ShowPTPall_Output.ptp_show_response[0].slave_cfg[2].index_ = 2
ShowPTPall_Output.ptp_show_response[0].slave_cfg[2].duration = 100
ShowPTPall_Output.ptp_show_response[0].slave_cfg[2].peer_ip_addr =
'0.0.0.0'
ShowPTPall_Output.ptp_show_response[0].slave_cfg[3].index_ = 3
ShowPTPall_Output.ptp_show_response[0].slave_cfg[3].duration = 100
ShowPTPall_Output.ptp_show_response[0].slave_cfg[3].peer_ip_addr =
'0.0.0.0'
ShowPTPall_Output.ptp_show_response[0].slave_cfg4.index_ = 4
ShowPTPall_Output.ptp_show_response[0].slave_cfg4.duration = 100
ShowPTPall_Output.ptp_show_response[0].slave_cfg4.peer_ip_addr = '0.0.0.0'

ShowPTPall Commit Success!!!
```

Additional References

Related Documents

Related Topic	Document Title
Cisco ME 3800x and ME 3600x Switches Software Configuration Guide, Cisco IOS Release 15.4(1)S	http://www.cisco.com/c/en/us/td/docs/switches/metro/me3600x_3800x/software/release/15-4_1_S/configuration/guide/3800x3600xscg.html

MIBs

MIB	MIBs Link
MIBs Supporting Cisco IOS	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

CHAPTER 13

Configuring ACLs

This chapter describes how to configure network security on the Cisco ME 1200 NID using access control lists (ACLs), which are also referred as access lists. Information in this chapter about ACLs is specific to IP Version 4 (IPv4).

For more information on ACLs, see Configuring Network Security with ACLs.

Prerequisites for Configuring ACLs

- NID must have an IP address.

Restrictions for Configuring ACLs

- Logging of the packet frames are not supported.
- Modifying ACL parameter that is applied on Cisco ME 1200 NID is not supported. To modify, remove the parameter using the **removeAclConfig** and **removeAclFromPort** commands, and apply it to a port afresh.
- A maximum of 512 ACL entries can be programmed.
- ACLs can be configured with policy IDs ranging from 0 to 63.

Tip To add more number of ACLs when the maximum entries are achieved, remove unwanted ACLs to configure more ACLs.

Note The rules defined in the Controller, can be configured in Cisco ME 1200 NID .

How to Configure ACLs

Configuring ACL Rules on the NID

DETAILED STEPS

	Command or Action	Purpose

Step 1	**mac access-list** {**extended** *WORD*}
	
	Example:
	`Switch# mac access-list extended nid-acl-50000`
		Configures the extended ACL rules.
		• **access-list—**Specifies the named access-list.
		  ◦ **extended—**Specifies that the access-list is of the type **extended**.
		    ◦ *WORD*—access-list name.

Step 2	**deny** {**H.H.H** |**any** |**host** *H.H.H*} {**H.H.H** |**any** |**host** *H.H.H*} OR **permit** {**H.H.H** | **any** |**host** *H.H.H* } {**H.H.H** |**any** |**host** *H.H.H* }
	
	Example:
	`Switch(ext-macl)# deny host 0000.0000.0001 host 5555.6666.7777`
	
	`Switch(ext-macl)# permit host 4444.aaaa.cccc host 4444.cccc.aaaa`
		Configures the ACL rule.
		• **deny—**Specifies the packets to be reject.
		  ◦ **icmp—**Internet Control Message Protocol.
		  ◦ **ip—**Any Internet Protocol.
		  ◦ **tcp—**Transmission Control Protocol.
		  ◦ **udp—**User Datagram Protocol.
		• **permit—**Specifies the packets to be forward.
		  ◦ **icmp—**Internet Control Message Protocol.
		  ◦ **ip—**Any Internet Protocol.
		  ◦ **tcp—**Transmission Control Protocol.
		  ◦ **udp—**User Datagram Protocol.
		• **H.H.H—**Specifies the 48-bit source or destination MAC address.
		• **any—**Specifies any source or destination MAC address.
		• **host—**Specifies a single source or destination host.
		  ◦ *H.H.H*—48-bit source or destination MAC address.

	Command or Action	Purpose
Step 3	**exit** **Example:** `Switch(ext-macl)# exit`	Exits the ext-macl mode.

Configuration Example

Note The following two configuration examples use IOS ACL commands.

```
Example 1: MAC
Switch# mac access-list extended nid_acl_50000
Switch(ext-macl)# deny host 0000.0000.0001 host 5555.6666.7777
Switch)# mac access-list extended nid_acl_1002
Switch(ext-macl)# permit host 4444.aaaa.cccc host 4444.cccc.aaaa
Switch(ext-macl)# permit any any etype-6000
Switch(ext-macl)# exit

Example 2: IP

Switch# ip access-list extended nid_acl_1001
Switch(ext-nacl)# deny ip host 15.15.1.2  host 15.15.1.3
Switch(ext-nacl)# deny tcp host 10.10.1.5 eq 101 host 10.10.1.6 eq 100
Switch(ext-macl)# exit
```

Creating ACL Global Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionACL** **Example:** `Switch# ProvisionACL`	Enters the ProvisionACL mode.
Step 2	**createAclConfigcreateAclConfigRequest** {**acl_name** *WORD*} **Example:** `Switch(ProvisionACL)# createAclConfig createAclConfigRequest acl-name nid-acl-50000`	Configures the ACL global configuration. • **acl-name—**Specifies the extended ACL. ◦ *WORD*—ACL name.
Step 3	**createAclConfig review** **Example:** `Switch(ProvisionACL)# createAclConfig review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**createAclConfig commit** **Example:** `Switch(ProvisionACL)# createAclConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionACL)# exit`	Exits from the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# createAclConfig createAclConfigRequest acl-name acl-nid-50000
Switch(ProvisionACL)# createAclConfig review

Commands in queue:
   createAclConfig createAclConfigRequest acl-name acl-nid-50000

Switch(ProvisionACL)# createAclConfig commit

   CreateAclConfig Commit Success!!!

Switch(ProvisionACL)# exit
```

Applying ACL Configuration to the Ports

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionACL** **Example:** `Switch# ProvisionACL`	Enters the ProvisionACL mode.

Step 2	**applyAclToPortapplyAclToPortRequest** {**acl-name** *WORD* | **port-number** *Port-Number*}
	
	Example:
	`Switch(ProvisionACL)# applyAclToPort applyAclToPortRequest acl-name nid-acl-50000`
	
	`Switch(ProvisionACL)# applyAclToPort applyAclToPortRequest port-number 3`
		Applies the ACL global configuration.
		• **acl-name—**specifies the extended ACL.
		  ◦ *WORD*—ACL name.
		• **port-number—**Specifies the port number.
		  ◦ *Port-Number*—port number. The range is from 1 to 6.

	Command or Action	Purpose
Step 3	**applyAclToPort review** **Example:** `Switch(ProvisionACL)# applyAclToPort review`	Displays the configuration.
Step 4	**applyAclToPort commit** **Example:** `Switch(ProvisionACL)# applyAclToPort commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionACL)# exit`	Exits the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# applyAclToPort applyAclToPortRequest acl-name nid-acl-50000
Switch(ProvisionACL)# applyAclToPort applyAclToPortRequest port-number 3
Switch(ProvisionACL)# applyAclToPort review

Commands in queue:
    applyAclToPort applyAclToPortRequest acl-name nid-acl-50000
    applyAclToPort applyAclToPortRequest port-number 3

Switch(ProvisionACL)# applyAclToPort commit

    ApplyAclToPort  Commit Success!!!

Switch(ProvisionACL)# exit
```

For applying the policy ID using EVC configuration, see Configuring ECE Sample Rule 1 and Other Commands For EVC Configuration

Viewing ACL Global Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionACL** **Example:** `Switch# ProvisionACL`	Enters the ProvisionACL mode.
Step 2	**getAclConfiggetAclConfigRequest** {**acl-name** *WORD*} **Example:** `Switch(ProvisionACL)# getAclConfig getAclConfigRequest acl-name nid-acl-50000`	Displays the ACL global configuration. • **acl_name**—Specifies the extended ACL . ◦ *WORD*—ACL name.

	Command or Action	Purpose
Step 3	**getAclConfig review** **Example:** `Switch(ProvisionACL)# getAclConfig review`	Displays the configuration.
Step 4	**getAclConfig commit** **Example:** `Switch(ProvisionACL)# getAclConfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionACL)# exit`	Exits the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# getAclConfig getAclConfigRequest acl-name nid-acl-50000
Switch(ProvisionACL)# getAclConfig review

Commands in queue:
    getAclConfig getAclConfigRequest acl-name nid-acl-50000

Switch(ProvisionACL)# getAclConfig commit
    GetAclConfig-Output.getAclConfigResponse.acl-definition = '
   Extended MAC access list nid-acl-50000
      permit host 0000.0000.0001 host 5555.5556.5557
      permit any any etype-6000'

    GetAclConfig Commit Success!!!

Switch(ProvisionACL)# exit

Example 2: IP

Switch# ProvisionACL
Switch(ProvisionACL)# getAclConfig getAclConfigRequest acl-name nid-acl-50000
Switch(ProvisionACL)# getAclConfig review

Commands in queue:
     getAclConfig getAclConfigRequest acl-name nid-acl-50000

Switch(ProvisionACL)# getAclConfig commit
     GetAclConfig-Output.getAclConfigResponse.acl-definition = '
    Extended IP access list nid-acl-1001
       ip access-list extended nid-acl-1001
       deny ip host 15.15.1.2 host 15.15.1.3'

     GetAclConfig Commit Success!!!

Switch(ProvisionACL)# exit
```

Removing ACL Global Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionACL** **Example:** `Switch# ProvisionACL`	Enters the ProvisionACL mode.
Step 2	**removeAclconfigremoveAclConfigRequest** {**acl-name** *WORD*} **Example:** `Switch(ProvisionACL)# removeAclconfig removeAclConfigRequest acl-name nid-acl-50000`	Removes the ACL global configuration. • **acl-name—**Specifies the extended ACL . ◦ *WORD*—ACL name.
Step 3	**removeAclconfig review** **Example:** `Switch(ProvisionACL)# removeAclconfig review`	Displays the configuration.
Step 4	**removeAclconfig commit** **Example:** `Switch(ProvisionACL)# removeAclconfig commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionACL)# exit`	Exits from the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# removeAclconfig removeAclConfigRequest acl-name nid-acl-50000
Switch(ProvisionACL)# removeAclconfig review

Commands in queue:
   removeAclconfig removeAclConfigRequest acl-name nid-acl-50000

Switch(ProvisionACL)# removeAclconfig commit
   RemoveAclConfig Commit Success!!!


To verify the remove action:

Switch(ProvisionACL)# getAclConfig getAclConfigRequest acl-name nid-acl-50000
Switch(ProvisionACL)# getAclConfig commit

   GetAclConfig-Output.getAclConfigResponse.acl-definition = '
   nid-acl-50000 does not exist '

   GetAclConfig Commit Success!!!

Switch(ProvisionACL)# exit
```

What to Do Next

Use the **getAclConfig getAclConfigRequest** command to verify the remove action.

```
Switch(ProvisionACL)# getAclConfig getAclConfigRequest acl_name acl_name
Switch(ProvisionACL)# getAclConfig review
Switch(ProvisionACL)# getAclConfig commit
```

Removing ACL Port Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionACL** **Example:** `Switch# ProvisionACL`	Enters the ProvisionACL mode.
Step 2	**removeAclFromPort removeAclFromPortRequest** {**acl-name** *WORD* | **port-number** *port-Number*} **Example:** `Switch(ProvisionACL)# removeAclFromPort removeAclFromPortRequest port-number 3`	Removes the ACL port configuration. • **acl-name—**Specifies the extended ACL. ◦ *WORD*—ACL name. • **port-number—**Specifies the port number. ◦ *Port-Number*—Port number. The range is from 1to 6.
Step 3	**removeAclFromPort review** **Example:** `Switch(ProvisionACL)# removeAclFromPort review`	Displays the configuration.
Step 4	**removeAclFromPort commit** **Example:** `Switch(ProvisionACL)# removeAclFromPort commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionACL)# exit`	Exits from the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# removeAclFromPort removeAclFromPortRequest port-number 3
Switch(ProvisionACL)# removeAclFromPort review

Commands in queue:
   removeAclFromPort removeAclFromPortRequest port-number 3
```

```
Switch(ProvisionACL)# removeAclFromPort commit
   RemoveAclFromPort Commit Success!!!

Switch(ProvisionACL)# exit
```

What to Do Next

Use the **showAclConfigSummary** command to view the interface ACL summary.

```
Switch(ProvisionACL)# showAclConfigSummary showAclConfigSummaryRequest
Switch(ProvisionACL)# showAclConfigSummary review
Switch(ProvisionACL)# showAclConfigSummary commit
```

Verifying ACL Configurations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionACL** **Example:** `Switch# ProvisionACL`	Enters the ProvisionACL mode.
Step 2	**showAclConfigSummaryshowAclConfigSummaryRequest** **Example:** `Switch(ProvisionACL)# showAclConfigSummary showAclConfigSummaryRequest`	Displays the ACL configuration summary.
Step 3	**showAclConfigSummary review** **Example:** `Switch(ProvisionACL)# showAclConfigSummary review`	Displays the configuration.
Step 4	**showAclConfigSummary commit** **Example:** `Switch(ProvisionACL)# showAclConfigSummary commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionACL)# exit`	Exits the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# showAclConfigSummary showAclConfigSummaryRequest
Switch(ProvisionACL)# showAclConfigSummary review

Commands in queue:
   showAclConfigSummary showAclConfigSummaryRequest

Switch(ProvisionACL)# showAclConfigSummary commit
```

```
   ShowAclConfigSummary-Output.showAclConfigSummaryResponse.showOutput = '
   Acl Configuration Summary
    policyid:  0 aclname: nid-acl-50000

   Interface Acl Summary
    Port 3: nid-acl-50000'

   ShowAclConfigSummary Commit Success!!!

Switch(ProvisionACL)# exit
```

CHAPTER 14

Configuring Quality of Service (QoS)

QoS includes traffic classification, marking, policing, queuing, and scheduling configured with service policies that are attached to ingress and egress targets. With QoS, you can provide preferential treatment to certain types of traffic at the expense of other types. When you do not configure QoS, the switch offers best-effort service to each packet, regardless of the packet contents or size.

Ingress QoS includes classification, marking, and policing. Classification can be based on the class of service (CoS), Differentiated Services Code Point (DSCP) in the inbound packet. You can classify based on Layer 2 MAC, IP-standard, or match based on AMAC, IP parameters using QCE configurations.

For EVC level QoS, see Creating a Policer, on page 86.

Hierarchical QoS on the Cisco ME 1200 Series Carrier Ethernet Access Devices supports queuing and scheduling per EVC level per port. 8 queues are supported per port on the EVC. The EVC must be configured on the interface before configuring HQoS.

Note Single EVC per single UNI (input port) is supported.

The port scheduler is configured by default for fair round-robin scheduling between each EVC and non-service traffic, but can be weighted by configuring guaranteed bandwidths for the EVC. When guaranteed bandwidth is configured for an EVC, the remaining bandwidth of the port is divided equally between the remaining EVCs and non-service traffic.

Note Configuring of guaranteed bandwidth for non-service traffic is *not* supported.

The CIR bandwidth requirements are configured for each CoS per EVC. Excess traffic is strictly *not* prioritized, but is shared proportionally between the CoS within the EVC.

For more information, see Configuring Quality of Service (QoS).

How to Configure QoS

Provisioning the ME 1200 NID to Configure QoS

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionQos** **Example:** `Switch# ProvisionQos`	Enters QoS provisioning mode.

Step 2	**ProvisionQos** {**default** | **deleteQCE** | **exit** | **getInputGlobalPolicy** | **getInputGlobalPolicy** | **getOutputGlobalPolicy** | **getOutputPortPolicy** | **getQCE** | **getSystemQosSettings** | **no** | **reorderQCEentries** | **setInputGlobalPolicy** | **setInputPortPolicy** | **setOutputGlobalPolicy** | **setOutputPortPolicy** | **setQCE** | **setSystemQosSettings** | **showQCElist** | **showQueueStatistics**}
	
	Example:
	`Switch(ProvisionQos)# ?`
	`ProvisionQos sub-mode commands:`
	`  default                Set a command to its defaults`
	`  deleteQCE              Delete a particular QCE`
	`  exit                   Exit from ProvisionQos sub configuration mode`
	`  getInputGlobalPolicy   Show Output QoS global features configured`
	`  getInputPortPolicy     Show Input Policy configured on Physical Port`
	`  getOutputGlobalPolicy  Show Global Output QoS features`
	`  getOutputPortPolicy    Show Output Policy configured on Physical Port`
	`  getQCE                 getQCE (default)`
	`  getSystemQosSettings   getSystemQosSettings (default)`
	`  no                     Negate a command or set its defaults`
	`  reorderQCEentries      reorderQCEentries (default)`
	`  setInputGlobalPolicy   configure Global Input QoS features`
	`  setInputPortPolicy     configure Input policy on Physical Port`
	`  setOutputGlobalPolicy  configure Global Output QoS features`
	`  setOutputPortPolicy    configure Output policy on Physical Port`
	`  setQCE                 setQCE (default)`
	`  setSystemQosSettings   set System-wide QoS settings`
	`  showQCElist            showQCElist (default)`
	`  showQueueStatistics    Display egress queue statistics`
		Displays the supported configurations for QoS.

Step 3	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The following example shows the supported QoS configuration:

```
Switch(ProvisionQos)# ?
ProvisionQos sub-mode commands:
```

```
default                   Set a command to its defaults
deleteQCE                 Delete a particular QCE
exit                      Exit from ProvisionQos sub configuration mode
getInputGlobalPolicy      Show Output QoS global features configured
getInputPortPolicy        Show Input Policy configured on Physical Port
getOutputGlobalPolicy     Show Global Output QoS features
getOutputPortPolicy       Show Output Policy configured on Physical Port
getQCE                    getQCE (default)
getSystemQosSettings      getSystemQosSettings (default)
no                        Negate a command or set its defaults
reorderQCEentries         reorderQCEentries (default)
setInputGlobalPolicy      configure Global Input QoS features
setInputPortPolicy        configure Input policy on Physical Port
setOutputGlobalPolicy     configure Global Output QoS features
setOutputPortPolicy       configure Output policy on Physical Port
setQCE                    setQCE (default)
setSystemQosSettings      set System-wide QoS settings
showQCElist               showQCElist (default)
showQueueStatistics       Display egress queue statistics
```

Configuring QoS Input Policy Features Globally on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setInputGlobalPolicy** {**commit** | **flush** | **inputGlobalPolicyConfig** | **review**}
	
	Example:
	
	`Switch(ProvisionQos)#` **`setInputGlobalPolicy ?`**
	`  commit                  commit setInputGlobalPolicy`
	`  flush                   flush all setInputGlobalPolicy commands from queue`
	`  inputGlobalPolicyConfig  configure Global Input QoS features`
	`  review                  review setInputGlobalPolicy commands`
		Sets the global input QoS policy.
		
		• **commit—**Sends the QoS configuration to NID.
		• **flush—**Flushes all QoS configuration from the queue.
		• **inputGlobalPolicyConfig—**Sets the input policy global configuration on the NID.
		• **review—**Displays the configuration on the NID.

Step 2	**setInputGlobalPolicy inputGlobalPolicyConfig** {**match-DSCP value_xx** {**mark-DSCP** *dscp-value* | **mark-egress-class** *egress-queue*} | **service-policy** {**attach** | **detach**}}
	
	Example:
	
	`Switch(ProvisionQos)#` **`setInputGlobalPolicy inputGlobalPolicyConfig match-DSCP`**
		Configures input global policy.
		
		• **match-DSCP—**Matches a particular DSCP value .
		• **value-xx—**Sets DSCP values on the ME 1200 NID. Use the following values:
		    • **value_00** DSCP 0. Default PHB for best effort traffic
		    value-01 DSCP 1
		    value-02 DSCP 2

	Command or Action	Purpose
	value-00 mark-DSCP 4 Switch(ProvisionQos)# **setInputGlobalPolicy inputGlobalPolicyConfig match-DSCP value-00 mark-egress-class 4** Switch(ProvisionQos)# **setInputGlobalPolicy inputGlobalPolicyConfig service-policy attach**	**value-03** DSCP 3 **value-04** DSCP 4 **value-05** DSCP 5 **value-06** DSCP 6 **value-07** DSCP 7 **value-08** CS1. Class Selector PHB precedence 1(DSCP 8) **value-09** DSCP 9 **value-10** AF11. Assured Forwarding PHB (DSCP 10) **value-11** DSCP 11 **value-12** AF12. Assured Forwarding PHB (DSCP 12) **value-13** DSCP 13 **value-14** AF13. Assured Forwarding PHB (DSCP 14) **value-15** DSCP 15 **value-16** CS2. Class Selector PHB precedence 1(DSCP 16) **value-16** CS2. Class Selector PHB precedence 1(DSCP 16) **value-17** DSCP 17 **value-18** AF21. Assured Forwarding PHB (DSCP 18) **value-19** DSCP 19 **value-20** AF22. Assured Forwarding PHB (DSCP 20) **value-21** DSCP 21 **value-22** AF23. Assured Forwarding PHB (DSCP 22) **value-23** DSCP 23 **value-24** CS3. Class Selector PHB precedence 1(DSCP 24) **value-25** DSCP 25 **value-26** AF31. Assured Forwarding PHB (DSCP 26) **value-27** DSCP 27 **value-28** AF32. Assured Forwarding PHB (DSCP 28) **value-29** DSCP 29 **value-30** AF33. Assured Forwarding PHB (DSCP 30) **value-31** DSCP 31 **value-32** CS4. Class Selector PHB precedence 1(DSCP 32) **value-33**DSCP 33 **value-34** AF41. Assured Forwarding PHB (DSCP 34) **value-35** DSCP 35

	Command or Action	Purpose
		value-36 AF42. Assured Forwarding PHB (DSCP 36) **value-37** DSCP 37 **value-38** AF43. Assured Forwarding PHB (DSCP 38) **value-39** DSCP 39 **value-40** CS5. Class Selector PHB precedence 1(DSCP 40) **value-41** DSCP 41 **value-42** DSCP 42 **value-43** DSCP 43 **value-44** VA. Voice Admit PHB(DSCP 44) **value-45** DSCP 45 **value-46** Expedited Forwarding PHB(DSCP 46) **value-47** DSCP 47 **value-48** CS6. Class Selector PHB precedence 1(DSCP 48) **value-49** DSCP 49 **value-50** DSCP 50 **value-51** DSCP 51 **value-52** DSCP 52 **value-53** DSCP 53 **value-54** DSCP 54 **value-55** DSCP 55 **value-56** CS7. Class Selector PHB precedence 1(DSCP 56) **value-57** DSCP 57 **value-58** DSCP 58 **value-59** DSCP 59 **value-60** DSCP 60 **value-61** DSCP 61 **value-62** DSCP 62 **value-63** DSCP 63 • **mark-DSCP—**Marks the DSCP on the ME 1200 NID. The valid range is from 0 to 63. 64 is invalid. • **mark-egress-class—**Assigns to egress queue. The valid range is from 0 to 7. 8 is invalid. • **service_policy—**Attaches or detaches the service policy. ◦ **attach—**Attaches the service policy and enables the configuration.

	Command or Action	Purpose
		◦ **detach—**Removes the service policy, removes all configuration and restore the default configuration.

Step 3	**setInputGlobalPolicy review**
	
	Example:
	`Switch(ProvisionQos)#`
	`setInputGlobalPolicy review`
	
	`Commands in queue:`
	`        setInputGlobalPolicy inputGlobalPolicyConfig match-DSCP value-02 mark-DSCP 4`
	`        setInputGlobalPolicy inputGlobalPolicyConfig match-DSCP value-02 mark-egress-class 4`
	`        setInputGlobalPolicy inputGlobalPolicyConfig service-policy attach`
		Displays the QoS configuration on the NID.

Step 4	**setInputGlobalPolicy commit** **Example:** `Switch(ProvisionQos)#` **`setInputGlobalPolicy commit`**	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)#` **`exit`**	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QoS input policy globally on the NID:

```
Switch(ProvisionQos)# setInputGlobalPolicy inputGlobalPolicyConfig match-DSCP value-00
mark-DSCP 4
Switch(ProvisionQos)# setInputGlobalPolicy inputGlobalPolicyConfig match-DSCP value-00
mark-egress-class 4
Switch(ProvisionQos)# setInputGlobalPolicy inputGlobalPolicyConfig service-policy attach
Switch(ProvisionQos)# setInputGlobalPolicy review
Commands in queue:
        setInputGlobalPolicy inputGlobalPolicyConfig match-DSCP value-02 mark-DSCP 4
        setInputGlobalPolicy inputGlobalPolicyConfig match-DSCP value-02 mark-egress-class
 4
        setInputGlobalPolicy inputGlobalPolicyConfig service-policy attach

Switch(ProvisionQos)# setInputGlobalPolicy commit
SetInputGlobalPolicy Commit Success!!!
Switch(ProvisionQos)# exit
```

Configuring QoS Input Policy Features at Port level on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

<table>
<tr><th></th><th>Command or Action</th><th>Purpose</th></tr>
<tr><td>Step 1</td><td>setInputPortPolicy {commit | flush | inputPortPolicyConfig | review}

Example:
<pre>Switch(ProvisionQos)# setInputPortPolicy ?
  commit   commit setInputPortPolicy
  flush   flush all setInputPortPolicy
 commands from queue
  inputPortPolicyConfig configure Input policy on
Physical Port
  review   review setInputPortPolicy
commands</pre></td><td>Sets the input QoS policy at port level.
commit—Sends the QoS configuration to NID.
flush—Flushes all QoS configuration from the queue.
inputPortPolicyConfig—Sets the input policy configuration at port level on the NID.
review—Displays the configuration on the NID.</td></tr>
<tr><td>Step 2</td><td>inputPortPolicyConfig {egress-class-marking {enable | disable} | globalDscpBasedDscpIngressMarking {enable | disable} | globalDscpBasedEgressClassMarking {enable | disable} | match cos value-xx mark-egress-class egress-queue | port-numberport-number | port-policer {cir kbps | state {enable | disable}} | qce {address {destination | source} | key {double-tag | ip-address | mac-ip-addr | normal}} | service-policy {attach | detach}}

Example:
<pre>Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig egress-class-marking enable
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig
globalDscpBasedDscpIngressMarking enable
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig
globalDscpBasedEgressClassMarking enable
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig match cos value_0
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig port-number 1
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig port-policer cir 1000
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig port-policer state enable
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig qce address destination
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig qce key double-tag
Switch(ProvisionQos)# setInputPortPolicy
inputPortPolicyConfig service-policy attach</pre></td><td>Configures input policy at port.
egress-class-marking—Enables egress class marking as configured per each cos matched packet.
globalDscpBasedDscpIngressMarking—Enables DSCP based DSCP ingress marking on the port as per the configured global policy.
globalDscpBasedEgressClassMarking—Enable DSCP based Egress Class marking on the port as per the configured global policy.
enable—Enables the marking.
disable—Disables the marking.
match—Matches input packet COS.
cos—Sets the COS value.
value-0—Sets the COS value 0.
value-1—Sets the COS value 1.
value-2—Sets the COS value 2.
value-3—Sets the COS value 3.
value-4—Sets the COS value 4.
value-5—Sets the COS value 5.</td></tr>
</table>

	Command or Action	Purpose
		◦ **value-6**—Sets the COS value 6. ◦ **value-7**—Sets the COS value 7. • **mark-egress-class** *egress-queue*—Sets the egress queue value. The valid range is from 0 to 7. Queue 8 in invalid. • **port-number** *port-number*—Sets the port number. The valid range is from 1 to 6. Port 7 is invalid. • **port-policer**—Sets port level policer. • **cir** *kbps*—Sets committed information rate in kbps. The valid range is from 100 to 1000000. • **state**—Enables or disables the policer state. • **qce**—Sets TCAM based QoS control entry settings for the port. • **address**—Matches the source or destination address of incoming packet in QCE. • **destination**—Matches against destination address. • **source**—Matches against source address. • **key**—Matches the key template in QCE. The default is normal. ◦ **double-tag**—Matches against Match outer tag, inner tag, IP protocol, DSCP and DPORT. ◦ **ip-address**—Matches against Match outer tag, SMAC/DMAC, IP protocol, DSCP, SIP and DIP. ◦ **mac-ip-addr**—Match outer tag, inner tag, SMAC, DMAC, IP protocol, DSCP, SIP,DIP, SPORT and DPORT. ◦ **normal**—Match outer tag, SMAC/DMAC, IP protocol, DSCP, SIP/DIP, SPORT and DPORT (default). • **service_policy**—Attaches or detaches the service policy on the port. • **attach**—Attaches the service policy and enables the configuration. • **detach**—Removes the service policy, removes the configuration and restores the default configuration.

	Command or Action	Purpose

Step 3	**setInputPortPolicy review**
	
	Example:
	`Switch(ProvisionQos)# setInputPortPolicy review`
	
	`Commands in queue:`
	`Commands in queue:`
	`setInputPortPolicy inputPortPolicyConfig egress-class-marking enable`
	`setInputPortPolicy inputPortPolicyConfig globalDscpBasedDscpIngressMarking enable`
	`setInputPortPolicy inputPortPolicyConfig globalDscpBasedEgressClassMarking enable`
	`setInputPortPolicy inputPortPolicyConfig match cos value-0 mark-egress-class 5`
	`setInputPortPolicy inputPortPolicyConfig match cos value-0 mark-egress-class 5`
	`setInputPortPolicy inputPortPolicyConfig port-policer state enable`
	`setInputPortPolicy inputPortPolicyConfig port-number 1`
	`setInputPortPolicy inputPortPolicyConfig port-policer cir 1000`
	`setInputPortPolicy inputPortPolicyConfig port-policer state enable`
	`setInputPortPolicy inputPortPolicyConfig qce address source`
	`setInputPortPolicy inputPortPolicyConfig qce key normal`
	`setInputPortPolicy inputPortPolicyConfig service-policy attach`
		Displays the QoS configuration on the NID.

Step 4	**setInputPortPolicycommit** **Example:** `Switch(ProvisionQos)# setInputPortPolicy commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QoS input port policy on the NID:

```
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig egress-class-marking enable
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig
globalDscpBasedDscpIngressMarking enable
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig
globalDscpBasedEgressClassMarking enable
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig match cos value_0
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig port-number 1
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig port-policer cir 1000
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig port-policer state enable
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig qce address destination
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig qce key double-tag
Switch(ProvisionQos)# setInputPortPolicy inputPortPolicyConfig service-policy attach
Switch(ProvisionQos)# setInputPortPolicy review
```

```
Commands in queue:
        Commands in queue:
        setInputPortPolicy inputPortPolicyConfig egress-class-marking enable
        setInputPortPolicy inputPortPolicyConfig globalDscpBasedDscpIngressMarking enable
        setInputPortPolicy inputPortPolicyConfig globalDscpBasedEgressClassMarking enable
        setInputPortPolicy inputPortPolicyConfig match cos value-0 mark-egress-class 5
        setInputPortPolicy inputPortPolicyConfig match cos value-0 mark-egress-class 5
        setInputPortPolicy inputPortPolicyConfig port-policer state enable
        setInputPortPolicy inputPortPolicyConfig port-number 1
        setInputPortPolicy inputPortPolicyConfig port-policer cir 1000
        setInputPortPolicy inputPortPolicyConfig port-policer state enable
        setInputPortPolicy inputPortPolicyConfig qce address source
        setInputPortPolicy inputPortPolicyConfig qce key normal
        setInputPortPolicy inputPortPolicyConfig service-policy attach
Switch(ProvisionQos)# setInputPortPolicy commit
SetInputPortPolicy Commit Success!!!
Switch(ProvisionQos)# exit
```

Configuring QoS Output Policy Features Globally on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setOutputGlobalPolicy** {**commit** | **flush** | **outputGlobalPolicyConfig** | **review**}
	
	Example:
	`Switch(ProvisionQos)#` **`setOutputGlobalPolicy ?`**
	`  commit                  commit setOutputGlobalPolicy`
	`  flush                   flush all setOutputGlobalPolicy commands from queue`
	`  outputGlobalPolicyConfig  configure Global Output QoS features`
	`  review                  review setOutputGlobalPolicy commands`
		Sets the global output QoS policy.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **outputGlobalPolicyConfig**—Sets the output policy global configuration on the NID.
		• **review**—Displays the configuration on the NID.

Step 2	**setOutputGlobalPolicy outputGlobalPolicyConfig** {**match-DSCP value-xx** {**mark-DSCP** *dscp-value*} | **service-policy** {**attach** | **detach**}}
	
	Example:
	`Switch(ProvisionQos)#` **`setOutputGlobalPolicy outputGlobalPolicyConfig match-DSCP value-01 mark-DSCP 1`**
	`Switch(ProvisionQos)#` **`setOutputGlobalPolicy`**
		Configures output global policy.
		• **match-DSCP**—Matches a particular DSCP value .
		• **value-xx**—Sets DSCP values on the NID. Use the following values:
		  • **value-00** DSCP 0. Default PHB for best effort traffic
		  value-01 DSCP 1
		  value-02 DSCP 2
		  value-03 DSCP 3
		  value-04 DSCP 4

	Command or Action	Purpose
	`outputGlobalPolicyConfig service-policy attach`	**value-05** DSCP 5 **value-06** DSCP 6 **value-07** DSCP 7 **value-08** CS1. Class Selector PHB precedence 1(DSCP 8) **value-09** DSCP 9 **value-10** AF11. Assured Forwarding PHB (DSCP 10) **value-11** DSCP 11 **value-12** AF12. Assured Forwarding PHB (DSCP 12) **value-13** DSCP 13 **value-14** AF13. Assured Forwarding PHB (DSCP 14) **value-15** DSCP 15 **value-16** CS2. Class Selector PHB precedence 1(DSCP 16) **value-16** CS2. Class Selector PHB precedence 1(DSCP 16) **value-17** DSCP 17 **value-18** AF21. Assured Forwarding PHB (DSCP 18) **value-19** DSCP 19 **value-20** AF22. Assured Forwarding PHB (DSCP 20) **value-21** DSCP 21 **value-22** AF23. Assured Forwarding PHB (DSCP 22) **value-23** DSCP 23 **value-24** CS3. Class Selector PHB precedence 1(DSCP 24) **value-25** DSCP 25 **value-26** AF31. Assured Forwarding PHB (DSCP 26) **value-27** DSCP 27 **value-28** AF32. Assured Forwarding PHB (DSCP 28) **value-29** DSCP 29 **value-30** AF33. Assured Forwarding PHB (DSCP 30) **value-31** DSCP 31 **value-32** CS4. Class Selector PHB precedence 1(DSCP 32) **value-33**DSCP 33 **value-34** AF41. Assured Forwarding PHB (DSCP 34) **value-35** DSCP 35 **value-36** AF42. Assured Forwarding PHB (DSCP 36) **value-37** DSCP 37

	Command or Action	Purpose
		value-38 AF43. Assured Forwarding PHB (DSCP 38) **value-39** DSCP 39 **value-40** CS5. Class Selector PHB precedence 1(DSCP 40) **value-41** DSCP 41 **value-42** DSCP 42 **value-43** DSCP 43 **value-44** VA. Voice Admit PHB(DSCP 44) **value-45** DSCP 45 **value-46** Expedited Forwarding PHB(DSCP 46) **value-47** DSCP 47 **value-48** CS6. Class Selector PHB precedence 1(DSCP 48) **value-49** DSCP 49 **value-50** DSCP 50 **value-51** DSCP 51 **value-52** DSCP 52 **value-53** DSCP 53 **value-54** DSCP 54 **value-55** DSCP 55 **value-56** CS7. Class Selector PHB precedence 1(DSCP 56) **value-57** DSCP 57 **value-58** DSCP 58 **value-59** DSCP 59 **value-60** DSCP 60 **value-61** DSCP 61 **value-62** DSCP 62 **value-63** DSCP 63 • **mark-DSCP—**Marks the DSCP on the NID. The valid range is from 0 to 63. 64 is invalid. • **service-policy—**Applies the service policy. • **attach—**Adds the service policy. • **detach—**Removes the service policy.

	Command or Action	Purpose

Step 3	**setOutputGlobalPolicy review**
	
	Example:
	`Switch(ProvisionQos)#`
	`setOutputGlobalPolicy review`
	
	`Commands in queue:`
	`        setOutputGlobalPolicy`
	`outputGlobalPolicyConfig match-DSCP`
	`value-01 mark-DSCP 1`
	`        setOutputGlobalPolicy`
	`outputGlobalPolicyConfig service-policy`
	` attach`
		Displays the QoS configuration on the NID.

Step 4	**setOutputGlobalPolicycommit** **Example:** `Switch(ProvisionQos)#` **`setOutputGlobalPolicy commit`**	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)#` **`exit`**	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QoS output policy globally on the NID:

```
Switch(ProvisionQos)# setOutputGlobalPolicy outputGlobalPolicyConfig match-DSCP value-00
mark-DSCP 4
Switch(ProvisionQos)# setOutputGlobalPolicy outputGlobalPolicyConfig service-policy attach
Switch(ProvisionQos)# setOutputGlobalPolicy review
Commands in queue:
        setOutputGlobalPolicy outputGlobalPolicyConfig match-DSCP value-01 mark-DSCP 1
        setOutputGlobalPolicy outputGlobalPolicyConfig service-policy attach

Switch(ProvisionQos)# setOutputGlobalPolicy commit
SetOutputGlobalPolicy Commit Success!!!
Switch(ProvisionQos)# exit
```

Configuring QoS Output Policy Features at Port level on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setOutputPortPolicy** {**commit** | **flush** | **outputPortPolicyConfig** | **review**}
	
	Example:
	
	`Switch(ProvisionQos)#` **`setOutputPortPolicy ?`**
	`  commit                 commit setOutputPortPolicy`
	`  flush                flush all setOutputPortPolicy`
	` commands from queue`
	`  outputPortPolicyConfig configure Output policy on`
	`Physical Port`
	`  review                 review setOutputPortPolicy`
	`commands`
		Sets the output QoS policy at port level.
		
		• **commit—**Sends the QoS configuration to NID.
		• **flush—**Flushes all QoS configuration from the queue.
		• **outputPortPolicyConfig—**Sets the output policy configuration at port level on the NID.
		• **review—**Displays the configuration on the NID.

Step 2	**outputPortPolicyConfig** {**cos-marking** {**enable** | **disable**} | **globalDscpBasedDscpEgressMarking** {**enable** | **disable**} | **matchegress-class-xx** {**bandwidth** {**priority-level** *pr-level* | **remaining-ratio** *ratio*} | **mark-cos** *mark-cos-vlaue* | **shaper** {**rate** *rate-value* | **state** {**enable** | **disable**}}} | **port-number***port-number* | **port-shape** {**rate** *rate-value* | **state** {**enable** | **disable**}} |**service-policy** {**attach** | **detach**}}
	
	Example:
	
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig cos-marking enable`
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig globalDscpBasedDscpEgressMarking`
	` enable`
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig match egress-class-0 bandwidth`
	` priority-level 8`
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig match egress-class-0 bandwidth`
	` remaining-ratio 20`
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig match egress-class-0 mark-cos`
	`7`
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig port-number 1`
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig port-shaper rate 1000`
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig port-shaper state enable`
	`Switch(ProvisionQos)#` **`setOutputPortPolicy`**
	`outputPortPolicyConfig service-policy attach`
		Configures output policy at port.
		
		• **cos-marking—**Enables egress class marking as configured per each cos matched packet.
		• **globalDscpBasedDscpEgressMarking—**Enables DSCP based DSCP egress marking on the port as per the configured global policy.
		• **enable—**Enables the marking.
		• **disable—**Disables the marking.
		• **match—**Matches output packet COS.
		  ◦ **all-egress-classes—**Sets the egress for all queues from 0 to 7.
		  ◦ **egress-class-0—**Sets queue 0, lowest priority.
		  ◦ **egress-class-1—**Sets queue 1.
		  ◦ **egress-class-2—**Sets queue 2.
		  ◦ **egress-class-3—**Sets queue 3.
		  ◦ **egress-class-4—**Sets queue 4.
		  ◦ **egress-class-5—**Sets queue 5, higher priority.
		  ◦ **egress-class-6—**Sets queue 6, highest priority.
		• **bandwith —**Sets scheduling scheme.
		• **priority-level** *pr-level***—**Configures priority scheduling. The valid range is from 1 to 8.
		• **remaining-ratio** *ratio***—**Configures weighted round robin mode of scheduling. The vallid range is from 1 to 100.
		• **shaper —**Configures queue level shaper.

	Command or Action	Purpose
		• **mark-cos** *cos-vallue*—Sets the COS value for marking The valid range is from 0 to 7. COS 8 in invalid. • **port-number** *port-number*—Sets the port number. The valid range is from 1 to 6. Port 7 is invalid. • **port-shaper**—Sets port level shaper. • **rate** *kbps*—Sets shaper rate in kbps. The valid range is from 100 to 1000000. • **state**—Enables or disables the port shaper state. • **service-policy**—Sets the service policy on the port. • **attach**—Adds the service policy. • **detach**—Removes the service policy.

Step 3	**setOutputPortPolicy review**
	
	Example:
	`Switch(ProvisionQos)# setOutputPortPolicy review`
	
	`Commands in queue:`
	`        setOutputPortPolicy outputPortPolicyConfig`
	`cos-marking enable`
	`        setOutputPortPolicy outputPortPolicyConfig`
	`globalDscpBasedDscpEgressMarking enable`
	`        setOutputPortPolicy outputPortPolicyConfig`
	`match egress-class-0 bandwidth priority-level 8`
	`        setOutputPortPolicy outputPortPolicyConfig`
	`match all-egress-classes mark-cos 7`
	`        setOutputPortPolicy outputPortPolicyConfig`
	`port-number 4`
	`        setOutputPortPolicy outputPortPolicyConfig`
	`port-shaper rate 100`
	`        setOutputPortPolicy outputPortPolicyConfig`
	`port-shaper state enable`
	`        setOutputPortPolicy outputPortPolicyConfig`
	`service-policy attach`
		Displays the QoS configuration on the NID.

Step 4	**setOutputPortPolicycommit** **Example:** `Switch(ProvisionQos)# setOutputPortPolicy commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QoS output port policy on the NID:

```
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig cos-marking enable
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig
globalDscpBasedDscpEgressMarking enable
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig match egress-class-0
bandwidth priority-level 8
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig match egress-class-0
bandwidth remaining-ratio 20
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig match egress-class-0
mark-cos 7
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig port-number 1
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig port-shaper rate 1000
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig port-shaper state enable
Switch(ProvisionQos)# setOutputPortPolicy outputPortPolicyConfig service-policy attach
Switch(ProvisionQos)# setOutputPortPolicy review
Commands in queue:
        setOutputPortPolicy outputPortPolicyConfig cos-marking enable
        setOutputPortPolicy outputPortPolicyConfig globalDscpBasedDscpEgressMarking enable
        setOutputPortPolicy outputPortPolicyConfig match egress-clas-0 bandwidth
priority-level 8
        setOutputPortPolicy outputPortPolicyConfig match all-egress-classes mark -cos 7
        setOutputPortPolicy outputPortPolicyConfig port-number 4
        setOutputPortPolicy outputPortPolicyConfig port-shaper rate 100
        setOutputPortPolicy outputPortPolicyConfig port-shaper state enable
        setOutputPortPolicy outputPortPolicyConfig service-policy attach
Switch(ProvisionQos)# setOutputPortPolicy commit
SetInputPortPolicy Commit Success!!!
Switch(ProvisionQos)# exit
```

Setting Default QoS Configuration on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**default ?**
	
	Example:
	`Switch(ProvisionQoS)# default ?`
	
	`deleteQCE               Delete a particular QCE`
	`exit                    Exit from ProvisionQos sub configuration mode`
	`getInputGlobalPolicy    Show Output QoS global features configured`
	`getInputPortPolicy      Show Input Policy configured on Physical Port`
	`getOutputGlobalPolicy   Show Global Output QoS features`
	`getOutputPortPolicy     Show Output Policy configured on Physical Port`
	`getQCE                  getQCE (default)`
	`getSystemQosSettings    getSystemQosSettings (default)`
	`reorderQCEentries       reorderQCEentries (default)`
	`setInputGlobalPolicy    configure Global Input QoS features`
	`setInputPortPolicy      configure Input policy on Physical Port`
	`setOutputGlobalPolicy   configure Global Output QoS features`
	`setOutputPortPolicy     configure Output policy on Physical Port`
		Sets the default QoS configuration.

	Command or Action	Purpose

	`setQCE                    setQCE (default)`
	`setSystemQosSettings      set System-wide QoS settings`
	`showQCElist               showQCElist (default)`
	`showQueueStatistics       Display egress queue statistics`	

Step 2	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuring QoS Control Entry (QCE) on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setQCE** {**commit** | **flush** | **QCE-configuration** | **review**}
	
	Example:
	`Switch(ProvisionQos)# setQCE ?`
	`  QCE-configuration   setQCE (default)`
	`  commit              commit setQCE`
	`  flush               flush all setQCE commands`
	`from queue`
	`  review              review setQCE commands`
		Sets QCE configuration.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **QCE-configuration**—Sets the default QCE on the NID.
		• **review**—Displays the configuration on the NID.

Step 2	**setQCE QCE-configuration** {**control** {**actions** | **ingress-match**} | **qce-id**}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-fields inner-cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-type vlan c-tagged`
	`Switch(ProvisionQos)# setQCE QCEconfiguration qce-id 4`
		Configures QCE.
		• **control**—Configures QCE.
		• **actions**—Configures QCE actions. See Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID, on page 230.
		• **ingress-match**—Configures ingress match. See Configuring QCE Match Ingress Parameters on the ME 1200 NID, on page 232.
		• **qce-id**—Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.

	Command or Action	Purpose
Step 3	**setQCE review** **Example:** `Switch(ProvisionQos)# setQCE review`	Displays the QoS configuration on the NID.
Step 4	**setQCE commit** **Example:** `Switch(ProvisionQos)# setQCE commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QoS QCE on the NID:

```
Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4
Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-fields
inner-cos val-0-1
Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-type vlan
 c-tagged
Switch(ProvisionQos)# setQCE review

Commands in queue:
        setQCE QCE-configuration control actions mark-COS 4
        setQCE QCE-configuration control actions mark-DSCP 3
        setQCE QCE-configuration control actions mark-egress-class 4
        setQCE QCE-configuration control ingress-match frame-type any
       setQCE QCE-configuration control ingress-match inner-tag-match match-fields inner-cos
 val-0-1

Switch(ProvisionQos)# setQCE commit
 SetQCE Commit Success!!!
Switch(ProvisionQos)# exit
```

Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setQCE QCE-configuration** {**control** {**actions** | **ingress-match**} | **qce-id**}	Configures QCE.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-fields inner-cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-type vlan c-tagged`
	`Switch(ProvisionQos)# setQCE QCEconfiguration qce-id 4`
		• **control**—Configures QCE.
		• **actions**—Configures QCE actions. See Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID, on page 230.
		• **ingress-match**—Configures ingress match. See Configuring QCE Match Ingress Parameters on the ME 1200 NID, on page 232.
		• **qce-id**—Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.

Step 2	**setQCE QCE-configurationcontrol** {**actions** {**mark-COS** *cos-vlaue* | **mark-DSCP** *dscp-vlaue* | **mark-egress-class** *egress-queue*}
	Example:
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4`
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-DSCP 3`
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-egress-class 4`
		• **control**—Configures QCE.
		• **actions**—Configures QCE actions.
		• **mark-COS** *cos-vlaue*—Marks the Cos packets. The valid range is from 0 to 7. Value 8 is invalid.
		• **mark-DSCP** *dscp-vlaue*—Marks the DSCP packets. The valid range is from 0 to 63. Value 64 is invalid.
		• **mark-egress-class** *egress-queue*—Marks the egress queue. The valid range is from 0 to 7. Value 8 is invalid.

Step 3	**setQCE review** **Example:** `Switch(ProvisionQos)# setQCE review`	Displays the QoS configuration on the NID.
Step 4	**setQCE commit** **Example:** `Switch(ProvisionQos)# setQCE commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QoS input policy globally on the NID:

```
Switch(ProvisionQos)# setQCE QCEConfig match-DSCP value-00 mark-DSCP 4
Switch(ProvisionQos)# setQCE QCEConfig match-DSCP value-00 mark-egress-class 4
Switch(ProvisionQos)# setQCE QCEConfig service-policy attach
Switch(ProvisionQos)# setQCE review
Commands in queue:
        setQCE QCE-configuration control actions mark-COS 4
        setQCE QCE-configuration control actions mark-DSCP 3
```

```
        setQCE QCE-configuration control actions mark-egress-class 4

Switch(ProvisionQos)# setQCE commit
Switch(ProvisionQos)# exit
```

Configuring QCE Match Ingress Parameters on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setQCE QCE-configuration** {**control** {**actions** | **ingress-match**} | **qce-id**} **Example:** `Switch(ProvisionQos)#` **`setQCE QCEconfiguration control action mark-Cos 4`** `Switch(ProvisionQos)#` **`setQCE QCEconfiguration ingress-match frame-type any match-fields inner-cos val-0-1`** `Switch(ProvisionQos)#` **`setQCE QCEconfiguration ingress-match frame-type any match-type vlan c-tagged`** `Switch(ProvisionQos)#` **`setQCE QCEconfiguration qce-id 4`**	Configures QCE. • **control**—Configures QCE. • **actions**—Configures QCE actions. See Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID, on page 230. • **ingress-match**—Configures ingress match. See Configuring QCE Match Ingress Parameters on the ME 1200 NID, on page 232. • **qce-id**—Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.
Step 2	**setQCE QCE-configuration control ingress-match** {**frame-type** | **inner-tag-match** | **mac-params outer-tag-match** | **ports**} **Example:** `Switch(ProvisionQos)#` **`setQCE QCE-configuration control ingress-match frame-type any match-fields inner-cos val-0-1 any`** `Switch(ProvisionQos)#` **`setQCE QCE-configuration control ingress-match inner-tag-match match-fields inner-cos val-0-3`** `Switch(ProvisionQos)#` **`setQCE QCE-configuration control ingress-match mac-params dmac-filter any`** `Switch(ProvisionQos)#` **`setQCE QCE-configuration control ingress-match outer-tag_match match-fields cos val-2-3`** `Switch(ProvisionQos)#` **`setQCE QCE-configuration control ingress-match ports gigabitEthernet-2 enable`**	• **ingress-match**—Configures ingress match. ◦ **frame-type**—Matches against frame payload. See Configuring QCE Control Ingress Match Frame Type Parameter on the ME 1200 NID, on page 233. ◦ **inner-tag-match**—Matches against inner tag. See Configuring QCE Control Ingress Inner Tag Match Parameter on the ME 1200 NID, on page 236. ◦ **mac-params**—Matches against MAC filters. See Configuring QCE Control Ingress MAC Params Parameter on the ME 1200 NID, on page 239. ◦ **outer-tag-match**—Matches against outer tag. See Configuring QCE Control Ingress Outer Tag Match Parameter on the ME 1200 NID, on page 240. ◦ **ports**—Matches against ports. See Configuring QCE Control Ingress Ports Parameter on the ME 1200 NID, on page 243.

	Command or Action	Purpose
Step 3	**setQCE review** **Example:** `Switch(ProvisionQos)# setQCE review`	Displays the QoS configuration on the NID.
Step 4	**setQCE commit** **Example:** `Switch(ProvisionQos)# setQCE commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QCE control ingress match parameters on the NID:

```
Switch(ProvisionQos)# setQCE QCE-configuration control ingress-match frame-type any
match-fields inner-cos val-0-1 any
Switch(ProvisionQos)# setQCE QCE-configuration control ingress-match inner-tag-match
match-fields inner-cos val-0-3
Switch(ProvisionQos)# setQCE QCE-configuration control ingress-match mac-params dmac-filter
 any
Switch(ProvisionQos)# setQCE QCE-configuration control ingress-match outer-tag-match
match-fields cos val-2-3
Switch(ProvisionQos)# setQCE QCE-configuration control ingress-match ports gigabitEthernet-2
 enable
Switch(ProvisionQos)# setQCE review
Commands in queue:
       setQCE QCE-configuration control ingress-match inner-tag-match match-fields inner-cos
 val-0-3
        setQCE QCE-configuration control ingress-match mac-params dmac-filter any
        setQCE QCE-configuration control ingress-match outer-tag-match match-fields cos
val-2-3
        setQCE QCE-configuration control ingress-match ports GigabitEthernet-2 enable

Switch(ProvisionQos)# setQCE commit
Switch(ProvisionQos)# exit
```

Configuring QCE Control Ingress Match Frame Type Parameter on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setQCE QCE-configuration** {**control** {**actions** | **ingress-match**} | **qce-id**}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-fields inner-cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-type vlan c-tagged`
	`Switch(ProvisionQos)# setQCE QCEconfiguration qce-id 4`
		Configures QCE.
		• **control**—Configures QCE.
		• **actions**—Configures QCE actions. See Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID, on page 230.
		• **ingress-match**—Configures ingress match. See Configuring QCE Match Ingress Parameters on the ME 1200 NID, on page 232.
		• **qce-id**—Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.

Step 2	**setQCE QCE-configuration control ingress-match frame-type** {**any** | **ipv4** {**dest-ip-filter** {**any** | **host** *host-name* | **network** {**dest-ip-addr** *dest-add* | **dest-ip-mask** *dest-mask*}} | **dscp-filter** {**any** | **range** *range-value* | **specific** *dscp-filter*} | **fragment-type** {**any** | **frag** | **non-frag**} | **protocol** {**any** | **specific** *protocol-value* | **tcp** | **udp**} | **source-ip-filter** {**any** | **host** *host-name* | **network** {**source-ip-addr source-ip-addr** *source-add* | **source-ip-mask** *source-mask*}} | **ipv6** {**dest-ip-filter** {**any** | **specific** {**dest-ip-addr-32bits** *dest-add* | **dest-ip-mask-32bits** *dest-mask*}} | **dscp-filter** {**any** | **range** *range-value* | **specific** *dscp-filter*} | **protocol** {**any** | **specific** *protocol-value* | **tcp** | **udp**} | **source-ip-filter** {**any** | **specific source-ip-addr-32bits** *source-add* | **source-ip-mask-32bits** *source-mask*}}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type any`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dest-ip-filter any`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dest-ip-filter host host1`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dest-ip-filter network dest-ip-addr addr2`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dscp-filter host any`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dscp-filter range 3-4`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 fragment-type frag`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 protocol specific 45`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 source-ip-filter network source-ip-mask soumask`
	`Switch(ProvisionQos)# setQCE QCE-configuration`
		• **control**—Configures QCE .
		• **ingress-match**—Configures ingress match.
		◦ **frame-type**—Matches against frame payload.
		◦ **any**—Matches against any frame payload .
		◦ **ipv4**—Matches against IPv4 frames.
		• **dest-ip-filter**—Matches against destination IP address filter .
		• **dscp-filter**—Matches against DSCP filter .
		• **fragment-type**—Matches against fragment type filter .
		• **protocol**—Matches against protocol filter .
		• **source-ip-filter**—Matches against source IP address filter .
		◦ **ipv6**—Matches against IPv6 frames .
		◦ **any**—Matches against any IP address, or filter.
		◦ **host** *host-name*—Matches against a specified host .
		◦ **network**—Matches against a network .
		◦ **dest-ip-addr** *dest-add*—Matches against the destination IP address .

	Command or Action	Purpose

	`ingress-match frame-type ipv6 dest-ip-filter any`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 dest-ip-filter specfic dest-ip-addr-32its dest34`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 dscp-filter specific 45 any`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 protocol specific 450`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 protocol specific 45`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 source-ip-filter specific source-ip-mask source-mask`
		◦ **dest-ip-mask** *dest-mask*—Matches against the destination IP address mask.
		◦ **range** *range-value*—Matches against the specified range .
		◦ **specific** *dscp-filter*—Matches against the specific DSCP filter .
		◦ **frag**—Matches against the specified IP fragment type .
		◦ **non-frag**—Matches against the non fragment type .
		◦ **specific** *protocol-value*—Matches against the specific protocol value .
		◦ **tcp**—Matches against the TCP value .
		◦ **udp**—Matches against the UDP value .
		◦ **source-ip-addr** *source-addr*—Matches against the source IP address .
		◦ **source-ip-mask** *source-mask*—Matches against the source IP address mask.
		◦ **dest-ip-addr-32bits** *dest-add*—Matches against the destination IP address.
		◦ **dest-ip-mask-32bits** *dest-mask*—Matches against the destination IP address mask.
		◦ **source-ip-addr-32bits** *source-add*—Matches against the source IP address.
		◦ **source-ip-mask-32bits** *source-mask*—Matches against the source IP address mask.

Step 3	**setQCE review** **Example:** `Switch(ProvisionQos)# setQCE review`	Displays the QoS configuration on the NID.
Step 4	**setQCE commit** **Example:** `Switch(ProvisionQos)# setQCE commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QCE Control Ingress Match frame type parameters on the NID:

```
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type any
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dest-ip-filter
 any
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dest-ip-filter
 host host1
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dest-ip-filter
 network dest-ip-addr addr2
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dscp-filter
host any
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 dscp-filter
range 3-4
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 fragment-type
 frag
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 protocol
specific 45
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv4 source-ip-filter
 network source-ip-mask soumask
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 dest-ip-filter
 any
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 dest-ip-filter
 specfic dest-ip-addr-32its dest34
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 dscp-filter
specific 45 any
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 protocol
specific 450
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 protocol
specific 45
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match frame-type ipv6 source-ip-filter
 specific source-ip-mask source-mask

Switch(ProvisionQos)# setQCE review
Commands in queue:
       setQCE QC-configuration control ingress-match inner-tag-match match-fields inner-cos
 val-0-3
        setQCE QCE-configuration control ingress-match outer-tag-match match-fields cos
val-2-3
        setQCE QCE-configuration control ingress-match frame-type ipv6 dest-ip-filter any
       setQCE QCE-configuration control ingress-match frame-type ipv6 dscp-filter specific
 45
       setQCE QCE-configuration control ingress-match frame-type ipv6 protocol pecific 450

        setQCE QCE-configuration control ingress-match frame-type ipv6 source-ip-filter
specific source-ip-mask-32bits source-mask

Switch(ProvisionQos)# setQCE commit
Switch(ProvisionQos)# exit
```

Configuring QCE Control Ingress Inner Tag Match Parameter on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setQCE QCE-configuration** {**control** {**actions** | **ingress-match**} | **qce-id**}
	
	Example:
	
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-fields inner-cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-type vlan c-tagged`
	`Switch(ProvisionQos)# setQCE QCEconfiguration qce-id 4`
		Configures QCE.
		• **control**—Configures QCE.
		• **actions**—Configures QCE actions. See Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID, on page 230.
		• **ingress-match**—Configures ingress match. See Configuring QCE Match Ingress Parameters on the ME 1200 NID, on page 232.
		• **qce-id**—Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.

Step 2	**setQCE QCE-configuration control ingress-match inner-tag-match** {**match-fields** {**inner-cos inner-cos-xx** | **vlan-id-filter** {**any** | **range** *vlan-range* | **specifc** *specific-vlan*}} | **match-type** {**any** | **c-tagged** | **s-tagged** | **tagged** | **untagged**}}
	
	Example:
	
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields inner-cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields vlan-id-filter any`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields vlan-id-filter range range1`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields vlan-id-filter specific 450`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-type c-tagged`
		• **control**—Configures QCE.
		• **ingress-match**—Configures ingress match.
		◦ **inner-tag-match**—Matches against inner tag value.
		◦ **match-fields**—Matches against tag fields .
		◦ **inner-cos inner-cos-xx**—Matches against inner packet Cos value.
		◦ **val-0-1**—Specifies packet COS 0-1.
		◦ **val-0-3**—Specifies packet COS 0-3.
		◦ **val-0-only**—Specifies packet COS 0.
		◦ **val-1-only**—Specifies packet COS 1.
		◦ **val-2-3**—Specifies packet COS 2-3.
		◦ **val-2-only**—Specifies packet COS 2-only.
		◦ **val-3-only**—Specifies packet COS 3-only.
		◦ **val-4-5**—Specifies packet COS 4-5.
		◦ **val-4-7**—Specifies packet COS 4-7.
		◦ **val-4-only**—Specifies packet COS 4-only.
		◦ **val-5-only**—Specifies packet COS 5-only.
		◦ **val-6-7**—Specifies packet COS 6-7.
		◦ **val-6-only**—Specifies packet COS 6.
		◦ **val-7-only**—Specifies packet COS 7.
		◦ **val-any**—Specifies packet COS any.

	Command or Action	Purpose
		◦ **vlan-id-filter—**Matches against VLAN ID filter. ◦ **any—**Matches against any VLAN. ◦ **range** *vlan-range***—**Matches against the specified VLAN range . ◦ **specific** *specific-vlan***—**Matches against the specific VLAN. The valid range is from 1 to 4095. ◦ **match-type—**Matches against tag fields. • **any—**Matches against any tagged . • **c-tagged—**Matches against C tagged . • **s-tagged—**Matches against S tagged . • **tagged—**Matches against tagged . • **untagged—**Matches against untagged .
Step 3	**setQCE review** **Example:** `Switch(ProvisionQos)# setQCE review`	Displays the QoS configuration on the NID.
Step 4	**setQCE commit** **Example:** `Switch(ProvisionQos)# setQCE commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QCE Control Match Ingress inner tag parameters on the NID:

```
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields
inner-cos val-0-1
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields
vlan-id-filter any
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields
vlan-id-filter range range1
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields
vlan-id-filter specific 450
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-type
c-tagged

Switch(ProvisionQos)# setQCE review
```

```
Commands in queue:
        setQCE QCE-configuration control ingress-match inner-tag-match match-fields inner-cos
 val-0-1
        setQCE QCE-configuration control ingress-match inner-tag-match match-fields
vlan-id-filter any
        setQCE QCE-configuration control ingress-match inner-tag-match match-fields
vlan-id-filter range range1
        setQCE QCE-configuration control ingress-match inner-tag-match match-fields
vlan-id-filter specific 450
        setQCE QCE-configuration control ingress-match inner-tag-match match-type c-tagged

Switch(ProvisionQos)# setQCE commit
Switch(ProvisionQos)# exit
```

Configuring QCE Control Ingress MAC Params Parameter on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setQCE QCE-configuration** {**control** {**actions** | **ingress-match**} | **qce-id**}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-fields inner_cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-type vlan c-tagged`
	`Switch(ProvisionQos)# setQCE QCEconfiguration qce-id 4`
		Configures QCE.
		• **control**—Configures QCE.
		• **actions**—Configures QCE actions. See Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID, on page 230.
		• **ingress_match**—Configures ingress match. See Configuring QCE Match Ingress Parameters on the ME 1200 NID, on page 232.
		• **qce-id**—Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.

Step 2	**setQCE QCE-configuration** {**control ingress-match mac-params** {**dmac-filter** {**any** | **broadcast** | **multicast** | **specific** *specific-fillter* | **unicast**} |**smac-filter** {**any** | **specific** *specific-filter*}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match mac-params dmac-filter any`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match mac-params dmac-filter broadcast`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match mac-params dmac-filter specific filter1`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match mac-params smac-filter any`
		• **control**—Configures QCE.
		• **ingress-match**—Configures ingress match.
		• **mac-params**—Configures MAC filters.
		• **dmac-filter**—Configures destination MAC filters.
		• **smac-filter**—Configures source MAC filters.
		• **any**—Configures any MAC filter.
		• **broadcast**—Configures any broadcast MAC filter.
		• **multicast**—Configures any multicast MAC filter.
		• **specific** *specific_filter*—Configures specific MAC filter.

	Command or Action	Purpose
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match mac-params smac-filter specific filter2`	
Step 3	**setQCE review** **Example:** `Switch(ProvisionQos)# setQCE review`	Displays the QoS configuration.
Step 4	**setQCE commit** **Example:** `Switch(ProvisionQos)# setQCE commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)#exit`	Exits the QoS mode.

Configuration Example

The example shows how to configure QCE Control Match Ingress MAC params parameters on the NID:

```
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields
inner-cos val-0-1
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields
vlan-id-filter any
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields
vlan-id-filter range range1
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-fields
vlan-id-filter specific 450
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match inner-tag-match match-type
c-tagged

Switch(ProvisionQos)# setQCE review
Commands in queue:
        setQCE QCE-configuration control ingress-match mac-params dmac-filter broadcast
        setQCE QCE-configuration control ingress-match mac-params smac-filter specific
source1
        setQCE QCE-configuration control ingress-match mac-params dmac-filter specific
filter1
        setQCE QCE-configuration control ingress-match mac-params smac-filter specific
filter2

Switch(ProvisionQos)# setQCE commit
Switch(ProvisionQos)# exit
```

Configuring QCE Control Ingress Outer Tag Match Parameter on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setQCE QCE-configuration** {**control** {**actions** | **ingress-match**} | **qce-id**}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-fields inner_cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-type vlan c-tagged`
	`Switch(ProvisionQos)# setQCE QCEconfiguration qce-id 4`
		Configures QCE.
		• **control**—Configures QCE.
		• **actions**—Configures QCE actions. See Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID, on page 230.
		• **ingress_match**—Configures ingress match. See Configuring QCE Match Ingress Parameters on the ME 1200 NID, on page 232.
		• **qce-id**—Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.

Step 2	**setQCE QCE-configuration** {**control ingress-match outer-tag-match** {**match-fields** {**cos cos-xx** | **vlan-id-filter** {**any** | **range** *vlan-range* | **specifc** *specific-vlan*} | **match-type** {**any** | **c-tagged** | **s-tagged** | **tagged** | **untagged**}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-fields cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-fields vlan-id-filter any`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-fields vlan-id-filter range range1`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-fields vlan-id-filter specific 230`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-type c-tagged`
		• **control**—Configures QCE.
		• **ingress-match**—Configures ingress match.
		◦ **outer-tag-match**—Matches against the outer tag value.
		◦ **match-fields**—Matches against outer tag fields .
		◦ **cos cos-xx**—Matches against packet Cos value.
		◦ **val-0-1**—Specifies packet COS 0-1.
		◦ **val-0-3**—Specifies packet COS 0-3.
		◦ **val-0-only**—Specifies packet COS 0.
		◦ **val-1-only**—Specifies packet COS 1.
		◦ **val-2-3**—Specifies packet COS 2-3.
		◦ **val-2-only**—Specifies packet COS 2-only.
		◦ **val-3-only**—Specifies packet COS 3-only.
		◦ **val-4-5**—Specifies packet COS 4-5.
		◦ **val-4-7**—Specifies packet COS 4-7.
		◦ **val-4-only**—Specifies packet COS 4-only.
		◦ **val-5-only**—Specifies packet COS 5-only.
		◦ **val-6-7**—Specifies packet COS 6-7.
		◦ **val-6-only**—Specifies packet COS 6.
		◦ **val-7-only**—Specifies packet COS 7.
		◦ **val-any**—Specifies packet COS any.

	Command or Action	Purpose
		◦ **vlan-id-filter—**Matches against VLAN ID filter. ◦ **any—**Matches against any VLAN. ◦ **range** *vlan-range***—**Matches against the specified VLAN range . ◦ **specific** *specific-vlan***—**Matches against the specific VLAN. The valid range is from 1 to 4095. ◦ **match-type—**Matches against tag fields. • **any—**Matches against any tagged . • **c-tagged—**Matches against C tagged . • **s-tagged—**Matches against S tagged . • **tagged—**Matches against tagged . • **untagged—**Matches against untagged .
Step 3	**setQCE review** **Example:** `Switch(ProvisionQos)# setQCE review`	Displays the QoS configuration.
Step 4	**setQCE commit** **Example:** `Switch(ProvisionQos)# setQCE commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)#exit`	Exits the QoS mode.

Configuration Example

The example shows how to configure QCE Control Match Ingress outer tag parameters on the NID:

```
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-fields
cos val-0-1
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-fields
vlan-id-filter any
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-fields
vlan-id-filter range range1
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-fields
vlan-id-filter specific 230
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match outer-tag-match match-type
c-tagged

Switch(ProvisionQos)# setQCE review
```

```
Commands in queue:
       setQCE QCE-configuration control ingress-match outer-tag-match match-fields
vlan-id-filter specific 230
        setQCE QCE-configuration control ingress-match outer-tag-match match-fields
vlan-id-filter range vlan2
        setQCE QCE-configuration control ingress-match outer-tag-match match-fields cos
val-0-1
        setQCE QCE-configuration control ingress-match outer-tag-match match-type c-tagged
Switch(ProvisionQos)# setQCE commit
Switch(ProvisionQos)# exit
```

Configuring QCE Control Ingress Ports Parameter on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setQCE QCE-configuration** {**control** {**actions** | **ingress-match**} | **qce-id**}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCEconfiguration control action mark-Cos 4`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-fields inner_cos val-0-1`
	`Switch(ProvisionQos)# setQCE QCEconfiguration ingress-match frame-type any match-type vlan c-tagged`
	`Switch(ProvisionQos)# setQCE QCEconfiguration qce-id 4`
		Configures QCE.
		• **control**—Configures QCE.
		• **actions**—Configures QCE actions. See Configuring QoS Control Entry (QCE) Control Actions on the ME 1200 NID, on page 230.
		• **ingress_match**—Configures ingress match. See Configuring QCE Match Ingress Parameters on the ME 1200 NID, on page 232.
		• **qce-id**—Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.

Step 2	**setQCE QCE-configuration control ingress-match ports** {**GigabitEthernet-1** | **GigabitEthernet-2** | **GigabitEthernet-3** | **GigabitEthernet-4** | **GigabitEthernet-5** | **GigabitEthernet-6**} {**enable** | **disable**}
	
	Example:
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match ports GigabitEthernet-1 enable`
	`Switch(ProvisionQos)# setQCE QCE-configuration ingress-match ports GigabitEthernet-3 disable`
		• **control**—Configures QCE.
		• **ingress-match**—Configures ingress match.
		• **ports**—Configures ingress ports.
		• **GigabitEthernet-1**—Configures physical port 1.
		• **GigabitEthernet-2**—Configures physical port 2.
		• **GigabitEthernet-3**—Configures physical port 3.
		• **GigabitEthernet-4**—Configures physical port 4.
		• **GigabitEthernet-5**—Configures physical port 5.
		• **GigabitEthernet-6**—Configures physical port 6.
		• **enable**—Enables the port.
		• **disable**—Disables the port.

	Command or Action	Purpose
Step 3	**setQCE review** **Example:** `Switch(ProvisionQos)# setQCE review`	Displays the QoS configuration.
Step 4	**setQCE commit** **Example:** `Switch(ProvisionQos)# setQCE commit`	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)#exit`	Exits the QoS mode.

Configuration Example

The example shows how to configure QCE Control Match Ingress ports on the NID:

```
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match ports GigabitEthernet-1 enable
Switch(ProvisionQos)# setQCE QCE-configuration ingress-match ports GigabitEthernet-3 disable

Switch(ProvisionQos)# setQCE review
Commands in queue:
        setQCE QCE-configuration control ingress-match ports GigabitEthernet-1 enable
        setQCE QCE-configuration control ingress-match ports GigabitEthernet-3 disable

Switch(ProvisionQos)# setQCE commit
Switch(ProvisionQos)# exit
```

Configuring System QoS on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setSystemQosSettings** {**commit** | **flush** | **system-qos-config** | **review**}
	
	Example:
	`Switch(ProvisionQos)# setSystemQosSettings ?`
	`  commit              commit setSystemQosSettings`
		Sets the system Qos configuration.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.

	Command or Action	Purpose

	`flush              flush all setSystemQosSettings commands from queue`
	`review             review setSystemQosSettings commands`
	`system-qos-config  set System-wide QoS settings`
		• **system-qos-config**—Sets the system wide QoS settings on the NID.
		• **review**—Displays the configuration on the NID.

Step 2	**setSystemQosSettings system-qos-config WRED** {**egress-class-0** | **egress-class-1** | **egress-class-2** | **egress-class-3** | **egress-class-4** | **egress-class-5**} {**max-threshold** *threshold-value*| **min-threshold** *threshold-value* | **state** {**enable** | **disable**}} **Example:** `Switch(ProvisionQos)# ` **`setSystemQosSettings system-qos-config WRED egress-class-0 max-threshold 20`** `Switch(ProvisionQos)# ` **`setSystemQosSettings system-qos-config WRED egress-class-1 min-threshold 40`** `Switch(ProvisionQos)# ` **`setSystemQosSettings system-qos-config WRED egress-class-2 state enable`**	Configures system QoS. • **WRED**—Enables WRED algorithm for a non-priority queues on all ports. • **egress-class-0**—Egress queue 0. • **egress-class-1**—Egress queue 1. • **egress-class-2**—Egress queue 2. • **egress-class-3**—Egress queue 3. • **egress-class-4**—Egress queue 4. • **egress-class-5**—Egress queue 5. • **max-threshold** *threshold-value*—Sets the maximum threshold. • **min-threshold** *threshold-value*—Sets the minimum threshold. • **state**—Sets the WRED state per queue. • **enable**—Enables the WRED. • **disable**—Disables the WRED.

Step 3	**setSystemQosSettings review**
	
	Example:
	`Switch(ProvisionQos)# ` **`setSystemQosSettings review`**
	
	`Commands in queue:`
	`        setSystemQosSettings system-qos-config WRED egress-class-0 max-threshold  20`
	`        setSystemQosSettings system-qos-config WRED egress-class-1 min-threshold  40`
	`        setSystemQosSettings system-qos-config WRED egress-class-2 state enable`
		Displays the QoS configuration on the NID.

Step 4	**setSystemQosSettingscommit** **Example:** `Switch(ProvisionQos)# ` **`setSystemQosSettings commit`**	Sends the QoS configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionQos)# ` **`exit`**	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure QOS system settings on the NID:

```
Switch(ProvisionQos)# setSystemQosSettings system-qos-config WRED egress-class-0 max-threshold
 20
Switch(ProvisionQos)# setSystemQosSettings system-qos-config WRED egress-class-1 min-threshold
 40
Switch(ProvisionQos)# setSystemQosSettings system-qos-config WRED egress-class-2 state
enable
Switch(ProvisionQos)# setSystemQosSettings review

Commands in queue:
        setSystemQosSettings system-qos-config WRED egress-class-0 max-threshold  20
        setSystemQosSettings system-qos-config WRED egress-class-1 min-threshold  40
        setSystemQosSettings system-qos-config WRED egress-class-2 state enable
Switch(ProvisionQos)# setSystemQosSettings commit
Switch(ProvisionQos)# exit
```

Configuring Hierarchical QoS on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setsetHqosId** {**commit** | **flush** | **hqos-id-config** | **review**}
	
	Example:
	`Switch(ProvisionQos)# setHqosId ?`
	`  commit           commit setHqosId`
	`  flush            flush all setHqosId commands from queue`
	`  hqos-id-config   setHqosId (default)`
	`  review           review setHqosId commands`
		Sets the hierarchical QoS configuration.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **hqos-id-config**—Sets the hierarchical QoS ID on the NID.
		• **review**—Displays the configuration on the NID.

Step 2	**setsetHqosId hqos-id-config** {**bandwidth** {**rate** *kbps* | **state** {**enable** | **disable**}} | **hqos-id** *hqos-id* | **match** {**egress-class-0** | **egress-class-1** | **egress-class-2** | **egress-class_3** | **egress-class_4** | **egress-class-5** | **egress-class-6** | **egress-class-7**} {**bandwidth priority-level** *priority*} | **shaper** {**rate** *kbps* | **state** {**enable** | **disable**}} | **port-number** *port-number* | **shaper** {**rate** *kbps* | **state** {**enable** | **disable**}} **Example:** `Switch(ProvisionQos)# sethqosid hqos-id-config`	Configures hierarchical QoS. • **bandwidth**—Specifies bandwidth for logical interface. • **rate**—Specifies bandwidth rate in kbps. The valid range if from 100 to 1000000. • **state**—Specifies bandwidth state. • **enable**—Enables bandwidth state.

	Command or Action	Purpose

	`bandwidth rate 100`
	`Switch(ProvisionQos)# sethqosid hqos-id-config bandwidth state enable`
	`Switch(ProvisionQos)# sethqosid hqos-id-config hqos-id 4`
	`Switch(ProvisionQos)# sethqosid hqos-id-config match egress-class-7 bandwidth priority-level 1`
	`Switch(ProvisionQos)# sethqosid hqos-id-config match egress-class-7 shaper rate 100`
	`Switch(ProvisionQos)# sethqosid hqos-id-config match egress-class-7 shaper state enable`
	`Switch(ProvisionQos)# sethqosid hqos-id-config port 2`
	`Switch(ProvisionQos)# sethqosid hqos-id-config shaper rate 100`
	`Switch(ProvisionQos)# sethqosid hqos-id-config shaper state enable`
		• **disble—**Disables bandwidth state.
		• **hqos_id** *hqos-id***—**Specifies HQos ID. The valid range is 0 to 256. 0 is invalid.
		• **match —**Specifies HQoS match queues.
		• **egress-class-0—**Egress queue 0; lowest priority
		• **egress-class-1—**Egress queue 1.
		• **egress-class-2—**Egress queue 2.
		• **egress-class-3—**Egress queue 3.
		• **egress-class-4—**Egress queue 4.
		• **egress-class-5—**Egress queue 5.
		• **egress-class-6—**Egress queue 6; higher priority.
		• **egress-class-7—**Egress queue 7; highest priority.
		• **bandwidhtpriority-level***priority***—**Sets the bandwidth priority scheduling level in strict mode. The valid values are 1-1.
		• **shaper—**Sets the queue level shaper.
		• **port-number** *port-number***—**Sets the port number. The valid range is from 1 to 6. Port 7 is invlaid.
		• **shaper—**Sets the interface level shaper.
		• **disable—**Disables the WRED.

Step 3	**setHqosId review**
	
	Example:
	`Switch(ProvisionQos)# setHqosId review`
	`Commands in queue:`
	`setHqosId hqos-id-config bandwidth rate 100`
	`setHqosId hqos-id-config bandwidth state enable`
	
	`setHqosId hqos-id-config hqos-id 4`
	`setHqosId hqos-id-config match egress-class-7 bandwidth priority-level 1`
	
	`setHqosId hqos-id-config match egress-class-7 shaper rate 100`
	`setHqosId hqos-id-config match egress-class-7 shaper state enable`
	`setHqosId hqos-id-config port-number 2`
	`setHqosId hqos-id-config shaper rate 100`
		Displays the HQoS configuration on the NID.

Step 4	**setHqosIdcommit** **Example:** `Switch(ProvisionQos)# setHqosId commit`	Sends the QoS configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to configure HQOS on the NID:

```
Switch(ProvisionQos)# sethqosid hqos-id-config bandwidth rate 100
Switch(ProvisionQos)# sethqosid hqos-id-config bandwidth state enable
Switch(ProvisionQos)# sethqosid hqos-id-config hqos-id 4
Switch(ProvisionQos)# sethqosid hqos-id-config match egress-class-7 bandwidth priority-level
 1
Switch(ProvisionQos)# sethqosid hqos-id-config match egress-class-7 shaper rate 100
Switch(ProvisionQos)# sethqosid hqos-id-config match egress-class-7 shaper state enable
Switch(ProvisionQos)# sethqosid hqos-id-config port 2
Switch(ProvisionQos)# sethqosid hqos-id-config shaper rate 100
Switch(ProvisionQos)# sethqosid hqos-id-config shaper state enable
Switch(ProvisionQos)# setHqosId review
Commands in queue:
        setHqosId hqos-id-config bandwidth rate 100
        setHqosId hqos-id-config bandwidth state enable
        setHqosId hqos-id-config hqos-id 4
        setHqosId hqos-id-config match egress-class-7 bandwidth priority-level 1

        setHqosId hqos-id-config match egress-class-7 shaper rate 100
        setHqosId hqos-id-config match egress-class-7 shaper state enable
        setHqosId hqos-id-config port-number 2
        setHqosId hqos-id-config shaper rate 100
Switch(ProvisionQos)# setHqosId commit
SetHqosId Commit Success!!!
Switch(ProvisionQos)# exit
```

Configuring EVC Hierarchical QoS Policy on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setEvcHqosPolicy** {**commit** | **flush** | **hqos-id-config** | **review**}
	
	Example:
	`Switch(ProvisionQos)# setEvcHqosPolicy ?`
	`  commit               commit setEvcHqosPolicy`
	`  evcHqosPolicyConfig  setEvcHqosPolicy (default)`
		Sets the hierarchical QoS configuration on the EVC.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.

<table>
<tr><th></th><th>Command or Action</th><th>Purpose</th></tr>
<tr><td></td><td><pre> flush   flush all setEvcHqosPolicy
commands from queue
  review   review setEvcHqosPolicy commands</pre></td><td>evcHqosPolicyConfig—Sets the EVC HQoS policy on the NID.
review—Displays the configuration on the NID.</td></tr>
<tr><td>Step 2</td><td>setEvcHqosPolicy evcHqosPolicyConfig {evc-id evc-id | hqos-id hqos-id | service-policy {attach | detach}

Example:<pre>Switch(ProvisionQos)# setEvcHqosPolicy
evcHqosPolicyConfig evc-id 1
Switch(ProvisionQos)# setEvcHqosPolicy
evcHqosPolicyConfig hqos-id 2
Switch(ProvisionQos)# setEvcHqosPolicy
evcHqosPolicyConfig service-policy attach</pre></td><td>Configures hierarchical QoS on the EVC.
evc-id evc-id—Specifies EVC ID. The valid range is from 1 to 1024
hqos-id hqos-id—Specifies HQos ID. The valid range is 0 to 256. 0 is invalid.
service-policy —Specifies service policy that should be applied or removed on the EVC.
attach—Applies the policy on the EVC.
detach—Detaches the policy on the EVC.</td></tr>
<tr><td>Step 3</td><td>setEvcHqosPolicy review

Example:<pre>Switch(ProvisionQos)# setEvcHqosPolicy review
Commands in queue:
        setEvcHqosPolicy evcHqosPolicyConfig evc-id 1

        setEvcHqosPolicy evcHqosPolicyConfig
service-policy attach
        setEvcHqosPolicy evcHqosPolicyConfig
service-policy detach
        setEvcHqosPolicy evcHqosPolicyConfig hqos-id
2
        setEvcHqosPolicy evcHqosPolicyConfig evc-id 1</pre></td><td>Displays the HQoS EVC configuration on the NID.</td></tr>
<tr><td>Step 4</td><td>setEvcHqosPolicycommit

Example:<pre>Switch(ProvisionQos)# setEvcHqosPolicy commit</pre></td><td>Sends the QoS configuration to the NID.</td></tr>
<tr><td>Step 5</td><td>exit

Example:<pre>Switch(ProvisionQos)# exit</pre></td><td>Exits the QoS provisioning mode.</td></tr>
</table>

Configuration Example

The example shows how to configure EVC HQOS on the NID:

```
Switch(ProvisionQos)# setEvcHqosPolicy evcHqosPolicyConfig evc-id 1
Switch(ProvisionQos)# setEvcHqosPolicy evcHqosPolicyConfig hqos-id 2
Switch(ProvisionQos)# setEvcHqosPolicy evcHqosPolicyConfig attach
Switch(ProvisionQos)# setEvcHqosPolicy review
```

```
Commands in queue:
        setEvcHqosPolicy evcHqosPolicyConfig evc-id 1
        setEvcHqosPolicy evcHqosPolicyConfig service-policy attach
        setEvcHqosPolicy evcHqosPolicyConfig service-policy detach
        setEvcHqosPolicy evcHqosPolicyConfig hqos-id 2
        setEvcHqosPolicy evcHqosPolicyConfig evc-id 1
Switch(ProvisionQos)# setEvcHqosPolicy commit
Switch(ProvisionQos)# exit
```

Reordering QoS Control Entry (QCE) on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**reorderQCEentries** {**commit** | **flush** | **reorder-qce** | **review**}
	
	Example:
	`Switch(ProvisionQos)# reorderQCEentries ?`
	`  commit        commit reorderQCEentries`
	`  flush         flush all reorderQCEentries commands from queue`
	`  reorder-qce   reorderQCEentries (default)`
	`  review        review reorderQCEentries commands`
		Reorders the QCE entries.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **reorder_qce**—Reorders the QCE on the NID.
		• **review**—Displays the configuration on the NID.

Step 2	**reorderQCEentries reorder-qce** {**qce-id** *qce-id* | **reorder** {**after** | **before** | **last**} {**qce-id** *qce-id*}}
	
	Example:
	`Switch(ProvisionQos)# reorderQCEentries reorder-qce qce-id 3`
	`Switch(ProvisionQos)# reorderQCEentries reorder reorder before qce-id 2`
		• **reorder-qce**—Reorders QCE .
		• **reorder**—Specifies the reorder operation.
		• **after**—Reorders after the specified QCE ID.
		• **before**—Reorders before the specified QCE ID..
		• **last**—Reorders QCE ID as last.
		• **qce-id**— Specifies the QCE ID. The valid range is from 1 to 1024. 0 is invalid.

Step 3	**reorderQCEentries review review**
	
	Example:
	`Switch(ProvisionQos)# reorderQCEentries review`
	`Commands in queue:`
	`        reorderQCEentries reorder-qce qce-id 3`
	`        reorderQCEentries reorder-qce qce-id 3`
	`        reorderQCEentries reorder-qce reorder before qce-id 2`
		Displays the QoS configuration on the NID.

	Command or Action	Purpose

Step 4	**setQCE commitcommit**
	
	Example:
	`Switch(ProvisionQos)# reorderQCEentries commit`
	`ReorderQCEentries Commit Success!!!`
		Sends the QoS configuration to the NID.

Step 5	**exit** **Example:** `Switch(ProvisionQos)#exit`	Exits the QoS mode.

Configuration Example

The example shows how to reorder QoS QCE on the NID:

```
Switch(ProvisionQos)# reorderQCEentries reorder-qce qce-id 3
Switch(ProvisionQos)# reorderQCEentries reorder reorder before qce-id 2

Switch(ProvisionQos)# reorderQCEentries review
Commands in queue:
        reorderQCEentries reorder-qce qce-id 3
        reorderQCEentries reorder-qce qce-id 3
        reorderQCEentries reorder-qce reorder before qce-id 2
Switch(ProvisionQos)# reorderQCEentries commit
reorderQCEentries commit
Switch(ProvisionQos)# exit
```

Deleting QoS Control Entry (QCE) on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**deleteQCE** {**commit** | **flush** | **delete-qce** *qce-id* | **review**}
	
	Example:
	`Switch(ProvisionQos)# deleteQCE ?`
	`  commit      commit deleteQCE`
	`  delete-qce  Delete a particular QCE`
	`  flush       flush all deleteQCE commands from queue`
	
	`  review      review deleteQCE commands`
	`Switch(ProvisionQos)# deleteQCE delete-qce 2`
		Deletes QoS configuration.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **delete_qce** *qce-id*—Deletes the QCE ID on the NID.
		• **review**—Displays the configuration on the NID.

	Command or Action	Purpose

Step 2	**deleteQCE review**
	
	Example:
	`Switch(ProvisionQos)# deleteQCE review`
	`Commands in queue:`
	`        deleteQCE delete-qce 3`
		Displays the QoS configuration on the NID.

Step 3	**deleteQCE commitcommit**
	
	Example:
	`Switch(ProvisionQos)# deleteQCE commit`
	`DeleteQCE Commit Success!!!`
		Sends the QoS configuration to the NID.

Step 4	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example shows how to delete QoS QCE on the NID:

```
Switch(ProvisionQos)# deleteQCE delete-qce 2
Switch(ProvisionQos)# deleteQCE review
Commands in queue:
        deleteQCE delete-qce 3
Switch(ProvisionQos)# deleteQCE commit
DeleteQCE Commit Success!!!
Switch(ProvisionQos)# exit
```

Deleting HQoS ID on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**deleteHqosId** {**commit** | **flush** | **delete-hqos-id** *hqos-id* | **review**}
	
	Example:
	`Switch(ProvisionQos)# deleteHqosId ?`
	`  commit          commit deleteHqosId`
	`  delete-hqos-id  deleteHqosId (default)`
		Deletes HQoS ID configuration.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.

	Command or Action	Purpose

	`flush flush all deleteHqosId commands from queue`
	`review review deleteHqosId commands`
	`Switch(ProvisionQos)# ` **`deleteHqosId delete-hqos-id 2`**
		• **delete-hqos-id** *hqos-id*—Deletes the HQoS ID on the NID.
		• **review—**Displays the configuration on the NID.

Step 2	**deleteHqosId review**
	
	Example:
	`Switch(ProvisionQos)# ` **`deleteHqosId review`**
	`Commands in queue:`
	`deleteHqosId delete-hqos-id 2`
		Displays the HQoS ID configuration on the NID.

Step 3	**deleteHqosIdcommit** **Example:** `Switch(ProvisionQos)# ` **`deleteHqosId commit`** `deleteHqosId Commit Success!!!`	Sends the QoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)#`**`exit`**	Exits the QoS mode.

Configuration Example

The example shows how to delete HQoS IDon the NID:

```
Switch(ProvisionQos)# deleteHqosId delete-hqos-id 2
Switch(ProvisionQos)# deleteHqosId review
Commands in queue:
        deleteHqosId delete-hqos-id 2
Switch(ProvisionQos)# deleteHqosId commit
DeleteHqosId Commit Success!!!
Switch(ProvisionQos)# exit
```

Negating QoS and Restoring Defaults

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**no ?**
	
	Example:
	`Switch(ProvisionQoS)# no ?`
	
	`deleteQCE               Delete a particular QCE`
	`exit                    Exit from ProvisionQos sub configuration mode`
	`getInputGlobalPolicy    Show Output QoS global features configured`
	`getInputPortPolicy      Show Input Policy configured on Physical Port`
	`getOutputGlobalPolicy   Show Global Output QoS features`
	`getOutputPortPolicy     Show Output Policy configured on Physical Port`
	`getQCE                  getQCE (default)`
	`getSystemQosSettings    getSystemQosSettings (default)`
	`reorderQCEentries       reorderQCEentries (default)`
	`setInputGlobalPolicy    configure Global Input QoS features`
	`setInputPortPolicy      configure Input policy on Physical Port`
	`setOutputGlobalPolicy   configure Global Output QoS features`
	`setOutputPortPolicy     configure Output policy on Physical Port`
	`setQCE                  setQCE (default)`
	`setSystemQosSettings    set System-wide QoS settings`
	`showQCElist             showQCElist (default)`
	`showQueueStatistics     Display egress queue statistics`
		Negates the commands and sets the default configuration.

Step 2	**exit** **Example:** `Switch(ProvisionQos)#exit`	Exits the QoS mode.

Viewing QoS Input Policy Global Features on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getInputGlobalPolicy** {**commit** | **flush** | **input** | **review**}
	
	Example:
	`Switch(ProvisionQos)# getInputGlobalPolicy ?`
	`  commit  commit getInputGlobalPolicy`
	`flush   flush all getInputGlobalPolicy commands from`
	` queue`
	`input   Show Output QoS global features configured`
	`review  review getInputGlobalPolicy commands`
		View the global input QoS policy.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **input** —Displays the input policy QoS global features configured the NID.

	Command or Action	Purpose
	`Switch(ProvisionQos)# getInputGlobalPolicy input`	• **review—**Displays the configuration on the NID.

Step 2	**getInputGlobalPolicy review**
	
	Example:
	`Switch(ProvisionQos)# getInputGlobalPolicy review`
	`Commands in queue:`
	`        getInputGlobalPolicy input`
		Displays the QoS configuration on the NID.

Step 3	**getInputGlobalPolicy commit** **Example:** `Switch(ProvisionQos)# getInputGlobalPolicy commit`	Sends the QoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example displays the QoS input port policy on the NID:

```
Switch(ProvisionQos)# getInputGlobalPolicy input
Switch(ProvisionQos)# getInputGlobalPolicy review
CCommands in queue:
        getInputGlobalPolicy input
Switch(ProvisionQos)# getInputGlobalPolicy commit

GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_00.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_00.mark_egress_class
= 8
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_01.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_01.mark_egress_class
= 8
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_02.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_02.mark_egress_class
= 8
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_03.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_03.mark_egress_class
= 8
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_04.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_04.mark_egress_class
= 8
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_05.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_05.mark_egress_class
= 8
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_06.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_06.mark_egress_class
= 8
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_07.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_07.mark_egress_class
= 8
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_08.mark_DSCP = 64
GetInputGlobalPolicy_Output.inputGlobalPolicyConfig.match_DSCP.value_08.mark_egress_class
= 8
.
.
```

```
!
 GetInputGlobalPolicy Commit Success!!!

Switch(ProvisionQos)# exit
```

Viewing QoS Input Policy Features at Port level on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getInputPortPolicy** {**commit** | **flush** | **input-port** *port-number*| **review**}
	
	Example:
	`Switch(ProvisionQos)# getInputPortPolicy ?`
	`  commit      commit getInputPortPolicy`
	`  flush       flush all getInputPortPolicy commands from queue`
	`  input-port  Show Input Policy configured on Physical Port`
	`  review      review getInputPortPolicy commands`
	`Switch(ProvisionQos)# getInputPortPolicy input-port 2`
		View the input QoS policy at port level.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **input-port** *port-number*—Displays the input port policy configuration at port level on the NID. The valid ports are 1 to 6. port 7 is invalid.
		• **review**—Displays the configuration on the NID.

Step 2	**getInputPortPolicy review**
	
	Example:
	`Switch(ProvisionQos)# getInputPortPolicy review`
	
	`Commands in queue:`
	`        getInputPortPolicy input-port 3`
	`        getInputPortPolicy input-port 2`
		Displays the QoS configuration on the NID.

Step 3	**getInputPortPolicy commit** **Example:** `Switch(ProvisionQos)# getInputPortPolicy commit`	Sends the QoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example displays the QoS input port policy on the NID:

```
Switch(ProvisionQos)# getInputPortPolicy input_port 2
Switch(ProvisionQos)# getInputPortPolicy review
Commands in queue:
        getInputPortPolicy input_port 3
        getInputPortPolicy input_port 2
Switch(ProvisionQos)# getInputPortPolicy commit
GetInputPortPolicy_Output.inputPortPolicyConfig.port_number = 2
GetInputPortPolicy_Output.inputPortPolicyConfig.port_policer.state = false
GetInputPortPolicy_Output.inputPortPolicyConfig.port_policer.cir = 1000000
GetInputPortPolicy_Output.inputPortPolicyConfig.globalDscpBasedDscpIngressMarking = false
GetInputPortPolicy_Output.inputPortPolicyConfig.globalDscpBasedEgressClassMarking = false
GetInputPortPolicy_Output.inputPortPolicyConfig.match.cos_.value_0.mark_egress_class = 1
GetInputPortPolicy_Output.inputPortPolicyConfig.match.cos_.value_1.mark_egress_class = 0
GetInputPortPolicy_Output.inputPortPolicyConfig.match.cos_.value_2.mark_egress_class = 2
GetInputPortPolicy_Output.inputPortPolicyConfig.match.cos_.value_3.mark_egress_class = 3
GetInputPortPolicy_Output.inputPortPolicyConfig.match.cos_.value_4.mark_egress_class = 4
GetInputPortPolicy_Output.inputPortPolicyConfig.match.cos_.value_5.mark_egress_class = 5
GetInputPortPolicy_Output.inputPortPolicyConfig.match.cos_.value_6.mark_egress_class = 6
GetInputPortPolicy_Output.inputPortPolicyConfig.match.cos_.value_7.mark_egress_class = 7
GetInputPortPolicy_Output.inputPortPolicyConfig.egress_class_marking = false
GetInputPortPolicy_Output.inputPortPolicyConfig.qce.address.t = 1
GetInputPortPolicy_Output.inputPortPolicyConfig.qce.address.u.source = ''
GetInputPortPolicy_Output.inputPortPolicyConfig.qce.key.t = 1
GetInputPortPolicy_Output.inputPortPolicyConfig.qce.key.u.normal = ''
GetInputPortPolicy_Output.inputPortPolicyConfig.service_policy.t = 2
GetInputPortPolicy_Output.inputPortPolicyConfig.service_policy.u.detach = ''

 GetInputPortPolicy Commit Success!!!
Switch(ProvisionQos)# exit
```

Viewing QoS Output Policy Global Features on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getInputGlobalPolicy** {**commit** | **flush** | **output** | **review**}
	
	Example:
	`Switch(ProvisionQos)# getInputGlobalPolicy ?`
	`  commit   commit getOutputGlobalPolicy`
	`  flush    flush all getOutputGlobalPolicy commands from queue`
	`  output   Show Global Output QoS features`
	`  review   review getOutputGlobalPolicy commands`
	
	`Switch(ProvisionQos)# getInputGlobalPolicy output`
		View global output QoS policy.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **input** —Displays the input policy QoS global features configured the NID.
		• **review**—Displays the configuration on the NID.

	Command or Action	Purpose

Step 2	**getOutputPortPolicy review**
	
	Example:
	`Switch(ProvisionQos)# getInputGlobalPolicy review`
	`Commands in queue:`
	`        getOutputGlobalPolicy output`
		Displays the QoS configuration on the NID.

Step 3	**getOutputPortPolicy commit** **Example:** `Switch(ProvisionQos)# getInputGlobalPolicy commit`	Sends the QoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example displays the QoS output policy global features on the NID:

```
Switch(ProvisionQos)# getInputGlobalPolicy output
Switch(ProvisionQos)# getInputGlobalPolicy review
Commands in queue:
        getOutputGlobalPolicy output

Switch(ProvisionQos)# getInputGlobalPolicy commit
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_00.mark_DSCP = 64
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_01.mark_DSCP = 64
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_02.mark_DSCP = 64
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_03.mark_DSCP = 64
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_04.mark_DSCP = 64
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_05.mark_DSCP = 64
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_06.mark_DSCP = 64
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_07.mark_DSCP = 64
GetOutputGlobalPolicy_Output.outputGlobalPolicyConfig.match_DSCP.value_08.mark_D

 GetOutputGlobalPolicy Commit Success!!!
Switch(ProvisionQos)# exit
```

Viewing QoS Output Policy Features at Port level on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getOutputPortPolicy** {**commit** | **flush** | **output-port** *port-number*| **review**}
	
	Example:
	`Switch(ProvisionQos)# getOutputPortPolicy ?`
	`  ccommit       commit getOutputPortPolicy`
	`  flush       flush all getOutputPortPolicy commands from queue`
	`  output-port  Show Output Policy configured on Physical Port`
	`  review       review getOutputPortPolicy commands`
	`Switch(ProvisionQos)# getOutputPortPolicy output-port 4`
		View the output Qos policy at port level.
		• **commit—**Sends the QoS configuration to NID.
		• **flush—**Flushes all QoS configuration from the queue.
		• **output-port** *port-number***—**Displays the output port policy configuration at port level on the NID. The valid ports are 1 to 6. port 7 is invalid.
		• **review—**Displays the configuration on the NID.

Step 2	**getOutputPortPolicy review**
	
	Example:
	`Switch(ProvisionQos)# getOutputPortPolicy review`
	
	`Commands in queue:`
	`        getOutputPortPolicy output-port 4`
		Displays the QoS configuration on the NID.

Step 3	**getOutputPortPolicy commit** **Example:** `Switch(ProvisionQos)# getOutputPortPolicy commit`	Sends the QoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example displays the QoS output port policy on the NID:

```
Switch(ProvisionQos)# getOutputPortPolicy output-port 4
Switch(ProvisionQos)# getOutputPortPolicy review
Commands in queue:
        getOutputPortPolicy output-port 4

Switch(ProvisionQos)# getOutputPortPolicy commit
GetOutputPortPolicy_Output.outputPortPolicyConfig.port_number = 4
GetOutputPortPolicy_Output.outputPortPolicyConfig.port_shaper.state = false
GetOutputPortPolicy_Output.outputPortPolicyConfig.port_shaper.rate = 1000000
GetOutputPortPolicy_Output.outputPortPolicyConfig.globalDscpBasedDscpEgressMarking = false
GetOutputPortPolicy_Output.outputPortPolicyConfig.match.egress_class_7.bandwidth.priority_level
 = 1
GetOutputPortPolicy_Output.outputPortPolicyConfig.match.egress_class_7.shaper.state = false
GetOutputPortPolicy_Output.outputPortPolicyConfig.match.egress_class_7.shaper.rate = 1000000
GetOutputPortPolicy_Output.outputPortPolicyConfig.match.egress_class_7.mark_cos= 7
GetOutputPortPolicy_Output.outputPortPolicyConfig.match.egress_class_6.bandwidth.priority_level
 = 2
```

```
GetOutputPortPolicy_Output.outputPortPolicyConfig.match.egress_class_6.shaper.state = false
GetOutputPortPolicy_Output.outputPortPolicyConfig.match.egress_class_6.shaper.rate = 1000000
.
.
!
GetOutputPortPolicy Commit Success!!!
Switch(ProvisionQos)# exit
```

Viewing QoS Control Entry (QCE) Configuration on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getQCE** {**commit** | **flush** | **QCE-ID** *qce-id*| **review**}
	
	Example:
	`Switch(ProvisionQos)# getOutputPortPolicy ?`
	`  QCE-ID   getQCE (default)`
	`  commit   commit getQCE`
	`  flush    flush all getQCE commands from queue`
	`  review   review getQCE commands`
	`Switch(ProvisionQos)# getOutputPortPolicy qce-id 4`
		View the QCE configuration.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **QCE-ID** *qce-id*—Displays the QCE configuration for QCE ID on the NID. The valid ports are 1 to 1024.
		• **review**—Displays the configuration on the NID.

Step 2	**getQCE review**
	
	Example:
	`Switch(ProvisionQos)# getQCE review`
	`Commands in queue:`
	`        getQCE QCE-ID 2`
	`        getQCE QCE-ID 3`
	`        getQCE QCE-ID 23`
		Displays the QoS configuration on the NID.

Step 3	**getOutputPortPolicy commit** **Example:** `Switch(ProvisionQos)# getQCE commit`	Sends the QoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example displays the QoS output port policy on the NID:

```
Switch(ProvisionQos)# getOutputPortPolicy qce-id 4
Switch(ProvisionQos)# getQCE review
Commands in queue:
        getQCE QCE-ID 2
        getQCE QCE-ID 3
        getQCE QCE-ID 23
Switch(ProvisionQos)# getQCE commit
GetQCE_Output.QCE_configuration.qce_id = 0
GetQCE_Output.QCE_configuration.control.ingress_match.ports.GigabitEthernet_1 = false
GetQCE_Output.QCE_configuration.control.ingress_match.ports.GigabitEthernet_2 =false
GetQCE_Output.QCE_configuration.control.ingress_match.ports.GigabitEthernet_3 =false
GetQCE_Output.QCE_configuration.control.ingress_match.ports.GigabitEthernet_4 =false
GetQCE_Output.QCE_configuration.control.ingress_match.ports.GigabitEthernet_5 =false
GetQCE_Output.QCE_configuration.control.ingress_match.ports.GigabitEthernet_6 =false
GetQCE_Output.QCE_configuration.control.ingress_match.outer_tag_match.match_type.t = 1
GetQCE_Output.QCE_configuration.control.ingress_match.outer_tag_match.match_type.u.any =
'0'
GetQCE_Output.QCE_configuration.control.ingress_match.outer_tag_match.match_fields.vlan_id_filter.t
 = 1
GetQCE_Output.QCE_configuration.control.ingress_match.outer_tag_match.match_fields.vlan_id_filter.u.any
 = '0'
GetQCE_Output.QCE_configuration.control.ingress_match.outer_tag_match.match_fields.cos_.t
= 1
GetQCE_Output.QCE_configuration.control.ingress_match.outer_tag_match.match_fields.cos_.u.val_any
 = '0'
GetQCE_Output.QCE_configuration.control.ingress_match.inner_tag_match.match_type.t = 1
GetQCE_Output.QCE_configuration.control.ingress_match.inner_tag_match.match_type.u.any =
'0'
GetQCE_Output.QCE_configuration.control.ingress_match.inner_tag_match.match_fields.vlan_id_filter.t
 = 1
GetQCE_Output.QCE_configuration.control.ingress_match.inner_tag_match.match_fields.vlan_id_filter.u.any
 = '0'
GetQCE_Output.QCE_configuration.control.ingress_match.inner_tag_match.match_fields.inner_cos.t
 = 1
GetQCE_Output.QCE_configuration.control.ingress_match.inner_tag_match.match_fields.inner_cos.u.val_any
 = '0'
GetQCE_Output.QCE_configuration.control.ingress_match.mac_params.smac_filter.t = 1
GetQCE_Output.QCE_configuration.control.ingress_match.mac_params.smac_filter.u.any = '0'
GetQCE_Output.QCE_configuration.control.ingress_match.mac_params.dmac_filter.t = 1
GetQCE_Output.QCE_configuration.control.ingress_match.mac_params.dmac_filter.u.any = '0'
GetQCE_Output.QCE_configuration.control.ingress_match.frame_type.t = 1
GetQCE_Output.QCE_configuration.control.ingress_match.frame_type.u.any = '0'
GetQCE_Output.QCE_configuration.control.actions.mark_egress_class = 8
GetQCE_Output.QCE_configuration.control.actions.mark_COS = 8
GetQCE_Output.QCE_configuration.control.actions.mark_DSCP = 64

 GetQCE Commit Success!!!

GetOutputPortPolicy Commit Success!!!
Switch(ProvisionQos)# exit
```

Viewing System QoS Settings on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getSystemQosSettings** {**commit** | **flush** | **QCE-ID** *qce-id*| **review**}
	
	Example:
	`Switch(ProvisionQos)#` **`getSystemQosSettings ?`**
	` commit      commit getSystemQosSettings`
	` flush       flush all getSystemQosSettings commands from queue`
	` review      review getSystemQosSettings commands`
	` system-qos  getSystemQosSettings (default)`
	
	`Switch(ProvisionQos)#` **`getSystemQosSettings system-qos`**
		View the system QoS configuration.
		• **commit—**Sends the QoS configuration to NID.
		• **flush—**Flushes all QoS configuration from the queue.
		• **system_qos—**Displays the system QOS configuration on the NID.
		• **review—**Displays the configuration on the NID.

Step 2	**getSystemQosSettings review**
	
	Example:
	`Switch(ProvisionQos)#` **`getSystemQosSettings review`**
	`Commands in queue:`
	`        getSystemQosSettings system-qos`
		Displays the QoS configuration on the NID.

Step 3	**getSystemQosSettings commit** **Example:** `Switch(ProvisionQos)#` **`getSystemQosSettings commit`**	Sends the QoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)#` **`exit`**	Exits the QoS provisioning mode.

Configuration Example

The example displays the system QoS settings on the NID:

```
Switch(ProvisionQos)# getSystemQosSettings system-qos
Switch(ProvisionQos)# getSystemQosSettings review
Commands in queue:
        getSystemQosSettings system-qos

Switch(ProvisionQos)# getSystemQosSettings commit
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_0.state = false
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_0.min_threshold = 0
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_0.max_threshold= 100
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_1.state = false
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_1.min_threshold= 0
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_1.max_threshold= 100
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_2.state = false
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_2.min_threshold= 0
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_2.max_threshold= 100
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_3.state = false
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_3.min_threshold= 0
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_3.max_threshold= 100
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_4.state = false
```

```
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_4.min_threshold= 0
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_4.max_threshold= 100
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_5.state = false
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_5.min_threshold= 0
GetSystemQosSettings_Output.system_qos_config.WRED.egress_class_5.max_threshold= 100

 GetSystemQosSettings Commit Success!!!

Switch(ProvisionQos)# exit
```

Viewing EVC HQoS ID on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getEvcHqosPolicy** {**commit** | **flush** | **evcHqosPolicy evc-id***evc-id* | **review**}
	
	Example:
	`Switch(ProvisionQos)# getEvcHqosPolicy ?`
	` commit          commit getEvcHqosPolicy`
	` evcHqosPolicy   getEvcHqosPolicy (default)`
	` flush           flush all getEvcHqosPolicy commands from queue`
	` review          review getEvcHqosPolicy commands`
	
	`Switch(ProvisionQos)# getEvcHqosPolicy evcHqosPolicy evc-id 1`
		View the EVC HQoS ID configuration.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **evcHqosPolicy evc-id***evc-id*—Displays the EVC HQOS ID configuration on the NID. The valid range is from 1 to 1024.
		• **review**—Displays the configuration on the NID.

Step 2	**getEvcHqosPolicy review**
	
	Example:
	`Switch(ProvisionQos)# getEvcHqosPolicy review`
	`Commands in queue:`
	`        getEvcHqosPolicy evcHqosPolicy evc-id 1`
		Displays the EVC HQoS ID configuration on the NID.

Step 3	**getHqosId commit** **Example:** `Switch(ProvisionQos)# getEvcHqosPolicy commit`	Sends the EVC HQoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example displays the EVC HQoS ID on the NID:

```
Switch(ProvisionQos)# getEvcHqosPolicy evcHqosPolicy evc-id 1
Switch(ProvisionQos)# getEvcHqosPolicy review
Commands in queue:
        getEvcHqosPolicy evcHqosPolicy evc-id 1
Switch(ProvisionQos)# getEvcHqosPolicy commit


Switch(ProvisionQos)# exit
```

Viewing HQoS ID on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getHqosId** {**commit** | **flush** | **hqos-id-value** *hqos-id* | **review**}
	
	Example:
	`Switch(ProvisionQos)# getHqosId ?`
	` commit          commit getHqosId`
	` flush           flush all getHqosId commands from queue`
	` hqos-id-value   getHqosId (default)`
	` review          review getHqosId commands`
	
	`Switch(ProvisionQos)# getHqosId hqos-id-value 4`
		View the HQoS ID configuration.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **hqos_id_value** *hqos_id*—Displays the HQOS ID configuration on the NID. The valid range is from 1 to 256.
		• **review**—Displays the configuration on the NID.

Step 2	**getHqosId review**
	
	Example:
	`Switch(ProvisionQos)# getHqosId review`
	`Commands in queue:`
	`        getHqosId hqos-id-value 2`
		Displays the HQoS ID configuration on the NID.

Step 3	**getHqosId commit** **Example:** `Switch(ProvisionQos)# getHqosId commit`	Sends the HQoS configuration to the NID.
Step 4	**exit** **Example:** `Switch(ProvisionQos)# exit`	Exits the QoS provisioning mode.

Configuration Example

The example displays the system HQoS ID on the NID:

```
Switch(ProvisionQos)# getHqosId hqos-id-value 4
Switch(ProvisionQos)# getHqosId review
Commands in queue:
        getHqosId hqos-id-value 2
Switch(ProvisionQos)# getHqosId commit
GetHqosId_Output.hqos_id_config.hqos_id = 4
GetHqosId_Output.hqos_id_config.port_number = 4
GetHqosId_Output.hqos_id_config.shaper.state = true
GetHqosId_Output.hqos_id_config.shaper.rate = 100000
GetHqosId_Output.hqos_id_config.bandwidth.state = true
GetHqosId_Output.hqos_id_config.bandwidth.rate = 10000
GetHqosId_Output.hqos_id_config.match.egress_class_7.bandwidth.priority_level = 1
GetHqosId_Output.hqos_id_config.match.egress_class_7.shaper.state = true
GetHqosId_Output.hqos_id_config.match.egress_class_7.shaper.rate = 40000
GetHqosId_Output.hqos_id_config.match.egress_class_6.bandwidth.priority_level = 2
GetHqosId_Output.hqos_id_config.match.egress_class_6.shaper.state = true
GetHqosId_Output.hqos_id_config.match.egress_class_6.shaper.rate = 50000
GetHqosId_Output.hqos_id_config.match.egress_class_5.bandwidth.t = 2
GetHqosId_Output.hqos_id_config.match.egress_class_5.bandwidth.u.remaining_ratio = 5
GetHqosId_Output.hqos_id_config.match.egress_class_4.bandwidth.t = 2
GetHqosId_Output.hqos_id_config.match.egress_class_4.bandwidth.u.remaining_ratio = 4
GetHqosId_Output.hqos_id_config.match.egress_class_3.bandwidth.t = 2
GetHqosId_Output.hqos_id_config.match.egress_class_3.bandwidth.u.remaining_ratio = 4
GetHqosId_Output.hqos_id_config.match.egress_class_2.bandwidth.t = 2
GetHqosId_Output.hqos_id_config.match.egress_class_2.bandwidth.u.remaining_ratio = 3
GetHqosId_Output.hqos_id_config.match.egress_class_1.bandwidth.t = 2
GetHqosId_Output.hqos_id_config.match.egress_class_1.bandwidth.u.remaining_ratio = 3
GetHqosId_Output.hqos_id_config.match.egress_class_0.bandwidth.t = 2
GetHqosId_Output.hqos_id_config.match.egress_class_0.bandwidth.u.remaining_ratio = 2
GetHqosId Commit Success!!!

Switch(ProvisionQos)# exit
```

Displaying the Hierarchical QoS ID List on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showHqosIdList** {**commit** | **flush** | **show-hqos-id** {**all** | **specific** *specific-QCE*} | **review**}
	
	Example:
	
	`Switch(ProvisionQos)#showHqosIdList show-hqos-id all`
	`Switch(ProvisionQos)#showHqosIdList show-hqos-id specific 2`
	`Switch(ProvisionQos)#showHqosIdList review`
	`Switch(ProvisionQos)#showHqosIdList commit`
		Displays the HQoS ID list.
		
		• **show-hqos-id**—Displays HQoS ID list.
		• **all**—Displays entire HQoS ID list.
		• **specific** *specific_hqos-id*—Displays specific HQos ID list.
		• **commit**—Sends the QoS configuration to the NID.
		• **flush**—Flushes all QoS configuration from the queue.

	Command or Action	Purpose
		• **review**—Displays the QoS configuration on the NID.
Step 2	**exit** **Example:** `Switch(ProvisionQos)#exit`	Exits the QoS mode.

Configuration Example

The example displays the HQoS ID list on the NID:

```
Switch(ProvisionQos)#showHqosIdList show-hqos-id specific 2
Switch(ProvisionQos)#showHqosIdList review
Commands in queue:
        showHqosIdList show-hqos-id all
        showHqosIdList show-hqos-id specific 2
Switch(ProvisionQos)#showHqosIdList commit
ShowHqosIdList_Output.show-hqos-id-response.hqos-id-list[0].hqos-id = 2
ShowHqosIdList_Output.show-hqos-id-response.hqos-id-list[0].status = false

ShowHqosIdList Commit Success!!!
Switch(ProvisionQos)# exit
```

Displaying the QCE List on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showQCElist** {**commit** | **flush** | **show-qce** {**all** | **specific** *specific-QCE*} | **review**}
	
	Example:
	`Switch(ProvisionQos)#showQCElist show-qce all`
	`Switch(ProvisionQos)#showQCElist show-qce specific 2`
	`Switch(ProvisionQos)#showQCElist review`
	`Switch(ProvisionQos)#showQCElist commit`
		Displays the QCE list.
		• **show-qce**—Displays QCE list.
		• **all**—Displays entire QCE list.
		• **specific** *specific-QCE*—Displays specific QCE list.
		• **commit**—Sends the QoS configuration to the NID.
		• **flush**—Flushes all QoS configuration from the queue.
		• **review**—Displays the QoS configuration on the NID.

	Command or Action	Purpose
Step 2	**exit** **Example:** `Switch(ProvisionQos)#exit`	Exits the QoS mode.

Configuration Example

The example displays the QCE list on the NID:

```
Switch(ProvisionQos)#showQCElist show_qce all
Switch(ProvisionQos)#showQCElist show_qce specific 2
Switch(ProvisionQos)#showQCElist review
Commands in queue:
        showQCElist show-qce all
        showQCElist show-qce specific 2
Switch(ProvisionQos)#showQCElist commit
ShowQCElist_Output.show-qce-configuration.QCE-List[0].qce-id = 2
ShowQCElist_Output.show-qce-configuration.QCE-List[0].status = false

 ShowQCElist Commit Success!!!
Switch(ProvisionQos)# exit
```

Displaying QoS Queue Statistics on the ME 1200 NID

Before You Begin

- Perform the steps to provision QoS on the ME 1200 NID. See Provisioning the ME 1200 NID to Configure QoS, on page 214.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showQueueStatistics** {**commit** | **flush** | **queue-stats port-number** *port-num*} | **review**}
	
	Example:
	`Switch(ProvisionQoS)#showQueueStatistics queue-stats port-number 3`
	`Switch(ProvisionQoS)#showQueueStatistics review`
	`Switch(ProvisionQoS)#showQueueStatistics commit`
		Displays the QoS queue statistics.
		• **queue-stats**—Displays egress queue statistics.
		• **port-number** *port-num*—Displays statistics for specified port. The valid range is from 1 to 6.
		• **commit**—Sends the QoS configuration to NID.
		• **flush**—Flushes all QoS from the queue.
		• **review**—Displays the QoS configuration on the NID.

	Command or Action	Purpose
Step 2	**exit** **Example:** `Switch(ProvisionQos)#exit`	Exits the QoS mode.

Configuration Example

The example displays the egress queue statistics on the NID:

```
Switch(ProvisionQoS)#showQueueStatistics queue_stats port_number 3
Switch(ProvisionQoS)#showQueueStatistics review
Commands in queue:
        showQueueStatistics queue_stats port_number 3

Switch(ProvisionQoS)#showQueueStatistics commit
ShowQueueStatistics_Output.queue_statistics.port_number = 3
ShowQueueStatistics_Output.queue_statistics.Queue_0.frames = 0
ShowQueueStatistics_Output.queue_statistics.Queue_1.frames = 0
ShowQueueStatistics_Output.queue_statistics.Queue_2.frames = 0
ShowQueueStatistics_Output.queue_statistics.Queue_3.frames = 0
ShowQueueStatistics_Output.queue_statistics.Queue_4.frames = 0
ShowQueueStatistics_Output.queue_statistics.Queue_5.frames = 0
ShowQueueStatistics_Output.queue_statistics.Queue_6.frames = 0
ShowQueueStatistics_Output.queue_statistics.Queue_7.frames = 0

ShowQueueStatistics Commit Success!!!
Switch(ProvisionQoS)# exit
```

CHAPTER 15

Configuring Ethernet OAM, Link OAM, and CFM

Ethernet Operations, Administration, and Maintenance (OAM) is a protocol for installing, monitoring, and troubleshooting Ethernet networks to increase management capability within the context of the overall Ethernet infrastructure. The Cisco ME 1200 Series Carrier Ethernet Access Device supports IEEE 802.1ag Connectivity Fault Management (CFM), and IEEE 802.3ah Ethernet OAM discovery, link monitoring, remote fault detection, and remote loopback.

This document provides information about configuring Ethernet OAM, Link OAM, and CFM.

For more information on Ethernet OAM and CFM, see the *Cisco IOS Carrier Ethernet Configuration Guide*.

Understanding the Ethernet OAM Protocol

The Ethernet OAM protocol for installing, monitoring, and troubleshooting Metro Ethernet networks and Ethernet WANs relies on an optional sublayer in the data link layer of the OSI model. Normal link operation does not require Ethernet OAM. You can implement Ethernet OAM on any full-duplex point-to-point or emulated point-to-point Ethernet link for a network or part of a network (specified interfaces).

OAM frames, called OAM protocol data units (OAM PDUs) use the slow protocol destination MAC address 0180.c200.0002. They are intercepted by the MAC sublayer and cannot propagate beyond a single hop within an Ethernet network. Ethernet OAM is a relatively slow protocol, with a maximum transmission rate of 10 frames per second, resulting in minor impact to normal operations. However, when you enable link monitoring, because the CPU must poll error counters frequently, the number of required CPU cycles is proportional to the number of interfaces that must be polled.

OAM Features

These OAM features are defined by IEEE 802.3ah:

- Discovery identifies devices in the network and their OAM capabilities. It uses periodic OAM PDUs to advertise OAM mode, configuration, and capabilities; PDU configuration; and platform identity. An optional phase allows the local station to accept or reject the configuration of the peer OAM entity.
- Link monitoring detects and indicates link faults under a variety of conditions and uses the event notification OAM PDU to notify the remote OAM device when it detects problems on the link. Error events include when the number of symbol errors, the number of frame errors, the number of frame errors within a specified number of frames, or the number of error seconds within a specified period exceed a configured threshold.
- Remote failure indication conveys a slowly deteriorating quality of an OAM entity to its peers by communicating these conditions: Link Fault means a loss of signal, Dying Gasp means an unrecoverable condition, and Critical Event means an unspecified vendor-specific critical event. The switch can receive and process but not generate Link Fault or Critical Event OAM PDUs. It can generate Dying Gasp OAM PDUs to show when Ethernet OAM is disabled, the interface is shut down, the interface enters the error-disabled state, or the switch is reloading. It also supports Dying Gasp PDUs based on loss of power.
- Remote loopback mode to ensure link quality with a remote peer during installation or troubleshooting. In this mode, when the switch receives a frame that is not an OAM PDU or a pause frame, it sends it back on the same port. The link appears to the user to be in the up state. You can use the returned loopback acknowledgment to test delay, jitter, and throughput.

The following sections describe how to configure ethernet OAM on the Cisco ME 1200 NID.

Setting the Alarm Indication Signal (AIS)

DETAILED STEPS

	Command or Action	Purpose
Step 1	**OperationsMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables provisioning of the MEP.

Step 2	**setAis aisConfig** {**aisAction** {**disable** | **enable** {**framerate** | **protect**} | **mepInstance** *mep-instance-number*}
	
	Example:
	`Switch(OperationsMepPortType)# setAis aisConfig aisAction enable frameRate fr1s`
	`Switch(OperationsMepPortType)# setAis aisConfig aisAction enable protect disable`
	`Switch(OperationsMepPortType)# setAis aisConfig aisAction disable`
	`Switch(OperationsMepPortType)# setAis aisConfig mepInstance 1`
		Enables or disables the alarm indication signal request on a Maintenance End Point (MEP) instance.
		
		• **aisAction**—Enables or disables the AIS.
		• **framerate**—Defines the frame rate, whether frames per minutes, or frames per second.
		• **protect**—Defines whether or not AIS can be used for protection.
		• **mepInstance**—Sets the MEP instance number. The valid values are from 1 to 128.

	Command or Action	Purpose
Step 3	**setAis review** **Example:** `Switch(OperationsMepPortType)# setAis review`	Displays the setAis configuration.
Step 4	**setAis commit** **Example:** `Switch(OperationsMepPortType)# setAis commit`	Sends the setAis configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Setting Delay Measurement

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables provisioning of the MEP.

Step 2	**setDm dmConfig** {**dmAction** {**disable** | **enable** {**calculation** | **cast** | **interval** | **lastN** | **mode** | **priority**}} | **mepInstance** *mep-instance-number*}
	
	Example:
	`Switch(OperationsMepPortType)# setDM dmConfig dmAction enable calculation rdtrp`
	`Switch(OperationsMepPortType)# setDM dmConfig dmAction enable cast uni mepId 0`
	`Switch(OperationsMepPortType)# setDM dmConfig dmAction enable interval 10`
	`Switch(OperationsMepPortType)# setDM dmConfig dmAction enable lastN 10`
	`Switch(OperationsMepPortType)# setDM dmConfig dmAction enable mode twoWay`
	`Switch(OperationsMepPortType)# setDM dmConfig dmAction enable priority 0`
	`Switch(OperationsMepPortType)# setDM dmConfig dmAction disable`
	`Switch(OperationsMepPortType)# setDM dmConfig mepInstance 1`
		Enables or disables the delay measurement request.
		• **dmAction—**Enables or disables the delay measurement.
		• **calculation—**Is the delay calculation.
		• **cast—**Is either unicast or multicast.
		• **interval—**Is the interval between PDU transmission. The valid values are from 10 to 65535.
		• **lastN—**Are the last N delays used for average last N calculation.
		• **mode—**Is either one-way mode or two-way mode.
		• **priority—**Is the priority in case of tagged OAM. In the EVC domain this is the COS-ID.
		• **mepInstance—**Is the MEP instance number. The valid values are from 1 to 128.

	Command or Action	Purpose
Step 3	**setDm review** **Example:** `Switch(OperationsMepPortType)# setDm review`	Displays the setDm configuration.
Step 4	**setDm commit** **Example:** `Switch(OperationsMepPortType)# setDm commit`	Sends the setDm configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Updating Delay Measurement

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 2	**updateDM updateDMConfig** {**mepInstance** *mep_instance_id* | **update** {**overflowReset** {**keep** | **reset**} | **synchronized** {**disable** | **enable**} | **txmode** {**proprietary** | **standardize**} | **unit** {**ns** | **us**} | **bin** { **fd** | **ifdv** | **threshold**}
	
	Example:
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update overflowReset keep`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update syncronized disable`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update txMode standardize`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update unit us`
		Updates the delay measurement request.
		• **mepInstance—**Configures the MEP instance number. The valid values are from 1 to 128.
		• **update—**Updates the delay measurement parameters.
		• **overflowRest—**Configures all Delay Measurement results on total delay counter overflow.
		• **synchronized—**Synchronizes the near- and far-end in real time.
		• **txmode—**Configures the transmission mode.
		• **unit—**Configures the delay in nano seconds or microseconds.
		• **bin—**Configures the delay measurement binning.
		◦ **fd —**Configures number of FD measurement bins . The values are from 2 to 10.

	Command or Action	Purpose
		◦ **ifdv** —Configures number of IFDV measurement Bins . The values are from 2 to 10. ◦ **threshold** —Configures threshold for each delay measurement binning . The values are from 1 to 50000.
Step 3	**updateDM review** **Example:** `Switch(OperationsMepPortType)# updateDM review`	Displays the updateDM configuration.
Step 4	**updateDM commit** **Example:** `Switch(OperationsMepPortType)# updateDM commit`	Sends the updateDM configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Setting Loss Measurement

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 2	**setlm lmConfig** {**lmAction** {**disable** | **enable** {**cast** | **flr** | **framerate** | **mode** | **priority**}} | **mepInstance** *mep-instance-number*}
	
	Example:
	`Switch(OperationsMepPortType)# setLM lmConfig lmAction enable cast uni`
	`Switch(OperationsMepPortType)# setLM lmConfig lmAction enable flr 5`
	`Switch(OperationsMepPortType)# setLM lmConfig lmAction enable frameRate fr1s`
	`Switch(OperationsMepPortType)# setLM lmConfig lmAction enable mode single`
	`Switch(OperationsMepPortType)# setLM lmConfig`
		Enables or disables the loss measurement request.
		• **lmAction**—Enables or disables the loss measurement.
		• **cast**—Defines whether OAM PDU is transmitted with either unicast MAC or multicast MAC.
		• **flr**—Is the frame loss ratio. The valid values for frame loss interval ratio is from 0 to 99.
		• **framerate**—Defines the frame rate, whether 1 or 10 frames per second, 1 or 6 frames per minutes, or 6 frames per hour.

	Command or Action	Purpose

	`lmAction enable priority 0`
	`Switch(OperationsMepPortType)# setLM lmConfig lmAction disable`
	`Switch(OperationsMepPortType)# setLM lmConfig mepInstance 1`
		• **mode**—Is either single mode or dual mode.
		• **priority**—Is the priority in case of tagged OAM. In the EVC domain this is the COS-ID. The valid values are from 0 to 7.
		• **mepInstance**—Is the MEP instance number. The valid values are from 1 to 128.

Step 3	**setLM review** **Example:** `Switch(OperationsMepPortType)# setLM review`	Displays the setLM configuration.
Step 4	**setLM commit** **Example:** `Switch(OperationsMepPortType)# setLM commit`	Sends the setLM configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Setting Lock Signal

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 2	**setlck lckConfig**{**lckAction** {**disable** | **enable framerate** | **mepInstance** *mep-instance-number*}
	
	Example:
	`Switch(OperationsMepPortType)# setLck lckConfig lckAction enable frameRate fr1s`
	`Switch(OperationsMepPortType)# setLck lckConfig lckAction disable`
	`Switch(OperationsMepPortType)# setLck lckConfig mepInstance 1`
		Enables or disables the lock signal request.
		• **lckAction**—Enables or disables the lock signal request.
		• **framerate**—Defines the frame rate, whether frames per minutes, or frames per second.
		• **mepInstance**—Is the MEP instance number. The valid values are from 1 to 128.

	Command or Action	Purpose
Step 3	**setlck review** **Example:** `Switch(OperationsMepPortType)# setlck review`	Displays the setlck configuration.
Step 4	**setlck commit** **Example:** `Switch(OperationsMepPortType)# setlck commit`	Sends the setlck configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Setting Link Trace

DETAILED STEPS

	Command or Action	Purpose
Step 1	**OperationsMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 2	**setlinkTrace linkTrace** {**ltAction** {**disable** | **enable** {**destination** | **priority** | **ttl**} | **mepInstance** *mep-instance-number*}
	
	Example:
	`Switch(OperationsMepPortType)# setLinkTrace linkTrace ltAction enable destination mepId 0`
	`Switch(OperationsMepPortType)# setLinkTrace linkTrace ltAction enable priority 0`
	`Switch(OperationsMepPortType)# setLinkTrace linkTrace ltAction enable ttl 1`
	`Switch(OperationsMepPortType)# setLinkTrace linkTrace ltAction disable`
	`Switch(OperationsMepPortType)# setLinkTrace linkTrace mepInstance 1`
		Enables or disables the link trace request.
		• **ltAction—**Enables or disables the link trace.
		• **enable destination—**Enables the target peer MEP.
		• **priority—**Is the priority in case of tagged OAM. In the EVC domain, this value is the COS-ID. The valid values are from 0 to 7.
		• **ttl—**Is the time-to-live value. The valid values are from 1 to 999.
		• **mepInstance—**Is the MEP instance number. The valid values are from 1 to 128.

Step 3	**setLinkTrace review** **Example:** `Switch(OperationsMepPortType)# setLinkTrace review`	Displays the setLinkTrace configuration.

	Command or Action	Purpose
Step 4	**setLinkTrace commit** **Example:** `Switch(OperationsMepPortType)# setLinkTrace commit`	Sends the setLinkTrace configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Setting Loopback

DETAILED STEPS

	Command or Action	Purpose
Step 1	**OperationsMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 2	**setloopBack loopBackConfig** {**lbAction** {**disable** | **enable** {**cast** | **count** | **dei** | **interval** | **priority** | **size**}} | **mepInstance** *mep-instance-number*}
	
	Example:
	`Switch(OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable cast uni mepId 0`
	`Switch(OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable count 5`
	`Switch(OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable dei disable`
	`Switch(OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable interval 10`
	`Switch(OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable priority 0`
	`Switch(OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable size 100`
	`Switch(OperationsMepPortType)# setLoopBack loopBackConfig lbAction disable`
	`Switch(OperationsMepPortType)# setLoopBack loopBackConfig mepInstance 1`
		Enables or disables the loopback request.
		• **lbAction—**Enables or disables loopback.
		• **cast—**Is either unicast or multicast.
		• **count—**Is the number of loopback message (LBM) PDUs to send in one loop test.
		• **dei—**Is the Drop Eligible Indicator in case of tagged OAM.
		• **interval—**Is the interval between transmitting LBM protocol data unit (PDU). The valid values are from 1 to 100.
		• **priority—**Is the priority in case of tagged OAM. In the EVC domain this is the COS-ID.
		• **size—**Is the number of bytes in the LBM PDU Data Pattern TLV. The valid values are from 1 to 1400.
		• **mepInstance—**Is the MEP instance number. The valid values are from 1 to 128.

	Command or Action	Purpose
Step 3	**setloopBack review** **Example:** `Switch(OperationsMepPortType)# setloopBack review`	Displays the setloopBack configuration.
Step 4	**setloopBack commit** **Example:** `Switch(OperationsMepPortType)# setloopBack commit`	Sends the setloopBack configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Setting Test Signal

DETAILED STEPS

	Command or Action	Purpose
Step 1	**OperationsMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 2	**settst tstConfig tstConfig** {**dei** {**disable** | **enable**} | **mepId** | **mepInstance** *mep-instance-id* | **pattern** | **priority** | **rate** | **sequence size**}
	
	Example:
	`Switch(OperationsMepPortType)# setTst tstConfig dei disable`
	`Switch(OperationsMepPortType)# setTst tstConfig mepId 0`
	`Switch(OperationsMepPortType)# setTst tstConfig mepInstance 1`
	`Switch(OperationsMepPortType)# setTst tstConfig pattern allZero`
	`Switch(OperationsMepPortType)# setTst tstConfig priority 0`
	`Switch(OperationsMepPortType)# setTst tstConfig rate 1`
	`Switch(OperationsMepPortType)# setTst tstConfig sequence disable`
	`Switch(OperationsMepPortType)# setTst tstConfig size 64`
		Enables or disables the test signal request.
		• **tstConfig**—Enables or disables the test signal request.
		• **dei**—Defines the Drop Eligible Indicator in case of tagged OAM.
		• **mepId**—Defines peer MEP ID. The valid values are from 0 to 8191.
		• **mepInstance**—Is the MEP instance number. The valid values are from 1 to 128.
		• **pattern**—Enables the sequence number in test PDU.
		• **priority**—Is the priority in case of tagged OAM. In the EVC domain this is the COS-ID.
		• **rate**—Is the test frame transmission bit rate – in Mega bits per second. The valid values are from 1 to 400.
		• **sequence**— Enables and disables sequence number in test PDUs

	Command or Action	Purpose
		• **size**—Is the test frame size. The valid values are from 1 to 1581.
Step 3	**setTst review** **Example:** `Switch(OperationsMepPortType)# setTst review`	Displays the setTst configuration.
Step 4	**setTst commit** **Example:** `Switch(OperationsMepPortType)# setTst commit`	Sends the setTst configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Updating Test Signal

DETAILED STEPS

	Command or Action	Purpose
Step 1	**OperationsMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 2	**updateTst updateTstConfig** {**mepInstance** *mep-instance-id* | **update** {**Rx** {**disable** | **enable**} | **Tx** {**disable** | **enable**}}
	
	Example:
	`Switch(OperationsMepPortType)# updateTst updateTstConfig update Rx enable`
	`Switch(OperationsMepPortType)# updateTst updateTstConfig update Tx enable`
	`Switch(OperationsMepPortType)# updateTst updateTstConfig mepInstance 1`
		Updates the test signal request.
		• **updateTstConfig**—Updates the test signal parameters.
		• **mepInstance**—Is the MEP instance number. The valid values are from 1 to 128.
		• **update**—Enables or disables the receive and transmit test signals.

Step 3	**updateTst review** **Example:** `Switch(OperationsMepPortType)# updateTst review`	Displays the updateTst configuration.

	Command or Action	Purpose
Step 4	**updateTst commit** **Example:** `Switch(OperationsMepPortType)# updateTst commit`	Sends the updateTst configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Understanding Link OAM

The following sections describe how to configure Link OAM on the Cisco ME 1200 NID.

Setting OAM Port Operations

DETAILED STEPS

	Command or Action	Purpose
Step 1	**LinkOamPortType** **Example:** `Switch# LinkOamPortType`	Enters the LinkOamPortType mode.

Step 2	**setLinkOamPortConfig portConfig** {**linkOam enable** | **linkmonitorSupport enable** | **loopbackOperation enable** | **loopbackSupport enable** | **mibretrivalSupport enable** | **oamMode** {**active** | **passive**} | **portNumber** *port-number* | **variableRetrieve** {**localInfo** | **remoteInfo**}
	
	Example:
	`Switch(LinkOamPortType)# setLinkOamPortConfig portConfig portNumber 5`
	`Switch(LinkOamPortType)# setLinkOamPortConfig portConfig linkOam enable`
	`Switch(LinkOamPortType)# setLinkOamPortConfig portConfig linkmonitorSupport enable`
	`Switch(LinkOamPortType)# setLinkOamPortConfig portConfig loopbackOperation enable`
	`Switch(LinkOamPortType)# setLinkOamPortConfig portConfig loopbackSupport enable`
	`Switch(LinkOamPortType)# setLinkOamPortConfig portConfig mibretrivalSupport enable`
	`Switch(LinkOamPortType)# setLinkOamPortConfig portConfig oamMode active`
	`Switch(LinkOamPortType)# setLinkOamPortConfig portConfig variableRetrieve localInfo`
		Sets the Link OAM port configuration.
		• **linkOam—**Sets the supported Link OAM.
		• **linkmonitorSupport—**Enables or disables the Link monitor support.
		• **loopbackOperation—**Sets the loopback operation.
		• **loopbackSupport—**Sets the Link OAM remote loopback support.
		• **mibretrivalSupport—**Set MIB retrieval support.
		• **oamMode—**Sets the Link OAM mode to Active or Passive.
		• **portNumber—**Sets the interface number. The valid values are from 1 to 6.

	Command or Action	Purpose
		• **variableRetrieve—**Sets the MIB variable retrieve value to local information or remote information.
Step 3	**setLinkOamPortConfig review** **Example:** `Switch(LinkOamPortType)# setLinkOamPortConfig review`	Displays the LinkOamPortType configuration.
Step 4	**setLinkOamPortConfig commit** **Example:** `Switch(LinkOamPortType)# setLinkOamPortConfig commit`	Sends the LinkOamPortType configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(LinkOamPortType)# exit`
	`Switch#`
		Exits the LinkOamPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the LinkOamPortType configuration.

```
Switch(LinkOamPortType)# getLinkOamPortConfig linkOamRequest portNumber 5
Switch(LinkOamPortType)# getLinkOamPortConfig review
Switch(LinkOamPortType)# getLinkOamPortConfig commit
```

Setting Link OAM Event Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**LinkOamPortType** **Example:** `Switch# LinkOamPortType`	Enters the LinkOamPortType mode.

Step 2	**setlinkeventConfig linkEventConfig** {**errorFrame** {**threshold** | **window**} | **frameSeconds** {**threshold** | **window**} | **portNumber** *interface-number* | **symbolPeriod** {**threshold** | **window**}}
	
	Example:
	`Switch(LinkOamPortType)# setLinkEventConfig linkEventConfig portNumber 5`
	`Switch(LinkOamPortType)# setLinkEventConfig`
		Sets the Link Event configuration request.
		
		• **errorFrame—**Configures the frame error event thresholds and window for error frames that trigger an error-frame link event.The valid threshold values are from 0 to 4294967295 number of frames. The valid window vales to count the number of error frames is from 1 to 60 seconds.

	Command or Action	Purpose

	`linkEventConfig errorFrame threshold 0`
	`Switch(LinkOamPortType)# setLinkEventConfig linkEventConfig errorFrame window 1`
	`Switch(LinkOamPortType)# setLinkEventConfig linkEventConfig frameSeconds threshold 0`
	`Switch(LinkOamPortType)# setLinkEventConfig linkEventConfig frameSeconds window 10`
	`Switch(LinkOamPortType)# setLinkEventConfig linkEventConfig symbolPeriod threshold 0`
	`Switch(LinkOamPortType)# setLinkEventConfig linkEventConfig symbolPeriod window 1`
		• **frameSeconds—**Configures the frame seconds summary. The valid threshold values are from 0 to 65535 number of permissible error frames. The valid window vales for monitoring the frames is from 10 to 900 seconds.
		• **portNumber—**Is the port number for the Link Event configuration request. The valid values are from 1 to 6.
		• **symbolPeriod—**Configures the window and thresholds for an error-symbol period that triggers an error-symbol period link event. The valid threshold values are from 0 to 4294967295 number of permissible error symbols. The valid window vales for monitoring the frames is from 1 to 60 seconds.

Step 3	**setLinkEventConfig review** **Example:** `Switch(LinkOamPortType)# setLinkEventConfig review`	Displays the setLinkEventConfig configuration.
Step 4	**setLinkEventConfig commit** **Example:** `Switch(LinkOamPortType)# setLinkEventConfig commit`	Sends the setLinkEventConfig configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(LinkOamPortType)# exit`
	`Switch#`
		Exits the LinkOamPortType mode.

What to Do Next

After the configuration is sent to the Cisco ME 1200 NID, use the following **get** command to view the setLinkEventConfig configuration.

```
Switch(LinkOamPortType)# getLinkEventConfig linkOamRequest portNumber 5
Switch(LinkOamPortType)# getLinkEventConfig review
Switch(LinkOamPortType)# getLinkEventConfig commit
```

Setting Remote Loopback Start And Stop

DETAILED STEPS

	Command or Action	Purpose
Step 1	**LinkOamPortType** **Example:** `Switch# LinkOamPortType`	Enters the LinkOamPortType mode.
Step 2	**setremoteLoopBack remoteLoopBak** {**start portList** | **stop portList**} **Example:** `Switch(LinkOamPortType)# setRemoteLoopBack remoteLoopBack start portList 1`	Sets the remote loopback request. • **start—**Starts the remote loopback on the defined port list. • **stop—**Stops the remote loopback on the defined port list.

Step 3	**setRemoteLoopBack review**
	
	Example:
	`Switch(LinkOamPortType)# setRemoteLoopBack review`
	`Commands in queue:`
	`setRemoteLoopBack remoteLoopBack start portList 1`
	`setRemoteLoopBack remoteLoopBack stop portList 1`
		Displays the setRemoteLoopBack configuration.

Step 4	**setRemoteLoopBack commit** **Example:** `Switch(LinkOamPortType)# setRemoteLoopBack commit`	Sends the setRemoteLoopBack configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(LinkOamPortType)# exit`
	`Switch#`
		Exits the LinkOamPortType mode.

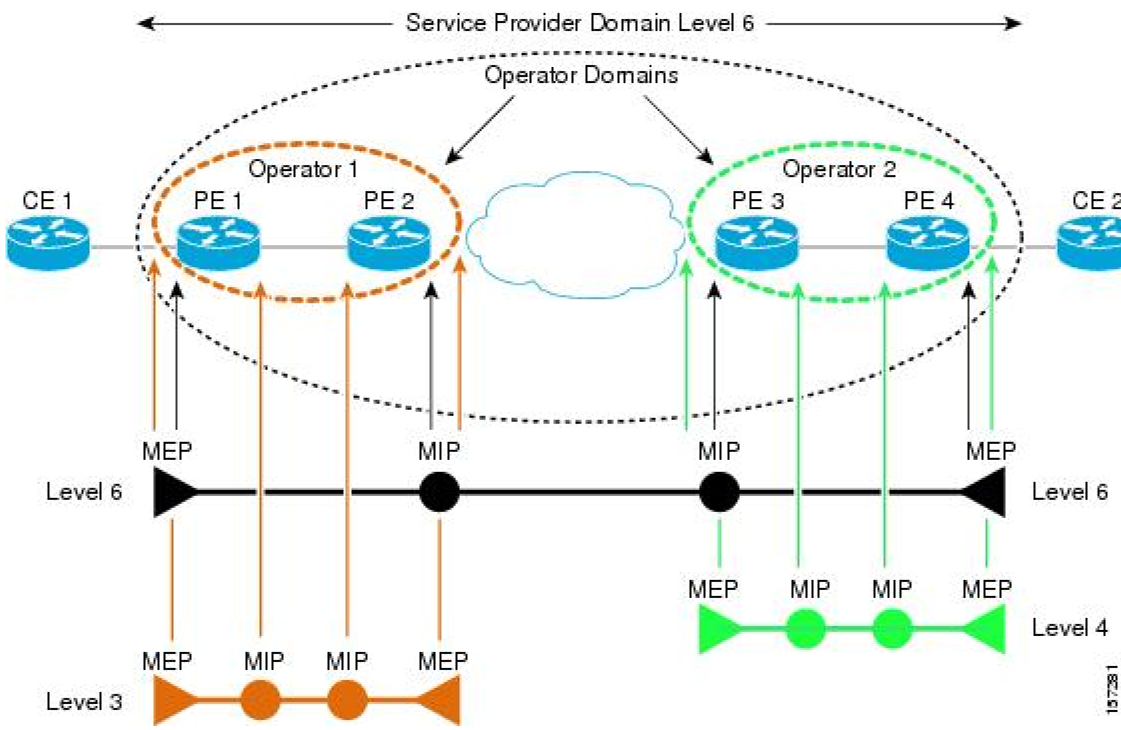
Understanding Connectivity Fault Management

Ethernet CFM is an end-to-end per VLAN Ethernet layer OAM protocol that includes proactive connectivity monitoring, fault verification, and fault isolation. End-to-end can be provider-edge-to-provider-edge (PE-to-PE) device or customer-edge-to-customer-edge (CE-to-CE) device. Ethernet CFM, as specified by IEEE 802.1ag, is the standard for Layer 2 ping, Layer 2 traceroute, and end-to-end connectivity check of the Ethernet network.

CFM Domain

A CFM maintenance domain is a management space on a network that is owned and operated by a single entity and defined by a set of ports internal to it, but at its boundary. You assign a unique maintenance level (from 0 to 7) to define the hierarchical relationship between domains. The larger the domain, the higher the level. For example, as shown in the figure below, a service-provider domain would be larger than an operator domain and might have a maintenance level of 6, while the operator domain maintenance level is 3 or 4.

Figure 9: CFM Maintenance Domains



Maintenance Associations and Maintenance Points

A maintenance association (MA) identifies a service that can be uniquely identified within the maintenance domain. The CFM protocol runs within a maintenance association. A maintenance point is a demarcation point on an interface that participates in CFM within a maintenance domain. Maintenance points drop all lower-level frames and forward all higher-level frames. There are two types of maintenance points:

- Maintenance end points (MEPs) are points at the edge of the domain that define the boundaries and confine CFM messages within these boundaries. Outward facing or Down MEPs communicate through the wire side (connected to the port). Inward facing or Up MEPs communicate through the relay function side, not the wire side.
- Maintenance intermediate points (MIPs) are internal to a domain, not at the boundary, and respond to CFM only when triggered by traceroute and loopback messages. They forward CFM frames received from MEPs and other MIPs, drop all CFM frames at a lower level (unless MIP filtering is enabled), and forward all CFM frames at a higher level and at a lower level and regardless of whether they are received

from the relay or wire side. When MIP filtering is enabled, the MIP drops CFM frames at a lower level. MIPs also catalog and forward continuity check messages (CCMs), but do not respond to them.

The following sections describe how to configure CFM on the Cisco ME 1200 NID.

Adding Continuity Check and Automatic Protection Switching

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

Step 2	**addccAps mepFunctionalConfig** {**aps** {**disable** | **enable** {**mode** {**multi** |**uni**} | **priority** | **switchingProtocol** {**laps** | **raps**}} | **cc** {**disable** | **enable** {**framerate** | **priority**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol laps`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 1`
		Adds the CC or APS configuration request.
		• **mepFunctionalConfig—**Adds the Continuity Check (CC) or automatic protection switching (APS) configuration request.
		• **aps—**Enables or disables the APS parameters.
		• **mode—**Defines whether multicast or unicast.
		• **priority—**Defines the priority in case of tagged OAM. In the EVC domain, this parameter is the COS-ID. The valid values are from 0 to 7.
		• **switchingProtocol—**Sets the appropriate APS switching protocol—Linear Automatic Protection Switching protocol (LAPS) or Ring Automatic Protection Switching protocol (RAPS).
		• **cc—**Enables or disables the CC parameters.
		• **framerate—**Sets the CC frame rate.

Step 3	**addCcAps review** **Example:** `Switch(ProvisionMepPortType)# addCcAps review`	Displays the addCcAps configuration.
Step 4	**addCcAps commit** **Example:** `Switch(ProvisionMepPortType)# addCcAps commit`	Sends the addCcAps configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionMepPortType)# exit`
	`Switch#`
		Exits the ProvisionMepPortType mode.

Adding Peer MEP IDs

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

Step 2	**addPeerMepId mepClientConfig** {**macAddress** *mac_address* | **mepInstance** *mep-instance* | **peerMepId** *peer-mep-id*}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId mepClientConfig aisPriority aisHighest`
	`Switch(ProvisionMepPortType)# addPeerMepId mepClientConfig domain VLAN`
	`Switch(ProvisionMepPortType)# addPeerMepId mepClientConfig flowId 21`
	`Switch(ProvisionMepPortType)# addPeerMepId mepClientConfig mepInstance 1`
		Adds the client configuration request.
		• **mepClientConfig—**Adds the client configuration request.
		• **macAddress—**The peer MAC address. This MAC address will be overwritten by any learned MAC address through CCM reception.
		• **mepInstance—**Sets the MEP instance number. The valid values are from 1 to 128.
		• **peerMepId—**Sets the peer MEP ID. The valid values are from 1 to 8191.

Step 3	**addPeerMepId review** **Example:** `Switch(ProvisionMepPortType)# addPeerMepId review`	Displays the addPeerMepId configuration.
Step 4	**addPeerMepId commit** **Example:** `Switch(ProvisionMepPortType)# addPeerMepId commit`	Sends the addPeerMepId configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionMepPortType)# exit`
	`Switch#`
		Exits the ProvisionMepPortType mode.

Adding Client Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

Step 2	**addClient mepClientConfig** {**aisPriority** {**aisHighest** | **priority**} | **domain** {**evc** |**vlan**} | **flowID** *flow-id* | **lckPriority** {**lckHighest** | **priority**} | **level** *meg-level* | **mepInstance** *mep-instance*}
	
	Example:
	`Switch(ProvisionMepPortType)# addClient mepClientConfig aisPriority aisHighest`
	`Switch(ProvisionMepPortType)# addClient mepClientConfig domain VLAN`
	`Switch(ProvisionMepPortType)# addClient mepClientConfig flowId 21`
	`Switch(ProvisionMepPortType)# addClient mepClientConfig mepInstance 1`
		Adds the client configuration request.
		• **mepClientConfig—**Adds the client configuration request.
		• **aisPriority—**Sets the alarm indication signal priority. The AIS priority can be set to either the highest priority or any other priority between 0 and 7.
		• **domain—**Sets the domain—whether EVC or VLAN.
		• **flowID—**Sets the ID of the flow. MEP is related to this flow.
		• **lckPriority—**Sets the lock priority. The lock priority can be set to either the highest priority or any other priority between 0 and 7.
		• **level—**Sets the MEG level of the MEP. The valid values are from 0 to 7.
		• **mepInstance—**Sets the MEP instance number. The valid values are from 1 to 128.

Step 3	**addClient review** **Example:** `Switch(ProvisionMepPortType)# addClient review`	Displays the addClient configuration.
Step 4	**addClient commit** **Example:** `Switch(ProvisionMepPortType)# addClient commit`	Sends the addClient configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionMepPortType)# exit`
	`Switch#`
		Exits the ProvisionMepPortType mode.

Creating MEP Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

Step 2	**createMep createMepConfig** {**direction** {**DOWN** | **UP**} | **domain** {**EVC** | **PORT** | **VLAN**} | **flowId** *flow-id* | **level** *meg-level* | **megDomain** {**maName** | **megIdFormat** {**ieee** | **ituCcMeg** | **ituMeg**}} | **mepId** *mep-id* | **mepInstance** *mep-instance* | **mode** {**mep** | **mip**} | **residencePort** *port* | **vid** *vid-number* | **voe** {**disable** | **enable**}}
	
	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction UP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain VLAN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig flowId 21`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 1`
	`Switch(ProvisionMepPortType)# createMep createMepConfig voe disable`
		Creates the Maintenance End Point configuration.
		• **createMepConfig—**Creates the MEP configuration.
		• **direction—**Sets the direction of the MEP—whether down (Down MEP) or up (Up MEP).
		• **domain—**Sets the domain—whether EVC, Port, or VLAN.
		• **flowID—**Sets the ID of the flow. MEP is related to this flow.
		• **level—**Sets the MEG level of the MEP. The valid values are from 0 to 7.
		• **megDomain—**Sets the maintenance domain configuration to either **maName** (ITU/IEEE MEG-ID) or **megIdFormat**.
		• **mepId—**Sets the MEP ID. The valid values are from 0 to 8191.
		• **mepInstance—**Sets the MEP instance number. The valid values are from 1 to 128.
		• **mode—**Sets the mode of the MEP instance—whether Maintenance Entity End Point (MEP) or Maintenance Entity Intermediate Point (MIP).
		• **residencePort—**Defines the port that MEP is monitoring. The valid values are from 1 to 6.
		• **vid—**The valid values are from 0 to 4094.
		Note If the MEP is a port Up-MEP or an EVC customer MIP, the VID must be provided.
		• **voe—**Enables or disables the MEP VOE.

Step 3	**createMep review** **Example:** `Switch(ProvisionMepPortType)# createMep review`	Displays the createMep configuration.

	Command or Action	Purpose
Step 4	**createMep commit** **Example:** `Switch(ProvisionMepPortType)# createMep commit`	Sends the createMep configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionMepPortType)# exit`
	`Switch#`
		Exits the ProvisionMepPortType mode.

Updating MEP Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

Step 2	**updateMep mepUpdateConfig** {**mepInstance** *mep_instance* | **update** {**level** *meg-level* | **megDomain** {**maName** | **megIdFormat** {**ieee** | **ituCcMeg** | **ituMeg**}} | **mepId** *mep-id* | **performanceMonitoring** {**disable** | **enable**} | **vid** *vid-number* | **voe** {**disable** | **enable**}}}
	
	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction UP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain VLAN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig flowId 21`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 1`
	`Switch(ProvisionMepPortType)# createMep createMepConfig voe disable`
		Updates the Maintenance End Point configuration.
		• **mepInstance—**Sets the MEP instance number. The valid values are from 1 to 128.
		• **update—**Updates the MEP configuration.
		• **level—**Sets the MEG level of the MEP. The valid values are from 0 to 7.
		• **megDomain—**Sets the maintenance domain configuration to either **maName** (ITU/IEEE MEG-ID) or **megIdFormat**.
		• **mepId—**Sets the MEP ID. The valid values are from 0 to 8191.
		• **performanceMonitoring—**Enables or disables performance monitoring
		• **vid—**The valid values are from 0 to 4094.
		Note If the MEP is a port Up-MEP or an EVC customer MIP, the VID must be provided.
		• **voe—**Enables or disables the MEP VOE.

	Command or Action	Purpose
Step 3	**updateMep review** **Example:** `Switch(ProvisionMepPortType)# updateMep review`	Displays the updateMep configuration.
Step 4	**updateMep commit** **Example:** `Switch(ProvisionMepPortType)# updateMep commit`	Sends the updateMep configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionMepPortType)# exit`
	`Switch#`
		Exits the ProvisionMepPortType mode.

Configuration Example: Loopback

Consider the following topology:

(Gi1/5)NID-3(Gi1/3)====(Gi1/3)NID-4(Gi1/6)

Configuration on Cisco ME 1200 NID-3

```
ProvisionPortVlanPortType
        createVlanCommand createVlanReq vlan_list 2000
createVlanCommand commit
        modifySwPort modifySWPortConfig interaface 3
        modifySwPort modifySWPortConfig mode trunk native vlan 1
        modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan_list 2000
modifySwPort commit
        modifySwPort modifySWPortConfig interaface 4
        modifySwPort modifySWPortConfig mode trunk native vlan 1
        modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan_list 2000
modifySwPort commit
exit
ProvisionMepPortType
        createMep createMepConfig mepInstance 100
        createMep createMepConfig direction DOWN
        createMep createMepConfig domain vlan
        createMep createMepConfig level 0
        createMep createMepConfig megDomain maName ERPS-128
        createMep createMepConfig megDomain megIdFormat ituMeg
        createMep createMepConfig mepId 100
        createMep createMepConfig mode MEP
        createMep createMepConfig residencePort 3
        createMep createMepConfig flow 2000
 createMep commit
       addPeerMepId peerMepConfig mepInstance 100
        addPeerMepId peerMepConfig peerMepId 101
addPeerMepId commit
       addCcAps mepFunctionalConfig mepInstance 100
        addCcAps mepFunctionalConfig cc enable priority 7
        addCcAps mepFunctionalConfig cc enable frameRate fr1s
        addCcAps mepFunctionalConfig aps enable mode multi
        addCcAps mepFunctionalConfig aps enable priority 7
```

```
        addCcAps mepFunctionalConfig aps enable switchingProtocol raps octet 1
addCcAps commit
exit

        setLoopBack loopBackConfig mepInstance 100
        setLoopBack loopBackConfig lbAction enable cast multi
        setLoopBack loopBackConfig lbAction enable count 10
        setLoopBack loopBackConfig lbAction enable dei disable
        setLoopBack loopBackConfig lbAction enable interval 1
        setLoopBack loopBackConfig lbAction enable priority 7
        setLoopBack loopBackConfig lbAction enable size 70
        setloopBack commit
```

Configuration on the Cisco ME 1200 NID-4

```
ProvisionPortVlanPortType
        createVlanCommand createVlanReq vlan_list 2000
createVlanCommand commit
        modifySwPort modifySWPortConfig interaface 3
        modifySwPort modifySWPortConfig mode trunk native vlan 1
        modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan_list 2000
modifySwPort commit
        modifySwPort modifySWPortConfig interaface 5
        modifySwPort modifySWPortConfig mode trunk native vlan 1
        modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan_list 2000
modifySwPort commit
exit
ProvisionMepPortType
        createMep createMepConfig mepInstance 100
        createMep createMepConfig direction DOWN
        createMep createMepConfig domain vlan
        createMep createMepConfig level 0
        createMep createMepConfig megDomain maName ERPS-128
        createMep createMepConfig megDomain megIdFormat ituMeg
        createMep createMepConfig mepId 101
        createMep createMepConfig mode MEP
        createMep createMepConfig residencePort 3
        createMep createMepConfig flow 2000
 createMep commit
       addPeerMepId peerMepConfig mepInstance 100
        addPeerMepId peerMepConfig peerMepId 100
addPeerMepId commit
        addCcAps mepFunctionalConfig mepInstance 100
        addCcAps mepFunctionalConfig cc enable priority 7
        addCcAps mepFunctionalConfig cc enable frameRate fr1s
        addCcAps mepFunctionalConfig aps enable mode multi
        addCcAps mepFunctionalConfig aps enable priority 7
        addCcAps mepFunctionalConfig aps enable switchingProtocol raps octet 1
addCcAps commit
exit
```

Loopback in Cisco ME 1200 NID-3

```
showloopBack mepRequest mepInstance 100
showloopBack commit
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.mepInstance = 100
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.dei.t = 2
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.dei.u.disable = 'DEI Disable'
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.priority = 7
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.cast.t = 2
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.cast.u.multi = 'MULTI'
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.count = 10
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.size = 70
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.interval = 1
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.mepInstance = 32
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.transactionId = 11
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.txLBM.upper = 0
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.txLBM.lower = 10
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].rcvMac = '00-3A-99-FD-47-2F'
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].received.upper = 0
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].received.lower = 10
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].outOfOrder.upper = 0
```

```
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].outOfOrder.lower = 0

 showLoopBack Commit Success!!!
```

Configuration Example: Loss Measurement–Single Ended

Consider the following topology:

TG1====(Gi1/5)NID-3(Gi1/4)====(Gi0/1ME 1200 NIDGi0/20)====(Gi1/5)NID-4(Gi1/6)====TG2

Cast: Multi

Ended: Single

Configuration on Cisco ME 1200 NID-3

```
ProvisionEVC
        addEVC evcConfiguration instance 1024
        addEVC evcConfiguration internal_vid 1024
        addEVC evcConfiguration learning enable
        addEVC evcConfiguration nni_ports GigabitEthernet_4_NNI enable
        addEVC evcConfiguration nni_vid 1024
addEVC commit
exit
ProvisionEVC
 addECE ece_configuration ece_id 1024
        addECE ece_configuration control ingress_match uni_ports GigabitEthernet_5_UNI
enable
        addECE ece_configuration control ingress_match outer_tag_match match_type tagged
        addECE ece_configuration control ingress_match outer_tag_match match_fields
vlan_id_filter specific 1024
        addECE ece_configuration control egress_outer_tag mode enabled
        addECE ece_configuration control egress_outer_tag pcp_mode fixed
        addECE ece_configuration control egress_outer_tag pcp_value 7
        addECE ece_configuration control actions class specific 7
        addECE ece_configuration control actions evc_id specific 1024
addECe commit
exit
ProvisionMepPortType
        createMep createMepConfig mepInstance 98
        createMep createMepConfig direction DOWN
        createMep createMepConfig domain EVC
        createMep createMepConfig flowId 1024
        createMep createMepConfig level 0
        createMep createMepConfig megDomain maName LM-Check
        createMep createMepConfig megDomain megIdFormat ituMeg
        createMep createMepConfig mepId  105
        createMep createMepConfig mode MEP
        createMep createMepConfig residencePort 4
createMep createMepConfig voe enable
createMep commit
       addPeerMepId peerMepConfig mepInstance 98
        addPeerMepId peerMepConfig peerMepId 106
addPeerMepId commit
        addCcAps mepFunctionalConfig mepInstance 98
        addCcAps mepFunctionalConfig cc enable priority 7
        addCcAps mepFunctionalConfig cc enable frameRate fr1s
addCcAps commit
exit
opearationsMepPortType
     setLM lmConfig mepInstance 98
        setLM lmConfig lmAction enable cast multi
        setLM lmConfig lmAction enable frameRate fr1s
        setLM lmConfig lmAction enable mode single
        setLM lmConfig lmAction enable priority 7
setLM commit
exit
```

Configuration on Cisco ME 1200 NID-4

```
ProvisionEVC
        addEVC evcConfiguration instance 1024
        addEVC evcConfiguration internal_vid 1024
        addEVC evcConfiguration learning enable
        addEVC evcConfiguration nni_ports GigabitEthernet_5_NNI enable
        addEVC evcConfiguration nni_vid 1024
addEVC commit
exit
ProvisionEVC
 addECE ece_configuration ece_id 1024
        addECE ece_configuration control ingress_match uni_ports GigabitEthernet_6_UNI
enable
        addECE ece_configuration control ingress_match outer_tag_match match_type tagged
        addECE ece_configuration control ingress_match outer_tag_match match_fields
vlan_id_filter specific 1024
        addECE ece_configuration control egress_outer_tag mode enabled
        addECE ece_configuration control egress_outer_tag pcp_mode fixed
        addECE ece_configuration control egress_outer_tag pcp_value 7
        addECE ece_configuration control actions class specific 7
        addECE ece_configuration control actions evc_id specific 1024
addECe commit
exit
ProvisionMepPortType
        createMep createMepConfig mepInstance 98
        createMep createMepConfig direction DOWN
        createMep createMepConfig domain EVC
        createMep createMepConfig flowId 1024
        createMep createMepConfig level 0
        createMep createMepConfig megDomain maName LM-Check
        createMep createMepConfig megDomain megIdFormat ituMeg
        createMep createMepConfig mepId  106
        createMep createMepConfig mode MEP
        createMep createMepConfig residencePort 5
createMep createMepConfig voe enable
createMep commit
       addPeerMepId peerMepConfig mepInstance 98
        addPeerMepId peerMepConfig peerMepId 105
addPeerMepId commit
        addCcAps mepFunctionalConfig mepInstance 98
        addCcAps mepFunctionalConfig cc enable priority 7
        addCcAps mepFunctionalConfig cc enable frameRate fr1s
addCcAps commit
exit
opearationsMepPortType
     setLM lmConfig mepInstance 98
        setLM lmConfig lmAction enable cast multi
        setLM lmConfig lmAction enable frameRate fr1s
        setLM lmConfig lmAction enable mode single
        setLM lmConfig lmAction enable priority 7
setLM commit
exit
```

Configuration on the ME 3600

```
Switch# show policy-map lm-v1024
  Policy Map lm-v1024
    Class lm-v1024
     police cir 1000000 bc 31250
       conform-action transmit
       exceed-action drop

Switch# show class-map lm-v1024
 Class Map match-all lm-v1024 (id 2)
   Match   dscp af12 (12)

Switch#

!
interface GigabitEthernet0/1
```

```
 switchport trunk allowed vlan none
 switchport mode trunk
 !
 service instance 1024 ethernet
  encapsulation dot1q 1024
  bridge-domain 1024
 !

!
interface GigabitEthernet0/20
 switchport trunk allowed vlan none
 switchport mode trunk
 service-policy input lm-v1024
 !
 service instance 1024 ethernet
  encapsulation dot1q 1024
  bridge-domain 1024
 !
```

Send 20Mbps traffic from TG2 on VLAN 1024 with DSCP set to af12

```
Switch(OpearationsMepPortType)# showLM mepRequest mepInstance 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.single = 'single'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 85
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 85
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 180123
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 0
```

To view loss measurement:

```
Switch# OpearationsMepPortType
Switch(OpearationsMepPortType)# showlm mepRequest mepInstance 98
Switch(OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 98
Switch(OpearationsMepPortType)# showlm commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.single = 'single'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 137
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 137
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 1105217
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 94

 showLM Commit Success!!!
Switch(OpearationsMepPortType)#
```

To stop traffic, do the following:

```
Switch# show policy-map int gi 0/20
 GigabitEthernet0/20

  Service-policy input: lm-v1024

    Class-map: lm-v1024 (match-all)
      2175126 packets, 287116632 bytes
      5 minute offered rate 5839000 bps, drop rate 5512000 bps
      Match:  dscp af12 (12)
      police:
        cir 1000000 bps, bc 31250 bytes
        conform-action transmit
        exceed-action drop
      conform: 122168 (packets) 16126176 (bytes)
      exceed: 2052958 (packets) 270990456 (bytes)
      conform: 331000 bps, exceed: 5512000 bps
              Input Policer:
                Policer Packets Drop: 2052958
                Policer Bytes Drop: 270990456

    Class-map: class-default (match-any)
      3606 packets, 293801 bytes
      5 minute offered rate 10000 bps, drop rate 0000 bps
      Match: any
```

To view loss measurement:

```
(OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 98
Switch(OpearationsMepPortType)# showlm commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.single = 'single'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 349
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 349
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 2052958
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 0

 showLM Commit Success!!!



Switch#OpearationsMepPortType
Switch(OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 98
Switch(OpearationsMepPortType)# showlm commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.single = 'single'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 358
```

```
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 358
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 2052958
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 0

 showLM Commit Success!!!
(OpearationsMepPortType)#
```

Configuration Example: Loss Measurement–Dual Ended

Consider the following topology:

TG1====(Gi1/5)NID-3(Gi1/4)====(Gi0/1)ME 3600(Gi0/20)====(Gi1/5)NID-4(Gi1/6)====TG2

Cast: Multi

Ended: Dual

Configuration on Cisco ME 1200 NID-3

```
ProvisionEVC
        addEVC evcConfiguration instance 1022
        addEVC evcConfiguration internal-vid 1022
        addEVC evcConfiguration learning enable
        addEVC evcConfiguration nni-ports GigabitEthernet-4-NNI enable
        addEVC evcConfiguration nni-vid 1022
addEVC commit
exit
ProvisionEVC
 addECE ece-configuration ece-id 1022
        addECE ece-configuration control ingress-match uni-ports GigabitEthernet-5-UNI
enable
        addECE ece-configuration control ingress-match outer-tag-match match-type tagged
        addECE ece-configuration control ingress-match outer-tag-match match-fields
vlan-id-filter specific 1022
        addECE ece-configuration control egress-outer-tag mode enabled
        addECE ece-configuration control egress-outer-tag pcp-mode fixed
        addECE ece-configuration control egress-outer-tag pcp-value 7
        addECE ece-configuration control actions class specific 7
        addECE ece-configuration control actions evc-id specific 1022
addECe commit
exit
ProvisionMepPortType
        createMep createMepConfig mepInstance 94
        createMep createMepConfig direction DOWN
        createMep createMepConfig domain EVC
        createMep createMepConfig flowId 1022
        createMep createMepConfig level 0
        createMep createMepConfig megDomain maName LM-Dual
        createMep createMepConfig megDomain megIdFormat ituMeg
        createMep createMepConfig mepId  102
        createMep createMepConfig mode MEP
        createMep createMepConfig residencePort 4
createMep createMepConfig voe enable
createMep commit
       addPeerMepId peerMepConfig mepInstance 94
        addPeerMepId peerMepConfig peerMepId 103
addPeerMepId commit
        addCcAps mepFunctionalConfig mepInstance 94
        addCcAps mepFunctionalConfig cc enable priority 7
        addCcAps mepFunctionalConfig cc enable frameRate fr1s
addCcAps commit
exit
opearationsMepPortType
     setLM lmConfig mepInstance 94
        setLM lmConfig lmAction enable cast multi
```

```
        setLM lmConfig lmAction enable frameRate fr1s
        setLM lmConfig lmAction enable mode dual
        setLM lmConfig lmAction enable priority 7
setLM commit
exit

ProvisionEVC
        addEVC evcConfiguration instance 1021
        addEVC evcConfiguration internal-vid 1021
        addEVC evcConfiguration learning enable
        addEVC evcConfiguration nni-ports GigabitEthernet-4-NNI enable
        addEVC evcConfiguration nni-vid 1021
addEVC commit
exit
```

Configuration on Cisco ME 1200 NID-4

```
ProvisionEVC
        addEVC evcConfiguration instance 1022
        addEVC evcConfiguration internal-vid 1022
        addEVC evcConfiguration learning enable
        addEVC evcConfiguration nni-ports GigabitEthernet-5-NNI enable
        addEVC evcConfiguration nni-vid 1022
addEVC commit
exit
ProvisionEVC
 addECE ece-configuration ece-id 1022
        addECE ece-configuration control ingress-match uni-ports GigabitEthernet-6-UNI
enable
        addECE ece-configuration control ingress-match outer-tag-match match-type tagged
        addECE ece-configuration control ingress-match outer-tag-match match-fields
vlan-id-filter specific 1022
        addECE ece-configuration control egress-outer-tag mode enabled
        addECE ece-configuration control egress-outer-tag pcp-mode fixed
        addECE ece-configuration control egress-outer-tag pcp-value 7
        addECE ece-configuration control actions class specific 7
        addECE ece-configuration control actions evc-id specific 1022
addECe commit
exit
ProvisionMepPortType
        createMep createMepConfig mepInstance 94
        createMep createMepConfig direction DOWN
        createMep createMepConfig domain EVC
        createMep createMepConfig flowId 1022
        createMep createMepConfig level 0
        createMep createMepConfig megDomain maName LM-Dual
        createMep createMepConfig megDomain megIdFormat ituMeg
        createMep createMepConfig mepId  103
        createMep createMepConfig mode MEP
        createMep createMepConfig residencePort 5
createMep createMepConfig voe enable
createMep commit
       addPeerMepId peerMepConfig mepInstance 94
        addPeerMepId peerMepConfig peerMepId 102
addPeerMepId commit
        addCcAps mepFunctionalConfig mepInstance 94
        addCcAps mepFunctionalConfig cc enable priority 7
        addCcAps mepFunctionalConfig cc enable frameRate fr1s
addCcAps commit
exit
opearationsMepPortType
     setLM lmConfig mepInstance 94
        setLM lmConfig lmAction enable cast multi
        setLM lmConfig lmAction enable frameRate fr1s
        setLM lmConfig lmAction enable mode dual
        setLM lmConfig lmAction enable priority 7
setLM commit
exit
```

Configuration on the ME 3600

```
Switch# show policy-map lm-v1022
```

```
 Policy Map lm-v1022
    Class lm-v1022
     police cir 1000000 bc 31250
       conform-action transmit
       exceed-action drop

Switch#
!
interface GigabitEthernet0/1
 switchport trunk allowed vlan none
 switchport mode trunk
!
 service instance 1022 ethernet
  encapsulation dot1q 1022
  bridge-domain 1022
 !
!
interface GigabitEthernet0/20
 switchport trunk allowed vlan none
 switchport mode trunk
 service-policy output lm-v1022
 !
 service instance 1022 ethernet
  encapsulation dot1q 1022
  bridge-domain 1022
 !
```

Send 20Mbps traffic from TG2 on VLAN 1022 with DSCP set to af11

```
Switch#ProvisionMepPortType
Switch(ProvisionMepPortType)# showMepConfig flush
Switch(ProvisionMepPortType)# showMepalar mepRequest mepInstance 94
Switch(ProvisionMepPortType)# showMepalar commit
ShowMepAlarms_Output.mepState.mepInst[0].mepInstance = 94
ShowMepAlarms_Output.mepState.mepInst[0].cLevel = false
ShowMepAlarms_Output.mepState.mepInst[0].cMeg = false
ShowMepAlarms_Output.mepState.mepInst[0].cMep = false
ShowMepAlarms_Output.mepState.mepInst[0].cAis = false
ShowMepAlarms_Output.mepState.mepInst[0].cLck = false
ShowMepAlarms_Output.mepState.mepInst[0].cSsf = false
ShowMepAlarms_Output.mepState.mepInst[0].aBlk = false
ShowMepAlarms_Output.mepState.mepInst[0].atsf = false
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].peerMepId = 102
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].cLoc = false
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].cRdi = false
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].cPeriod = false
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].cPrio = false

 showMepAlarms Commit Success!!!
```

To view loss measurement:

```
Switch# OpearationsMepPortType
Switch(OpearationsMepPortType)# showlm mepRequest mepInstance 98
Switch(OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 98
Switch(OpearationsMepPortType)# showlm commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.single = 'single'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 137
```

```
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 137
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 1105217
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 94

 showLM Commit Success!!!
Switch(OpearationsMepPortType)#

Switch#ProvisionMepPortType
Switch(ProvisionMepPortType)#showMepConfig flush
Switch(ProvisionMepPortType)#showMepalar mepRequest mepInstance 94
Switch(ProvisionMepPortType)#showMepalar commit
ShowMepAlarms_Output.mepState.mepInst[0].mepInstance = 94
ShowMepAlarms_Output.mepState.mepInst[0].cLevel = false
ShowMepAlarms_Output.mepState.mepInst[0].cMeg = false
ShowMepAlarms_Output.mepState.mepInst[0].cMep = false
ShowMepAlarms_Output.mepState.mepInst[0].cAis = false
ShowMepAlarms_Output.mepState.mepInst[0].cLck = false
ShowMepAlarms_Output.mepState.mepInst[0].cSsf = false
ShowMepAlarms_Output.mepState.mepInst[0].aBlk = false
ShowMepAlarms_Output.mepState.mepInst[0].atsf = false
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].peerMepId = 103
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].cLoc = false
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].cRdi = false
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].cPeriod = false
ShowMepAlarms_Output.mepState.mepInst[0].peerMepState[0].cPrio = false

 showMepAlarms Commit Success!!!
Switch(ProvisionMepPortType)#


Switch#OpearationsMepPortType
Switch(OpearationsMepPortType)#showlm flush
Switch(OpearationsMepPortType)#showlm mepRequest mepInstance 94
Switch(OpearationsMepPortType)#showlm commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 1
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.dual = 'dual'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 64
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 47
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 1
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 586684
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 94

 showLM Commit Success!!!

Switch#OpearationsMepPortType
Switch(OpearationsMepPortType)#showlm flush
Switch(OpearationsMepPortType)#showlm mepRequest mepInstance 94
Switch(OpearationsMepPortType)#showlm commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 1
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.dual = 'dual'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 70
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 61
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 811684
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 1
```

```
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 0

 showLM Commit Success!!!
Switch(OpearationsMepPortType)#
```

To stop traffic, do the following:

```
Service-policy output: lm-v1022

    Class-map: lm-v1022 (match-all)
      3389497 packets, 447413604 bytes
      5 minute offered rate 8626000 bps, drop rate 8126000 bps
      Match:  dscp af11 (10)
      police:
        cir 1000000 bps, bc 31250 bytes
        conform-action transmit
        exceed-action drop
      conform: 196188 (packets) 25112064 (bytes)
      exceed: 3193309 (packets) 408743552 (bytes)
      conform: 492000 bps, exceed: 7880000 bps
          Queue-limit current-queue-depth 0 bytes
              Output Queue:
                Default Queue-limit 49152 bytes
                Tail Packets Drop: 3193309
                Tail Bytes Drop: 421516788

    Class-map: class-default (match-any)
      2491 packets, 170276 bytes
      5 minute offered rate 6000 bps, drop rate 0000 bps
      Match: any
```

To view loss measurement:

```
#
Switch# OpearationsMepPortType
Switch(OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 94
Switch(OpearationsMepPortType)# showlm commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 1
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.dual = 'dual'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 262
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 262
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 3193309
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 0

 showLM Commit Success!!!


Switch# OpearationsMepPortType
Switch(OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 94
Switch(OpearationsMepPortType)# showlm commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 1
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.dual = 'dual'
```

```
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 94
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 277
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 276
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 3193309
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 0

 showLM Commit Success!!!
Switch(OpearationsMepPortType)#
```

Setting Performance Monitoring Parameters

SUMMARY STEPS

1. **ProvisionMepPortType**
2. **setPerformanceMonitoring perform-mon**{ **interval** { **dm** { **disable** | **dm_value**} | **evc** { **disable** | **evc_value**} | **lm** { **disable** | **lm_value**} } | **session** { **dm** { **disable** | **enable**} | **evc** { **disable** | **enable**} | **lm** { **disable** | **enable**} } | **storage** { **dm** { **disable** | **enable**} | **evc** { **disable** | **enable**} | **lm** { **disable** | **enable**} | **dm_binning** { **disable** | **enable** } } | **transfer** { **fixed_offset** { **disable** | **value**} | **hour** { **disable** | **value**} | **incomplete** { **disable** | **enable** } | **minute** { **disable** | **minute** } | **mode** { **all** | **disable** | **fixed** | **new**} | **random_offset** { **disable** | **random_offset**} | **status** { **disable** | **enable**} | **url** { **disable** | **enable**} } }
3. **setPerformanceMonitoring review**
4. **setPerformanceMonitoring commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables provisioning of the MEP.
Step 2	**setPerformanceMonitoring perform-mon**{ **interval** { **dm** { **disable** | **dm_value**} | **evc** { **disable** | **evc_value**} | **lm** { **disable** | **lm_value**} } | **session** { **dm** { **disable** | **enable**} | **evc** { **disable** | **enable**} | **lm** { **disable** | **enable**} } | **storage** { **dm** { **disable** | **enable**} | **evc** { **disable** | **enable**} | **lm** { **disable** | **enable**} | **dm_binning** { **disable** | **enable** } } | **transfer** { **fixed_offset** { **disable** | **value**} | **hour** { **disable** | **value**} | **incomplete** { **disable** | **enable** } | **minute** { **disable** | **minute** } | **mode** { **all** | **disable** | **fixed** | **new**} | **random_offset** {	Specify the performance monitoring parameters. • **interval—**Specifies measurement interval. ◦ **dm —**Specifies delay measurement interval in minute or disable it. The delay management ranges from 1-60 minute. ◦ **evc —**Specifies EVC in minute or disable it. The EVC ranges from 1-60 minute. ◦ **lm—**Specifies loss measurement in minute or disable it. The loss measurement ranges from 1-60 minute. • **session——**Specifies the session.

	Command or Action	Purpose
	disable | **random_offset**} | **status** { **disable** | **enable**} | **url** { **disable** | **enable**} } } **Example:**	◦ **dm** —Disable or enable intervals from previous incomplete transfers. ◦ **evc** —Disable or enable intervals from previous incomplete transfers. ◦ **lm**—Disable or enable intervals from previous incomplete transfers. • **storage**—Specifies storage. ◦ **dm** —Disable or enable intervals from previous incomplete transfers. ◦ **evc** —Disable or enable intervals from previous incomplete transfers. ◦ **lm**—Disable or enable intervals from previous incomplete transfers. ◦ **dm_binning**—Disable or enable intervals from previous incomplete transfers. • **transfer**—Enable transfer mode. ◦ **fixed-offset** —Specifies a scheduled offset value in minute or disable it. Allowed range is 1-15 minute. ◦ **hour** —Specifies scheduled hour to transfer or disable it. Allowed range is 0-23 type hour. ◦ **incomplete**—Disable or enable intervals from previous incomplete transfers. ◦ **minute**—Specifies scheduled minute to transfer or disable it. Allowed range is 0, 15, 30 or 45. ◦ **mode**—Specifies interval mode. ◦ **all**—Specifies all available interval . ◦ **disable**—Disable interval. ◦ **fixed**—Specifies fixed interval. Allowed range is 1-96. ◦ **new**—Specifies new interval since last transfer . ◦ **random_offset**—Disable or enable random offset value. Allowed range is 0-900 seconds. ◦ **status**—Disable or enable the status. ◦ **url**—Disable or enable server url.

	Command or Action	Purpose
Step 3	**setPerformanceMonitoring review** **Example:** `Switch(OperationsMepPortType)# setPerformanceMonitoring review`	Displays the performance monitoring configuration.
Step 4	**setPerformanceMonitoring commit** **Example:** `Switch(OperationsMepPortType)# setPerformanceMonitoring commit`	Sends the performance monitoring configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

Viewing Performance Monitoring Parameters

SUMMARY STEPS

1. **ProvisionMepPortType**
2. **getPerformanceMonitoring getPerfomanceMonitorParameters**
3. **getPerformanceMonitoring review**
4. **g?etPerformanceMonitoring commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables provisioning of the MEP.
Step 2	**getPerformanceMonitoring getPerfomanceMonitorParameters** **Example:** `Switch(config-controller-OperationsMepPortType)#getPerformanceMonitoring getPerfomanceMonitorParameters`	Retrieve Performance Monitor parameters

	Command or Action	Purpose
Step 3	**getPerformanceMonitoring review** **Example:** `Switch(OperationsMepPortType)# getPerformanceMonitoring review`	Displays the performance monitoring configuration.
Step 4	**g?etPerformanceMonitoring commit** **Example:** `Switch(OperationsMepPortType)# getPerformanceMonitoring commit`	Sends the performance monitoring configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(OperationsMepPortType)# exit`
	`Switch#`
		Exits the OperationsMepPortType mode.

CHAPTER 16

Configuring Performance Monitoring

Performance Monitor is a carrier Ethernet software feature which provides:

- Monitoring delay measurements
- Monitoring loss measurements
- Monitoring ECE
- Monitoring EVC
- Storing the monitored data
- Transferring the monitored data

For information on configuring EVC, see How to Configure Ethernet Virtual Circuit, on page 85.

For information on configuring MEP, see Creating MEP Configuration, on page 287.

Restrictions for Configuring Performance Monitoring

- Performance monitoring is not enabled by default for loss measurement (LM), delay measurement (DM), EVC, and ECE.

ITU-T Y.1731 Performance Monitoring in a Service Provider Network

ITU-T Y.1731 performance monitoring provides standard-based Ethernet performance monitoring that encompasses the measurement of Ethernet frame delay, frame-delay variation, and throughput as outlined in the ITU-T Y.1731 specification and interpreted by the Metro Ethernet Forum (MEF). Service providers offer service level agreements (SLAs) that describe the level of performance customers can expect for services. This document describes the Ethernet performance management aspect of SLAs.

Frame Delay and Frame-Delay Variation

The Frame Delay parameter can be used for on-demand OAM measurements of frame delay and frame-delay variation. When a maintenance end point (MEP) is enabled to generate frames with frame-delay measurement (ETH-DM) information, it periodically sends frames with ETH-DM information to its peer MEP in the same maintenance entity. Peer MEPs perform frame-delay and frame-delay variation measurements through this periodic exchange during the diagnostic interval.

An MEP requires the following specific configuration information to support ETH-DM:

- MEG level—MEG level at which the MEP exists
- Priority
- Drop eligibility—marked drop ineligible
- Transmission rate
- Total interval of ETH-DM
- MEF10 frame-delay variation algorithm

A MEP transmits frames with ETH-DM information using the TxTimeStampf information element. TxTimeStampf is the time stamp for when the ETH-DM frame was sent. A receiving MEP can compare the TxTimeStampf value with the RxTimef value, which is the time the ETH-DM frame was received, and calculate one-way delay using the formula *frame delay = RxTimef – TxTimeStampf*.

One-way frame-delay measurement (1DM) requires that clocks at both the transmitting MEP and the receiving MEPs are synchronized. Measuring frame-delay variation does not require clock synchronization and the variation can be measured using 1DM or a frame-delay measurement message (DMM) and a frame-delay measurement reply (DMR) frame combination.

If it is not practical to have clocks synchronized, only two-way frame-delay measurements can be made. In this case, the MEP transmits a frame containing ETH-DM request information and the TxTimeStampf element, and the receiving MEP responds with a frame containing ETH-DM reply information and the TxTimeStampf value copied from the ETH-DM request information.

Two-way frame delay is calculated as *frame delay = RxTimeb – TxTimeStampf*, where RxTimeb is the time that the frame with ETH-DM reply information was received. Two-way frame delay and variation can be measured using only DMM and DMR frames.

To allow more precise two-way frame-delay measurement, the MEP replying to a frame with ETH-DM request information can also include two additional time stamps in the ETH-DM reply information:

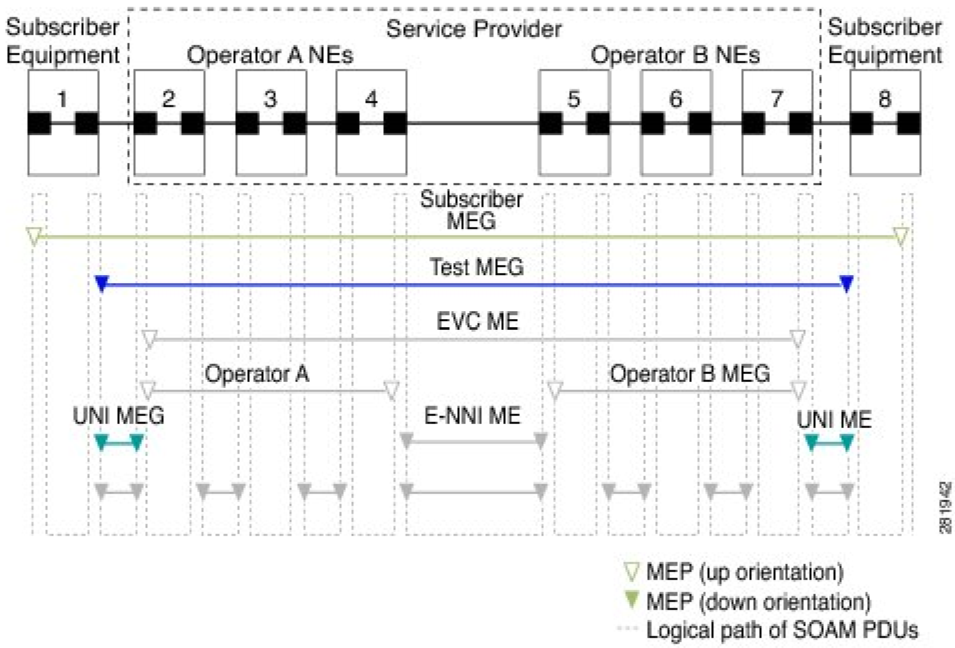
- RxTimeStampf—Time stamp of the time at which the frame with ETH-DM request information was received.
- TxTimeStampb—Time stamp of the time at which the transmitting frame with ETH-DM reply information was sent.

Note The frame-delay and frame-delay variation measurement processes are aborted when faults related to continuity and availability occur or when known network topology changes occur.

An MIP is transparent to the frames with ETH-DM information; therefore, an MIP does not require information to support the ETH-DM function.

The figure below shows a functional overview of a typical network in which Y.1731 performance monitoring is used.

Figure 10: Y.1731 Performance Monitoring



How to Configure Performance Monitoring

Provisioning the Cisco ME 1200 NID to Configure Performance Monitoring

DETAILED STEPS

	Command or Action	Purpose
Step 1	**OperationsMepPortType** **Example:** `Switch# OperationsMepPortType`	Enters performance monitoring provisioning (PM) mode.

	Command or Action	Purpose

Step 2	**OperationsMepPortType** {**clearMepStats** | **default** | **exit**| **no** | **setAis** | **setDM** | **setLM** | **setLck** | **setLinkTrace** | **setLoopBack** | **setTst** | **showAis** | **showDM** | **showLM** | **showLck** | **showLinkTrace** | **showLoopBack** | **showTst** | **updateDM** | **updateTst**}
	
	Example:
	`Switch(OperationsMepPortType)# ?`
	`  OperationsMepPortType sub-mode commands:`
	`  clearMepStats  Clear mep statistics request`
	`  default        Set a command to its defaults`
	`  exit           Exit from OperationsMepPortType sub configuration mode`
	`  no             Negate a command or set its defaults`
	`  setAis         Enable or Disable AIS request`
	`  setDM          Enable or Disable delay measurement request`
	`  setLM          Enable or Disable loss measurement request`
	`  setLck         Enable or Disable lock signal request`
	`  setLinkTrace   Enable or Disable linktrace request`
	`  setLoopBack    Enable/Disable loopback`
	`  setTst         Enable or Disable test signal request`
	`  showAis        Show AIS configuration request`
	`  showDM         Show delay measurement statistics request`
	`  showLM         Show LM statistics request`
	`  showLck        Show lock signal current configuration request`
	`  showLinkTrace  Show linktrace state and current configuration request`
	`  showLoopBack   Show loopback state and current configuration request`
	`  showTst        Show test signal statistics and current configuration`
	`request`
	`  updateDM       Update DM parameters request`
	`  updateTst      Update Tst signal request`
		Displays the supported configurations for performance monitoring.

Step 3	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The following example shows the supported PM configuration:

```
Switch(OperationsMepPortType)# ?
OperationsMepPortType sub-mode commands:
  clearMepStats  Clear mep statistics request
  default        Set a command to its defaults
  exit           Exit from OpearationsMepPortType sub configuration mode
  no             Negate a command or set its defaults
  setAis         Enable or Disable AIS request
  setDM          Enable or Disable delay measurement request
  setLM          Enable or Disable loss measurement request
  setLck         Enable or Disable lock signal request
  setLinkTrace   Enable or Disable linktrace request
  setLoopBack    Enable/Disable loopback
  setTst         Enable or Disable test signal request
  showAis        Show AIS configuration request
  showDM         Show delay measurement statistics request
  showLM         Show LM statistics request
  showLck        Show lock signal current configuration request
  showLinkTrace  Show linktrace state and current configuration request
  showLoopBack   Show loopback state and current configuration request
  showTst        Show test signal statistics and current configuration request
  updateDM       Update DM parameters request
  updateTst      Update Tst signal request
```

Configuring Performance Monitoring with Default Configuration

You can set the default performance monitoring configurations on the Cisco ME 1200 NID .

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**default**{**clearMepStats** | **setAis** | **setDM** | **setLM** |**setLck** | **setLinkTrace** | **setLoopBack** | **setTst** | **showAis** | **showDM** | **showLM** | **showLck** | **showLinkTrace** | **showLoopBack** | **showTst** | **updateDM** | **updateTst** |**exit**}
	
	Example:
	`Switch(OperationsMepPortType)# default ?`
	
	`clearMepStats  Clear mep statistics request`
	`exit           Exit from OpearationsMepPortType sub configuration mode`
	`setAis         Enable or Disable AIS request`
	`setDM          Enable or Disable delay measurement request`
	`setLM          Enable or Disable loss measurement request`
	`setLck         Enable or Disable lock signal request`
	`setLinkTrace   Enable or Disable linktrace request`
	`setLoopBack    Enable/Disable loopback`
	`setTst         Enable or Disable test signal request`
	`showAis        Show AIS configuration request`
	`showDM         Show delay measurement statistics request`
	`showLM         Show LM statistics request`
	`showLck        Show lock signal current configuration request`
	`showLinkTrace  Show linktrace state and current configuration request`
	`showLoopBack   Show loopback state and current configuration request`
	`showTst        Show test signal statistics and current configuration request`
	`updateDM       Update DM parameters request`
	`updateTst      Update Tst signal request`
		Sets the default configuration.
		• **clearMepStats—**Clears MEP statistics.
		• **setAis—**Enables or disables AIS.
		• **setDM—**Enables or disables delay measurement.
		• **setLM—**Enables or disables loss measurement.
		• **setLck—**Enables or disables lock signals
		• **setLinkTrace—**Enables or disables link traces.
		• **setLoopBack—**Enables or disables loopback
		• **setTst—**Enables or disables the test signal.
		• **showAis—**Displays AIS configuration request.
		• **showDM—**Displays delay measurement statistics.
		• **showLM—**Displays loss measurement statistics.
		• **showLck—**Displays current configured loss signals.
		• **showLinkTrace—**Displays current configured link trace state.
		• **showLoopBack—**Displays current configured loopback state.
		• **showTst—**Displays current configured test signals statistics.
		• **updateDM—**Updates the delay measurement parameters.
		• **updateTst—**Updates test signal parameters.
		• **exit—**Exits from OperationsMepPortType configuration mode.

	Command or Action	Purpose
Step 2	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuring Alarm Information Signal (AIS) on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setAis** {**commit** | **flush** | **aisConfig** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# setAis ?`
	`  aisConfig  Enable or Disable AIS request`
	`  commit     commit setAis`
	`  flush      flush all setAis commands from qu`
	`  review     review setAis commands`
		Configures alarm information signal (AIS).
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **aisConfig—**Enables or disables the AIS configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID.

Step 2	**setAis aisConfig** {**aisaction** {**enable** {**frameRate** {**fr1m** | **fr1s**} | **disable**} | **protect** {**enable** | **disable**} } | **mepInstance***instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# setAis aisConfig aisaction enable frameRate fr1m`
	`Switch(OperationsMepPortType)# setAis aisConfig aisaction enable frameRate fr1s`
	`Switch(OperationsMepPortType)# setAis aisConfig aisaction enable protect enable`
	`Switch(OperationsMepPortType)# setAis aisConfig mepInstance 20`
		Configures AIS.
		• **aisaction—**Enables or disables AIS on the Cisco ME 1200 NID .
		• **enable—**Enables lock signal configuration.
		• **disable—**Disables lock signal configuration.
		• **frameRate—**Indicates the frame rate.
		• **fr1m—**Indicates the frame rate is 1 f/m.
		• **fr1s—**Indicates the frame rate is 1 f/s.
		• **mepinstance** *instance-no*—Indicates the MEP instance. The valid values are from 1 to 128.

	Command or Action	Purpose

Step 3	**setAis review**
	
	Example:
	`Switch(OperationsMepPortType)# setAis review`
	
	`Commands in queue:`
	`setAis aisConfig aisAction enable protect enable`
	`setAis aisConfig aisAction enable frameRate fr1s`
	`setAis aisConfig aisAction enable frameRate fr1m`
	`setAis aisConfig mepInstance 20`
		Displays the AIS configuration on the Cisco ME 1200 NID .

Step 4	**setAiscommit** **Example:** `Switch(OperationsMepPortType)# setAis commit`	Sends the AIS configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to configure AIS on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# setAis aisConfig aisaction enable frameRate fr1m
Switch(OperationsMepPortType)# setAis aisConfig aisaction enable frameRate fr1s
Switch(OperationsMepPortType)# setAis aisConfig aisaction enable protect enable
Switch(OperationsMepPortType)# setAis review
Switch(OperationsMepPortType)# setAis aisConfig mepInstance 20

Commands in queue:
        setAis aisConfig aisAction enable protect enable
        setAis aisConfig aisAction enable frameRate fr1s
        setAis aisConfig aisAction enable frameRate fr1m
        setAis aisConfig mepInstance 20

Commands in queue:
        Commands in queue:
        setAis aisConfig mepInstance 2

Switch(OperationsMepPortType)# setAis commit
SetAis Output.mepResponse = 34537474

 SetAis Commit Success!!!
Switch(OperationsMepPortType)#end
```

Configuring Delay Measurement (DM) on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setDM** {**commit** | **flush** | **dmConfig** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# setDM ?`
	`  commit    commit setDM`
	`  dmConfig  Enable or Disable delay measurement request`
	`  flush     flush all setDM commands from queue`
	`  review    review setDM commands`
		Configures delay measurement.
		• **commit**—Sends the configuration to NID.
		• **flush**—Flushes all configuration from the queue.
		• **dmConfig**—Enables or disables the delay measurement configuration.
		• **review**—Displays the configuration on the Cisco ME 1200 NID .

Step 2	**setDM dmConfig** {**dmaction** {**enable** {**calculation** {**flow** | **rdtrp**} | **cast** {**mutli** | **uni mepId** *mep-Id* } | **interval** *interval-no* | **lastN** *delay-calc* | **mode** {**oneway** | **twoway**} | **priority** *priority-no* } | **disable** } | **mepInstance** *instance-no* }
	
	Example:
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable calculation flow`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable calculation rdtrp`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable cast multi`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable cast uni mepId 23`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable interval 20`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable lastN 200`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable mode oneway`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable mode twoway`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable priority 3`
	`Switch(OperationsMepPortType)# setDM dmConfig dmaction enable calculation rdtrp`
	`Switch(OperationsMepPortType)# setDM dmConfig mepInstance 1`
		Sets DM parameters
		• **dmaction**—Enables or disables DM on the Cisco ME 1200 NID .
		• **enable**—Enables delay measurement configuration.
		• **disable**—Disables delay measurement configuration.
		• **calculation**—Calculates delay.
		• **flow**—Two-way delay is calculated as round trip symmetrical flow. Far end resistance time is subtracted.
		• **rdtrp**—Two-way delay is calculated as round trip delay. Far end resistance time is *not* subtracted.
		• **cast**—Specifies transmission mode.
		• **multi**—Specifies OAM protocol data units (PDU) transmission with multicast MAC.
		• **uni**—Specifies OAM protocol data units (PDU) transmission with unicast MAC. The MAC is procured from the peer MEP MAC database.
		• **mepId** *mep-id*—Specifies Peer MEP ID for unicast MAC.
		• **interval** *interval-no*—Specifies the interval time between the PDU transmission in ms. The valid range is from 0 to 65535. The minimum value is 10ms.
		• **lastN**—Specifies the latest N delays for calculation. The valid range is from 10 to 2000.
		• **mode**—Specifies the mode of delay measurement.
		• **oneway**—Specifies mode on 1DM PDU measurement.
		• **twoway**—Specifies mode on DMM or DMR PDU.

	Command or Action	Purpose
		• **priority** *priority-no*—Priority in case of tagged OAM. In the EVC domain this is the COS-ID. The valid range is from 0 to 7. • **mepinstance** *instance-no*—Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**setDM review**
	
	Example:
	`Switch(OperationsMepPortType)# setDM review`
	
	`Commands in queue:`
	`setDM dmConfig dmAction enable mode oneWay`
	`setDM dmConfig dmAction enable interval 10`
	`setDM dmConfig dmAction enable lastN 20`
	`setDM dmConfig dmAction enable calculation flow`
	`setDM dmConfig dmAction enable calculation rdtrp`
	`setDM dmConfig dmAction enable priority 2`
	`setDM dmConfig dmAction enable calculation flow`
	`setDM dmConfig dmAction enable calculation rdtrp`
	`setDM dmConfig dmAction enable cast multi`
	`setDM dmConfig dmAction enable cast uni mepId 23`
	`setDM dmConfig dmAction enable interval 20`
	`setDM dmConfig dmAction enable priority 3`
	`setDM dmConfig mepInstance 2`
		Displays the DM configuration on the Cisco ME 1200 NID .

Step 4	**setDMcommit**
	
	Example:
	`Switch(OperationsMepPortType)# setDM commit`
	
	`SetDM Commit Success!!!`
		Sends the DM configuration to the NID.

Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to configure DM on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable calculation flow
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable calculation rdtrp
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable cast multi
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable cast uni mepId 23
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable interval 20
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable lastN 200
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable mode oneway
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable mode twoway
```

```
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable priority 3
Switch(OperationsMepPortType)# setDM dmConfig dmaction enable calculation rdtrp
Switch(OperationsMepPortType)# setDM dmConfig mepInstance 1
Switch(OperationsMepPortType)# setDM review

Commands in queue:
        setDM dmConfig dmAction enable mode oneWay
        setDM dmConfig dmAction enable interval 10
        setDM dmConfig dmAction enable lastN 20
        setDM dmConfig dmAction enable calculation flow
        setDM dmConfig dmAction enable calculation rdtrp
        setDM dmConfig dmAction enable priority 2
        setDM dmConfig dmAction enable calculation flow
        setDM dmConfig dmAction enable calculation rdtrp
        setDM dmConfig dmAction enable cast multi
        setDM dmConfig dmAction enable cast uni mepId 23
        setDM dmConfig dmAction enable interval 20
        setDM dmConfig dmAction enable priority 3
        setDM dmConfig mepInstance 2

Switch(OperationsMepPortType)# setDM commit
DM.dmConfig.mepInstance = 119
DM.dmConfig.dmAction.t = 1
DM.dmConfig.dmAction.u.enable.priority = 4
DM.dmConfig.dmAction.u.enable.cast.t = 2
DM.dmConfig.dmAction.u.enable.cast.u.multi = 'any <b z="1">test</b> element'
DM.dmConfig.dmAction.u.enable.mode.t = 2
DM.dmConfig.dmAction.u.enable.mode.u.twoWay = 'any <b z="1">test</b> element'
DM.dmConfig.dmAction.u.enable.calculation.t = 2
DM.dmConfig.dmAction.u.enable.calculation.u.flow = 'any <b z="1">test</b> elemen
t'
DM.dmConfig.dmAction.u.enable.interval = 42689
DM.dmConfig.dmAction.u.enable.lastN = 1573
DM.dmConfig.mepInstance = 119
DM.dmConfig.dmAction.t = 1
DM.dmConfig.dmAction.u.enable.priority = 0
DM.dmConfig.dmAction.u.enable.cast.t = 1
DM.dmConfig.dmAction.u.enable.cast.u.uni.mepId = 23
DM.dmConfig.dmAction.u.enable.mode.t = 1
DM.dmConfig.dmAction.u.enable.mode.u.oneWay = 'one-way'
DM.dmConfig.dmAction.u.enable.calculation.t = 1
DM.dmConfig.dmAction.u.enable.calculation.u.rdtrp = 'rdtrp'
DM.dmConfig.dmAction.u.enable.interval = 42689
DM.dmConfig.dmAction.u.enable.lastN = 1573
SetDM-Output.mepResponse = 0

Switch(OperationsMepPortType)#end
```

Configuring Loss Measurement (LM) on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setLM** {**commit** | **flush** | **lmConfig** | **review**} **Example:** `Switch(OperationsMepPortType)# setLM ?`	Configures loss measurement (LM). • **commit**—Sends the configuration to NID. • **flush**—Flushes all configuration from the queue.

	Command or Action	Purpose

	`commit    commit setLM`
	`lmConfig  Enable or Disable loss measurement request`
	`flush     flush all setLM commands from queue`
	`review    review setLM commands`
		• **lmConfig—**Enables or disables the loss measurement configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**setLM LmConfig** { **lmaction** {**enable** {**cast** {**multi** | **uni**} | **flr** *frame-interval* | **frameRate** {**fr10s** | **fr1m** | **fr1s** | **fr6h** | **fr6m**} | **mode** {**dual** | **single**} | **priority** *priority-no* } | **disable** } | **mepInstance** *instance-no* }
	
	Example:
	
	`Switch(OperationsMepPortType)# setLM lmConfig lmaction enable cast multi`
	`Switch(OperationsMepPortType)# setLM lmConfig lmaction enable cast uni`
	`Switch(OperationsMepPortType)# setLM lmConfig lmaction enable flr`
	`Switch(OperationsMepPortType)# setLM lmConfig lmaction frameRate fr10s`
	`Switch(OperationsMepPortType)# setLM lmConfig lmaction enable mode dual`
	`Switch(OperationsMepPortType)# setLM lmConfig lmaction enable priority 4`
	`Switch(OperationsMepPortType)# setLM lmConfig mepInstance 1`
		Sets LM parameters.
		• **lmaction—**Enables or disables LM on the Cisco ME 1200 NID .
		• **enable—**Enables loss measurement configuration.
		• **disable—**Disables loss measurement configuration.
		• **cast—**Specifies transmission mode.
		• **multi—**Specifies OAM protocol data units (PDU) transmission with multicast MAC.
		• **uni—**Specifies OAM protocol data units (PDU) transmission with unicast MAC. The MAC is procured from the peer MEP MAC database.
		• **flr** *frame-interval***—**Specifies the frame loss ratio interval time. The valid range is from 0 to 99.
		• **frameRate—**Specifies the LM frame rate.
		  ◦ **fr10s —**Specifies the frame rate as 10 f/s.
		  ◦ **fr1m —**Specifies the frame rate as 1 f/min.
		  ◦ **fr1s —**Specifies the frame rate as 1 f/s.
		  ◦ **fr6h —**Specifies the frame rate as 6 f/hour.
		  ◦ **fr6m —**Specifies the frame rate as 6 f/min.
		• **mode—**Specifies the mode of delay measurement.
		• **dual—**Specifies dual LM mode on CCM PDU.
		• **single—**Specifies single LM mode on LMM or LMR PDU.
		• **priority** *priority-no***—**Priority in case of tagged OAM. In the EVC domain this is the COS-ID. The valid range is from 0 to 7.
		• **mepinstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.

	Command or Action	Purpose

Step 3	**setLM review**
	
	Example:
	`Switch(OperationsMepPortType)# setLM review`
	
	`Commands in queue:`
	`setLM lmConfig lmAction enable cast multi`
	
	`setLM lmConfig lmAction enable cast uni`
	`setLM lmConfig lmAction enable flr 2`
	`setLM lmConfig lmAction enable frameRate fr10s`
	`setLM lmConfig lmAction enable mode dual`
	
	`setLM lmConfig lmAction enable priority 4`
		Displays the LM configuration on the Cisco ME 1200 NID .

Step 4	**setLMcommit**
	
	Example:
	`Switch(OperationsMepPortType)# setLM commit`
	`SetLM Commit Success!!!`
		Sends the LM configuration to the NID.

Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to configure LM on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# setLM lmConfig lmaction enable cast multi
Switch(OperationsMepPortType)# setLM lmConfig lmaction enable cast uni
Switch(OperationsMepPortType)# setLM lmConfig lmaction enable flr
Switch(OperationsMepPortType)# setLM lmConfig lmaction frameRate fr10s
Switch(OperationsMepPortType)# setLM lmConfig lmaction enable mode dual
Switch(OperationsMepPortType)# setLM lmConfig lmaction enable priority 4
Switch(OperationsMepPortType)# setLM lmConfig mepInstance 1
Switch(OperationsMepPortType)# setLM review

Commands in queue:
        setLM lmConfig lmAction enable cast multi
        setLM lmConfig lmAction enable cast uni
        setLM lmConfig lmAction enable flr 2
        setLM lmConfig lmAction enable frameRate fr10s
        setLM lmConfig lmAction enable mode dual
        setLM lmConfig lmAction enable priority 4

Switch(OperationsMepPortType)# setLM commit


Switch(OperationsMepPortType)#end
```

Configuring Lock Signal on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setLck** {**commit** | **flush** | **lckConfig** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# setLck ?`
	`commit      commit setLck`
	`flush       flush all setLck commands from queue`
	`lckConfig  Enable or Disable lock signal request`
	`review      review setLck commands`
		Configures lock signal.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **lckConfig—**Enables or disables the lock signal configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 .

Step 2	**setLck lckConfig** {**lckaction** {**enable frameRate** {**fr1m** | **fr1s**} | **disable**} | **mepInstance** *instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# setlck lckConfig lckaction enable frameRate fr1m`
	`Switch(OperationsMepPortType)# setlck lckConfig lckaction mepInstance 1`
		Sets lock signal parameters.
		• **lckaction—**Enables or disables lock signal on the Cisco ME 1200 NID .
		• **enable—**Enables lock signal configuration.
		• **frameRate—**Configures the frame rate.
		◦ **fr1m—**Specifies frame rate as 1 f/m.
		◦ **fr1s—**Specifies frame rate as 1 f/s.
		• **disable—**Disables lock signal configuration.
		• **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**setlck review**
	
	Example:
	`Switch(OperationsMepPortType)# setlck review`
	
	`Commands in queue:`
	`        setLck lckConfig lckAction enable frameRate fr1m`
	`        setLck lckConfig mepInstance 1`
		Displays the lock signal configuration on the Cisco ME 1200 NID .

Step 4	**setlckcommit** **Example:** `Switch(OperationsMepPortType)# setlck commit`	Sends the lock signal configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to configure lock signal on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# setlck lckConfig lckaction enable frameRate frm1
Switch(OperationsMepPortType)# setlck lckConfig lckaction mepInstance 1
Switch(OperationsMepPortType)# setlck review

Commands in queue:
        setLck lckConfig lckAction enable frameRate fr1m
        setLck lckConfig mepInstance 1

Switch(OperationsMepPortType)# setlck commit
SetLck-Output.mepResponse = 0
SetLck Commit Success!!!
Switch(OperationsMepPortType)#end
```

Configuring LoopBack on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setLoopBack** {**commit** | **flush** | **loopBackConfig** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# setLoopBack ?`
	`  commit           commit setLoopBack`
	`  flush          flush all setLoopBack commands from queue`
	`  loopBackConfig  Enable/Disable loopback`
	`  review           review setLoopBack commands`
		Configures loopback.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **loopBackConfig—**Enables or disables the loopback configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**setLoopBack loopBackConfig** {**lbAction** {**enable** {**cast** {**multi** | **uni** {**destination** {**macAddress** *target-MAC* | **mepid** *mep-id*} } } | **count** *count-no* | **dei** { **enable** | **disable**} | **interval** *interval* | **priority** *priority-no* | **size** *bytes*} | **disable**} | **mepInstance** *instance-no*}	Sets loopback parameters. • **lbaction—**Enables or disables loop back on the Cisco ME 1200 NID . • **enable—**Enables loop back trace configuration.

<table>
<tr><th></th><th>Command or Action</th><th>Purpose</th></tr>
<tr><td></td><td>

Example:

<pre>
Switch(-OperationsMepPortType)# setLoopBack
loopbackConfig lbaction enable cast multi
Switch(OperationsMepPortType)# setLoopBack
loopbackConfig lbaction enable cast uni destination
 macAddress mac1
Switch(OperationsMepPortType)# setLoopBack
loopbackConfig lbaction enable cast unidestination
mepId 3
Switch(OperationsMepPortType)# setLoopBack
loopbackConfig lbaction enable count 345
Switch(OperationsMepPortType)# setLoopBack
loopbackConfig lbaction enable dei enable
Switch(OperationsMepPortType)# setLoopBack
loopbackConfig lbaction enable interval 20
Switch(OperationsMepPortType)# setLoopBack
loopbackConfig lbaction enable priority 7
Switch(OperationsMepPortType)# setLoopBack
loopbackConfig lbaction enable size 1400
Switch(OperationsMepPortType)# setLoopBack
loopbackConfig mepInstance 125
</pre>
</td><td>

cast—Specifies the type of loop back configuration.
multi—Specifies OAM protocol data units (PDU) transmission with multicast MAC.
uni—Specifies OAM protocol data units (PDU) transmission with unicast MAC. The MAC is procured from the peer MEP MAC database.
destination—Specifies the target peer MEP.
macAddress target-MAC—Specifies the MAC address for LT in MEP.
mepId mep-id—Specifies Peer MEP ID. The valid range is from 0 to 8191.
dei—Specifies drop eligible indicator for tagged OAM.
enable—Enables drop eligible indicator configuration.
disable—Disables drop eligible indicator configuration.
count count-no—Specifies the number of loop back PDU sent in a single loop test .
interval interval-no—Specifies the interval time between the PDU transmission in ms. The valid range is from 0 to 65535. The minimum value is 10ms.
priority priority-no—Specifies the priority for tagged OAM. In EVC domain, it indicates the COS-ID. The valid range is from 0 to 7.
size frames—Specifies the number of bytes. The valid range is from 1 to 1400.
disable—Disables loop back configuration.
mepInstance instance-no—Indicates the MEP instance. The valid values are from 1 to 128.

</td></tr>
<tr><td>Step 3</td><td>
setloopback review

Example:
<pre>
Switch(OperationsMepPortType)# setloopback review
Commands in queue:
        setLoopBack loopBackConfig lbAction enable
cast multi
        setLoopBack loopBackConfig lbAction enable
cast uni destination macAddress mac1
        setLoopBack loopBackConfig lbAction enable
cast uni destination mepId 3
        setLoopBack loopBackConfig lbAction enable
count 345
        setLoopBack loopBackConfig lbAction enable
dei enable
</pre>
</td><td>Displays the loop back configuration on the Cisco ME 1200 NID .</td></tr>
</table>

	Command or Action	Purpose

	`setLoopBack loopBackConfig lbAction enable interval 20`
	`setLoopBack loopBackConfig lbAction enable priority 7`
	`setLoopBack loopBackConfig lbAction enable size 1400`
	`setLoopBack loopBackConfig mepInstance 125`	

Step 4	**setlckcommit** **Example:** `Switch(OperationsMepPortType)# setloopback commit`	Sends the loop back configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to configure loop back on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# setLoopBack loopbackConfig lbaction enable cast multi
Switch(OperationsMepPortType)# setLoopBack loopbackConfig lbaction enable cast uni destination
 macAddress mac1
Switch(OperationsMepPortType)# setLoopBack loopbackConfig lbaction enable cast unidestination
 mepId 3
Switch(OperationsMepPortType)# setLoopBack loopbackConfig lbaction enable count 345
Switch(OperationsMepPortType)# setLoopBack loopbackConfig lbaction enable dei enable
Switch(OperationsMepPortType)# setLoopBack loopbackConfig lbaction enable interval 20
Switch(OperationsMepPortType)# setLoopBack loopbackConfig lbaction enable priority 7
Switch(OperationsMepPortType)# setLoopBack loopbackConfig lbaction enable size 1400
Switch(OperationsMepPortType)# setLoopBack loopbackConfig mepInstance 125
Switch(OperationsMepPortType)# setsetloopback review

Commands in queue:
        setLoopBack loopBackConfig lbAction enable cast multi
        setLoopBack loopBackConfig lbAction enable cast uni destination macAddre
ss mac1
        setLoopBack loopBackConfig lbAction enable cast uni destination mepId 3
        setLoopBack loopBackConfig lbAction enable cast uni destination mepId 3
        setLoopBack loopBackConfig lbAction enable count 345
        setLoopBack loopBackConfig lbAction enable dei enable
        setLoopBack loopBackConfig lbAction enable interval 20
        setLoopBack loopBackConfig lbAction enable priority 7
        setLoopBack loopBackConfig lbAction enable size 1400

Switch(OperationsMepPortType)# setsetloopback commit
SetLoopBack-Output.mepResponse = 34275330


 SetLoopBack Commit Success!!!
Switch(OperationsMepPortType)#end
```

Configuring Link Trace on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setLinkTrace** {**commit** | **flush** | **linkTrace** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# setLinkTrace ?`
	`commit      commit setLinkTrace`
	`flush       flush all setLinkTrace commands from queue`
	`linkTrace   Enable or Disable linktrace request`
	`review      review setLinkTrace commands`
		Configures link trace.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **linkTrace—**Enables or disables the link trace configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**setLinkTrace linkTrace** {**ltAction** {**enable** {**destination** {**macAddress** *target-MAC* | **mepId** *mep-id*} | **priority** *priority-no* | **ttl** *ttl-time* **disable**}} | **mepInstance** *instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# setlinkTrace linkTrace ltkaction enable destination macAddress mac1`
	`Switch(OperationsMepPortType)# setlinkTrace linkTrace ltkaction enable destination mepId 3`
	`Switch(OperationsMepPortType)# setlinkTrace linkTrace ltkaction enable priority 2`
	`Switch(OperationsMepPortType)# setlinkTrace linkTrace ltkaction enable ttl 3`
		Sets link trace parameters.
		• **ltaction—**Enables or disables link trace on the Cisco ME 1200 NID.
		• **enable—**Enables link trace configuration.
		• **destination—**Specifies the target peer MEP.
		◦ **macAddress** *target-MAC***—**Specifies the link trace MAC address for LT in MEP.
		◦ **mepId** *mep-id***—**Specifies Peer MEP ID for link trace. The valid range is from 0 to 8191.
		• **priority** *priority-no***—**Specifies the priority for tagged OAM. In EVC domain, it indicates the COS-ID. The valid range is from 0 to 7.
		• **ttl** *ttl-time***—**Specifies the time to live. The valid range is from 1 to 999.
		• **disable—**Disables link trace signal configuration.
		• **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.

	Command or Action	Purpose
Step 3	**setLinkTrace review** **Example:** `Switch(OperationsMepPortType)# setlinkTrace review`	Displays the link trace configuration on the Cisco ME 1200 NID .
Step 4	**setlckcommit** **Example:** `Switch(OperationsMepPortType)# setlinkTrace commit`	Sends the link trace configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to configure link trace on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# setlinkTrace linkTrace ltkaction enable destination macAddress
 mac1
Switch(OperationsMepPortType)# setlinkTrace linkTrace ltkaction enable destination mepId 3
Switch(OperationsMepPortType)# setlinkTrace linkTrace ltkaction enable priority 2
Switch(OperationsMepPortType)# setlinkTrace linkTrace ltkaction enable ttl 3
Switch(OperationsMepPortType)# setlinkTrace review


Switch(OperationsMepPortType)# setlinkTrace commit
 SetLinkTrace-Output.mepResponse = 34340866

 SetLinkTrace Commit Success!!!
Switch(OperationsMepPortType)#end
```

Configuring Test Signal on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setTst** {**commit** | **flush** | **tstConfig** | **review**}	Configures test signal.

	Command or Action	Purpose

	Example:
	
	`Switch(OperationsMepPortType)# `**`setTst ?`**
	`commit     commit setTst`
	`flush      flush all setTst commands from queue`
	`review     review setTst commands`
	`tstConfig  Enable or Disable test signal request`
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **tstConfig—**Enables or disables the test signal configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID.

Step 2	**setTst tstConfig** {**dei** {**enable** | **disable**} | **mepId** *mep-Id* | **mepInstance** *mep-instance* | **pattern** {**allOne** | **allZero** | **oneZero**} | **priority** *priority-no* | **rate** *bit-rate* | **sequence** {**enable** | **disable**} | **size** *frames*} **Example:** `Switch(OperationsMepPortType)# `**`setTst tstConfig dei enable`** `Switch(OperationsMepPortType)# `**`setTst tstConfig mepid 2`** `Switch(OperationsMepPortType)# `**`setTst tstConfig mepinstance 2`** `Switch(OperationsMepPortType)# `**`setTst tstConfig pattern allOne`** `Switch(OperationsMepPortType)# `**`setTst tstConfig pattern allZero`** `Switch(OperationsMepPortType)# `**`setTst tstConfig sequence enable`** `Switch(OperationsMepPortType)# `**`setTst tstConfig rate 400`** `Switch(OperationsMepPortType)# `**`setTst tstConfig size 45`**	Sets test signal parameters. • **dei—**Specifies drop eligible indicator for tagged OAM. • **enable—**Enables drop eligible indicator configuration. • **disable—**Disables drop eligible indicator configuration. • **mepId** *mep-instance***—**Specifies Peer MEP ID. The valid range is from 0 to 8191. • **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128. • **priority** *priority-no***—**Specifies the priority for tagged OAM. In EVC domain, it indicates the COS-ID. The valid range is from 0 to 7. • **pattern —**Specifies the sequence number is test PDU. • **allOne—**Specifies the test pattern to all one. • **allZero—**Specifies the test pattern to all zero. • **oneZero—**Specifies the test pattern to one zero. • **rate** *bit-rate***—**Specifies the test frame transmission rate in Megabits per second. The valid range is from 1 to 1518. • **sequence—**Enables or disables the sequence in test PDU. • **size** *frames***—**Specifies the test pattern size in frames. The valid range is from 1 to 1518.

Step 3	**setTst review**
	
	Example:
	`Switch(-OperationsMepPortType)# `**`setTst review`**
	`Commands in queue:`
	`        setTst tstConfig dei enable`
	`        setTst tstConfig mepId 2`
	`        setTst tstConfig mepInstance 2`
	`        setTst tstConfig pattern allOne`
	`        setTst tstConfig pattern allZero`
	`        setTst tstConfig priority 5`
	`        setTst tstConfig pattern allZero`
		Displays the test signal configuration on the Cisco ME 1200 NID .

	Command or Action	Purpose
	`setTst tstConfig rate 400` `setTst tstConfig size 45`	
Step 4	**setTstcommit** **Example:** `Switch(OperationsMepPortType)# ` **`setTst commit`**	Sends the link trace configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# ` **`exit`**	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to configure test signal on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# setTst tstConfig dei enable
Switch(OperationsMepPortType)# setTst tstConfig mepid 2
Switch(OperationsMepPortType)# setTst tstConfig mepinstance 2
Switch(OperationsMepPortType)# setTst tstConfig pattern allOne
Switch(OperationsMepPortType)# setTst tstConfig pattern allZero
Switch(OperationsMepPortType)# setTst tstConfig rate 400
Switch(OperationsMepPortType)# setTst tstConfig sequence enable
Switch(OperationsMepPortType)# setTst tstConfig size 45

Switch(OperationsMepPortType)# setTst review
Commands in queue:
        setTst tstConfig dei enable
        setTst tstConfig mepId 2
        setTst tstConfig mepInstance 2
        setTst tstConfig pattern allOne
        setTst tstConfig pattern allZero
        setTst tstConfig priority 5
        setTst tstConfig pattern allZero
        setTst tstConfig rate 400
        setTst tstConfig size 45

Switch(OperationsMepPortType)# setTst commit
SetTst-Output.mepResponse = 34471938
SetTst Commit Success!!!
Switch(OperationsMepPortType)#end
```

Viewing Alarm Information Signal (AIS) on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showAis** {**commit** | **flush** | **mepRequest** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# `**`showAis ?`**
	`  commit      commit showAis`
	`  flush      flush all showAis commands from queue`
	
	`  mepRequest  Show AIS configuration request`
	`  review      review showAis commands`
		Displays alarm information signal configuration.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **mepRequest—**Displays the alarm configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**showAis mepRequest** {**all** | **mepInstance** *instance-no*} **Example:** `Switch(OperationsMepPortType)# `**`showAis mepRequest all`** `Switch(OperationsMepPortType)# `**`showAis mepRequest mepInstance 120`**	• **all—**Displays AIS configuration for all MEPs on the Cisco ME 1200 NID . • **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**showAis review**
	
	Example:
	`Switch(OperationsMepPortType)# `**`showAis review`**
	
	`Commands in queue:`
	`        showAis mepRequest all`
	`        showAis mepRequest mepInstance 120`
		Displays the configuration on the Cisco ME 1200 NID.

Step 4	**showAis commit** **Example:** `Switch(OperationsMepPortType)# `**`showAis commit`**	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# `**`exit`**	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to display the AIS on the Cisco ME 1200 NID:

```
Switch(OperationsMepPortType)# showAis mepRequest all
Switch(OperationsMepPortType)# showAis mepRequest mepInstance 120
Switch(OperationsMepPortType)# showAis review

Commands in queue:
        showAis mepRequest all
        showAis mepRequest mepInstance 120

Switch(OperationsMepPortType)# showAis commit
Ais_Output.aisInfo.mepInst[0].config.mepInstance = 100
```

```
ShowAis_Output.aisInfo.mepInst[0].config.frameRate.t = 2
ShowAis_Output.aisInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowAis_Output.aisInfo.mepInst[0].config.protect.t = 1
ShowAis_Output.aisInfo.mepInst[0].config.protect.u.enable = 'enable'

 showAis Commit Success!!!
Switch(OperationsMepPortType)# end
```

Viewing Delay Measurement (DM) Statistics on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showDM** {**commit** | **flush** | **mepRequest** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# showDM ?`
	`  commit      commit showDM`
	`  flush       flush all showDM commands from queue`
	`  mepRequest  Show delay measurement statistics request`
	`  review      review showDM commands`
		Displays delay measurement (DM).
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **mepRequest—**Displays the configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**showDM mepRequest** {**all** | **mepInstance** *instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# showDM mepRequest all`
	
	`Switch(OperationsMepPortType)# showDM mepRequest mepInstance 100`
		• **all—**Displays DM configuration for all MEPs on the Cisco ME 1200 NID .
		• **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**showDM review**
	
	Example:
	`Switch(OperationsMepPortType)# showDM review`
	`Commands in queue:`
	`        showDM mepRequest all`
	`        showDM mepRequest all`
	`        showDM mepRequest mepInstance 100`
		Displays the configuration on the Cisco ME 1200 NID .

Step 4	**showDM commit** **Example:** `Switch(OperationsMepPortType)# showDM commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to display the delay measurement statistics on the Cisco ME 1200 NID:

```
Switch(OperationsMepPortType)# showDM mepRequest all
Switch(OperationsMepPortType)# showDM mepRequest mepInstance 100
Switch(OperationsMepPortType)# showDM review
Commands in queue:
        showDM mepRequest all
        showDM mepRequest all
        showDM mepRequest mepInstance 100

Switch(OperationsMepPortType)# showDM commit
ShowDM_Output.dmInfo.mepInst[0].config.mepInstance = 98
ShowDM_Output.dmInfo.mepInst[0].config.priority = 7
ShowDM_Output.dmInfo.mepInst[0].config.cast.t = 1
ShowDM_Output.dmInfo.mepInst[0].config.cast.u.uni.mepId = 106
ShowDM_Output.dmInfo.mepInst[0].config.mode.t = 2
ShowDM_Output.dmInfo.mepInst[0].config.mode.u.twoWay = 'two-way'
ShowDM_Output.dmInfo.mepInst[0].config.txMode.t = 1
ShowDM_Output.dmInfo.mepInst[0].config.txMode.u.standardize = 'standardize'
ShowDM_Output.dmInfo.mepInst[0].config.calculation.t = 1
ShowDM_Output.dmInfo.mepInst[0].config.calculation.u.rdtrp = 'rdtrp'
ShowDM_Output.dmInfo.mepInst[0].config.interval = 10
ShowDM_Output.dmInfo.mepInst[0].config.lastN = 10
ShowDM_Output.dmInfo.mepInst[0].config.unit.t = 2
ShowDM_Output.dmInfo.mepInst[0].config.unit.u.us = 'micro seconds'
ShowDM_Output.dmInfo.mepInst[0].config.syncronized.t = 2
ShowDM_Output.dmInfo.mepInst[0].config.syncronized.u.disable = 'Disable'
ShowDM_Output.dmInfo.mepInst[0].config.overflowReset.t = 1
ShowDM_Output.dmInfo.mepInst[0].config.overflowReset.u.keep = 'keep'
ShowDM_Output.dmInfo.mepInst[0].state.mepInstance = 106
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.tx = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.rxTimeout = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.rx = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.rxError = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.avgTotal = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.avgLastN = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.min = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.max = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.avgVariationTotal = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.avgVariationLastN = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.minVar = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.maxVar = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.F_to_N.overflow = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.tx = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.rxTimeout = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.rx = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.rxError = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.avgTotal = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.avgLastN = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.min = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.max = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.avgVariationTotal = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.avgVariationLastN = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.minVar = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.maxVar = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.oneWay.N_to_F.overflow = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.tx = 793
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.rxTimeout = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.rx = 793
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.rxError = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.avgTotal = 17
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.avgLastN = 17
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.min = 17
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.max = 18
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.avgVariationTotal = 0
```

```
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.avgVariationLastN = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.minVar = 0
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.maxVar = 1
ShowDM_Output.dmInfo.mepInst[0].state.mode.twoWay.overflow = 0
 showDM Commit Success!!!

Switch(OperationsMepPortType)# end
```

Viewing Loss Measurement (LM) Statistics on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showLM** {**commit** | **flush** | **mepRequest** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# showLM ?`
	`  commit       commit showLM`
	`  flush        flush all showLM commands from queue`
	`  mepRequest   Show LM statistics request`
	`  review       review showLM commands`
		Displays loss measurement configuration.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **mepRequest—**Displays the configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID.

Step 2	**showLM mepRequest** {**all** | **mepInstance** *instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# showLM mepRequest all`
	`Switch(OperationsMepPortType)# showLM mepRequest mepInstance 100`
		• **all—**Displays LM statistics for all MEPs on the Cisco ME 1200 NID.
		• **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**showLM review**
	
	Example:
	`Switch(OperationsMepPortType)# showLM review`
	`Commands in queue:`
	`        showLM mepRequest all`
	`        showLM mepRequest mepInstance 100`
		Displays the configuration on the Cisco ME 1200 NID.

Step 4	**showLM commit** **Example:** `Switch(OperationsMepPortType)# showLM commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to display the loss measurement statistics on the Cisco ME 1200 NID:

```
Switch(OperationsMepPortType)# showLM mepRequest all
Switch(OperationsMepPortType)# showLM mepRequest mepInstance 100
Switch(OperationsMepPortType)# showLM review

CCommands in queue:
        showLM mepRequest all
        showLM mepRequest mepInstance 100

Switch(OperationsMepPortType)# showLM commit
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.priority = 7
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.cast.u.multi = 'multi'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.t = 2
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.mode.u.single = 'single'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.t = 3
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.frameRate.u.fr1s = 'fr1s'
ShowLM_Output.lossMeasurentInfo.mepInst[0].config.flr = 5
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.mepInstance = 98
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.tx = 137
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.rx = 137
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearCount = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farCount = 1105217
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.nearRatio = 0
ShowLM_Output.lossMeasurentInfo.mepInst[0].state.farRatio = 94
 showLM Commit Success!!!

Switch(OperationsMepPortType)# exit
```

Viewing Lock Signal on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showlck** {**commit** | **flush** | **mepRequest** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# showAis ?`
	`  commit      commit showLck`
	`  flush       flush all showLck commands from queue`
	`  mepRequest  Show lock signal current configuration request`
	`  review      review showLck commands`
		Displays lock signal information.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **mepRequest—**Displays the configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

	Command or Action	Purpose

Step 2	**showlck mepRequest** {**all** | **mepInstance** *instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# showlck mepRequest all`
	`Switch(OperationsMepPortType)# showlck mepRequest mepInstance 20`
		• **all**—Displays lock signal configuration for all MEPs on the Cisco ME 1200 NID .
		• **mepInstance** *instance-no*—Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**showlck review**
	
	Example:
	`Switch(OperationsMepPortType)# showlck review`
	`Commands in queue:`
	`showLck mepRequest all`
	`showLck mepRequest mepInstance 20`
		Displays the configuration on the Cisco ME 1200 NID .

Step 4	**setlck commit** **Example:** `Switch(OperationsMepPortType)# showlck commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to display the lock signal on the Cisco ME 1200 NID:

```
Switch(OperationsMepPortType)# showlck mepRequest all
Switch(OperationsMepPortType)# showlck mepRequest mepInstance 20
Switch(OperationsMepPortType)# showlck review

Commands in queue:
        showLck mepRequest all
        showLck mepRequest mepInstance 20

Switch(OperationsMepPortType)# showlck commit
SetLck-Output.mepResponse = 0

 SetLck Commit Success!!!
Switch(OperationsMepPortType)# end
```

Viewing Loopback State on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showLoopBack** {**commit** | **flush** | **mepRequest** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# showLoopBack ?`
	`   commit      commit showLoopBack`
	`   flush       flush all showLoopBack commands from queue`
	`   mepRequest  Show loopback state and current configuration request`
	`   review      review showLoopBack commands`
		Display loopback information.
		• **commit**—Sends the configuration to NID.
		• **flush**—Flushes all configuration from the queue.
		• **mepRequest**—Displays the configuration.
		• **review**—Displays the configuration on the Cisco ME 1200 NID .

Step 2	**showLoopBack mepRequest** {**all** | **mepInstance** *instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# showLoopBack mepRequest all`
	`Switch(OperationsMepPortType)# showLoopBack mepRequest mepInstance 30`
		• **all**—Displays loopback configuration for all MEPs on the Cisco ME 1200 NID.
		• **mepInstance** *instance-no*—Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**showLoopBack review**
	
	Example:
	`Switch(OperationsMepPortType)# showLoopBack review`
	
	`Commands in queue:`
	`        showLoopBack mepRequest all`
	`        showLoopBack mepRequest mepInstance 30`
		Displays the configuration on the Cisco ME 1200 NID .

Step 4	**showLoopBack commit** **Example:** `Switch(OperationsMepPortType)# showLoopBack commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to display the loop back state on the Cisco ME 1200 NID:

```
Switch(OperationsMepPortType)# showLoopBack mepRequest all
Switch(OperationsMepPortType)# showLoopBack mepRequest mepInstance 30
Switch(OperationsMepPortType)# showLoopBack review

Commands in queue:
        showLoopBack mepRequest all
        showLoopBack mepRequest mepInstance 30

Switch(OperationsMepPortType)# showLoopBack commit
```

```
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.mepInstance = 100
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.dei.t = 2
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.dei.u.disable = 'DEI Disable'
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.priority = 7
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.cast.t = 2
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.cast.u.multi = 'MULTI'
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.count = 10
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.size = 70
ShowLoopBack_Output.loopbackInfo.mepInst[0].config.interval = 1
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.mepInstance = 32
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.transactionId = 11
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.txLBM.upper = 0
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.txLBM.lower = 10
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].rcvMac = '00-3A-99-FD-47-2F'
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].received.upper = 0
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].received.lower = 10
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].outOfOrder.upper = 0
ShowLoopBack_Output.loopbackInfo.mepInst[0].state.reply[0].outOfOrder.lower = 0

Switch(OperationsMepPortType)# exit
```

Viewing Link Trace State on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showLinkTrace** {**commit** | **flush** | **mepRequest** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# showLinkTrace ?`
	`  commit       commit showLinkTrace`
	`  flush        flush all showLinkTrace commands from queue`
	`  mepRequest   Show linktrace state and current configuration request`
	`  review       review showLinkTrace commands`
		Displays link trace configuration.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **mepRequest—**Displays the configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**showLinkTrace mepRequest** {**all** | **mepInstance** *instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# showLinkTrace mepRequest all`
	`Switch(OperationsMepPortType)# showLinkTrace mepRequest mepInstance 40`
		• **all—**Displays link trace state configuration for all MEPs on the Cisco ME 1200 NID .
		• **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**showLinkTrace review**
	
	Example:
	`Switch(OperationsMepPortType)# showLinkTrace review`
	
	`Commands in queue:`
	`        showLinkTrace mepRequest all`
	`        showLinkTrace mepRequest mepInstance 120`
		Displays the configuration on the Cisco ME 1200 NID .

	Command or Action	Purpose
Step 4	**showLinkTrace commit** **Example:** `Switch(OperationsMepPortType)# showLinkTrace commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to display the link trace state on the Cisco ME 1200 NID:

```
Switch(OperationsMepPortType)# showLinkTrace mepRequest all
Switch(OperationsMepPortType)# showLinkTrace mepRequest mepInstance 40
Switch(OperationsMepPortType)# showLinkTrace review

Commands in queue:
        showLinkTrace mepRequest all
        showLinkTrace mepRequest mepInstance 40

Switch(OperationsMepPortType)# showLinkTrace commit
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].config.mepInstance = 100
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].config.priority = 7
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].config.mepId = 101
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].config.macAddress = '00-00-00-00-00-00'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].config.ttl = 1
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].transactionId = 1
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].ttl = 0
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].mode.t = 1
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].mode.u.MEP = 'MEP'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].direction.t = 2
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].direction.u.DOWN = 'DOWN'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].forwarded.t = 2
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].forwarded.u.NO = 'Not
forwarded'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].relay = 1
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].lastMac = '00-3A-99-FD-4A-53'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[0].reply[0].nextMac = '00-3A-99-FD-47-2F'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].transactionId = 2
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].ttl = 0
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].mode.t = 1
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].mode.u.MEP = 'MEP'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].direction.t = 2
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].direction.u.DOWN = 'DOWN'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].forwarded.t = 2
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].forwarded.u.NO = 'Not
forwarded'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].relay = 1
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].lastMac = '00-3A-99-FD-4A-53'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[1].reply[0].nextMac = '00-3A-99-FD-47-2F'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].transactionId = 3
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].ttl = 0
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].mode.t = 1
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].mode.u.MEP = 'MEP'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].direction.t = 2
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].direction.u.DOWN = 'DOWN'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].forwarded.t = 2
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].forwarded.u.NO = 'Not
forwarded'
```

```
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].relay = 1
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].lastMac = '00-3A-99-FD-4A-53'
ShowLinkTrace_Output.linkTraceInfo.mepInst[0].state[2].reply[0].nextMac = '00-3A-99-FD-47-2F'

 showLinkTrace Commit Success!!!

Switch(OperationsMepPortType)# end
```

Viewing Test Signal Statistics on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showTst** {**commit** | **flush** | **mepRequest** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# showTst ?`
	`  commit      commit showTst`
	`  flush       flush all showTst commands from queue`
	`  mepRequest  Show test signal statistics and current configuration request`
	`  review      review showTst commands`
		Displays test signal statistics.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **mepRequest—**Displays the configuration.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**showTst mepRequest** {**all** | **mepInstance** *instance-no*}
	
	Example:
	`Switch(OperationsMepPortType)# showTst mepRequest all`
	`Switch(OperationsMepPortType)# showTst mepRequest mepInstance 50`
		• **all—**Displays test signal statistics configuration for all MEPs on the Cisco ME 1200 NID.
		• **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.

Step 3	**showTst review**
	
	Example:
	`Switch(OperationsMepPortType)# showTst review`
	
	`Commands in queue:`
	`        showTst mepRequest all`
	`        showTst mepRequest mepInstance 50`
		Displays the configuration on the Cisco ME 1200 NID .

Step 4	**showTstcommit** **Example:** `Switch(OperationsMepPortType)# showTst commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to display the test signal statistics on the Cisco ME 1200 NID:

```
Switch(OperationsMepPortType)# showTst mepRequest all
Switch(OperationsMepPortType)# showTst mepRequest mepInstance 120
Switch(OperationsMepPortType)# showTst review

Commands in queue:
        showTst mepRequest all
        showTst mepRequest mepInstance 50

Switch(OperationsMepPortType)# showTst commit
ShowTst_Output.tstInfo.mepInst[0].config.mepInstance = 100
ShowTst_Output.tstInfo.mepInst[0].config.dei.t = 2
ShowTst_Output.tstInfo.mepInst[0].config.dei.u.disable = 'Disable'
ShowTst_Output.tstInfo.mepInst[0].config.priority = 7
ShowTst_Output.tstInfo.mepInst[0].config.mepId = 101
ShowTst_Output.tstInfo.mepInst[0].config.rate = 1000
ShowTst_Output.tstInfo.mepInst[0].config.size = 64
ShowTst_Output.tstInfo.mepInst[0].config.pattern.t = 1
ShowTst_Output.tstInfo.mepInst[0].config.pattern.u.allZero = 'all-zero'
ShowTst_Output.tstInfo.mepInst[0].config.sequence.t = 1
ShowTst_Output.tstInfo.mepInst[0].config.sequence.u.enable = 'Enable'
ShowTst_Output.tstInfo.mepInst[0].config.Tx.t = 1
ShowTst_Output.tstInfo.mepInst[0].config.Tx.u.enable = 'Enable'
ShowTst_Output.tstInfo.mepInst[0].config.Rx.t = 1
ShowTst_Output.tstInfo.mepInst[0].config.Rx.u.enable = 'Enable'
ShowTst_Output.tstInfo.mepInst[0].state.txFrameCount.upper = 0
ShowTst_Output.tstInfo.mepInst[0].state.txFrameCount.lower = 241803
ShowTst_Output.tstInfo.mepInst[0].state.rxFrameCount.upper = 0
ShowTst_Output.tstInfo.mepInst[0].state.rxFrameCount.lower = 0
ShowTst_Output.tstInfo.mepInst[0].state.rxRate = 0
ShowTst_Output.tstInfo.mepInst[0].state.testTime = 162
 showTst Commit Success!!!

Switch(OperationsMepPortType)# end
```

Updating Delay Measurement (DM) on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**updateDM** {**commit** | **flush** | **updateDmConfig** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# updateDM ?`
	`  commit          commit updateDM`
	`  flush           flush all updateDM commands from`
	`queue`
		Updates delay measurement (DM).
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **updateDmConfig—**Updates the delay measurement parameters.

	Command or Action	Purpose
	`review          review updateDM commands` `updateDmConfig  Update DM parameters request`	• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**updateDM updateDmConfig** {**mepInstance** *instance-no* | **update** {**overflowReset** {**keep** | **reset**} | **syncronized** {**enable** | **disable**} | **txMode** {**proprietary** | **standardize**} | **unit** {**ns** | **us**}}}
	
	Example:
	`Switch(OperationsMepPortType)# updateDM updateDmConfig mepInstance 100`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update overflowReset keep`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update overflowReset reset`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update synchronized enable`
	`SwitchOperationsMepPortType)# updateDM updateDmConfig update overflowReset keep`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update txMode proprietary`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update txMode standardize`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update unit ns`
	`Switch(OperationsMepPortType)# updateDM updateDmConfig update unit us`
		Updates DM parameters.
		• **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.
		• **update—**Updates DM parameters for all MEPs on the Cisco ME 1200 NID.
		• **overflowReset—**Reset all delay Measurement results on total delay counters.
		• **keep—**Retains all delay Measurement results.
		• **reset—**Resets all delay Measurement results.
		• **syncronized—**Synchronizes near end and far end time intervals.
		• **enable—**Enables synchronization of near and far end time interval.
		• **disable—**Disables synchronization of near and far end time interval.
		• **txMode—**Sets the Tx mode.
		• **proprietary—**Sets the proprietary delay measurement parameters .
		• **standardize—**Sets the Y.1731 standards to transmit 1DM/DMR delay measurement parameters.
		• **unit—**Sets the delay in units.
		• **ns—**Specifies nanoseconds.
		• **us—**Sets microseconds.

Step 3	**updateDM review**
	
	Example:
	`Switch(OperationsMepPortType)# updateDM review`
	`Commands in queue:`
	`        updateDM updateDmConfig mepInstance 1`
	`        updateDM updateDmConfig update overflowReset`
	`keep`
	`        updateDM updateDmConfig update overflowReset`
	`reset`
	`        updateDM updateDmConfig update syncronized`
	`enable`
	`        updateDM updateDmConfig update txMode`
	`proprietary`
	`        updateDM updateDmConfig update txMode`
	`standardize`
		Displays the configuration on the ME 1200 NID .

	Command or Action	Purpose

	`updateDM updateDmConfig update txMode standardize`
	`updateDM updateDmConfig update unit ns`
	`updateDM updateDmConfig update unit us`	

Step 4	**updateDM commit** **Example:** `Switch(OperationsMepPortType)# updateDM commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to update the delay measurement parameters on the Cisco ME 1200 NID:

```
Switch(OperationsMepPortType)# updateDM updateDmConfig mepInstance 100
Switch(OperationsMepPortType)# updateDM updateDmConfig update overflowReset keep
Switch(OperationsMepPortType)# updateDM updateDmConfig update overflowReset reset
Switch(OperationsMepPortType)# updateDM updateDmConfig update synchronized enable
Switch(OperationsMepPortType)# updateDM updateDmConfig update overflowReset keep
Switch(OperationsMepPortType)# updateDM updateDmConfig update txMode proprietary
Switch(OperationsMepPortType)# updateDM updateDmConfig update txMode standardize
Switch(OperationsMepPortType)# updateDM updateDmConfig update unit ns
Switch(OperationsMepPortType)# updateDM updateDmConfig update unit us
Switch(OperationsMepPortType)# updateDM review
Commands in queue:
        updateDM updateDmConfig mepInstance 1
        updateDM updateDmConfig update overflowReset keep
        updateDM updateDmConfig update overflowReset reset
        updateDM updateDmConfig update syncronized enable
        updateDM updateDmConfig update txMode proprietary
        updateDM updateDmConfig update txMode standardize
        updateDM updateDmConfig update txMode standardize
        updateDM updateDmConfig update unit ns
        updateDM updateDmConfig update unit us

Switch(OperationsMepPortType)# updateDM commit
Switch(OperationsMepPortType)# end
```

Updating Test Signal Parameters on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**updateTst** {**commit** | **flush** | **updateTstConfig** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# updateTst ?`
	`  commit            commit updateTst`
	`  flush             flush all updateTst commands from queue`
	`  review            review updateTst commands`
	`  updateTstConfig   Update Tst signal request`
		Updates the test signal parameters.
		• **commit**—Sends the configuration to NID.
		• **flush**—Flushes all configuration from the queue.
		• **updateTstConfig**—Updates the test signal parameters.
		• **review**—Displays the configuration on the Cisco ME 1200 NID .

Step 2	**updateTst updateTstConfig** {**mepInstance** *instance-no* | **update** {**Rx** | **Tx**} {**enable** | **disable**}}
	
	Example:
	`Switch(OperationsMepPortType)# updateTst updatetstConfig mepInstance 100`
	`Switch(OperationsMepPortType)# updateTst updatetstConfig update Rx enable`
	`Switch(OperationsMepPortType)# updateTst updatetstConfig update Tx enable`
		• **mepInstance** *instance-no*—Indicates the MEP instance. The valid values are from 1 to 128.
		• **update**—Updates DM parameters for all MEPs.
		• **Rx**—Sets the Rx mode.
		• **Tx**—Sets the Tx mode.
		• **enable**—Enables the mode.
		• **disable**—Disables the mode.

Step 3	**updateTst review**
	
	Example:
	`Switch(OperationsMepPortType)# updateTst review`
	`Commands in queue:`
	`        updateTst updateTstConfig mepInstance 2`
	`        updateTst updateTstConfig update Rx enable`
	`        updateTst updateTstConfig update Tx enable`
	`        updateTst updateTstConfig update Tx enable`
		Displays the configuration on the Cisco ME 1200 NID .

Step 4	**updateTst commit** **Example:** `Switch(OperationsMepPortType)# updateTst commit`	Sends the configuration to the NID.
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to update the test signal parameters on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# updateTst updatetstConfig mepInstance 100
Switch(OperationsMepPortType)# updateTst updatetstConfig update Rx enable
```

```
Switch(OperationsMepPortType)# updateTst updatetstConfig update Tx enable

Switch(OperationsMepPortType)# updateTst review
Commands in queue:
        updateTst updateTstConfig mepInstance 2
        updateTst updateTstConfig update Rx enable
        updateTst updateTstConfig update Tx enable
        updateTst updateTstConfig update Tx enable

Switch(OperationsMepPortType)# updateTst commit
Switch(OperationsMepPortType)# end
```

Clearing MEP Statistics on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**clearMepStats** {**commit** | **flush** | **clearStats** | **review**}
	
	Example:
	`Switch(OperationsMepPortType)# clearMepStats ?`
	`   clearStats  Clear mep statistics request`
	`   commit      commit clearMepStats`
	`   flush       flush all clearMepStats commands from queue`
	`   review      review clearMepStats commands`
		Clears the MEP statistics.
		• **commit—**Sends the configuration to NID.
		• **flush—**Flushes all configuration from the queue.
		• **clearStats—**Clears the MEP statistics.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**clearMepStats cleatStats** {**mepInstance** *instance-no* | **StatsType** {**DM** | **LM** | **TST**}}
	
	Example:
	`Switch(OperationsMepPortType)# clearMepStats clearStats mepInstance 25`
	`Switch(OperationsMepPortType)# clearMepStats clearStats statstype DM`
		• **mepInstance** *instance-no***—**Indicates the MEP instance. The valid values are from 1 to 128.
		• **Statstype—**Indicates the protocol type.
		• **DM—**Specifies the delay measurement statistics.
		• **LM—**Specifies the loss measurement statistics.
		• **TST—**Specifies the test signal statistics.

Step 3	**clearMepStats review**
	
	Example:
	`Switch(OperationsMepPortType)# clearMepStats review`
	
	`Commands in queue:`
	`        clearMepStats clearStats mepInstance 23`
		Displays the configuration on the Cisco ME 1200 NID .

Step 4	**clearMepStats commit** **Example:** `Switch(OperationsMepPortType)# clearMepStats commit`	Sends the configuration to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

Configuration Example

The example shows how to clear the MEP statistics on the Cisco ME 1200 NID :

```
Switch(OperationsMepPortType)# clearMepStats clearStats mepInstance 25
Switch(OperationsMepPortType)# clearMepStats clearStats statstype DM
Switch(OperationsMepPortType)# clearMepStats review

Commands in queue:
        clearMepStats clearStats mepInstance 23

Switch(OperationsMepPortType)# clearMepStats commit
Switch(OperationsMepPortType)#end
```

Negating Performance Monitoring Configuration and Restoring Defaults

Before You Begin

- Perform the steps to provision performance monitoring on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**no ?**
	
	Example:
	`Switch(OperationsMepPortType)# no ?`
	
	`  clearMepStats  Clear mep statistics request`
	`  exit           Exit from OperationsMepPortType sub configuration mode`
	`  setAis         Enable or Disable AIS request`
	`  setDM          Enable or Disable delay measurement request`
	`  setLM          Enable or Disable loss measurement request`
	`  setLck         Enable or Disable lock signal request`
	`  setLinkTrace   Enable or Disable linktrace request`
	`  setLoopBack    Enable/Disable loopback`
	`  setTst         Enable or Disable test signal request`
	`  showAis        Show AIS configuration request`
	`  showDM         Show delay measurement statistics request`
	`  showLM         Show LM statistics request`
	`  showLck        Show lock signal current configuration request`
	`  showLinkTrace  Show linktrace state and current configuration request`
	`  showLoopBack   Show loopback state and current configuration request`
	`  showTst        Show test signal statistics and current configuration`
	`request`
	`  updateDM       Update DM parameters request`
		Negates the commands and sets the default configuration.

	Command or Action	Purpose
	`updateTst       Update Tst signal request`	
Step 2	**exit** **Example:** `Switch(OperationsMepPortType)# exit`	Exits the OperationsMepPortType mode.

CHAPTER 17

Configuring EPS

This document describes the Ethernet Protection Switching (EPS) feature and configuration steps to implement protection switching mechanisms for Ethernet layer topologies.

Prerequisites for Configuring EPS

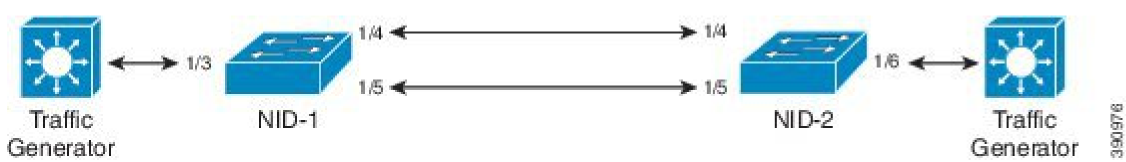
- NID must have an IP address.
- Loop protection and Spanning tree must be disabled on the ports where EPS is configured.

Information About EPS

EPS is a fully allocated protection mechanism that ensures the route and bandwidth of the protection entity are reserved for a selected working entity. It provides a fast and simple protection mechanism. It is easier for the network administrators to monitor the status of the network (e.g., active network topology) with EPS when compared with other protocols such as Rapid Spanning Tree Protocol (RSTP).

The following figure shows the topology used for provisioning EPS on NID-1 and NID-2.

Figure 11: EPS Topology



How to Provision EPS

Creating MEP on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.

Step 2	**createMep** {**createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level-number* | **residencePort** *port-number* | **mepId** *id-number* | **megdomain** {**maName** *ma-name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}
	
	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 20`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepId 12`
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain PORT`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 4`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName nid-nid`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg`
	`Switch(ProvisionMepPortType)# createMep createMepConfig vid 1112`
		Creates MEP configuration.
		• **mepinstance—**Specifies the MEP instance number.
		• **mode—**Specifies the mode of the MEP instance.
		• **mep—**Specifies the maintenance entity end point.
		• **mip—**Specifies the maintenance entity intermediate point.
		• **direction—**Selects the direction of the MEP.
		• **up—**Specifies an Up MEP - monitoring egress OAM and traffic on residence port.
		• **down—**Specifies a Down MEP - monitoring ingress OAM and traffic on residence port.
		• **domain—**Selects the domain of the MEP.
		• **port—**Specifies a MEP in the Port Domain. Flow Instance is a Port.
		• **evc—**Specifies a MEP in the EVC Domain. Flow Instance is a EVC. The EVC must be created.
		• **vlan—**Specifies a MEP in the VLAN Domain. Flow Instance is a VLAN. The VLAN must be created.
		• **flowId—**Specifies the flow related to the MEP.
		• **vid—**In case the MEP is a port Up-MEP or a EVC customer MIP the VID must be given.
		• **level—**Specifies the MEG level of the MEP.
		• *level-number*—MEG level number.
		• **residencePort—**Specifies the port monitored by MEP.
		• *port-number*—Residence port number.

	Command or Action	Purpose
		• **mepId—**Specifies MEP ID. • *id-number*—MEP ID number. • **megdomain—**Specifies the maintenance domain configuration. • **maName—**Specifies the ITU/IEEE MEG-ID (short MA name). • *ma-name*—Short MA name. • **megIdFormat—**Selects the MEG ID format. • **ituMeg—**Specifies the MEG-ID using ITU format (ICC - UMC). • **ituCcMeg—**Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC). • **ieee—**Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

Step 3	**addPeerMepId** {**commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 20`
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 11`
		Adds peer MEP request.
		• **commit—**Commits addPeerMepId.
		• **flush—**Flushes all addPeerMepId commands from queue.
		• **peerMepConfig—**Adds peer mep request.
		• **macAddress—**Specifies the peer MAC. This is overwritten by any learned MAC - through CCM reception.
		• **mepInstance—**Specifies the mep instance number.
		• **peerMepId—**Specifies the peer MEP-ID.

Step 4	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep-instance-number*} | **review**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 20`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode uni`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol laps`
		Adds CC/APS configuration request.
		• **commit—**Commits addCcAps.
		• **flush—**Flushes all addCcAps commands from queue.
		• **mepFunctionalConfig—**Adds CC/APS configuration request.
		• **aps—**Specifies APS protocol.
		• **enable—**Enables APS.
		• **disbale—**Disables APS.
		• **cc—**Specifies continuity check.
		• **enable—**Enables CC.
		• **disbale—**Disables CC.

	Command or Action	Purpose
		• **mepInstance—**Specifies the mep instance number. • *mep-instance-number*—MEP instance number.

Step 5	**createMep createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level-number* | **residencePort** *port-number* | **mepId** *id-number* | **megdomain** {**maName** *ma-name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}
	
	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 21`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepId 14`
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain PORT`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 5`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName nid-nid`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg`
	`Switch(ProvisionMepPortType)# createMep createMepConfig vid 1112`
		Creates MEP configuration.
		• **mepinstance—**Specifies the MEP instance number.
		• **mode—**Specifies the mode of the MEP instance.
		• **mep—**Specifies the maintenance entity end point.
		• **mip—**Specifies the maintenance entity intermediate point.
		• **direction—**Selects the direction of the MEP.
		• **up—**Specifies an Up MEP - monitoring egress OAM and traffic on residence port.
		• **down—**Specifies a Down MEP - monitoring ingress OAM and traffic on residence port.
		• **domain—**Selects the domain of the MEP.
		• **port—**Specifies a MEP in the Port Domain. Flow Instance is a Port.
		• **evc—**Specifies a MEP in the EVC Domain. Flow Instance is a EVC. The EVC must be created.
		• **vlan—**Specifies a MEP in the VLAN Domain. Flow Instance is a VLAN. The VLAN must be created.
		• **flowId—**Specifies the flow related to the MEP.
		• **vid—**In case the MEP is a port Up-MEP or a EVC customer MIP the VID must be given.
		• **level—**Specifies the MEG level of the MEP.
		• *level-number*—MEG level number.
		• **residencePort—**Specifies the port monitored by MEP.
		• *port-number*—Residence port number.
		• **mepId—**Specifies MEP ID.
		• *id-number*—MEP ID number.
		• **megdomain—**Specifies the maintenance domain configuration.
		• **maName—**Specifies the ITU/IEEE MEG-ID(short MA name)
		• *ma-name*—Short MA name.
		• **megIdFormat—**Selects the MEG ID format.

	Command or Action	Purpose
		• **ituMeg—**Specifies the MEG-ID using ITU format (ICC - UMC). • **ituCcMeg—**Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC). • **ieee—**Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

Step 6	**addPeerMepId** {**commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 21`
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 13`
		Adds peer MEP request.
		• **commit—**Commits addPeerMepId.
		• **flush—**Flushes all addPeerMepId commands from queue.
		• **peerMepConfig—**Adds peer mep request.
		• **macAddress—**Specifies the peer MAC. This is overwritten by any learned MAC - through CCM reception.
		• **mepInstance—**Specifies the mep instance number.
		• **peerMepId—**Specifies the peer MEP-ID.

Step 7	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep-instance-number*} | **review**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 21`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode uni`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol laps`
		Adds CC/APS configuration request.
		• **commit—**Commits addCcAps.
		• **flush—**Flushes all addCcAps commands from queue.
		• **mepFunctionalConfig—**Adds CC/APS configuration request.
		• **aps—**Specifies APS protocol.
		• **enable—**Enables APS.
		• **disbale—**Disables APS.
		• **cc—**Specifies continuity check.
		• **enable—**Enables CC.
		• **disbale—**Disables CC.
		• **mepInstance—**Specifies the mep instance number.
		• *mep-instance-number*—MEP instance number.

Step 8	**addCcAps review** **Example:** `Switch(ProvisionMepPortType)# addCcAps review`	Displays the configuration.

	Command or Action	Purpose
Step 9	**addCcAps commit** **Example:** `Switch(ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.
Step 10	**exit** **Example:** `Switch(ProvisionMepPortType)# exit`	Exits the ProvisionMepPortType mode.

Configuration Example

The example shows how to create MEP on NID-1:

```
Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 20
Switch(ProvisionMepPortType)# createMep createMepConfig mepId 12
Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(ProvisionMepPortType)# createMep createMepConfig domain PORT
Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 4
Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(ProvisionMepPortType)# createMep createMepConfig level 0
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName nid-nid
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg
Switch(ProvisionMepPortType)# createMep createMepConfig vid 1112

Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 20
Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 11
Switch(ProvisionMepPortType)# addPeerMepId commit

Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 20
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode uni
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol
laps

Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 21
Switch(ProvisionMepPortType)# createMep createMepConfig mepId 14
Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN
SwitchProvisionMepPortType)# createMep createMepConfig domain PORT
Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 5
Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(ProvisionMepPortType)# createMep createMepConfig level 0
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName nid-nid
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg
Switch(ProvisionMepPortType)# createMep createMepConfig vid 1112

Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 21
Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 13

Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 21
SwitchProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode uni
SwitchProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7
SwitchProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol laps

Switch(ProvisionMepPortType)# addCcAps review
Switch(ProvisionMepPortType)# addCcAps commit
Switch(ProvisionMepPortType)# exit
```

Creating MEP on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.

Step 2	**createMep createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level-number* | **residencePort** *port-number* | **mepId** *id-number* | **megdomain** {**maName** *ma-name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}
	
	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 20`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepId 11`
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain PORT`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 4`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName nid-nid`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg`
	`Switch(ProvisionMepPortType)# createMep createMepConfig vid 1112`
		Creates MEP configuration.
		• **mepinstance—**Specifies the MEP instance number.
		• **mode—**Specifies the mode of the MEP instance.
		• **mep—**Specifies the maintenance entity end point.
		• **mip—**Specifies the maintenance entity intermediate point.
		• **direction—**Selects the direction of the MEP.
		• **up—**Specifies an Up MEP - monitoring egress OAM and traffic on residence port.
		• **down—**Specifies a Down MEP - monitoring ingress OAM and traffic on residence port.
		• **domain—**Selects the domain of the MEP.
		• **port—**Specifies a MEP in the Port Domain. Flow Instance is a Port.
		• **evc—**Specifies a MEP in the EVC Domain. Flow Instance is a EVC. The EVC must be created.
		• **vlan—**Specifies a MEP in the VLAN Domain. Flow Instance is a VLAN. The VLAN must be created.
		• **flowId—**Specifies the flow related to the MEP.
		• **vid—**In case the MEP is a port Up-MEP or a EVC customer MIP, the VID must be given.
		• **level—**Specifies the MEG level of the MEP.
		• *level-number*—MEG level number.
		• **residencePort—**Specifies the port monitored by MEP.
		• *port-number*—Residence port number.
		• **mepId—**Specifies MEP ID.
		• *id-number*—MEP ID number.

	Command or Action	Purpose
		• **megdomain—**Specifies the maintenance domain configuration. • **maName—**Specifies the ITU/IEEE MEG-ID (short MA name). • *ma-name*—Short MA name. • **megIdFormat—**Selects the MEG ID format. • **ituMeg—**Specifies the MEG-ID using ITU format (ICC - UMC). • **ituCcMeg—**Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC). • **ieee—**Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

Step 3	**addPeerMepId** {**commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 20`
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 12`
		Adds peer MEP request.
		• **commit—**Commits addPeerMepId.
		• **flush—**Flushes all addPeerMepId commands from queue.
		• **peerMepConfig—**Adds peer mep request.
		• **macAddress—**Specifies the peer MAC. This is overwritten by any learned MAC - through CCM reception.
		• **mepInstance—**Specifies the mep instance number.
		• **peerMepId—**Specifies the peer MEP-ID.

Step 4	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep-instance-number*} | **review**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 20`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode uni`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol laps`
		Adds CC/APS configuration request.
		• **commit—**Commits addCcAps.
		• **flush—**Flushes all addCcAps commands from queue.
		• **mepFunctionalConfig—**Adds CC/APS configuration request.
		• **aps—**Specifies APS protocol.
		• **enable—**Enables APS.
		• **disbale—**Disables APS.
		• **cc—**Specifies continuity check.
		• **enable—**Enables CC.
		• **disbale—**Disables CC.
		• **mepInstance—**Specifies the mep instance number.
		• *mep-instance-number*—MEP instance number.

	Command or Action	Purpose

Step 5	**createMep createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level-number* | **residencePort** *port-number* | **mepld** *id-number* | **megdomain** {**maName** *ma-name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}
	
	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 21`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepId 13`
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain PORT`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 5`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName nid-nid`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg`
	`Switch(ProvisionMepPortType)# createMep createMepConfig vid 1112`
		Creates MEP configuration.
		• **mepinstance—**Specifies the MEP instance number.
		• **mode—**Specifies the mode of the MEP instance.
		• **mep—**Specifies the maintenance entity end point.
		• **mip—**Specifies the maintenance entity intermediate point.
		• **direction—**Selects the direction of the MEP.
		• **up—**Specifies an Up MEP - monitoring egress OAM and traffic on residence port.
		• **down—**Specifies a Down MEP - monitoring ingress OAM and traffic on residence port.
		• **domain—**Selects the domain of the MEP.
		• **port—**Specifies a MEP in the Port Domain. Flow Instance is a Port.
		• **evc—**Specifies a MEP in the EVC Domain. Flow Instance is a EVC. The EVC must be created.
		• **vlan—**Specifies a MEP in the VLAN Domain. Flow Instance is a VLAN. The VLAN must be created.
		• **flowId—**Specifies the flow related to the MEP.
		• **vid—**In case the MEP is a port Up-MEP or a EVC customer MIP the VID must be given.
		• **level—**Specifies the MEG level of the MEP.
		• *level-number*—MEG level number.
		• **residencePort—**Specifies the port monitored by MEP.
		• *port-number*—Residence port number.
		• **mepld—**Specifies MEP ID.
		• *id-number*—MEP ID number.
		• **megdomain—**Specifies the maintenance domain configuration.
		• **maName—**Specifies the ITU/IEEE MEG-ID(short MA name)
		• *ma-name*—Short MA name.
		• **megIdFormat—**Selects the MEG ID format.
		• **ituMeg—**Specifies the MEG-ID using ITU format (ICC - UMC).

	Command or Action	Purpose
		• **ituCcMeg—**Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC). • **ieee—**Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

Step 6	**addPeerMepId** {**commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 21`
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 14`
		Adds peer MEP request.
		• **commit—**Commits addPeerMepId.
		• **flush—**Flushes all addPeerMepId commands from queue.
		• **peerMepConfig—**Adds peer mep request.
		• **macAddress—**Specifies the peer MAC. This is overwritten by any learned MAC - through CCM reception.
		• **mepInstance—**Specifies the mep instance number.
		• **peerMepId—**Specifies the peer MEP-ID.

Step 7	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep-instance-number*} | **review**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 21`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode uni`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol laps`
		Adds CC/APS configuration request.
		• **commit—**Commits addCcAps.
		• **flush—**Flushes all addCcAps commands from queue.
		• **mepFunctionalConfig—**Adds CC/APS configuration request.
		• **aps—**Specifies APS protocol.
		• **enable—**Enables APS.
		• **disbale—**Disables APS.
		• **cc—**Specifies continuity check.
		• **enable—**Enables CC.
		• **disbale—**Disables CC.
		• **mepInstance—**Specifies the mep instance number.
		• *mep-instance-number***—**MEP instance number.

Step 8	**addCcAps review** **Example:** `Switch(ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 9	**addCcAps commit** **Example:** `Switch(ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 10	**exit** **Example:** `Switch(ProvisionMepPortType)# exit`	Exits the ProvisionMepPortType mode.

Configuration Example

The example shows how to create MEP on NID2:

```
Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 20
Switch(ProvisionMepPortType)# createMep createMepConfig mepId 11
Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(ProvisionMepPortType)# createMep createMepConfig domain PORT
Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 4
Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(ProvisionMepPortType)# createMep createMepConfig level 0
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName nid-nid
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg
Switch(ProvisionMepPortType)# createMep createMepConfig vid 1112

Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 20
Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 12
Switch(ProvisionMepPortType)# addPeerMepId commit

Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 20
SwitchProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode uni
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol
laps

Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 21
Switch(ProvisionMepPortType)# createMep createMepConfig mepId 13
Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(ProvisionMepPortType)# createMep createMepConfig domain PORT
Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 5
Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(ProvisionMepPortType)# createMep createMepConfig level 0
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName nid-nid
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg
Switch(ProvisionMepPortType)# createMep createMepConfig vid 1112

Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 21
Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 14

Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 21
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode uni
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol
laps

Switch(ProvisionMepPortType)# addCcAps review
Switch(ProvisionMepPortType)# addCcAps commit
Switch(ProvisionMepPortType)# exit
```

Configuring Bidirectional EPS on NID-2

Before You Begin

- Architecture a1plus1 bidirectional
- Domain port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

Step 2	**setEpsInstConfig epsConfig** {**epsInst** *epsInst-number* | **domain** {**port** | **evc**} | **architecture** {**a1plus1** | **a1for1**} | **workflow** {**inst** *inst-number* | **portNo** *port-number*} | **protectFlow** {**inst** *inst-number* | **portNo** *port-number*} | **mepWork** *mepWork-number* | **mepProtect** *mepProtect-number* | **mepAps** *mepAPS-number*}
	
	Example:
	`Switch(EpsPortType)# setEpsInstance epsConfig epsInst 30`
	`Switch(EpsPortType)# setEpsInstance epsConfig architecture a1plus1`
	`Switch(EpsPortType)# setEpsInstance epsConfig domain port`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepAps 21`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepProtect 21`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepWork 20`
	`Switch(EpsPortType)# setEpsInstance epsConfig protectFlow portNo 5`
	`Switch(EpsPortType)# setEpsInstance epsConfig workFlow portNo 4`
		Sets EPS configuration.
		• **epsConfig—**Specifies the EPS configuration.
		• **epsInst—** Specifies the EPS instance.
		• *epsInst-number*—EPS instance number.
		• **domain—**Specifies the domain of the EPS.
		• **port—**Specifies that this EPS is protecting in the port domain.
		• **evc—**Specifies that this EPS is protecting in the EVC domain.
		• **architecture—**Specifies the EPS architecture.
		• **a1plus1—**Specifies that the architecture is 1 plus 1.
		• **a1for1—**Specifies that the architecture is 1 for 1.
		• **workflow—**Specifies the working flow instance for the related EPS.
		• **inst—**Specifies the working flow instance number when not in the port domain.
		• *inst-number*—Working flow instance number.
		• **portNo—**Specifies port ID.
		• *port-number*—Port ID number.
		• **protectFlow—**Specifies the protect flow instance for the related EPS.
		• **inst—**Specifies the protect flow instance number when not in the port domain.
		• *inst-number*—Protect flow instance number.
		• **portNo—**Specifies port ID.

	Command or Action	Purpose
		• *port-number*—Port ID number. • **mepWork—**Specifies working MEP instance. • *mepWork-number*—Working MEP number. • **mepProtect—**Specifies protect MEP instance. • *mepProtect-number*—Protect MEP number. • **mepAps—**Specifies APS MEP instance. • *mepAPS-number*—APS MEP number.

Step 3	**setEpsInstProperties epsInstconfig** {**epsInst** *eps-instance-number* | **protectionType** {**uni** | **bi**} | **aps** {**enable** | **disable**} | **revertive** {**enable** | **disable**} | **wtrTime w***time*[**m** | **s**] **holdoff**}
	
	Example:
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig epsInst 30`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig holdoff 1`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig protectionType bi`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig revertive enable`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig wtrTime w10s`
		Adds CC/APS configuration request.
		• **epsInst—**Specifies the EPS instance.
		• *ep-instance-number*—EPS instance number.
		• **protectionType—**Specifies the protection type in case of 1plus1.
		• **uni—**Specifies unidirectional.
		• **bi—** Specifies bidirectional.
		• **aps—**Specifies EPS 1+1 unidirectional with APS protection type.
		• **enable—**Enables APS protection.
		• **disable—**Disables APS protection.
		• **revertive—**Specifies revertive EPS.
		• **enable—**Enables revertive EPS.
		• **disable—** Disables revertive EPS.
		• **wtrTime—** Specifies the WTR time.
		• *time*—WTR time in minutes or seconds.
		• **m—** Time in minutes. Valid values are from 5 to 12.
		• **s—** Time in seconds. Valid values are 10 and 30.
		• **holdoff—** Specifies the hold off timer.

Step 4	**setEpsInstProperties review** **Example:** `Switch(EpsPortType)# setEpsInstProperties review`	Displays the configuration.

	Command or Action	Purpose
Step 5	**setEpsInstProperties commit** **Example:** `Switch(EpsPortType)# setEpsInstProperties commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to configure bidirectional EPS on NID-2:

```
Switch(EpsPortType)# setEpsInstance epsConfig epsInst 30
Switch(EpsPortType)# setEpsInstance epsConfig architecture a1plus1
Switch(EpsPortType)# setEpsInstance epsConfig domain port
Switch(EpsPortType)# setEpsInstance epsConfig mepAps 21
Switch(EpsPortType)# setEpsInstance epsConfig mepProtect 21
Switch(EpsPortType)# setEpsInstance epsConfig mepWork 20
Switch(EpsPortType)# setEpsInstance epsConfig protectFlow portNo 5
Switch(EpsPortType)# setEpsInstance epsConfig workFlow portNo 4

Switch(EpsPortType)# setEpsInstProperties epsInstConfig epsInst 30
Switch(EpsPortType)# setEpsInstProperties epsInstConfig holdoff 1
Switch(EpsPortType)# setEpsInstProperties epsInstConfig protectionType bi
Switch(EpsPortType)# setEpsInstProperties epsInstConfig revertive enable
Switch(EpsPortType)# setEpsInstProperties epsInstConfig wtrTime w10s

Switch(EpsPortType)# setEpsInstProperties review
Switch(EpsPortType)# setEpsInstProperties commit
Switch(EpsPortType)# exit
```

Configuring Bidirectional EPS on NID-1

Before You Begin

- Architecture a1plus1 bidirectional
- Domain port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

	Command or Action	Purpose

Step 2	**setEpsInstConfig epsConfig** {**epsInst** *epsInst-number* | **domain** {**port** | **evc**} | **architecture** {**a1plus1** | **a1for1**} | **workflow** {**inst** *inst-number* | **portNo** *port-number*} | **protectFlow** {**inst** *inst-number* | **portNo** *port-number*} | **mepWork** *mepWork-number* | **mepProtect** *mepProtect-number* | **mepAps** *mepAPS-number*}
	
	Example:
	`Switch(EpsPortType)# setEpsInstance epsConfig epsInst 30`
	`Switch(EpsPortType)# setEpsInstance epsConfig architecture a1plus1`
	`Switch(EpsPortType)# setEpsInstance epsConfig domain port`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepAps 21`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepProtect 21`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepWork 20`
	`Switch(EpsPortType)# setEpsInstance epsConfig protectFlow portNo 5`
	`Switch(EpsPortType)# setEpsInstance epsConfig workFlow portNo 4`
		Sets EPS configuration.
		• **epsConfig—**Specifies the EPS configuration.
		• **epsInst—** Specifies the EPS instance.
		• *epsInst-number*—EPS instance number.
		• **domain—**Specifies the domain of the EPS.
		• **port—**Specifies that this EPS is protecting in the port domain.
		• **evc—**Specifies that this EPS is protecting in the EVC domain.
		• **architecture—**Specifies the EPS architecture.
		• **a1plus1—**Specifies that the architecture is 1 plus 1.
		• **a1for1—**Specifies that the architecture is 1 for 1.
		• **workflow—**Specifies the working flow instance for the related EPS.
		• **inst**—Specifies the working flow instance number when not in the port domain.
		• *inst-number*—Working flow instance number.
		• **portNo—**Specifies port ID.
		• *port-number*—Port ID number.
		• **protectFlow—**Specifies the protect flow instance for the related EPS.
		• **inst**—Specifies the protect flow instance number when not in the port domain.
		• *inst-number*—Protect flow instance number.
		• **portNo—**Specifies port ID.
		• *port-number*—Port ID number.
		• **mepWork—**Specifies working MEP instance.
		• *mepWork-number*—Working MEP number.
		• **mepProtect—**Specifies protect MEP instance.
		• *mepProtect-number*—Protect MEP number.
		• **mepAps**—Specifies APS MEP instance.
		• *mepAPS-number*—APS MEP number.

Step 3	**setEpsInstProperties epsInstconfig** {**epsInst** *eps-instance-number* | **protectionType** {**uni** | **bi**} | **aps**	Adds CC/APS configuration request. • **epsInst—**Specifies the EPS instance.

	Command or Action	Purpose

	{**enable** | **disable**} | **revertive** {**enable** | **disable**} | **wtrTime w***time*[**m** | **s**] **holdoff**}
	
	Example:
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig epsInst 30`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig holdoff 1`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig protectionType bi`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig revertive enable`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig wtrTime w10s`
		• *ep-instance-number*—EPS instance number.
		• **protectionType—**Specifies the protection type in case of 1plus1.
		• **uni—**Specifies unidirectional.
		• **bi—** Specifies bidirectional.
		• **aps—**Specifies EPS 1+1 unidirectional with APS protection type.
		• **enable—**Enables APS protection.
		• **disable—**Disables APS protection.
		• **revertive—**Specifies revertive EPS.
		• **enable—**Enables revertive EPS.
		• **disable—** Disables revertive EPS.
		• **wtrTime—** Specifies the WTR time.
		• *time*—WTR time in minutes or seconds.
		• **m—** Time in minutes. Valid values are from 5 to 12.
		• **s—** Time in seconds. Valid values are 10 and 30.
		• **holdoff—** Specifies the hold off timer.

Step 4	**setEpsInstProperties review** **Example:** `Switch(EpsPortType)# setEpsInstProperties review`	Displays the configuration.
Step 5	**setEpsInstProperties commit** **Example:** `Switch(EpsPortType)# setEpsInstProperties commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to configure bidirectional EPS on NID-1:

```
Switch(EpsPortType)# setEpsInstance epsConfig epsInst 30
Switch(EpsPortType)# setEpsInstance epsConfig architecture a1plus1
Switch(EpsPortType)# setEpsInstance epsConfig domain port
```

```
Switch(EpsPortType)# setEpsInstance epsConfig mepAps 21
Switch(EpsPortType)# setEpsInstance epsConfig mepProtect 21
Switch(EpsPortType)# setEpsInstance epsConfig mepWork 20
Switch(EpsPortType)# setEpsInstance epsConfig protectFlow portNo 5
Switch(EpsPortType)# setEpsInstance epsConfig workFlow portNo 4

Switch(EpsPortType)# setEpsInstProperties epsInstConfig epsInst 30
Switch(EpsPortType)# setEpsInstProperties epsInstConfig holdoff 1
Switch(EpsPortType)# setEpsInstProperties epsInstConfig protectionType bi
Switch(EpsPortType)# setEpsInstProperties epsInstConfig revertive enable
Switch(EpsPortType)# setEpsInstProperties epsInstConfig wtrTime w10s

Switch(EpsPortType)# setEpsInstProperties review
Switch(EpsPortType)# setEpsInstProperties commit
Switch(EpsPortType)# exit
```

Configuring Unidirectional EPS on NID-2

Before You Begin

- Architecture a1plus1 unidirectional aps enable
- Domain port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

Step 2	**setEpsInstConfig epsConfig** {**epsInst** *epsInst-number*| **domain** {**port** | **evc**} | **architecture** {**a1plus1** | **a1for1**} | **workflow** {**inst** *inst-number* | **portNo** *port-number*} | **protectFlow** {**inst** *inst-number* | **portNo** *port-number*} | **mepWork** *mepWork-number* | **mepProtect** *mepProtect-number* | **mepAps** *mepAPS-number*}
	
	Example:
	`Switch(EpsPortType)# setEpsInstance epsConfig epsInst 30`
	`Switch(EpsPortType)# setEpsInstance epsConfig architecture a1plus1`
	`Switch(EpsPortType)# setEpsInstance epsConfig domain port`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepAps 21`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepProtect 21`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepWork 20`
	`Switch(EpsPortType)# setEpsInstance epsConfig protectFlow portNo 5`
	`Switch(EpsPortType)# setEpsInstance epsConfig workFlow portNo 4`
		Sets EPS configuration.
		• **epsConfig—**Specifies the EPS configuration.
		• **epsInst—** Specifies the EPS instance.
		• *epsInst-number*—EPS instance number.
		• **domain—**Specifies the domain of the EPS.
		• **port—**Specifies that this EPS is protecting in the port domain.
		• **evc—**Specifies that this EPS is protecting in the EVC domain.
		• **architecture—**Specifies the EPS architecture.
		• **a1plus1—**Specifies that the architecture is 1 plus 1.
		• **a1for1—**Specifies that the architecture is 1 for 1.
		• **workflow—**Specifies the working flow instance for the related EPS.
		• **inst—**Specifies the working flow instance number when not in the port domain.
		• *inst-number*—Working flow instance number.

	Command or Action	Purpose
		• **portNo—**Specifies port ID. • *port-number*—Port ID number. • **protectFlow—**Specifies the protect flow instance for the related EPS. • **inst—**Specifies the protect flow instance number when not in the port domain. • *inst-number*—Protect flow instance number. • **portNo—**Specifies port ID. • *port-number*—Port ID number. • **mepWork—**Specifies working MEP instance. • *mepWork-number*—Working MEP number. • **mepProtect—**Specifies protect MEP instance. • *mepProtect-number*—Protect MEP number. • **mepAps—**Specifies APS MEP instance. • *mepAPS-number*—APS MEP number.

Step 3	**setEpsInstProperties epsInstconfig** {**epsInst** *eps-instance-number* | **protectionType** {**uni** | **bi**} | **aps** {**enable** | **disable**} | **revertive** {**enable** | **disable**} | **wtrTime w***time*[**m** | **s**] **holdoff**}
	
	Example:
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig epsInst 30`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig aps enable`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig protectionType uni`
		Adds CC/APS configuration request.
		• **epsInst—**Specifies the EPS instance.
		• *eps-instance-number*—EPS instance number.
		• **protectionType—**Specifies the protection type in case of 1plus1.
		• **uni—**Specifies unidirectional.
		• **bi—** Specifies bidirectional.
		• **aps—**Specifies EPS 1+1 unidirectional with APS protection type.
		• **enable—**Enables APS protection.
		• **disable—**Disables APS protection.
		• **revertive—**Specifies revertive EPS.
		• **enable—**Enables revertive EPS.
		• **disable—** Disables revertive EPS.
		• **wtrTime—** Specifies the WTR time.
		• *time*—WTR time in minutes or seconds.
		• **m—** Time in minutes. Valid values are from 5 to 12.

	Command or Action	Purpose
		• **s—** Time in seconds. Valid values are 10 and 30. • **holdoff—** Specifies the hold off timer.
Step 4	**setEpsInstProperties review** **Example:** `Switch(EpsPortType)# setEpsInstProperties review`	Displays the configuration.
Step 5	**setEpsInstProperties commit** **Example:** `Switch(EpsPortType)# setEpsInstProperties commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to configure unidirectional EPS on NID-2:

```
Switch(EpsPotType)# setEpsInstance epsConfig epsInst 30
Switch(EpsPortType)# setEpsInstance epsConfig architecture a1plus1
Switch(EpsPortType)# setEpsInstance epsConfig domain port
Switch(EpsPortType)# setEpsInstance epsConfig mepAps 21
Switch(EpsPortType)# setEpsInstance epsConfig mepProtect 21
Switch(EpsPortType)# setEpsInstance epsConfig mepWork 20
Switch(EpsPortType)# setEpsInstance epsConfig protectFlow portNo 5
Switch(EpsPortType)# setEpsInstance epsConfig workFlow portNo 4

Switch(EpsPortType)# setEpsInstProperties epsInstConfig epsInst 30
Switch(EpsPortType)# setEpsInstProperties epsInstConfig aps enable
Switch(EpsPortType)# setEpsInstProperties epsInstConfig protectionType uni

Switch(EpsPortType)# setEpsInstProperties review
Switch(EpsPortType)# setEpsInstProperties commit
Switch(EpsPortType)# exit
```

Configuring Bidirectional EPS on NID-2

Before You Begin

- Architecture a1for1 bidirectional
- Domain port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

Step 2	**setEpsInstConfig epsConfig** {**epsInst** *epsInst-number* | **domain** {**port** | **evc**} | **architecture** {**a1plus1** | **a1for1**} | **workflow** {**inst** *inst-number* | **portNo** *port-number*} | **protectFlow** {**inst** *inst-number* | **portNo** *port-number*} | **mepWork** *mepWork-number* | **mepProtect** *mepProtect-number* | **mepAps** *mepAPS-number*}
	
	Example:
	`Switch(EpsPortType)# setEpsInstance epsConfig epsInst 30`
	`Switch(EpsPortType)# setEpsInstance epsConfig architecture a1for1`
	`Switch(EpsPortType)# setEpsInstance epsConfig domain port`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepAps 21`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepProtect 21`
	`Switch(EpsPortType)# setEpsInstance epsConfig mepWork 20`
	`Switch(EpsPortType)# setEpsInstance epsConfig protectFlow portNo 5`
	`Switch(EpsPortType)# setEpsInstance epsConfig workFlow portNo 4`
		Sets EPS configuration.
		• **epsConfig**—Specifies the EPS configuration.
		• **epsInst**— Specifies the EPS instance.
		• *epsInst-number*—EPS instance number.
		• **domain**—Specifies the domain of the EPS.
		• **port**—Specifies that this EPS is protecting in the port domain.
		• **evc**—Specifies that this EPS is protecting in the EVC domain.
		• **architecture**—Specifies the EPS architecture.
		• **a1plus1**—Specifies that the architecture is 1 plus 1.
		• **a1for1**—Specifies that the architecture is 1 for 1.
		• **workflow**—Specifies the working flow instance for the related EPS.
		• **inst**—Specifies the working flow instance number when not in the port domain.
		• *inst-number*—Working flow instance number.
		• **portNo**—Specifies port ID.
		• *port-number*—Port ID number.
		• **protectFlow**—Specifies the protect flow instance for the related EPS.
		• **inst**—Specifies the protect flow instance number when not in the port domain.
		• *inst-number*—Protect flow instance number.
		• **portNo**—Specifies port ID.
		• *port-number*—Port ID number.
		• **mepWork**—Specifies working MEP instance.
		• *mepWork-number*—Working MEP number.
		• **mepProtect**—Specifies protect MEP instance.
		• *mepProtect-number*—Protect MEP number.

	Command or Action	Purpose
		• **mepAps—**Specifies APS MEP instance. • *mepAPS-number*—APS MEP number.

Step 3	**setEpsInstProperties epsInstconfig** {**epsInst** *eps-instance-number* | **protectionType** {**uni** | **bi**} | **aps** {**enable** | **disable**} | **revertive** {**enable** | **disable**} | **wtrTime w***time*[**m** | **s**] **holdoff**}
	
	Example:
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig epsInst 30`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig protectionType bi`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig revertive enable`
	`Switch(EpsPortType)# setEpsInstProperties epsInstConfig wtrTime w10s`
		Adds CC/APS configuration request.
		• **epsInst—**Specifies the EPS instance.
		• *eps-instance-number*—EPS instance number.
		• **protectionType—**Specifies the protection type in case of 1plus1.
		• **uni—**Specifies unidirectional.
		• **bi—** Specifies bidirectional.
		• **aps—**Specifies EPS 1+1 unidirectional with APS protection type.
		• **enable—**Enables APS protection.
		• **disable—**Disables APS protection.
		• **revertive—**Specifies revertive EPS.
		• **enable—**Enables revertive EPS.
		• **disable—** Disables revertive EPS.
		• **wtrTime—** Specifies the WTR time.
		• *time*—WTR time in minutes or seconds.
		• **m—** Time in minutes. Valid values are from 5 to 12.
		• **s—** Time in seconds. Valid values are 10 and 30.
		• **holdoff—** Specifies the hold off timer.

Step 4	**setEpsInstProperties review** **Example:** `Switch(EpsPortType)# setEpsInstProperties review`	Displays the configuration.
Step 5	**setEpsInstProperties commit** **Example:** `Switch(EpsPortType)# setEpsInstProperties commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to configure bidirectional EPS on NID-2:

```
Switch(EpsPortType)# setEpsInstance epsConfig epsInst 30
Switch(EpsPortType)# setEpsInstance epsConfig architecture a1for1
Switch(EpsPortType)# setEpsInstance epsConfig domain port
Switch(EpsPortType)# setEpsInstance epsConfig mepAps 21
Switch(EpsPortType)# setEpsInstance epsConfig mepProtect 21
Switch(EpsPortType)# setEpsInstance epsConfig mepWork 20
Switch(EpsPortType)# setEpsInstance epsConfig protectFlow portNo 5
Switch(EpsPortType)# setEpsInstance epsConfig workFlow portNo 4

Switch(EpsPortType)# setEpsInstProperties epsInstConfig epsInst 30
Switch(EpsPortType)# setEpsInstProperties epsInstConfig protectionType bi
Switch(EpsPortType)# setEpsInstProperties epsInstConfig revertive enable
Switch(EpsPortType)# setEpsInstProperties epsInstConfig wtrTime w10s

Switch(EpsPortType)# setEpsInstProperties review
Switch(EpsPortType)# setEpsInstProperties commit
Switch(EpsPortType)# exit
```

Displaying EPS

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.
Step 2	**getEpsInstProperties epsRequest epsInst** *eps-instance-number* **Example:** `Switch(EpsPortType)# getEpsInstProperties epsRequest epsInst 30`	Sets EPS configuration. • **epsRequest—**Specifies EPS get request parameter. • **epsInst—** Specifies the EPS instance. • *eps-instance-number*—EPS instance number.
Step 3	**getEpsInstance epsRequest** {**epsInst** *eps-instance-number* **Example:** `Switch(EpsPortType)# getEpsInstance epsRequest epsInst 30`	Adds CC/APS configuration request. • **epsRequest—**Specifies EPS get request parameter. • **epsInst—** Specifies the EPS instance. • *eps-instance-number*—EPS instance number.
Step 4	**showEpsConfig showEpsReq epsInstList** *eps-instance-number* **Example:** `Switch(EpsPortType)# showEpsConfig showEpsReq epsInstList 30`	Adds CC/APS configuration request. • **showEpsReq—**Displays the EPS configuration. • **epsInstList—**Specifies the EPS instance list. • *eps-instance-list-number*—EPS instance list number.

	Command or Action	Purpose
Step 5	**showEpsState showEpsReq epsInstList** *eps-instance-list-number* **Example:** `Switch(EpsPortType)# showEpsState showEpsReq epsInstList 30`	Adds CC/APS configuration request. • **showEpsReq—**Displays EPS request parameter. • **epsInstList—**Specifies the EPS instance list. • *eps-instance-list-number***—**EPS instance list number. The valid value are from 1-100.
Step 6	**setEpsInstProperties review** **Example:** `Switch(EpsPortType)# setEpsInstProperties review`	Displays the configuration.
Step 7	**setEpsInstProperties commit** **Example:** `Switch(EpsPortType)# setEpsInstProperties commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to display EPS:

```
Switch(EpsPortType)# getEpsInstProperties epsRequest epsInst 30
Switch(EpsPortType)# getEpsInstance epsRequest epsInst 30
Switch(EpsPortType)# showEpsConfig showEpsReq epsInstList 30
Switch(EpsPortType)# showEpsState showEpsReq epsInstList 30
Switch(EpsPortType)# setEpsInstProperties review
Switch(EpsPortType)# setEpsInstProperties commit
Switch(EpsPortType)# exit
```

Clearing EPS Wait-To-Restore Timer

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

	Command or Action	Purpose
Step 2	**clearEpsWtr clearEps epsInst** *eps-instance-number* **Example:** `Switch(EpsPortType)# clearEpsWtr clearEps epsInst 30`	Sets EPS configuration. • **clearEps—**Specifies clear EPS WTR. • **epsInst—** Specifies the EPS instance. • *eps-instance-number***—**EPS instance number.
Step 3	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to clear EPS:

```
Switch(EpsPortType)# clearEpsWtr clearEps epsInst 30
Switch(EpsPortType)# exit
```

Updating EPS

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

Step 2	**updateEpsInstance epsCommand** {**epsInst** *epsInst-number* | **command** {**lockout** | **forced** | **manualp** | **manualw** | **exercise** | **freeze** | **localLockout**}}
	
	Example:
	`Switch(EpsPortType)# updateEpsInstance epsCommand epsInst 1`
	
	Example:
	`Switch(EpsPortType)# updateEpsInstance epsCommand epsInst 1`
	`Switch(EpsPortType)# updateEpsInstance epsCommand command exercise`
	`Switch(EpsPortType)# updateEpsInstance epsCommand command forced`
	`Switch(EpsPortType)# updateEpsInstance epsCommand command freeze`
	`Switch(EpsPortType)# updateEpsInstance epsCommand command localLockout`
		Use only one of the following commands, as required: Sets EPS configuration.
		• **epsCommand—**Specifies the EPS command configuration.
		• **epsInst—** Specifies the EPS instance.
		• *epsInst-number***—**EPS instance number.
		• **command—**Specifies the EPS commands.
		• **lockout—**Locks out of protection.
		• **forced—**Forces switching of normal traffic to protection.
		• **manualp—**Manually switches normal traffic to protection.

	Command or Action	Purpose

	`Switch(EpsPortType)# updateEpsInstance epsCommand command lockout`
	`Switch(EpsPortType)# updateEpsInstance epsCommand command manualp`
	`Switch(EpsPortType)# updateEpsInstance epsCommand command manualw`
		• **manualw**—Manually switches normal traffic to working.
		• **exercise**—Specifies the exercise signal.
		• **freeze**—Specifies local freezing of EPS.
		• **localLockout**—Specifies local lockout of EPS.
		• **clear**—Clears EPS commands.

Step 3	**updateEpsInstance review** **Example:** `Switch(EpsPortType)# updateEpsInstance review`	Displays the configuration.
Step 4	**updateEpsInstance commit** **Example:** `Switch(EpsPortType)# updateEpsInstance commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to update EPS:

```
Switch(EpsPortType)# updateEpsInstance epsCommand epsInst 1
```

Use only one of the following commands, as required:

```
Switch(EpsPortType)# updateEpsInstance epsCommand command exercise
Switch(EpsPortType)# updateEpsInstance epsCommand command forced
Switch(EpsPortType)# updateEpsInstance epsCommand command freeze
Switch(EpsPortType)# updateEpsInstance epsCommand command localLockout
Switch(EpsPortType)# updateEpsInstance epsCommand command lockout
Switch(EpsPortType)# updateEpsInstance epsCommand command manualp
Switch(EpsPortType)# updateEpsInstance epsCommand command manualw

Switch(EpsPortType)# updateEpsInstance review
Switch(EpsPortType)# updateEpsInstance commit
Switch(EpsPortType)# exit
```

Deleting EPS

Before You Begin

- Architecture a1plus1 bidirectional
- Domain port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

Step 2	**deleteEps deleteEpsConfig** {**epsInst** *eps-instance-number* | **delete** {**eps** | **command** | **holdoff** | **revertive**}}
	
	Example:
	`Switch(EpsPortType)# deleteEps deleteEpsConfig epsInst 30`
	`Switch(EpsPortType)# deleteEps deleteEpsConfig delete eps`
		Adds CC/APS configuration request.
		• **deleteEpsConfig—**Deletes EPS configuration.
		• **epsInst—**Specifies the EPS instance.
		• *ep-instance-number***—**EPS instance number.
		• **delete—**Deletes the configuration.
		• **eps—**Deletes EPS instance.
		• **command—**Deletes EPS commands.
		• **holdoff—**Clears hold off timer.
		• **revertive—**Disables revertive EPS.

Step 3	**deleteEps review** **Example:** `Switch(EpsPortType)# deleteEps review`	Displays the configuration.
Step 4	**deleteEps commit** **Example:** `Switch(EpsPortType)# deleteEps commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to delete EPS:

```
Switch(EpsPortType)# deleteEps deleteEpsConfig epsInst 30
Switch(EpsPortType)# deleteEps deleteEpsConfig delete eps

Switch(EpsPortType)# deleteEps review
Switch(EpsPortType)# deleteEps commit
Switch(EpsPortType)# exit
```

Deleting EPS Command

Before You Begin

- Architecture a1plus1 bidirectional
- Domain port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

Step 2	**deleteEps deleteEpsConfig** {**epsInst** *eps-instance-number* | **delete** {**eps** | **command** | **holdoff** | **revertive**}}
	
	Example:
	`Switch(EpsPortType)# deleteEps deleteEpsConfig epsInst 30`
	`Switch(EpsPortType)# deleteEps deleteEpsConfig delete command`
		Adds CC/APS configuration request.
		• **deleteEpsConfig—**Deletes EPS configuration.
		• **epsInst—**Specifies the EPS instance.
		• *ep-instance-number*—EPS instance number.
		• **delete—**Deletes the configuration.
		• **eps—**Deletes EPS instance.
		• **command—**Deletes EPS commands.
		• **holdoff—**Clears hold off timer.
		• **revertive—**Disables revertive EPS.

Step 3	**deleteEps review** **Example:** `Switch(EpsPortType)# deleteEps review`	Displays the configuration.
Step 4	**deleteEps commit** **Example:** `Switch(EpsPortType)# deleteEps commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode..

Configuration Example

The example shows how to delete EPS command:

```
Switch(EpsPortType)# deleteEps deleteEpsConfig epsInst 30
Switch(EpsPortType)# deleteEps deleteEpsConfig delete command

Switch(EpsPortType)# deleteEps review
Switch(EpsPortType)# deleteEps commit
Switch(EpsPortType)# exit
```

Deleting EPS Hold Off Timer

Before You Begin

- Architecture a1plus1 bidirectional
- Domain port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

Step 2	**deleteEps deleteEpsConfig** {**epsInst** *eps-instance-number* | **delete** {**eps** | **command** | **holdoff** | **revertive**}}
	
	Example:
	`Switch(EpsPortType)# deleteEps deleteEpsConfig epsInst 30`
	`Switch(EpsPortType)# deleteEps deleteEpsConfig delete holdoff`
		Adds CC/APS configuration request.
		• **deleteEpsConfig—**Deletes EPS configuration.
		• **epsInst—**Specifies the EPS instance.
		• *ep-instance-number*—EPS instance number.
		• **delete—**Deletes the configuration.
		• **eps—**Deletes EPS instance.
		• **command—**Deletes EPS commands.
		• **holdoff—**Clears hold off timer.
		• **revertive—**Disables revertive EPS.

Step 3	**deleteEps review** **Example:** `Switch(EpsPortType)# deleteEps review`	Displays the configuration.
Step 4	**deleteEps commit** **Example:** `Switch(EpsPortType)# deleteEps commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to delete EPS hold off timer:

```
Switch(EpsPortType)# deleteEps deleteEpsConfig epsInst 30
Switch(EpsPortType)# deleteEps deleteEpsConfig delete holdoff

Switch(EpsPortType)# deleteEps review
Switch(EpsPortType)# deleteEps commit
Switch(EpsPortType)# exit
```

Deleting EPS Revertive Timer

Before You Begin

- Architecture a1plus1 bidirectional
- Domain port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**EpsPortType** **Example:** `Switch# EpsPortType`	Enters the EpsPortType mode.

Step 2	**deleteEps deleteEpsConfig** {**epsInst** *eps-instance-number* | **delete** {**eps** | **command** | **holdoff** | **revertive**}}
	
	Example:
	`Switch(EpsPortType)# deleteEps deleteEpsConfig epsInst 30`
	`Switch(EpsPortType)# deleteEps deleteEpsConfig delete revertive`
		Adds CC/APS configuration request.
		• **deleteEpsConfig—**Deletes EPS configuration.
		• **epsInst—**Specifies the EPS instance.
		• *ep-instance-number***—**EPS instance number.
		• **delete—**Deletes the configuration.
		• **eps—**Deletes EPS instance.
		• **command—**Deletes EPS commands.
		• **holdoff—**Clears hold off timer.
		• **revertive—**Disables revertive EPS.

	Command or Action	Purpose
Step 3	**deleteEps review** **Example:** `Switch(EpsPortType)# deleteEps review`	Displays the configuration.
Step 4	**deleteEps commit** **Example:** `Switch(EpsPortType)# deleteEps commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(EpsPortType)# exit`	Exits the EpsPortType mode.

Configuration Example

The example shows how to delete EPS revertive timer:

```
Switch(EpsPortType)# deleteEps deleteEpsConfig epsInst 30
Switch(EpsPortType)# deleteEps deleteEpsConfig delete revertive

Switch(EpsPortType)# deleteEps review
Switch(EpsPortType)# deleteEps commit
Switch(EpsPortType)# exit
```

Verifying EPS

Use the following commands to verify the EPS status on the Cisco ME 1200 NID .

- **showEpsConfig showEpsReq epsInstList 1**

  This command displays the EPS configuration status on the NID. The following is a sample output from the command:

```
Switch(EpsPortType)# showEpsConfig showEpsReq epsInstList 1
Switch(EpsPortType)# showEpsConfig review
```

```
Commands in queue:
 showEpsConfig showEpsReq epsInstList 1
```

```
Switch(EpsPortType)# showEpsConfig commit
```

```
Clearing Socket 5
xpinfo->value : 1Clearing Socket 5
ShowEpsConfig_Output.epsInfo.epsInstance[0].epsInst = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.domain.t = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.domain.u.port =
'Port'
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.architecture.t =
1
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.architecture.u.a1plus1
 = '1plus1'
```

```
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.workFlow.t = 2
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.workFlow.u.portNo
 = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.protectFlow.t = 2
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.protectFlow.u.portNo
 = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.mepWork = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.mepProtect = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].config.mepAps = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.protectionType.t
 = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.protectionType.u.uni
 = 'unidirectional'
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.revertive.t =
 2
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.revertive.u.disable
 = 'Disable'
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.aps.t = 2
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.aps.u.disable
 = 'Disable'
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.wtrTime.t = 1
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.wtrTime.u.w10m
 = ''
ShowEpsConfig_Output.epsInfo.epsInstance[0].instConfig.holdoff = 100
ShowEpsConfig_Output.epsInfo.epsInstance[0].command.t = 2
ShowEpsConfig_Output.epsInfo.epsInstance[0].command.u.forced = 'forced'

 ShowEpsConfig Commit Success!!!
```

- **showEpsState showEpsReq epsInstList 1**

  This command displays the EPS status on the NID. The following is a sample output from the command:

```
Switch(EpsPortType)# showEpsState showEpsReq epsInstList 1
Switch(EpsPortType)# showEpsState review
```

```
Commands in queue:
 showEpsState showEpsReq epsInstList 1
```

```
Switch(EpsPortType)# showEpsState commit
```

```
Clearing Socket 5 Clearing Socket 5
ShowEpsState_Output.epsStateInfo.epsInst[0].epsInst = 1
ShowEpsState_Output.epsStateInfo.epsInst[0].protectionState = 'Disable'
ShowEpsState_Output.epsStateInfo.epsInst[0].wFlow = 'Ok'
ShowEpsState_Output.epsStateInfo.epsInst[0].pFlow = 'Ok'
ShowEpsState_Output.epsStateInfo.epsInst[0].transmitAps = 'LO'
ShowEpsState_Output.epsStateInfo.epsInst[0].receiveAps = 'LO'
ShowEpsState_Output.epsStateInfo.epsInst[0].architectureMismatch =
true
ShowEpsState_Output.epsStateInfo.epsInst[0].APSOnWorking = true
ShowEpsState_Output.epsStateInfo.epsInst[0].switchingIncomplete = true
ShowEpsState_Output.epsStateInfo.epsInst[0].noAPSReceived = true
ShowEpsState_Output.epsStateInfo.epsInst[0].txApsRe = 1
ShowEpsState_Output.epsStateInfo.epsInst[0].txApsBr = 2200564160
ShowEpsState_Output.epsStateInfo.epsInst[0].rxApsRe = 2200566368
ShowEpsState_Output.epsStateInfo.epsInst[0].rxApsBr = 2222748384

 ShowEpsState Commit Success!!!
```

CHAPTER 18

Configuring ERPS

This document describes the Ethernet Ring Protection Switching (ERPS) feature and configuration steps to implement protection switching mechanisms for Ethernet layer ring topologies.

Prerequisites for Configuring ERPS

- NID must have an IP address.

Restrictions for Configuring ERPS

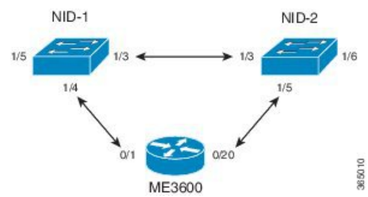
- Maintenance End Point (MEP) is not supported on Ethernet Virtual Connections (EVC) bridge domain.
- MEP domain for control VLAN is only on Port or VLAN.

Information About ERPS

The ITU-T G.8032 ERPS feature implements protection switching mechanisms for Ethernet layer ring topologies. This feature uses the G.8032 Ethernet Ring Protection (ERP) protocol, defined in ITU-T G.8032, to provide protection for Ethernet traffic in a ring topology, while ensuring that no loops are within the ring at the Ethernet layer. The loops are prevented by blocking traffic on either a predetermined link or a failed link.

The following figure shows the topology used for provisioning ERPS on NID-1 and NID-2.

Figure 12: ERPS Topology



How to Provision ERPS

Creating VLAN on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createVlanCommand createVlanReq vlan-list** *vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 2000`	Creates VLAN list.

Step 3	**modifySwPort modifySWPortConfig interface** *interface-id* | **mode** [**access Vlan** *vlan-number*] | **trunk** {**allowed** | **native**}
	
	Example:
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 3`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 1`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list 2000`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 4`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 1`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list 2000`
		Modifies the switchport configuration.
		• **interface**—Selects the interface to be configured.
		• *Interface Id*—Specifies the interface ID.
		• **mode**—Specifies the mode of operation.
		• **access**—Sets mode to ACCESS unconditionally.
		• **vlan**—Sets VLAN when interface is in access mode.
		• *vlan-number*—Specifies the VLAN number.
		• **trunk**—Sets mode to TRUNK unconditionally.
		• **allowed**—Sets allowed VLAN characteristics when interface is in trunk mode.

	Command or Action	Purpose
		• **native—**Sets native VLAN.
Step 4	**modifySwPort review** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort review`	Displays the configuration.
Step 5	**modifySwPort commit** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionPortVlanPortType mode.

Configuration Example

The example shows how to create VLAN on NID-1:

```
Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 2000

Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 3
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan
1
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan
 add vlan-list 2000

Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 4
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan
1
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan
 add vlan-list 2000

Switch(ProvisionPortVlanPortType)# modifySwPort review
Switch(ProvisionPortVlanPortType)# modifySwPort commit
Switch(ProvisionPortVlanPortType)# exit
```

Creating MEP on Port 1 of NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.

	Command or Action	Purpose

Step 2	**createMep createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level-number* | **residencePort** *port-number* | **mepld** *id-number* | **megdomain** {**maName** *ma-name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}
	
	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 100`
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain vlan`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName ERPS-1`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepId 100`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 3`
	`Switch(ProvisionMepPortType)# createMep createMepConfig flow 2000`
		Creates MEP configuration.
		• **mepinstance—**Specifies the MEP instance number.
		• **mode—**Specifies the mode of the MEP instance.
		• **mep—**Specifies the maintenance entity end point.
		• **mip—**Specifies the maintenance entity intermediate point.
		• **direction—**Selects the direction of the MEP.
		• **up—**Specifies an Up MEP - monitoring egress OAM and traffic on residence port.
		• **down—**Specifies a Down MEP - monitoring ingress OAM and traffic on residence port.
		• **domain—**Selects the domain of the MEP.
		• **port—**Specifies a MEP in the Port Domain. Flow Instance is a Port.
		• **evc—**Specifies a MEP in the EVC Domain. Flow Instance is a EVC. The EVC must be created.
		• **vlan—**Specifies a MEP in the VLAN Domain. Flow Instance is a VLAN. The VLAN must be created.
		• **flowId—**Specifies the flow related to the MEP.
		• **vid—**In case the MEP is a port Up-MEP or a EVC customer MIP the VID must be given.
		• **level—**Specifies the MEG level of the MEP.
		• *level-number*—MEG level number.
		• **residencePort—**Specifies the port monitored by MEP.
		• *port-number*—Residence port number.
		• **mepld—**Specifies MEP ID.
		• *id-number*—MEP ID number.
		• **megdomain—**Specifies the maintenance domain configuration.
		• **maName—**Specifies the ITU/IEEE MEG-ID (short MA name).
		• *ma-name*—Short MA name.
		• **megIdFormat—**Selects the MEG ID format.
		• **ituMeg—**Specifies the MEG-ID using ITU format (ICC - UMC).

	Command or Action	Purpose
		• **ituCcMeg—**Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC). • **ieee—**Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

Step 3	**addPeerMepId commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 100`
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 101`
		Adds peer MEP request.
		• **commit—**Commits addPeerMepId.
		• **flush—**Flushes all addPeerMepId commands from queue.
		• **peerMepConfig—**Adds peer mep request.
		• **macAddress—**Specifies the peer MAC. This is overwritten by any learned MAC - through CCM reception.
		• **mepInstance—**Specifies the mep instance number.
		• **peerMepId—**Specifies the peer MEP-ID.

Step 4	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep-instance-number*} | **review**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 100`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol raps octet 1`
		Adds CC/APS configuration request.
		• **commit—**Commits addCcAps.
		• **flush—**Flushes all addCcAps commands from queue.
		• **mepFunctionalConfig—**Adds CC/APS configuration request.
		• **aps—**Specifies APS protocol.
		• **enable—**Enables APS.
		• **disbale—**Disables APS.
		• **cc—**Specifies continuity check.
		• **enable—**Enables CC.
		• **disbale—**Disables CC.
		• **mepInstance—**Specifies the mep instance number.
		• *mep-instance-number*—MEP instance number.

Step 5	**addCcAps review** **Example:** `Switch(ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 6	**addCcAps commit** **Example:** `Switch(ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 7	**exit** **Example:** `Switch(ProvisionMepPortType)# exit`	Exits the ProvisionMepPortType mode.

Configuration Example

The example shows how to create MEP on port 1 of NID-1:

```
Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 100
Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(ProvisionMepPortType)# createMep createMepConfig domain vlan
Switch(ProvisionMepPortType)# createMep createMepConfig level 0
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName ERPS-1
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg
Switch(ProvisionMepPortType)# createMep createMepConfig mepId 100
Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 3
Switch(ProvisionMepPortType)# createMep createMepConfig flow 2000

Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 100
Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 101

Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 100
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol
raps octet 1

Switch(ProvisionMepPortType)# addCcAps review
Switch(ProvisionMepPortType)# addCcAps commit
Switch(ProvisionMepPortType)# exit
```

Creating MEP on Port 2 of NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.
Step 2	**createMep createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level-number* | **residencePort** *port-number* | **mepId** *id-number* | **megdomain** {**maName** *ma-name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}	Creates MEP configuration. • **mepinstance—**Specifies the MEP instance number. • **mode—**Specifies the mode of the MEP instance. • **mep—**Specifies the maintenance entity end point.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 99`
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain vlan`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName W-N-V2000`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ieee name W-N-V2000`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepId 101`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 4`
	`Switch(ProvisionMepPortType)# createMep createMepConfig flow 2000`
		• **mip—**Specifies the maintenance entity intermediate point.
		• **direction—**Selects the direction of the MEP.
		• **up—**Specifies an Up MEP - monitoring egress OAM and traffic on residence port.
		• **down—**Specifies a Down MEP - monitoring ingress OAM and traffic on residence port.
		• **domain—**Selects the domain of the MEP.
		• **port—**Specifies a MEP in the Port Domain. Flow Instance is a Port.
		• **evc—**Specifies a MEP in the EVC Domain. Flow Instance is a EVC. The EVC must be created.
		• **vlan—**Specifies a MEP in the VLAN Domain. Flow Instance is a VLAN. The VLAN must be created.
		• **flowId—**Specifies the flow related to the MEP.
		• **vid—**In case the MEP is a port Up-MEP or a EVC customer MIP the VID must be given.
		• **level—**Specifies the MEG level of the MEP.
		• *level-number*—MEG level number.
		• **residencePort—**Specifies the port monitored by MEP.
		• *port-number*—Residence port number.
		• **mepId—**Specifies MEP ID.
		• *id-number*—MEP ID number.
		• **megdomain—**Specifies the maintenance domain configuration.
		• **maName—**Specifies the ITU/IEEE MEG-ID (short MA name).
		• *ma-name*—Short MA name.
		• **megIdFormat—**Selects the MEG ID format.
		• **ituMeg—**Specifies the MEG-ID using ITU format (ICC - UMC).
		• **ituCcMeg—**Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC).
		• **ieee—**Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

	Command or Action	Purpose

Step 3	**addPeerMepId commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 99`
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 102`
		Adds peer MEP request.
		• **commit—**Commits addPeerMepId.
		• **flush—**Flushes all addPeerMepId commands from queue.
		• **peerMepConfig—**Adds peer mep request.
		• **macAddress—**Specifies the peer MAC. This is overwritten by any learned MAC - through CCM reception.
		• **mepInstance—**Specifies the mep instance number.
		• **peerMepId—**Specifies the peer MEP-ID.

Step 4	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep-instance-number*} | **review**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 99`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol raps octet 1`
		Adds CC/APS configuration request.
		• **commit—**Commits addCcAps.
		• **flush—**Flushes all addCcAps commands from queue.
		• **mepFunctionalConfig—**Adds CC/APS configuration request.
		• **aps—**Specifies APS protocol.
		• **enable—**Enables APS.
		• **disbale—**Disables APS.
		• **cc—**Specifies continuity check.
		• **enable—**Enables CC.
		• **disbale—**Disables CC.
		• **mepInstance—**Specifies the mep instance number.
		• *mep-instance-number*—MEP instance number.

Step 5	**addCcAps review** **Example:** `Switch(ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 6	**addCcAps commit** **Example:** `Switch(ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.
Step 7	**exit** **Example:** `Switch(ProvisionMepPortType)# exit`	Exits the ProvisionMepPortType mode.

Configuration Example

The example shows how to create MEP on port2 of NID-1:

```
Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 99
Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(ProvisionMepPortType)# createMep createMepConfig domain vlan
Switch(ProvisionMepPortType)# createMep createMepConfig level 0
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName W-N-V2000
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ieee name
W-N-V2000
Switch(ProvisionMepPortType)# createMep createMepConfig mepId 101
Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 4
Switch(ProvisionMepPortType)# createMep createMepConfig flow 2000

Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 99
Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 102

Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 99
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol
raps octet 1

Switch(ProvisionMepPortType)# addCcAps review
Switch(ProvisionMepPortType)# addCcAps commit
Switch(ProvisionMepPortType)# exit
```

Configuring ERPS on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ErpsPortType** **Example:** `Switch# ErpsPortType`	Enters the ErpsPortType mode.

Step 2	**setErpsInstConfig erpsConfig** {**erpsInst** *erpsInst-number* | **mep** {**port0** {**sf** *sf-number* | **aps** *aps-number*} | **port1** {**sf** *sf-number* | **aps** *aps-number*}} | **ringType** {**major** | **sub**}}
	
	Example:
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig erpsInst 1`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port0 aps 100`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port0 sf 100`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port1 aps 99`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port1 sf 99`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig port0 3`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig port1 4`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig ringType major`
		Sets ERPS configuration.
		• **erpsConfig—**Specifies the ERPS configuration.
		• **erpsInst—** Specifies the ERPS instance.
		• *erpsInst-number*—ERPS instance number
		• **mep—**Specifies the MEP configuration.
		• **port0—**Selects the ERPS port 0 interface.
		• **port1—**Selects the ERPS port 0 interface.
		• **sf—**Specifies signal fail MEP.
		• *sf-number*—Signal fail MEP number.
		• **aps—**Specifies the APS MEP.
		• *aps-number*— APS MEP number.

	Command or Action	Purpose
		• **ringType—**Specifies type of ring. • **major—**Specifies the major ring. • **sub—**Specifies the sub ring.

Step 3	**setErpsInstProperties erpsInstconfig** {**wtrTime** *time-in-minutes* | **erpsInst** *erp-instance-number* | **rplPort** {**port0** | **port1**} | **rplRole** {**owner** | **neighbour**} | **vlan** {**vlanList** *vlan-list-number* | **add** | **remove** | **none**}}
	
	Example:
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig erpsInst 1`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig rplPort port0`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig rplRole owner`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig vlan vlanList 2-10`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1`
		Adds CC/APS configuration request.
		• **wtrTime—** Specifies the WTR time.
		• *time-in-minutes*—WTR time in minutes. Allowed range is 1, 5-12.
		• **erpsInst—**Specifies the ERPS instance.
		• *erp-instance-number*—ERPS instance number.
		• **rplPort—**Specifies the RPL port.
		• **port0—**Selects the ERPS port 0 interface.
		• **port1—** Selects the ERPS port 1 interface.
		• **rplRole—**Specifies the RPL role.
		• **owner—**Specifies the RPL owner.
		• **neighbour—**Specifies the RPL neighbour.
		• **vlan—**Specifies the VLAN configuration.
		• **vlanList—**Specifies the VLAN list.
		• *vlan-list-number*— VLAN list number.
		• **add—**Adds to the set of included VLANs.
		• **remove—**Removes from the set of included VLANs.
		• **none—** Does not include any VLANs.

Step 4	**setErpsInstProperties review** **Example:** `Switch(ErpsPortType)# setErpsInstProperties review`	Displays the configuration.
Step 5	**setErpsInstProperties commit** **Example:** `Switch(ErpsPortType)# setErpsInstProperties commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(ErpsPortType)# exit`	Exits the ErpsPortType mode.

Configuration Example

The example shows how to configure ERPS on NID-1:

```
Switch(ErpsPortType)# setErpsInstConfig erpsConfig erpsInst 1
Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port0 aps 100
Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port0 sf 100
Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port1 aps 99
Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port1 sf 99
Switch(ErpsPortType)# setErpsInstConfig erpsConfig port0 3
Switch(ErpsPortType)# setErpsInstConfig erpsConfig port1 4
Switch(ErpsPortType)# setErpsInstConfig erpsConfig ringType major

Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig erpsInst 1
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig rplPort port0
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig rplRole owner
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig vlan vlanList 2-10
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1

Switch(ErpsPortType)# setErpsInstProperties review
Switch(ErpsPortType)# setErpsInstProperties commit
Switch(ErpsPortType)# exit
```

Creating VLAN on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**createVlanCommand createVlanReq vlan-list** *vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 2000`	Creates VLAN list.

Step 3	**modifySwPort modifySWPortConfig interface** *interface-id* | **mode** [**access Vlan** *vlan-number*] | **trunk** {**allowed** | **native**}
	
	Example:
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 3`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 1`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list 2000`
	
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 5`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 1`
	`Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list 2000`
		Modifies the switchport configuration.
		• **interface—**Selects the interface to be configured.
		• *Interface Id*—Specifies the interface ID.
		• **mode—**Specifies the mode of operation.
		• **access—**Sets mode to ACCESS unconditionally.
		• **vlan—**Sets VLAN when interface is in access mode.
		• *vlan-number*—Specifies the VLAN number.
		• **trunk—**Sets mode to TRUNK unconditionally.

	Command or Action	Purpose
		• **allowed—**Sets allowed VLAN characteristics when interface is in trunk mode. • **native—**Sets native VLAN.
Step 4	**modifySwPort review** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort review`	Displays the configuration.
Step 5	**modifySwPort commit** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionPortVlanPortType mode.

Configuration Example

The example shows how to create VLAN on NID-2:

```
Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 2000

Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 3
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan
1
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan
 add vlan-list 2000
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 5
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan
1
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan
 add vlan-list 2000

Switch(ProvisionPortVlanPortType)# modifySwPort review
Switch(ProvisionPortVlanPortType)# modifySwPort commit
Switch(ProvisionPortVlanPortType)# exit
```

Creating MEP on Port 1 of NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.

	Command or Action	Purpose

Step 2	**createMep createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level-number* | **residencePort** *port-number* | **mepId** *id-number* | **megdomain** {**maName** *ma-name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}
	
	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 100`
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain vlan`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName ERPS-1`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepId 101`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 3`
	`Switch(ProvisionMepPortType)# createMep createMepConfig flow 2000`
		Creates MEP configuration.
		• **mepinstance—**Specifies the MEP instance number.
		• **mode—**Specifies the mode of the MEP instance.
		• **mep—**Specifies the maintenance entity end point.
		• **mip—**Specifies the maintenance entity intermediate point.
		• **direction—**Selects the direction of the MEP.
		• **up—**Specifies an Up MEP - monitoring egress OAM and traffic on residence port.
		• **down—**Specifies a Down MEP - monitoring ingress OAM and traffic on residence port.
		• **domain—**Selects the domain of the MEP.
		• **port—**Specifies a MEP in the Port Domain. Flow Instance is a Port.
		• **evc—**Specifies a MEP in the EVC Domain. Flow Instance is a EVC. The EVC must be created.
		• **vlan—**Specifies a MEP in the VLAN Domain. Flow Instance is a VLAN. The VLAN must be created.
		• **flowId—**Specifies the flow related to the MEP.
		• **vid—**In case the MEP is a port Up-MEP or a EVC customer MIP the VID must be given.
		• **level—**Specifies the MEG level of the MEP.
		• *level-number***—**MEG level number.
		• **residencePort—**Specifies the port monitored by MEP.
		• *port-number***—**Residence port number.
		• **mepId—**Specifies MEP ID.
		• *id-number***—**MEP ID number.
		• **megdomain—**Specifies the maintenance domain configuration.
		• **maName—**Specifies the ITU/IEEE MEG-ID (short MA name).
		• *ma-name***—**Short MA name.
		• **megIdFormat—**Selects the MEG ID format.
		• **ituMeg—**Specifies the MEG-ID using ITU format (ICC - UMC).

	Command or Action	Purpose
		• **ituCcMeg—**Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC). • **ieee—**Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

Step 3	**addPeerMepId commit | flush | peerMepConfig** {**macAddress | mepInstance | peerMepId**}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 100`
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 100`
		Adds peer MEP request.
		• **commit—**Commits addPeerMepId.
		• **flush—**Flushes all addPeerMepId commands from queue.
		• **peerMepConfig—**Adds peer mep request.
		• **macAddress—**Specifies the peer MAC. This is overwritten by any learned MAC - through CCM reception.
		• **mepInstance—**Specifies the mep instance number.
		• **peerMepId—**Specifies the peer MEP-ID.

Step 4	**addCcAps** {**commit | flush | mepFunctionalConfig** {**aps** {**enable | disable**} **| cc** {**enable | disable**} **| mepInstance** *mep-instance-number*} **| review**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 100`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol raps octet 1`
		Adds CC/APS configuration request.
		• **commit—**Commits addCcAps.
		• **flush—**Flushes all addCcAps commands from queue.
		• **mepFunctionalConfig—**Adds CC/APS configuration request.
		• **aps—**Specifies APS protocol.
		• **enable—**Enables APS.
		• **disbale—**Disables APS.
		• **cc—**Specifies continuity check.
		• **enable—**Enables CC.
		• **disbale—**Disables CC.
		• **mepInstance—**Specifies the mep instance number.
		• *mep-instance-number*—MEP instance number.

Step 5	**addCcAps review** **Example:** `Switch(ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 6	**addCcAps commit** **Example:** `Switch(ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 7	**exit** **Example:** `Switch(ProvisionMepPortType)# exit`	Exits the ProvisionMepPortType mode.

Configuration Example

The example shows how to create MEP on port 1 of NID-2:

```
Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 100
Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(ProvisionMepPortType)# createMep createMepConfig domain vlan
Switch(ProvisionMepPortType)# createMep createMepConfig level 0
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName ERPS-1
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg
Switch(ProvisionMepPortType)# createMep createMepConfig mepId 101
Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 3
Switch(ProvisionMepPortType)# createMep createMepConfig flow 2000

Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 100
Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 100

Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 100
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol
raps octet 1

Switch(ProvisionMepPortType)# addCcAps review
Switch(ProvisionMepPortType)# addCcAps commit
Switch(ProvisionMepPortType)# exit
```

Creating MEP on Port 2 of NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMepPortType** **Example:** `Switch# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.
Step 2	**createMep createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level-number* | **residencePort** *port-number* | **mepId** *id-number* | **megdomain** {**maName** *ma-name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}	Creates MEP configuration. • **mepinstance—**Specifies the MEP instance number. • **mode—**Specifies the mode of the MEP instance. • **mep—**Specifies the maintenance entity end point.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 99`
	`Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(ProvisionMepPortType)# createMep createMepConfig domain vlan`
	`Switch(ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName W-N-V2000`
	`Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ieee name W-N-V2000`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mepId 103`
	`Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 5`
	`Switch(ProvisionMepPortType)# createMep createMepConfig flow 2000`
		• **mip**—Specifies the maintenance entity intermediate point.
		• **direction**—Selects the direction of the MEP.
		• **up**—Specifies an Up MEP - monitoring egress OAM and traffic on residence port.
		• **down**—Specifies a Down MEP - monitoring ingress OAM and traffic on residence port.
		• **domain**—Selects the domain of the MEP.
		• **port**—Specifies a MEP in the Port Domain. Flow Instance is a Port.
		• **evc**—Specifies a MEP in the EVC Domain. Flow Instance is a EVC. The EVC must be created.
		• **vlan**—Specifies a MEP in the VLAN Domain. Flow Instance is a VLAN. The VLAN must be created.
		• **flowId**—Specifies the flow related to the MEP.
		• **vid**—In case the MEP is a port Up-MEP or a EVC customer MIP the VID must be given.
		• **level**—Specifies the MEG level of the MEP.
		• *level-number*—MEG level number.
		• **residencePort**—Specifies the port monitored by MEP.
		• *port-number*—Residence port number.
		• **mepId**—Specifies MEP ID.
		• *id-number*—MEP ID number.
		• **megdomain**—Specifies the maintenance domain configuration.
		• **maName**—Specifies the ITU/IEEE MEG-ID (short MA name).
		• *ma-name*—Short MA name.
		• **megIdFormat**—Selects the MEG ID format.
		• **ituMeg**—Specifies the MEG-ID using ITU format (ICC - UMC).
		• **ituCcMeg**—Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC).
		• **ieee**—Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

	Command or Action	Purpose

Step 3	**addPeerMepId commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}
	
	Example:
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 99`
	`Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 104`
		Adds peer MEP request.
		• **commit**—Commits addPeerMepId.
		• **flush**—Flushes all addPeerMepId commands from queue.
		• **peerMepConfig**—Adds peer mep request.
		• **macAddress**—Specifies the peer MAC. This is overwritten by any learned MAC - through CCM reception.
		• **mepInstance**—Specifies the mep instance number.
		• **peerMepId**—Specifies the peer MEP-ID.

Step 4	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep-instance-number*} | **review**}
	
	Example:
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 99`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol raps octet 1`
		Adds CC/APS configuration request.
		• **commit**—Commits addCcAps.
		• **flush**—Flushes all addCcAps commands from queue.
		• **mepFunctionalConfig**—Adds CC/APS configuration request.
		• **aps**—Specifies APS protocol.
		• **enable**—Enables APS.
		• **disbale**—Disables APS.
		• **cc**—Specifies continuity check.
		• **enable**—Enables CC.
		• **disbale**—Disables CC.
		• **mepInstance**—Specifies the mep instance number.
		• *mep-instance-number*—MEP instance number.

Step 5	**addCcAps review** **Example:** `Switch(ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 6	**addCcAps commit** **Example:** `Switch(ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.
Step 7	**exit** **Example:** `Switch(ProvisionMepPortType)# exit`	Exits the ProvisionMepPortType mode.

Configuration Example

The example shows how to create MEP on port 2 of NID-2:

```
Switch(ProvisionMepPortType)# createMep createMepConfig mepInstance 99
Switch(ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(ProvisionMepPortType)# createMep createMepConfig domain vlan
Switch(ProvisionMepPortType)# createMep createMepConfig level 0
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain maName W-N-V2000
Switch(ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ieee name
W-N-V2000
Switch(ProvisionMepPortType)# createMep createMepConfig mepId 103
Switch(ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(ProvisionMepPortType)# createMep createMepConfig residencePort 5
Switch(ProvisionMepPortType)# createMep createMepConfig flow 2000

Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 99
Switch(ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 104

Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 99
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7
Switch(ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol
raps octet 1

Switch(ProvisionMepPortType)# addCcAps review
Switch(ProvisionMepPortType)# addCcAps commit
Switch(ProvisionMepPortType)# exit
```

Configuring ERPS on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ErpsPortType** **Example:** `Switch# ErpsPortType`	Enters the ErpsPortType mode.

Step 2	**setErpsInstConfig erpsConfig** {**erpsInst** *erpsInst-number* | **mep** {**port0** {**sf** *sf-number* | **aps** *aps-number*} | **port1** {**sf** *sf-number* | **aps** }} | **ringType** {**major** | **sub**}}
	
	Example:
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig erpsInst 1`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port0 aps 100`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port0 sf 100`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port1 aps 99`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port1 sf 99`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig port0 3`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig port1 5`
	`Switch(ErpsPortType)# setErpsInstConfig erpsConfig ringType major`
		Sets ERPS configuration.
		• **erpsConfig—**Specifies the ERPS configuration.
		• **erpsInst—** Specifies the ERPS instance.
		• *erpsInst-number*—ERPS instance number
		• **mep—**Specifies the MEP configuration.
		• **port0—**Selects the ERPS port 0 interface.
		• **port1—**Selects the ERPS port 0 interface.
		• **sf—**Specifies signal fail MEP.
		• *sf-number*—Signal fail MEP number.
		• **aps—**Specifies the APS MEP.
		• *aps-number*— APS MEP number.

	Command or Action	Purpose
		• **ringType**—Specifies type of ring. • **major**—Specifies the major ring. • **sub**—Specifies the sub ring.

Step 3	**setErpsInstProperties erpsInstconfig** {**wtrTime** *time-in-minutes* | **erpsInst** *erp-instance-number* | **rplPort** {**port0** | **port1**} | **rplRole** {**owner** | **neighbour**} | **vlan** {**vlanList** *vlan-list-number* | **add** | **remove** | **none**}}
	
	Example:
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig erpsInst 1`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig rplPort port0`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig rplRole neighbour`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig vlan vlanList 2-10`
	`Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1`
		Sets ERPS instance.
		• **wtrTime**— Specifies the WTR time.
		• *time-in-minutes*—WTR time in minutes. Allowed range is 1, 5-12.
		• **erpsInst**—Specifies the ERPS instance.
		• *erp-instance-number*—ERPS instance number.
		• **rplPort**—Specifies the RPL port.
		• **port0**—Selects the ERPS port 0 interface.
		• **port1**— Selects the ERPS port 1 interface.
		• **rplRole**—Specifies the RPL role.
		• **owner**—Specifies the RPL owner.
		• **neighbour**—Specifies the RPL neighbour.
		• **vlan**—Specifies the VLAN configuration.
		• **vlanList**—Specifies the VLAN list.
		• *vlan-list-number*— VLAN list number.
		• **add**—Adds to the set of included VLANs.
		• **remove**—Removes from the set of included VLANs.
		• **none**— Does not include any VLANs.

Step 4	**setErpsInstProperties review** **Example:** `Switch(ErpsPortType)# setErpsInstProperties review`	Displays the configuration.
Step 5	**setErpsInstProperties commit** **Example:** `Switch(ErpsPortType)# setErpsInstProperties commit`	Sends the configuration to NID.
Step 6	**exit** **Example:** `Switch(ErpsPortType)# exit`	Exits the ErpsPortType mode.

Configuration Example

The example shows how to configure ERPS on NID-2:

```
Switch(ErpsPortType)# setErpsInstConfig erpsConfig erpsInst 1
Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port0 aps 100
Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port0 sf 100
Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port1 aps 99
Switch(ErpsPortType)# setErpsInstConfig erpsConfig mep port1 sf 99
Switch(ErpsPortType)# setErpsInstConfig erpsConfig port0 3
Switch(ErpsPortType)# setErpsInstConfig erpsConfig port1 5
Switch(ErpsPortType)# setErpsInstConfig erpsConfig ringType major

Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig erpsInst 1
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig rplPort port0
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig rplRole neighbour
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig vlan vlanList 2-10
Switch(ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1

Switch(ErpsPortType)# setErpsInstProperties review
Switch(ErpsPortType)# setErpsInstProperties commit
Switch(ErpsPortType)# exit
```

Configuring ERPS on the ME 3600

To configure ERPS on the ME 3600, such as Cisco ME 3600X Series Ethernet Access Switch, complete the following steps.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**ethernet ring g8032** *ring-name* **Example:** `Device(config)# ethernet ring g8032 ring1`	Specifies the Ethernet ring and enters Ethernet ring port configuration mode.
Step 4	**port0 interface** *type number* **Example:** `Device(config-erp-ring)# port0 interface fastethernet 0/1/0`	Connects port0 of the local node of the interface to the Ethernet ring and enters Ethernet ring protection mode.

	Command or Action	Purpose
Step 5	**monitor service instance** *instance-id* **Example:** `Device(config-erp-ring-port)# monitor service instance 1`	Assigns the Ethernet service instance to monitor the ring port (port0) and detect ring failures.
Step 6	**exit** **Example:** `Device(config-erp-ring-port)# exit`	Exits Ethernet ring port configuration mode.
Step 7	**port1** {**interface***type number* | **none**} **Example:** `Device(config-erp-ring)# port1 interface fastethernet 0/1/1`	Connects port1 of the local node of the interface to the Ethernet ring and enters Ethernet ring protection mode.
Step 8	**monitor service instance** *instance-id* **Example:** `Device(config-erp-ring-port)# monitor service instance 2`	Assigns the Ethernet service instance to monitor the ring port (port1) and detect ring failures. • The interface (to which port1 is attached) must be a subinterface of the main interface.
Step 9	**exit** **Example:** `Device(config-erp-ring-port)# exit`	Exits Ethernet ring port configuration mode.
Step 10	**exclusion-list vlan-ids** *vlan-id* **Example:** `Device(config-erp-ring)# exclusion-list vlan-ids 2`	Specifies VLANs that are unprotected by the Ethernet ring protection mechanism.
Step 11	**open-ring** **Example:** `Device(config-erp-ring)# open-ring`	Specifies the Ethernet ring as an open ring.
Step 12	**instance** *instance-id* **Example:** `Device(config-erp-ring)# instance 1`	Configures the Ethernet ring instance and enters Ethernet ring instance configuration mode.

	Command or Action	Purpose
Step 13	**description** *descriptive-name* **Example:** `Device(config-erp-inst)# description cisco-customer-instance`	Specifies a descriptive name for the Ethernet ring instance.
Step 14	**profile** *profile-name* **Example:** `Device(config-erp-inst)# profile profile1`	Specifies the profile associated with the Ethernet ring instance.
Step 15	**rpl** {**port0** | **port1**} {**owner** | **neighbor** | **next-neighbor** } **Example:** `Device(config-erp-inst)# rpl port0 neighbor`	Specifies the Ethernet ring port on the local node as the RPL owner, neighbor, or next neighbor.
Step 16	**inclusion-list vlan-ids** *vlan-id* **Example:** `Device(config-erp-inst)# inclusion-list vlan-ids 11`	Specifies VLANs that are protected by the Ethernet ring protection mechanism.
Step 17	**aps-channel** **Example:** `Device(config-erp-inst)# aps-channel`	Enters Ethernet ring instance aps-channel configuration mode.
Step 18	**level** *level-value* **Example:** `Device(config-erp-inst-aps)# level 5`	Specifies the Automatic Protection Switching (APS) message level for the node on the Ethernet ring. • All nodes in the Ethernet ring must be configured with the same level.
Step 19	**port0** **service instance** *instance-id* **Example:** `Device(config-erp-inst-aps)# port0 service instance 100`	Associates APS channel information with port0.
Step 20	**port1 service instance** {*instance-id* | **none** } **Example:** `Device(config-erp-inst-aps)# port1 service instance 100`	Associates APS channel information with port1.

	Command or Action	Purpose
Step 21	**end** **Example:** `Device(config-erp-inst-aps)# end`	Returns to user EXEC mode.

Configuration Example

The example shows how to configure ERPS on the ME 3600:

```
!
ethernet cfm domain W-N-V2000 level 0
service W-N-V2000 evc evc2000 vlan 2000 direction down
  continuity-check
  continuity-check interval 1s
  efd notify g8032
!

!
interface GigabitEthernet0/1
switchport trunk allowed vlan none
switchport mode trunk
!
service instance 2000 ethernet evc2000
  encapsulation dot1q 2000
  bridge-domain 2000
  cfm mep domain W-N-V2000 mpid 102
   rmep mpid 101
!

!
interface GigabitEthernet0/20
switchport trunk allowed vlan none
switchport mode trunk
!
service instance 2000 ethernet evc2000
  encapsulation dot1q 2000
  bridge-domain 2000
  cfm mep domain W-N-V2000 mpid 104
   rmep mpid 103
!

!
ethernet ring g8032 profile 1
timer wtr 1
!
ethernet ring g8032 1
port0 interface GigabitEthernet0/1
port1 interface GigabitEthernet0/20
instance 1
  profile 1
  inclusion-list vlan-ids 2-10,2000
  aps-channel
   level 0
   port0 service instance 2000
   port1 service instance 2000
  !
!
```

Verifying ERPS

Use the following command to verify the ERPS status on the Cisco ME 1200 NID.

- **showErpsConfig showErpsReq erpsInstList 1**

  This command displays the ERPS status on the Cisco ME 1200 NID. The following is a sample output from the command:

```
Switch(ErpsPortType)# showErpsConfig showErpsReq erpsInstList 1
Switch(ErpsPortType)# showErpsConfig review
```

```
showErpsConfig reviewCommands in queue:
        showErpsConfig showErpsReq erpsInstList 1
```

```
Switch(ErpsPortType)# showErpsConfig commit
```

```
Stat = 0ShowErpsConfig_Output.erpsInfo.erpsInstance[0].grpId = 1
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.ringType.t = 1
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.ringType.u.major
 = 'major'
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.virtualConnection.t
 = 2
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.virtualConnection.u.disable
 = 'Disable'
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.interconnect.t
 = 2
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.interconnect.u.disable
 = 'Disable'
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.instance = 0
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.port0 = 3
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.port1 = 4
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.mep.port0.sf =
 100
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.mep.port0.aps
= 100
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.mep.port1.sf =
 99
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].config.mep.port1.aps
= 99
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.guardTime
= 500
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.wtrTime =
1
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.revertive.t
 = 1
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.revertive.u.enable
 = 'Enable'
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.version.t
= 2
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.version.u.v2
 = 'V2'
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.topologyChangePropagate.t
 = 2
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.topologyChangePropagate.u.disable
 = 'Disable'
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.holdoff =
0
```

```
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.rplRole.t
= 1
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.rplRole.u.owner
 = 'owner'
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.rplPort.t
= 1
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.rplPort.u.port0
 = 'port0'
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.vlan.t = 1
ShowErpsConfig_Output.erpsInfo.erpsInstance[0].instConfig.vlan.u.vlanList
 =
'2,3,4,5,6,7,8,9,10,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,1023,1024,1022,1021,1013,1012'


 ShowErpsConfig Commit Success!!!
```

- **showErpsStats erpsShowStateReq erpsInst 1**

  This command displays the ERPS status on the Cisco ME 1200 NID. The following is a sample output from the command:

```
Switch(EpsPortType)# showErpsStats erpsShowStateReq erpsInst 1
Switch(EpsPortType)# showErpsStats erpsShowStateReq show brief
Switch(EpsPortType)# showErpsstats commit
```

```
ShowErpsStats_Output.erpsState.erpsInst[0].grpId = 1
ShowErpsStats_Output.erpsState.erpsInst[0].show.t = 1
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.grpId = 1
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.type = 'Maj'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.version = '2'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.port0 =
'GigabitEthernet 1/3'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.port0Lnk =
'U'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.port0Blk =
'B'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.majGrp = ''
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rplRole =
'Ownr'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rplPort =
'Port0'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rplBlk = 'Y'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.fsmState =
'IDLE'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rApsTx = 'Y'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rApsPort0Rx
= ' '
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.fop = 'N'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.port1 =
'GigabitEthernet 1/4'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.port1Lnk =
'U'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.port1Blk =
'U'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.revertive =
'Rev'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.ringType =
'-'
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rplRole_1 =
```

```
''
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rplPort_1 =
''
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rplBlk_1 = ''
ShowErpsStats_Output.erpsState.erpsInst[0].show.u.brief.rApsPort1Rx
= ' '

ShowErpsStats Commit Success!!!
```

CHAPTER 19

Configuring L2CP

This document describes the Layer 2 Control Protocol (L2CP) feature and configuration steps to implement L2CP.

Prerequisites for Configuring L2CP

- NID must have an IP address.

Restrictions for Configuring L2CP

- When committing multiple lists, the list in previous commit is not retained. Example: a peer list 16-18 in a previous commit is replaced by a new commit of peer list 21.

  To retain multiple lists, you must specify the lists in a single commit. Example: peer list 16-18,21.
- Any L2CP processing configured using forward/peer/discard modes applies to all EVCs on the port.
- Provisioning L2CP in tunnel mode is not supported. You cannot prevent core switches from processing frame as a L2CP frame in a service provider network.
- To delete a previously configured discardList, you must configure **discard discardList** command with **no** before you commit the command. Otherwise, by default the previously configured value is retained.

  Example:

  ```
  setL2CPPortConfig l2cpPortConfiguration portNumber 6
  setL2CPPortConfig l2cpPortConfiguration discard discardList no
  ```

Information About L2CP

L2CP addresses the requirement for a bidirectional, IP- based protocol that operates across a number of access and aggregation network technologies such as Ethernet. The L2CP message exchange conveys status and control information between access devices and one or more other devices that require the information for executing local functions.

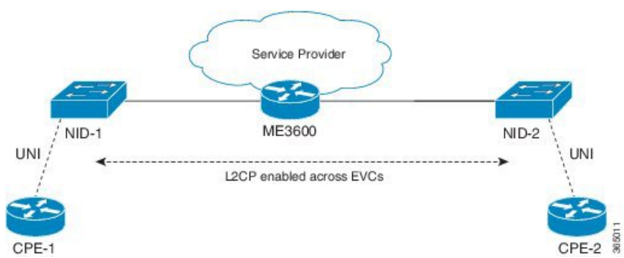
L2CP handling is required for edge switches providing Ethernet Virtual Connections (EVCs) in a service provider network.

The following options are available to provision L2CP on NID:

- **Forward**—The L2CP frame is forwarded to the network port like other layer 2 frames in the EVC.
- **Peer**—The L2CP frame is processed by a local protocol entity and is not forwarded.
- **Discard**—The L2CP frame is discarded.

The following figure shows the topology used for provisioning L2CP on NID 1 and NID 2.

Figure 13: L2CP Topology



Configuring L2CP Using a Cisco ME 1200 NID

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionL2CPPortType** **Example:** `Switch# ProvisionL2CPPortType`	Enters the ProvisionL2CPPortType mode.
Step 2	**ProvisionL2CPPortType** {**default** | **exit** | **getL2CPPortConfig** | **no** | **setL2CPPortConfig**} **Example:** `Switch# ProvisionL2CPPortType`	Sub-command options. • **default**—Sets a command to its defaults. • **exit**—Exits from ProvisionL2CPPortType sub configuration mode. • **getL2CPPortConfig**—Retrieves current L2CP configuration request.

	Command or Action	Purpose
		• **no**—Negates a command or set its defaults. • **setL2CPPortConfig**—Configures L2CP forward on EVCs on this port.
Step 3	**getL2CPPortConfig l2cpPort** *l2cpPort-number* **Example:** `Switch(ProvisionL2CPPortType)# getL2CPPortConfig l2cpPort 5`	Retrieves initial or default L2CP configuration. • **l2cpPort**—Specifies L2CP port configuration request. • *l2cpPort-number*—L2CP port number. The valid range is from 1 to 6.

Step 4	**setL2CPPortConfig l2cpPortConfiguration** {**enabled** | **portNumber** *portNumber* | **discard** {**discardList** *discardList-range*} | **forward** {**forwardList** *forwardList-range*} | **peer** {**peerList** *peerList-range*}}
	
	Example:
	`Switch(ProvisionL2CPPortType)# setL2CPPortConfig l2cpPortConfiguration portNumber 5`
	`Switch(ProvisionL2CPPortType)# setL2CPPortConfig l2cpPortConfiguration enabled enable`
		Sets up L2CP forward/peer/discard configuration request on all EVCs on this port.
		• **enabled**—Specifies L2CP configuration enabled/disabled on this port.
		• **portNumber**—Specifies port number to configure L2CP.
		• *portNumber*—Port number to configure L2CP. The valid range is from 1 to 6.
		• **discard**—Discards L2CP frames.
		• **discardList**— Selects BPDU addresses and GARP addresses.
		• *discardList-range*— BPDU addresses (0-15) and GARP addresses (16-31).
		• **forward**— Allows forwarding of L2CP frames.
		• **forwardList**—Selects BPDU addresses and GARP addresses.
		• *forwardList-range*— BPDU addresses (0-15) and GARP addresses (16-31).
		• **peer**—Redirects L2CP frames to local protocol entity.
		• **peerList**—Selects BPDU addresses and GARP addresses.
		• *peerList-range*— BPDU addresses (0-15) and GARP addresses (16-31).

Step 5	**setL2CPPortConfig review** **Example:** `Switch(L2CPPortType)# setL2CPPortConfig review`	(Optional) Displays the configuration.

	Command or Action	Purpose
Step 6	**setL2CPPortConfig flush** **Example:** `Switch(L2CPPortType)# setL2CPPortConfig flush`	(Optional) Flushes the configuration.
Step 7	**setL2CPPortConfig commit** **Example:** `Switch(L2CPPortType)# setL2CPPortConfig commit`	Sends the configuration to NID.
Step 8	**getL2CPPortConfig l2cpPort** *l2cpPort-number* **Example:** `Switch(ProvisionL2CPPortType)# getL2CPPortConfig l2cpPort 5`	Retrieves current L2CP configuration for a specified port. • **l2cpPort—**Specifies L2CP port configuration request. • *l2cpPort-number*—L2CP port number. The valid range is from 1 to 6.
Step 9	**getL2CPPortConfig review** **Example:** `Switch(ProvisionL2CPPortType)# getL2CPPortConfig review`	(Optional) Displays the configuration.
Step 10	**getL2CPPortConfig flush** **Example:** `Switch(ProvisionL2CPPortType)# getL2CPPortConfig flush`	(Optional) Flushes the configuration.
Step 11	**getL2CPPortConfig commit** **Example:** `Switch(ProvisionL2CPPortType)# getL2CPPortConfig commit`	Sends the configuration to NID.
Step 12	**exit** **Example:** `Switch(ProvisionL2CPPortType)# exit`	Exits the ProvisionL2CPPortType mode.

Configuration Example

- The example shows how to enable L2CP on a port:

```
Switch#ProvisionL2CPPortType ?
  <cr>

Switch(ProvisionL2CPPortType)#?
ProvisionL2CPPortType sub-mode commands:
  default             Set a command to its defaults
  exit                Exit from ProvisionL2CPPortType sub configuration mode
  getL2CPPortConfig   Get current L2CP configuration request
  no                  Negate a command or set its defaults
  setL2CPPortConfig   Configure L2CP forward on EVCs on this port
```

```
Switch(ProvisionL2CPPortType)#setL2CPPortConfig ?
  commit                  commit setL2CPPortConfig
  flush                   flush all setL2CPPortConfig commands from queue
  l2cpPortConfiguration   Configure L2CP forward on EVCs on this port
  review                  review setL2CPPortConfig commands

Switch(ProvisionL2CPPortType)#setL2CPPortConfig l2
Switch(ProvisionL2CPPortType)#$pPortConfiguration ?
  discard     Discard L2CP frames
  enabled     L2CP configuration enabled/disabled on this port
  forward     Allow forwarding of L2CP frames
  peer        Redirect L2CP frames to local protocol entity
  portNumber  Port number to configure L2CP

Switch(ProvisionL2CPPortType)#$guration portNumber 3
Switch(ProvisionL2CPPortType)#$guration enabled enable

Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable

Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
Switch(ProvisionL2CPPortType)#setL2CPPortConfig commit
 SetL2CPPortConfig Commit Success!!!
```

When SetL2CPPortConfig operation is executed on a NID from a Cisco ME 1200 NID , initially GetL2CPPortConfig fetches the current configuration. This is followed by SetL2CPPortConfig to set the new L2CP configuration. The following is a sample output on the NID.

```
#
Decoding of Request message was successful
Decoded record:
GetL2CPPortConfig_Output.l2cpPortConfiguration.enabled = true
GetL2CPPortConfig_Output.l2cpPortConfiguration.portNumber = 3
GetL2CPPortConfig_Output.l2cpPortConfiguration.discard.discardList =
 ''
GetL2CPPortConfig_Output.l2cpPortConfiguration.forward.forwardList =
 '16-31'
GetL2CPPortConfig_Output.l2cpPortConfiguration.peer.peerList = '0-15'
GetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
GetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetL2CPPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
Decoding of Request message was successful
Decoded record:
SetL2CPPortConfig_Input.l2cpPortConfiguration.enabled = true
SetL2CPPortConfig_Input.l2cpPortConfiguration.portNumber = 3
SetL2CPPortConfig_Input.l2cpPortConfiguration.discard.discardList =
''
SetL2CPPortConfig_Input.l2cpPortConfiguration.forward.forwardList =
'16-31'
SetL2CPPortConfig_Input.l2cpPortConfiguration.peer.peerList = '0-15'
Encoding of Response message was successful
```

```
Encoded record:
SetL2CPPortConfig_Output.l2cpPortConfigResponse = 0
SetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
SetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
SetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
SetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
SetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
SetL2CPPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

- The examples shows how to enable L2CP Forward on a port.

```
Switch#ProvisionL2CPPortType ?
  <cr>

Switch(ProvisionL2CPPortType)#?
ProvisionL2CPPortType sub-mode commands:
  default            Set a command to its defaults
  exit               Exit from ProvisionL2CPPortType sub configuration mode
  getL2CPPortConfig  Get current L2CP configuration request
  no                 Negate a command or set its defaults
  setL2CPPortConfig  Configure L2CP forward on EVCs on this port

Switch(ProvisionL2CPPortType)#setL2CPPortConfig ?
  commit                 commit setL2CPPortConfig
  flush                  flush all setL2CPPortConfig commands from queue
  l2cpPortConfiguration  Configure L2CP forward on EVCs on this port
  review                 review setL2CPPortConfig commands

Switch(ProvisionL2CPPortType)#setL2CPPortConfig l2
Switch(ProvisionL2CPPortType)#$pPortConfiguration ?
  discard     Discard L2CP frames
  enabled     L2CP configuration enabled/disabled on this port
  forward     Allow forwarding of L2CP frames
  peer        Redirect L2CP frames to local protocol entity
  portNumber  Port number to configure L2CP

Switch(ProvisionL2CPPortType)#$guration portNumber 3
Switch(ProvisionL2CPPortType)#$guration enabled enable
Switch(ProvisionL2CPPortType)#$guration forward for
Switch(ProvisionL2CPPortType)#$orward forwardList 1-14
Switch(ProvisionL2CPPortType)#
Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration forward forwardList 1-14
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
Switch(ProvisionL2CPPortType)#setL2CPPortConfig commit
 SetL2CPPortConfig Commit Success!!!
```

The following is a sample output on the NID.

```
#
Decoding of Request message was successful
Decoded record:
GetL2CPPortConfig_Input.l2cpPort = 3
Encoding of Response message was successful
Encoded record:
GetL2CPPortConfig_Output.l2cpPortConfiguration.enabled = true
GetL2CPPortConfig_Output.l2cpPortConfiguration.portNumber = 3
GetL2CPPortConfig_Output.l2cpPortConfiguration.discard.discardList =
 ''
```

```
GetL2CPPortConfig_Output.l2cpPortConfiguration.forward.forwardList =
 '16-31'
GetL2CPPortConfig_Output.l2cpPortConfiguration.peer.peerList = '0-15'
GetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
GetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetL2CPPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
Decoding of Request message was successful
Decoded record:
SetL2CPPortConfig_Input.l2cpPortConfiguration.enabled = true
SetL2CPPortConfig_Input.l2cpPortConfiguration.portNumber = 3
SetL2CPPortConfig_Input.l2cpPortConfiguration.discard.discardList =
''
SetL2CPPortConfig_Input.l2cpPortConfiguration.forward.forwardList =
'1-14'
SetL2CPPortConfig_Input.l2cpPortConfiguration.peer.peerList = '0-15'
Encoding of Response message was successful
Encoded record:
SetL2CPPortConfig_Output.l2cpPortConfigResponse = 0
SetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
SetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
SetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
SetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
SetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
SetL2CPPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

```
#show running-config interface GigabitEthernet 1/3
```

```
Building configuration...
interface GigabitEthernet 1/3
 switchport hybrid allowed vlan 1
 switchport hybrid acceptable-frame-type untagged
 switchport hybrid ingress-filtering
 switchport hybrid port-type unaware
 switchport mode trunk
 lldp med type end-point
 qos dscp-remark rewrite
 evc l2cp forward 1-14
```

- The examples shows how to enable L2CP Forward, Peer, Discard on a port.

```
Switch#ProvisionL2CPPortType ?
  <cr>

Switch(ProvisionL2CPPortType)#?
ProvisionL2CPPortType sub-mode commands:
  default            Set a command to its defaults
  exit               Exit from ProvisionL2CPPortType sub configuration mode
```

```
  getL2CPPortConfig  Get current L2CP configuration request
  no                 Negate a command or set its defaults
  setL2CPPortConfig  Configure L2CP forward on EVCs on this port

Switch(ProvisionL2CPPortType)#setL2CPPortConfig ?
  commit                 commit setL2CPPortConfig
  flush                  flush all setL2CPPortConfig commands from queue
  l2cpPortConfiguration  Configure L2CP forward on EVCs on this port
  review                 review setL2CPPortConfig commands

Switch(ProvisionL2CPPortType)#setL2CPPortConfig l2
Switch(ProvisionL2CPPortType)#$pPortConfiguration ?
  discard     Discard L2CP frames
  enabled     L2CP configuration enabled/disabled on this port
  forward     Allow forwarding of L2CP frames
  peer        Redirect L2CP frames to local protocol entity
  portNumber  Port number to configure L2CP

Switch(ProvisionL2CPPortType)#$guration portNumber 3
Switch(ProvisionL2CPPortType)#$guration enabled enable
Switch(ProvisionL2CPPortType)#$guration forward for
Switch(ProvisionL2CPPortType)#$orward forwardList 1-14
Switch(ProvisionL2CPPortType)#$peer peerList 16-20
Switch(ProvisionL2CPPortType)#$guration discard di
Switch(ProvisionL2CPPortType)#$iscard discardList 19
Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
        setL2CPPortConfig l2cpPortConfiguration peer peerList 16-20
        setL2CPPortConfig l2cpPortConfiguration discard discardList 19
        setL2CPPortConfig l2cpPortConfiguration forward forwardList 1-14

Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
        setL2CPPortConfig l2cpPortConfiguration peer peerList 16-20
        setL2CPPortConfig l2cpPortConfiguration discard discardList 19
        setL2CPPortConfig l2cpPortConfiguration forward forwardList 1-14
Switch(ProvisionL2CPPortType)#setL2CPPortConfig commit
 SetL2CPPortConfig Commit Success!!!
```

The following is a sample output on the NID.

```
# Decoding of Request message was successful
Decoded record:
GetL2CPPortConfig_Input.l2cpPort = 3
Encoding of Response message was successful
Encoded record:
GetL2CPPortConfig_Output.l2cpPortConfiguration.enabled = true
GetL2CPPortConfig_Output.l2cpPortConfiguration.portNumber = 3
GetL2CPPortConfig_Output.l2cpPortConfiguration.discard.discardList =
 ''
GetL2CPPortConfig_Output.l2cpPortConfiguration.forward.forwardList =
 '1-14'
GetL2CPPortConfig_Output.l2cpPortConfiguration.peer.peerList = '0-15'
GetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
GetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetL2CPPortConfig_Output.xmlns:wsdl =
```

```
"http://schemas.xmlsoap.org/wsdl/"
Decoding of Request message was successful
Decoded record:
SetL2CPPortConfig_Input.l2cpPortConfiguration.enabled = true
SetL2CPPortConfig_Input.l2cpPortConfiguration.portNumber = 3
SetL2CPPortConfig_Input.l2cpPortConfiguration.discard.discardList =
'19'
SetL2CPPortConfig_Input.l2cpPortConfiguration.forward.forwardList =
'1-14'
SetL2CPPortConfig_Input.l2cpPortConfiguration.peer.peerList = '16-20'
Encoding of Response message was successful
Encoded record:
SetL2CPPortConfig_Output.l2cpPortConfigResponse = 0
SetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
SetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
SetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
SetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
SetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
SetL2CPPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

```
# show running-config interface GigabitEthernet 1/3
```

```
Building configuration...
interface GigabitEthernet 1/3
 switchport hybrid allowed vlan 1
 switchport hybrid acceptable-frame-type untagged
 switchport hybrid ingress-filtering
 switchport hybrid port-type unaware
 switchport mode trunk
 lldp med type end-point
 qos dscp-remark rewrite
 evc l2cp peer 16-18,20 forward 1-14 discard 19
!
end
```

- The examples shows how to disable or reset L2CP Discard on a port.

```
Switch#ProvisionL2CPPortType ?
  <cr>

Switch(ProvisionL2CPPortType)#?
ProvisionL2CPPortType sub-mode commands:
  default            Set a command to its defaults
  exit               Exit from ProvisionL2CPPortType sub configuration mode
  getL2CPPortConfig  Get current L2CP configuration request
  no                 Negate a command or set its defaults
  setL2CPPortConfig  Configure L2CP forward on EVCs on this port

Switch(ProvisionL2CPPortType)#setL2CPPortConfig ?
  commit                 commit setL2CPPortConfig
  flush                  flush all setL2CPPortConfig commands from queue
  l2cpPortConfiguration  Configure L2CP forward on EVCs on this port
  review                 review setL2CPPortConfig commands

Switch(ProvisionL2CPPortType)#setL2CPPortConfig l2
Switch(ProvisionL2CPPortType)#$pPortConfiguration ?
  discard     Discard L2CP frames
```

```
  enabled     L2CP configuration enabled/disabled on this port
  forward     Allow forwarding of L2CP frames
  peer        Redirect L2CP frames to local protocol entity
  portNumber  Port number to configure L2CP

Switch(ProvisionL2CPPortType)#$guration portNumber 3
Switch(ProvisionL2CPPortType)#$guration enabled enable
Switch(ProvisionL2CPPortType)#$guration discard di
Switch(ProvisionL2CPPortType)#$iscard discardList no
Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
        setL2CPPortConfig l2cpPortConfiguration peer peerList 16-20
        setL2CPPortConfig l2cpPortConfiguration discard discardList 19
        setL2CPPortConfig l2cpPortConfiguration forward forwardList 1-14

Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
        setL2CPPortConfig l2cpPortConfiguration discard discardList no

Switch(ProvisionL2CPPortType)#setL2CPPortConfig commit
 SetL2CPPortConfig Commit Success!!!
```

The following is a sample output on the NID.

```
# Decoding of Request message was successful
Decoded record:
GetL2CPPortConfig_Input.l2cpPort = 3
Encoding of Response message was successful
Encoded record:
GetL2CPPortConfig_Output.l2cpPortConfiguration.enabled = true
GetL2CPPortConfig_Output.l2cpPortConfiguration.portNumber = 3
GetL2CPPortConfig_Output.l2cpPortConfiguration.discard.discardList =
 '19'
GetL2CPPortConfig_Output.l2cpPortConfiguration.forward.forwardList =
 '1-14'
GetL2CPPortConfig_Output.l2cpPortConfiguration.peer.peerList = '16-20'
GetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
GetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetL2CPPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
Decoding of Request message was successful
Decoded record:
SetL2CPPortConfig_Input.l2cpPortConfiguration.enabled = true
SetL2CPPortConfig_Input.l2cpPortConfiguration.portNumber = 3
SetL2CPPortConfig_Input.l2cpPortConfiguration.discard.discardList =
'no'
SetL2CPPortConfig_Input.l2cpPortConfiguration.forward.forwardList =
'1-14'
SetL2CPPortConfig_Input.l2cpPortConfiguration.peer.peerList = '16-20'
Encoding of Response message was successful
Encoded record:
SetL2CPPortConfig_Output.l2cpPortConfigResponse = 0
SetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
```

```
SetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
SetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
SetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
SetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
SetL2CPPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

```
# show running-config interface GigabitEthernet 1/3
```

```
Building configuration...
interface GigabitEthernet 1/3
 switchport hybrid allowed vlan 1
 switchport hybrid acceptable-frame-type untagged
 switchport hybrid ingress-filtering
 switchport hybrid port-type unaware
 switchport mode trunk
 lldp med type end-point
 qos dscp-remark rewrite
 evc l2cp peer 16-20 forward 1-14
```

- The examples shows how to retrieve current configuration on a NID.

```
Switch(ProvisionL2CPPortType)#getL2CPPortConfig ?
  commit    commit getL2CPPortConfig
  flush     flush all getL2CPPortConfig commands from queue
  l2cpPort  Get current L2CP configuration request
  review    review getL2CPPortConfig commands

Switch(ProvisionL2CPPortType)#getL2CPPortConfig l2cpPort ?
  <1-6>  Get L2CP Port Configuration Request

Switch(ProvisionL2CPPortType)#$Config l2cpPort 3 ?
  <cr>
Switch(ProvisionL2CPPortType)#getL2CPPortConfig review
Commands in queue:
        getL2CPPortConfig l2cpPort 3
Switch(ProvisionL2CPPortType)#
Switch(ProvisionL2CPPortType)#getL2CPPortConfig commit
GetL2CPPortConfig_Output.l2cpPortConfiguration.enabled = true
GetL2CPPortConfig_Output.l2cpPortConfiguration.portNumber = 3
GetL2CPPortConfig_Output.l2cpPortConfiguration.discard.discardList = 'no'
GetL2CPPortConfig_Output.l2cpPortConfiguration.forward.forwardList = '1-14'
GetL2CPPortConfig_Output.l2cpPortConfiguration.peer.peerList = '16-20'

GetL2CPPortConfig Commit Success!!!
```

The following is a sample output on the NID.

```
# Decoding of Request message was successful
Decoded record:
GetL2CPPortConfig_Input.l2cpPort = 3
Encoding of Response message was successful
Encoded record:
GetL2CPPortConfig_Output.l2cpPortConfiguration.enabled = true
GetL2CPPortConfig_Output.l2cpPortConfiguration.portNumber = 3
GetL2CPPortConfig_Output.l2cpPortConfiguration.discard.discardList =
 'no'
GetL2CPPortConfig_Output.l2cpPortConfiguration.forward.forwardList =
 '1-14'
GetL2CPPortConfig_Output.l2cpPortConfiguration.peer.peerList = '16-20'
```

```
GetL2CPPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
GetL2CPPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetL2CPPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetL2CPPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetL2CPPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetL2CPPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

- The examples shows how to flush L2CP configuration on a port.

```
Switch#ProvisionL2CPPortType ?
  <cr>

Switch(ProvisionL2CPPortType)#?
ProvisionL2CPPortType sub-mode commands:
  default            Set a command to its defaults
  exit               Exit from ProvisionL2CPPortType sub configuration mode
  getL2CPPortConfig  Get current L2CP configuration request
  no                 Negate a command or set its defaults
  setL2CPPortConfig  Configure L2CP forward on EVCs on this port

Switch(ProvisionL2CPPortType)#setL2CPPortConfig ?
  commit                 commit setL2CPPortConfig
  flush                  flush all setL2CPPortConfig commands from queue
  l2cpPortConfiguration  Configure L2CP forward on EVCs on this port
  review                 review setL2CPPortConfig commands

Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
        setL2CPPortConfig l2cpPortConfiguration forward forwardList 1-14
        setL2CPPortConfig l2cpPortConfiguration peer peerList 16-20
Switch(ProvisionL2CPPortType)#setL2CPPortConfig flush
Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
 No commands in queue
```

- The examples shows how to remove specific configuration CLI from a Cisco ME 1200 NID .

```
Switch#ProvisionL2CPPortType ?
  <cr>

Switch(ProvisionL2CPPortType)#?
ProvisionL2CPPortType sub-mode commands:
  default            Set a command to its defaults
  exit               Exit from ProvisionL2CPPortType sub configuration mode
  getL2CPPortConfig  Get current L2CP configuration request
  no                 Negate a command or set its defaults
  setL2CPPortConfig  Configure L2CP forward on EVCs on this port

Switch(ProvisionL2CPPortType)#setL2CPPortConfig ?
  commit                 commit setL2CPPortConfig
  flush                  flush all setL2CPPortConfig commands from queue
  l2cpPortConfiguration  Configure L2CP forward on EVCs on this port
  review                 review setL2CPPortConfig commands

Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
        setL2CPPortConfig l2cpPortConfiguration forward forwardList 1-14
        setL2CPPortConfig l2cpPortConfiguration peer peerList 16-20

Switch(ProvisionL2CPPortType)#no setL2CPPortConfig l2cpPor$
```

```
Switch(ProvisionL2CPPortType)#$n forward forwardList 1-14
Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
        setL2CPPortConfig l2cpPortConfiguration peer peerList 16-20
Switch(ProvisionL2CPPortType)#setL2CPPortConfig review
Commands in queue:
        setL2CPPortConfig l2cpPortConfiguration portNumber 3
        setL2CPPortConfig l2cpPortConfiguration enabled enable
        setL2CPPortConfig l2cpPortConfiguration peer peerList 16-20
Switch(ProvisionL2CPPortType)#setL2CPPortConfig commit
 SetL2CPPortConfig Commit Success!!!
```

CHAPTER 20

Configuring MAC Security

This document describes the MAC security feature and configuration steps to implement MAC security.

Prerequisites for Configuring MAC Security

- NID must have an IP address.

Information About MAC Security

You can use the MAC security feature to restrict input to an interface by limiting and identifying MAC addresses of the devices that are allowed to access the port. When you assign secure MAC addresses to a secure port, the port does not forward packets with source addresses outside the group of defined addresses. If you limit the number of secure MAC addresses to one and assign a single secure MAC address, the device attached to that port is assured the full bandwidth of the port.

How to Provision MAC Security

Configuring Port Security

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMacTableSecurityType** **Example:** `Switch# ProvisionMacTableSecurityType`	Enters the ProvisionMacTableSecurityType mode.

Step 2	**portSecurityGlobalConfig portSecurityGlobalConfigReq** {**mode** {**disable** | **enable**} | **agingTime** {**time** *time* | **disable**}}
	
	Example:
	`Switch(ProvisionMacTableSecurityType)# portSecurityGlobalConfig portSecurityGlobalConfigReq agingTime time 60`
	`Switch(ProvisionMacTableSecurityType)# portSecurityGlobalConfig portSecurityGlobalConfigReq mode enable`
		Port Security Global Configuration.
		• **portSecurityGlobalConfigReq—**Specifies port security global configuration.
		• **mode—**Option to enable/disable port security.
		• **disable—**Disables port security globally.
		• **enable—**Enables port security globally.
		• **agingTime—**Enables or disables port security aging.
		• **time—**Enables and sets time.
		• *time*—Time. The valid range is from 10 to 10000000 seconds.
		• **disable—**Disables aging.

Step 3	**portSecurityGlobalConfig review** **Example:** `Switch(ProvisionMacTableSecurityType)# portSecurityGlobalConfig review`	Displays the configuration.
Step 4	**portSecurityGlobalConfig commit** **Example:** `Switch(ProvisionMacTableSecurityType)# portSecurityGlobalConfig commit`	Sends the configuration to NID.
Step 5	**portSecurityInterfaceConfig portSecurityInterfaceConfigReq** {**interface-id** *interface-id* | **port-security** {**mode** {**disable** | **enable**} | **mac-limit** {**maximum** *max-mac-number* | **disable**} | **violation** {**protect** | **shutdown** | **traponly** | **trap-shutdown** | **disable**}}}	Interface mode Port Security Configuration. • **interface-id—**Specifies the interface ID. • *interface-id*—Interface ID. The valid range is from 1 to 6.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig portSecurityInterfaceConfigReq interface-id 2`
	`Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig portSecurityInterfaceConfigReq port-security mode enable`
	
	`Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig portSecurityInterfaceConfigReq interface-id 2`
	`Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig portSecurityInterfaceConfigReq port-security mac-limit maximum 100`
	
	`Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig portSecurityInterfaceConfigReq interface-id 2`
	`Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig portSecurityInterfaceConfigReq port-security violation shutdown`
	`own`
		• **port-security—**Configures port security.
		• **mode—**Specifies the mode for port security.
		• **disable—**Disables port security.
		• **enable—**Enables port security.
		• **mac-limit—**Specifies MAC address learning limit.
		• **maximum—**Specifies the maximum number of MAC addresses.
		• *max-mac-number*—Maximum number of MAC addresses. The valid range is from 1 to 1024.
		• **disable—**Removes the MAC limit.
		• **violation—**Specifies the action when exceeding the limit.
		• **protect—**Specifies no action.
		• **shutdown—**Shuts down the port.
		• **traponly—**Sends an SNMP trap.
		• **trap-shutdown—**Sends an SNMP trap and shuts down the port.
		• **disable—**Disables violation type.

Step 6	**portSecurityInterfaceConfig review** **Example:** `Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig review`	Displays the configuration.
Step 7	**portSecurityInterfaceConfig commit** **Example:** `Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(ProvisionMacTableSecurityType)# exit`	Exits the ProvisionMacTableSecurityType mode.

Configuration Example

The example shows how to configure port security:

```
Switch(ProvisionMacTableSecurityType)# portSecurityGlobalConfig portSecurityGlobalConfigReq
 agingTime time 60
```

```
Switch(ProvisionMacTableSecurityType)# portSecurityGlobalConfig portSecurityGlobalConfigReq
 mode enable
Switch(ProvisionMacTableSecurityType)# portSecurityGlobalConfig review
Switch(ProvisionMacTableSecurityType)# portSecurityGlobalConfig commit

Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig
portSecurityInterfaceConfigReq interface-id 2
Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig
portSecurityInterfaceConfigReq port-security mode enable
Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig
portSecurityInterfaceConfigReq interface-id 2
Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig
portSecurityInterfaceConfigReq port-security mac-limit maximum 100
Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig
portSecurityInterfaceConfigReq interface-id 2
Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig
portSecurityInterfaceConfigReq port-security violation shutdown

Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig review
Switch(ProvisionMacTableSecurityType)# portSecurityInterfaceConfig commit
Switch(ProvisionMacTableSecurityType)# exit
```

Configuring MAC Security

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMacTableSecurityType** **Example:** `Switch# ProvisionMacTableSecurityType`	Enters the ProvisionMacTableSecurityType mode.
Step 2	**setMacGlobalConfig setMacGlobalConfigReq** {**macAgingTime** {**setAgingTime** *aging-time* | **disable**} | **staticMacEntry** | **learning**} **Example:** `Switch(ProvisionMacTableSecurityType)# setMacGlobalConfig setMacGlobalConfigReq macAgingTime setAgingTime 100`	Global Configuration for MAC address table. • **macAgingTime—**Configures MAC aging time. • **setAgingTime—**Specifies aging time. • *aging-time*—Aging time in seconds. Valid range is from 10 to 1000000. • **disable—**Disables MAC aging. • **staticMacEntry—**Specifies static MAC address. • **learning—**Specifies MAC learning on VLAN.
Step 3	**setMacGlobalConfig review** **Example:** `Switch(ProvisionMacTableSecurityType)# setMacGlobalConfig review`	Displays the configuration.
Step 4	**setMacGlobalConfig commit** **Example:** `Switch(ProvisionMacTableSecurityType)# setMacGlobalConfig commit`	Sends the configuration to NID.

	Command or Action	Purpose

Step 5	**setMacInterfaceConfig setMacInterfaceConfigReq** {**interface-id** interface-id | **mode** {**learning** {**enable** | **disable**} | **secure** {**enable** | **disable**}}}
	
	Example:
	`Switch(ProvisionMacTableSecurityType)# setMacInterfaceConfig setMacInterfaceConfigReq interface-id 3`
	`Switch(ProvisionMacTableSecurityType)# setMacInterfaceConfig setMacInterfaceConfigReq mode learning enable`
		Interface mode for MAC configuration.
		• **interface-id—**Specifies the interface ID.
		• *interface-id***—**Interface ID.
		• **mode—**Specifies the learning mode.
		• **learning—**Specifies port default learning mode.
		• **enable—**Enables MAC learning.
		• **disable—**Disables MAC learning.
		• **secure—**Specifies port secure learning mode.
		• **enable—**Enables secure MAC learning.
		• **disable—**Disables secure MAC learning.

Step 6	**setMacInterfaceConfig review** **Example:** `Switch(ProvisionMacTableSecurityType)# setMacInterfaceConfig review`	Displays the configuration.
Step 7	**setMacInterfaceConfig commit** **Example:** `Switch(ProvisionMacTableSecurityType)# setMacInterfaceConfig commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(ProvisionMacTableSecurityType)# exit`	Exits the ProvisionMacTableSecurityType mode.

Configuration Example

The example shows how to configure MAC table learning:

```
Switch(ProvisionMacTableSecurityType)# setMacGlobalConfig setMacGlobalConfigReq macAgingTime
 setAgingTime 100
Switch(ProvisionMacTableSecurityType)# setMacGlobalConfig review
Switch(ProvisionMacTableSecurityType)# setMacGlobalConfig commit

Switch(ProvisionMacTableSecurityType)# setMacInterfaceConfig setMacInterfaceConfigReq
interface-id 3
Switch(ProvisionMacTableSecurityType)# setMacInterfaceConfig setMacInterfaceConfigReq mode
 learning enable
Switch(ProvisionMacTableSecurityType)# setMacInterfaceConfig review
Switch(ProvisionMacTableSecurityType)# setMacInterfaceConfig commit

Switch(ProvisionMacTableSecurityType)# exit
```

Clearing MAC Address Table

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionMacTableSecurityType** **Example:** `Switch# ProvisionMacTableSecurityType`	Enters the ProvisionMacTableSecurityType mode.
Step 2	**clearMacTable clearMacTableReq clearAll** **Example:** `Switch(ProvisionMacTableSecurityType)# clearMacTable clearMacTableReq clearAll`	Clears MAC address table. • **clearAll—**Clears all entries.
Step 3	**clearMacTable review** **Example:** `Switch(ProvisionMacTableSecurityType)# clearMacTable review`	Displays the configuration.
Step 4	**clearMacTable commit** **Example:** `Switch(ProvisionMacTableSecurityType)# clearMacTable commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(ProvisionMacTableSecurityType)# exit`	Exits the ProvisionMacTableSecurityType mode.

Configuration Example

The example shows how to configure port security:

```
Switch(ProvisionMacTableSecurityType)# clearMacTable clearMacTableReq clearAll
Switch(ProvisionMacTableSecurityType)# clearMacTable review
Switch(ProvisionMacTableSecurityType)# clearMacTable commit
Switch(ProvisionMacTableSecurityType)# exit
```

Verifying MAC Security

Use the following command to verify the MAC security status on the Cisco ME 1200 NID .

- **showMacTableLearningReq mode**

This command displays the MAC table learning status. The following is a sample output from the command:

```
Switch(ProvisionMacTableSecurityType)# showmacTablelearning showMacTableLearningReq
mode
Switch(ProvisionMacTableSecurityType)# showmacTablelearning review
```

```
Commands in queue:
showMacTableLearning showMacTableLearningReq mode
```

```
Switch(ProvisionMacTableSecurityType)# showmacTablelearning commit
```

```
Clearing Socket 4
ShowMacTableLearning_Output.showMacTableLearingResp.status[0].interface_
 = 1
ShowMacTableLearning_Output.showMacTableLearingResp.status[0].mode =
 'Auto'
ShowMacTableLearning_Output.showMacTableLearingResp.status[1].interface_
 = 2
ShowMacTableLearning_Output.showMacTableLearingResp.status[1].mode =
 'Auto'
ShowMacTableLearning_Output.showMacTableLearingResp.status[2].interface_
 = 3
ShowMacTableLearning_Output.showMacTableLearingResp.status[2].mode =
 'Auto'
ShowMacTableLearning_Output.showMacTableLearingResp.status[3].interface_
 = 4
ShowMacTableLearning_Output.showMacTableLearingResp.status[3].mode =
 'Auto'
ShowMacTableLearning_Output.showMacTableLearingResp.status[4].interface_
 = 5
ShowMacTableLearning_Output.showMacTableLearingResp.status[4].mode =
 'Auto'
ShowMacTableLearning_Output.showMacTableLearingResp.status[5].interface_
 = 6
ShowMacTableLearning_Output.showMacTableLearingResp.status[5].mode =
 'Auto'
 ShowMacTableLearning Commit Success!!!
```

- **showMacTableEntriesReq all**

This command displays the list of all MAC entries. The following is a sample output from the command:

```
Switch(ProvisionMacTableSecurityType)# showMacTableEntries showMacTableEntriesReq all
Switch(ProvisionMacTableSecurityType)# showmacTableentries review
```

```
Commands in queue:
 showMacTableEntries showMacTableEntriesReq all
```

```
Switch(ProvisionMacTableSecurityType)# showmacTableentries commit
```

```
Clearing Socket 4
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].mac_address
 = '00:00:0c:07:ac:03'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].ports
 = 'GigabitEthernet 1/1 CPU'
```

```
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].mac_address
 = '00:09:e8:74:36:c5'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].mac_address
 = '00:14:1b:ec:18:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].mac_address
 = '00:19:a9:a2:9e:80'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].mac_address
 = '00:1c:b0:f5:b4:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].mac_address
 = '00:1c:b1:9a:00:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].mac_address
 = '00:1c:b1:f9:d0:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].mac_address
 = '00:1c:b1:fa:48:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].type
 = 'Static '
```

```
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].mac_address
 = '00:3a:99:fd:4b:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].ports
 = ' CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].mac_address
 = '18:9c:5d:a7:f4:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].mac_address
 = '33:33:00:00:00:01'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].mac_address
 = '33:33:00:00:00:02'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].mac_address
 = '33:33:ff:fd:4b:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].type
 = 'Static '
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].mac_address
 = 'ff:ff:ff:ff:ff:ff'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].ports
 = 'GigabitEthernet 1/1-6 CPU'
 ShowMacTableEntries Commit Success!!!
```

- **showMacTableEntriesReq interface-id 2**

  This command displays the list of all MAC entries for a given interface. The following is a sample output from the command:

```
Switch(ProvisionMacTableSecurityType)# showMacTableEntries showMacTableEntriesReq
interface-id 2
Switch(ProvisionMacTableSecurityType)# showmacTableentries review
```

```
Commands in queue:

showMacTableEntries showMacTableEntriesReq interface-id 2
```

```
Switch(ProvisionMacTableSecurityType)# showmactableentries commit
```

```
Clearing Socket 4
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].mac_address
 = '33:33:00:00:00:01'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].mac_address
 = '33:33:00:00:00:02'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].mac_address
 = '33:33:ff:fd:4b:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].mac_address
 = 'ff:ff:ff:ff:ff:ff'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].ports
 = 'GigabitEthernet 1/1-6 CPU'

 ShowMacTableEntries Commit Success!!!
```

- **showMacTableEntriesReq mac-address ff:ff:ff:ff:ff:ff**

  This command displays the list of all MAC entries for a given MAC address. The following is a sample output from the command:

```
Switch(ProvisionMacTableSecurityType)# showMacTableEntries showMacTableEntriesReq
mac-address ff:ff:ff:ff:ff:ff
Switch(ProvisionMacTableSecurityType)# showmacTableentries review
```

```
Commands in queue:
 showMacTableEntries showMacTableEntriesReq mac_address
ff:ff:ff:ff:ff:ff
```

```
Switch(ProvisionMacTableSecurityType)# showmactableentries commit
```

```
Clearing Socket 4
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].type
 = 'Static'
```

```
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].mac_address
 = 'ff:ff:ff:ff:ff:ff'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].ports
 = 'GigabitEthernet 1/1-6 CPU'

 ShowMacTableEntries Commit Success!!!
```

- **showMacTableEntriesReq static**

  This command displays all the static MAC entries. The following is a sample output from the command:

```
Switch(ProvisionMacTableSecurityType)# showMacTableEntries showMacTableEntriesReq static
Switch(ProvisionMacTableSecurityType)# showmacTableentries review
```

```
Commands in queue:
 showMacTableEntries showMacTableEntriesReq static
```

```
Switch(ProvisionMacTableSecurityType)# showmactableentries commit
```

```
Clearing Socket 4
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].mac_address
 = '00:00:0c:07:ac:03'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].mac_address
 = '00:09:e8:74:36:c5'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].mac_address
 = '00:14:1b:ec:18:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].mac_address
 = '00:19:a9:a2:9e:80'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].mac_address
 = '00:1c:b0:f5:b4:00'
```

```
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].mac_address
 = '00:1c:b1:9a:00:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].mac_address
 = '00:1c:b1:f9:d0:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].mac_address
 = '00:1c:b1:fa:48:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].mac_address
 = '00:3a:99:fd:4b:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].ports
 = ' CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].mac_address
 = '18:9c:5d:a7:f4:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].mac_address
 = '33:33:00:00:00:01'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].mac_address
 = '33:33:00:00:00:02'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].ports
 = 'GigabitEthernet 1/1-6 CPU'
```

```
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].mac_address
 = '33:33:ff:fd:4b:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].mac_address
 = 'ff:ff:ff:ff:ff:ff'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].ports
 = 'GigabitEthernet 1/1-6 CPU'
 ShowMacTableEntries Commit Success!!!
```

- **showMacTableEntriesReq vlan-id 1**

  This command displays all the MAC entries for a specified VLAN ID. The following is a sample output from the command:

```
Switch(ProvisionMacTableSecurityType)# showMacTableEntries showMacTableEntriesReq
vlan-id 1
Switch(ProvisionMacTableSecurityType)# showmacTableentries review
```

```
Commands in queue:
  showMacTableEntries showMacTableEntriesReq vlan_id 1
```

```
Switch(ProvisionMacTableSecurityType)# showMacTableEntries commit
```

```
Clearing Socket 4
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].mac_address
 = '00:00:0c:07:ac:03'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[0].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].mac_address
 = '00:09:e8:74:36:c5'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[1].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].mac_address
 = '00:14:1b:ec:18:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[2].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].vlan_id
```

```
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].mac_address
 = '00:19:a9:a2:9e:80'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[3].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].mac_address
 = '00:1c:b0:f5:b4:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[4].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].mac_address
 = '00:1c:b1:9a:00:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[5].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].mac_address
 = '00:1c:b1:f9:d0:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[6].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].mac_address
 = '00:1c:b1:fa:48:00'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[7].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].mac_address
 = '00:3a:99:fd:4b:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[8].ports
 = ' CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].mac_address
 = '18:9c:5d:a7:f4:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[9].ports
 = 'GigabitEthernet 1/1 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].mac_address
```

```
 = '33:33:00:00:00:01'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[10].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].mac_address
 = '33:33:00:00:00:02'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[11].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].vlan0_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].mac_address
 = '33:33:ff:fd:4b:1c'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[12].ports
 = 'GigabitEthernet 1/1-6 CPU'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].type
 = 'Static'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].vlan_id
 = 1
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].mac_address
 = 'ff:ff:ff:ff:ff:ff'
ShowMacTableEntries_Output.showMacTableEntriesResp.macEntries[13].ports
 = 'GigabitEthernet 1/1-6 CPU'
 ShowMacTableEntries Commit Success!!!
```

- **showMacAddressCountReq count**

  This command displays count of MAC addresses learnt per interface. The following is a sample output from the command:

```
Switch(ProvisionMacTableSecurityType)# showMacTableCount showMacAddressCountReq count
Switch(ProvisionMacTableSecurityType)# showmacTablecount review
```

```
Commands in queue:
 showMacTableCount showMacAddressCountReq count
```

```
Switch(ProvisionMacTableSecurityType)# showmacTablecount commit
```

```
Clearing Socket 4
ShowMacTableCount_Output.showMacAddressCountResp.macCount[0].Interface_id
 = 1
ShowMacTableCount_Output.showMacAddressCountResp.macCount[0].count =
 9
ShowMacTableCount_Output.showMacAddressCountResp.macCount[1].Interface_id
 = 2
ShowMacTableCount_Output.showMacAddressCountResp.macCount[1].count =
 0
ShowMacTableCount_Output.showMacAddressCountResp.macCount[2].Interface_id
 = 3
ShowMacTableCount_Output.showMacAddressCountResp.macCount[2].count =
 0
ShowMacTableCount_Output.showMacAddressCountResp.macCount[3].Interface_id
 = 4
ShowMacTableCount_Output.showMacAddressCountResp.macCount[3].count =
 0
```

```
ShowMacTableCount_Output.showMacAddressCountResp.macCount[4].Interface_id
 = 5
ShowMacTableCount_Output.showMacAddressCountResp.macCount[4].count =
 0
ShowMacTableCount_Output.showMacAddressCountResp.macCount[5].Interface_id
 = 6
ShowMacTableCount_Output.showMacAddressCountResp.macCount[5].count =
 0
 ShowMacTableCount Commit Success!!!
```

- **showMacTableAgingReq agingTimeValue**

  This command displays the MAC aging time. The following is a sample output from the command:

```
Switch(ProvisionMacTableSecurityType)# showMacTableAgingTime showMacTableAgingReq
agingTimeValue
Switch(ProvisionMacTableSecurityType)# showmactableagingTime review
```

```
Commands in queue:
 showMacTableAgingTime showMacTableAgingReq agingTimeValue
```

```
Switch(ProvisionMacTableSecurityType)# showmactableagingTime commit
```

```
Clearing Socket 4
ShowMacTableAgingTime_Output.showMacTableAgingResp.macAgingTime = 'MAC
 Age Time: 300'

 ShowMacTableAgingTime Commit Success!!!
```

CHAPTER 21

Configuring NTP

The Network Time Protocol (NTP) synchronizes the time of day among a set of distributed time servers and clients so that you can correlate events when you receive system logs and other time-specific events from multiple network devices. NTP uses the User Datagram Protocol (UDP) as its transport protocol. All NTP communications use Coordinated Universal Time (UTC).

Prerequisites for Configuring NTP

- The NID must have an IP address.

Restrictions for Configuring NTP

- Maximum number of servers supported is 5.

Information About NTP

Network Time Protocol

Network Time Protocol (NTP) is a protocol designed to time-synchronize a network of machines. NTP runs on UDP, which in turn runs on IP. NTP Version 3 (NTPv3) is documented in RFC 1305.

An NTP network usually gets its time from an authoritative time source such as a radio clock or an atomic clock attached to a time server. NTP then distributes this time across the network. NTP is extremely efficient;

no more than one packet per minute is necessary to synchronize two machines to the accuracy of within a millisecond of one another.

NTP uses the concept of a stratum to describe how many NTP hops away a machine is from an authoritative time source. A stratum 1 time server typically has an authoritative time source (such as a radio or atomic clock or a Global Positioning System [GPS] time source) directly attached, a stratum 2 time server receives its time via NTP from a stratum 1 time server, and so on.

NTP has two ways to avoid synchronizing to a machine whose time may not be accurate. NTP does not synchronize to a machine that is not in turn synchronized with the NTP. NTP compares the time reported by several machines and does not synchronize to a machine whose time is significantly different from others, even if its stratum is lower. This strategy effectively builds a self-organizing tree of NTP servers.

Our implementation of NTP does not support stratum 1 service; that is, you cannot connect to a radio or atomic clock (for some specific platforms, however, you can connect to a GPS time-source device). We recommend that the time service you derive for your network from the public NTP servers that are available in the IP Internet.

If the network is isolated from the Internet, our implementation of NTP allows a machine to be configured so that it acts as though it is synchronized via NTP, when in fact the network has determined the time by using other means. Other machines can then synchronize to that machine via NTP.

A number of manufacturers include NTP software for their host systems and a publicly available version for systems running UNIX. This software also allows UNIX-derivative servers to acquire the time directly from an atomic clock, which would subsequently propagate time information along to Cisco devices.

The communication between machines running NTP (known as associations) are usually statically configured; each machine is given the IP address of all machines with which it should form associations. Accurate timekeeping is made possible through exchange of NTP messages between each pair of machines with an association.

However, in a LAN environment, NTP can be configured to use IP broadcast messages instead. This alternative reduces configuration complexity because each machine can be configured to send or receive broadcast messages. However, the accuracy of timekeeping is marginally reduced because the information flow is only one way.

The time kept on a machine is a critical resource, so we strongly recommend that you use the security features of NTP to avoid the accidental or malicious setting of incorrect time. Two security mechanisms are available: an access-list-based restriction scheme and an encrypted authentication mechanism.

When multiple sources of time (VINES, hardware clock, manual configuration) are available, NTP is always considered to be more authoritative. NTP time overrides the time set by any other method.

NTP services are disabled on all interfaces by default.

For more information about NTP, see the following sections:

How to Configure NTP

Provisioning the Cisco ME 1200 NID to Configure NTP

DETAILED STEPS

	Command or Action	Purpose
Step 1	**NtpPortType** **Example:** `Switch# NtpPortType`	Enters NTP provisioning mode.

Step 2	**NtpPortType** {**default** | **deleteNtpConfig** | **exit** | **getNtpConfig** | **no** | **setNtpConfig**}
	
	Example:
	`Switch(NtpPortType)# ?`
	`NtpPortType sub-mode commands:`
	`  default          Set a command to its defaults`
	`  deleteNtpConfig  delete NTP config request`
	`  exit             Exit from NtpPortType sub configuration mode`
	`  getNtpConfig     get ntp properties request`
	`  no               Negate a command or set its defaults`
	`  setNtpConfig     Set Ntp Server Details`
		Displays the supported configurations for NTP.

Step 3	**exit** **Example:** `Switch(NtpPortType)# exit`	Exits the NTP mode.

Configuration Example

The following example shows the supported NTP configuration:

```
Switch(NtpPortType)# ?
NtpPortType sub-mode commands:
  default          Set a command to its defaults
  deleteNtpConfig  delete NTP config request
  exit             Exit from NtpPortType sub configuration mode
  getNtpConfig     get ntp properties request
  no               Negate a command or set its defaults
  setNtpConfig     Set Ntp Server Details
```

Configuring NTP on the Cisco ME 1200 NID

Before You Begin

- Ensure that the NID is reachable for the provided NTP server.

- Set the time zone for synchronization with the NTP server. See Configuring the System Clock, on page 19.
- Perform the steps to provision NTP on the Cisco ME 1200 NID . See Provisioning the Cisco ME 1200 NID to Configure NTP, on page 433

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setNtpConfig** {**commit** | **flush** | **ntpConfig** | **review**}
	
	Example:
	`Switch(NtpPortType)# setNtpConfig ?`
	`  commit             commit deleteNtpConfig`
	`  flush              flush all deleteNtpConfig commands`
	`from queue`
	`  ntpConfig          Set Ntp Server Details`
	`  review             review deleteNtpConfig commands`
		Sets NTP configuration
		• **commit**—Sends the NTP configuration to NID.
		• **flush**—Flushes all NTP configuration from the queue.
		• **ntpConfig**—Sets the NTP server configuration on the Cisco ME 1200 NID .
		• **review**—Displays the configuration on the Cisco ME 1200 NID .

Step 2	**setNtpConfig ntpConfig** {**hostinfo** {**hostname** *host-name*} | **ipv4address** *IPv4-address* | **ipv6address** *IPv6-address*} | **ntpmode** {**enable** | **number** *server-number*}}
	
	Example:
	`Switch(NtpPortType)# setNtpConfig hostinfo hostname`
	`host1`
	`Switch(NtpPortType)# setNtpConfig ipv4address 192.34.7.8`
	`Switch(NtpPortType)# setNtpConfig ipv6address`
	`2001:DB8:0:ABCD::1`
	`Switch(NtpPortType)# setNtpConfig ntpmode enable`
	`Switch(NtpPortType)# setNtpConfig ntpmode number 5`
		Configures NTP.
		• **hostinfo**—Sets the host information such as host name, IPv4 address and IPv6 address on the Cisco ME 1200 NID .
		• **ntpmode**—Enables or disables the NTP mode on the Cisco ME 1200 NID .
		• **number** *server-number*—Sets the NTP server details. The valid range is from 1 to 5.

Step 3	**setNtpconfig review**
	
	Example:
	`Switch(NtpPortType)# setNtpconfig review`
	
	`Commands in queue:`
	`        setNtpConfig ntpConfig hostInfo hostName host1`
	`        setNtpConfig ntpConfig hostInfo ipv4Address`
	`192.34.7.8`
	`        setNtpConfig ntpConfig ntpMode enable`
	`        setNtpConfig ntpConfig number 5`
	`        setNtpConfig ntpConfig ntpMode enable`
		Displays the NTP configuration on the Cisco ME 1200 NID .

Step 4	**setNtpconfigcommit** **Example:** `Switch(NtpPortType)# setNtpconfig commit`	Sends the NTP configuration to the NID.
Step 5	**exit** **Example:** `Switch(NtpPortType)# exit`	Exits the NTP mode.

Configuration Example

The example shows how to configure NTP on the Cisco ME 1200 NID :

```
Switch(NtpPortType)# setNtpConfig hostinfo hostname host1
Switch(NtpPortType)# setNtpConfig ipv4address 192.34.7.8
Switch(NtpPortType)# setNtpConfig ipv6address 2001:DB8:0:ABCD::1
Switch(NtpPortType)# setNtpConfig ntpmode enable
Switch(NtpPortType)# setNtpConfig ntpmode number 5
Switch(NtpPortType)# setNtpconfig review

Commands in queue:
        setNtpConfig ntpConfig hostInfo hostName host1
        setNtpConfig ntpConfig hostInfo ipv4Address 192.34.7.8
        setNtpConfig ntpConfig ntpMode enable
        setNtpConfig ntpConfig number 5
        setNtpConfig ntpConfig ntpMode enable

Switch(NtpPortType)# setNtpconfig commit
Switch(NtpPortType)# exit
```

Configuring NTP with Default Configuration

You can set the default NTP configuration on the Cisco ME 1200 NID.

Before You Begin

- Perform the steps to provision NTP on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**default**{**getNtpConfig** | **setNtpConfig** | **deleteNtpConfig** | **exit** }
	
	Example:
	`Switch(NtpPortType)# default ?`
	
	`deleteNtpConfig  delete NTP config request`
	`exit             Exit from NtpPortType sub configuration mode`
	`getNtpConfig     get ntp properties request`
	`setNtpConfig     Set Ntp Server Details`
		Sets the default NTP configuration.
		
		• **getNtpConfig—**View the configuration on the ME 1200 NID.
		• **setNtpConfig—**Sets the configuration on theME 1200 NID.
		• **deleteNtpConfig—**Deletes the configuration from the ME 1200 NID.
		• **exit—**Exits from NtpPortType configuration mode.

Step 2	**exit** **Example:** `Switch(NtpPortType)# exit`	Exits the NTP mode.

Viewing the NTP Configuration

Before You Begin

- Perform the steps to provision NTP on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**getNtpConfig** {**commit** | **flush** | **ntpStatusRequest** *ntp-status*| **review**} **Example:** `Switch(NtpPortType)#`**`getNtpConfig ntpStatusRequest 1`** `Switch(NtpPortType)#`**`getNtpConfig review`** `Switch(NtpPortType)#`**`getNtpConfig commit`**	• **ntpStatusRequest—**Request NTP configuration properties. • **commit—**Sends the NTP configuration to NID. • **flush—**Flushes all NTP configuration from the queue. • **review—**Displays the configuration.
Step 2	**exit** **Example:** `Switch(NtpPortType)# `**`exit`**	Exits the NTP mode.

Configuration Example

The example shows how to view the configuration:

```
Switch(NtpPortType)# getNtpConfig ntpStatusRequest 1
Switch(NtpPortType)# getNtpConfig review

Commands in queue:
        getNtpConfig ntpStatusRequest 1
        getNtpConfig ntpStatusRequest 2
        getNtpConfig ntpStatusRequest 3

Switch(NtpPortType)# getNtpConfig commmit
Switch(NtpPortType)# end
```

Deleting the NTP Configuration

Before You Begin

- Perform the steps to provision NTP on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**deleteNtpConfig** {**commit** | **flush** | **ntpDeleteConfig** | **review**}
	
	Example:
	`Switch(NtpPortType)# `**`deleteNtpConfig ?`**
	`  commit           commit deleteNtpConfig`
	`  flush            flush all deleteNtpConfig commands from queue`
	`  ntpDeleteConfig  delete NTP config request`
	`  review           review deleteNtpConfig commands`
		Removes the NTP configuration.
		• **commit—**Sends the NTP configuration to NID.
		• **flush—**Flushes all NTP configuration from the queue.
		• **ntpDeleteConfig—**Deletes the NTP configuration request on the Cisco ME 1200 NID.
		• **review—**Displays the configuration on the Cisco ME 1200 NID .

Step 2	**ntpDeleteConfig** {**ntpEnable** | **ntpServerNo***server-num*} **Example:** `Switch(NtpPortType)# `**`deleteNtpConfig ntpDeleteConfig ntpEnable`** `Switch(NtpPortType)# `**`deleteNtpConfig ntpDeleteConfig ntpServer 1`**	Removes NTP configuration. • **ntpEnable—**Disables the NTP configuration. • **ntpServerNo—**Disables the NTP server. • *server-num***—**Specifies the NTP server. The valid range is from 1 to 5.
Step 3	**ntpDeleteConfig review** **Example:** `Switch(NtpPortType)# `**`deleteNtpConfig review`**	Displays the NTP configuration.
Step 4	**ntpDeleteConfig commit** **Example:** `Switch(NtpPortType)# `**`deleteNtpConfig commit`**	Sends the NTP configuration to the NID.
Step 5	**exit** **Example:** `Switch(NtpPortType)# `**`exit`**	Exits the NTP mode.

Configuration Example

The following example shows how to delete the NTP configuration:

```
Switch(NtpPortType)# deleteNtpConfig ntpDeleteConfig ntpEnable
Switch(NtpPortType)# deleteNtpConfig ntpDeleteConfig ntpServer 1
Switch(NtpPortType)# deleteNtpConfig review
Commands in queue:
        deleteNtpConfig ntpDeleteConfig ntpEnable
        deleteNtpConfig ntpDeleteConfig ntpServerNo 2
Switch(NtpPortType)# deleteNtpConfig commit
DeleteNtpConfig Commit Success!!!
Switch(NtpPortType)# deleteNtpConfig exit
```

CHAPTER 22

Configuring Storm Control

A traffic storm occurs when packets flood the LAN, creating excessive traffic and degrading network performance. The traffic broadcast and multicast suppression (or storm control) feature prevents LAN ports from being disrupted by a broadcast, multicast and unicast traffic storm on physical interfaces.

Restrictions for Configuring Strorm Control

- Storm control cannot be configured per port. It is configured globally on all ports

Information on Storm Control

A broadcast storm occurs when huge amount of broadcast, multicast, or unknown unicast packets flood the LAN, creating excessive traffic and degrading network performance. Errors in the protocol-stack implementation or in the network configuration can also cause a storm. The mechanism to prevent and control such events is known as storm control or broadcast suppression.

Broadcast and Multicast Suppression monitors incoming traffic levels periodically, and compares traffic level with configured storm control policer level or rate. The traffic storm control threshold level is measured based on the traffic rate in bits (or kilobits) per second at which broadcast, multicast, unicast packets are received.

Storm control prevents traffic on a LAN from being disrupted by a broadcast, multicast, or unicast storm on a port. Storm control is applicable for physical interfaces and is used to restrict the unicast, broadcast and multicast ingress traffic on the Layer2 interfaces.

How to Configure Storm Control

Provisioning the Cisco ME 1200 NID to Configure Storm Control

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStormControl** **Example:** `Switch# ProvisionStormControl`	Enters Storm control provisioning mode.
Step 2	**ProvisionStormControl** {**getStormControlGlobal** | **setStormControlGlobal** | **showStormControl** |**no** | **exit**} **Example:** `Switch(ProvisionStormControl)# ?`	Displays the supported configurations for storm control. • **getStormControlGlobal**—View the configuration, see Retrieving the Storm Control Configuration, on page 443. • **setStormControlGlobal**—Configures storm control, see Configuring Storm Control on the Cisco ME 1200 NID , on page 441. • **showStormControlGlobal**—Displays the configuration, see Displaying the Storm Control Configuration, on page 444. • **no**—Negates the configuration, see Negating Storm Control Configuration and Restoring Defaults, on page 445. • **exit**—Exits the configuration.
Step 3	**exit** **Example:** `Switch(ProvisionStormControl)# exit`	Exits the storm control mode.

Configuration Example

The following example shows the supported storm control configuration:

```
Switch(ProvisionStormControl)# ?
ProvisionStormControl sub-mode commands:
  exit                   Exit from ProvisionStormControl sub configuration mode
  getStormControlGlobal  Storm Control Global Configuration Get Request
  no                     Negate a command or set its defaults
  setStormControlGlobal  Storm Control Global Configuration Set Request
  showStormControl       Display Storm Control Policer properties
```

Configuring Storm Control on the Cisco ME 1200 NID

Before You Begin

- Perform the steps to provision storm control on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**setStormControlGlobal** {**commit** | **flush** | **stormControlGlobalConfiguration** | **review**}
	
	Example:
	`Switch(ProvisionStormControl)# setStormControlGlobal ?`
	`  commit                          commit setStormControlGlobal`
	`  flush                             flush all`
	`setStormControlGlobal commands`
	`                                    from queue`
	`  review                          review setStormControlGlobal`
	` commands`
	`  stormControlGlobalConfiguration  Storm Control Global`
	`Configuration Set`
	`                                    Request`
		Configures global storm control.
		• **commit**—Sends the storm control configuration to NID.
		• **flush**—Flushes all storm control configuration from the queue.
		• **stormControlGlobalConfiguration**—Sets the storm control configuration globally.
		Note Storm control is configured globally (all ports) and *not* per port.
		• **review**—Displays the configuration.

Step 2	**setStormControlGlobal stormControlGlobalConfiguration** {**broadcast** {**bc-enabled** {**enable** | **disable**} | **level** *level-bps* | **mode** {**bps** | **kbps**}} | **multicast** {**level** *level-bps* | **mc-enabled** {**enable** | **disable**} | **mode** {**bps** | **kbps**}} | **unicast** {**level** *level-bps* | **uc-enabled** {**enable** | **disable**} | **mode** {**bps** | **kbps**}}}
	
	Example:
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration broadcast level 64`
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration broadcast mode kps`
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration broadcast bc-enabled enable`
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration mulicast level 8`
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration mulicast mode bps`
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration broadcast mc-enabled disable`
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration unicast level 16`
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration unicast uc-enabled disable`
	`Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration unicast mode bps`
		• **broadcast**—Sets police broadcast frames.
		• **multicast**—Sets police multicast frames.
		• **unicast**—Sets police unicast frames.
		• **bc-enabled**—Sets broadcast policer rate.
		• **mc-enabled**—Sets multicast policer rate.
		• **uc-enabled**—Sets unicast policer rate.
		• **level** *level-bps*—Configure policer rate or level. Allowed values are 1,2,4,8,16,32,64,128,256,512 (bps/kbps) and 1024 kbps.
		• **mode**—Sets the mode in bps or kbps
		• **bps**—Configures policer rate in bps.
		• **kbps**—Configures policer rate in kbps.
		• **disable**—Disables the storm control configuration.
		• **enable**—Enables the storm control configuration.

	Command or Action	Purpose

Step 3	**setStormControlGlobal review**
	
	Example:
	`Switch(ProvisionStormControl)# setStormControlGlobal review`
	
	`Commands in queue:`
	`setStormControlGlobal stormControlGlobalConfiguration broadcast bc-enabled enable`
	`setStormControlGlobal stormControlGlobalConfiguration broadcast level 64`
	`setStormControlGlobal stormControlGlobalConfiguration broadcast mode bps`
	`setStormControlGlobal stormControlGlobalConfiguration unicast uc-enabled enable`
	`setStormControlGlobal stormControlGlobalConfiguration unicast level 16`
	`setStormControlGlobal stormControlGlobalConfiguration unicast mode kbps`
	`setStormControlGlobal stormControlGlobalConfiguration multicast mc-enabled enable`
	`setStormControlGlobal stormControlGlobalConfiguration multicast mode bps`
	`setStormControlGlobal stormControlGlobalConfiguration unicast level 8`
		Displays the storm control configuration.

Step 4	**setStormControlGlobalcommit** **Example:** `Switch(ProvisionStormControl)# setStormControlGlobal commit`	Sends the storm control configuration to the NID.
Step 5	**exit** **Example:** `Switch(ProvisionStormControl)# exit`	Exits the storm control mode.

Configuration Example

The example shows how to configure storm control on the Cisco ME 1200 NID :

```
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration broadcast
 level 64
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration broadcast
 mode kps
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration broadcast
 bc-enabled enable
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration mulicast
 level 8
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration mulicast
 mode bps
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration broadcast
 mc-enabled disable
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration unicast
 level 16
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration unicast
 uc-enabled disable
Switch(ProvisionStormControl)# setStormControlGlobal stormControlGlobalConfiguration unicast
 mode bps
Switch(ProvisionStormControl)# setStormControlGlobal review

Commands in queue:
```

```
        setStormControlGlobal stormControlGlobalConfiguration broadcast bc-enabled enable
        setStormControlGlobal stormControlGlobalConfiguration broadcast level 64
        setStormControlGlobal stormControlGlobalConfiguration broadcast mode bps
        setStormControlGlobal stormControlGlobalConfiguration unicast uc-enabled enable
        setStormControlGlobal stormControlGlobalConfiguration unicast level 16
        setStormControlGlobal stormControlGlobalConfiguration unicast mode kbps
        setStormControlGlobal stormControlGlobalConfiguration multicast mc-enabled enable
        setStormControlGlobal stormControlGlobalConfiguration multicast mode bps
        setStormControlGlobal stormControlGlobalConfiguration unicast level 8

Switch(ProvisionStormControl)# setStormControlGlobal commit
SetStormControlGlobal Commit Success!!!
Switch(ProvisionStormControl)#end
```

Retrieving the Storm Control Configuration

Before You Begin

- Perform the steps to provision storm control on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**getStormControlGlobal** {**commit** | **flush** | **getStormControlGlobalRequest** | **review**}
	
	Example:
	`Switch(ProvisionStormControl)#getStormControlGlobal getStormControlGlobalRequest`
	`Switch(ProvisionStormControl)#getStormControlGlobal review`
	`Switch(ProvisionStormControl)#getStormControlGlobal commit`
		Retrieve the storm control configuration.
		• **getStormControlGlobalRequest—**Request storm control configuration properties.
		• **commit—**Sends the storm control configuration to NID.
		• **flush—**Flushes all storm control configuration from the queue.
		• **review—**Displays the configuration.

Step 2	**exit** **Example:** `Switch(ProvisionStormControl)# exit`	Exits the storm control mode.

Configuration Example

The example shows how to retrieve the configuration on the ME1200:

```
Switch(ProvisionStormControl)#getStormControlGlobal getStormControlGlobalRequest
Switch(ProvisionStormControl)#getStormControlGlobal review
Commands in queue:
        getStormControlGlobal getStormControlGlobalRequest
        getStormControlGlobal getStormControlGlobalRequest
```

```
Switch(ProvisionStormControl)# getStormControlGlobal commmit
Switch(ProvisionStormControl)# end
```

Displaying the Storm Control Configuration

Before You Begin

- Perform the steps to provision storm control on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**showStormControl** {**commit** | **flush** | **showStormControlReq** | **review**}
	
	Example:
	`Switch(ProvisionStormControl)#showStormControl showStormControlReq`
	`Switch(ProvisionStormControl)#showStormControl review`
	`Switch(ProvisionStormControl)#showStormControl commit`
		Displays the storm control configuration.
		• **showStormControlReq—**Displays storm control policer properties.
		• **commit—**Sends the show storm control configuration to NID.
		• **flush—**Flushes all show storm control configuration from the queue.
		• **review—**Displays the show storm configuration.

Step 2	**exit** **Example:** `Switch(ProvisionStormControl)# exit`	Exits the storm control mode.

Configuration Example

The example shows how to view the configuration:

```
Switch(ProvisionStormControl)#showStormControl showStormControlReq
Switch(ProvisionStormControl)#showStormControl review

Commands in queue:
        showStormControl showStormControlReq
Switch(ProvisionStormControl)#showStormControl commit

ShowStormControl_Output.stormControlGlobalConfiguration.broadcast.bc_enabled = true
ShowStormControl_Output.stormControlGlobalConfiguration.broadcast.level = 1024000
ShowStormControl_Output.stormControlGlobalConfiguration.broadcast.mode.t = 2
ShowStormControl_Output.stormControlGlobalConfiguration.broadcast.mode.u.kbps = 'kbps'
ShowStormControl_Output.stormControlGlobalConfiguration.multicast.mc_enabled = true
ShowStormControl_Output.stormControlGlobalConfiguration.multicast.level = 512000
ShowStormControl_Output.stormControlGlobalConfiguration.multicast.mode.t = 2
ShowStormControl_Output.stormControlGlobalConfiguration.multicast.mode.u.kbps = 'kbps'
ShowStormControl_Output.stormControlGlobalConfiguration.unicast.uc_enabled = true
ShowStormControl_Output.stormControlGlobalConfiguration.unicast.level = 1000
ShowStormControl_Output.stormControlGlobalConfiguration.unicast.mode.t = 2
ShowStormControl_Output.stormControlGlobalConfiguration.unicast.mode.u.kbps = 'kbps'
ShowStormControl Commit Success!!!
```

```
Switch(ProvisionStormControl)# exit
```

Negating Storm Control Configuration and Restoring Defaults

Note Following are the default values for storm control:

- broadcast
  - bc-enabled
  - level = 1
  - mode = bps
- multicast
  - mc-enabled
  - level = 1
  - mode = bps
- unicast
  - uc-enabled
  - level = 1
  - mode = bps

Before You Begin

- Perform the steps to provision storm control on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**no** {**getStormControlGlobal** | **setStormControlGlobal** | **showStormControl** | **exit**}
	
	Example:
	`Switch(ProvisionStormControl)# no ?`
	`exit Exit from ProvisionStormControl sub configuration mode`
	`getStormControlGlobal Storm Control Global Configuration Get Request`
	`setStormControlGlobal Storm Control Global Configuration Set Request`
	`showStormControl Display Storm Control Policer`
		Negates storm control configurations.
		• **getStormControlGlobal—**View the configuration.
		• **setStormControlGlobal—**Sets the configuration.
		• **showStormControl—**Displays the configuration.
		• **exit—**Exits from ProvisionStormControl mode.

	Command or Action	Purpose
	properties	
Step 2	**exit** **Example:** `Switch(ProvisionStormControl)# exit`	Exits the storm control mode.

Configuration Example

The following example is a sample output for negation:

```
Switch(ProvisionStormControl)#showStormControl review
Commands in queue:
showStormControl showStormControlReq

Switch(ProvisionStormControl)#no showStormControl showStormControlReq
Switch(ProvisionStormControl)#showStormControl review
No commands in queue

Switch(ProvisionStormControl)#setStormControlGlobal review
Commands in queue:
setStormControlGlobal stormControlGlobalConfiguration broadcast bc-enabled enable
setStormControlGlobal stormControlGlobalConfiguration broadcast level 64
setStormControlGlobal stormControlGlobalConfiguration broadcast level 128

Switch(ProvisionStormControl)#no setStormControlGlobal stormControlGlobalConfiguration
broadcast level 64
Switch(ProvisionStormControl)#stormControlGlobal review
Commands in queue:
setStormControlGlobal stormControlGlobalConfiguration broadcast bc-enabled enable
setStormControlGlobal stormControlGlobalConfiguration broadcast level 128
```

Deleting the NTP Configuration

Before You Begin

- Perform the steps to provision NTP on the Cisco ME 1200 NID.

DETAILED STEPS

	Command or Action	Purpose

Step 1	**deleteNtpConfig** {**commit** | **flush** | **ntpDeleteConfig** | **review**}
	
	Example:
	`Switch(NtpPortType)# deleteNtpConfig ?`
	`  commit           commit deleteNtpConfig`
	`  flush            flush all deleteNtpConfig`
	`commands from queue`
		Removes the storm control configuration.
		• **commit**—Sends the NTP configuration to NID.
		• **flush**—Flushes all NTP configuration from the queue.
		• **ntpDeleteConfig**—Deletes the NTP configuration request on the Cisco ME 1200 NID.
		• **review**—Displays the configuration.

	Command or Action	Purpose
	`ntpDeleteConfig  delete NTP config request` `review           review deleteNtpConfig commands`	

Step 2	**ntpDeleteConfig** { **ntpEnable** | **ntpServerNo***server-num* }
	
	Example:
	`Switch(NtpPortType)# deleteNtpConfig ntpDeleteConfig ntpEnable`
	`Switch(NtpPortType)# deleteNtpConfig ntpDeleteConfig ntpServer 1`
		• **ntpEnable—**Disables the NTP configuration.
		• **ntpServerNo—**Disables the NTP server.
		• *server-num*—Specifies the NTP server. The valid range is from 1 to 5.

Step 3	**exit** **Example:** `Switch(NtpPortType)# exit`	Exits the NTP mode.

CHAPTER 23

Configuring Syslog

This document describes the Syslog feature and configuration steps to implement Syslog.

Prerequisites for Configuring Syslog

- NID must have an IP address.

Information About Syslog

Syslog is a method to collect messages from devices to a server running a syslog daemon. A syslog service simply accepts messages, and stores them in files or prints them according to a simple configuration file. This form of logging is the best available for Cisco devices because it can provide protected long-term storage for logs. This is useful both in routine troubleshooting and in incident handling.

Enabling Syslog

DETAILED STEPS

	Command or Action	Purpose
Step 1	**sysLog** **Example:** `Switch# sysLog`	Enters the sysLog mode.

Step 2	**setSyslogProperties sysLogConf** {**valid** | **logServer** {**valid** | **host** {**hostname** | **ipv4address**}} | **level** {**info** | **error** | **warning**}} {**enable** | **disable**}
	
	Example:
	`Switch(sysLog)# setSyslogProperties sysLogConf valid enable`
	`Switch(sysLog)# setSyslogProperties sysLogConf level info`
	`Switch(sysLog)# setSyslogProperties sysLogConf logServer valid enable`
	`Switch(sysLog)# setSyslogProperties sysLogConf logServer host ipv4address 10.78.101.221`
		Configures syslog properties.
		• **sysLogConf—**Sets syslog properties.
		• **valid—**Enables or disables logging.
		• **logServer—**Specifies the logging server.
		• **valid—**Enables or disables logging server.
		• **host—**Specifies log server name or hostname.
		• **hostname—**Specifies domain name of the logging server.
		• **ipv4address—**Specifies IPv4 address of the logging server.
		• **level—**Specifies the log level.
		• **info—** Specifies the level information.
		• **error—** Specifies the level error.
		• **warning—** Specifies the level warning.
		• **enable—** Enables configuration of syslog properties.
		• **disable—** Disables configuration of syslog properties.

Step 3	**setSyslogProperties review** **Example:** `Switch(sysLog)# setSyslogProperties review`	Displays the configuration.
Step 4	**setSyslogProperties commit** **Example:** `Switch(sysLog)# setSyslogProperties commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(sysLog)# exit`	Exits the syslog mode.

Configuration Example

The example shows how to enable syslog:

```
Switch(sysLog)# setSyslogProperties sysLogConf valid enable
Switch(sysLog)# setSyslogProperties sysLogConf level info
Switch(sysLog)# setSyslogProperties sysLogConf logServer valid enable
Switch(sysLog)# setSyslogProperties sysLogConf logServer host ipv4address 10.78.101.221

Switch(sysLog)# setSyslogProperties review
Switch(sysLog)# setSyslogProperties commit
Switch(sysLog)# exit
```

Clearing Syslog

DETAILED STEPS

	Command or Action	Purpose
Step 1	**sysLog** **Example:** `Switch# sysLog`	Enters the sysLog mode.
Step 2	**clearSysLog clearLogLevelConf** {**error** | **info** | **warning**} {**enable** | **disable**} **Example:** `Switch(sysLog)# clearSysLog clearLogLevelConf info enable`	Clears system log information. • **clearLogLevelConf—**Clears log information. • **error—**Specifies level error. • **info—**Specifies level information. • **warning—**Specifies level warning. • **enable—**Enables the clearing of log information. • **disable—**Disables the clearing of log information.
Step 3	**clearSysLog review** **Example:** `Switch(sysLog)# clearSysLog review`	Displays the configuration.
Step 4	**clearSysLog commit** **Example:** `Switch(sysLog)# clearSysLog commit`	Sends the configuration to NID.
Step 5	**clearSysLog clearLogLevelConf** {**error** | **info** | **warning**} {**enable** | **disable**}	Clears system log level errors. • **clearLogLevelConf—**Clears log information.

	Command or Action	Purpose
	Example: `Switch(sysLog)# clearSysLog clearLogLevelConf error enable`	• **error—**Specifies level error. • **info—**Specifies level information. • **warning—**Specifies level warning. • **enable—**Enables the clearing of log information. • **disable—**Disables the clearing of log information.
Step 6	**clearSysLog review** **Example:** `Switch(sysLog)# clearSysLog review`	Displays the configuration.
Step 7	**clearSysLog commit** **Example:** `Switch(sysLog)# clearSysLog commit`	Sends the configuration to NID.
Step 8	**clearSysLog clearLogLevelConf** {**error** | **info** | **warning**} {**enable** | **disable**} **Example:** `Switch(sysLog)# clearSysLog clearLogLevelConf warning enable`	Clears system log level warnings. • **clearLogLevelConf—**Clears log information. • **error—**Specifies level error. • **info—**Specifies level information. • **warning—**Specifies level warning. • **enable—**Enables the clearing of log information. • **disable—**Disables the clearing of log information.
Step 9	**clearSysLog review** **Example:** `Switch(sysLog)# clearSysLog review`	Displays the configuration.
Step 10	**clearSysLog commit** **Example:** `Switch(sysLog)# clearSysLog commit`	Sends the configuration to NID.
Step 11	**exit** **Example:** `Switch(sysLog)# exit`	Exits the syslog mode.

Configuration Example

The example shows how to clear syslog:

```
Switch(sysLog)# clearSysLog clearLogLevelConf info
Switch(sysLog)# clearSysLog review
Switch(sysLog)# clearSysLog commit
Switch(sysLog)# clearSysLog clearLogLevelConf error
Switch(sysLog)# clearSysLog review
Switch(sysLog)# clearSysLog commit
Switch(sysLog)# clearSysLog clearLogLevelConf warning
Switch(sysLog)# clearSysLog review
Switch(sysLog)# clearSysLog commit
Switch(sysLog)# exit
```

Verifying Syslog

Use the following command to verify the syslog status on the Cisco ME 1200 NID.

- **showLogLevelConf**

  This command displays the syslog configuration status on the NID. The following is a sample output from the command:

```
Switch(sysLog)# showSysLog showLogLevelConf
Switch(sysLog)# showSysLog review
```

```
Commands in queue:
 showSysLog showLogLevelConf
```

```
Switch(sysLog)# showSysLog commit
```

```
Clearing Socket 0 Clearing Socket 0
ShowSysLog_Output.showLogLevelResponse.hostMode = true
ShowSysLog_Output.showLogLevelResponse.hostAddress = '10.78.101.221'
ShowSysLog_Output.showLogLevelResponse.logLevel = 'info'
ShowSysLog_Output.showLogLevelResponse.noOfLogEntries.InfoCounter =
40
ShowSysLog_Output.showLogLevelResponse.noOfLogEntries.warningCounter
 = 0
ShowSysLog_Output.showLogLevelResponse.noOfLogEntries.errorCounter =
 0

 ShowSysLog Commit Success!!!
```

CHAPTER 24

Configuring SPAN

This document describes the Switched Port Analyzer (SPAN) feature and configuration steps to implement SPAN.

Prerequisites for Configuring SPAN

- You must enable SPAN globally to support the desired SPAN configuration.
- NID must have an IP address.
- You must select a SPAN source from the following options:
  - Interface—one or more source interfaces.
  - VLAN— one or more source VLANs.
  - CPU— to monitor CPU traffic.

Restrictions for Configuring SPAN

- You cannot configure a port as both a source and destination port.
- VLAN SPAN monitors only the traffic that leaves or enters Layer 2 ports in the VLAN.
- SPAN sources interface and VLAN cannot exit together.

Information About SPAN

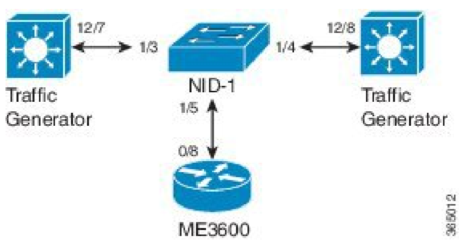
Switched Port Analyzer (SPAN) feature, sometimes called port mirroring or port monitoring, selects network traffic for analysis by a network analyzer. The SPAN feature is local when the monitored ports are all located on the same switch as the destination port. A local SPAN session is an association of a destination port with source ports. You can monitor incoming or outgoing traffic on a series or range of ports.

SPAN is used to monitor traffic within the switch. Traffic source can be from:

- Single or multiple ports
- Single or multiple VLANs
- Source CPU

Destination can be an interface on the same switch. The following figure shows the topology used for provisioning SPAN on a NID.

Figure 14: SPAN Topology



How to Provision SPAN

Enabling SPAN Globally to Start a Monitoring Session

DETAILED STEPS

	Command or Action	Purpose
Step 1	**span** **Example:** `Switch# span`	Enters the SPAN mode.
Step 2	**setSpanGlobalConfReq** {**enable** | **disbale**} **Example:** `Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable`	Enters SPAN global configuration mode. Sub-command options. • **enable**—Enables SPAN globally. • **disbale**—Disables SPAN globally.

	Command or Action	Purpose
Step 3	**setSpanGlobalConf review** **Example:** `Switch(SPAN)# setSpanGlobalConf review`	(Optional) Displays the configuration.
Step 4	**setSpanGlobalConf commit** **Example:** `Switch(SPAN)# setSpanGlobalConf commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to enable SPAN globally:

```
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
```

Configuring SPAN Source Interface

Before You Begin

Perform the steps to enable SPAN globally. See Enabling SPAN Globally to Start a Monitoring Session, on page 456.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setSpanSrcConfRequest** {**source** {**cpu** {**rx** | **tx** | **both**} | {**vlan** *vlan-list*} | **interface** {*intf-range* | **traffic-type** {**rx** | **tx** | **both**}} **Example:** `Switch(SPAN)# setSpanSrcConf commitsetSpanSrcConf setSpanSrcConfRequest source interface intf-range 1-2`	Configures SPAN source interface. • **source**—Mirrors source interface or VLAN. • **cpu**—Mirrors source CPU. • **rx**—Mirrors received traffic. • **tx**—Mirrors transmitted traffic. • **both**—Mirrors received and transmitted traffic. • **vlan**—Mirrors source VLAN. • *vlan-list*—Mirrors source VLAN.

	Command or Action	Purpose
		• **interface—** Mirrors source interface and traffic type. • *intf-range*—Mirrors an interface number or a range from 1 to 6. • **traffic-type—**Mirrors traffic type. • **rx—**Mirrors received traffic. • **tx—**Mirrors transmitted traffic. • **both—**Mirrors received and transmitted traffic.
Step 2	**setSpanSrcConfRequest** {**source** {**cpu** {**rx** | **tx** | **both**} | {**vlan** *vlan-list*} | **interface** {*intf-range* | **traffic-type** {**rx** | **tx** | **both**}} **Example:** `Switch(SPAN)# setSpanSrcConf commitsetSpanSrcConf setSpanSrcConfRequest source interface traffic-type both`	Configures SPAN source traffic type as both, receive and transmit. • **source—**Mirrors source interface or VLAN. • **cpu—**Mirrors source CPU. • **rx—**Mirrors received traffic. • **tx—**Mirrors transmitted traffic. • **both—**Mirrors received and transmitted traffic. • **vlan—**Mirrors source VLAN. • *vlan-list*—Mirrors source VLAN. • **interface—** Mirrors source interface and traffic type. • *intf-range*—Mirrors an interface number or a range from 1 to 6. • **traffic-type—**Mirrors traffic type. • **rx—**Mirrors received traffic. • **tx—**Mirrors transmitted traffic. • **both—**Mirrors received and transmitted traffic.
Step 3	**setSpanSrcConf review** **Example:** `Switch(SPAN)# setSpanSrcConf review`	(Optional) Displays the configuration.
Step 4	**setSpanGlobalConf commit** **Example:** `Switch(SPAN)# setSpanSrcConf commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure SPAN on an interface range:

```
Switch # span
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
Switch(SPAN)# setSpanSrcConf commitsetSpanSrcConf setSpanSrcConfRequest source interface
 intf-range 1-2
Switch(SPAN)# setSpanSrcConf commitsetSpanSrcConf setSpanSrcConfRequest source interface
 traffic-type both
Switch(SPAN)# setSpanSrcConf review
Switch(SPAN)# setSpanSrcConf commit
Switch(SPAN)# exit
```

Configuring SPAN Source CPU

Before You Begin

Perform the steps to enable SPAN globally. See Enabling SPAN Globally to Start a Monitoring Session, on page 456.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setSpanSrcConfRequest** {**source** {**cpu** {**rx** | **tx** | **both**} | {**vlan** *vlan-list*} | **interface** {*intf-range* | **traffic-type** {**rx** | **tx** | **both**}} **Example:** `Switch(SPAN)# setSpanSrcConf setSpanSrcConfRequest source cpu both`	Configures SPAN source CPU. • **source**—Mirrors source interface or VLAN. • **cpu**—Mirrors source CPU. • **rx**—Mirrors received traffic. • **tx**—Mirrors transmitted traffic. • **both**—Mirrors received and transmitted traffic. • **vlan**—Mirrors source VLAN. • *vlan-list*—Mirrors source VLAN. • **interface**— Mirrors source interface and traffic type. • *intf-range*—Mirrors an interface number or a range from 1 to 6. • **traffic-type**—Mirrors traffic type. • **rx**—Mirrors received traffic. • **tx**—Mirrors transmitted traffic. • **both**—Mirrors received and transmitted traffic.

	Command or Action	Purpose
Step 2	**setSpanSrcConf review** **Example:** `Switch(SPAN)# setSpanSrcConf review`	(Optional) Displays the configuration.
Step 3	**setSpanGlobalConf commit** **Example:** `Switch(SPAN)# setSpanSrcConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure SPAN on an interface range:

```
Switch # span
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
Switch(SPAN)# setSpanSrcConf setSpanSrcConfRequest source cpu both
Switch(SPAN)# setSpanSrcConf review
Switch(SPAN)# setSpanSrcConf commit
Switch(SPAN)# exit
```

Configuring SPAN Source VLAN

Before You Begin

Perform the steps to enable SPAN globally. See Enabling SPAN Globally to Start a Monitoring Session, on page 456.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setSpanSrcConfRequest** {**source** {**cpu** {**rx** | **tx** | **both**} | {**vlan** *vlan-list*} | **interface** {*intf-range* | **traffic-type** {**rx** | **tx** | **both**}} **Example:** `Switch(SPAN)# setSpanSrcConf setSpanSrcConfRequest source vlan vlan-list`	Configures SPAN source VLAN. • **source**—Mirrors source interface or VLAN. • **cpu**—Mirrors source CPU. • **rx**—Mirrors received traffic. • **tx**—Mirrors transmitted traffic.

	Command or Action	Purpose
		• **both**—Mirrors received and transmitted traffic. • **vlan**—Mirrors source VLAN. • *vlan-list*—Mirrors source VLAN. • **interface**— Mirrors source interface and traffic type. • *intf-range*—Mirrors an interface number or a range from 1 to 6. • **traffic-type**—Mirrors traffic type. • **rx**—Mirrors received traffic. • **tx**—Mirrors transmitted traffic. • **both**—Mirrors received and transmitted traffic.
Step 2	**setSpanSrcConf review** **Example:** `Switch(SPAN)# setSpanSrcConf review`	(Optional) Displays the configuration.
Step 3	**setSpanGlobalConf commit** **Example:** `Switch(SPAN)# setSpanSrcConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure SPAN on an interface range:

```
Switch # span
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
Switch(SPAN)# setSpanSrcConf setSpanSrcConfRequest source vlan vlan-list 100
Switch(SPAN)# setSpanSrcConf review
Switch(SPAN)# setSpanSrcConf commit
Switch(SPAN)# exit
```

Configuring SPAN Destination

Before You Begin

Perform the steps to enable SPAN globally. See Enabling SPAN Globally to Start a Monitoring Session, on page 456.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setSpanDestConfRequest destination intf-id** **Example:** `Switch(SPAN)# setSpanDestConf setSpanDestConfRequest destination intf-id 4`	Configures SPAN destination. • **destination**—Mirrors destination interface. • **intf-id**—Specifies single port ID range from 1 to 6.
Step 2	**setSpanDestConf review** **Example:** `Switch(SPAN)# setSpanDestConf review`	(Optional) Displays the configuration.
Step 3	**setSpanDestConf commit** **Example:** `Switch(SPAN)# setSpanDestConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure SPAN destination:

```
Switch # span
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
Switch(SPAN)# setSpanDestConf setSpanDestConfRequest destination intf-id 4
Switch(SPAN)# setSpanDestConf review
Switch(SPAN)# setSpanDestConf commit
Switch(SPAN)# exit
```

Deleting SPAN Source Configuration

Before You Begin

Perform the steps to enable SPAN globally. See Enabling SPAN Globally to Start a Monitoring Session, on page 456.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**delSpanSrcConfRequest** {**source** {**cpu** {**rx** | **tx** | **both**} | {**vlan** *vlan-list*} | **interface** {*intf-range* | **traffic-type** {**rx** | **tx** | **both**}} **Example:** `Switch(SPAN)# delSpanSrcConf delSpanSrcConfRequest source cpu rx`	Deletes SPAN source configuration. • **source**—Removes mirror of source interface or VLAN. • **cpu**—Removes mirror of source CPU. • **rx**—Removes mirror of received traffic. • **tx**—Removes mirror of transmitted traffic. • **both**—Removes mirror of received and transmitted traffic. • **vlan**—Removes mirror of source VLAN. • *vlan-list*—Removes mirror of source VLAN. • **interface**— Removes mirror of source interface and traffic type. • *intf-range*—Removes mirror of interface number or a range from 1 to 6. • **traffic-type**—Removes mirror of traffic type. • **rx**—Removes mirror of received traffic. • **tx**—Removes mirror of transmitted traffic. • **both**—Removes mirror of received and transmitted traffic.
Step 2	**delSpanSrcConf review** **Example:** `Switch(SPAN)# delSpanSrcConf review`	(Optional) Displays the configuration.
Step 3	**delSpanSrcConf commit** **Example:** `Switch(SPAN)# delSpanSrcConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure SPAN on an interface range:

```
Switch # span
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
Switch(SPAN)# delSpanSrcConf delSpanSrcConfRequest source cpu rx
Switch(SPAN)# delSpanSrcConf review
Switch(SPAN)# delSpanSrcConf commit
Switch(SPAN)# exit
```

Deleting SPAN Destination Configuration

Before You Begin

Perform the steps to enable SPAN globally. See Enabling SPAN Globally to Start a Monitoring Session, on page 456.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**delSpanDestConfRequest destination intf-id** **Example:** `Switch(SPAN)# delSpanDstConf delSpanDstConfRequest detination intf-id 4`	Deletes SPAN destination configuration. • **destination—**Removes mirror of destination interface. • **intf-id—**Specifies single port ID range from 1 to 6.
Step 2	**delSpanDstConf review** **Example:** `Switch(SPAN)# delSpanDstConf review`	(Optional) Displays the configuration.
Step 3	**delSpanDstConf commit** **Example:** `Switch(SPAN)# delSpanDstConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure SPAN destination:

```
Switch # span
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
```

```
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
Switch(SPAN)# delSpanDstConf delSpanDstConfRequest detination intf-id 4
Switch(SPAN)# delSpanDstConf review
Switch(SPAN)# delSpanDstConf commit
Switch(SPAN)# exit
```

Verifying Diagnostics POST

Use the following commands to verify the diagnostics test status.

- **showDiagResults showDiagTestResults**

  The following is a sample output from the command:

```
Switch(Diagnostics)#  showDiagResults showDiagTestResults
Switch(Diagnostics)#  showDiagResults review
```

```
Commands in queue:
                 showDiagResults showDiagTestResults
```

```
Switch(Diagnostics)#  showDiagResults commit
```

```
ShowDiagResults_Output.diagTestResults.testresult[0] = 'External Port
 Loopback Test =>'
ShowDiagResults_Output.diagTestResults.testresult[1] = 'Passed'
ShowDiagResults_Output.diagTestResults.testresult[2] = 'Sync-E
Reference Source Clock Test =>'
ShowDiagResults_Output.diagTestResults.testresult[3] = 'Passed'
ShowDiagResults_Output.diagTestResults.testresult[4] = 'PTP One PPS
Test =>'
ShowDiagResults_Output.diagTestResults.testresult[5] = 'Passed'
 ShowDiagResults Commit Success!!!
```

Additional References

Related Documents

Related Topic	Document Title
Cisco ME 3800x and ME 3600x Switches Software Configuration Guide, Cisco IOS Release 15.4(1)S	http://www.cisco.com/c/en/us/td/docs/switches/metro/me3600x_3800x/software/release/15-4_1_S/configuration/guide/3800x3600xscg.html

MIBs

MIB	MIBs Link
MIBs Supporting Cisco IOS	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

CHAPTER 25

Configuring RSPAN

This document describes the Remote Switched Port Analyzer (RSPAN) feature and configuration steps to implement RSPAN.

Prerequisites for Configuring RSPAN

- You must enable SPAN globally to support the desired SPAN configuration.
- NID must have an IP address.
- You must select a SPAN source from the following options:
    - Interface—one or more source interfaces.
    - VLAN— one or more source VLANs.
    - CPU— to monitor CPU traffic.

Restrictions for Configuring RSPAN

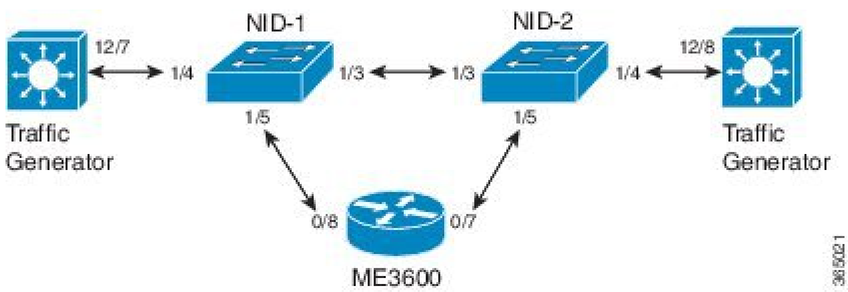
- You cannot configure a port as both a source and destination port.
- VLAN SPAN monitors only the traffic that leaves or enters Layer 2 ports in the VLAN.
- SPAN sources interface and VLAN cannot exit together.

Information About RSPAN

Remote Switched Port Analyzer (RSPAN) is an advanced feature that requires a special VLAN to carry the traffic that is monitored by SPAN between switches. RSPAN is useful when source ports are not located on the same switch as the destination port.

The following figure shows the topology used for provisioning RSPAN on NID 1 and NID 2.

Figure 15: RSPAN Topology



How to Provision RSPAN

Enabling SPAN Globally to Start a Monitoring Session

DETAILED STEPS

	Command or Action	Purpose
Step 1	**span** **Example:** `Switch# span`	Enters the SPAN mode.
Step 2	**setSpanGlobalConfReq** {**enable** | **disbale**} **Example:** `Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable`	Enters SPAN global configuration mode. Sub-command options. • **enable**—Enables SPAN globally. • **disbale**—Disables SPAN globally.
Step 3	**setSpanGlobalConf review** **Example:** `Switch(SPAN)# setSpanGlobalConf review`	(Optional) Displays the configuration.

	Command or Action	Purpose
Step 4	**setSpanGlobalConf commit** **Example:** `Switch(SPAN)# setSpanGlobalConf commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to enable SPAN globally:

```
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
```

Configuring SPAN Source Interface on NID-1

Before You Begin

Perform the steps to enable SPAN globally. See Enabling SPAN Globally to Start a Monitoring Session, on page 456.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setSpanSrcConfRequest** {**source** {**cpu** {**rx** | **tx** | **both**} | {**vlan** *vlan-list*} | **interface** {*intf-range* | **traffic-type** {**rx** | **tx** | **both**}} **Example:** `Switch(SPAN)# setSpanSrcConf commitsetSpanSrcConf setSpanSrcConfRequest source interface intf-range 1/4`	Configures SPAN source interface. • **source**—Mirrors source interface or VLAN. • **cpu**—Mirrors source CPU. • **rx**—Mirrors received traffic. • **tx**—Mirrors transmitted traffic. • **both**—Mirrors received and transmitted traffic. • **vlan**—Mirrors source VLAN. • *vlan-list*—Mirrors source VLAN. • **interface**— Mirrors source interface and traffic type. • *intf-range*—Mirrors an interface number or a range from 1 to 6.

	Command or Action	Purpose
		• **traffic-type**—Mirrors traffic type. • **rx**—Mirrors received traffic. • **tx**—Mirrors transmitted traffic. • **both**—Mirrors received and transmitted traffic.
Step 2	**setSpanSrcConf review** **Example:** `Switch(SPAN)# setSpanSrcConf review`	(Optional) Displays the configuration.
Step 3	**setSpanGlobalConf commit** **Example:** `Switch(SPAN)# setSpanSrcConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure SPAN source on NID-1:

```
Switch(SPAN)# setSpanSrcConf commitsetSpanSrcConf setSpanSrcConfRequest source interface
 intf-range 1/4
Switch(SPAN)# setSpanSrcConf review
Switch(SPAN)# setSpanSrcConf commit
Switch(SPAN)# exit
```

Configuring Destination VLAN on NID-1

Before You Begin

Perform the steps to configure SPAN source on NID-1. See Configuring SPAN Source Interface on NID-1, on page 469.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setrSpandestConf setRSpanDestConfRequest remote** *vlan-id*	Configures destination VLAN. • **remote**—Mirrors remote destination.

	Command or Action	Purpose
	Example: `Switch(SPAN)# setrSpandestConf setRSpanDestConfRequest remote vlan-id`	• *vlan-id*— Remote mirror destination VLAN number.
Step 2	**setrSpandestConf review** **Example:** `Switch(SPAN)# setrSpandestConf review`	(Optional) Displays the configuration.
Step 3	**setrSpandestConf commit** **Example:** `Switch(SPAN)# setrSpandestConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure destination VLAN on NID-1:

```
Switch(SPAN)# setrSpandestConf setRSpanDestConfRequest remote vlan-id 500
Switch(SPAN)# setrSpandestConf review
Switch(SPAN)# setrSpandestConf commit
Switch(SPAN)# exit
```

Configuring Source VLAN on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**span** **Example:** `Switch# span`	Enters the SPAN mode.
Step 2	**setrSpansrcConf setRSpanSrcConfRequest remote** *vlan-id* **Example:** `Switch(SPAN)# setrSpansrcConf setRSpanSrcConfRequest remote vlan-id 500`	Configures RSPAN source. • **remote—**Mirrors remote source. • *vlan-id*— Remote mirror source VLAN number.

	Command or Action	Purpose
Step 3	**setrSpansrcConf review** **Example:** `Switch(SPAN)# setrSpansrcConf review`	(Optional) Displays the configuration.
Step 4	**setrSpansrcConf commit** **Example:** `Switch(SPAN)# setrSpansrcConf commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure source VLAN on NID-2:

```
Switch # span
Switch(SPAN)# setSpanGlobalConf setSpanGlobalConfReq enable
Switch(SPAN)# setSpanGlobalConf review
Switch(SPAN)# setSpanGlobalConf commit
Switch(SPAN)# exit
Switch(SPAN)# setrSpansrcConf setRSpanSrcConfRequest remote vlan-id 500
Switch(SPAN)# setrSpansrcConf review
Switch(SPAN)# setrSpansrcConf commit
Switch(SPAN)# exit
```

Configuring Destination Interface on NID-2

Before You Begin

Perform the steps to configure source VLAN on NID-2. See Configuring Source VLAN on NID-2, on page 471.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setSpanDestConf setSpanDestConfRequest destination** *intf-id* **Example:** `Switch(SPAN)# setSpanDestConf setSpanDestConfRequest destination intf-id 5`	Configures destination interface. • **destination—**Mirrors destination interface. • *intf-id*— Single port ID from 1 to 6.

	Command or Action	Purpose
Step 2	**setSpanDestConf review** **Example:** `Switch(SPAN)# setSpanDestConf review`	(Optional) Displays the configuration.
Step 3	**setSpanDestConf commit** **Example:** `Switch(SPAN)# setSpanDestConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to configure destination VLAN on NID-1:

```
Switch(SPAN)# setSpanDestConf setSpanDestConfRequest destination intf-id 5
Switch(SPAN)# setSpanDestConf review
Switch(SPAN)# setSpanDestConf commit
Switch(SPAN)# exit
```

Deleting RSPAN Source Configuration on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**delRSpanSrcConfRequest remote** *vlan-id* **Example:** `Switch(SPAN)# delRSpanSrcConf delRSpanSrcConfRequest remote vlan-id 500`	Deletes RSPAN source configuration. • **remote—**Removes remote mirror source. • *vlan-id*— Removes remote mirror source VLAN number.
Step 2	**delRSpanSrcConf review** **Example:** `Switch(SPAN)# delRSpanSrcConf review`	(Optional) Displays the configuration.
Step 3	**delRSpanSrcConf commit** **Example:** `Switch(SPAN)# delRSpanSrcConf commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to delete RSPAN source configuration on NID-2:

```
Switch(SPAN)# delRSpanSrcConf delRSpanSrcConfRequest remote vlan-id 500
Switch(SPAN)# delRSpanSrcConf review
Switch(SPAN)# delRSpanSrcConf commit
Switch(SPAN)# exit
```

Deleting RSPAN Destination Configuration on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**delRSpanDstConfRequest remote** *vlan-id* **Example:** `Switch(SPAN)# delRSpanDstConf delRSpanDstConfRequest remote vlan-id 500`	Deletes RSPAN destination configuration. • **remote**—Removes remote mirror destination. • *vlan-id*—Removes remote mirror destination VLAN number.
Step 2	**delSpanDstConf review** **Example:** `Switch(SPAN)# delRSpanDstConf review`	(Optional) Displays the configuration.
Step 3	**delSpanDstConf commit** **Example:** `Switch(SPAN)# delRSpanDstConf commit`	Sends the configuration to NID.
Step 4	**exit** **Example:** `Switch(SPAN)# exit`	Exits the SPAN mode.

Configuration Example

- The example shows how to delete RSPAN destination configuration on NID-1:

```
Switch(SPAN)# delRSpanDstConf delRSpanDstConfRequest remote vlan-id 500
Switch(SPAN)# delRSpanDstConf review
Switch(SPAN)# delRSpanDstConf commit
Switch(SPAN)# exit
```

Verifying RSPAN

Use the following commands to verify the RSPAN status on the Cisco ME 1200 NID.

- **showSpanConfig showSpanConfigReq**

  This command displays the SPAN configuration status on the NID, when source interface is 1/4 and traffic type is both. The following is a sample output from the command:

```
Switch(SPAN)# showSpanConfig showSpanConfigReq
Switch(SPAN)# showSpanConfig review
```

```
Commands in queue:
    showSpanConfig showSpanConfigReq
```

```
Switch(SPAN)# showSpanConfig commit
```

```
ShowSpanConfig_Output.showSpanConfigResp.span_config[0] = 'Session:
1, Mode: Disabled'
ShowSpanConfig_Output.showSpanConfigResp.span_config[1] = 'Type: Remote
 Source Session'
ShowSpanConfig_Output.showSpanConfigResp.span_config[2] = 'Dest RMIRROR
 VLAN: 500'
ShowSpanConfig_Output.showSpanConfigResp.span_config[3] = 'Source
VLAN(s): '
ShowSpanConfig_Output.showSpanConfigResp.span_config[4] = 'Source
port(s): 1/5'
ShowSpanConfig_Output.showSpanConfigResp.span_config[5] = 'Traffic
Type: '
ShowSpanConfig_Output.showSpanConfigResp.span_config[6] = 'rx : 1/5'
ShowSpanConfig_Output.showSpanConfigResp.span_config[7] = 'Destination
 Ports: 1/4'
ShowSpanConfig Commit Success!!!
```

Additional References

Related Documents

Related Topic	Document Title
Cisco ME 3800x and ME 3600x Switches Software Configuration Guide, Cisco IOS Release 15.4(1)S	http://www.cisco.com/c/en/us/td/docs/switches/metro/me3600x_3800x/software/release/15-4_1_S/configuration/guide/3800x3600xscg.html

MIBs

MIB	MIBs Link
MIBs Supporting Cisco IOS	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

CHAPTER 26

Configuring RFC 2544

This document describes the RFC 2544 feature and configuration steps to implement RFC 2544.

Prerequisites for Configuring RFC 2544

- You must disable:
  - Link Layer Discovery Protocol (LLDP) transmit and receive on source port.
  - Loop protection on destination port or Spanning Tree Protocol (STP) on destination and source port.
- You must create:
  - Traffic test loop on destination port.
  - RFC 2544 profile with source port specified.
- There should be no traffic coming in or out of the ports.
- NID must have an IP address.

Restrictions for Configuring RFC 2544

- Ethernet Virtual Circuit (EVC) Maintenance End Points (MEP) is not supported.

•

Information About RFC 2544

RFC 2544 defines a number of tests that can be used to describe the performance characteristics of a network interconnect devices. These tests certify that a Service Level Agreement (SLA) between a customer and a service provider is met.

You can perform RFC 2544 benchmark tests on Carrier Ethernet switch platforms running ME 1200 software without the need for any external test equipment.

The RFC 2544 benchmarking can be run on a Metro Ethernet and offers a variety of diagnosis, such as:

- Throughput—Measures the maximum rate at which none of the offered frames are dropped on the device.
- Back-to-back—Measures the buffering capacity of a device.
- Frame loss—Measures the performance of a network device in an overloaded state.
- Latency—Measures the round-trip time taken by a test frame to travel through a network device or across the network and back to the test port.

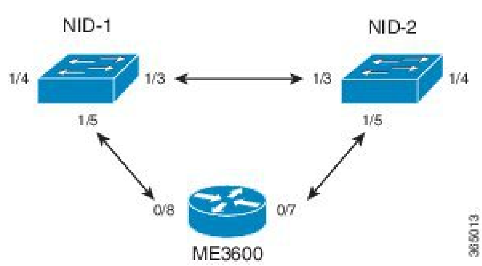
In addition, the ME 1200 software includes a test suite tool that allows creating, saving, and executing test profiles and capturing and reporting results. The Local Node acts as a frame generator and checker.

Note For RFC 2544 to function properly, the Remote Node must support looping of particular frames.

The RFC 2544 benchmarking can be done either on the Port MEP or Virtual Local Area Network (VLAN) MEP.

The following figure shows the topology used for provisioning RFC 2544 on two NIDs.

Figure 16: RFC 2544 Topology



Before executing RFC 2544 test, you must prepare a test profile. The RFC 2544 test profile contains all the parameters associated with one test, where *one test* may be a combination of one or more sub-tests (Throughput, Latency, and Frame Loss, Back-to-Back).

Common and sub-test specific parameters in a test profile are listed below:

- **Common Parameters**
  - Profile Name— Name of each profile. Name can be up to 32 characters. Default name is New profile.

- ◦ Profile Description—A text description up to 128 characters associated with the profile. Default description is blank.
- ◦ MEG Level— Maintenance Entity Group (MEG) level on which the RFC 2544 test is run. Default MEG level is 7.
- ◦ Egress Port—Egress port of the switch on which the RFC 2544 test frames are generated and checked.
- ◦ Sequence Number Check—Checks generated frame sequence number. Default is Disabled.
- ◦ Dwell Time—Number of seconds to wait after each trial for the system to settle before reading statistics from the hardware. Default is 2 seconds.
- ◦ Type—Selects between two types of traffic: Port Down-MEP and VLAN-based Down-MEP. With VLAN-based Down-MEP, a configurable VLAN tag is inserted in the generated test frames.
- ◦ VLAN ID—Specifies the VLAN ID if VLAN-based Down-MEP is configured.
- ◦ PCP—Specifies the PCP value if VLAN-basedDown-MEP is configured.
- ◦ DEI—Specifies the DEI value if VLAN-based Down-MEP is configured.
- ◦ DMAC—Specifies the DMAC of the generated frames for both Port-based and VLAN-based Down-MEP.
- ◦ Frame Size—Specifies the frame size each test must be repeated with, such as 64,128,256,512, 1024,1280,1518,2000, and 9600 bytes. Default frame size is all but 9600.
- ◦ Sub-Tests To Run—Specifies the sub-tests to be run in the profile (Throughput, Latency, Frame Loss, Back-to-Back). Default sub-tests to run is Throughput and Latency.

- **Throughput Test Parameters**
  - ◦ Trial Duration—Duration of a trial run in seconds. Valid range is from 1 to 1800 seconds. Default trial duration is 60 seconds.
  - ◦ Minimum and Maximum Rate—Specifies the maximum and minimum search rates.
  - ◦ Rate Step—Specifies the granularity of search within the minimum and maximum rates define above. All three input parameters are specified in % of the egress port's actual link speed and must be in the range from 1 to 1000% with a granularity of 1%. Default rate step is Minimum: 800% of link speed, Maximum: 1000% of link speed, and Step size: 20% of link speed.
  - ◦ Allowed Frame Loss—Specifies the allowable frame loss. Valid value is in range is from 0 to 100% with a granularity of 1%. Default allowable frame loss is 0.

- **Latency Test Parameters**
  - ◦ Trial Duration—Duration of a trial run in seconds. Valid range is from 10 to 1800 seconds. Default trial duration is 120 seconds.
  - ◦ Delay Measurement Interval—Specifies the number of seconds between each delay measurement. Valid range is from 1 to 60 seconds in steps of 1 second. Default delay measurement interval is 10 seconds.
  - ◦ Allowed Frame Loss—Specifies the pass criterion of an allowable frame loss. Valid range is from 0 to 10% with a granularity of 0.1%. Default allowed frame loss is 0.

- **Frame Loss Test Parameters**
  - Trial Duration—Duration of a trial run in seconds. Valid range is from 1 to 1800 seconds. Default trial duration is 60 seconds.
  - Minimum and Maximum Rate—Specifies the maximum and minimum search rates.
  - Rate Step—Specifies the granularity of search within the minimum and maximum rates define above. All three input parameters must be specified in % of the egress port's actual link speed and must be in the range from 1 to 1000% with a granularity of 1%. Default rate step is Minimum: 800%.
- **Back-to-Back Test Parameters**
  - Trial duration—Specifies the duration of a burst. Valid range is from 100 to 10000 milliseconds. Default trial duration is 2000 milliseconds.
  - Trial Count—Specifies the number of times the trial is executed. Valid range is from 1 to 100. Default trial count is 50. Up to 16 profiles can be created and saved in the switch flash memory.

RFC 2544 Test Report

On executing a RFC 2544 test profile, RFC 2544 test report is generated. The RFC 2544 test report is in clear text format and contains all the input parameters defined by the associated test profile and the measurement results. The RFC 2544 test report can be used to certify if an SLA is met.

The last 10 RFC 2544 test reports are stored in the Flash memory of the ME 1200 NID.

How to Provision RFC 2544

Disabling LLDP Port on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.

Step 2	**setLldpportconfig lldpPortConfiguration** {**lldp-receive-enable** {**disable** | **enable**} | **lldp-transmit-enable** {**disable** | **enable**} | **port-number** *port-number*}
	
	Example:
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration port-number 3`
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-receive-enable disable`
		Sets the Link Layer Discovery Protocol (LLDP) port configuration.
		• **lldp-receive-enable**—Whether LLDP receive is enabled or disabled.
		• **lldp-transmit-enable**—Whether LLDP transmit is enabled or disabled.

	Command or Action	Purpose
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-transmit-enable disable`	• **port-number—**The target interface number. The valid values are from 1 to 6.
Step 3	**setLldpPortConfig review** **Example:** `Switch(ProvisionLldpPortType)# setLldpPortConfig review`	Displays the setLldpPortConfig configuration.
Step 4	**setLldpPortConfig commit** **Example:** `Switch(ProvisionLldpPortType)# setLldpPortConfig commit`	Sends the setLldpConfig configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(ProvisionLldpPortType)# exit`	Exits the Exits ProvisionLldpPortType mode.

Configuration Example

The example shows how to disable LLDP port on NID-1:

```
Switch # ProvisionLldpPortType
Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration port-number 3
Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-receive-enable
 disable
Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-transmit-enable
 disable
Switch(ProvisionLldpPortType)# setLldpPortConfig review
Switch(ProvisionLldpPortType)# setLldpPortConfig commit
Switch(ProvisionLldpPortType)# exit
```

Creating Layer 2 VLANs on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** `Switch# ProvisionLldpPortType`	Enters the ProvisionLldpPortType mode.
Step 2	**createVlanCommand createVlanReq vlan-list** *vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list  2-4095`	Creates the VLAN list. The valid values are from 1 to 4095.

	Command or Action	Purpose
Step 3	**createVlanCommand review** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand review`	Displays the createVlanCommand configuration.
Step 4	**createVlanCommand commit** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand commit`	Sends the createVlanCommand configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionPortVlanPortType mode.

Configuration Example

The example shows how to create Layer 2 VLANs on NID-1:

```
Switch # ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 2-4095
Switch(ProvisionPortVlanPortType)# createVlanCommand review
Switch(ProvisionPortVlanPortType)# createVlanCommand commit
Switch(ProvisionPortVlanPortType)# exit
```

Assigning VLANs to Ports on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**modifySwPort modifySWPortConfig mode access vlan** *vlan-id* **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 3`	Sets the mode to ACCESS, and assigns a VLAN.
Step 3	**modifySwPort modifySWPortConfig mode trunk** {**allowed vlan** {**add** {**all** | **vlan-list** *vlan-list* } | **remove** {**all** | **vlan-list** *vlan-list* }} | {**native vlan** *vlan-list* }	Sets the mode to TRUNK. • **allowed**—Sets the allowed VLAN characteristics when interface is in trunk mode.

	Command or Action	Purpose
	Example: `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list  2-4095`	• **add—**Adds either all VLANs or specified VLANs to the current list. • **remove—**Removes either all VLANs or specified VLANs from the current list. • *vlan-d*—Specifies the VLAN ID. The valid values are from 0 to 4095.
Step 4	**modifySwPort review** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort review`	Displays the modifySwPort configuration.
Step 5	**modifySwPort commit** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort commit`	Sends the modifySwPort configuration to the ME 1200 NID.
Step 6	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionPortVlanPortType mode.

Configuration Example

The example shows how to assign VLANs to ports on NID-1:

```
Switch # ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interaface 3
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan
3
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan
 add vlan-list 2-4095
Switch(ProvisionPortVlanPortType)# modifySwPort review
Switch(ProvisionPortVlanPortType)# modifySwPort commit
Switch(ProvisionPortVlanPortType)# exit
```

Disabling Spanning-Tree Protocol on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.

	Command or Action	Purpose

Step 2	**setStpglobalConfig stpGlobalConfig** {**edge** {**bpdu-filter** | **bpdu-guard**} {**enable** | **disable**} | **mode** {**mstp** | **rstp** | **stp**} {**enable** | **disable**} | **mst** {**forward-time** *Fwdtime* | **instance** *instance* {**active** {**enable** | **disable**} | **priority** *Prio* | **vlan** *WORD*} | **max-age** *Maxage* | **max-hops** *Maxhops* | **name** *Name* | **revision** *Revision* } | **port-number** *Port number* {**enable** | **disable**} | **recovery** *Interval* | **transmit** *hold-count* }
	
	Example:
	`Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig port-number 3 disable`
	
	Note If the spanning-tree mode is STP or RSTP, and if the priority for the software needs to be changed, you can change using mst instance 0 and priority.
		Configures the spanning-tree global configuration.
		• **stpGlobalConfig**—Sets the spanning-tree global configuration.
		• **edge**—Configures the edge ports.
		  ◦ **bpdu-filter**—Enables or disables the BPDU filter (stop BPDU tx/rx).
		  ◦ **bpdu-guard**—Enables or disables the BPDU guard.
		• **mode**—Configures the STP protocol mode.
		  ◦ **mstp**—Enables or disables the Multiple Spanning Tree (802.1s).
		  ◦ **rstp**—Enables or disables the Rapid Spanning Tree (802.1w)
		  ◦ **stp**—Enables or disables the Spanning Tree (802.1D).
		• **mst**—Configures the STP bridge instance.
		  ◦ *Fwdtime*—Forward time. The range is from 4 to 30 seconds.
		  ◦ *instance*—Instance. The range is from 0 to 7 where CIST=0, MST2=1 and so on.
		    ◦ **active**—Enables or disables the instance.
		    ◦ *Prio* —Specifies the priority. The range is from 0 to 61440 seconds. The range should be given in the sets of (0, 4096, 8192...) and so on.
		    ◦ *WORD*—VLAN range.
		  ◦ *Maxage*—Maximum age. The range is from 6 to 40 seconds.
		  ◦ *Maxhops*—Maximum hops. The range is from 6 to 40 hop counts.
		  ◦ *Name*—Name of the bridge. You can use 32 characters to define.
		  ◦ *Revision*—Revision. The range is from 0-65535 revisions.
		• **port-number**—Configures the port number in the range from 1 to 6.
		  ◦ *Port number*—Port number. The range is from 1 to 6.
		  ◦ **disable**—Disables the port-number.
		  ◦ **enable**—Enables the port-number.
		• **recovery**—Configures the error recovery timeout.

	Command or Action	Purpose
		◦ *Interval*—Interval. The range is from 30-86400 seconds. • **transmit—**Configures the BPDUs to transmit. ◦ *hold-count*—Maximum number of transmit BPDUs per second. The range is from 1 to 10 seconds.
Step 3	**setStpGlobalConfig review** **Example:** `Switch(ProvisionStpPortType)# setStpGlobalConfig review`	Displays the setStpGlobalConfig.
Step 4	**setStpGlobalConfig commit** **Example:** `Switch(ProvisionStpPortType)# setStpGlobalConfig commit`	Sends the setStpGlobalConfig configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

The example shows how to disable Spanning-Tree Protocol on NID-1:

```
Switch # ProvisionStpPortType
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig port-number 3 disable
Switch(ProvisionStpPortType)# setStpGlobalConfig review
Switch(ProvisionStpPortType)# setStpGlobalConfig commit
Switch(ProvisionStpPortType)# exit
```

Disabling LLDP Port on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLldpPortType** **Example:** Switch# ProvisionLldpPortType	Enters the ProvisionLldpPortType mode.
Step 2	**setLldpportconfig lldpPortConfiguration** {**lldp-receive-enable** {**disable** | **enable**} | **lldp-transmit-enable** {**disable** | **enable**} | **port-number** *port-number*}	Sets the Link Layer Discovery Protocol (LLDP) port configuration.

	Command or Action	Purpose

	Example:
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration port-number 3`
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-receive-enable disable`
	`Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-transmit-enable disable`
		• **lldp-receive-enable—**Whether LLDP receive is enabled or disabled.
		• **lldp-transmit-enable—**Whether LLDP transmit is enabled or disabled.
		• **port-number—**The target interface number. The valid values are from 1 to 6.

Step 3	**setLldpPortConfig review** **Example:** `Switch(ProvisionLldpPortType)# setLldpPortConfig review`	Displays the setLldpPortConfig configuration.
Step 4	**setLldpPortConfig commit** **Example:** `Switch(ProvisionLldpPortType)# setLldpPortConfig commit`	Sends the setLldpConfig configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(ProvisionLldpPortType)# exit`	Exits the Exits ProvisionLldpPortType mode.

Configuration Example

The example shows how to disable LLDP port on NID-2:

```
Switch # ProvisionLldpPortType
Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration port-number 3
Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-receive-enable
 disable
Switch(ProvisionLldpPortType)# setLldpPortConfig lldpPortConfiguration lldp-transmit-enable
 disable
Switch(ProvisionLldpPortType)# setLldpPortConfig review
Switch(ProvisionLldpPortType)# setLldpPortConfig commit
Switch(ProvisionLldpPortType)# exit
```

Creating Layer 2 VLANs on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.

	Command or Action	Purpose
Step 2	**createVlanCommand createVlanReq vlan-list** *vlan-list* **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list  2-4095`	Creates the VLAN list. The valid values are from 1 to 4095.
Step 3	**createVlanCommand review** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand review`	Displays the createVlanCommand configuration.
Step 4	**createVlanCommand commit** **Example:** `Switch(ProvisionPortVlanPortType)# createVlanCommand commit`	Sends the createVlanCommand configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionLldpPortType mode.

Configuration Example

The example shows how to create Layer 2 VLANs on NID-2:

```
Switch # ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan-list 2-4095
Switch(ProvisionPortVlanPortType)# createVlanCommand review
Switch(ProvisionPortVlanPortType)# createVlanCommand commit
Switch(ProvisionPortVlanPortType)# exit
```

Assigning VLANs to Ports on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionPortVlanPortType** **Example:** `Switch# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 2	**modifySwPort modifySWPortConfig interface** *interface-id* **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interaface 3`	Modifies the switchport configuration on the defined interface.

	Command or Action	Purpose
Step 3	**modifySwPort modifySWPortConfig mode access vlan** *vlan-id* **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 3`	Sets the mode to ACCESS, and assigns a VLAN.
Step 4	**modifySwPort modifySWPortConfig mode trunk** {**allowed vlan** {**add** {**all** | **vlan-list** *vlan-list* } | **remove** {**all** | **vlan-list** *vlan-list* }} | {**native vlan** *vlan-list* } **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list  2-4095`	Sets the mode to TRUNK. • **allowed—**Sets the allowed VLAN characteristics when interface is in trunk mode. • **add—**Adds either all VLANs or specified VLANs to the current list. • **remove—**Removes either all VLANs or specified VLANs from the current list. • *vlan-d*—Specifies the VLAN ID. The valid values are from 0 to 4095.
Step 5	**modifySwPort review** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort review`	Displays the modifySwPort configuration.
Step 6	**modifySwPort commit** **Example:** `Switch(ProvisionPortVlanPortType)# modifySwPort commit`	Sends the modifySwPort configuration to the ME 1200 NID.
Step 7	**exit** **Example:** `Switch(ProvisionPortVlanPortType)# exit`	Exits the ProvisionPortVlanPortType mode.

Configuration Example

The example shows how to assign VLANs to ports on NID-2:

```
Switch # ProvisionPortVlanPortType
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interaface 3
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan
3
Switch(ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan
 add vlan-list 2-4095
Switch(ProvisionPortVlanPortType)# modifySwPort review
Switch(ProvisionPortVlanPortType)# modifySwPort commit
Switch(ProvisionPortVlanPortType)# exit
```

Disabling Spanning-Tree Protocol on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionStpPortType** **Example:** `Switch# ProvisionStpPortType`	Enters the ProvisionStpPortType mode.
Step 2	**setStpglobalConfig stpGlobalConfig** {**edge** {**bpdu-filter** | **bpdu-guard**} {**enable** | **disable**} | **mode** {**mstp** | **rstp** | **stp**} {**enable** | **disable**} | **mst** {**forward-time** *Fwdtime* | **instance** *instance* {**active** {**enable** | **disable**} | **priority** *Prio* | **vlan** *WORD*} | **max-age** *Maxage* | **max-hops** *Maxhops* | **name** *Name* | **revision** *Revision* } | **port-number** *Port number* {**enable** | **disable**} | **recovery** *Interval* | **transmit** *hold-count* } **Example:** `Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig port-number 3 disable` **Note** If the spanning-tree mode is STP or RSTP, and if the priority for the software needs to be changed, you can change using mst instance 0 and priority.	Configures the spanning-tree global configuration. • **stpGlobalConfig**—Sets the spanning-tree global configuration. • **edge**—Configures the edge ports. ◦ **bpdu-filter**—Enables or disables the BPDU filter (stop BPDU tx/rx). ◦ **bpdu-guard**—Enables or disables the BPDU guard. • **mode**—Configures the STP protocol mode. ◦ **mstp**—Enables or disables the Multiple Spanning Tree (802.1s). ◦ **rstp**—Enables or disables the Rapid Spanning Tree (802.1w) ◦ **stp**—Enables or disables the Spanning Tree (802.1D). • **mst**—Configures the STP bridge instance. ◦ *Fwdtime*—Forward time. The range is from 4 to 30 seconds. ◦ *instance*—Instance. The range is from 0 to 7 where CIST=0, MST2=1 and so on. ◦ **active**—Enables or disables the instance. ◦ *Prio* —Specifies the priority. The range is from 0 to 61440 seconds. The range should be given in the sets of (0, 4096, 8192...) and so on. ◦ *WORD*—VLAN range. ◦ *Maxage*—Maximum age. The range is from 6 to 40 seconds. ◦ *Maxhops*—Maximum hops. The range is from 6 to 40 hop counts. ◦ *Name*—Name of the bridge. You can use 32 characters to define. ◦ *Revision*—Revision. The range is from 0-65535 revisions.

	Command or Action	Purpose
		• **port-number**—Configures the port number in the range from 1 to 6. ◦ *Port number*—Port number. The range is from 1 to 6. ◦ **disable**—Disables the port-number. ◦ **enable**—Enables the port-number. • **recovery**—Configures the error recovery timeout. ◦ *Interval*—Interval. The range is from 30-86400 seconds. • **transmit**—Configures the BPDUs to transmit. ◦ *hold-count*—Maximum number of transmit BPDUs per second. The range is from 1 to 10 seconds.
Step 3	**setStpGlobalConfig review** **Example:** `Switch(ProvisionStpPortType)# setStpGlobalConfig review`	Displays the setStpGlobalConfig.
Step 4	**setStpGlobalConfig commit** **Example:** `Switch(ProvisionStpPortType)# setStpGlobalConfig commit`	Sends the setStpGlobalConfig configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(ProvisionStpPortType)# exit`	Exits the ProvisionStpPortType mode.

Configuration Example

The example shows how to disable Spanning-Tree Protocol on NID-2:

```
Switch # ProvisionStpPortType
Switch(ProvisionStpPortType)# setStpGlobalConfig stpGlobalConfig port-number 3 disable
Switch(ProvisionStpPortType)# setStpGlobalConfig review
Switch(ProvisionStpPortType)# setStpGlobalConfig commit
Switch(ProvisionStpPortType)# exit
```

Creating Port MEP Profile on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.

Step 2	**setRfc2544Profile Rfc2544Profile** {**profileName** | **description** | **megLevel** | **egressPort** | **seqNoCheck** {**enable** | **disable**} | **dwellTime** | **mepType** {**portDownMep** | **vlanDownMep**} | **vlanId** | **pcp** | **dei** | **dMac**}
	
	Example:
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile profileName profile1`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile description profile1`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile egressPort 3`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile megLevel 5`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile mepType portDownMep`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile seqNoCheck disable`
		Creates Port MEP profile.
		• **profileName—**Specifies RFC 2544 profile name.
		• **description—**Adds a description to profile.
		Note We recommend that you add a description for the profile.
		• **megLevel—**Sets profile MEG level used in TST PDUs.
		• **egressPort—**Sets the egress interface on which PDUs are transmitted.
		• **seqNoCheck—**Enables sequence number checking of looped TST PDUs.
		◦ **enable—**Enables sequence number.
		◦ **disable—**Disables sequence number.
		• **dwellTime—**Controls the number of seconds that the execution pauses after each trial, before reading counters and status from hardware.
		• **mepType—**Specifies MEP type port. MEP or VLAN MEP.
		◦ **portDownMep—**Creates a port down MEP.
		◦ **vlanDownMep—**Creates a VLAN down MEP. All PDUs are then transmitted with a VLAN tag.
		• **vlanId—**Specifies VLAN ID incase of VLAN down MEP.
		• **pcp—**Specifies PCP value used in the VLAN tag incase of VLAN MEP.
		• **dei—**Specifies DEI value used in the VLAN tag incase vlan mep.
		• **dMac—**Specifies destination MAC address used in generation of the Y.1731 TST and 1DM frames.

	Command or Action	Purpose
Step 3	**setRfc2544Profile review** **Example:** `Switch(RFC2544PortType)# setRfc2544Profile review`	Displays the setRfc2544Profile.
Step 4	**setRfc2544Profile commit** **Example:** `Switch(RFC2544PortType)# setRfc2544Profile commit`	Sends the setRfc2544Profile configuration to the Cisco ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to create Port MEP profile on NID-1:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile profileName profile1
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile description profile1
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile egressPort 3
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile megLevel 5
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile mepType portDownMep
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile seqNoCheck disable
Switch(RFC2544PortType)# setRfc2544Profile review
Switch(RFC2544PortType)# setrfc2544profile commit
Switch(RFC2544PortType)# exit
```

Creating Traffic Test Loop on Destination Port on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType configuration mode.
Step 2	**setTrafficTestLoop trafficTestLoopConfig** {**instNum** | **adminState** {**enable** | **disable**} | **custVID** | **name** | **type** {**macLoop** | **oamLoop**} | **interface** | **direction** {**facility** | **terminal**} | **domain** {**evc** | **port** | **vlan**} | **flowId** | **level**}	Creates traffic test loop on destination port on NID-2. • **instNum—**Specifies the traffic-test-loop instance number. • **adminState—**Specifies the administrative state. ◦ **enable—**Creates a loop if all required resources are available and operational state is up.

	Command or Action	Purpose

	Example:
	`Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig interface 3`
	`Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig type macLoop`
	`Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig direction facility`
	`Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig domain port`
	`Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig adminState enable`
	`Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig instNum 1`
		◦ **disable**—Deletes the loop and operational state is down.
		• **custVID**—Only relevant for OAM-loop in EVC domain. Loops C-tagged customer frames with this specified VID in the EVC.
		• **name**—Specifies the traffic-test-loop name.
		• **type**—Specifies the type of the traffic-test-loop. Currently only MAC loop is supported.
		◦ **macLoop**—All frames in the flow are looped with MAC swap.
		◦ **oamLoop**—Y.1731 OAM aware and is looping the following:
		◦ Loopback Messages (LBM) and Loopback Replies (LBR)
		◦ Delay Measurement Message (DMM) and Delay Measurement Reply (DMR)
		• **interface**—Specifies the residence port of the traffic-test-loop.
		• **direction**—Specifies the direction of the traffic-test-loop.
		◦ **facility**—Specifies that this traffic-test-loop is pointing to the port. Looping is done from ingress to egress.
		◦ **terminal**—Specifies that this traffic-test-loop is pointing to the forwarding plane. Looping is done from egress to ingress.
		Note The **terminal** option is not supported.
		• **domain**—The domain of the traffic-test-loop.
		◦ **evc**—This traffic-test-loop is in the EVC domain.
		◦ **port**—This traffic-test-loop is in the Port domain.
		◦ **vlan**—This traffic-test-loop is in the VLAN domain.
		Note Only **port** domain is supported.
		• **flowld**—Specifies the EVC domain instance ID or VID in VLAN domain.
		• **level**—Specifies the Y.1731 OAM level of the traffic-test-loop. This is relevant only for OAM looping type traffic-test-loop.

	Command or Action	Purpose
Step 3	**setTrafficTestLoop review** **Example:** `Switch(RFC2544PortType)# setTrafficTestLoop review`	Displays the setTrafficTestLoop configuration.
Step 4	**setTrafficTestLoop commit** **Example:** `Switch(RFC2544PortType)# setTrafficTestLoop commit`	Sends the setTrafficTestLoop configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to create traffic test loop on destination port on NID-2:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig interface 3
Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig type macLoop
Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig direction facility
Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig domain port
Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig adminState enable
Switch(RFC2544PortType)# setTrafficTestLoop trafficTestLoopConfig instNum 1
Switch(RFC2544PortType)# setTrafficTestLoop review
Switch(RFC2544PortType)# setTrafficTestLoop commit
Switch(RFC2544PortType)# exit
```

Disabling Loop Protection on Destination Port on NID-2

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType configuration mode.
Step 2	**deleteTrafficTestLoop deleteLoopConfig** {**trafficLoop** *instNum* |**loopPotect** *interface*} **Example:** `Switch(RFC2544PortType)# deleteTrafficTestLoop deleteLoopConfig loopPotect interface 3`	Disables loop protection on destination port on NID-2. • **deleteLoopConfig—**Deletes traffic test loop configuration. • **trafficLoop—**Deletes traffic test loop configuration. ◦ *instNum*—Specifies the traffic-test-loop instance number.

	Command or Action	Purpose
		• **loopPotect—**Deletes loop protection at port level. ◦ *interface*—Specifies the residence port of the traffic-test-loop.
Step 3	**deleteTrafficTestLoop review** **Example:** `Switch(RFC2544PortType)# deleteTrafficTestLoop review`	Displays the deleteTrafficTestLoop configuration.
Step 4	**deleteTrafficTestLoop commit** **Example:** `Switch(RFC2544PortType)# deleteTrafficTestLoop commit`	Sends the deleteTrafficTestLoop configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to disable loop protection on destination port on NID-2:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# deleteTrafficTestLoop deleteLoopConfig loopPotect interface 3
Switch(RFC2544PortType)# deleteTrafficTestLoop review
Switch(RFC2544PortType)# deleteTrafficTestLoop commit
Switch(RFC2544PortType)# exit
```

Setting RFC 2544 Reporting Parameters on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.
Step 2	**setReportParams rfc2544Reports reportAction** {**delete** *reportName* | **save** {*reportName* | *tftpPath*} |	Sets RFC 2544 reporting parameters. • **reportAction—**Specifies action to be performed on the report.

	Command or Action	Purpose

	start {*reportName* | *profileName* | *description*} | **stop** *reportName* | **rename** {*oldName* | *newName*}}
	
	Example:
	`Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start profileName profile1`
	`Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start reportName profile1`
	`Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start description profile1`
		◦ **delete**—Deletes the existing report.
		◦ *reportName*—Specifies name of the report.
		◦ **save**—Saves the existing report.
		◦ *reportName*—Specifies the name of existing report.
		◦ *tftpPath*—Specifies TFTP server URL tftp://server[:port]/path-to-file.
		◦ **start**—Starts profile execution
		◦ *reportName*—Specifies unique name of the resulting report.
		◦ *profileName*—Specifies name of the profile to execute.
		◦ *description*—(Optional) Provides a description of the report.
		Note We recommend that you add a description for the report.
		◦ **stop**—Stops the report.
		◦ *reportName*—Specifies name of the report to be stopped.
		◦ **rename**—Renames the existing report.
		◦ *oldName*—Specifies name of the old profile.
		◦ *newName*—Specifies name of the new profile.

Step 3	**setReportParams review** **Example:** `Switch(RFC2544PortType)# setReportParams review`	Displays the setReportParams configuration.
Step 4	**setReportParams commit** **Example:** `Switch(RFC2544PortType)# setReportParams commit`	Sends the setReportParams configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to set the RFC 2544 reporting parameters on NID-1:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start profileName
profile1
Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start reportName
profile1
Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start description
profile1
Switch(RFC2544PortType)# setReportParams review
Switch(RFC2544PortType)# setReportParams commit
Switch(RFC2544PortType)# exit
```

Displaying RFC 2544 Profile and Report on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.
Step 2	**showRfc2544 showRequest show** {**profiles** | **report**} **Example:** `Switch(RFC2544PortType)# showRfc2544 showRequest show profiles`	Displays RFC 2544 profile. • **show**—Displays profile or report. ◦ **profiles**—Displays profile information. ◦ **report**—Displays report information.
Step 3	**showRfc2544 review** **Example:** `Switch(RFC2544PortType)# showRfc2544 review`	Displays the showRfc2544 configuration.
Step 4	**showRfc2544 commit** **Example:** `Switch(RFC2544PortType)# showRfc2544 commit`	Sends the setRfc2544Profile configuration to the ME 1200 NID.
Step 5	**showRfc2544 showRequest show** {**profiles** | **report**} **Example:** `Switch(RFC2544PortType)# showRfc2544 showRequest show report`	Displays RFC 2544 profile. • **show**—Displays profile or report. ◦ **profiles**—Displays profile information. ◦ **report**—Displays report information.

	Command or Action	Purpose
Step 6	**showRfc2544 review** **Example:** `Switch(RFC2544PortType)# showRfc2544 review`	Displays the showRfc2544 configuration.
Step 7	**showRfc2544 commit** **Example:** `Switch(RFC2544PortType)# showRfc2544 commit`	Sends the setRfc2544Profile configuration to the ME 1200 NID.
Step 8	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to display RFC 2544 profile and report on NID-1:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# showRfc2544 showRequest show profiles
Switch(RFC2544PortType)# showRfc2544 review
Switch(RFC2544PortType)# showRfc2544 commit
```

```
ShowRfc2544_Output.showResponse.t = 1
ShowRfc2544_Output.showResponse.u.profile[0].profileName = 'profile1'
ShowRfc2544_Output.showResponse.u.profile[0].description = 'profile1'

 ShowRfc2544 Commit Success!!!
```

```
Switch# RFC2544PortType
Switch(RFC2544PortType)# showRfc2544 showRequest show report
Switch(RFC2544PortType)# showRfc2544 review
Switch(RFC2544PortType)# showRfc2544 commit
```

```
ShowRfc2544_Output.showResponse.t = 2
ShowRfc2544_Output.showResponse.u.report[0].reportName = 'Report1'
ShowRfc2544_Output.showResponse.u.report[0].created =
'1970-01-04T07:29:25+00:00'
ShowRfc2544_Output.showResponse.u.report[0].status = 'Succeeded'
ShowRfc2544_Output.showResponse.u.report[1].reportName = 'Rep15'
ShowRfc2544_Output.showResponse.u.report[1].created =
'1970-01-02T01:57:34+00:00'
ShowRfc2544_Output.showResponse.u.report[1].status = 'Failed'
ShowRfc2544_Output.showResponse.u.report[2].reportName = 'Rep16'
ShowRfc2544_Output.showResponse.u.report[2].created =
'1970-01-02T02:08:12+00:00'
ShowRfc2544_Output.showResponse.u.report[2].status = 'Succeeded'
ShowRfc2544_Output.showResponse.u.report[3].reportName = 'profile1'
ShowRfc2544_Output.showResponse.u.report[3].created =
'1970-01-02T03:48:16+00:00'
ShowRfc2544_Output.showResponse.u.report[3].status = 'Failed'
```

```
ShowRfc2544 Commit Success!!!
```

Switch(RFC2544PortType)# exit

Creating VLAN Profile on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.

Step 2	**setRfc2544Profile Rfc2544Profile** {**profileName** | **description** | **megLevel** | **egressPort** | **seqNoCheck** {**enable** | **disable**} | **dwellTime** | **mepType** {**portDownMep** | **vlanDownMep**} | **vlanId** | **pcp** | **dei** | **dMac**}
	
	Example:
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile profileName vlan-profile`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile egressPort 3`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile mepType vlanDownMep`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile vlanId 999`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile megLevel 4`
	`Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile description vlanprofile`
		Creates RFC profile.
		• **profileName**—Specifies RFC 2544 profile name.
		• **description**—Adds a description to profile.
		Note We recommend that you add a description for the profile.
		• **megLevel**—Sets profile MEG level used in TST PDUs.
		• **egressPort**—Sets the egress interface on which PDUs are transmitted.
		• **seqNoCheck**—Enables sequence number checking of looped TST PDUs.
		◦ **enable**—Enables sequence number.
		◦ **disable**—Disables sequence number.
		• **dwellTime**—Controls the number of seconds that the execution pauses after each trial, before reading counters and status from hardware.
		• **mepType**—Specifies MEP type port. MEP or VLAN MEP.
		◦ **portDownMep**—Creates a port down MEP.
		◦ **vlanDownMep**—Creates a VLAN down MEP. All PDUs are then transmitted with a VLAN tag.
		• **vlanId**—Specifies VLAN ID incase of VLAN down MEP.
		• **pcp**—Specifies PCP value used in the VLAN tag incase of VLAN MEP.
		• **dei**—Specifies DEI value used in the VLAN tag incase vlan mep.

	Command or Action	Purpose
		• **dMac—**Specifies destination MAC address used in generation of the Y.1731 TST and 1DM frames.
Step 3	**setRfc2544Profile review** **Example:** `Switch(RFC2544PortType)# setRfc2544Profile review`	Displays the setRfc2544Profile.
Step 4	**setRfc2544Profile commit** **Example:** `Switch(RFC2544PortType)# setRfc2544Profile commit`	Sends the setRfc2544Profile configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to create VLAN profile on NID-1:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile profileName vlan-profile
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile egressPort 3
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile mepType vlanDownMep
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile vlanId 999
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile megLevel 4
Switch(RFC2544PortType)# setRfc2544Profile Rfc2544Profile description vlanprofile
Switch(RFC2544PortType)# setRfc2544Profile review
Switch(RFC2544PortType)# setrfc2544profile commit
Switch(RFC2544PortType)# exit
```

Getting RFC 2544 Profile for VLAN on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.
Step 2	**getRfc2544Profile rfc2544Request profileName** *profileName*	Gets the RFC 2544 profile. • **rfc2544Request—**Specifies RFC2544 request parameter.

	Command or Action	Purpose
	Example: `Switch(RFC2544PortType)# getRfc2544Profile rfc2544Request profileName vlan-profile`	• **profileName—**Specifies name of the profile.
Step 3	**getRfc2544Profile review** **Example:** `Switch(RFC2544PortType)# getRfc2544Profile review`	Displays the getRfc2544Profile configuration.
Step 4	**getRfc2544Profile commit** **Example:** `Switch(RFC2544PortType)# getRfc2544Profile commit`	Sends the getRfc2544Profile configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to get RFC 2544 profile for VLAN on NID-1:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# getRfc2544Profile rfc2544Request profileName vlan-profile
Switch(RFC2544PortType)# getRfc2544Profile review
Switch(RFC2544PortType)# getRfc2544Profile commit
```

```
GetRfc2544Profile-Output.Rfc2544Profile.profileName = 'vlan-profile'
GetRfc2544Profile-Output.Rfc2544Profile.description = 'vlanprofile'
GetRfc2544Profile-Output.Rfc2544Profile.megLevel = 4
GetRfc2544Profile-Output.Rfc2544Profile.egressPort = 3
GetRfc2544Profile-Output.Rfc2544Profile.seqNoCheck.t = 2
GetRfc2544Profile-Output.Rfc2544Profile.seqNoCheck.u.disable = ''
GetRfc2544Profile-Output.Rfc2544Profile.dwellTime = 2
GetRfc2544Profile-Output.Rfc2544Profile.mepType.t = 2
GetRfc2544Profile-Output.Rfc2544Profile.mepType.u.vlanDownMep = ''
GetRfc2544Profile-Output.Rfc2544Profile.vlanId = 999
GetRfc2544Profile-Output.Rfc2544Profile.pcp = 0
GetRfc2544Profile-Output.Rfc2544Profile.dei = 0
GetRfc2544Profile-Output.Rfc2544Profile.dMac = '00-00-00-00-00-01'


 GetRfc2544Profile Commit Success!!!
```

```
Switch(RFC2544PortType)# exit
```

Setting RFC 2544 Reporting Parameters for VLAN on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.

Step 2	**setReportParams rfc2544Reports reportAction** {**delete** *reportName* | **save** {*reportName* | *tftpPath*} | **start** {*reportName* | *profileName* | *description*} | **stop** *reportName* | **rename** {*oldName* | *newName*}}
	
	Example:
	`Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start profileName vlan-profile`
	`Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start reportName vlan-profile`
	`Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start description vlan-profile`
		Sets RFC 2544 reporting parameters.
		• **reportAction**—Specifies action to be performed on the report.
		◦ **delete**—Deletes the existing report.
		◦ *reportName*—Specifies name of the report.
		◦ **save**—Saves the existing report.
		◦ *reportName*—Specifies the name of existing report.
		◦ *tftpPath*—Specifies TFTP server URL tftp://*server[:port]/path-to-file*.
		◦ **start**—Starts profile execution
		◦ *reportName*—Specifies unique name of the resulting report.
		◦ *profileName*—Specifies name of the profile to execute.
		◦ *description*—(Optional) Provides a description of the report.
		Note We recommend that you add a description for the report.
		◦ **stop**—Stops the report.
		◦ *reportName*—Specifies name of the report to be stopped.
		◦ **rename**—Renames the existing report.
		◦ *oldName*—Specifies name of the old profile.
		◦ *newName*—Specifies name of the new profile.

	Command or Action	Purpose
Step 3	**setReportParams review** **Example:** `Switch(RFC2544PortType)# setReportParams review`	Displays the setReportParams configuration.
Step 4	**setReportParams commit** **Example:** `Switch(RFC2544PortType)# setReportParams commit`	Sends the setReportParams configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to set the RFC 2544 reporting parameters for VLAN on NID-1:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start profileName
vlan-profile
Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start reportName
vlan-profile
Switch(RFC2544PortType)# setReportParams rfc2544Reports reportAction start description
vlan-profile
Switch(RFC2544PortType)# setReportParams review
Switch(RFC2544PortType)# setReportParams commit
Switch(RFC2544PortType)# exit
```

Displaying RFC 2544 Report for VLAN on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.
Step 2	**showRfc2544 showRequest show** {**profiles** | **report**} **Example:** `Switch(RFC2544PortType)# showRfc2544 showRequest show profiles`	Displays RFC 2544 profile. • **show—**Displays profile or report. ◦ **profiles—**Displays profile information. ◦ **report—**Displays report information.

	Command or Action	Purpose
Step 3	**showRfc2544 review** **Example:** `Switch(RFC2544PortType)# showRfc2544 review`	Displays the showRfc2544 configuration.
Step 4	**showRfc2544 commit** **Example:** `Switch(RFC2544PortType)# showRfc2544 commit`	Sends the setRfc2544Profile configuration to the ME 1200 NID.
Step 5	**showRfc2544 showRequest show** {**profiles** | **report**} **Example:** `Switch(RFC2544PortType)# showRfc2544 showRequest show report`	Displays RFC 2544 profile. • **show**—Displays profile or report. ◦ **profiles**—Displays profile information. ◦ **report**—Displays report information.
Step 6	**showRfc2544 review** **Example:** `Switch(RFC2544PortType)# showRfc2544 review`	Displays the showRfc2544 configuration.
Step 7	**showRfc2544 commit** **Example:** `Switch(RFC2544PortType)# showRfc2544 commit`	Sends the setRfc2544Profile configuration to the ME 1200 NID.
Step 8	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to display RFC 2544 report for VLAN on NID-1:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# showRfc2544 showRequest show report
Switch(RFC2544PortType)# showRfc2544 review
Switch(RFC2544PortType)# showRfc2544 commit
```

```
ShowRfc2544_Output.showResponse.t = 2
ShowRfc2544_Output.showResponse.u.report[0].reportName = 'Report1'
ShowRfc2544_Output.showResponse.u.report[0].created =
'1970-01-04T07:29:25+00:00'
ShowRfc2544_Output.showResponse.u.report[0].status = 'Succeeded'
ShowRfc2544_Output.showResponse.u.report[1].reportName = 'Rep15'
ShowRfc2544_Output.showResponse.u.report[1].created =
'1970-01-02T01:57:34+00:00'
ShowRfc2544_Output.showResponse.u.report[1].status = 'Failed'
ShowRfc2544_Output.showResponse.u.report[2].reportName = 'Rep16'
```

```
ShowRfc2544_Output.showResponse.u.report[2].created =
'1970-01-02T02:08:12+00:00'
ShowRfc2544_Output.showResponse.u.report[2].status = 'Succeeded'
ShowRfc2544_Output.showResponse.u.report[3].reportName = 'profile1'
ShowRfc2544_Output.showResponse.u.report[3].created =
'1970-01-02T03:48:16+00:00'
ShowRfc2544_Output.showResponse.u.report[3].status = 'Failed'

 ShowRfc2544 Commit Success!!!
```

```
Switch(RFC2544PortType)# exit
```

Deleting RFC 2544 Profile on NID-1

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.
Step 2	**deleterfc2544 rfc2544DeleteConfig** {**profileName** *profileName* | **delete** {**btob** | **dMAC** | **description** | **dwellTime** | **frameLoss** | **frameSizes** | **ifc** | **latency** | **megLevel** | **rfc2544** | **throughput** | **vid**}} **Example:** `Switch(RFC2544PortType)# deleteRfc2544 rfc2544DeleteConfig profileName profile1`	Deletes RFC profile. • **profileName—**Specifies RFC 2544 profile name. • *profileName*—Name of the RFC 2544 profile . • **delete—**Deletes the specific attributes of the profile. • **btob—**Removes back-to-back test. • **dMAC—**Removes destination MAC. • **description—**Removes description. • **dwellTime—**Removes dwell time. • **frameLoss—**Removes frame loss test. • **frameSizes—**Removes frame sizes. • **ifc—**Removes IFC. • **latency—**Removes latency test. • **megLevel—**Removes MEG level. • **rfc2544—**Removes RFC 2544 profile. • **throughput—**Removes throughput test. • **vid—**Removes version ID (VID).

	Command or Action	Purpose
Step 3	**deleteRfc2544 review** **Example:** `Switch(RFC2544PortType)# deleteRfc2544 review`	Displays the deleteRfc2544 configuration.
Step 4	**deleteRfc2544 commit** **Example:** `Switch(RFC2544PortType)# deleteRfc2544 commit`	Sends the deleteRfc2544 configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to delete RFC 2544 profile on NID-1:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# deleteRfc2544 rfc2544DeleteConfig profileName profile1
Switch(RFC2544PortType)# deleteRfc2544 review
Switch(RFC2544PortType)# deleteRfc2544 commit
Switch(RFC2544PortType)# exit
```

Modifying RFC 2544 with Frameloss and Backtoback

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.
Step 2	**SetRfc2544TestToRun testParameters** {**profileName** *profileName* | **frameSizes** | **testToRun** {**throughput** | **latency** | **frameLoss** | **backToBack**} | **thoughputTParams** {**trialDuration** | **minRate** | **maxRate** | **accuracy** | **allowedFrameLoss**} | **latencyTParams** {**trialDuration** | **delayMessInterval** | **allowedFrameLoss**} | **frameLossTParams** {**trialDuration** | **minRate** | **maxRate** | **rateStep**} | **backToBackTParams** {**trialDuration** | **trialCount**}}	Modifies RFC 2544 with Frameloss and Backtoback. • **testParameters—**Specifies RFC 2544 test parameters. • **profileName—**Specifies RFC 2544 profile name. • *profileName*—Name of the RFC 2544 profile. • **frameSizes—**Specifies frame sizes separated by a comma, for example, 1024,128,1280,1518, 2000, 256, 512, 64, 9600. • **testToRun—**Test to be run. ◦ **throughput—**Enables throughput test and optionally set its parameters.

	Command or Action	Purpose

	Example:
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters profileName vlan-profile`
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters backToBackTParams trialCount 2`
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters frameLossTParams minRate 100`
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters frameLossTParams maxRate 200`
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters frameLossTParams rateStep 10`
		◦ **latency—**Enables latency test and optionally set its parameters.
		◦ **frameLoss—**Enables frame-loss test and optionally set its parameters.
		◦ **backToBack—**Enables back-to-back test and optionally set its parameters.
		• **thoughputTParams—**Specifies throughput test parameters.
		◦ **trialDuration—**Sets the duration of one trial.
		◦ **minRate—**Sets the minimum rate.
		◦ **maxRate—**Sets the maximum rate.
		◦ **accuracy—**Sets the accuracy (stop criterion).
		◦ **allowedFrameLoss—**Sets the maximum allowed test protocol data unit (PDU) loss at which the test is considered successful.
		• **latencyTParams—**Specifies latency test parameters.
		◦ **trialDuration—**Sets the duration of one trial.
		◦ **delayMessInterval—**Specifies interval between sending delay measurement frames.
		◦ **allowedFrameLoss—**Sets the maximum allowed test PDU loss at which the test is considered successful.
		• **frameLossTParams—**Specifies frame loss test parameters.
		◦ **trialDuration—**Sets the duration of one trial.
		◦ **minRate—** Sets the minimum rate.
		◦ **maxRate—** Sets the maximum rate.
		◦ **rateStep—**Sets the step rate.
		• **backToBackTParams—**Specifies back to back test parameters.
		◦ **trialDuration—**Specifies the time (in milliseconds) to transmit a burst of Y.1731 test frames at line rate and frame size.
		◦ **trialCount—**Specifies the number of times to repeat the burst.

	Command or Action	Purpose
Step 3	**SetRfc2544TestToRun review** **Example:** `Switch(RFC2544PortType)# SetRfc2544TestToRun review`	Displays the SetRfc2544TestToRun configuration.
Step 4	**SetRfc2544TestToRun commit** **Example:** `Switch(RFC2544PortType)# SetRfc2544TestToRun commit`	Sends the SetRfc2544TestToRun configuration to the ME 1200 NID.

Step 5	**SetRfc2544TestToRun testParameters** {**profileName** *profileName* | **frameSizes** | **testToRun** {**throughput** | **latency** | **frameLoss** | **backToBack**} | **thoughputTParams** {**trialDuration** | **minRate** | **maxRate** | **accuracy** | **allowedFrameLoss**} | **latencyTParams** {**trialDuration** | **delayMessInterval** | **allowedFrameLoss**} | **frameLossTParams** {**trialDuration** | **minRate** | **maxRate** | **rateStep**} | **backToBackTParams** {**trialDuration** | **trialCount**}}
	
	Example:
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters testToRun backToBack enable`
	
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters testToRun frameLoss enable`
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters testToRun latency disable`
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters testToRun throughput disable`
	
	`Switch(RFC2544PortType)# setRfc2544TestToRun testParameters profileName vlan-profile`
		Modifies RFC 2544 with Frameloss and Backtoback.
		• **testParameters—**Specifies RFC 2544 test parameters.
		• **profileName—**Specifies RFC 2544 profile name.
		• *profileName*—Name of the RFC 2544 profile.
		• **frameSizes—**Specifies frame sizes separated by a comma, for example, 1024,128,1280,1518, 2000, 256, 512, 64, 9600.
		• **testToRun—**Test to be run.
		  ◦ **throughput—**Enables throughput test and optionally set its parameters.
		  ◦ **latency—**Enables latency test and optionally set its parameters.
		  ◦ **frameLoss—**Enables frame-loss test and optionally set its parameters.
		  ◦ **backToBack—**Enables back-to-back test and optionally set its parameters.
		• **thoughputTParams—**Specifies throughput test parameters.
		  ◦ **trialDuration—**Sets the duration of one trial.
		  ◦ **minRate—**Sets the minimum rate.
		  ◦ **maxRate—**Sets the maximum rate.
		  ◦ **accuracy—**Sets the accuracy (stop criterion).
		  ◦ **allowedFrameLoss—**Sets the maximum allowed test protocol data unit (PDU) loss at which the test is considered successful.
		• **latencyTParams—**Specifies latency test parameters.
		  ◦ **trialDuration—**Sets the duration of one trial.

	Command or Action	Purpose
		◦ **delayMessInterval—**Specifies interval between sending delay measurement frames. ◦ **allowedFrameLoss—**Sets the maximum allowed test PDU loss at which the test is considered successful. • **frameLossTParams—**Specifies frame loss test parameters. ◦ **trialDuration—**Sets the duration of one trial. ◦ **minRate—** Sets the minimum rate. ◦ **maxRate—** Sets the maximum rate. ◦ **rateStep—**Sets the step rate. • **backToBackTParams—**Specifies back to back test parameters. ◦ **trialDuration—**Specifies the time (in milliseconds) to transmit a burst of Y.1731 test frames at line rate and frame size. ◦ **trialCount—**Specifies the number of times to repeat the burst.
Step 6	**SetRfc2544TestToRun review** **Example:** `Switch(RFC2544PortType)# SetRfc2544TestToRun review`	Displays the SetRfc2544TestToRun configuration.
Step 7	**SetRfc2544TestToRun commit** **Example:** `Switch(RFC2544PortType)# SetRfc2544TestToRun commit`	Sends the SetRfc2544TestToRun configuration to the ME 1200 NID.
Step 8	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to modify and enable RFC 2544 with Frameloss and Backtoback:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# setRfc2544TestToRun testParameters profileName vlan-profile
Switch(RFC2544PortType)# setRfc2544TestToRun testParameters backToBackTParams trialCount 2

Switch(RFC2544PortType)# setRfc2544TestToRun testParameters frameLossTParams minRate 100
Switch(RFC2544PortType)# setRfc2544TestToRun testParameters frameLossTParams maxRate 200
Switch(RFC2544PortType)# setRfc2544TestToRun testParameters frameLossTParams rateStep 10
```

```
Switch(RFC2544PortType)# setRfc2544TestToRun review
Switch(RFC2544PortType)# setRfc2544TestToRun commit

Switch(RFC2544PortType)# setRfc2544TestToRun testParameters testToRun backToBack enable
Switch(RFC2544PortType)# setRfc2544TestToRun testParameters testToRun frameLoss enable
Switch(RFC2544PortType)# setRfc2544TestToRun testParameters testToRun latency disable
Switch(RFC2544PortType)# setRfc2544TestToRun testParameters testToRun throughput disable
Switch(RFC2544PortType)# setRfc2544TestToRun testParameters profileName vlan-profile
Switch(RFC2544PortType)# setRfc2544TestToRun review
Switch(RFC2544PortType)# setRfc2544TestToRun commit

Switch(RFC2544PortType)# exit
```

Getting RFC 2544 Profile after Modifying Frameloss and Backtoback

DETAILED STEPS

	Command or Action	Purpose
Step 1	**RFC2544PortType** **Example:** `Switch# RFC2544PortType`	Enters the RFC2544PortType mode.
Step 2	**getRfc2544TestToRun rfc2544Request profileName** *profileName* **Example:** `Switch(RFC2544PortType)# getRfc2544TestToRun rfc2544Request profileName vlan-profile`	Gets the RFC 2544 profile. • **rfc2544Request—**Specifies RFC2544 request parameter. • **profileName—**Specifies name of the profile.
Step 3	**getRfc2544TestToRun review** **Example:** `Switch(RFC2544PortType)# getRfc2544TestToRun review`	Displays the getRfc2544Profile configuration.
Step 4	**getRfc2544TestToRun commit** **Example:** `Switch(RFC2544PortType)# getRfc2544TestToRun commit`	Sends the getRfc2544Profile configuration to the ME 1200 NID.
Step 5	**exit** **Example:** `Switch(RFC2544PortType)# exit`	Exits the RFC2544PortType mode.

Configuration Example

The example shows how to get RFC 2544 Profile after modifying frameloss and backtoback:

```
Switch # RFC2544PortType
Switch(RFC2544PortType)# getRfc2544TestToRun rfc2544Request profileName vlan-profile
Switch(RFC2544PortType)# getRfc2544TestToRun review
Switch(RFC2544PortType)# getRfc2544TestToRun commit
```

```
GetRfc2544TestToRun_Output.testParameters.profileName = 'vlan-profile'
GetRfc2544TestToRun_Output.testParameters.frameSizes =
'64-128-256-512-1024-1280-1518-2000'
GetRfc2544TestToRun_Output.testParameters.testToRun.throughput = false
GetRfc2544TestToRun_Output.testParameters.testToRun.latency = false
GetRfc2544TestToRun_Output.testParameters.testToRun.frameLoss = true
GetRfc2544TestToRun_Output.testParameters.testToRun.backToBack = true
GetRfc2544TestToRun_Output.testParameters.thoughputTParams.trialDuration
 = 60
GetRfc2544TestToRun_Output.testParameters.thoughputTParams.minRate = 800
GetRfc2544TestToRun_Output.testParameters.thoughputTParams.maxRate = 1000
GetRfc2544TestToRun_Output.testParameters.thoughputTParams.accuracy = 2
GetRfc2544TestToRun_Output.testParameters.thoughputTParams.allowedFrameLoss
 = 0
GetRfc2544TestToRun_Output.testParameters.latencyTParams.trialDuration =
 120
GetRfc2544TestToRun_Output.testParameters.latencyTParams.delayMessInterval
 = 10
GetRfc2544TestToRun_Output.testParameters.latencyTParams.allowedFrameLoss
 = 0
GetRfc2544TestToRun_Output.testParameters.frameLossTParams.trialDuration
 = 60
GetRfc2544TestToRun_Output.testParameters.frameLossTParams.minRate = 800
GetRfc2544TestToRun_Output.testParameters.frameLossTParams.maxRate = 1000
GetRfc2544TestToRun_Output.testParameters.frameLossTParams.rateStep = 5
GetRfc2544TestToRun_Output.testParameters.backToBackTParams.trialDuration
 = 2000
GetRfc2544TestToRun_Output.testParameters.backToBackTParams.trialCount =
 50

 GetRfc2544TestToRun Commit Success!!!
```

```
Switch(RFC2544PortType)# exit
```

Verifying RFC 2544

Use the following commands to verify the RFC 2544 status on the ME 1200 NID.

- **showRfc2544 com**

  This command displays the RFC 2544 report. The following is a sample output from the command:

```
Switch(SPAN)# showRfc2544 com
Switch(SPAN)# showRfc2544 com review
```

```
Commands in queue:
     showRfc2544 com
```

```
Switch(SPAN)# showSpanConfig commit
```

```
ShowRfc2544_Output.showResponse.t = 2
ShowRfc2544_Output.showResponse.u.report[0].reportName = 'Jul3'
ShowRfc2544_Output.showResponse.u.report[0].created =
'1970-01-04T01:02:24+00:00'
ShowRfc2544_Output.showResponse.u.report[0].status = 'Failed'
ShowRfc2544_Output.showResponse.u.report[1].reportName = 'July3'
ShowRfc2544_Output.showResponse.u.report[1].created =
'1970-01-04T01:15:37+00:00'
```

```
ShowRfc2544_Output.showResponse.u.report[1].status = 'Failed'
ShowRfc2544_Output.showResponse.u.report[2].reportName = 'repjuly3'
ShowRfc2544_Output.showResponse.u.report[2].created =
'1970-01-04T01:52:07+00:00'
ShowRfc2544_Output.showResponse.u.report[2].status = 'Succeeded'
ShowRfc2544_Output.showResponse.u.report[3].reportName = 'Report1'
ShowRfc2544_Output.showResponse.u.report[3].created =
'1970-01-04T07:29:25+00:00'
ShowRfc2544_Output.showResponse.u.report[3].status = 'Succeeded'
ShowRfc2544_Output.showResponse.u.report[4].reportName = 'rep-vlan'
ShowRfc2544_Output.showResponse.u.report[4].created =
'1970-01-04T21:01:59+00:00'
ShowRfc2544_Output.showResponse.u.report[4].status = 'Failed'
ShowRfc2544_Output.showResponse.u.report[5].reportName = 'Report20'
ShowRfc2544_Output.showResponse.u.report[5].created =
'1970-01-01T08:15:17+00:00'
ShowRfc2544_Output.showResponse.u.report[5].status = 'Failed'
ShowRfc2544_Output.showResponse.u.report[6].reportName = 'Rep22'
ShowRfc2544_Output.showResponse.u.report[6].created =
'1970-01-01T09:36:14+00:00'
ShowRfc2544_Output.showResponse.u.report[6].status = 'Failed'
ShowRfc2544_Output.showResponse.u.report[7].reportName = 'profile2'
ShowRfc2544_Output.showResponse.u.report[7].created =
'1970-01-02T00:55:43+00:00'
ShowRfc2544_Output.showResponse.u.report[7].status = 'Failed'

ShowRfc2544 Commit Success!!!
```

Additional References

Related Documents

Related Topic	Document Title
Cisco ME 3800x and ME 3600x Switches Software Configuration Guide, Cisco IOS Release 15.4(1)S	http://www.cisco.com/c/en/us/td/docs/switches/metro/me3600x_3800x/software/release/15-4_1_S/configuration/guide/3800x3600xscg.html

MIBs

MIB	MIBs Link
MIBs Supporting Cisco IOS	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

CHAPTER 27

Configuring sFlow

This document describes the sampled flow (sFlow) feature and configuration steps to implement sFlow.

Prerequisites for Configuring sFlow

- You must enable sFlow on an interface on Cisco ME 1200 NID.
- NID must have an IP address.

Restrictions for Configuring sFlow

- ME 1200 NID does not support configuring more than one sFlow instance with maximum sample rate on the specified data source, either in the ingress or egress direction.

Information About sFlow

Using sFlow, a standards-based protocol mechanism, allows you to monitor Layer 2 traffic in data networks that contain switches and routers. It consists of :

- **sFlow Agent** (embedded on ME 1200 NID)—The sFlow Agent uses sampling technology to capture traffic statistics from the monitored device and then forwards the sampled data to a central sFlow Collector for analysis. Packet sampling is done using one or more sFlow instances, each configured with a sampling rate.

- ◦ sFlow Instances—There may be one or more sFlow Instances associated with a single data source. Each sFlow instance operates independently of other sFlow instances. For example, Packet Flow Sampling instances have their own sampling rates and Counter Sampling instances have their own sampling intervals.

- **sFlow Collector—**The sFlow Collector is a software application that can receive sFlow datagrams and present a view of traffic and other network parameters which are output as type, length, and value (TLV) in the datagrams. The sFlow collectors can also read and configure sFlow-managed objects. Both counter and packet flow statistics are collected and sent as sFlow Datagrams (defined by maximum datagram size of 200-1468) to a sFlow Collector.
    - ◦ sFlow Datagram—The sFlow Datagram format specifies a standard format for the sFlow Agent to send sampled data to a remote sFlow Collector. The sFlow Datagram version 5 is supported.

      The format of the sFlow Datagram is specified using the External Data Representation (XDR) standard. This makes it simpler for the sFlow Agent to encode and the sFlow Collector to decode.

      Samples are sent as User Datagram Protocol (UDP) packets to the host and port specified in the SFLOW MIB or CLI. The assigned port for sFlow (and the default specified in the SFLOW MIB) is port 6343. All sFlow Agents and applications by default must use UDP port 6343.

By default, sFlow is disabled on ME 1200 NID. You can enable sFlow on a specific interface or port.

How to Provision sFlow

Enabling sFlow Globally

DETAILED STEPS

	Command or Action	Purpose
Step 1	**sflow** **Example:** `Switch# sflow`	Enters the sFlow mode.

Step 2	**sFlow-global** {**agent-ip** {**ipv4** | **ipv6**} | **collector-ip** {**ipv4** | **ipv6**} | **collector-port** | **datagram-maxsize** | **rx-timeout**}
	
	Example:
	`Switch(SFlow)# setsFlowGlobalConfig sFlow-global agent-ip ipv4 7.25.16.63`
	`Switch(SFlow)# setsFlowGlobalConfig sFlow-global collector-ip ipv4 7.25.16.253`
	`Switch(SFlow)# setsFlowGlobalConfig sFlow-global collector-port 2033`
	`Switch(SFlow)# setsFlowGlobalConfig sFlow-global datagram-maxsize 512`
	`Switch(SFlow)#setsFlowGlobalConfig sFlow-global rx-timeout 50000`
		Enters the sFlow global configuration mode.
		• **agent-ip—**Specifies Agent IP address.
		◦ **ipv4—**Specifies IPv4 address.
		◦ **ipv6—**Specifies IPv6 address.
		• **collector-ip—**Specifies collector IP address.
		◦ **ipv4—**Specifies IPv4 address.
		◦ **ipv6—**Specifies IPv6 address.

	Command or Action	Purpose
		• **collector-port—**Specifies collector UDP port. The valid range is from 1 to 65535. • **datagram-maxsize—**Specifies maximum datagram size. The valid range is from 200 to 1468. • **rx-timeout—**Specifies the receive timeout in seconds. The valid range is from 0 to 2147483647. The switch decrements the timeout once every second, and samples are received as long as it is non-zero. Once it reaches zero, receiver and all its configurations are reset to defaults.
Step 3	**setsFlowGlobalConfig review** **Example:** `Switch(SFlow)# setsFlowGlobalConfig review`	(Optional) Displays the configuration.
Step 4	**setsFlowGlobalConfig commit** **Example:** `Switch(SFlow)# setsFlowGlobalConfig commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(SFlow)# exit`	Exits the SFlow mode.

Configuration Example

• The example shows how to enable sFlow globally:

```
Switch # sflow
Switch(SFlow)# setsFlowGlobalConfig sFlow-global agent-ip ipv4 7.25.16.63
Switch(SFlow)# setsFlowGlobalConfig sFlow-global collector-ip ipv4 7.25.16.253
Switch(SFlow)# setsFlowGlobalConfig sFlow-global collector-port 2033
Switch(SFlow)# setsFlowGlobalConfig sFlow-global datagram-maxsize 512
Switch(SFlow)# setsFlowGlobalConfig sFlow-global rx-timeout 50000
Switch(SFlow)# setsFlowGlobalConfig review
```

```
Commands in queue:
         setsFlowGlobalConfig sFlow_global agent-ip ipv4 7.25.16.63
       setsFlowGlobalConfig sFlow_global collector-ip ipv4 7.25.16.253

        setsFlowGlobalConfig sFlow_global collector-port 6343
        setsFlowGlobalConfig sFlow_global datagram-maxsize 512
        setsFlowGlobalConfig sFlow_global rx-timeout 50000
```

```
Switch(SFlow)# setsFlowGlobalConfig commit
```

```
 SetsFlowGlobalConfig Commit Success!!!
```

```
Switch(SFlow)# exit
```

Enabling sFlow on a Port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**sflow** **Example:** `Switch# sflow`	Enters the sFlow mode.

Step 2	**sflow-port** {**interface-id** | **enable** | **flow-sampler** {**enable-defaults** | **sampling-rate** | **sampling-maxsize**} | **counter-poller** {**enable** | **interval**}}
	
	Example:
	`Switch(SFlow)# setsFlowPortConfig sFlow-port interface-id 3`
	`Switch(SFlow)# setsFlowPortConfig sFlow-port enable enable`
	`Switch(SFlow)# setsFlowPortConfig sFlow-port counter-poller enable enable`
	`Switch(SFlow)# setsFlowPortConfig sFlow-port counter-poller interval 10`
	`Switch(SFlow)# setsFlowPortConfig sFlow-port flow-sampler enable-defaults enable`
		Enters the sFlow port specific configuration mode.
		• **interface-id—**Specifies physical port.
		• **enable—**Enables or disables sFlow on this port.
		• **flow-sampler—**Specifies sFlow flow sampler configuration.
		◦ **enable-defaults—**Enables the flow sampler default values.
		Note To configure **sampling-rate** and **sampling-maxsize** as per your requirement, you must set this option to disable.
		◦ **sampling-rate—**Specifies the statistical sampling rate. The valid range is from 1 to 4294967295.
		◦ **sampling-maxsize—**Specifies maximum number of bytes to transmit per flow sample. The valid range is from 14 to 200.
		• **counter-poller—**Specifies Interface counter poller configuration.
		◦ **enable—**Enables counter poller.
		◦ **interval—**Specifies counter poll interval. The valid range is from 1 to 3600 seconds.

Step 3	**setsFlowPortConfig review** **Example:** `Switch(SFlow)# setsFlowPortConfig review`	(Optional) Displays the configuration.
Step 4	**setsFlowPortConfig commit** **Example:** `Switch(SFlow)# setsFlowPortConfig commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(SFlow)# exit`	Exits the SFlow mode.

Configuration Example

> **Note** sFlow configuration does not persist on the NID. Running **show running-config.xml** command does not display the sFlow configuration globally or per-port. This is working as designed.

- The example shows how to enable sFlow on a port with default values enabled:

```
Switch # sflow
Switch(SFlow)# setsFlowPortConfig sFlow-port interface-id 3
Switch(SFlow)# setsFlowPortConfig sFlow-port enable enable
Switch(SFlow)# setsFlowPortConfig sFlow-port flow-sampler enable-defaults enable
Switch(SFlow)# setsFlowPortConfig review
```

```
Commands in queue:
        setsFlowPortConfig sFlow_port interface-id 3
        setsFlowPortConfig sFlow_port enable enable
        setsFlowPortConfig sFlow_port flow-sampler enable-defaults
enable
```

```
Switch(SFlow)# setsFlowPortConfig commit
```

```
 SetsFlowPortConfig Commit Success!!!
```

```
Switch(SFlow)# exit
```

- The example shows how to enable sFlow on a port without any default values set:

```
Switch # sflow
Switch(SFlow)# setsFlowPortConfig sFlow-port interface-id 1
Switch(SFlow)# setsFlowPortConfig sFlow-port enable enable
Switch(SFlow)# setsFlowPortConfig sFlow-port flow-sampler enable-defaults disable
Switch(SFlow)# setsFlowPortConfig review
```

```
Commands in queue:
        setsFlowPortConfig sFlow_port interface-id 1
        setsFlowPortConfig sFlow_port enable enable
        setsFlowPortConfig sFlow_port flow-sampler enable-defaults
disable
```

```
Switch(SFlow)# setsFlowPortConfig commit
```

```
 SetsFlowPortConfig Commit Success!!!
```

```
Switch(SFlow)# exit
```

- The example shows how enable sFlow on a port with user-configured parameters:

```
Switch # sflow
Switch(SFlow)# setsFlowPortConfig sFlow-port interface-id 1
Switch(SFlow)# setsFlowPortConfig sFlow-port enable enable
Switch(SFlow)# setsFlowPortConfig sFlow-port flow-sampler enable-defaults disable
Switch(SFlow)# setsFlowPortConfig sFlow-port flow-sampler sampling-maxsize 512
Switch(SFlow)# setsFlowPortConfig sFlow-port flow-sampler sampling-rate 200
Switch(SFlow)# setsFlowPortConfig sFlow-port counter-poller enable enable
Switch(SFlow)# setsFlowPortConfig sFlow-port counter-poller interval 30
Switch(SFlow)# setsFlowPortConfig review
```

```
Commands in queue:
        setsFlowPortConfig sFlow_port interface-id 1
        setsFlowPortConfig sFlow_port enable enable
        setsFlowPortConfig sFlow_port flow-sampler enable-defaults
disable
        setsFlowPortConfig sFlow_port flow-sampler sampling-maxsize
512
        setsFlowPortConfig sFlow_port flow-sampler sampling-rate 200

        setsFlowPortConfig sFlow_port counter-poller enable enable
        setsFlowPortConfig sFlow_port counter-poller interval 30
```

```
Switch(SFlow)# setsFlowPortConfig commit
```

```
 SetsFlowPortConfig Commit Success!!!
```

```
Switch(SFlow)# exit
```

Getting Current Global sFlow Values

DETAILED STEPS

	Command or Action	Purpose
Step 1	**sflow** **Example:** `Switch# sflow`	Enters the sFlow mode.
Step 2	**sFlow-global-req** **Example:** `Switch(SFlow)# getsFlowGlobalConfig sFlow-global-req`	Enters the sFlow global configuration mode.
Step 3	**getsFlowGlobalConfig review** **Example:** `Switch(SFlow)# getsFlowGlobalConfig review`	(Optional) Displays the configuration.
Step 4	**getsFlowGlobalConfig commit** **Example:** `Switch(SFlow)# getsFlowGlobalConfig commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(SFlow)# exit`	Exits the SFlow mode.

Configuration Example

- The example shows how to get current global sFlow values:

```
Switch # sflow
Switch(SFlow)# getsFlowGlobalConfig sFlow-global-req
Switch(SFlow)# getsFlowGlobalConfig review
```

```
Commands in queue:
                getsFlowGlobalConfig sFlow_global_req
```

```
Switch(SFlow)# getsFlowGlobalConfig commit
```

```
GetsFlowGlobalConfig_Output.sFlow_global.agent_ip.t = 1
GetsFlowGlobalConfig_Output.sFlow_global.agent_ip.u.ipv4 = '0.0.0.0'
GetsFlowGlobalConfig_Output.sFlow_global.collector_ip.t = 1
GetsFlowGlobalConfig_Output.sFlow_global.collector_ip.u.ipv4 =
'0.0.0.0'
GetsFlowGlobalConfig_Output.sFlow_global.collector_port = 65535
GetsFlowGlobalConfig_Output.sFlow_global.datagram-maxsize = 1468
GetsFlowGlobalConfig_Output.sFlow_global.rx-timeout = 50000

 GetsFlowGlobalConfig Commit Success!!!
```

```
Switch(SFlow)# exit
```

The following is a sample output on the NID.

```
Decoding of Request message was successful urn:#getsFlowConfig
Decoded record:
GetsFlowGlobalConfig_Input.sFlow_global_req = '0'
Encoding of Response message was successful
Encoded record:
GetsFlowGlobalConfig_Output.sFlow_global.agent_ip.t = 1
GetsFlowGlobalConfig_Output.sFlow_global.agent_ip.u.ipv4 = '0.0.0.0'
GetsFlowGlobalConfig_Output.sFlow_global.collector_ip.t = 1
GetsFlowGlobalConfig_Output.sFlow_global.collector_ip.u.ipv4 =
'0.0.0.0'
GetsFlowGlobalConfig_Output.sFlow_global.collector_port = 65535
GetsFlowGlobalConfig_Output.sFlow_global.datagram-maxsize = 1468
GetsFlowGlobalConfig_Output.sFlow_global.rx-timeout = 50000
GetsFlowGlobalConfig_Output.xmlns:ns0 =
"http://new.webservice.namespace"
GetsFlowGlobalConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetsFlowGlobalConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetsFlowGlobalConfig_Output.xmlns:soap =
```

```
"http://schemas.xmlsoap.org/wsdl/soap/"
GetsFlowGlobalConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetsFlowGlobalConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

Getting Current Port Specific sFlow Values

DETAILED STEPS

	Command or Action	Purpose
Step 1	**sflow** **Example:** `Switch# sflow`	Enters the sFlow mode.
Step 2	**sflowPortConfigReq** *port id* **Example:** `Switch(SFlow)# getsFlowPortConfig sflowPortConfigReq 2`	Enters the sFlow port-specific configuration mode.
Step 3	**getsFlowGlobalConfig review** **Example:** `Switch(SFlow)# getsFlowGlobalConfig review`	(Optional) Displays the configuration.
Step 4	**getsFlowGlobalConfig commit** **Example:** `Switch(SFlow)# getsFlowGlobalConfig commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(SFlow)# exit`	Exits the SFlow mode.

Configuration Example

- The example shows how to get current port-specific sFlow values:

```
Switch # sflow
Switch(SFlow)# getsFlowPortConfig sflowPortConfigReq 2
Switch(SFlow)# getsFlowGlobalConfig review
```

```
Commands in queue:
        getsFlowPortConfig sFlowPortConfigReq 2
```

```
Switch(SFlow)# getsFlowGlobalConfig commit
```

```
GetsFlowPortConfig_Output.sFlow_port.interface_id = 2
GetsFlowPortConfig_Output.sFlow_port.enable = false
GetsFlowPortConfig_Output.sFlow_port.flow_sampler.enable_defaults =
true
GetsFlowPortConfig_Output.sFlow_port.flow_sampler.sampling_rate = 4096
GetsFlowPortConfig_Output.sFlow_port.flow_sampler.sampling-maxsize =
 128
GetsFlowPortConfig_Output.sFlow_port.counter_poller.enable = false
GetsFlowPortConfig_Output.sFlow_port.counter_poller.interval = 60

 GetsFlowPortConfig Commit Success!!!
```

```
Switch(SFlow)# exit
```

The following is a sample output on the NID.

```
 GetsFlowPortConfig_Input.sFlowPortConfigReq = 2
Encoding of Response message was successful
Encoded record:
GetsFlowPortConfig_Output.sFlow_port.interface_id = 2
GetsFlowPortConfig_Output.sFlow_port.enable = false
GetsFlowPortConfig_Output.sFlow_port.flow_sampler.enable_defaults =
true
GetsFlowPortConfig_Output.sFlow_port.flow_sampler.sampling_rate = 4096
GetsFlowPortConfig_Output.sFlow_port.flow_sampler.sampling-maxsize =
 128
GetsFlowPortConfig_Output.sFlow_port.counter_poller.enable = false
GetsFlowPortConfig_Output.sFlow_port.counter_poller.interval = 60
GetsFlowPortConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
GetsFlowPortConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetsFlowPortConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetsFlowPortConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetsFlowPortConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetsFlowPortConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

Clearing sFlow Statistics

DETAILED STEPS

	Command or Action	Purpose
Step 1	**sflow** **Example:** `Switch# sflow`	Enters the sFlow mode.

	Command or Action	Purpose
Step 2	**clear-sflow-stats** **Example:** `Switch(SFlow)# clearsFlowStatistics clear-sflow-stats`	Clears sFlow statistics.
Step 3	**clearsFlowStatistics review** **Example:** `Switch(SFlow)# clearsFlowStatistics review`	(Optional) Displays the configuration.
Step 4	**clearsFlowStatistics commit** **Example:** `Switch(SFlow)# clearsFlowStatistics commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(SFlow)# exit`	Exits the SFlow mode.

Configuration Example

- The example shows how to clear sFlow statistics:

```
Switch # sflow
Switch(SFlow)# clearsFlowStatistics clear-sflow-stats
Switch(SFlow)# clearsFlowStatistics review
```

```
Commands in queue:
                  clearsFlowStatistics clear_sflow_stats
```

```
Switch(SFlow)# clearsFlowStatistics commit
```

```
ClearsFlowStatistics Commit Success!!!
```

```
Switch(SFlow)# exit
```

Verifying sFlow

Use the following commands to verify the sFlow status on the Cisco ME 1200 NID.

- **showsFlowStatistics sFlow-stats-req**

  This command displays the sFlow statistics on the NID. The following is a sample output from the command:

```
Switch(SFlow)# showsFlowStatistics sFlow-stats-req
Switch(SFlow)#  showsFlowStatistics review
```

```
Commands in queue:
                showsFlowStatistics sFlow_stats_req
```

```
Switch(SFlow)#  showsFlowStatistics commit
```

```
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[0].interface_id
 = 1
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[0].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[0].counter_samples
 = 42
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[1].interface_id
 = 2
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[1].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[1].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[2].interface_id
 = 3
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[2].tx_flow_samples
 = 1
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[2].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[3].interface_id
 = 4
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[3].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[3].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[4].interface_id
 = 5
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[4].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[4].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[5].interface_id
 = 6
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[5].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[5].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.receiver.statistics[0].tx_successes
 = 0
ShowsFlowStatistics_Output.sFlow_stats.receiver.statistics[0].tx_errors
 = 43
ShowsFlowStatistics_Output.sFlow_stats.receiver.statistics[0].flow_samples
 = 1
ShowsFlowStatistics_Output.sFlow_stats.receiver.statistics[0].counter_samples
 = 42

 ShowsFlowStatistics Commit Success!!!
```

The following is a sample output on the NID.

```
 Decoding of Request message was successful urn:#showsFlowStatistics
Decoded record:
ShowsFlowStatistics_Input.sFlow_stats_req = '0'
Encoding of Response message was successful
```

```
Encoded record:
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[0].interface_id
 = 1
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[0].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[0].counter_samples
 = 42
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[1].interface_id
 = 2
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[1].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[1].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[2].interface_id
 = 3
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[2].tx_flow_samples
 = 1
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[2].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[3].interface_id
 = 4
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[3].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[3].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[4].interface_id
 = 5
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[4].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[4].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[5].interface_id
 = 6
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[5].tx_flow_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.samplers.interface_[5].counter_samples
 = 0
ShowsFlowStatistics_Output.sFlow_stats.receiver.statistics[0].tx_successes
 = 0
ShowsFlowStatistics_Output.sFlow_stats.receiver.statistics[0].tx_errors
 = 43
ShowsFlowStatistics_Output.sFlow_stats.receiver.statistics[0].flow_samples
 = 1
ShowsFlowStatistics_Output.sFlow_stats.receiver.statistics[0].counter_samples
 = 42
ShowsFlowStatistics_Output.xmlns:ns0 =
"http://new.webservice.namespace"
ShowsFlowStatistics_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
ShowsFlowStatistics_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
ShowsFlowStatistics_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
ShowsFlowStatistics_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
ShowsFlowStatistics_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

Additional References

Related Documents

Related Topic	Document Title
Cisco ME 3800x and ME 3600x Switches Software Configuration Guide, Cisco IOS Release 15.4(1)S	http://www.cisco.com/c/en/us/td/docs/switches/metro/me3600x_3800x/software/release/15-4_1_S/configuration/guide/3800x3600xscg.html

MIBs

MIB	MIBs Link
MIBs Supporting Cisco IOS	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

CHAPTER 28

Configuring UDLD

This document describes the Unidirectional Link Detection (UDLD) feature and configuration steps to implement UDLD.

Prerequisites for Configuring UDLD

- The NID must have an IP address.

Restrictions for Configuring UDLD

- Access Control Lists (ACLs) cannot be used to block the UDLD traffic.
- UDLD on ME 1200 NID cannot interoperate with other devices. UDLD can be enabled only between ME 1200 NIDs.

Information About UDLD

UDLD is a Layer 2 protocol that enables devices connected through Ethernet cables to monitor the physical configuration and detect presence of a unidirectional link. A unidirectional link occurs when traffic sent by a local device is received by its neighbor but traffic coming from the neighboring device is not received by the local device. When a unidirectional link is detected, the affected port is disabled and user is alerted. This can help prevent spanning tree topology loops.

UDLD supports two operation modes:

- **Normal—**In this mode, UDLD detects a unidirectional link due to misconnected fibers on a fiber-optic link that is not detected by Layer 1 mechanisms.

> **Note** If port connections are correct and traffic is one way, UDLD does not detect the unidirectional link. In this case, no action is taken and link is considered undetermined.

- **Aggressive—**In this mode, unidirectional link due to one-way traffic on fiber-optic and twisted pair links, and misconnected ports on fiber-optic links can be detected. Specifically, if one end of the link cannot send or receive traffic, or one of the ports is down and the other is up, the unidirectional link can be detected. Using the loss of hello packets as indication to detect bi-directional link that cannot be re-established, UDLD disables the affected port.

In addition, UDLD can detect the identities of neighbors by caching the information contained in UDLD hello packet.

By default, UDLD is disabled on ME 1200 NID. The normal or aggressive mode can be

- enabled globally on all ports or
- enabled or modified on the individual ports

How to Provision UDLD

Enabling UDLD Mode Globally

DETAILED STEPS

	Command or Action	Purpose
Step 1	**UDLDPortType** **Example:** `Switch# UDLDPortType`	Enters the UDLD mode.

Step 2	**udldGlobalConfig** {**mode** {**normal** | **aggressive**} | **message-interval**}
	
	Example:
	`Switch(UDLDPortType)# setGlobalUDLDConfig udldGlobalConfig mode normal enable`
	`Switch(UDLDPortType)# setGlobalUDLDConfig udldGlobalConfig message-interval 10`
		Enters UDLD global configuration mode.
		
		Sub-command options:
		• **mode—**Specifies UDLD configuration mode.
		  ◦ **normal—**Enables UDLD in normal mode on all fiber-optic ports.
		  ◦ **aggressive—**Enables UDLD in aggressive mode on all fiber-optic ports.

	Command or Action	Purpose
		• **message-interval—**Specifies time interval between UDLD probe messages on ports (7-90 seconds).
Step 3	**setGlobalUDLDConfig review** **Example:** `Switch(UDLDPortType)# setGlobalUDLDConfig review`	(Optional) Displays the configuration.
Step 4	**setGlobalUDLDConfig commit** **Example:** `Switch(UDLDPortType)# setGlobalUDLDConfig commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(UDLDPortType)# exit`	Exits the UDLDPortType mode.

Configuration Example

- The example shows how to enable UDLD globally in normal mode:

```
Switch # UDLDPortType
Switch(UDLDPortType)# setGlobalUDLDConfig udldGlobalConfig mode normal enable
Switch(UDLDPortType)# setGlobalUDLDConfig udldGlobalConfig message-interval 10
Switch(UDLDPortType)# setGlobalUDLDConfig review
```

```
Commands in queue:
        setGlobalUDLDConfig udldGlobalConfig mode normal enable
        setGlobalUDLDConfig udldGlobalConfig message-interval 10
```

```
Switch(UDLDPortType)# setGlobalUDLDConfig commit
```

```
 SetGlobalUDLDConfig Commit Success!!!
```

```
Switch(UDLDPortType)# exit
```

This enables UDLD on all ports of ME 1200 NID with a time interval of 10 seconds.

Disabling UDLD Mode Globally

DETAILED STEPS

	Command or Action	Purpose
Step 1	**UDLDPortType** **Example:** `Switch# UDLDPortType`	Enters the UDLD mode.
Step 2	**udldGlobalConfig** {**mode** {**normal** | **aggressive**} | **message-interval**} **Example:** `Switch(UDLDPortType)# setGlobalUDLDConfig udldGlobalConfig mode normal disable`	Enters UDLD global configuration mode. Sub-command options: • **mode**—Specifies UDLD configuration mode. ◦ **normal**—Enables UDLD in normal mode on all fiber-optic ports. ◦ **aggressive**—Enables UDLD in aggressive mode on all fiber-optic ports. • **message-interval**—Specifies time interval between UDLD probe messages on ports. The valid range is from 7 to 90 seconds.
Step 3	**setGlobalUDLDConfig review** **Example:** `Switch(UDLDPortType)# setGlobalUDLDConfig review`	(Optional) Displays the configuration.
Step 4	**setGlobalUDLDConfig commit** **Example:** `SwitchUDLDPortType)# setGlobalUDLDConfig commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(UDLDPortType)# exit`	Exits the UDLDPortType mode.

Configuration Example

- The example shows how to disable UDLD globally in normal mode:

```
Switch # UDLDPortType
Switch(UDLDPortType)# setGlobalUDLDConfig udldGlobalConfig mode normal disable
Switch(UDLDPortType)# setGlobalUDLDConfig review
```

```
Commands in queue:
        setGlobalUDLDConfig udldGlobalConfig mode normal disable
```

```
Switch(UDLDPortType)# setGlobalUDLDConfig commit
```

```
 SetGlobalUDLDConfig Commit Success!!!
```

```
Switch(UDLDPortType)# exit
```

This disables UDLD on all ports of ME 1200 NID.

Enabling UDLD Mode on a Port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**UDLDPortType** **Example:** `Switch# UDLDPortType`	Enters the UDLD mode.

Step 2	**udldInterfaceConfig** {**mode** {**enable** | **aggressive**} | **message-interval** *seconds* | **port** *port number*}
	
	Example:
	`Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig mode aggressive enable`
	`Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig message-interval 20`
	`Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig port 3`
		Enters UDLD global configuration mode.
		Sub-command options:
		• **mode**—Specifies UDLD configuration mode.
		  ◦ **enable**—Enables UDLD in normal mode on selected interface.
		  ◦ **aggressive**—Enables UDLD in aggressive mode on selected interface.
		• **message-interval**—Specifies time interval between UDLD probe messages on ports.
		  ◦ *seconds*—Time interval in seconds. Valid range is from 7 to 90 seconds.
		• **port**—Specifies targeted interface.
		  ◦ *port number*—Specifies number of the selected port.

Step 3	**setIntfUDLDConfig review** **Example:** `Switch(UDLDPortType)# setIntfUDLDConfig review`	(Optional) Displays the configuration.

	Command or Action	Purpose
Step 4	**setIntfUDLDConfig commit** **Example:** `Switch(UDLDPortType)# setIntfUDLDConfig commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(UDLDPortType)# exit`	Exits the UDLDPortType mode.

Configuration Example

- The example shows how to enable UDLD on a specific port in an aggressive mode:

```
Switch # UDLDPortType
Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig mode aggressive enable
Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig message-interval 20
Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig port 3
Switch(UDLDPortType)# setIntfUDLDConfig review
```

```
Commands in queue:
        Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig
mode aggressive enable
        Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig
message-interval 20
        Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig
port 3
```

```
Switch(UDLDPortType)# setIntfUDLDConfig commit
```

```
 SetIntfUDLDConfig Commit Success!!!
```

```
Switch(UDLDPortType)# exit
```

This enables UDLD in aggressive mode only on port 3 of ME 1200 NID with a time interval of 20 seconds.

Disabling UDLD Mode on a Port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**UDLDPortType** **Example:** `Switch# UDLDPortType`	Enters the UDLD mode.
Step 2	**udldInterfaceConfig** {**mode** {**enable** | **aggressive**} | **message-interval** *seconds* | **port** *port number*}	Enters UDLD port specific configuration mode. Sub-command options:

	Command or Action	Purpose

	Example:
	`Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig port 3`
	`Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig mode aggressive disable`
		• **mode**—Specifies UDLD configuration mode.
		◦ **enable**—Enables UDLD in normal mode on selected interface.
		◦ **aggressive**—Enables UDLD in aggressive mode on selected interface.
		• **message-interval**—Specifies time interval between UDLD probe messages on ports.
		◦ *seconds*—Time interval in seconds. Valid range is from 7 to 90 seconds.
		• **port**—Specifies targeted interface.
		◦ *port number*—Specifies number of the selected port.

Step 3	**setIntfUDLDConfig review** **Example:** `Switch(UDLDPortType)# setIntfUDLDConfig review`	(Optional) Displays the configuration.
Step 4	**setIntfUDLDConfig commit** **Example:** `Switch(UDLDPortType)# setIntfUDLDConfig commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(UDLDPortType)# exit`	Exits the UDLDPortType mode.

Configuration Example

• The example shows how to disable UDLD on a specific port in an aggressive mode:

```
Switch # UDLDPortType
Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig port 3
Switch(UDLDPortType)# setIntfUDLDConfig udldInterfaceConfig mode aggressive disable
Switch(UDLDPortType)# setIntfUDLDConfig review
```

```
Commands in queue:
        setIntfUDLDConfig udldInterfaceConfig port 3
       setIntfUDLDConfig udldInterfaceConfig mode aggressive disable
```

```
Switch(UDLDPortType)# setIntfUDLDConfig commit
```

```
 SetIntfUDLDConfig Commit Success!!!
```

```
Switch(UDLDPortType)# exit
```

This disables UDLD in an aggressive mode on port 3 of ME 1200 NID.

Getting Current Global UDLD Values

DETAILED STEPS

	Command or Action	Purpose
Step 1	**UDLDPortType** **Example:** `Switch# UDLDPortType`	Enters the UDLD mode.
Step 2	**getGlobalUDLDConfReq** **Example:** `Switch(UDLDPortType)# getGlobalUDLDConfig getGlobalUDLDConfReq`	Enters UDLD global configuration mode.
Step 3	**getGlobalUDLDConfig review** **Example:** `Switch(UDLDPortType)# getGlobalUDLDConfig review`	(Optional) Displays the configuration.
Step 4	**getGlobalUDLDConfig commit** **Example:** `Switch(UDLDPortType)# getGlobalUDLDConfig commit`	Sends the configuration to NID.
Step 5	**exit** **Example:** `Switch(UDLDPortType)# exit`	Exits the UDLDPortType mode.

Configuration Example

- The example shows how to get current global UDLD values:

```
Switch # UDLDPortType
Switch(UDLDPortType)# getGlobalUDLDConfig getGlobalUDLDConfReq
Switch(UDLDPortType)# getGlobalUDLDConfig review
```

```
Commands in queue:
        getGlobalUDLDConfig getGlobalUDLDConfReq
```

```
Switch(UDLDPortType)# getGlobalUDLDConfig commit
```

```
GetGlobalUDLDConfig_Output.udldGlobalConfig.mode.t = 1
GetGlobalUDLDConfig_Output.udldGlobalConfig.mode.u.normal = false
GetGlobalUDLDConfig_Output.udldGlobalConfig.message_interval = 7
```

```
 GetGlobalUDLDConfig Commit Success!!!
```

```
Switch(UDLDPortType)# exit
```

The following is a sample output on the NID.

```
Decoding of Request message was successful
Decoded record:
GetGlobalUDLDConfig_Input.getGlobalUDLDConfReq = '0'

 Set UDLD global to defaultsEncoding of Response message was successful
Encoded record:
GetGlobalUDLDConfig_Output.udldGlobalConfig.mode.t = 1
GetGlobalUDLDConfig_Output.udldGlobalConfig.mode.u.normal = false
GetGlobalUDLDConfig_Output.udldGlobalConfig.message_interval = 7
GetGlobalUDLDConfig_Output.xmlns:ns0 =
"http://new.webservice.namespace"
GetGlobalUDLDConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetGlobalUDLDConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetGlobalUDLDConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetGlobalUDLDConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetGlobalUDLDConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

Getting Current Port Specific UDLD Values

DETAILED STEPS

	Command or Action	Purpose
Step 1	**UDLDPortType** **Example:** `Switch# UDLDPortType`	Enters the UDLD mode.
Step 2	**etGlobalUDLDConfReq** **Example:** `Switch(UDLDPortType)# getIntfUDLDConfig udldPhyPort 3`	Enters UDLD port specific configuration mode.
Step 3	**setGlobalUDLDConfig review** **Example:** `Switch(UDLDPortType)# getIntfUDLDConfig review`	(Optional) Displays the configuration.
Step 4	**setGlobalUDLDConfig commit** **Example:** `Switch(UDLDPortType)# getIntfUDLDConfig commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(UDLDPortType)# exit`	Exits the UDLDPortType mode.

Configuration Example

- The example shows how to get current port specific UDLD values when UDLD is disabled:

```
Switch # UDLDPortType
Switch(UDLDPortType)# getIntfUDLDConfig udldPhyPort 3
Switch(UDLDPortType)# getIntfUDLDConfig review
```

```
Commands in queue:
        getIntfUDLDConfig udldPhyPort 3
```

```
Switch(UDLDPortType)# getIntfUDLDConfig commit
```

```
GetIntfUDLDConfig_Output.udldInterfaceConfig.mode.t = 1
GetIntfUDLDConfig_Output.udldInterfaceConfig.mode.u.enable = false
GetIntfUDLDConfig_Output.udldInterfaceConfig.message_interval = 7
GetIntfUDLDConfig_Output.udldInterfaceConfig.port = 3

 GetIntfUDLDConfig Commit Success!!!
```

```
Switch(UDLDPortType)# exit
```

The following is a sample output on the NID.

```
# Decoding of Request message was successful
Decoded record:
GetIntfUDLDConfig-Input.udldPhyPort = 3
Set UDLD intf to defaultsEncoding of Response message was successful
Encoded record:
GetIntfUDLDConfig_Output.udldInterfaceConfig.mode.t = 1
GetIntfUDLDConfig_Output.udldInterfaceConfig.mode.u.enable = false
GetIntfUDLDConfig_Output.udldInterfaceConfig.message_interval = 7
GetIntfUDLDConfig_Output.udldInterfaceConfig.port = 3
GetIntfUDLDConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
GetIntfUDLDConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetIntfUDLDConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetIntfUDLDConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetIntfUDLDConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetIntfUDLDConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

- The example shows how to get current port specific UDLD values when UDLD is enabled:

```
Switch # UDLDPortType
Switch(UDLDPortType)# getIntfUDLDConfig udldPhyPort 3
Switch(UDLDPortType)# getIntfUDLDConfig review
```

```
Commands in queue:
        getIntfUDLDConfig udldPhyPort 3
```

```
Switch(UDLDPortType)# getIntfUDLDConfig commit
```

```
GetIntfUDLDConfig_Output.udldInterfaceConfig.mode.t = 1
GetIntfUDLDConfig_Output.udldInterfaceConfig.mode.u.enable = true
GetIntfUDLDConfig_Output.udldInterfaceConfig.message_interval = 7
GetIntfUDLDConfig_Output.udldInterfaceConfig.port = 3

 GetIntfUDLDConfig Commit Success!!!
```

```
Switch(UDLDPortType)# exit
```

The following is a sample output on the NID.

```
# Decoding of Request message was successful
Decoded record:
GetIntfUDLDConfig-Input.udldPhyPort = 3

Set UDLD intf to defaultsEncoding of Response message was successful
Encoded record:
GetIntfUDLDConfig_Output.udldInterfaceConfig.mode.t = 1
GetIntfUDLDConfig_Output.udldInterfaceConfig.mode.u.enable = true
GetIntfUDLDConfig_Output.udldInterfaceConfig.message_interval = 7
GetIntfUDLDConfig_Output.udldInterfaceConfig.port = 3
GetIntfUDLDConfig_Output.xmlns:ns0 = "http://new.webservice.namespace"
GetIntfUDLDConfig_Output.xmlns:http =
"http://schemas.xmlsoap.org/wsdl/http/"
GetIntfUDLDConfig_Output.xmlns:mime =
"http://schemas.xmlsoap.org/wsdl/mime/"
GetIntfUDLDConfig_Output.xmlns:soap =
"http://schemas.xmlsoap.org/wsdl/soap/"
GetIntfUDLDConfig_Output.xmlns:soapenc =
"http://schemas.xmlsoap.org/soap/encoding/"
GetIntfUDLDConfig_Output.xmlns:wsdl =
"http://schemas.xmlsoap.org/wsdl/"
```

Verifying UDLD

Use the following command to verify the UDLD status on the Cisco ME 1200 NID.

- **showUDLDStatusReq**

  This command displays the UDLD configuration status on the NID. The following is a sample output from the command:

```
Switch(UDLDPortType)# showUDLDStatus showUDLDStatusReq
Switch(UDLDPortType)# showUDLDStatus review
```

```
Commands in queue:
                showUDLDStatus showUDLDStatusReq
```

`Switch(UDLDPortType)#` **`showUDLDStatus commit`**

```
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].port = 1
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].mode =
'Disable'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].messageInterval
 = 7
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].adminState
 = false
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].localDeviceId
 = 'B8-38-61-68-7B-BC'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].localDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].bidirState
 = 'Indeterminant'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].nbrPortID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].nbrDeviceID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].nbrDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[0].nbrLinkState
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].port = 2
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].mode =
'Disable'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].messageInterval
 = 7
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].adminState
 = false
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].localDeviceId
 = 'B8-38-61-68-7B-BC'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].localDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].bidirState
 = 'Indeterminant'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].nbrPortID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].nbrDeviceID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].nbrDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[1].nbrLinkState
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].port = 3
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].mode =
'Normal'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].messageInterval
 = 10
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].adminState
 = true
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].localDeviceId
 = 'B8-38-61-68-7B-BC'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].localDeviceName
 = ''
```

```
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].bidirState
 = 'Indeterminant'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].nbrPortID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].nbrDeviceID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].nbrDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[2].nbrLinkState
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].port = 4
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].mode =
'Normal'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].messageInterval
 = 10
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].adminState
 = true
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].localDeviceId
 = 'B8-38-61-68-7B-BC'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].localDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].bidirState
 = 'Indeterminant'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].nbrPortID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].nbrDeviceID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].nbrDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[3].nbrLinkState
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].port = 5
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].mode =
'Normal'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].messageInterval
 = 10
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].adminState
 = true
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].localDeviceId
 = 'B8-38-61-68-7B-BC'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].localDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].bidirState
 = 'Indeterminant'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].nbrPortID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].nbrDeviceID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].nbrDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[4].nbrLinkState
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].port = 6
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].mode =
'Disable'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].messageInterval
 = 7
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].adminState
```

```
 = false
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].localDeviceId
 = 'B8-38-61-68-7B-BC'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].localDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].bidirState
 = 'Indeterminant'
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].nbrPortID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].nbrDeviceID
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].nbrDeviceName
 = ''
ShowUDLDStatus_Output.showUDLDStatusResp.udldStatusList[5].nbrLinkState
 = ''
```

Additional References

Related Documents

Related Topic	Document Title
Cisco ME 3800x and ME 3600x Switches Software Configuration Guide, Cisco IOS Release 15.4(1)S	http://www.cisco.com/c/en/us/td/docs/switches/metro/me3600x_3800x/software/release/15-4_1_S/configuration/guide/3800x3600xscg.html

MIBs

MIB	MIBs Link
MIBs Supporting Cisco IOS	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/support

CHAPTER 29

Configuring Flex Links

This document describes the Flex Link feature and configuration steps to implement Flex Links. They also describe how to configure the MAC address table move update feature.

Note Flex Links does not currently support stacking, duo switches structure, or VLAN separation.

Prerequisites for Configuring Flex Links

- Disable STP before configuring Flex Links. If STP is disabled on the switch, make sure that there are no Layer 2 loops in the topology.
- Flex Links is supported on the Serval CEServices application.

Default Configuration

Default Flex Links configuration is when there is no configuration for Flex Links pairs or for the MAC address move update transmit feature.

Restrictions for Configuring Flex Links

- Only one Flex Links backup link can be configured for any active link, and it must be a different interface from the active interface.

- The backup link does not have to be the same type as the active link. However, they should be configured with similar characteristics so that there are no loops or changes in operation if the standby link becomes active.
- An active link cannot belong to another Flex Links pair.
- The Flex Links pair cannot belong to the same port channel. However, a Flex Links pair can be a port channel and a physical interface, or two port channels or physical interfaces.
- The port channel interface should be active when included in the Flex Links pair, for it to be configured properly.

Information about Flex Links

Flex Links configuration provides link-level redundancy in the absence of Spanning Tree Protocol (STP). Flex Links consists of a pair of interfaces (ports or port channels) with one interface configured as the primary interface (forwarding status) and the other as the backup interface (standby status). When a failure occurs on the primary interface, the backup interface moves to forwarding status and starts to forward traffic.

Flex Links works by detecting link down on a primary interface and then bringing up the backup interface that has been defined as backup. It is most commonly implemented at the access layer where the switch has dual uplinks to the distribution layer.

Flex Links is designed to interact with supporting modules, such as the port module, the aggregation module, the packet module, and the configuration module. The basic Flex Links protocol functions are as follows:

- Initialize module configurations
- Interact with the packet module to transmit/receive MAC address table update frames
- Interact with the configuration module to read/write FL configurations
- Register with the port module to receive the port up/down event

The Flex Links API layer provides direct interaction with the switch for the implementation of the active and backup ports groups, the setup of the port status, and the MAC-address table read.

MAC Address Table Move Update

The MAC address table move update is an optional Flex Links feature. It allows the switch to provide rapid bidirectional convergence when an active link goes down and the backup link starts forwarding traffic.

Note MAC address table move update enables fast recovery of network connectivity but consumes CPU resources.

How to Configure Flex Links

Configuring Flexlink Ports

DETAILED STEPS

	Command or Action	Purpose
Step 1	**FlexlinksPortType** **Example:** `Switch# FlexlinksPortType`	Enters FlexlinksPortType mode to provision Flex Links.

Step 2	**flexlinkPortConfiguration|flexlinksConfiguration**{**activePort|backupPort|flexlinkEnabled**}
	
	Example:
	`Switch(FlexlinkPortType)# flexlinkPortConfiguration flexlinksConfiguration activePort activePortId 4`
	`flexlinkPortConfiguration flexlinksConfiguration backupPort backupPortId 6`
	`flexlinkPortConfiguration flexlinksConfiguration flexlinkEnabled enable`
		• **activePort—** Enter the Port number of interface to be configured .
		• **backupPort—** Enter the backup interface port number. It can be a physical port number or LLAG/LACP group ID.
		• **flexlinkEnabled—** Enter enable or disable to configure Flexlink port number.

Step 3	**flexlinkPortConfiguration review** **Example:** `Switch(FlexlinksPotType)# flexlinkPortConfiguration review`	Displays the Flexlink configuration commands in the queue.
Step 4	**flexlinkPortConfiguration commit** **Example:** `Switch(FlexlinksPotType)# flexlinkPortConfiguration commit`	Sends the Flexlink port configuration to the NID.
Step 5	**exit** **Example:** `Switch(FlexLinksPortType)# exit`	Exits the Flex Links mode.

Provisioning Flex Link Ports

DETAILED STEPS

	Command or Action	Purpose
Step 1	**FlexlinksPortType** **Example:** `Switch# FlexlinksPortType`	Enters the FlexlinksPortType mode to provision Flex Links.

Step 2	**getFlexlinksConfiguration getFlexlinkConfigRequest**{**llagGroupId***llagGroup-Id*|**phyPortId***phyPort-Id*}
	
	Example:
	`Switch(FlexlinksPotType)# getFlexlinksConfiguration`
	`Switch(FlexlinksPotType)# getFlexlinksConfiguration getFlexlinkConfigRequest port phyPortId 4`
	`Switch(FlexlinksPotType)# getFlexlinksConfiguration getFlexlinkConfigRequest llagGroupId 2`
		Gets the activeport configuration using getcommand.

Step 3	**getFlexlinksConfiguration review** **Example:** `Switch(FlexlinksPotType)# getFlexlinksConfiguration review`	Displays the activeport configuration using getcommand.
Step 4	**getFlexlinksConfiguration commit** **Example:** `Switch(FlexlinksPotType)# getFlexlinksConfiguration commit`	Sends the activeport configuration to the NID.
Step 5	**exit** **Example:** `Switch(FlexLinksPortType)# exit`	Exits the Flex Links mode.

Viewing Flex Link Configuration at Port Level on the NID

Before You Begin

- Perform the steps to provision Flex Links on the NID.

DETAILED STEPS

	Command or Action	Purpose
Step 1	**FlexlinksPortType** **Example:** `Switch# FlexlinksPortType`	Enters FlexlinksPortType mode to provision Flex Links.

Step 2	**getFlexlinksConfiguration getFlexlinkConfigRequestportllagGroupId phyPortId**
	
	Example:
	`Switch(FlexlinksPortType)# getFlexlinksConfiguration getFlexlinkConfigRequest port llagGroupId 2`
	`Switch(FlexlinksPortType)# getFlexlinksConfiguration getFlexlinkConfigRequest port phyPortId 4`
		Retrieves the Flex Links configuration at port.
		• **llagGroupId** *llagGroup-Id*—Displays the targeted active LLAG Group Id.
		• **review**—Displays the targeted active physical port.

Step 3	**getFlexlinksConfiguration review**
	
	Example:
	`Switch(FlexlinksPortType)#` **`getFlexlinksConfiguration review`**
	`Commands in queue:`
	`getFlexlinksConfiguration flexlinksPhysicalPort 4`
		Displays the Flex Links configuration.

Step 4	**getFlexlinksConfiguration commit** **Example:** `Switch(FlexlinksPortType)#` **`getFlexlinksConfiguration commit`**	Sends the Flex Links configuration to the NID.
Step 5	**exit** **Example:** `Switch(FlexLinksPortType)#` **`exit`**	Exits the Flex Links mode.

Configuration Example

The example retrieves the Flex Links configuration for port 4 on the NID:

```
Switch(FlexlinksPortType)# getFlexlinksConfigRequestportphyPortId 4
Switch(FlexlinksPortType)# getFlexlinksConfiguration review
Commands in queue:
       getFlexlinksConfigRequestportphyPortId 4
Switch(FlexlinksPortType)# getFlexlinksConfiguration commit
GetFlexlinksConfiguration_Output.getFlexlinksConfiguration.portNumber = 4
GetFlexlinksConfiguration_Output.getFlexlinksConfiguration.flexlinksEnable = false
GetFlexlinksConfiguration_Output.getFlexlinksConfiguration.key = 4
GetFlexlinksConfiguration_Output.getFlexlinksConfiguration.role.t = 4
GetFlexlinksConfiguration_Output.getFlexlinksConfiguration.role.u.active = true
GetFlexlinksConfiguration_Output.getFlexlinksConfiguration.portPriority = 32768
GetFlexlinksConfiguration_Output.getFlexlinksConfiguration.timeout.t = 4
getFlexlinksConfiguration_Output.getFlexlinksConfiguration.timeout.u.fast = true

 GetFlexlinksConfiguration Commit Success!!!
Switch(FlexlinksPortType)# exit
```

Viewing Flexlink Active Port Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**FlexlinksPortType** **Example:** `Switch# FlexlinksPortType`	Enters FlexlinksPortType mode to provision Flex Links.
Step 2	**showFlexlinksConfigdisplayFlexlinksConfigport**{**llagGroupID**|**phyPortId**} **Example:** `Switch(FlexlinksPortType)# showFlexlinksConfig displayFlexlinksConfig port phyPortId 4`	• **port—** Displays the targeted active port. • **llagGroupID—** Displays the active llagGroupID number. • **phyPortId—** Displays the active physical port number.
Step 3	**showFlexlinksConfig review** **Example:** `Switch(FlexlinksPotType)# showFlexlinksConfig review`	Displays the ports for Flexlink configuration.
Step 4	**showFlexlinksConfig commit** **Example:** `Switch(FlexlinksPotType)# showFlexlinksConfig commit`	Sends the Flexlink configuration to the NID.
Step 5	**exit** **Example:** `Switch(FlexLinksPortType)# exit`	Exits the Flex Links mode.

Configuration Example

The example shows the flexlink configuration in active ports.

```
Switch# FlexlinksPortType
Switch(FlexlinksPortType)# showFlexlinksConfig displayFlexlinksConfig port phyPortId 4

(FlexlinksPortType)# showFlexlinksConfig commit
ShowFlexlinksConfig_Output.displayFlexlinksConfigResp[0].backupPort = 'GigabitEthernet 1/6'
ShowFlexlinksConfig_Output.displayFlexlinksConfigResp[0].activePort = 'GigabitEthernet 1/4'
ShowFlexlinksConfig_Output.displayFlexlinksConfigResp[0].backupState = 'Active Up/Backup
Standby'
ShowFlexlinksConfig_Output.displayFlexlinksConfigResp[0].macUpdateEnabled = 'enabled'

(FlexlinksPortType)# showFlexlinksConfig commit
ShowFlexlinksConfig_Output.displayFlexlinksConfigResp[0].backupPort = 'GigabitEthernet 1/6'
ShowFlexlinksConfig_Output.displayFlexlinksConfigResp[0].activePort = 'GigabitEthernet 1/4'
ShowFlexlinksConfig_Output.displayFlexlinksConfigResp[0].backupState = 'Active Up/Backup
Standby'
```

```
ShowFlexlinksConfig_Output.displayFlexlinksConfigResp[0].macUpdateEnabled = 'enabled'

ShowFlexlinksConfig Commit Success!!!(FlexlinksPortType)#
Commit Success!!!(FlexlinksPortType)#
```

Enabling macMoveupdate on Active Port

DETAILED STEPS

	Command or Action	Purpose
Step 1	**FlexlinksPortType** **Example:** `Switch# FlexlinksPortType`	Enters the FlexlinksPortType mode to provision Flex Links.

Step 2	**macMoveUpdatePortConfig macMoveUpdateConfig** { **llagGroupId** *llagGroup-Id* | **mmuEnabled** { **enable|disable** } | **portNumber** *portNumber* }
	
	Example:
	`Switch(FlexlinksPortType)# macMoveUpdatePortConfig macMoveUpdateConfig`
	`Switch(FlexlinksPortType)# macMoveUpdatePortConfig macMoveUpdateConfig llagGroup id 2`
	`Switch(FlexlinksPortType)# macMoveUpdatePortConfig macMoveUpdateConfig portNumber 4`
	`Switch(FlexlinksPortType)# macMoveUpdatePortConfig macMoveUpdateConfig mmuEnabled enable`
		Displays the macMoveUpdateConfig mode.
		Note User can enable macMoveUpdate, only after flex link is configured.
		• **llagGroupId—** Configures llag as an active port in flex link. The range is from 1-4
		• **portNumber—** Configures port number in flex link. The range is from 1-124
		• **mmuEnabled—**Updates the MAC Move Transmitr in flex link to either enale o disable.

Step 3	**macMoveUpdatePortConfig review** **Example:** `Switch(FlexlinksPotType)# macMoveUpdatePortConfig review`	Displays the macMoveUpdatePortConfig commands.
Step 4	**macMoveUpdatePortConfig commit** **Example:** `Switch(FlexlinksPotType)# macMoveUpdatePortConfig commit`	Sends the macMoveUpdatePortConfig commands to the NID.
Step 5	**exit** **Example:** `Switch(FlexLinksPortType)# exit`	Exits the Flex Links mode.

Viewing macMoveUpdate Active Port Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**FlexlinksPortType** **Example:** `Switch# FlexlinksPortType`	Enters FlexlinksPortType mode to provision Flex Links.
Step 2	**getMACMoveUpdateConfiggetFlexlinkConfigRequestport**{**llagGroupId**|**phyPortId**} **Example:** `Switch(FlexlinksPortType)# getMACMoveUpdateConfig getFlexlinkConfigRequest port phyPortId 4`	• **port—** Displays the targeted active port. • **llagGroupID—** Displays the active llagGroupID number. • **phyPortId—** Displays the active physical port number.
Step 3	**getMACMoveUpdateConfig review** **Example:** `Switch(FlexlinksPotType)# getMACMoveUpdateConfig review`	Displays the ports for Flexlink configuration.
Step 4	**getMACMoveUpdateConfig commit** **Example:** `Switch(FlexlinksPotType)# getMACMoveUpdateConfig review`	Sends the Flexlink configuration to the NID.
Step 5	**exit** **Example:** `Switch(FlexLinksPortType)# exit`	Exits the Flex Links provisioning mode.

Configuration Example

The example shows the flexlink configuration in active ports.

```
Switch# FlexlinksPortType
Switch(FlexlinksPortType)# getMACMoveUpdateConfig getFlexlinkConfigRequest port phyPortId
4
(FlexlinksPortType)# getMACMoveUpdateConfig review

Commands in queue: 1

getMACMoveUpdateConfig getFlexlinkConfigRequest port phyPortId 4
(FlexlinksPortType)# getMACMoveUpdateConfig commit
GetMACMoveUpdateConfig_Output.macMoveUpdateConfig._choice1.t = 1
GetMACMoveUpdateConfig_Output.macMoveUpdateConfig._choice1.u.portNumber = 4
GetMACMoveUpdateConfig_Output.macMoveUpdateConfig.mmuEnabled = true

GetMACMoveUpdateConfig Commit Success!!!(FlexlinksPortType)#
```

CHAPTER 30

Configuring Y.1564

This document describes the Y.1564 test feature and configuration steps to execute Y.1564 feature.

Prerequisites for Configuring Y.1564

- You must disable:
  - Link Layer Discovery Protocol (LLDP) transmit and receive on source port.
  - Loop protection on destination port or Spanning Tree Protocol (STP) on destination and source port.
  - Spanning Tree Protocol (STP).
- NID must have an IP address.
- Loop should not be configured.

Information About Y.1564

ITU-T Y.1564 (Or sometimes called Y.156sam or EtherSAM - Ethernet Service Activation Methodology) is a QoS and network performance ITU-T Ethernet-based service test methodology. This testing procedure tests service turn-up, installation and troubleshooting of Ethernet-based services.

Y.1564 allows simultaneous testing of multiple Ethernet services and measures. It also validates the different QoS mechanisms provisioned in the network to prioritize different service types - allowing faster deployment, easier service and network troubleshooting.

Y.1564 allows simultaneous testing of multiple Ethernet services and measures. It also validates the different QoS mechanisms provisioned in the network to prioritize different service types - allowing faster deployment, easier service and network troubleshooting.

Configuring New Y.1564 Profile

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ciscoY1564** **Example:** `Switch# ciscoY1564`	Enters ciscoY1564 configuration mode.

Step 2	**setY1564Profile y1564ProfileProfile name|description|acceptable-fdv** *acceptable-gdv*|**acceptable-flr** *acceptable-flr*|**acceptable-ftd** *acceptable-ftd* | **cir-test** {**dm-interval** *dm-interval* |**duration** *duration* | **step-count** *step-count* | **start** { **enable** | **disable** } } | **dst-oam- aware** { **enable** | **disable** } | **dwell-time** *dwell-time* | **eir-test** { **enable** | **disable** } | **meg-level** *meg-level duration* | **performance-test** { **enable** | **disable** } | **traffic-policing-test** { *dm-interval* | **duration** } | } **traffic-type** { **customer-simulated** | **oam** } | **emix** | **user-defined-frame-size** }
	
	Example:
	`Switch(ciscoY1564)# setY1564Profile y1564Profile profileName`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile description`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile acceptable-fdv 0-10000`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile acceptable-flr 0-1000`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile acceptable-ftd 0-10000`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile cir-test start enable`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile cir-test dm-interval 100-10000`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile cir-test duration <cr>`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile cir-test step-count 1-1000`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile dst-oam-aware enable`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile dwell-time 100-10000`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile eir-test enable`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile meg-level 0-7`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile performance-test enable`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile traffic-policing-test dm-interval 100-10000`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile traffic-policing-test duration <cr>`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile traffic-policing-test duration start enable`
		• **profileName—** Enter the name of the profile for Y1564 .
		• **description—** Enter a brief description about the profile .
		• **acceptable-fdv—** Enter frame delay variation in milliseconds to configure Y1564. Acceptable limit is 0-10000. The default value is 0, which disables the test.
		• **acceptable-flr—** Enter frame loss ratio per mile to configure Y1564. Acceptable limit is 0-1000. The default value is 0 and 1000 disables the test.
		• **acceptable-ftd—** Enter frame transfer delay in milliseconds to configure Y1564. Acceptable limit is 0-10000.Acceptable limit is 0-10000. The default value is 0, which disables the test.
		• **cir-test—** Enter frame delay variation in milliseconds to configure Y1564. Acceptable limit is 0-10000.
		◦ **dm-interval—** Enter the interval of between sending delay measurement frame. Acceptable limit is 100-10000.
		◦ **duration—** Enter the duration of one step.
		◦ **step-count—** Enter the number of steps to configure CIR. Acceptable limit is 1-1000
		◦ **start—**Enter enable or disable to configure CIR test.
		• **dst-oam-aware—** Enter enable or disable to configure remote end Y.1731 OAM aware.
		• **dwell-time—** Enter the time frame of execution, pauses in milliseconds after each trial before reading counters, and status from hardware. Acceptable limit is 100-10000. Default value is 500.
		• **eir-test—** Enter EIR configuration test and optionally set its parameters to configure Y1564. Parameters are dm-interval, duration and start.

	Command or Action	Purpose

	`Switch(ciscoY1564)# setY1564Profile y1564Profile traffic-type`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile traffic-type customer-simulated <cr>`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile traffic-type oam <cr>`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile emix`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile e emix U`
	`Switch(ciscoY1564)# setY1564Profile y1564Profile user-defined-frame-size 10000`
		• **meg-level—** Enter the profile MEG level to configure Y1564 . Acceptable limit is 0-7.
		• **performance-test—** Enter the performance test parameters.
		◦ **dm-interval—** Enter the time interval in milliseconds between sending delay measurement frame. Acceptable limit is 100-10000.
		◦ **duration—** Enter the duration of performance test.
		◦ **start—**Enter enable or disable to start the performance test.
		• **traffic-policing-test—** Enter the traffic policing test parameters..
		◦ **dm-interval—** Enter the time interval in milliseconds between sending delay measurement frame. Acceptable limit is 100-10000.
		◦ **duration—** Enter the duration of traffic policing test.
		◦ **start—**Enter enable or disable to start the traffic policing test.
		• **traffic-type—** Enter the type of traffic generated at the near end.
		◦ **customer-simulated—** Enter the frames that simulate real customer traffic as background traffic.
		◦ **oam—** Enter the duration of traffic policing test.
		• **emix—** select the frame size(EMIX letter-encoded) that the enabled tests will use. Encoding is as follows: a: 64, b: 128, c: 256, d: 512, e: 1024,f: 1280, g: 1518, h: MTU, u: user-defined.
		• **user-defined-frame-size—** Enter the frame size if emix is set to 'U'. Acceptable limit is 64-10236

Step 3	**review** **Example:** `Switch(ciscoY1564)# setY1564Profile review`	Reviews the ciscoY1564 profile configuration parameters.
Step 4	**commit** **Example:** `Switch(ciscoY1564)# setY1564Profile commit`	Sends the ciscoY1564 profile parameters to the NID.

	Command or Action	Purpose
Step 5	**exit** **Example:** `Switch(ciscoY1564)# exit`	Exits ciscoY1564 profile configuration mode.

Getting the Profile Configuration using Profile Name

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ciscoY1564** **Example:** `Switch# ciscoY1564`	Enters ciscoY1564 configuration mode.
Step 2	**getY1564ProfilegetY1564ProfileReq** **Example:** `Switch(ciscoY1564)# getY1564Profile getY1564ProfileReq`	Retrieves the Profile configuration.
Step 3	**getY1564Profilereview** **Example:** `Switch(ciscoY1564)# getY1564Profile review`	Displays the Y.1564 profile configuration.
Step 4	**getY1564Profilecommit** **Example:** `Switch(ciscoY1564)# getY1564Profile commit`	Sends the Y.1564 profile configuration information to the NID.
Step 5	**exit** **Example:** `Switch(ciscoY1564)# exit`	Exits ciscoY1564 profile configuration mode.

The following example shows the Profile Configuration using the Profile Name:

```
Switch# getY1564Profile commit
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.profileName = 'cisco123456'
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.description = 'oamunaware'
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.acceptable_fdv = 0
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.acceptable_ftd = 0
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.acceptable_flr = 0
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.dst_oam_aware = false
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.dwell_time = 500
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.emix = '1024'
```

```
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.meg_level = 7
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.traffic_type.t = 1
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.traffic_type.u.oam = '0'
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.user_defined_frame_size = 2000
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.cir_test.start = true
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.cir_test.duration = 60
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.cir_test.dm_interval = 500
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.cir_test.step_count = 4
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.eir_test.start = true
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.eir_test.duration = 60
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.eir_test.dm_interval = 500
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.performance_test.start = true
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.performance_test.duration = 10
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.performance_test.dm_interval = 100
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.traffic_policing_test.start = true
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.traffic_policing_test.duration =
10
GetY1564Profile_Output.y1564Profile.y1564Profile_ELEM_0.traffic_policing_test.dm_interval
= 100

 GetY1564Profile Commit Success
```

Viewing Profile Names

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ciscoY1564** **Example:** `Switch# ciscoY1564`	Enters ciscoY1564 configuration mode.
Step 2	**showY1564showY1564Req**{**profiles**|**reports**} **Example:** `Switch(ciscoY1564)# showY1564 showY1564Req`	Displays existing profiles or report information.
Step 3	**showY1564review** **Example:** `Switch(ciscoY1564)# showY1564 review`	Displays the profile configurations.
Step 4	**exit** **Example:** `Switch(ciscoY1564)# exit`	Exits ciscoY1564 profile configuration mode.

The following example shows the configurations to display a particular Profiles using the profile name or description:

```
Switch(ciscoy1564)#showY1564 commit
ShowY1564_Output.showY1564Resp.t = 1
ShowY1564_Output.showY1564Resp.u.profile[0].profileName = 'NewProfile1'
ShowY1564_Output.showY1564Resp.u.profile[0].description = ''
ShowY1564_Output.showY1564Resp.u.profile[1].profileName = 'cisco123456'
ShowY1564_Output.showY1564Resp.u.profile[1].description = 'oamunaware'
ShowY1564 Commit Success
```

Managing Y.1564 Profile Names

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ciscoY1564** **Example:** `Switch# ciscoY1564`	Enters ciscoY1564 configuration mode.

Step 2	**y1564ProfileManagement|old-y1564ProfileManagmentReq**{**delete|rename**{**new-name|old-name**}}
	
	Example:
	`Switch(ciscoY1564)# y1564ProfileManagement y1564ProfileManagmentReq rename old-name cisco123456`
	`Switch(ciscoY1564)# y1564ProfileManagement y1564ProfileManagmentReq rename new-name cisco`
	`Switch(ciscoY1564)# y1564ProfileManagement y1564ProfileManagmentReq delete cisco`
		• **rename—**Set rename to rename a old profile name.
		• **delete—**Set delete to delete an existing profile.

Step 3	**review** **Example:** `Switch(ciscoY1564)# y1564ProfileManagement review`	Reviews the ciscoY1564 profile names.
Step 4	**commit** **Example:** `Switch(ciscoY1564)# y1564ProfileManagement commit`	Sends the changed or deleted ciscoY1564 profile names to the NID .
Step 5	**exit** **Example:** `Switch(ciscoY1564)# exit`	Exits ciscoY1564 profile configuration mode.

Configuring Y.1564 Test Parameters

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ciscoY1564** **Example:** `Switch# ciscoY1564`	Enters ciscoY1564 configuration mode.

	Command or Action	Purpose

Step 2	**setY1564TestParamsy1564TestsReq** { **dei**|**description** |**dscp**|**ece** | **evc** | **interface** | **pcp** | **peer-mac** | **profile-name** | **report-name** | **vlan** *vlan-id* }
	
	Example:
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq profile-name cisco123456`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq report-name controllerreport123456`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq description dstmodeno`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq evc 1`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq ece 1`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq interface 3`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq peer-mac 00-00-00-00-00-01`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq pcp 2`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq vlan untagged`
	`Switch(ciscoY1564)# setY1564TestParams y1564TestsReq dei 0`
	`Switch(ciscoY1564)# setY1564TestParams review`
	`Switch(ciscoY1564)# setY1564TestParams commit`
		• **dei—** Enter the DEI number of the profile. The valid range is 0-1.
		• **description—** Enter the description about the test.
		• **dscp—** Enter the DSCP number of the profile. The valid range is 0-63.
		• **ece—** Enter the ECE ID number of the profile, on which the test needs to be executed. The valid range is 1-1024.
		• **evc—** Enter the EVC ID number of the profile. The valid range is 1-1024.
		• **interface—** Enter the UNI port. The valid range is 1-125.
		• **pcp—** Enter the PCP number of the profile. The valid range is 0-7.
		• **peer-mac—** Enter peer MAC address.
		• **profile-name—** Enter the name of the existing profile, that needs to be tested.
		• **report-name—** Enter a unique name for the test report.
		• **vlan—** Enter the Vlan ID.

Step 3	**review** **Example:** `Switch(ciscoY1564)# setY1564TestParams review`	Reviews the ciscoY1564 profile test parameters.
Step 4	**commit** **Example:** `Switch(ciscoY1564)# setY1564TestParams commit`	Sends the test parameter reports to the NID.
Step 5	**exit** **Example:** `Switch(ciscoY1564)# exit`	Exits ciscoY1564 profile configuration mode.

Configuration Example

when profile is configured as DST, then OAM-aware port and peer-mac address need to be specified in setY1564TestParams.

```
Switch# ciscoY1564
Switch(ciscoY1564)# setY1564TestParams y1564TestsReq
```

```
Switch(ciscoY1564)# setY1564TestParams y1564TestsReq profile-name cisco123456
Switch(ciscoY1564)# setY1564TestParams y1564TestsReq report-name controllerreport123456
Switch(ciscoY1564)# setY1564TestParams y1564TestsReq description dstmodeno
Switch(ciscoY1564)# setY1564TestParams y1564TestsReq peer-mac 00-02:01:00:01:03
Switch(ciscoY1564)# setY1564TestParams y1564TestsReq evc 1
Switch(ciscoY1564)# setY1564TestParams y1564TestsReq ece 1
Switch(ciscoY1564)# setY1564TestParams y1564TestsReq interface 3
Switch(ciscoY1564)# setY1564TestParams review
Switch(ciscoY1564)# setY1564TestParams commit
```

Viewing Y.1564 Test Parameters

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ciscoY1564** **Example:** `Switch# ciscoY1564`	Enters ciscoY1564 configuration mode.
Step 2	**getY1564TestParamsgetY1564TestsReq** **Example:** `Switch(ciscoY1564)# getY1564TestParams getY1564TestsReq`	Retrieves the parameters set for latest tet.
Step 3	**review** **Example:** `Switch(ciscoY1564)# getY1564TestParams review`	Reviews the ciscoY1564 profile configuration parameters.
Step 4	**commit** **Example:** `Switch(ciscoY1564)# getY1564TestParams commit`	Sends the test parameter reports to the NID.
Step 5	**exit** **Example:** `Switch(ciscoY1564)# exit`	Exits ciscoY1564 profile configuration mode.

Saving Y.1564 Test Report

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ciscoY1564** **Example:** `Switch# ciscoY1564`	Enters the ciscoY1564 configuration mode.

	Command or Action	Purpose

Step 2	**y1564ReportManagement y1564ReportManagementReqsave|stop**
	
	Example:
	`Switch(ciscoY1564)# y1564ReportManagemen y1564ReportManagementReq save reportName controllerreport`
	`Switch(ciscoY1564)# y1564ReportManagemen y1564ReportManagementReq save tftpPath tftp://202.153.144.25/auto/tftp-blr-users1/sharsh`
		• **Save—**Set save to save a profile test report.
		• **Stop—**Set stop to stop an ongoing profile test .

Step 3	**review** **Example:** `Switch(ciscoY1564)#y1564ReportManagement review`	Reviews the ciscoY1564 profile test report.
Step 4	**commit** **Example:** `Switch(ciscoY1564)#y1564ReportManagement commit`	Sends the ciscoY1564 profile test report to the NID.
Step 5	**exit** **Example:** `Switch(ciscoY1564)# exit`	Exits ciscoY1564 profile configuration mode.

Deleting Y.1564 Test Report

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ciscoY1564** **Example:** `Switch# ciscoY1564`	Enters the ciscoY1564 configuration mode.
Step 2	**y1564ReportManagement y1564ReportManagementReq**{**delete**|**stop**} **Example:** `Switch(ciscoY1564)# y1564ReportManagemen y1564ReportManagementReq delete controlerreport`	• **delete—**Set delete to delete an existing profile test report. • **Stop—**Set stop to stop an ongoing profile test .
Step 3	**review** **Example:** `Switch(ciscoY1564)# y1564ReportManagement review`	Reviews the ciscoY1564 profile test report.

	Command or Action	Purpose
Step 4	**commit** **Example:** `Switch(ciscoY1564)# y1564ReportManagement commit`	Sends the ciscoY1564 profile test report to the NID.
Step 5	**exit** **Example:** `Switch(ciscoY1564)# exit`	Exits ciscoY1564 profile configuration mode.

CHAPTER 31

Configuring LST

This chapter describes how to configure Link State Tracking on theCisco ME 1200 NID

Prerequisites for Configuring LST

- Configure UP MEP using ProvisionMepPortType template. To know more, refer creating MEP configuration.
- Configure ccmTLV in UP MEP in LSTPortType template.

Note While configuring UP MEP, the ports should be of same VLAN.

Understanding How Link State Tracking Works

Link-state tracking, also known as trunk failover, is a feature that binds the link state of multiple interfaces. When LST is enabled in an instance, Local SF or received 'isDown' in CCM Interface Status TLV, will bring down the residence port. Only valid in Up-MEP. The CCM rate must be 1 f/s or faster.

Configuring mepTLV

DETAILED STEPS

	Command or Action	Purpose
Step 1	**LSTPortType** **Example:** `Switch# LSTPortType`	Enters LST Port Type configuration mode.
Step 2	**mepTLVConfiguration** **Example:** `Switch(LSTPortType)# mepTLVConfiguration`	Enters mepTLVConfiguration mode.

Step 3	**ccmTLVConfigccmEnabled**{**enable**|**disable**}
	
	Example:
	`Switch(LSTPortType)# mepTLVConfiguration`
	`Switch# mepTLVConfiguration ccmTLVConfig ccmEnabled enable`
		Enables or Disables ccmTLVConfig.

Step 4	**mepTLVConfigurationccmTLVConfigmepInstance***mepInstance_id*
	
	Example:
	`Switch(LSTPortType)# mepTLVConfiguration`
	`Switch(LSTPortType)# mepTLVConfiguration ccmTLVConfig mepInstance 1-100`
		Creates Link State Tracking Configuration at MEP instance number. The valid number is 1 to 100.

Step 5	**mepTLVConfiguration review** **Example:** `Switch(LSTPortType)# mepTLVConfiguration review`	Reviews the mepTLVConfiguration mode.
Step 6	**mepTLVConfiguration commit** **Example:** `Switch(LSTPortType)# mepTLVConfiguration commit`	Sends the mepTLVConfiguration to the NID.
Step 7	**exit** **Example:** `Switch(LSTPortType)# exit`	Exits the LSTPortType mode.

Checking ccmTLV Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**LSTPortType** **Example:** `Switch# LSTPortType`	Enters LST Port Type configuration mode.

Step 2	**LinkStateTrackingConfigurationlinkStateTrackingConfigmepInstance***mepInstance_id*
	
	Example:
	`Switch(LSTPortType)# LinkStateTrackingConfiguration`
	`Switch(LSTPortType)# LinkStateTrackingConfiguration`
	`linkStateTrackConfig mepInstance 1-100`
		Creates Link State Tracking Configuration at MEP instance number. The valid number is 1 to 100.

Step 3	**getmepTLVConfiguration review** **Example:** `Switch(LSTPortType)# getmepTLVConfiguration review`	Reviews the mepTLVConfiguration mode.
Step 4	**getmepTLVConfiguration commit** **Example:** `Switch(LSTPortType)# getmepTLVConfiguration commit`	Sends the mepTLVConfiguration to the NID.

Configuring LST

DETAILED STEPS

	Command or Action	Purpose
Step 1	**LSTPortType** **Example:** `Switch# LSTPortType`	Enters LST Port Type configuration mode.
Step 2	**LinkStateTrackingConfiguration** **Example:** `Switch(LSTPortType)# LinkStateTrackingConfiguration`	Enters LinkStateTrackingConfiguration mode.

	Command or Action	Purpose

Step 3	**LinkStateTrackingConfigurationlinkStateTrackingConfigmepInstance***mepInstance_id*
	
	Example:
	`Switch(LSTPortType)# LinkStateTrackingConfiguration`
	`Switch(LSTPortType)# LinkStateTrackingConfiguration linkStateTrackConfig mepInstance 1-100`
		Creates Link State Tracking Configuration at MEP instance number. The valid number is 1 to 100.

Step 4	**LinkStateTrackingConfigurationlinkStateTrackingConfiglstEnabled**{**disable**|**enable**}
	
	Example:
	`Switch(LSTPortType)# LinkStateTrackingConfiguration`
	`Switch(LSTPortType)# LinkStateTrackingConfiguration linkStateTrackConfig lstEnabled enable/disable`
		Sets up LSTPortType configuration.
		• enable- Enables the LST configuration on the ports.
		• disable- Disables the LST configuration on the ports.

Step 5	**LinkStateTrackingConfiguration review** **Example:** `Switch(LSTPortType)# LinkStateTrackingConfiguration review`	Reviews the LinkStateTrackingConfiguration mode.
Step 6	**LinkStateTrackingConfiguration commit** **Example:** `Switch(LSTPortType)# LinkStateTrackingConfiguration commit`	Sends the LinkStateTrackingConfiguration to theNID.
Step 7	**exit** **Example:** `Switch(LSTPortType)# exit`	Exits the LSTPortType mode.

Checking LST Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**LSTPortType** **Example:** `Switch# LSTPortType`	Enters LST Port Type configuration mode.
Step 2	**getLSTConfiguration** **Example:** `Switch(LSTPortType)# getLSTConfiguration`	Gets the link state tracking configuration response.

	Command or Action	Purpose

Step 3	**getLSTConfigurationmepInstance***mepInstance_id*
	
	Example:
	`Switch(LSTPortType)#getLSTConfiguration`
	`Switch(LSTPortType)#getLSTConfiguration mepInstance 1-100`
		Creates Link State Tracking Configuration at MEP instance number. The valid number is 1 to 100.

Step 4	**getLSTConfiguration review** **Example:** `Switch(LSTPortType)# getLSTConfiguration review`	Reviews the LSTConfiguration mode.
Step 5	**getLSTConfiguration commit** **Example:** `Switch(LSTPortType)# getLSTConfiguration commit`	Sends the LSTConfiguration mode to the NID.

Viewing LST Configuration

DETAILED STEPS

	Command or Action	Purpose
Step 1	**LSTPortType** **Example:** `Switch# LSTPortType`	Enters LST Port Type configuration mode.
Step 2	**displayLSTConfiguration** **Example:** `Switch(LSTPortType)# displayLSTConfiguration`	Displays the link state tracking configuration response.

Step 3	**displayLSTConfigurationmepInstance***mepInstance_id*
	
	Example:
	`Switch(LSTPortType)# displayLSTConfiguration`
	`Switch(LSTPortType)# displayLSTConfiguration mepInstance 1-100`
		Displays Link State Tracking Configuration at MEP instance number. The valid number is 1 to 100.

Step 4	**displayLSTConfiguration review** **Example:** `Switch(LSTPortType)# displayLSTConfiguration review`	Display the LSTConfiguration mode.

	Command or Action	Purpose
Step 5	**displayLSTConfiguration commit** **Example:** `Switch(LSTPortType)# displayLSTConfiguration commit`	Display the LSTConfiguration mode in the NID.

CHAPTER 32

Configuring Security Access Control Lists

This chapter describes how to configure security access control lists (ACLs) on your Cisco ME 1200 NID. ACLs provide basic security for your network by filtering traffic and controlling network connections.

Creating Access Control Entry

SUMMARY STEPS

1. **SECURITYACL**
2. **setACLGlobalConfig ace-global-config { ace-id | ace-enable {enable | disable} | action { deny | Permit | filter{ any | intf-range} } | dot1q-tag { any | tagged | untagged} | evc-policer { disable | policer-id} | frame-type { any | arp { arp-req-rep { any | reply | request} | arp-sender-mac-match { any | value} | arp-type {any | arp | other | rarp} | ethernet { any | value} | ip { any | value } ip-length { any | value } rarp-target-mac-match { any | value } sip-filter { any | ip-subnet } tip-filter { any | ip-subnet} | ethernet-type { dmac-filter { any | dmac-type | specific} | ethertype-filter { any | specific} | smac-filter { any | specific } | ipv4 { dip-filter { any | ipv4-subnet} | dmac-filter { dmac-type} | ip-protocol-filter { icmp { code-filter { any | code-value} |ip-fragment { value | any} | ip-option { value | any } | ip-ttl { value | any} type-filter { any | type-value } | other { any | ip-protocol-value} | tcp { dest-port-filter { any | port-number | range} | ip-fragment { value | any} | ip-option { value | any} | ip-ttl { value | any} | src-port-filter { any | port-number | range } | tcp-ack { value | any} | tcp-fin { value | any} | tcp-psh { value | any} | tcp-rst { value | any} | tcp-rst { value | any} | tcp-syn { value | any} | tcp-urg { value | any} }| udp { dest-port-filter { any | port-number | range} | ip-fragment { value | any} | ip-option { value | any} | ip-ttl { value | any} | src-port-filter { any | port-number | range } | sip-filter { ipv4-subnet | any}| ipv6 { dmac-filter { dmac-type}| hop-limit { any | value} | ip-protocol-filter { icmp { code-filter | type-filter} | other { next-header-value} | tcp { dest-port-filter { any | port-number | range} | ip-ttl { value | any} | src-port-filter { any | port-number | range } | tcp-ack { value | any} | tcp-fin { value | any} | tcp-psh { value | any} | tcp-rst { value | any} | tcp-rst { value | any} | tcp-syn { value | any} | tcp-urg { value | any} | udp { dest-port-filter { any | port-number | range} | src-port-filter { any | port-number | range} } | sip-filter { any | specific}} | ingress-port { any | intf-range} | logging { enable | disable } mirror { enable | disable } next { disable | last | next-ace-id} policy-filter { any | policy-value} | rate-limiter { disable| value} | shutdown { enable | disable } | tag-priority { any | value } vid { any | vlan-type} }**
3. **setaclglobalconfig review**
4. **setaclglobalconfig commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**SECURITYACL** **Example:** `Switch# SECURITYACL`	Enters the SecurityACL mode.
Step 2	**setACLGlobalConfig ace-global-config { ace-id | ace-enable {enable | disable} | action { deny | Permit | filter{ any | intf-range} } | dot1q-tag { any | tagged | untagged} | evc-policer { disable | policer-id} | frame-type { any | arp { arp-req-rep { any | reply | request} |**	Applies the ACL global configuration. • **ace-enable—**Specifies the port number. ◦ —port number. The range is from 1 to 6.

	Command or Action	Purpose
	arp-sender-mac-match { **any** | **value**} | **arp-type** {**any** | **arp** | **other** | **rarp**} | **ethernet** { **any** | **value**} | **ip** { **any** | **value** } **ip-length** { **any** | **value** } **rarp-target-mac-match** { **any** | **value** } **sip-filter** { **any** | **ip-subnet** } **tip-filter** { **any** | **ip-subnet**} | **ethernet-type** { **dmac-filter** { **any** | **dmac-type** | **specific**} | **ethertype-filter** { **any** | **specific**} | **smac-filter** { **any** | **specific** } | **ipv4** { **dip-filter** { **any** | **ipv4-subnet**} | **dmac-filter** { **dmac-type**} | **ip-protocol-filter** { **icmp** { **code-filter** { **any** | **code-value**} |**ip-fragment** { **value** | **any**} | **ip-option** { **value** | **any** } | **ip-ttl** { **value** | **any**} **type-filter** { **any** | **type-value** } | **other** { **any** | **ip-protocol-value**} | **tcp** { **dest-port-filter** { **any** | **port-number** | **range**} | **ip-fragment** { **value** | **any**} | **ip-option** { **value** | **any**} | **ip-ttl** { **value** | **any**} | **src-port-filter** { **any** | **port-number** | **range** } | **tcp-ack** { **value** | **any**} | **tcp-fin** { **value** | **any**} | **tcp-psh** { **value** | **any**} | **tcp-rst** { **value** | **any**} | **tcp-rst** { **value** | **any**} | **tcp-syn** { **value** | **any**} | **tcp-urg** { **value** | **any**} }| **udp** { **dest-port-filter** { **any** | **port-number** | **range**} | **ip-fragment** { **value** | **any**} | **ip-option** { **value** | **any**} | **ip-ttl** { **value** | **any**} | **src-port-filter** { **any** | **port-number** | **range** } | **sip-filter** { **ipv4-subnet** | **any**}| **ipv6** { **dmac-filter** { **dmac-type**}| **hop-limit** { **any** | **value**} | **ip-protocol-filter** { **icmp** { **code-filter** | **type-filter**} | **other** { **next-header-value**} | **tcp** { **dest-port-filter** { **any** | **port-number** | **range**} | **ip-ttl** { **value** | **any**} | **src-port-filter** { **any** | **port-number** | **range** } | **tcp-ack** { **value** | **any**} | **tcp-fin** { **value** | **any**} | **tcp-psh** { **value** | **any**} | **tcp-rst** { **value** | **any**} | **tcp-rst** { **value** | **any**} | **tcp-syn** { **value** | **any**} | **tcp-urg** { **value** | **any**} | **udp** { **dest-port-filter** { **any** | **port-number** | **range**} | **src-port-filter** { **any** | **port-number** | **range**} } | **sip-filter** { **any** | **specific**}} | **ingress-port** { **any** | **intf-range**} | **logging** { **enable** | **disable** } **mirror** { **enable** | **disable** } **next** { **disable** | **last** | **next-ace-id**} **policy-filter** { **any** | **policy-value**} | **rate-limiter** { **disable**| **value**} | **shutdown** { **enable** | **disable** } | **tag-priority** { **any** | **value** } **vid** { **any** | **vlan-type**} }	• **ace-id** —Specify a valid ACE ID. The available options are from 1-512. • **action** —Specify the action to take with a frame that hits this ACE. ◦ **permit** —The frame that hits this ACE is granted permission for the ACE operation. ◦ **deny** —The frame that hits this ACE is dropped. ◦ **filter** —Frames matching the ACE are filtered . • **dot1q-tag** —Specifies tagging. • **evc-policer** —Select whether EVC policer is enabled or disabled. The default value is "Disabled". Note that the ACL rate limiter and EVC policer can not both be enabled. If enabled, specify the EVC policer ID. You can specify EVC policer Id from 1-1022 • **frame-type**— Select the frame type for this ACE. These frame types are mutually exclusive. ◦ **any** —Any frame can match this ACE. ◦ **ethernet-type** —Only Ethernet Type frames can match this ACE. The available options are : ◦ **dmac-filter**—Specifies destination MAC address field. Available values are any, dmac-type and specific. ◦ **ethertype-filter**—Specifies Etype value. Available values are any and specific. ◦ **smac-filter**—Specifies source MAC address field. ◦ **arp** —Only ARP frames can match this ACE. Notice the ARP frames won't match the ACE with ethernet type. ◦ **arp-req-rep**—Specifies request or reply. Available options are any, request or reply. ◦ **arp-sender-mac-match**—Specifies arp sender MAC match. Available options are any or value 0-1. ◦ **arp-type**—Specifies ARP parameters. Available options are any, arp, other, and rarp. ◦ **ethernet**—Specifies Ethernet value. Available options are any or value 0-1. ◦ **ip**—Specifies IP value. Available options are any or value 0-1.

Command or Action	Purpose

Example:
`Switch(SecurityACL)# setaclglobalconfig ace-global-config ?`
`  ace-enable     Enable or disable ACE`
`  ace-id         ACE ID`
`  action         Access list action`
`  dot1q-tag      Tag`
`  evc-policer    EVC policer`
`  frame-type     Frame Type`
`  ingress-port   Ingress port`
`  logging        Logging frame information`
`  lookup         Second lookup`
`  mirror         Mirror frame to destination mirror port`
`  next           insert the current ACE before the next ACE ID`
`  policy-filter  Policy`
`  rate-limiter   Rate Limiter`
`  shutdown       Shutdown incoming port`
`  tag-priority   Tag priority`
`  vid            VID field`
	◦ **ip-length—**Specifies IP or Ethernet length value. Available options are any or value 0-1.
	◦ **rarp-target-mac-match—**Specifies rarp target mismatch. Available options are any or value 0-1.
	◦ **sip-filter—**Specifies source IP address field. Available options are any or **ip-subnet**. IP Subnet specify the host IP address and mask.
	◦ **tip-filter—**Specifies target IP address field. Available options are any or **ip-subnet**. IP Subnet specify the host IP address and mask.
	◦ **ipv4 —**Only ipv4 frames can match this ACE. Notice the ipv4 frames won't match the ACE with ethernet type.
	  ◦ **dip-filter—**Specifies destination IP address field. Available options are any or **ipv4-subnet**. IP Subnet specify the host IP address and mask.
	  ◦ **dmac-filter—**Specifies destination MAC address field. DMAC type includes, any/unicast/multicast/broadcast.
	  ◦ **ip-protocol-filter—**Specifies IP protocol filter.
	    ◦ **icmp—**Specifies frame type of IPv6 ICMP. You can configure code-filter, IP-fragment field, IP option field, IP TTL field and ICMP type field.
	    ◦ **other—**Specifies protocol value. Allowed range is 0,2-5,7-16,18-255 .
	    ◦ **tcp—**Specifies frame type of IPv6 TCP. You can configure following parameters :
	      ◦ dest-port-filter — TCP destination port field
	      ◦ ip-fragment — IP fragment field
	      ◦ ip-option — IP option fiield
	      ◦ ip-ttl —IP TTL field
	      ◦ src-port-filter —TCP source port field
	      ◦ tcp-ack —TCP ack field
	      ◦ tcp-fin —TCP fin field
	      ◦ tcp-psh —TCP psh field
	      ◦ tcp-rst— TCP rst field
	      ◦ tcp-syn— TCP syn field
	      ◦ tcp-urg —TCP urg field

	Command or Action	Purpose
		◦ **udp**—Specifies frame type of IPv6 UDP. You can configure code-filter and type-filter field. ◦ **sip-filter**—Specifies source IP address field. Available options are any or **ipv4-subnet**. IP Subnet specify the host IP address and mask. ◦ **ipv6** —Only ipv6 frames can match this ACE. Notice the ipv6 frames won't match the ACE with ethernet type. ◦ **dmac-filter**—Specifies destination MAC address field. Available values are any/unicast/multicast/broadcast. ◦ **hop-limit**—Specifies hop limit value. Available values are any and value ranges from 0-1. ◦ **ip-protocol--ilter**—Specifies IP protocol filter. ◦ **icmp**—Specifies frame type of IPv6 ICMP. You can configure code-filter and type-filter field. ◦ **other**—Specifiesnext-header-value value. Allowed range is 0-65535 . ◦ **tcp**—Specifies frame type of IPv6 TCP. You can configure following parameters : ◦ dest-port-filter — TCP destination port field ◦ src-port-filter —TCP source port field ◦ tcp-ack —TCP ack field ◦ tcp-fin —TCP fin field ◦ tcp-psh —TCP psh field ◦ tcp-rst— TCP rst field ◦ tcp-syn— TCP syn field ◦ tcp-urg —TCP urg field ◦ **udp**—Specifies frame type of IPv6 UDP. You can configure dest-port-filter and src-port-filter. • **ingress-port**—Select the ingress port for which this ACE applies. ◦ **any** —No policy filter is specified. (policy filter status is "don't-care".) ◦ **intf-range** —If you want to filter a specific policy with this ACE, choose this value. Two field for entering an policy value

	Command or Action	Purpose
		and bitmask appears. Select an Interface Number/Range [1-6]/1,2,3,4,5,6 • **logging—**Specify the logging operation of the ACE. Notice that the logging message doesn't include the 4 bytes CRC information. ◦ **enable —**Frames matching the ACE are stored in the System Log. ◦ **disable —**Frames matching the ACE are not logged. **Note** The logging feature only works when the packet length is less than 1518(without VLAN tags) and the System Log memory size and logging rate is limited. • **lookup—**Specify to enable or disable the second lookup operation of the ACE. • **mirror—**Specify the mirror operation of this port. Frames matching the ACE are mirrored to the destination mirror port. The rate limiter will not affect frames on the mirror port. ◦ **enable —**Frames received on the port are mirrored. ◦ **disable —**Frames received on the port are not mirrored. The default value is "Disabled". • **next—**Specify the current ACE before the next ACE ID • **policy-filter—**Specify the policy number filter for this ACE. ◦ **any —**No policy filter is specified. (policy filter status is "don't-care".) ◦ **specific —**If you want to filter a specific policy with this ACE, choose this value. Two field for entering an policy value and bitmask appears. • **rate-limiter—**Specify the rate limiter in number of base units. The allowed range is 1 to 16. Disabled indicates that the rate limiter operation is disabled. • **shutdown—**Specify the port shut down operation of the ACE. ◦ **enable —**If a frame matches the ACE, the ingress port will be disabled. ◦ **disable —**Port shut down is disabled for the ACE. **Note** The shutdown feature only works when the packet length is less than 1518(without VLAN tags). • **tag-priority—**Specifies tag priority.

	Command or Action	Purpose
		• **vid—**Specifies vid. **Note** EVC policer and rate limiter can not be configured at the same time .
Step 3	**setaclglobalconfig review** **Example:** `Switch(SecurityACL)# setaclglobalconfig review`	Displays the configuration.
Step 4	**setaclglobalconfig commit** **Example:** `Switch(SecurityACL)# setaclglobalconfig commit`	Sends the configuration to the controller.
Step 5	**exit** **Example:** `Switch(SecurityACL)# exit`	Exits the ProvisionACL mode.

Configuration Example

```
Switch(SecurityACL)# configure terminal
Switch(setACLGlobalConfig)# ace-global-config ace-id 30
setACLGlobalConfig ace-global-config ace-enable enable
setACLGlobalConfig ace-global-config lookup enable
setACLGlobalConfig ace-global-config lookup enable
setACLGlobalConfig ace-global-config ingress-port intf-range 3-4
setACLGlobalConfig ace-global-config policy-filter policy-value 4
setACLGlobalConfig ace-global-config frame-type ethernet-type dmac-filter specific
00-00-00-00-10-01
setACLGlobalConfig ace-global-config frame-type ethernet-type smac-filter specific
00-00-00-00-20-02
setACLGlobalConfig ace-global-config action permit


setACLGlobalConfig ace-global-config ace-id 30
setACLGlobalConfig ace-global-config ace-enable enable
setACLGlobalConfig ace-global-config lookup enable
setACLGlobalConfig ace-global-config lookup enable
setACLGlobalConfig ace-global-config ingress-port intf-range 3-4
setACLGlobalConfig ace-global-config policy-filter policy-value 4
setACLGlobalConfig ace-global-config frame-type ethernet-type dmac-filter specific
00-00-00-00-10-01
setACLGlobalConfig ace-global-config frame-type ethernet-type smac-filter specific
00-00-00-00-20-02
setACLGlobalConfig ace-global-config action permit
setACLGlobalConfig ace-global-config evc-policer policer-id 10
setACLGlobalConfig ace-global-config mirror disable
setACLGlobalConfig ace-global-config shutdown disable
setACLGlobalConfig ace-global-config logging disable
whales1(config-controller-SecurityACL)#setaclglobalConfig commit
 SetACLGlobalConfig Commit Success!!!

Mac acl rule :

setACLGlobalConfig ace-global-config ace-enable enable
setACLGlobalConfig ace-global-config ace-id 2
```

```
setACLGlobalConfig ace-global-config lookup enable
setACLGlobalConfig ace-global-config ingress-port intf-range 2-5
setACLGlobalConfig ace-global-config policy-filter policy-value 63
setACLGlobalConfig ace-global-config frame-type ethernet-type smac-filter specific
00-00-00-00-00-01
setACLGlobalConfig ace-global-config frame-type ethernet-type dmac-filter any
setACLGlobalConfig ace-global-config frame-type ethernet-type ethertype-filter specific
0xffff
setACLGlobalConfig ace-global-config dot1q-tag tagged
setACLGlobalConfig ace-global-config vid vlan-value 80
setACLGlobalConfig ace-global-config tag-priority value 6-7
setACLGlobalConfig ace-global-config action deny redirect intf-range 6
setACLGlobalConfig ace-global-config evc-policer policer-id 2
setACLGlobalConfig ace-global-config logging enable
setACLGlobalConfig ace-global-config shutdown enable
setACLGlobalConfig ace-global-config mirror enable
setACLGlobalConfig review
setACLGlobalConfig commit


IP acl rule :


setACLGlobalConfig ace-global-config lookup enable
setACLGlobalConfig ace-global-config ace-enable enable
setACLGlobalConfig ace-global-config ace-id 3
setACLGlobalConfig ace-global-config policy-filter policy-value 62
setACLGlobalConfig ace-global-config frame-type ipv4 dip-filter any
setACLGlobalConfig ace-global-config frame-type ipv4 sip-filter ipv4-subnet 10.20.10.2/16
setACLGlobalConfig ace-global-config shutdown enable
setACLGlobalConfig ace-global-config mirror enable
setACLGlobalConfig ace-global-config frame-type ipv4 dmac-filter dmac-type broadcast
setACLGlobalConfig ace-global-config frame-type ipv4 ip-protocol-filter icmp code-filter
code-value 1
setACLGlobalConfig ace-global-config frame-type ipv4 ip-protocol-filter icmp type-filter
type-value 1
setACLGlobalConfig ace-global-config dot1q-tag tagged
setACLGlobalConfig ace-global-config vid vlan-value 100
setACLGlobalConfig ace-global-config tag-priority value 5
setACLGlobalConfig ace-global-config action deny redirect intf-range 5
setACLGlobalConfig ace-global-config evc-policer policer-id 5
setACLGlobalConfig review
setACLGlobalConfig commit

ipv6 :

setACLGlobalConfig ace-global-config ace-enable enable
setACLGlobalConfig ace-global-config ace-id 55
setACLGlobalConfig ace-global-config policy-filter policy-value 63
setACLGlobalConfig ace-global-config ingress-port intf-range 2-3
setACLGlobalConfig ace-global-config frame-type ipv6 sip-filter specific ipv6-address
0:0:0:0:0:0:0:5
setACLGlobalConfig ace-global-config frame-type ipv6 dmac-filter dmac-type unicast
setACLGlobalConfig ace-global-config frame-type ipv6 hop-limit value 1
setACLGlobalConfig ace-global-config frame-type ipv6 ip-protocol-filter icmp code-filter
code-value 1
setACLGlobalConfig ace-global-config frame-type ipv6 ip-protocol-filter icmp type-filter
type-value 1
setACLGlobalConfig ace-global-config action deny redirect intf-range 4
setACLGlobalConfig ace-global-config mirror enable
setACLGlobalConfig ace-global-config rate-limiter value 10
setACLGlobalConfig review
setACLGlobalConfig commit
```

Configuring Rate Limiter

SUMMARY STEPS

1. **setaclrateLimiter**
2. **setaclrateLimiter acl-rate-limiter id | unit| { rate-in-kbps | rate-in-pps}**
3. **setaclrateLimiter review**
4. **setaclrateLimiter commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**setaclrateLimiter** **Example:** `Switch# setaclrateLimiter`	Enters the applyACLtoport mode.

Step 2	**setaclrateLimiter acl-rate-limiter id | unit| { rate-in-kbps | rate-in-pps}**
	
	Example:
	`Switch(SecurityACL)#setaclrateLimiter acl-rate-limiter ?`
	`  id    Rate limiter ID`
	`  unit  Specify Unit and rate value`
		Configure the rate limiter for the of the switch. .
		• **id**—The rate limiter ID for the settings contained in the same row and its range is 1 to 16.
		• **unit** —Specify the rate unit. The allowed values are: pps: packets per second. kbps: Kbits per second.

Step 3	**setaclrateLimiter review** **Example:** `Switch(SecurityACL)# setaclrateLimiter review`	Displays the configuration.
Step 4	**setaclrateLimiter commit** **Example:** `Switch(SecurityACL)# setaclrateLimiter commit`	Sends the configuration to the controller.
Step 5	**exit** **Example:** `Switch(SecurityACL)# exit`	Exits the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# SetACLRateLimiter acl-rate-limiter id 2
Switch(ProvisionACL)# setACLRateLimiter acl-rate-limiter unit rate-in-kbps 10000
```

```
Switch(ProvisionACL)# exit
```

Applying ACL to Ports

SUMMARY STEPS

1. **applyACLtoPort**
2. **applyACLtoPort acl-port-config { action-deny { enable| disable} | evc-policy { enable | evc-policer-id} | logging { enable| disable} | mirror { enable| disable} | policy { enable| policer-id} | port-number | rate-limiter { disable | rate-limiter-id} | redirect { disable| intf-range} | shutdown { enable| disable} }**
3. **applyACLtoPort review**
4. **applyACLtoPort commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**applyACLtoPort** **Example:** `Switch# applyACLtoPort`	Enters the applyACLtoport mode.

Step 2	**applyACLtoPort acl-port-config { action-deny { enable| disable} | evc-policy { enable | evc-policer-id} | logging { enable| disable} | mirror { enable| disable} | policy { enable| policer-id} | port-number | rate-limiter { disable | rate-limiter-id} | redirect { disable| intf-range} | shutdown { enable| disable} }**
	
	Example:
	`Switch(SecurityACL)#applyACLtoPort acl-port-config ?`
	`action-deny   Access list action deny if enabled to true, else permit`
	`evc-policy    EVC policer`
	`logging       Logging frame information.`
	`mirror        Mirror frame to destination mirror port`
	`policy        Policy`
	`port-number   Port Number`
	`rate-limiter  Rate Limiter`
	`redirect      Redirect frame to specific port`
	`shutdown      Shutdown incoming port`
		Configure the ACL parameters of each switch port. These parameters will affect frames received on a port unless the frame matches a specific ACE.
		
		• **action-deny—**Select whether forwarding is permitted ("Permit") or denied ("Deny"). The default value is "Permit".
		  ◦ **enable —**Access list action deny if enabled to true, denies forwarding.
		  ◦ **disable —**Access list action deny if disabled, permits forwarding.
		
		• **evc-policy —**Select which EVC policer ID to apply on this port.
		  ◦ **enable —**Enabling evc-policy disable policer .
		  ◦ **evc-policer-id —**Enter an EVC Policy ID. The The allowed values are Disabled or the values 1 through 1022.
		
		.
		
		• **logging —**Specify the logging operation of this port. Notice that the logging message doesn't include the 4 bytes CRC.
		  ◦ **enable —**Frames received on the port are stored in the System Log.

	Command or Action	Purpose
		◦ **disable** —Frames received on the port are not logged. **Note** The default value is "Disabled". The logging feature only works when the packet length is less than 1518(without VLAN tags) and the System Log memory size and logging rate is limited. • **mirror** —Specify the mirror operation of this port. ◦ **enable** —Frames received on the port are mirrored. ◦ **disable** —Frames received on the port are not mirrored. **Note** The default value is "Disabled". • **policy**—Select which EVC policer ID to apply on this port. ◦ **enable** —Enabling evc-policy disable policy.. ◦ **policy-id** —Enter an EVC Policy ID. The The allowed values are Disabled or the values 0 through 63. • **port-number**—The logical port for the settings contained in the same row. . • **rate-limiter**—Select which rate limiter to apply on this port. The allowed values are Disabled or the values 1 through 16. The default value is "Disabled". • **redirect**—Select which port frames are redirected on. The allowed values are Disabled or a specific port number and it can't be set when action is permitted. The default value is "Disabled". ◦ **disable** —Disable direct. ◦ **intf-range** —Interface number ranges from 1-6. • **shutdown**—Specify the port shut down operation of this port. ◦ **enable** —To reopen ports by changing the volatile port configuration of the ACL user module. ◦ **disable** —To close ports by changing the volatile port configuration of the ACL user module. The default value is "Enabled".
Step 3	**applyACLtoPort review** **Example:** `Switch(SecurityACL)# applyACLtoPort review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**applyACLtoPort commit** **Example:** `Switch(SecurityACL)# applyAclToPort commit`	Sends the configuration to the controller.
Step 5	**exit** **Example:** `Switch(SecurityACL)# exit`	Exits the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# applyACLtoPort acl-port-config port-number 3
applyACLtoPort acl-port-config evc-policy enable enable
applyACLtoPort acl-port-config evc-policy enable enable
applyACLtoPort acl-port-config evc-policy evc-policer-id 55
applyACLtoPort acl-port-config policy enable enable
applyACLtoPort acl-port-config policy policy-id 33


Switch(ProvisionACL)# applyAclToPort commit

    ApplyAclToPort  Commit Success!!!

Switch(ProvisionACL)# exit
```

Viewing Access Control Entry

SUMMARY STEPS

1. **SECURITYACL**
2. **getACLGlobalConfig get-acl-global-config ace-id**
3. **getaclglobalconfig review**
4. **setaclglobalconfig commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**SECURITYACL** **Example:** `Switch# SECURITYACL`	Enters the SecurityACL mode.

	Command or Action	Purpose

Step 2	**getACLGlobalConfig get-acl-global-config ace-id**
	
	Example:
	`Switch(SecurityACL)#setaclglobalconfig ace-global-config ?`
	
	`ace-enable     Enable or disable ACE`
	`ace-id         ACE ID`
	`action         Access list action`
	`dot1q-tag      Tag`
	`evc-policer    EVC policer`
	`frame-type     Frame Type`
	`ingress-port   Ingress port`
	`logging        Logging frame information`
	`lookup         Second lookup`
	`mirror         Mirror frame to destination mirror port`
	`next           insert the current ACE before the next ACE ID`
	
	`policy-filter  Policy`
	`rate-limiter   Rate Limiter`
	`shutdown       Shutdown incoming port`
	`tag-priority   Tag priority`
	`vid            VID field`
		Retrives the ACL global configuration.
		
		• **ace-id** —Specify a valid ACE ID. The available options are from 1-512.

Step 3	**getaclglobalconfig review** **Example:** `Switch(SecurityACL)# getaclglobalconfig review`	Displays the configuration.
Step 4	**setaclglobalconfig commit** **Example:** `Switch(SecurityACL)# getaclglobalconfig commit`	Sends the configuration to the controller.
Step 5	**exit** **Example:** `Switch(SecurityACL)# exit`	Exits to the SecurityACL mode.

Configuration Example

```
Switch(SecurityACL)# GetACLGlobalConfig-Output.ace-global-config.ace-id = 30
GetACLGlobalConfig-Output.ace-global-config.ace-enable = true
GetACLGlobalConfig-Output.ace-global-config.lookup = true
GetACLGlobalConfig-Output.ace-global-config.ingress-port.t = 2
GetACLGlobalConfig-Output.ace-global-config.ingress-port.u.intf-range = '2-3'
GetACLGlobalConfig-Output.ace-global-config.policy-filter.t = 2
GetACLGlobalConfig-Output.ace-global-config.policy-filter.u.policy-value = 4
GetACLGlobalConfig-Output.ace-global-config.dot1q-tag.t = 1
GetACLGlobalConfig-Output.ace-global-config.dot1q-tag.u.any = 'any'
GetACLGlobalConfig-Output.ace-global-config.tag-priority.t = 1
GetACLGlobalConfig-Output.ace-global-config.tag-priority.u.any = 'any'
GetACLGlobalConfig-Output.ace-global-config.vid.t = 1
GetACLGlobalConfig-Output.ace-global-config.vid.u.any = 'any'
GetACLGlobalConfig-Output.ace-global-config.rate-limiter.t = 1
GetACLGlobalConfig-Output.ace-global-config.rate-limiter.u.disable = 'disable'
GetACLGlobalConfig-Output.ace-global-config.mirror = false
GetACLGlobalConfig-Output.ace-global-config.logging = false
GetACLGlobalConfig-Output.ace-global-config.shutdown = false
GetACLGlobalConfig-Output.ace-global-config.evc-policer.t = 1
GetACLGlobalConfig-Output.ace-global-config.evc-policer.u.disable = 'disable'
```

```
GetACLGlobalConfig-Output.ace-global-config.action.t = 2
GetACLGlobalConfig-Output.ace-global-config.action.u.deny.redirect.t = 1
GetACLGlobalConfig-Output.ace-global-config.action.u.deny.redirect.u.disable = '0'
GetACLGlobalConfig-Output.ace-global-config.frame-type.t = 2
GetACLGlobalConfig-Output.ace-global-config.frame-type.u.ethernet-type.smac-filter.t = 2
GetACLGlobalConfig-Output.ace-global-config.frame-type.u.ethernet-type.smac-filter.u.specific
 = '00-00-00-00-20-02'
GetACLGlobalConfig-Output.ace-global-config.frame-type.u.ethernet-type.dmac-filter.t = 1
GetACLGlobalConfig-Output.ace-global-config.frame-type.u.ethernet-type.dmac-filter.u.specific
 = '00-00-00-00-10-01'
GetACLGlobalConfig-Output.ace-global-config.frame-type.u.ethernet-type.ethertype-filter.t
= 1
GetACLGlobalConfig-Output.ace-global-config.frame-type.u.ethernet-type.ethertype-filter.u.any
 = 'default'
GetACLGlobalConfig-Output.ace-global-config.next.t = 3
GetACLGlobalConfig-Output.ace-global-config.next.u.disable = 'disable'
```

Viewing ACL Rate Limiter

SUMMARY STEPS

1. **getaclrateLimiter**
2. **getaclrateLimiter get-acl-rate-limiter id | unit| { rate-in-kbps | rate-in-pps}**
3. **getaclrateLimiter review**
4. **getaclrateLimiter commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**getaclrateLimiter** **Example:** `Switch# getaclrateLimiter`	Enters the applyACLtoport mode.
Step 2	**getaclrateLimiter get-acl-rate-limiter id | unit| { rate-in-kbps | rate-in-pps}** **Example:** `Switch(config-controller-SecurityACL)#getaclrateLimiter get-acl-rate-limiter ? rate-id Rate limiter ID`	Configure the rate limiter for the of the switch. . • **id**—The rate limiter ID for the settings contained in the same row and its range is 1 to 16. • **unit** —Specify the rate unit. The allowed values are: pps: packets per second. kbps: Kbits per second.
Step 3	**getaclrateLimiter review** **Example:** `Switch(SecurityACL)# getaclrateLimiter review`	Displays the configuration.

	Command or Action	Purpose
Step 4	**getaclrateLimiter commit** **Example:** `Switch(SecurityACL)# getaclrateLimiter commit`	Sends the configuration to the controller.
Step 5	**exit** **Example:** `Switch(SecurityACL)# exit`	Exits the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# getACLrateLimiter commit
GetACLRateLimiter-Output.acl-rate-limiter.id = 2
GetACLRateLimiter-Output.acl-rate-limiter.unit.t = 2
GetACLRateLimiter-Output.acl-rate-limiter.unit.u.rate-in-kbps = 10000

GetACLRateLimiter Commit Success!!!


Switch(ProvisionACL)# exit
```

Viewing ACL Ports

SUMMARY STEPS

1. **getaclportConfig**
2. **getaclportConfig get-acl-port-config port port-number**
3. **ggetaclportConfig review**
4. **getaclportConfig commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**getaclportConfig** **Example:** `Switch# getaclportConfig`	Enters the applyACLtoport mode.

	Command or Action	Purpose

Step 2	**getaclportConfig get-acl-port-config port** *port-number*
	
	Example:
	`Switch(SecurityACL)#getaclportConfig get-acl-port-config port?`
	`  port-number Port Number`
		Configure the ACL parameters of each switch port. These parameters will affect frames received on a port unless the frame matches a specific ACE.
		
		• **port-number—**The logical port for the settings contained in the same row. .

Step 3	**ggetaclportConfig review** **Example:** `Switch(SecurityACL)# getaclportConfig review`	Displays the configuration.
Step 4	**getaclportConfig commit** **Example:** `Switch(SecurityACL)# getaclportConfig commit`	Sends the configuration to the controller.
Step 5	**exit** **Example:** `Switch(SecurityACL)# exit`	Exits the ProvisionACL mode.

Configuration Example

```
Switch# ProvisionACL
Switch(ProvisionACL)# GetACLPortConfig-Output.acl-port-config.port-number = 3
GetACLPortConfig-Output.acl-port-config.action-deny = false
GetACLPortConfig-Output.acl-port-config.policy.enable = true
GetACLPortConfig-Output.acl-port-config.policy.policy-id = 33
GetACLPortConfig-Output.acl-port-config.rate-limiter.t = 2
GetACLPortConfig-Output.acl-port-config.rate-limiter.u.rate-limiter-id = 18
GetACLPortConfig-Output.acl-port-config.evc-policy.enable = true
GetACLPortConfig-Output.acl-port-config.evc-policy.evc-policer-id = 55
GetACLPortConfig-Output.acl-port-config.mirror = false
GetACLPortConfig-Output.acl-port-config.logging = false
GetACLPortConfig-Output.acl-port-config.shutdown = false
GetACLPortConfig-Output.acl-port-config.redirect.t = 1
GetACLPortConfig-Output.acl-port-config.redirect.u.disable = true

GetACLPortConfig Commit Success!!!


Switch(ProvisionACL)# exit
```

CHAPTER 33

Multicast Vlan Register

Multicast Vlan Register (MVR) allows a subscriber on a device port to register/ unregister subscription of the multicast stream on the network-wide multicast VLAN. For example, television channels over a service provider network. It allows a single multicast VLAN to be shared on the network while subscribers remain in separate VLANs. The MVR group address required by the subscriber thus forms the VLAN trunk. To select the expected group address for an MVR VLAN requires cooperation from an IPMC profile. MVR has the following three kinds of port roles.

- Source ports indicate where the multicasting servers are located. Source ports are also known as Uplink ports.
- Receiver ports indicate where the multicast listeners are located. Receiver ports are also known as Downlink ports.
- Inactive ports denote that MVR operations on the designated ports are disabled.

A switch port may be a source port, a receiver port, or an inactive port in an MVR VLAN per system, and it must stay in the same port role for multiple MVR VLANs.

IPMC Profile

IPMC provides IPMC profile, an access control on registration. IPMC profile manages permissions in multicast registration for group tables. An IPMC profile provides the rules for specific group addresses to decide whether or not the multicast registration should happen. The concept of an IPMC profile is similar to that of an ACL that gives permission by checking the given rules in a specific order. An IPMC profile is constructed with address range rules where the first matching condition takes effect.

Configuring IPMC and MVR Global administration

SUMMARY STEPS

1. **IPMCMVR**
2. **setIPMC-MVRglobal**
3. **setIPMC-MVRglobal setIPMC-MVRglobalreq** {**IPMC** | **MVR** }
4. **setIPMC-MVRglobal review**
5. **setIPMC-MVRglobal commit**
6. **setIPMC-MVRglobal exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**setIPMC-MVRglobal** **Example:** `switch(IPMC_MVR)# setIPMC-MVRglobal`	Enters IPMC and MVR global configuration mode.

Step 3	**setIPMC-MVRglobal setIPMC-MVRglobalreq** {**IPMC** | **MVR** }
	
	Example:
	`switch(IPMC_MVR)# setIPMC-MVRglobal`
	`         switch(IPMC_MVR)# ssetIPMC-MVRglobal setIPMC-MVRglobalreq`
	`         switch(IPMC_MVR)# ssetIPMC-MVRglobal setIPMC-MVRglobalreq IPMC enable`
	`         switch(IPMC_MVR)# ssetIPMC-MVRglobal setIPMC-MVRglobalreq MVR enable`
		• **IPMC—** Enabling IPMC status makes the IPMC global configuration to make an entry in the NID. You can either enable or disable IPMC configuration at the NID.
		• **MVR—** Enabling MVR status makes the MVR global configuration to make an entry in the NID. You can either enable or disable IPMC configuration at the NID.

Step 4	**setIPMC-MVRglobal review** **Example:** `switch(IPMC_MVR)# setIPMC-MVRglobal review`	Displays IPMC or MVR configuration in the queue.
Step 5	**setIPMC-MVRglobal commit** **Example:** `switch(IPMC_MVR)# setIPMC-MVRglobal commit`	Sends IPMC or MVR configuration to the NID.
Step 6	**setIPMC-MVRglobal exit** **Example:** `switch(IPMC_MVR)# setIPMC-MVRglobal exit`	Exists IPMC and MVR global configuration mode..

Creating IP Multicaste Entry Range

SUMMARY STEPS

1. **IPMCMVR**
2. **setIPMCentryrange**
3. **setIPMCentryrange setprofilerangereq** { **end-address** | **entry-name** | **start-address** | **status** }
4. **setIPMCentryrange review**
5. **setIPMCentryrange commit**
6. **setIPMCentryrange exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**setIPMCentryrange** **Example:** `switch(IPMC_MVR)# setIPMCentryrange`	Enters IPMC entry range configuration mode.

Step 3	**setIPMCentryrange setprofilerangereq** { **end-address** | **entry-name** | **start-address** | **status** }
	
	Example:
	`switch(IPMC_MVR)# setIPMCentryrange`
	`switch(IPMC_MVR)# setIPMCentryrange setprofilerangereq`
	`switch(IPMC_MVR)# setIPMCentryrange setprofilerangereq end-address`
	`switch(IPMC_MVR)# setIPMCentryrange setprofilerangereq entry-name`
	`switch(IPMC_MVR)# setIPMCentryrange setprofilerangereq start address`
	`switch(IPMC_MVR)# setIPMCentryrange setprofilerangereq status`
		• **end-address—** Enter a valid IPv4 or IPv6 address for multi cast end address range.
		• **start-address—** Enter a valid IPv4 or IPv6 address for multi cast start address range.
		• **entry-name—** Enter IPMC range entry name. The length of the name should not exceed 16 character.
		• **status—** Enabling status makes the multicast range configuration to make an entry in the NID. You can either enable or disable multicast range configuration.

Step 4	**setIPMCentryrange review** **Example:** `switch(IPMC_MVR)# setIPMCentryrange review`	Displays IPMC entry range configuration in the queue.

	Command or Action	Purpose
Step 5	**setIPMCentryrange commit** **Example:** `switch(IPMC_MVR)# setIPMCentryrange commit`	Sends IPMC entry range configuration to the NID.
Step 6	**setIPMCentryrange exit** **Example:** `switch(IPMC_MVR)# setIPMCentryrange exit`	Exists IPMC entry range configuration mode.

Configuring IPMC Profile

SUMMARY STEPS

1. **IPMCMVR**
2. **setprofileIPMC**
3. **setprofileIPMC setIPMCprofileConfig** {**description** \| **profile-name** \| **range-profile** { **range-name** \| **range-rules** { **deny-logDisable** \| **deny-logEnable** \| **permit-logDisable** \| **permit-logDisable**} } \| **status** }
4. **setprofileIPMC review**
5. **setprofileIPMC commit**
6. **setprofileIPMC exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `Switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**setprofileIPMC** **Example:** `Switch(IPMC_MVR)# setprofileIPMC`	Enters IPMC profile configuration mode.

Step 3	**setprofileIPMC setIPMCprofileConfig** {**description** | **profile-name** | **range-profile** { **range-name** | **range-rules** { **deny-logDisable** | **deny-logEnable** | **permit-logDisable** | **permit-logDisable**} } | **status** }
	
	Example:
	`Switch(IPMC_MVR)# setprofileIPMC`
	`        Switch(IPMC_MVR)# setprofileIPMC`
		• **description—** Enter a brief description about the profile.
		• **profile-name—** Enter a profile name.
		• **range-profile—** Enter name and rule for IPMC profile.
		    • **range-name—** Enter a range name. The character of range name should be 16.

	Command or Action	Purpose

	`setIPMCprofileConfig`
	`Switch(IPMC_MVR)# setprofileIPMC setIPMCprofileConfig description`
	`Switch(IPMC_MVR)# setprofileIPMC setIPMCprofileConfig profile-name`
	`Switch(IPMC_MVR)# setprofileIPMC setIPMCprofileConfig range-profile`
	`Switch(IPMC_MVR)# setprofileIPMC setIPMCprofileConfig status`
		• **range-rules—** Enter a range rules for IPMC profile.
		• **deny-logDisable —** Deny matching addresses.
		• **deny-logEnable —** Deny matching addresses and Log when matching.
		• **permit-logDisable —** Permit matching addresses.
		• **permit-logDisable —** Permit matching addresses and Log when matching.
		• **status—** Enabling status makes the multicast range configuration to make an entry in the NID. You can either enable or disable multicast range configuration.
		Note To configure IPMC Profile, it is mandatary to configure **entry-name** and **range-name** parameters.

Step 4	**setprofileIPMC review** **Example:** `Switch(IPMC_MVR)# setprofileIPMC review`	Displays IPMC profile in the queue.
Step 5	**setprofileIPMC commit** **Example:** `Switch(IPMC_MVR)# setprofileIPMC commit`	Sends IPMC profile configuration to the NID.
Step 6	**setprofileIPMC exit** **Example:** `Switch(IPMC_MVR)# setprofileIPMC exit`	Exists IPMC profile configuration mode.

Configuring MVR Global

SUMMARY STEPS

1. **IPMCMVR**
2. **setglobalMVRConfig**
3. **setglobalMVRConfig setMVRglobalconfig** {**VLAN-Name** | **channel-name** | **frame** { **priority** | **tagged** } | **igmp-address** | **last-member-query-interval** | **mode** { **compatible** | **dynamic**} **vlan-id status**}
4. **setglobalMVRConfig review**
5. **setglobalMVRConfig commit**
6. **setglobalMVRConfig exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**setglobalMVRConfig** **Example:** `switch(IPMC_MVR)# setglobalMVRConfig`	Enters MVR global configuration mode.

Step 3	**setglobalMVRConfig setMVRglobalconfig** {**VLAN-Name** | **channel-name** | **frame** { **priority** | **tagged** } | **igmp-address** | **last-member-query-interval** | **mode** { **compatible** | **dynamic**} **vlan-id status**}
	
	Example:
	`switch(IPMC_MVR)# setglobalMVRConfig`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig VLAN-Name`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig channel-name`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig frame`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig igmp-address`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig last-member-query-interval`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig mode`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig vlan-id`
	`switch(IPMC_MVR)# setglobalMVRConfig setMVRglobalconfig status`
		• **VLAN-Name—** Enter MVR multicast VLAN name .
		• **frame—**
		  ◦ **Priority—** Enter interface CoS priority. Configurable values are 0-7.
		  ◦ **tagged—** Enabling frame status makes the IGMP/MLD frames configuration to make an entry in the NID. You can either enable or disable tagged configuration at the NID. .
		• **igmp-address—** Enter a valid IPv4 unicast address.
		• **last-member-query-interval—** Enter a last member query interval in tenths of seconds. The configurable value range is 0 - 31744.
		• **mode—**
		  ◦ **compatible—** Select enable or disable for compatible interface mode.
		  ◦ **dynamic—** Select enable or disable for dynamic interface mode.

	Command or Action	Purpose
		• **vlan-id—** Enter a MVR Multicast vlan id. The valid range is 1-4095. • **Status—** Enabling status makes the MVR global configuration to make an entry in the NID. You can either enable or disable MVR global configuration. **Note** To configure MVR GLOBAL, it is mandatary to configure **vlan-name** and **vlan-id** parameters while configuring profile. **Note** There is a particular **vlan-name** for the corresponding **vlan-id** as stored in ME1200 NID. You can not configure if **vlan-name** and **vlan-id** mismatches as previously configured value.
Step 4	**setglobalMVRConfig review** **Example:** `switch(IPMC_MVR)# setglobalMVRConfig review`	Displays MVR global configuration in the queue.
Step 5	**setglobalMVRConfig commit** **Example:** `switch(IPMC_MVR)# setglobalMVRConfig commit`	Sends MVR global configuration to the NID.
Step 6	**setglobalMVRConfig exit** **Example:** `switch(IPMC_MVR)# setglobalMVRConfig exit`	Exists the MVR global configuration mode..

Configuring MVR Port

SUMMARY STEPS

1. **IPMCMVR**
2. **setMVRportconfig**
3. **setMVRportconfig setmvrportConfigReq** {**VLAN-name** | **immediate-leave** | **port-number** | **type** |**status** }
4. **setMVRportconfig review**
5. **setMVRportconfig commit**
6. **setMVRportconfig exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**setMVRportconfig** **Example:** `switch(IPMC_MVR)# setMVRportconfig`	Enters MVR port configuration mode.

Step 3	**setMVRportconfig setmvrportConfigReq** {**VLAN-name** | **immediate-leave** | **port-number** | **type** |**status** }
	
	Example:
	`switch(IPMC_MVR)# setMVRportconfig`
	`switch(IPMC_MVR)# setMVRportconfig setmvrportConfigReq`
	`switch(IPMC_MVR)# setMVRportconfig setmvrportConfigReq VLAN-name`
	`switch(IPMC_MVR)# setMVRportconfig setmvrportConfigReq immediate-leave`
	`switch(IPMC_MVR)# setMVRportconfig setmvrportConfigReq port-number`
	`switch(IPMC_MVR)# setMVRportconfig setmvrportConfigReq status`
		• **VLAN-name—** Enter previously configured MVR multicast VLAN name.
		• **immediate-leave—** Enabling immediate leave implements immediate leave capability of the designated port.
		• **type—**
		  • **receiver—** Define if you want to configure the port as receiver.
		  • **Source—** Define if you want to configure the port as a source .
		• **port-number—** Enter the targeted interface .
		• **status—** Enabling status makes MVR port configuration to make an entry in the NID. You can either enable or disable MVR port configuration.
		
		Note To configure MVR Port, it is mandatary to configure **vlan-name** and **port-number** parameters .

Step 4	**setMVRportconfig review** **Example:** `switch(IPMC_MVR)# setMVRportconfig review`	Displays MVR port configuration in the queue.
Step 5	**setMVRportconfig commit** **Example:** `switch(IPMC_MVR)# setMVRportconfig commit`	Sends MVR port configuration to the NID.
Step 6	**setMVRportconfig exit** **Example:** `switch(IPMC_MVR)# setMVRportconfig exit`	Exists MVR port configuration mode.

Viewing IPMC and MVR Global configuration

SUMMARY STEPS

1. **IPMCMVR**
2. **getIPMC-MVRglobal**
3. **getIPMC-MVRglobal getIPMC-MVRglobalreq**
4. **getIPMC-MVRglobal review**
5. **setIPMC-MVRglobal commit**
6. **setIPMC-MVRglobal exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**getIPMC-MVRglobal** **Example:** `switch(IPMC_MVR)# setIPMC-MVRglobal`	Enters IPMC and MVR global configuration mode.

Step 3	**getIPMC-MVRglobal getIPMC-MVRglobalreq**
	
	Example:
	`switch(IPMC_MVR)# getIPMC-MVRglobal`
	`switch(IPMC_MVR)# getIPMC-MVRglobal getIPMC-MVRglobalreq`
		Retrieves IPMC and MVR information using get command.

Step 4	**getIPMC-MVRglobal review** **Example:** `switch(IPMC_MVR)# getIPMC-MVRglobal review`	Displays IPMC or MVR configuration in the queue.
Step 5	**setIPMC-MVRglobal commit** **Example:** `switch(IPMC_MVR)# getIPMC-MVRglobal commit`	Sends IPMC or MVR configuration to the NID.
Step 6	**setIPMC-MVRglobal exit** **Example:** `switch(IPMC_MVR)# setIPMC-MVRglobal exit`	Exists IPMC and MVR global configuration mode..

Viewing IPMC Entry Range

SUMMARY STEPS

1. **IPMCMVR**
2. **getIPMCentryrange**
3. **getIPMCentryrange getprofilerangereq entry-name**
4. **setIPMCentryrange review**
5. **setIPMCentryrange commit**
6. **getIPMCentryrange exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**getIPMCentryrange** **Example:** `switch(IPMC_MVR)# getIPMCentryrange`	Enters IPMC entry range configuration mode.

Step 3	**getIPMCentryrange getprofilerangereq entry-name**
	
	Example:
	`switch(IPMC_MVR)# getIPMCentryrange`
	`switch(IPMC_MVR)# getIPMCentryrange getprofilerangereq`
		• **entry-name—** Enter IPMC range entry name. The length of the name should not exceed 16 character.

Step 4	**setIPMCentryrange review** **Example:** `switch(IPMC_MVR)# getIPMCentryrange review`	Displays IPMC entry range configuration in the queue.
Step 5	**setIPMCentryrange commit** **Example:** `switch(IPMC_MVR)# getIPMCentryrange commit`	Sends IPMC entry range configuration to the NID.
Step 6	**getIPMCentryrange exit** **Example:** `switch(IPMC_MVR)# setIPMCentryrange exit`	Exists IPMC entry range configuration mode.

Viewing IPMC Profile

SUMMARY STEPS

1. **IPMCMVR**
2. **getprofileIPMC**
3. **getprofileIPMC getIPMCprofileconfigreq profile-name**
4. **getprofileIPMC review**
5. **getprofileIPMC commit**
6. **setprofileIPMC exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**getprofileIPMC** **Example:** `switch(IPMC_MVR)# getprofileIPMC`	Enters IPMC profile configuration mode.

Step 3	**getprofileIPMC getIPMCprofileconfigreq profile-name**
	
	Example:
	`switch(IPMC_MVR)# getprofileIPMC`
	`switch(IPMC_MVR)# getprofileIPMC getIPMCprofileConfigreq`
	`switch(IPMC_MVR)# getprofileIPMC getIPMCprofileConfigreq profile-name`
		• **profile-name—** Enter a profile name.

Step 4	**getprofileIPMC review** **Example:** `switch(IPMC_MVR)# getprofileIPMC review`	Displays IPMC profile in the queue.
Step 5	**getprofileIPMC commit** **Example:** `switch(IPMC_MVR)# getprofileIPMC commit`	Sends IPMC profile configuration to the NID.
Step 6	**setprofileIPMC exit** **Example:** `switch(IPMC_MVR)# getprofileIPMC exit`	Exists IPMC profile configuration mode.

Viewing MVR Global Configuration

SUMMARY STEPS

1. **IPMCMVR**
2. **getglobalMVRConfig**
3. **getglobalMVRConfig getMVRglobalconfig VLAN-Name**
4. **getglobalMVRConfig review**
5. **getglobalMVRConfig commit**
6. **getglobalMVRConfig exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**getglobalMVRConfig** **Example:** `switch(IPMC_MVR)# getglobalMVRConfig`	Enters MVR global configuration mode.

Step 3	**getglobalMVRConfig getMVRglobalconfig VLAN-Name**
	
	Example:
	`switch(IPMC_MVR)# getglobalMVRConfig`
	`switch(IPMC_MVR)# getglobalMVRConfig getMVRglobalconfig`
	`switch(IPMC_MVR)# getglobalMVRConfig getMVRglobalconfig VLAN-Name`
		• **VLAN-Name—** Enter MVR multicast VLAN name .

Step 4	**getglobalMVRConfig review** **Example:** `switch(IPMC_MVR)# getglobalMVRConfig review`	Displays MVR global configuration in the queue.
Step 5	**getglobalMVRConfig commit** **Example:** `switch(IPMC_MVR)# getglobalMVRConfig commit`	Sends MVR global configuration to the NID.
Step 6	**getglobalMVRConfig exit** **Example:** `switch(IPMC_MVR)# setglobalMVRConfig exit`	Exists the MVR global configuration mode.

Viewing MVR Port Configuration

SUMMARY STEPS

1. **IPMCMVR**
2. **getMVRportconfig**
3. **getMVRportconfig getmvrportConfigReq** {**VLAN-name** | **port-number** }
4. **getMVRportconfig review**
5. **getMVRportconfig commit**
6. **getMVRportconfig exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**IPMCMVR** **Example:** `switch#IPMCMVR`	Enters Cisco MVR template services mode.
Step 2	**getMVRportconfig** **Example:** `switch(IPMC_MVR)# getMVRportconfig`	Enters MVR port configuration mode.

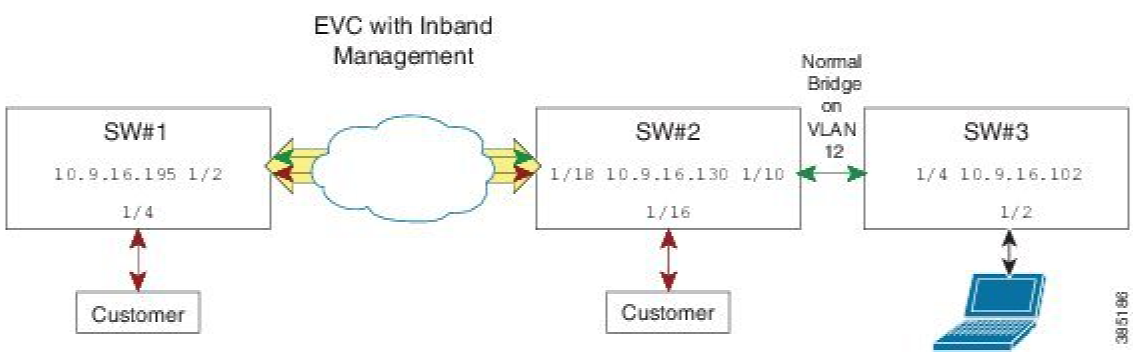
Step 3	**getMVRportconfig getmvrportConfigReq** {**VLAN-name** | **port-number** }
	
	Example:
	`switch(IPMC_MVR)# getMVRportconfig`
	`switch(IPMC_MVR)# getMVRportconfig getmvrportConfigReq`
	`switch(IPMC_MVR)# getMVRportconfig getmvrportConfigReq VLAN-name`
	`switch(IPMC_MVR)# getMVRportconfig getmvrportConfigReq port-number`
		• **VLAN-name—** Enter previously configured MVR multicast VLAN name.
		• **port-number—** Enter the targeted interface .

Step 4	**getMVRportconfig review** **Example:** `switch(IPMC_MVR)# getMVRportconfig review`	Displays MVR port configuration in the queue.
Step 5	**getMVRportconfig commit** **Example:** `switch(IPMC_MVR)# getMVRportconfig commit`	Sends MVR port configuration to the NID.
Step 6	**getMVRportconfig exit** **Example:** `switch(IPMC_MVR)# getMVRportconfig exit`	Exists MVR port configuration mode.

CHAPTER 34

Double-tagged management VLAN using IVID parameter

This enhancement allows configuring double VLAN tag management for remote management over a single Ethernet service connection where management is done in one VLAN and customer traffic in another VLAN and both are carried over the same Ethernet virtual connection (EVC). Following example describes how double VLAN management works.



In the above diagram, switch SW1 is the remote node, managed through a single EVC carrying both customer and management traffic. SW2 is the end point for the EVC from where customer and management traffic is carried as standard management VLAN (VLAN 12 in example) to SW3. Customer traffic is received on port GigabitEthernet 1/4 on SW1 and sent between SW1 and SW2.

- Configuring Ethernet Virtual Circuit V2, page 600
- Configuring ECE V3, page 601

Configuring Ethernet Virtual Circuit V2

SUMMARY STEPS

1. **ProvisionEVC**
2. **addEVC_v2 createEvcConfig** {**instance** | **internal_vid learning**{**enable** | **disable**} |**nni-ports** | **nni-vid** | **policer-id** | **name** | **internal-vid** }
3. **addEVC_v2 review**
4. **addEVC_v2 commit**
5. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionEVC** **Example:** `Switch# ProvisionEVC`	Enters the ProvisionEVC mode.

Step 2	**addEVC_v2 createEvcConfig** {**instance** | **internal_vid learning**{**enable** | **disable**} |**nni-ports** | **nni-vid** | **policer-id** | **name** | **internal-vid** }
	
	Example:
	`Switch(ProvisionEVC)# addEVC_v2 createEvcConfig instance 1`
	`Switch(ProvisionEVC)#addEVC_v2 createEvcConfig nni-ports 2`
	`Switch(ProvisionEVC)# addEVC_v2 createEvcConfig learning enable`
	`Switch(ProvisionEVC)#addEVC_v2 createEvcConfig nni-vid 100`
	`Switch(ProvisionEVC)#addEVC_v2 createEvcConfig internal-vid 100`
		Adds the EVE configuration.

Step 3	**addEVC_v2 review** **Example:** `Switch(ProvisionEVC)# addEVC_v2 review`	Reviews the addEVC configuration.
Step 4	**addEVC_v2 commit** **Example:** `Switch(ProvisionEVC)# addEVC_v2 commit`	Sends the addEVC configuration to the Cisco ME 1200 NID.

Step 5	**exit**
	
	Example:
	`Switch(ProvisionEVC)# exit`
	`Switch#`
		Exits the ProvisionEVC mode.

Example

```
 On SW1, 2 EVC instances are configured on NNI port GigabitEthernet 1/2. Both instances
have VLAN ID (VID)=100, but EVC1 has an internal VID (IVID) = 100 while EVC2 has IVID=12
which is the management VID. This is achieved using addEVC-v2 operation in ProvisionEVC
template.

(ProvisionEVC)# addEVC-v2 review
Commands in queue: 5
        addEVC_v2 createEvcConfig instance 1
        addEVC_v2 createEvcConfig nni-ports 2
        addEVC_v2 createEvcConfig learning enable
  addEVC_v2 createEvcConfig nni_vid 100
        addEVC_v2 createEvcConfig internal_vid 100
(ProvisionEVC)# addEVC-v2 commit
 AddEVC_v2 Commit Success!!!

(ProvisionEVC)# addEVC_v2 review
Commands in queue: 5
        addEVC_v2 createEvcConfig instance 2
        addEVC_v2 createEvcConfig learning enable
        addEVC_v2 createEvcConfig nni_ports 2
        addEVC_v2 createEvcConfig nni_vid 100
        addEVC_v2 createEvcConfig internal_vid 12
(ProvisionEVC)# addEVC_v2 commit
 AddEVC_v2 Commit Success!!!
```

Configuring ECE V3

An EVC control entry (ECE) from UNI-NNI port is configured with outer tag 100 and inner tag 12. This is achieved using addECE-v3 operation in ProvisionEVC template.

SUMMARY STEPS

1. **configure terminal**
2. **controller nid** *1/NID_ID*
3. **ProvisionEVC**
4. **addECE_v3**
5. **addECE_v3eceConfiguration_v3 control action**{**class** {**disabled** | **specific** *specific_id*} | **direction** {**bothnni_to_uni** |**uni_to_nni**} | **drop_precedence** {**disabled** | **one** | **zero**} | **evc_id** {**none** | **specific** *specific_eve_id*} | **policer_id** {**discard** | **evc** | **none** | **specific** *specific_id*} | **policy_id** *acl_policy_id* | **tag_pop_count** *tag_pop_count*} | **rule_type** { **both** | **rx** | **tx**} | **tx_lookup** { **isdx** | **vid_only** | **vid_pcp**}
6. **addECE_v3 eceConfiguration_v3 control egress-inner-tagaddECE ece_configuration control egress_inner_tag** {**dei-modedei_mode** {**classified** | **drop_prec** | **fixed**} | **dei_value** *dei* | **pcp_mode** {**classified** | **fixed** | **mapped**} | **pcp_value** *pcp_value* | **type** *type* | **vlan_id** *vlan_id*}
7. **addECE ece_configuration control egress_outer_tag** {**dei_mode** {**classified** | **drop_prec** | **fixed**} | **dei_value** *dei_value* | **mode** {**enabled** | **disabled**} | **pcp_mode** {**classified** | **fixed** | **mapped**} | **pcp_value** *pcp_value* | **vlan_id** *vlan_id*
8. **addECE ece_configuration control ingress_match** {**frame_type** {**any** | **ipv4** {**dest_ip_filter** | **source_ip_filter**} | **ipv6** {**dest_ip_filter** | **source_ip_filter**}} | **inner_tag_match** {**match_fields** | **match_type**} | **mac_params** {**dmac_filer** | **smac_filter**} | **outer_tag_match** {**match_fields** | **match_type**} | **uni_ports** {**GigabitEthernet_1_UNI** | **GigabitEthernet_2_UNI** | **GigabitEthernet_3_UNI** | **GigabitEthernet_4_UNI** | **GigabitEthernet_5_UNI** | **GigabitEthernet_6_UNI**}}
9. **addECE review**
10. **addECE commit**
11. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Switch# configure terminal`	Enters global configuration mode.
Step 2	**controller nid** *1/NID_ID* **Example:** `Switch(config)# controller nid 1/1`	Enters the controller configuration mode.
Step 3	**ProvisionEVC** **Example:** Switch# ProvisionEVC	Enters the ProvisionEVC mode.
Step 4	**addECE_v3** **Example:** `Switch(config-controller-ProvisionEVC)# addECE_v3`	Adds ECE configuration.

	Command or Action	Purpose

Step 5	**addECE_v3eceConfiguration_v3 control action**{**class** {**disabled** | **specific** *specific_id*} | **direction** {**bothnni_to_uni** |**uni_to_nni**} | **drop_precedence** {**disabled** | **one** | **zero**} | **evc_id** {**none** | **specific** *specific_eve_id*} | **policer_id** {**discard** | **evc** | **none** | **specific** *specific_id*} | **policy_id** *acl_policy_id* | **tag_pop_count** *tag_pop_count*} | **rule_type** { **both** | **rx** | **tx**} | **tx_lookup** { **isdx** | **vid_only** | **vid_pcp**}
	
	Example:
	
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control actions evc_id specific 7`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control actions tag_pop_count 1`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control actions policer_id specific 1`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control actions class specific 4`
		Adds the ECE control action configuration.
		
		• **class—**Specifies the ECE class.
		• **direction—**Specifies the direction of flow of traffic.
		• **drop_precedence—**Specifies the drop precedence (higher value means more dropping).
		• **evc_id—**Specifies the EVC ID. The valid **specific** values are from 1 to 1024.
		• **policer_id—**Specifies the policer ID. The valid **specific** values are from 1 to 1022.
		• **policy_id—**Specifies the ACL policy ID. The valid values are from 0 to 63.
		• **tag_pop_count—**Specifies the tagged VLAN count to be removed (either one or two outermost tags).
		• **rule_type—**Specifies a rule type.
		• **tx_lookup—**Specifies tx lookup.

Step 6	**addECE_v3 eceConfiguration_v3 control egress-inner-tagaddECE ece_configuration control egress_inner_tag** {**dei-modedei_mode** {**classified** | **drop_prec** | **fixed**} | **dei_value** *dei* | **pcp_mode** {**classified** | **fixed** | **mapped**} | **pcp_value** *pcp_value* | **type** *type* | **vlan_id** *vlan_id*}
	
	Example:
	
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_inner_tag dei_mode classified`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_inner_tag type none`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_inner_tag vlan_id 3`
		Adds the ECE control egress inner tag rewrite configuration.
		
		• **dei_mode—**Specifies the DEI mode**—**whether **classified**, **drop precedence**, or **fixed**.
		• **dei_value—**Specifies the DEI value. The valid values are 0 and 1.
		• **pcp_mode—**Specifies the PCP mode**—**whether **classified**, **fixed**, or **mapped**.
		• **pcp_value—**Specifies the PCP value. The valid values are from 1 to 7.
		• **type—**Specifies the type**—**whether **c-tagged**, **none**, **s-custom**, or **s-tagged**.
		• **vlan_id—**Specifies the VLAN ID. The valid values are from 1 to 4095.

Step 7	**addECE ece_configuration control egress_outer_tag** {**dei_mode** {**classified** | **drop_prec** | **fixed**} | **dei_value** *dei_value* | **mode** {**enabled** | **disabled**} | **pcp_mode** {**classified** | **fixed** | **mapped**} | **pcp_value** *pcp_value* | **vlan_id** *vlan_id*	Adds the ECE control egress outer tag rewrite configuration. • **dei_mode—**Specifies the DEI mode**—**whether **classified**, **drop precedence**, or **fixed**.

	Command or Action	Purpose

	Example:
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_outer_tag pcp_mode fixed`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control egress_outer_tag pcp_value 4`
		• **dei_value**—Specifies the DEI value. The valid values are 0 and 1.
		• **mode**—Specifies the mode—whether **enabled** or **disabled**.
		• **pcp_mode**—Specifies the PCP mode—whether **classified**, **fixed**, or **mapped**.
		• **pcp_value**—Specifies the PCP value. The valid values are from 1 to 7.
		• **vlan_id**—Specifies the VLAN ID. The valid values are from 1 to 4095.

Step 8	**addECE ece_configuration control ingress_match** {**frame_type** {**any** | **ipv4** {**dest_ip_filter** | **source_ip_filter**} | **ipv6** {**dest_ip_filter** | **source_ip_filter**}} | **inner_tag_match** {**match_fields** | **match_type**} | **mac_params** {**dmac_filer** | **smac_filter**} | **outer_tag_match** {**match_fields** | **match_type**} | **uni_ports** {**GigabitEthernet_1_UNI** | **GigabitEthernet_2_UNI** | **GigabitEthernet_3_UNI** | **GigabitEthernet_4_UNI** | **GigabitEthernet_5_UNI** | **GigabitEthernet_6_UNI**}}
	Example:
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control ingress_match uni_ports GigabitEthernet_2_UNI enable`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control ingress_match outer_tag_match match_type c_tagged`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control ingress_match outer_tag_match match_fields vlan_id_filter specific 100`
	`Switch(config-controller-ProvisionEVC)# addECE ece_configuration control ingress_match outer_tag_match match_fields inner_pcp val_4-7`
		Adds the ECE control ingress inner tag rewrite configuration.
		• **frame_type**—Specifies the type of frame relay.
		• **inner_tag_match**—Specifies the inner tag match value.
		• **mac_params**—Specifies the DMAC and SMAC default values.
		• **outer_tag_match**—Specifies the outer tag match value.
		• **uni_ports**—Specifies the GigabitEthernet UNI ports.

Step 9	**addECE review** **Example:** `Switch(config-controller-ProvisionEVC)# addECE_v3 review`	Reviews the addECE configuration.
Step 10	**addECE commit** **Example:** `Switch(config-controller-ProvisionEVC)# addECE_v3 commit`	Sends the configuration to the NID.

	Command or Action	Purpose

Step 11	**exit**
	
	Example:
	
	`Switch(config-controller-ProvisionEVE)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Example

```
 An EVC control entry (ECE) from UNI-NNI port is configured with outer tag 100 and inner
tag 12. This is achieved using addECE-v3 operation in ProvisionEVC template.

(ProvisionEVC)# addECE-v3 review
Commands in queue: 7
        addECE_v3 eceConfiguration_v3 ece-id 5
        addECE_v3 eceConfiguration_v3 control egress_outer_tag mode enabled
        addECE_v3 eceConfiguration_v3 control egress_outer-tag vlan_id 100
        addECE_v3 eceConfiguration_v3 control egress_inner-tag type c_tagged
        addECE_v3 eceConfiguration_v3 control egress_inner-tag vlan_id 12
        addECE_v3 eceConfiguration_v3 control actions rule_type tx
        addECE_v3 eceConfiguration_v3 control actions evc-id specific 2
(ProvisionEVC)# addECE-v3 commit
 AddECE_v3 Commit Success!!!

 Another ECE entry is configured for NNI-UNI direction matching on same tags and popping
off the two tags.

(ProvisionEVC)# addECE-v3 review
Commands in queue: 10
        addECE_v3 eceConfiguration_v3 ece-id 6
        addECE_v3 eceConfiguration_v3 control ingress_match outer_tag-match match_type
c_tagged
        addECE_v3 eceConfiguration_v3 control ingress_match outer_tag-match match_fields
vlan_id_filter specific 100
        addECE_v3 eceConfiguration_v3 control ingress_match inner_tag-match match_type
c_tagged
        addECE_v3 eceConfiguration_v3 control ingress_match inner_tag-match match_fields
vlan_id_filter specific 12
        addECE_v3 eceConfiguration_v3 control actions_rule_type rx
        addECE_v3 eceConfiguration_v3 control actions_evc-id specific 2
        addECE_v3 eceConfiguration_v3 control actions policer_id none

        addECE_v3 eceConfiguration_v3 control actions tag_pop_count 2
        addECE_v3 eceConfiguration_v3 control actions policy_id 1
(ProvisionEVC)# addECE-v3 commit
 AddECE_v3 Commit Success!!!


 For customer traffic coming on GigabitEthernet1/4 on, say VLAN 10, a third, bi-directional
 EVC control entry (ECE) is configured with VID=10

(ProvisionEVC)# addECE_v3 review
Commands in queue: 6
        addECE_v3 eceConfiguration_v3 ece_id 7
        addECE_v3 eceConfiguration_v3 control ingress_match uni-ports 4
        addECE_v3 eceConfiguration_v3 control ingress_match outer_tag_match match_type
tagged
        addECE_v3 eceConfiguration_v3 control ingress_match outer-tag-match match_fields
vlan_id_filter specific 10
        addECE_v3 eceConfiguration_v3 control actions policer_id none
        addECE_v3 eceConfiguration_v3 control actions policy-id 1
```

```
(ProvisionEVC)# addECE_v3 commit
 AddECE_v3 Commit Success!!!
```

CHAPTER 35

Configuring LAG Aggregation

SUMMARY STEPS

1. **ProvisionLacpPortType**
2. **setAggregationCfg aggPortConfig** { **aggEnabled** | **group** | **portNumber**}
3. **setAggregationCfg review**
4. **setAggregationCfg commit**
5. **setAggregationCfg exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLacpPortType** **Example:** `Switch# ProvisionLacpPortType`	Enters the ProvisionLacpPortType mode.

Step 2	**setAggregationCfg aggPortConfig** { **aggEnabled** | **group** | **portNumber**}
	
	Example:
	`Switch(ProvisionLacpPortType)# setAggregationCfg`
	`Switch(ProvisionLacpPortType)# setAggregationCfg aggPortConfig`
	`Switch(ProvisionLacpPortType)# setAggregationCfg aggPortConfig aggEnabled`
	`Switch(ProvisionLacpPortType)# setAggregationCfg aggPortConfig group`
	`Switch(ProvisionLacpPortType)# setAggregationCfg aggPortConfig portNumber`
		Configures Static LAG aggregation on LACP mode.
		• **aggEnabled**
		  • **enable—**Enable static LAG group on interface.
		  • **disable—**Disable static LAG group on interface.
		.
		• **group—**Configure aggregation group.
		• **portNumber—**Configure targeted interface on the ME 1200 NID.

	Command or Action	Purpose
Step 3	**setAggregationCfg review** **Example:** `Switch(ProvisionLacpPortType)# setAggregationCfg review`	Displays the LACP aggregation configuration on the ME 1200 NID.
Step 4	**setAggregationCfg commit** **Example:** `Switch(ProvisionLacpPortType)# setAggregationCfg commit`	Sends the LACP aggregation configuration on the ME 1200 NID.
Step 5	**setAggregationCfg exit** **Example:** `Switch(ProvisionLacpPortType)# setAggregationCfg exit`	Exists the LACP aggregation configuration mode.

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- Viewing LAG Traffic Distribution Mode, page 611
- Viewing Static Aggregation Group, page 612

Viewing LAG Aggregation Commands on the ME 1200 NID.

SUMMARY STEPS

1. **ProvisionLacpPortType**
2. **getAggregationCfg aggPortConfig lacpPhysicalPort**
3. **getAggregationCfg review**
4. **getAggregationCfg commit**
5. **getAggregationCfg exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLacpPortType** **Example:** `Switch# ProvisionLacpPortType`	Enters the ProvisionLacpPortType mode.

Step 2	**getAggregationCfg aggPortConfig lacpPhysicalPort**
	
	Example:
	`Switch(ProvisionLacpPortType)# getAggregationCfg`
	`Switch(ProvisionLacpPortType)# getAggregationCfg aggPortConfig`
	`Switch(ProvisionLacpPortType)# getAggregationCfg aggPortConfig lacpPhysicalPort`
		• **lacpPhysicalPort—**Gets static aggregation request commands on ME 1200 NID.

Step 3	**getAggregationCfg review** **Example:** `Switch(ProvisionLacpPortType)#` **`getAggregationCfg review`**	Displays the LAG aggregation commands on the ME 1200 NID.
Step 4	**getAggregationCfg commit** **Example:** `Switch(ProvisionLacpPortType)#` **`GetAggregationCfg commit`**	Sends the LAG aggregation configuration on the ME 1200 NID.
Step 5	**getAggregationCfg exit** **Example:** `Switch(ProvisionLacpPortType)#` **`setAggregationCfg exit`**	Exists the LACP aggregation configuration mode.

Configuring LAG Traffic Distribution Mode

SUMMARY STEPS

1. **ProvisionLacpPortType**
2. **setAggregationMode aggModeConfig** {**dmac** { **enable** | **disable**} | **ip** { **enable** | **disable**} | **port** { **enable** | **disable**} | **smac** { **enable** | **disable**} }
3. **aggModeConfig review**
4. **aggModeConfig commit**
5. **aggModeConfig exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLacpPortType** **Example:** `Switch# ProvisionLacpPortType`	Enters the ProvisionLacpPortType mode.

Step 2	**setAggregationMode aggModeConfig** {**dmac** { **enable** | **disable**} | **ip** { **enable** | **disable**} | **port** { **enable** | **disable**} | **smac** { **enable** | **disable**} }
	
	Example:
	`Switch(ProvisionLacpPortType)# setAggregationMode aggModeConfig`
	`Switch(ProvisionLacpPortType)# setAggregationMode aggModeConfig dmac enable`
	`Switch(ProvisionLacpPortType)# setAggregationMode aggModeConfig ip enable`
	`Switch(ProvisionLacpPortType)# setAggregationMode aggModeConfig port enable`
	`Switch(ProvisionLacpPortType)# setAggregationMode aggModeConfig smac enble`
		Configures traffic distribution mode.
		• **dmac**
		  • **enable—**Uses destination MAC address for traffic distribution.
		  • **disable—**Does not use destination MAC address for traffic distribution.
		• **ip**
		  • **enable—**Uses ip address for traffic distribution.
		  • **disable—**Does not use ip address for traffic distribution.
		• **port**
		  • **enable—**Uses ip port for traffic distribution.
		  • **disable—**Does not use ip port for traffic distribution.
		• **smac**
		  • **enable—**Uses source MAC address for traffic distribution.
		  • **disable—**Does not use source MAC address for traffic distribution.

	Command or Action	Purpose
Step 3	**aggModeConfig review** **Example:** `Switch(ProvisionLacpPortType)# aggModeConfig review`	Displays the LACP aggregation configuration mode commands on the ME 1200 NID.
Step 4	**aggModeConfig commit** **Example:** `Switch(ProvisionLacpPortType)# aggModeConfig commit`	Sends the LACP aggregation mode configuration commands on the ME 1200 NID.
Step 5	**aggModeConfig exit** **Example:** `Switch(ProvisionLacpPortType)# aggModeConfig exit`	Exists the LACP aggregation configuration mode.

Viewing LAG Traffic Distribution Mode

SUMMARY STEPS

1. **ProvisionLacpPortType**
2. **getAggregationMode aggModeConfigReq**
3. **getAggregationMode review**
4. **getAggregationMode commit**
5. **getAggregationMode exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLacpPortType** **Example:** `Switch# ProvisionLacpPortType`	Enters the ProvisionLacpPortType mode.
Step 2	**getAggregationMode aggModeConfigReq**	• **aggModeConfigReq—**Gets aggregation mode configuration

	Command or Action	Purpose
	Example: `Switch(ProvisionLacpPortType)# getAggregationMode aggModeConfigReq`	
Step 3	**getAggregationMode review** **Example:** `Switch(ProvisionLacpPortType)# getAggregationMode review`	Displays the aggregation configuration mode commands on the ME 1200 NID.
Step 4	**getAggregationMode commit** **Example:** `Switch(ProvisionLacpPortType)# getAggregationMode commit`	Sends the LACP aggregation mode configuration commands on the ME 1200 NID.
Step 5	**getAggregationMode exit** **Example:** `Switch(ProvisionLacpPortType)# getAggregationMode exit`	Exists the LACP aggregation configuration mode.

Viewing Static Aggregation Group

SUMMARY STEPS

1. **ProvisionLacpPortType**
2. **showAggregation showAggConfigReq**
3. **showAggregation review**
4. **showAggregation commit**
5. **setAggregationCfg exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**ProvisionLacpPortType** **Example:** `Switch# ProvisionLacpPortType`	Enters the ProvisionLacpPortType mode.

Step 2	**showAggregation showAggConfigReq**
	
	Example:
	`Switch(ProvisionLacpPortType)# showAggregation`
	`Switch(ProvisionLacpPortType)# showAggregation showAggConfigReq`
		Displays Static LAG aggregation on LACP mode.
		• **showAggConfigReq—**Displays all on the ME 1200 NID.

Step 3	**showAggregation review** **Example:** `Switch(ProvisionLacpPortType)# `**`showAggregation review`**	Displays the LAG aggregation configuration on the ME 1200 NID.
Step 4	**showAggregation commit** **Example:** `Switch(ProvisionLacpPortType)# `**`setAggregationCfg commit`**	Sends the LAG aggregation configuration on the ME 1200 NID.
Step 5	**setAggregationCfg exit** **Example:** `Switch(ProvisionLacpPortType)# `**`setAggregationCfg exit`**	Exists the LACP aggregation configuration mode.