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 be added to the controller.
- NID must be accessible from the controller.

Restrictions for Configuring ERPS

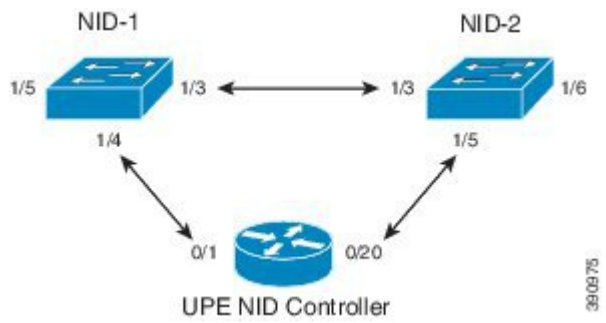
- Maintenance End Point (MEP) is not supported on Ethernet Virtual Connections (EVC) bridge domain.
- MEP domain for control VLAN is only on Port or VLAN.

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 using a UPE NID Controller.

Figure 1: ERPS Topology



How to Provision ERPS

Creating VLAN on NID-1

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)# contoller nid 1/2`	Enters the controller configuration mode.
Step 3	**ProvisionPortVlanPortType** **Example:** `Switch(config-controller)# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 4	**createVlanCommand createVlanReq vlan_list** *vlan_list* **Example:** `Switch(config-controller-ProvisionPortVlanPortType)# createVlanCommand createVlanReq  vlan_list 2000`	Creates VLAN list.
Step 5	**modifySwPort modifySWPortConfig interface** *interface_id* | **mode** [**access Vlan** *vlan_number*] | **trunk** {**allowed** | **native**}	Modifies the switchport configuration. • **interface—**Selects the interface to be configured.

	Command or Action	Purpose

	Example:
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 3`
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 1`
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan_list 2000`
	
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 4`
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 1`
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan-list 2000`
		• *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.
		• **native**—Sets native VLAN.

Step 6	**modifySwPort review** **Example:** `Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort review`	Displays the configuration.
Step 7	**modifySwPort commit** **Example:** `Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(config-controller-ProvisionPortVlanPortType)# exit`	Exits to the config-controller mode.

Configuration Example

The example shows how to create VLAN on NID-1:

```
Switch(config-controller-ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan_list
 2000

Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface
 3
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode
trunk native vlan 1
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode
trunk allowed vlan add vlan_list 2000

Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface
 4
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode
trunk native vlan 1
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode
trunk allowed vlan add vlan_list 2000
```

```
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort review
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort commit
Switch(config-controller-ProvisionPortVlanPortType)# exit
```

Creating MEP on Port 1 of NID-1

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)# contoller nid 1/2`	Enters the controller configuration mode.
Step 3	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.

Step 4	**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(config-controller-ProvisionMepPortType)# createMep createMepConfig mepInstance 100`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain vlan`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain maName ERPS-1`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ituMeg`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepId 100`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 3`
	`Switch(config-controller-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.

	Command or Action	Purpose
		• **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.

Step 5	**addPeerMepId commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 100`
	`Switch(config-controller-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 6	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep_instance_number*} | **review**}	Adds CC/APS configuration request. • **commit—**Commits addCcAps.

	Command or Action	Purpose

	Example:
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 100`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable switchingProtocol raps octet 1`
		• **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 7	**addCcAps review** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 8	**addCcAps commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.
Step 9	**exit** **Example:** `Switch(config-controller-ProvisionMepPortType)# exit`	Exits to the config-controller mode.

Configuration Example

The example shows how to create MEP on port 1 of NID-1:

```
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepInstance 100
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain vlan
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain maName
 ERPS-1
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain
megIdFormat ituMeg
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepId 100
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 3
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig flow 2000

Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 100
```

```
Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 101

Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance
100
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable
priority 7
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable
frameRate fr1s
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
mode multi
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
priority 7
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
switchingProtocol raps octet 1

Switch(config-controller-ProvisionMepPortType)# addCcAps review
Switch(config-controller-ProvisionMepPortType)# addCcAps commit
Switch(config-controller-ProvisionMepPortType)# exit
```

Creating MEP on Port 2 of NID-1

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)# contoller nid 1/2`	Enters the controller configuration mode.
Step 3	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.

Step 4	**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(config-controller-ProvisionMepPortType)# createMep createMepConfig mepInstance 99`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain vlan`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain maName W-N-V2000`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat`
		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.

	Command or Action	Purpose

	`ieee name W-N-V2000`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepId 101`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 4`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig flow 2000`
		• **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.

Step 5	**addPeerMepId commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 99`
	`Switch(config-controller-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.

	Command or Action	Purpose
		• **mepInstance—**Specifies the mep instance number. • **peerMepId—**Specifies the peer MEP-ID.

Step 6	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep_instance_number*} | **review**}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 99`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(config-controller-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 7	**addCcAps review** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 8	**addCcAps commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.
Step 9	**exit** **Example:** `Switch(config-controller-ProvisionMepPortType)# exit`	Exits to the config-controller mode.

Configuration Example

The example shows how to create MEP on port2 of NID-1:

```
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepInstance 99
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain vlan
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0
```

```
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain maName
 W-N-V2000
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain
megIdFormat ieee name W-N-V2000
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepId 101
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 4
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig flow 2000

Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 99
Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 102

Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance
99
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable
priority 7
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable
frameRate fr1s
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
mode multi
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
priority 7
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
switchingProtocol raps octet 1

Switch(config-controller-ProvisionMepPortType)# addCcAps review
Switch(config-controller-ProvisionMepPortType)# addCcAps commit
Switch(config-controller-ProvisionMepPortType)# exit
```

Configuring ERPS on NID-1

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)# contoller nid 1/2`	Enters the controller configuration mode.
Step 3	**ErpsPortType** **Example:** `Switch(config-controller)# ErpsPortType`	Enters the ErpsPortType mode.

Step 4	**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(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig erpsInst 1`
	`Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port0 aps 100`
	`Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port0 sf 100`
		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.

	Command or Action	Purpose

	`Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port1 aps 99`
	`Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port1 sf 99`
	`Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig port0 3`
	`Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig port1 4`
	`Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig ringType major`
		• **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.
		• **ringType**—Specifies type of ring.
		• **major**—Specifies the major ring.
		• **sub**—Specifies the sub ring.

Step 5	**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(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1`
	`Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig erpsInst 1`
	`Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig rplPort port0`
	`Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig rplRole owner`
	`Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig vlan vlanList 2-10`
	`Switch(config-controller-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 6	**setErpsInstProperties review** **Example:** `Switch(config-controller-ErpsPortType)# setErpsInstProperties review`	Displays the configuration.

	Command or Action	Purpose
Step 7	**setErpsInstProperties commit** **Example:** `Switch(config-controller-ErpsPortType)# setErpsInstProperties commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(config-controller-ErpsPortType)# exit`	Exits to the config-controller mode.

Configuration Example

The example shows how to configure ERPS on NID-1:

```
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig erpsInst 1
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port0 aps 100
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port0 sf 100
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port1 aps 99
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port1 sf 99
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig port0 3
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig port1 4
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig ringType major

Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig erpsInst 1
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig rplPort port0
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig rplRole owner
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig vlan vlanList
 2-10
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1

Switch(config-controller-ErpsPortType)# setErpsInstProperties review
Switch(config-controller-ErpsPortType)# setErpsInstProperties commit
Switch(config-controller-ErpsPortType)# exit
```

Creating VLAN on NID-2

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)# contoller nid 1/2`	Enters the controller configuration mode.

	Command or Action	Purpose
Step 3	**ProvisionPortVlanPortType** **Example:** `Switch(config-controller)# ProvisionPortVlanPortType`	Enters the ProvisionPortVlanPortType mode.
Step 4	**createVlanCommand createVlanReq vlan_list** *vlan_list* **Example:** `Switch(config-controller-ProvisionPortVlanPortType)# createVlanCommand createVlanReq  vlan_list 2000`	Creates VLAN list.

Step 5	**modifySwPort modifySWPortConfig interface** *interface_id* | **mode** [**access Vlan** *vlan_number*] | **trunk** {**allowed** | **native**}
	
	Example:
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 3`
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 1`
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk allowed vlan add vlan_list 2000`
	
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface 5`
	`Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode trunk native vlan 1`
	`Switch(config-controller-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.
		• **native—**Sets native VLAN.

Step 6	**modifySwPort review** **Example:** `Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort review`	Displays the configuration.
Step 7	**modifySwPort commit** **Example:** `Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(config-controller-ProvisionPortVlanPortType)# exit`	Exits to the config-controller mode.

Configuration Example

The example shows how to create VLAN on NID-2:

```
Switch(config-controller-ProvisionPortVlanPortType)# createVlanCommand createVlanReq vlan_list
 2000

Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface
 3
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode
trunk native vlan 1
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode
trunk allowed vlan add vlan_list 2000

Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig interface
 5
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode
trunk native vlan 1
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort modifySWPortConfig mode
trunk allowed vlan add vlan_list 2000

Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort review
Switch(config-controller-ProvisionPortVlanPortType)# modifySwPort commit
Switch(config-controller-ProvisionPortVlanPortType)# exit
```

Creating MEP on Port 1 of NID-2

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)# contoller nid 1/2`	Enters the controller configuration mode.
Step 3	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.

Step 4	**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(config-controller-ProvisionMepPortType)# createMep createMepConfig mepInstance 100`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain vlan`
	`Switch(config-controller-ProvisionMepPortType)#`
		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.

	Command or Action	Purpose

	`createMep createMepConfig level 0`
	`Switch(config-controller-ProvisionMepPortType)#`
	`createMep createMepConfig megDomain maName ERPS-1`
	`Switch(config-controller-ProvisionMepPortType)#`
	`createMep createMepConfig megDomain megIdFormat ituMeg`
	`Switch(config-controller-ProvisionMepPortType)#`
	`createMep createMepConfig mepId 101`
	`Switch(config-controller-ProvisionMepPortType)#`
	`createMep createMepConfig mode MEP`
	`Switch(config-controller-ProvisionMepPortType)#`
	`createMep createMepConfig residencePort 3`
	`Switch(config-controller-ProvisionMepPortType)#`
	`createMep createMepConfig flow 2000`
		• **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.

Step 5	**addPeerMepId commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)#`
	`addPeerMepId peerMepConfig mepInstance 100`
		Adds peer MEP request.
		• **commit—**Commits addPeerMepId.
		• **flush—**Flushes all addPeerMepId commands from queue.
		• **peerMepConfig—**Adds peer mep request.

	Command or Action	Purpose
	`Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 100`	• **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 6	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep_instance_number*} | **review**}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 100`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(config-controller-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 7	**addCcAps review** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 8	**addCcAps commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.
Step 9	**exit** **Example:** `Switch(config-controller-ProvisionMepPortType)# exit`	Exits to the config-controller mode.

Configuration Example

The example shows how to create MEP on port 1 of NID-2:

```
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepInstance 100
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain vlan
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain maName
 ERPS-1
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain
megIdFormat ituMeg
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepId 101
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 3
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig flow 2000

Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 100
Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 100

Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance
100
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable
priority 7
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable
frameRate fr1s
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
mode multi
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
priority 7
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
switchingProtocol raps octet 1

Switch(config-controller-ProvisionMepPortType)# addCcAps review
Switch(config-controller-ProvisionMepPortType)# addCcAps commit
Switch(config-controller-ProvisionMepPortType)# exit
```

Creating MEP on Port 2 of NID-2

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)# contoller nid 1/2`	Enters the controller configuration mode.
Step 3	**ProvisionMepPortType** **Example:** `Switch(config-controller)# ProvisionMepPortType`	Enters the ProvisionMepPortType mode.
Step 4	**createMep createMepConfig** {**mepinstance** | **mode** {**mep** | **mip**} | **direction** {**up** | **down**} | **domain** {**port** | **evc** | **vlan**} | **flowId** | **vid** | **level** *level_number* | **residencePort**	Creates MEP configuration. • **mepinstance—**Specifies the MEP instance number.

	Command or Action	Purpose

	port_number | **mepId** *id_number* | **megdomain** {**maName** *ma_name* | **megIdFormat** {**ituMeg** | **ituCcMeg** | **ieee**}}}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepInstance 99`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction DOWN`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain vlan`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain maName W-N-V2000`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain megIdFormat ieee name W-N-V2000`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepId 103`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 5`
	`Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig flow 2000`
		• **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).
		• **ituCcMeg**—Specifies the MEG-ID using ITU Country Code format (CC - ICC - UMC).

	Command or Action	Purpose
		• **ieee—**Specifies the MEG-ID (Short MA Name) using IEEE Character String format.

Step 5	**addPeerMepId commit** | **flush** | **peerMepConfig** {**macAddress** | **mepInstance** | **peerMepId**}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 99`
	`Switch(config-controller-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 6	**addCcAps** {**commit** | **flush** | **mepFunctionalConfig** {**aps** {**enable** | **disable**} | **cc** {**enable** | **disable**} | **mepInstance** *mep_instance_number*} | **review**}
	
	Example:
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance 99`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable priority 7`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable frameRate fr1s`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable mode multi`
	`Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable priority 7`
	`Switch(config-controller-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 7	**addCcAps review** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps review`	Displays the configuration.
Step 8	**addCcAps commit** **Example:** `Switch(config-controller-ProvisionMepPortType)# addCcAps commit`	Sends the configuration to NID.

	Command or Action	Purpose
Step 9	**exit** **Example:** `Switch(config-controller-ProvisionMepPortType)# exit`	Exits to the config-controller mode.

Configuration Example

The example shows how to create MEP on port 2 of NID-2:

```
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepInstance 99
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig direction DOWN
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig domain vlan
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig level 0
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain maName
 W-N-V2000
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig megDomain
megIdFormat ieee name W-N-V2000
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mepId 103
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig mode MEP
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig residencePort 5
Switch(config-controller-ProvisionMepPortType)# createMep createMepConfig flow 2000

Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig mepInstance 99
Switch(config-controller-ProvisionMepPortType)# addPeerMepId peerMepConfig peerMepId 104

Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig mepInstance
99
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable
priority 7
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig cc enable
frameRate fr1s
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
mode multi
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
priority 7
Switch(config-controller-ProvisionMepPortType)# addCcAps mepFunctionalConfig aps enable
switchingProtocol raps octet 1

Switch(config-controller-ProvisionMepPortType)# addCcAps review
Switch(config-controller-ProvisionMepPortType)# addCcAps commit
Switch(config-controller-ProvisionMepPortType)# exit
```

Configuring ERPS on NID-2

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)# contoller nid 1/2`	Enters the controller configuration mode.
Step 3	**ErpsPortType** **Example:** `Switch(config-controller)# ErpsPortType`	Enters the ErpsPortType mode.

Step 4	**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(config-controller-ErpsPortType)#`
	`setErpsInstConfig erpsConfig erpsInst 1`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstConfig erpsConfig mep port0 aps 100`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstConfig erpsConfig mep port0 sf 100`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstConfig erpsConfig mep port1 aps 99`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstConfig erpsConfig mep port1 sf 99`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstConfig erpsConfig port0 3`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstConfig erpsConfig port1 5`
	`Switch(config-controller-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.
		• **ringType—**Specifies type of ring.
		• **major—**Specifies the major ring.
		• **sub—**Specifies the sub ring.

Step 5	**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(config-controller-ErpsPortType)#`
	`setErpsInstProperties erpsInstconfig wtrTime 1`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstProperties erpsInstconfig erpsInst 1`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstProperties erpsInstconfig rplPort port0`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstProperties erpsInstconfig rplRole neighbour`
	`Switch(config-controller-ErpsPortType)#`
	`setErpsInstProperties erpsInstconfig vlan vlanList 2-10`
	`Switch(config-controller-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.

	Command or Action	Purpose
		• **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 6	**setErpsInstProperties review** **Example:** `Switch(config-controller-ErpsPortType)# setErpsInstProperties review`	Displays the configuration.
Step 7	**setErpsInstProperties commit** **Example:** `Switch(config-controller-ErpsPortType)# setErpsInstProperties commit`	Sends the configuration to NID.
Step 8	**exit** **Example:** `Switch(config-controller-ErpsPortType)# exit`	Exits to the config-controller mode.

Configuration Example

The example shows how to configure ERPS on NID-2:

```
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig erpsInst 1
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port0 aps 100
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port0 sf 100
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port1 aps 99
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig mep port1 sf 99
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig port0 3
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig port1 5
Switch(config-controller-ErpsPortType)# setErpsInstConfig erpsConfig ringType major

Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig erpsInst 1
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig rplPort port0
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig rplRole neighbour
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig vlan vlanList
 2-10
Switch(config-controller-ErpsPortType)# setErpsInstProperties erpsInstconfig wtrTime 1

Switch(config-controller-ErpsPortType)# setErpsInstProperties review
Switch(config-controller-ErpsPortType)# setErpsInstProperties commit
Switch(config-controller-ErpsPortType)# exit
```

Configuring ERPS on the UPE NID Controller

To configure ERPS on the UPE NID Controller, 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.
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.

	Command or Action	Purpose
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.
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.

	Command or Action	Purpose
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.
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 UPE NID Controller:

```
!
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 controller.

- **showErpsConfig showErpsReq erpsInstList 1**

  This command displays the ERPS status on the NID. The following is a sample output from the command:

```
Switch(config-controller-ErpsPortType)# showErpsConfig showErpsReq erpsInstList 1
Switch(config-controller-ErpsPortType)# showErpsConfig review
```

```
showErpsConfig reviewCommands in queue:
        showErpsConfig showErpsReq erpsInstList 1
```

```
Switch(config-controller-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 NID. The following is a sample output from the command:

```
Switch(config-controller-EpsPortType)# showErpsStats erpsShowStateReq erpsInst 1
Switch(config-controller-EpsPortType)# showErpsStats erpsShowStateReq show brief
Switch(config-controller-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!!!
```