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	**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	**OperationsMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables provisioning of the MEP.
Step 4	**setAis aisConfig**{**aisAction** {**disable** | **enable** {**framerate** | **protect**} | **mepInstance** *mep_instance_number*}	Enables or disables the alarm indication signal request on a Maintenance End Point (MEP) instance.

	Command or Action	Purpose

	Example:
	`Switch(config-controller-OperationsMepPortType)# setAis aisConfig aisAction enable frameRate fr1s`
	`Switch(config-controller-OperationsMepPortType)# setAis aisConfig aisAction enable protect disable`
	`Switch(config-controller-OperationsMepPortType)# setAis aisConfig aisAction disable`
	`Switch(config-controller-OperationsMepPortType)# setAis aisConfig mepInstance 1`
		• **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.

Step 5	**setAis review** **Example:** `Switch(config-controller-OperationsMepPortType)# setAis review`	Displays the setAis configuration.
Step 6	**setAis commit** **Example:** `Switch(config-controller-OperationsMepPortType)# setAis commit`	Sends the setAis configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	Example:
	`Switch(config-controller-OperationsMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Setting Delay Measurement

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.

	Command or Action	Purpose
Step 3	**ProvisionMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables provisioning of the MEP.

Step 4	**setDm dmConfig** {**dmAction** {**disable** | **enable** {**calculation** | **cast** | **interval** | **lastN** | **mode** | **priority**}} | **mepInstance** *mep_instance_number*}
	
	Example:
	
	`Switch(config-controller-OperationsMepPortType)# setDM dmConfig dmAction enable calculation rdtrp`
	`Switch(config-controller-OperationsMepPortType)# setDM dmConfig dmAction enable cast uni mepId 0`
	`Switch(config-controller-OperationsMepPortType)# setDM dmConfig dmAction enable interval 10`
	`Switch(config-controller-OperationsMepPortType)# setDM dmConfig dmAction enable lastN 10`
	`Switch(config-controller-OperationsMepPortType)# setDM dmConfig dmAction enable mode twoWay`
	`Switch(config-controller-OperationsMepPortType)# setDM dmConfig dmAction enable priority 0`
	`Switch(config-controller-OperationsMepPortType)# setDM dmConfig dmAction disable`
	`Switch(config-controller-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.

Step 5	**setDm review** **Example:** `Switch(config-controller-OperationsMepPortType)# setDm review`	Displays the setDm configuration.
Step 6	**setDm commit** **Example:** `Switch(config-controller-OperationsMepPortType)# setDm commit`	Sends the setDm configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	
	`Switch(config-controller-OperationsMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Updating Delay Measurement

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	**ProvisionMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 4	**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(config-controller-OperationsMepPortType)# updateDM updateDmConfig update overflowReset keep`
	`Switch(config-controller-OperationsMepPortType)# updateDM updateDmConfig update syncronized disable`
	`Switch(config-controller-OperationsMepPortType)# updateDM updateDmConfig update txMode standardize`
	`Switch(config-controller-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.
		◦ **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.

	Command or Action	Purpose
Step 5	**updateDM review** **Example:** `Switch(config-controller-OperationsMepPortType)# updateDM review`	Displays the updateDM configuration.
Step 6	**updateDM commit** **Example:** `Switch(config-controller-OperationsMepPortType)# updateDM commit`	Sends the updateDM configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	`Switch(config-controller-OperationsMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Setting Loss Measurement

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	**ProvisionMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.
Step 4	**setlm lmConfig** {**lmAction** {**disable** | **enable** {**cast** | **flr** | **framerate** | **mode** | **priority**}} | **mepInstance** *mep_instance_number*} **Example:** `Switch(config-controller-OperationsMepPortType)#`	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.

	Command or Action	Purpose

	`setLM lmConfig lmAction enable cast uni`
	`Switch(config-controller-OperationsMepPortType)#`
	`setLM lmConfig lmAction enable flr 5`
	`Switch(config-controller-OperationsMepPortType)#`
	`setLM lmConfig lmAction enable frameRate fr1s`
	`Switch(config-controller-OperationsMepPortType)#`
	`setLM lmConfig lmAction enable mode single`
	`Switch(config-controller-OperationsMepPortType)#`
	`setLM lmConfig lmAction enable priority 0`
	`Switch(config-controller-OperationsMepPortType)#`
	`setLM lmConfig lmAction disable`
	`Switch(config-controller-OperationsMepPortType)#`
	`setLM lmConfig mepInstance 1`
		• **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.
		• **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 5	**setLM review**
	
	Example:
	`Switch(config-controller-OperationsMepPortType)#`
	`setLM review`
		Displays the setLM configuration.

Step 6	**setLM commit**
	
	Example:
	`Switch(config-controller-OperationsMepPortType)#`
	`setLM commit`
		Sends the setLM configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	
	`Switch(config-controller-OperationsMepPortType)#`
	`exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Setting Lock Signal

DETAILED STEPS

	Command or Action	Purpose
Step 1	**configure terminal** **Example:** `Switch# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 2	**controller nid** *1/NID_ID* **Example:** `Switch(config)# controller nid 1/1`	Enters the controller configuration mode.
Step 3	**ProvisionMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 4	**setlck lckConfig**{**lckAction** {**disable** | **enable framerate** | **mepInstance** *mep_instance_number*}
	
	Example:
	`Switch(config-controller-OperationsMepPortType)# setLck lckConfig lckAction enable frameRate fr1s`
	`Switch(config-controller-OperationsMepPortType)# setLck lckConfig lckAction disable`
	`Switch(config-controller-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.

Step 5	**setlck review** **Example:** `Switch(config-controller-OperationsMepPortType)# setlck review`	Displays the setlck configuration.
Step 6	**setlck commit** **Example:** `Switch(config-controller-OperationsMepPortType)# setlck commit`	Sends the setlck configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	`Switch(config-controller-OperationsMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Setting Link Trace

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	**OperationsMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 4	**setlinkTrace linkTrace** {**ltAction** {**disable** | **enable** {**destination** | **priority** | **ttl**} | **mepInstance** *mep_instance_number*}
	
	Example:
	
	`Switch(config-controller-OperationsMepPortType)# setLinkTrace linkTrace ltAction enable destination mepId 0`
	`Switch(config-controller-OperationsMepPortType)# setLinkTrace linkTrace ltAction enable priority 0`
	`Switch(config-controller-OperationsMepPortType)# setLinkTrace linkTrace ltAction enable ttl 1`
	`Switch(config-controller-OperationsMepPortType)# setLinkTrace linkTrace ltAction disable`
	`Switch(config-controller-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 5	**setLinkTrace review** **Example:** `Switch(config-controller-OperationsMepPortType)# setLinkTrace review`	Displays the setLinkTrace configuration.
Step 6	**setLinkTrace commit** **Example:** `Switch(config-controller-OperationsMepPortType)# setLinkTrace commit`	Sends the setLinkTrace configuration to the Cisco ME 1200 NID.

	Command or Action	Purpose

Step 7	**exit**
	
	Example:
	`Switch(config-controller-OperationsMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Setting Loopback

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	**OperationsMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 4	**setloopBack loopBackConfig** {**lbAction** {**disable** | **enable** {**cast** | **count** | **dei** | **interval** | **priority** | **size**}} | **mepInstance** *mep_instance_number*}
	
	Example:
	
	`Switch(config-controller-OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable cast uni mepId 0`
	`Switch(config-controller-OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable count 5`
	`Switch(config-controller-OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable dei disable`
	`Switch(config-controller-OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable interval 10`
	`Switch(config-controller-OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable priority 0`
	`Switch(config-controller-OperationsMepPortType)# setLoopBack loopBackConfig lbAction enable size 100`
	`Switch(config-controller-OperationsMepPortType)# setLoopBack loopBackConfig lbAction disable`
		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.

	Command or Action	Purpose
	`Switch(config-controller-OperationsMepPortType)# setLoopBack loopBackConfig mepInstance 1`	• **mepInstance—**Is the MEP instance number. The valid values are from 1 to 128.
Step 5	**setloopBack review** **Example:** `Switch(config-controller-OperationsMepPortType)# setloopBack review`	Displays the setloopBack configuration.
Step 6	**setloopBack commit** **Example:** `Switch(config-controller-OperationsMepPortType)# setloopBack commit`	Sends the setloopBack configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	
	`Switch(config-controller-OperationsMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Setting Test Signal

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	**OperationsMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.
Step 4	**settst tstConfig tstConfig** {**dei** {**disable** | **enable**} | **mepId** | **mepInstance** *mep_instance_id* | **pattern** | **priority** | **rate** | **sequence size**}	Enables or disables the test signal request. • **tstConfig—**Enables or disables the test signal request.

	Command or Action	Purpose

	Example:
	`Switch(config-controller-OperationsMepPortType)# setTst tstConfig dei disable`
	`Switch(config-controller-OperationsMepPortType)# setTst tstConfig mepId 0`
	`Switch(config-controller-OperationsMepPortType)# setTst tstConfig mepInstance 1`
	`Switch(config-controller-OperationsMepPortType)# setTst tstConfig pattern allZero`
	`Switch(config-controller-OperationsMepPortType)# setTst tstConfig priority 0`
	`Switch(config-controller-OperationsMepPortType)# setTst tstConfig rate 1`
	`Switch(config-controller-OperationsMepPortType)# setTst tstConfig sequence disable`
	`Switch(config-controller-OperationsMepPortType)# setTst tstConfig size 64`
		• **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
		• **size—**Is the test frame size. The valid values are from 1 to 1581.

Step 5	**setTst review** **Example:** `Switch(config-controller-OperationsMepPortType)# setTst review`	Displays the setTst configuration.
Step 6	**setTst commit** **Example:** `Switch(config-controller-OperationsMepPortType)# setTst commit`	Sends the setTst configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	Example:
	`Switch(config-controller-OperationsMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Updating Test Signal

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	**OperationsMepPortType** **Example:** `Switch(config-controller)# OperationsMepPortType`	Enters the OperationsMepPortType mode and enables fault management and performance monitoring on the MEP.

Step 4	**updateTst updateTstConfig** {**mepInstance** *mep_instance_id* | **update** {**Rx** {**disable** | **enable**} | **Tx** {**disable** | **enable**}}
	
	Example:
	`Switch(config-controller-OperationsMepPortType)# updateTst updateTstConfig update Rx enable`
	`Switch(config-controller-OperationsMepPortType)# updateTst updateTstConfig update Tx enable`
	`Switch(config-controller-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 5	**updateTst review** **Example:** `Switch(config-controller-OperationsMepPortType)# updateTst review`	Displays the updateTst configuration.
Step 6	**updateTst commit** **Example:** `Switch(config-controller-OperationsMepPortType)# updateTst commit`	Sends the updateTst configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	`Switch(config-controller-OperationsMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration 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	**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	**LinkOamPortType** **Example:** `Switch(config-controller)# LinkOamPortType`	Enters the LinkOamPortType mode.

Step 4	**setLinkOamPortConfig portConfig** {**linkOam enable** | **linkmonitorSupport enable** | **loopbackOperation enable** | **loopbackSupport enable** | **mibretrivalSupport enable** | **oamMode** {**active** | **passive**} | **portNumber** *port_number* | **variableRetrieve** {**localInfo** | **remoteInfo**}
	
	Example:
	`Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig portConfig portNumber 5`
	`Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig portConfig linkOam enable`
	`Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig portConfig linkmonitorSupport enable`
	
	`Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig portConfig loopbackOperation enable`
	`Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig portConfig loopbackSupport enable`
	`Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig portConfig mibretrivalSupport enable`
	`Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig portConfig oamMode active`
	`Switch(config-controller-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.
		• **variableRetrieve—**Sets the MIB variable retrieve value to local information or remote information.

	Command or Action	Purpose
Step 5	**setLinkOamPortConfig review** **Example:** `Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig review`	Displays the LinkOamPortType configuration.
Step 6	**setLinkOamPortConfig commit** **Example:** `Switch(config-controller-LinkOamPortType)# setLinkOamPortConfig commit`	Sends the LinkOamPortType configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	
	`Switch(config-controller-LinkOamPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration 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(config-controller-LinkOamPortType)# getLinkOamPortConfig linkOamRequest portNumber
5
Switch(config-controller-LinkOamPortType)# getLinkOamPortConfig review
Switch(config-controller-LinkOamPortType)# getLinkOamPortConfig commit
```

Setting Link OAM Event Configuration

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	**LinkOamPortType** **Example:** `Switch(config-controller)# LinkOamPortType`	Enters the LinkOamPortType mode.

	Command or Action	Purpose

Step 4	**setlinkeventConfig linkEventConfig** {**errorFrame** {**threshold** | **window**} | **frameSeconds** {**threshold** | **window**} | **portNumber** *interface_number* | **symbolPeriod** {**threshold** | **window**}}
	
	Example:
	`Switch(config-controller-LinkOamPortType)# setLinkEventConfig linkEventConfig portNumber 5`
	`Switch(config-controller-LinkOamPortType)# setLinkEventConfig linkEventConfig errorFrame threshold 0`
	`Switch(config-controller-LinkOamPortType)# setLinkEventConfig linkEventConfig errorFrame window 1`
	`Switch(config-controller-LinkOamPortType)# setLinkEventConfig linkEventConfig frameSeconds threshold 0`
	`Switch(config-controller-LinkOamPortType)# setLinkEventConfig linkEventConfig frameSeconds window 10`
	`Switch(config-controller-LinkOamPortType)# setLinkEventConfig linkEventConfig symbolPeriod threshold 0`
	`Switch(config-controller-LinkOamPortType)# setLinkEventConfig linkEventConfig symbolPeriod window 1`
		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.
		• **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 5	**setLinkEventConfig review** **Example:** `Switch(config-controller-LinkOamPortType)# setLinkEventConfig review`	Displays the setLinkEventConfig configuration.
Step 6	**setLinkEventConfig commit** **Example:** `Switch(config-controller-LinkOamPortType)# setLinkEventConfig commit`	Sends the setLinkEventConfig configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	`Switch(config-controller-LinkOamPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration 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(config-controller-LinkOamPortType)# getLinkEventConfig linkOamRequest portNumber 5
```

```
Switch(config-controller-LinkOamPortType)# getLinkEventConfig review
Switch(config-controller-LinkOamPortType)# getLinkEventConfig commit
```

Setting Remote Loopback Start And Stop

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	**LinkOamPortType** **Example:** `Switch(config-controller)# LinkOamPortType`	Enters the LinkOamPortType mode.
Step 4	**setremoteLoopBack remoteLoopBak** {**start portList** | **stop portList**} **Example:** `Switch(config-controller-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 5	**setRemoteLoopBack review**
	
	Example:
	`Switch(config-controller-LinkOamPortType)# setRemoteLoopBack review`
	`Commands in queue:`
	`setRemoteLoopBack remoteLoopBack start portList 1`
	`setRemoteLoopBack remoteLoopBack stop portList 1`
		Displays the setRemoteLoopBack configuration.

Step 6	**setRemoteLoopBack commit** **Example:** `Switch(config-controller-LinkOamPortType)# setRemoteLoopBack commit`	Sends the setRemoteLoopBack configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	`Switch(config-controller-LinkOamPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

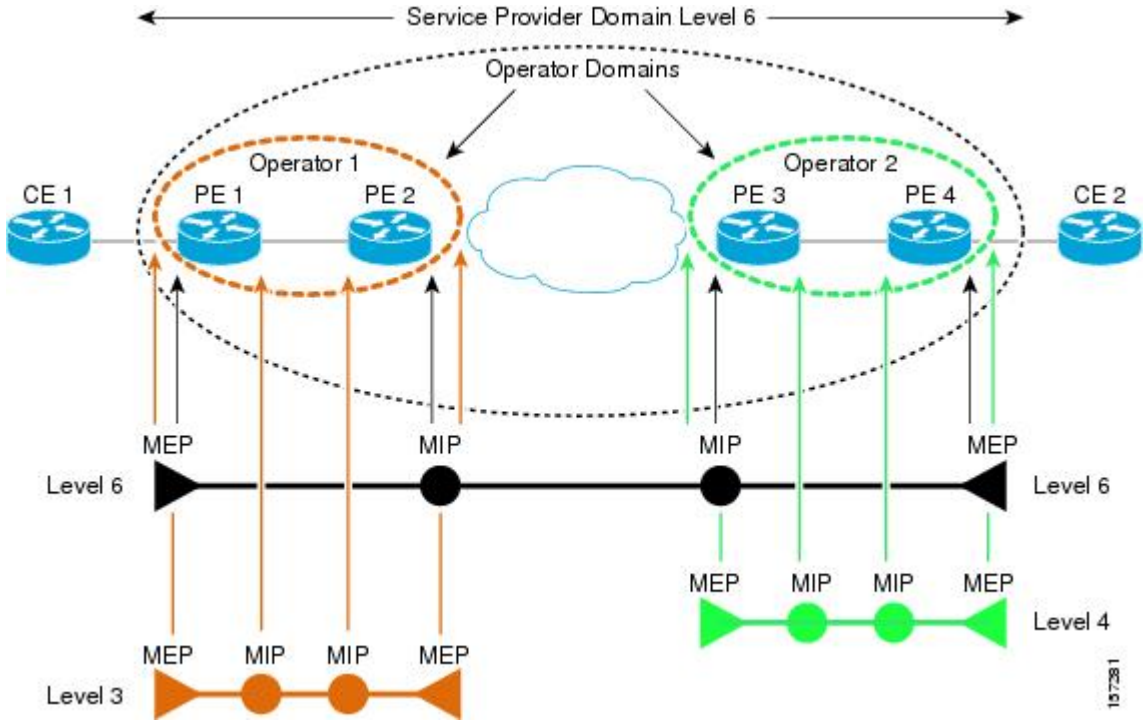
Understanding Connectivity Fault Management

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 1: 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	**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	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

Step 4	**addccAps mepFunctionalConfig** {**aps** {**disable** | **enable** {**mode** {**multi** |**uni**} | **priority** | **switchingProtocol** {**laps** | **raps**}} | **cc** {**disable** | **enable** {**framerate** | **priority**}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol laps`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(config-controller-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

	Command or Action	Purpose
		Switching protocol (LAPS) or Ring Automatic Protection Switching protocol (RAPS). • **cc—**Enables or disables the CC parameters. • **framerate—**Sets the CC frame rate.
Step 5	**addCcAps review** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps review`	Displays the addCcAps configuration.
Step 6	**addCcAps commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps commit`	Sends the addCcAps configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	Example:
	`Switch(config-controller-ProvisionMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Adding Peer MEP IDs

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	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

	Command or Action	Purpose

Step 4	**addPeerMepId mepClientConfig** {**macAddress** *mac_address* | **mepInstance** *mep_instance* | **peerMepId** *peer_mep_id*}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addPeerMepId mepClientConfig aisPriority aisHighest`
	`Switch(config-controller-ProvisionMepPortType)# addPeerMepId mepClientConfig domain VLAN`
	`Switch(config-controller-ProvisionMepPortType)# addPeerMepId mepClientConfig flowId 21`
	`Switch(config-controller-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 5	**addPeerMepId review** **Example:** `Switch(config-controller-ProvisionMepPortType)# addPeerMepId review`	Displays the addPeerMepId configuration.
Step 6	**addPeerMepId commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# addPeerMepId commit`	Sends the addPeerMepId configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Adding Client Configuration

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.

	Command or Action	Purpose
Step 3	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

Step 4	**addClient mepClientConfig** {**aisPriority** {**aisHighest** | **priority**} | **domain** {**evc** |**vlan**} | **flowID** *flow_id* | **lckPriority** {**lckHighest** | **priority**} | **level** *meg_level* | **mepInstance** *mep_instance*}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addClient mepClientConfig aisPriority aisHighest`
	`Switch(config-controller-ProvisionMepPortType)# addClient mepClientConfig domain VLAN`
	`Switch(config-controller-ProvisionMepPortType)# addClient mepClientConfig flowId 21`
	`Switch(config-controller-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 5	**addClient review** **Example:** `Switch(config-controller-ProvisionMepPortType)# addClient review`	Displays the addClient configuration.
Step 6	**addClient commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# addClient commit`	Sends the addClient configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Creating MEP Configuration

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	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.

Step 4	**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(config-controller-ProvisionMepPortType)# createMep createMepConfig direction UP`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain VLAN`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig flowId 21`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 1`
	`Switch(config-controller-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.

	Command or Action	Purpose
		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 5	**createMep review** **Example:** `Switch(config-controller-ProvisionMepPortType)# createMep review`	Displays the createMep configuration.
Step 6	**createMep commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# createMep commit`	Sends the createMep configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	Example:
	`Switch(config-controller-ProvisionMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration mode.

Updating MEP Configuration

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	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode and enables provisioning of the MEP.
Step 4	**updateMep mepUpdateConfig** {**mepInstance** *mep_instance* | **update** {**level** *meg_level* | **megDomain** {**maName** | **megIdFormat** {**ieee** | **ituCcMeg** | **ituMeg**}} | **mepId** *mep_id*	Updates the Maintenance End Point configuration. • **mepInstance—**Sets the MEP instance number. The valid values are from 1 to 128.

	Command or Action	Purpose

	| **performanceMonitoring** {**disable** | **enable**} | **vid** *vid_number* | **voe** {**disable** | **enable**}}}
	
	Example:
	
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction UP`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain VLAN`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig flowId 21`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 1`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig voe disable`
		• **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.

Step 5	**updateMep review** **Example:** `Switch(config-controller-ProvisionMepPortType)# updateMep review`	Displays the updateMep configuration.
Step 6	**updateMep commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# updateMep commit`	Sends the updateMep configuration to the Cisco ME 1200 NID.

Step 7	**exit**
	
	Example:
	
	`Switch(config-controller-ProvisionMepPortType)# exit`
	`Switch(config-controller)#`
		Exits to the controller configuration 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)====(Gi0/1UPE NID ControllerGi0/20)====(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 UPE NID Controller

```
Controller-Switch# show policy-map lm-v1024
  Policy Map lm-v1024
    Class lm-v1024
     police cir 1000000 bc 31250
       conform-action transmit
       exceed-action drop

Controller-Switch# show class-map lm-v1024
 Class Map match-all lm-v1024 (id 2)
   Match   dscp af12 (12)

Controller-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

```
Controller-Switch(config-controller-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:

```
Controller-Switch(config)# controller nid 0/2
Controller-Switch(config-controller)# OpearationsMepPortType
Controller-Switch(config-controller-OpearationsMepPortType)# showlm mepRequest mepInstance
 98
Controller-Switch(config-controller-OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 98
Controller-Switch(config-controller-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!!!
Controller-Switch(config-controller-OpearationsMepPortType)#
```

To stop traffic, do the following:

```
Controller-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:

```
Controller-(config-controller-OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 98
Controller-Switch(config-controller-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!!!

Controller-Switch(config-controller-OpearationsMepPortType)# controller nid 0/2

Controller-Switchconfig-controller-#OpearationsMepPortType
Controller-Switch(config-controller-OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 98
Controller-Switch(config-controller-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!!!
Controller-config-controller-(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 UPE NID Controller

```
Controller-Switch# show policy-map lm-v1022
 Policy Map lm-v1022
    Class lm-v1022
     police cir 1000000 bc 31250
       conform-action transmit
       exceed-action drop

Controller-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

```
Controller-Switch(config-controller-ProvisionMepPortType)# controller nid 0/2
Controller-Switch(config-controller)#ProvisionMepPortType
Controller-Switch(config-controller-ProvisionMepPortType)# showMepConfig flush
Controller-Switch(config-controller-ProvisionMepPortType)# showMepalar mepRequest mepInstance
 94
Controller-Switch(config-controller-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:

```
Controller-Switch(config)# controller nid 0/2
Controller-Switch(config-controller)# OpearationsMepPortType
Controller-Switch(config-controller-OpearationsMepPortType)# showlm mepRequest mepInstance
 98
Controller-Switch(config-controller-OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 98
Controller-Switch(config-controller-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!!!
Controller-Switch(config-controller-OpearationsMepPortType)#
Controller-Switch(config-controller-ProvisionMepPortType)#controller nid 0/1

Controller-Switch(config-controller)#ProvisionMepPortType
Controller-Switch(config-controller-ProvisionMepPortType)#showMepConfig flush
Controller-Switch(config-controller-ProvisionMepPortType)#showMepalar mepRequest mepInstance
 94
Controller-Switch(config-controller-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!!!
Controller-Switch(config-controller-ProvisionMepPortType)#

Controller-Switch(config-controller-ProvisionMepPortType)#controller nid 0/1
Controller-Switch(config-controller)#OpearationsMepPortType
Controller-Switch(config-controller-OpearationsMepPortType)#showlm flush
Controller-Switch(config-controller-OpearationsMepPortType)#showlm mepRequest mepInstance
94
Controller-Switch(config-controller-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!!!
Controller-Switch(config-controller-OpearationsMepPortType)#controller nid 0/2
Controller-Switch(config-controller)#OpearationsMepPortType
Controller-Switch(config-controller-OpearationsMepPortType)#showlm flush
Controller-Switch(config-controller-OpearationsMepPortType)#showlm mepRequest mepInstance
94
Controller-Switch(config-controller-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!!!
Controller-Switch(config-controller-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:

```
Controller-Switch(config)# controller nid 0/1
```

```
Controller-Switch(config-controller)#
Controller-Switch(config-controller)# OpearationsMepPortType
Controller-Switch(config-controller-OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 94
Controller-Switch(config-controller-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!!!

Controller-Switch(config)# controller nid 0/2
Controller-Switch(config-controller)# OpearationsMepPortType
Controller-Switch(config-controller-OpearationsMepPortType)# showlm review
Commands in queue:
        showLM mepRequest mepInstance 94
Controller-Switch(config-controller-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!!!
Controller-Switch(config-controller-OpearationsMepPortType)#
```