Pseudowire Command Reference

This chapter describes commands used to configure the pseudowire.

backup delay

To specify how long a backup pseudowire virtual circuit (VC) must wait before resuming operation after the primary pseudowire VC goes down, use the **backup delay** command in xconnect configuration mode.

backup delay *enable-delay* {*disable-delay* | **never**}

Syntax Description

enable-delay	Number of seconds that elapse after the primary pseudowire VC goes down before the secondary pseudowire VC is activated. The range is 0 to 180 seconds. The default value is 0 seconds.
disable-delay	Number of seconds that elapse after the primary pseudowire VC comes up before the secondary pseudowire VC is deactivated. The range is 0 to 180 seconds. The default value is 0 seconds.
never	Indicates that the secondary pseudowire VC will not fall back to the primary pseudowire VC if the primary pseudowire VC becomes available again unless the secondary pseudowire VC fails.

Command Modes

Xconnect configuration (config-if-xconn)

Command History

Release	Modification
9.3.0	This command was introduced.

Examples

The following example shows how to create a xconnect with one redundant peer. After a switchover to the secondary VC occurs, there will be no fallback to the primary VC unless the secondary VC fails.

```
Router(config)# pseudowire-class mpls
Router(config-pw-class)# encapsulation mpls
Router(config-if)# xconnect 10.0.0.1 50 pw-class mpls
Router(config-if-xconn)# backup peer 10.0.0.2 50
Router(config-if-xconn)# backup delay 0 never
```

Related Commands

Command	Description
backup peer	Configures a redundant peer for a pseudowire VC.

backup peer

To specify a redundant peer for a pseudowire virtual circuit (VC), use the **backup peer** command in xconnect configuration mode. To remove the redundant peer, use the **no** form of this command.

backup peer *peer-router-ip-addr vcid* [**pw-class** *pw-class-name*]

no backup peer *peer-router-ip-addr vcid*

Syntax Description

peer-router-ip-addr	IP address of the remote peer.
vcid	32-bit identifier of the virtual circuit between the routers at each end of the layer control channel.
pw-class	(Optional) Specifies the pseudowire class.
pw-class-name	(Optional) Name of the pseudowire class.

Command Default

A redundant peer is not established.

Command Modes

Xconnect configuration (config-if-xconn)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

The combination of the *peer-router-ip-addr* and *vcid* arguments must be unique on the router.

Examples

The following example shows how to create an MPLS xconnect with one redundant peer.

```
Router(config)# pseudowire-class mpls
Router(config-pw-class)# encapsulation mpls

Router(config)# interface TenGigabitEthernet4/1
Router(config-if)# xconnect 10.0.0.1 100 pw-class mpls
Router(config-if-xconn)# backup peer 10.0.0.2 200
```

Related Commands

Command	Description
backup delay	Specifies how long the backup pseudowire VC must wait before resuming operation after the primary pseudowire VC goes down.

encapsulation (pseudowire)

To specify an encapsulation type for tunneling Layer 2 traffic over a pseudowire, use the **encapsulation** command in pseudowire class configuration mode.

encapsulation mpls

Syntax Description

mpls	Specifies that MPLS is used as the data encapsulation method.

Command Default

Encapsulation type for tunneling Layer 2 traffic is not configured.

Command Modes

Pseudowire-class configuration (config-pw-class)

Command History

Release	Modification
9.3.0	This command was introduced.

Examples

The following example shows how to configure MPLS as the data encapsulation method for the pseudowire class ether-pw.

```
Router(config)# pseudowire-class ether-pw
Router(config-pw-class)# encapsulation mpls
```

Related Commands

Command	Description
xconnect	Binds an attachment circuit to a pseudowire for xconnect service and enters xconnect configuration mode.
pseudowire-class	Specifies the name of a pseudowire class and enters pseudowire class configuration mode.

interworking

To enable the L2VPN Interworking feature, use the **interworking** command in pseudowire class configuration mode. To disable the L2VPN Interworking feature, use the **no** form of this command.

interworking {**ethernet** | **vlan**}

no interworking {**ethernet** | **vlan**}

Syntax Description

ethernet	Enables Ethernet frames to be extracted from the attachment circuit and sent over the pseudowire. Ethernet end-to-end transmission is assumed. Attachment circuit frames that do not contain Ethernet frames are dropped. In the case of VLAN, the VLAN tag is removed, which leaves a pure Ethernet frame.
vlan	Enables Ethernet frames and the VLAN tag to be sent over the pseudowire. Ethernet end-to-end transmission is assumed. Attachment circuit frames that do not contain Ethernet frames are dropped.

Command Default

L2VPN interworking is not enabled.

Command Modes

Pseudowire class configuration (config-pw)

Command History

Release	Modification
9.3.0	This command was introduced.

Examples

The following example shows how to create a pseudowire class configuration that enables the L2VPN Interworking feature.

```
Router(config)# pseudowire-class ip-interworking
Router(config-pw)# encapsulation mpls
Router(config-pw)# interworking ethernet
```

Related Commands

Command	Description
encapsulation mpls	Specifies that MPLS is used as the data encapsulation method for tunneling Layer 2 traffic over the pseudowire.

l2 vfi point-to-point

To establish a point-to-point Layer 2 virtual forwarding interface (VFI) between two separate networks, use the **l2 vfi point-to-point** command in global configuration mode. To disable the connection, use the **no** form of this command.

l2 vfi *name* **point-to-point**

no l2 vfi *name* **point-to-point**

Syntax Description

name	Name of the connection between the two networks.

Command Default

Point-to-point Layer 2 virtual forwarding interfaces are not created.

Command Modes

Global configuration (config)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

If you disable L2VPN Pseudowire Stitching with the **no l2 vfi point-to-point** command, the virtual circuits (VCs) are deleted.

Examples

The following example shows how to establish a point-to-point Layer 2 VFI.

```
Router(config)# l2 vfi atomvfi point-to-point
```

Related Commands

Command	Description
neighbor (L2VPN Pseudowire Stitching)	Establishes the two routers with which to form a connection.

local link notification

To specify the soak time for an interface, use the **local link notification** command in interface configuration mode.

local link notification soak-duration *duration*

Syntax Description

soak-duration *duration*	Specifies the soak time for an interface in seconds. The valid values range from 0 to 300. The default is 10.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
9.5.0	This command was introduced.

Usage Guidelines

The soak time can be configured even if the Remote Ethernet Port Shutdown feature is disabled. However, the soak time is effective only when the Remote Ethernet Port Shutdown feature is enabled.

The soak time applies only to the individual ports. It does not apply to the ports of a channel group if the channel group is configured as an attachment circuit.

Examples

The following example shows how to specify the soak time for an interface:

```
Router> enable
Router# configure terminal
Router(config)# interface TenGigabitEthernet4/1
Router(config-if)# local link notification soak-duration 30
Router(config-if)# exit
```

Related Commands

Command	Description
remote link failure notification	Enables the Remote Ethernet Port Shutdown feature on an interface.

mpls control-word

To enable the MPLS control word in a static pseudowire connection, use the **mpls control-word** command in xconnect configuration mode. To disable the control word, use the **no** form of this command.

mpls control-word

no mpls control-word

Syntax Description

This command has no arguments or keywords.

Command Default

The control word is included in static pseudowire connections.

Command Modes

Xconnect configuration (config-if-xconn)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

This command is used when configuring static pseudowires. Because the control word is included by default, it may be necessary to explicitly disable this command in static pseudowire configurations.

When the **mpls control-word** command is used in static pseudowire configurations, the command must be configured the same way on both ends of the connection to work correctly. Otherwise, the provider edge routers cannot exchange control messages to negotiate inclusion or exclusion of the control word.

Examples

The following example shows the how to configure the control word in a static pseudowire connection.

```
Router# configure terminal
Router(config)# interface TenGigabitEthernet4/1
Router(config-if)# xconnect 10.131.191.251 100 encapsulation mpls manual pw-class mpls
Router(config-if-xconn)# mpls label 100 150
Router(config-if-xconn)# no mpls control-word
Router(config-if-xconn)# exit
Router(config-if)# exit
```

Related Commands

Command	Description
mpls label	Configures a static pseudowire connection by defining local and remote pseudowire labels.
xconnect	Binds an attachment circuit to a pseudowire, and configures a static pseudowire.

Command	Description
show mpls l2transport vc	Displays information about virtual circuits and static pseudowires that are enabled to route Layer 2 packets on a router.

mpls label

To configure a static pseudowire connection by defining local and remote circuit labels, use the **mpls label** command in xconnect configuration mode. To remove the local and remote pseudowire labels, use the **no** form of this command.

mpls label *local-pseudowire-label remote-pseudowire-label*

no mpls label

Syntax Description

local-pseudowire-label	Static label that is unused within the range defined by the **mpls label range** command.
remote-pseudowire-label	Value of the local pseudowire label of the peer provider edge router.

Command Default

Default labels are not configured.

Command Modes

Xconnect configuration (config-if-xconn)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

This command is mandatory when configuring static pseudowires, and must be configured at both ends of the connection.

The **mpls label** command checks the validity of the local pseudowire label and will generate an error message if the label is invalid.

Examples

The following example shows how to configure both ends of a static pseudowire connection.

```
Router# configure terminal
Router(config)# interface TenGigabitEthernet4/1
Router(config-if)# no ip address
Router(config-if)# xconnect 10.131.191.251 100 encapsulation mpls manual pw-class mpls
Router(config-if-xconn)# mpls label 100 150
Router(config-if-xconn)# exit
Router(config-if)# exit

Router# configure terminal
Router(config)# interface TenGigabitEthernet4/1
Router(config-if)# no ip address
Router(config-if)# xconnect 10.132.192.252 100 encapsulation mpls manual pw-class mpls
Router(config-if-xconn)# mpls label 150 100
Router(config-if-xconn)# exit
Router(config-if)# exit
```

Related Commands

Command	Description
mpls control-word	Enables sending the MPLS control word in a static pseudowire connection.
show mpls l2transport vc	Displays information about virtual circuits and static pseudowires that have been enabled to route Layer 2 packets on a router.
xconnect	Binds an attachment circuit to a pseudowire, and configures a static pseudowire.

mtu

To adjust the maximum packet size or maximum transmission unit (MTU) size, use the **mtu** command in interface configuration mode. To revert the MTU value to its default value, use the **no** form of this command.

mtu bytes

no mtu

Syntax Description

bytes	MTU size, in bytes. The default value is 1500 bytes.

Command Default

The default MTU value for Ethernet is 1500 bytes.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

Each interface has a default maximum packet size or MTU size. This number generally defaults to the largest size possible for that interface type.

Examples

The following example shows how to specify a MTU size.

```
Router(config)# interface TenGigabitEthernet4/1
Router(config-if)# mtu 1800
```

neighbor (L2VPN Pseudowire Stitching)

To specify the routers that must form a point-to-point Layer 2 virtual forwarding interface (VFI) connection, use the **neighbor** command in L2 VFI point-to-point configuration mode. To disconnect the routers, use the **no** form of this command.

neighbor *ip-address vcid* {**encapsulation mpls** | **pw-class** *pw-class-name*}

no neighbor *ip-address vcid* {**encapsulation mpls** | **pw-class** *pw-class-name*}

Syntax Description

ip-address	IP address of the VFI neighbor.
vc-id	Virtual circuit (VC) identifier.
encapsulation mpls	Specifies the encapsulation type.
pw-class	Specifies the pseudowire type.
pw-class-name	Name of the pseudowire you created when you established the pseudowire class.

Command Default

Routers do not form a point-to-point Layer 2 VFI connection.

Command Modes

L2 VFI point-to-point configuration (config-vfi)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

A maximum of two **neighbor** commands are allowed when you issue the **l2 vfi point-to-point** command.

Examples

The following example shows how to configure a Layer 2 VFI connection.

```
Router(config)# l2 vfi atom point-to-point
Router(config-vfi)# neighbor 10.10.10.10 1 encapsulation mpls
```

Related Commands

Command	Description
l2 vfi point-to-point	Establishes a point-to-point Layer 2 VFI between two separate networks.

preferred-path

To specify the Multiprotocol Label Switching Transport Profile (MPLS-TP) or MPLS Traffic Engineering (MPLS-TE) tunnel path that the traffic uses, use the **preferred-path** command in pseudowire configuration mode. To disable the tunnel path selection, use the **no** form of this command.

preferred-path {**interface tunnel** *tunnel-number* | **peer** {*ip-address* | *host-name*}} [**disable- fallback**]

no preferred-path {**interface tunnel** *tunnel-number* | **peer** {*ip-address* | *host-name*}} [**disable- fallback**]

Syntax Description

interface tunnel *tunnel-number*	Specifies a MPLS–TE or MPLS–TP tunnel interface.
peer *ip-address* | *host-name*	Specifies an IP address or DNS name configured on the peer provider edge (PE) router, which is reachable through a label switched path (LSP).
disable-fallback	(Optional) Disables the router from using the default path when the preferred path is unreachable.

Command Default

The tunnel path selection is not enabled.

Command Modes

Pseudowire configuration (config-pw)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

The following guidelines provide more information about using this command:

- This command is available only if the pseudowire encapsulation type is MPLS.
- Tunnel selection is enabled when you exit from pseudowire configuration mode.
- The selected path must be an LSP destined to the peer PE router.
- The selected tunnel must be either an MPLS–TE or MPLS–TP tunnel.
- If you select a tunnel, the tunnel tail-end must be on the remote PE router.
- If you specify an IP address, that address must be the IP address of the loopback interface on the remote PE. The address must have a /32 mask.

Examples

The following example shows how to create a pseudowire class and specifies tunnel 1 as the preferred path.

```
Router(config)# pseudowire-class pw1
Router(config-pw)# encapsulation mpls
Router(config-pw)# preferred-path interface tunnel 1 disable-fallback
```

Related Commands

Command	Description
show mpls l2transport vc	Displays information about the virtual circuits that have been enabled to route Layer 2 packets on a router.

pseudowire-class

To specify the name of a Layer 2 pseudowire class and enter pseudowire class configuration mode, use the **pseudowire-class** command in global configuration mode. To remove a pseudowire class configuration, use the **no** form of this command.

pseudowire-class [*pw-class-name*]

no pseudowire-class [*pw-class-name*]

Syntax Description

pw-class-name	(Optional) Name of a Layer 2 pseudowire class. If you want to configure more than one pseudowire class, you must enter a value for the *pw-class-name* argument.

Command Default

Pseudowire classes are not defined.

Command Modes

Global configuration (config)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

The **pseudowire-class** command enables you to configure a pseudowire class template that consists of configuration settings used by all the attachment circuits bound to the class. A pseudowire class includes the following configuration settings:

- Data encapsulation type
- Control protocol
- Sequencing
- IP address of the local Layer 2 interface

After you enter the **pseudowire-class** command, the router switches to pseudowire class configuration mode, where pseudowire settings can be configured.

Examples

The following example shows how to enter pseudowire class configuration mode to configure a pseudowire configuration template named class1.

```
Router(config)# pseudowire-class class1
Router(config-pw)#
```

Related Commands

Command	Description
pseudowire	Binds an attachment circuit to a Layer 2 pseudowire for xconnect service.
xconnect	Binds an attachment circuit to a pseudowire for xconnect service and enters xconnect configuration mode.

pseudowire

To bind an attachment circuit to a Layer 2 pseudowire for xconnect service, use the **pseudowire** command in interface configuration mode.

pseudowire *peer-ip-address vcid* **pw-class** *pw-class-name* [**sequencing** {**transmit** | **receive** | **both**}]

Syntax Description

peer-ip-address	IP address of the remote peer.
vcid	32-bit identifier of the virtual circuit (VC) between the routers at each end of the Layer 2 control channel.
pw-class *pw-class-name*	Specifies the pseudowire class configuration from which the data encapsulation type is taken.
sequencing {transmit | receive | both}	(Optional) Sets the sequencing method to be used for packets received or sent in sessions. • **transmit**—Sets sequencing of data packets received from the session. • **receive**—Sets sequencing of data packets sent into the session. • **both**—Sets sequencing of data packets that are both sent and received from the session.

Command Default

None.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

The combination of the *peer-ip-address* and *vcid* arguments must be unique on the router. Each pseudowire configuration must have a unique combination of *peer-ip-address* and *vcid* configuration.

The same *vcid* value that identifies the attachment circuit must be configured using the **pseudowire** command on the local and remote router at each end of a Layer 2 session. The virtual circuit identifier creates the binding between a pseudowire and an attachment circuit.

The **pw-class** *pw-class-name* value binds the pseudowire configuration of an attachment circuit to a specific pseudowire class. In this way, the pseudowire class configuration serves as a template that contains settings used by all attachment circuits bound to it with the **pseudowire** command.

Examples

The following example shows how to bind the attachment circuit to a Layer 2 pseudowire for a xconnect service for the pseudowire class named pwclass1.

```
Router(config-if)# pseudowire 172.24.13.196 10 pw-class pwclass1
```

Related Commands

Command	Description
pseudowire-class	Specifies the name of a pseudowire class and enters pseudowire class configuration mode.

remote link failure notification

To enable the Remote Ethernet Port Shutdown feature on an interface, use the **remote link failure notification** command in Ethernet Xconnect configuration mode. To disable the Remote Ethernet Port Shutdown feature on an interface, use the **no** form of this command.

remote link failure notification

no remote link failure notification

Syntax Description

This command has no arguments or keywords.

Command Modes

Ethernet Xconnect configuration (config-if-ether-vc-xconn)

Command History

Release	Modification
9.5.0	This command was introduced.

Usage Guidelines

The Remote Ethernet Port Shutdown feature applies only to a xconnect that is configured under the default Ethernet Flow Point (EFP). This feature applies only to attachment circuit failures on Virtual Private Wired Service (VPWS) port-based pseudowires.

Examples

The following example shows how to enable the Remote Ethernet Port Shutdown feature:

```
Router> enable
Router# configure terminal
Router(config)# interface TenGigabitEthernet4/1
Router(config-if)# local link notification soak-duration 30
Router(config-if)# service instance 100 ethernet
Router(config-if-srv)# encapsulation default
Router(config-if-srv)# xconnect 10.131.191.252 100 encapsulation mpls pw-class class1
Router(config-if-ether-vc-xconn)# remote link failure notification
Router(config-if-ether-vc-xconn)# exit
Router(config-if-srv)# exit
Router(config-if)# exit
```

Related Commands

Command	Description
local link notification	Specifies the soak time for an interface.

show mpls l2transport binding

To display virtual circuit (VC) label binding information, use the **show mpls l2transport binding** command in privileged EXEC mode.

show mpls l2transport binding [*vc-id* | *ip-address* | **local-label** *number* | **remote-label** *number*]

Syntax Description

vc-id	(Optional) VC label binding information for the specified VC is displayed.
ip-address	(Optional) VC label binding information for the specified VC destination is displayed.
local-label *number*	(Optional) Displays VC label binding information for the specified local assigned label.
remote-label *number*	(Optional) Displays VC label binding information for the specified remote assigned label.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
9.3.0	This command was introduced.

Examples

The following example is a sample output from the **show mpls l2transport binding** command that shows the VC label binding information.

```
Router# show mpls l2transport binding

Destination Address: 10.5.5.51, VC ID: 108
  Local Label: 16
  Remote Label: 18
```

Related Commands

Command	Description
show mpls l2transport vc	Displays information about virtual circuits and static pseudowires that have been enabled to route Layer 2 packets on a router.

show mpls l2transport vc

To display information about virtual circuits (VCs) and static pseudowires that have been enabled to route Layer 2 packets on a router, use the **show mpls l2transport vc** command in privileged EXEC mode.

show mpls l2transport vc [**vcid** *vc-id-min* | *vc-id-min*] [*vc-id-max*] [**interface** *type number* [*local-circuit-id*]] [**destination** {*ip-address* | *hostname*}] [**detail**] [**pwid** *pw-identifier*] [**stitch** *endpoint endpoint*]

Syntax Description

vcid	(Optional) Displays the VC ID.
vc-id-min	(Optional) Minimum VC ID value. The range is from 1 to 4294967295.
vc-id-max	(Optional) Maximum VC ID value. The range is from 1 to 4294967295.
interface *type number*	(Optional) Displays the interface of the router that has been enabled to transport Layer 2 packets.
local-circuit-id	(Optional) Local circuit number.
destination	(Optional) Displays the remote router.
ip-address	(Optional) IP address of the remote router.
hostname	(Optional) Host name assigned to the remote router.
detail	(Optional) Displays the detailed information about the VCs.
pwid *pw-identifier*	(Optional) Displays the number of a pseudowire for a single VC. The valid entries range from 1 to 4294967295.
stitch *endpoint endpoint*	(Optional) Displays the dynamically stitched pseudowires between the specified endpoints.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

If you do not specify any keywords or arguments, the command displays a summary of all the VCs.

Examples

The following is a sample output from the **show mpls l2transport vc** command that shows information about the interfaces and VCs that have been configured to transport various Layer 2 packets on the router.

```
Router# show mpls l2transport vc
```

```
Local intf     Local circuit    Dest address   VC ID    Status
-----------    --------------   ------------   ------   -------
Te7/2           Eth VLAN 100    47.47.47.47     1        UP
Te7/2           Eth VLAN 300    47.47.47.47     5        UP
```

The following is a sample output that shows information from the **show mpls l2transport vc detail** command.

```
Router# show mpls l2transport vc detail
```

```
Local interface: Gi36/1 up, line protocol up, Eth VLAN 1 up
 Interworking type is Ethernet
 Destination address: 70.70.70.70, VC ID: 1, VC status: down
   Output interface: none, imposed label stack {}
   Preferred path: not configured
   Default path: no route
   No adjacency
 Create time: 4d11h, last status change time: 3d15h
 Signaling protocol: LDP, peer unknown
   Targeted Hello: 80.80.80.80(LDP Id) -> 70.70.70.70, LDP is DOWN, no
binding
   Status TLV support (local/remote)   : disabled/None (no remote binding)

     LDP route watch                   : enabled
     Label/status state machine        : local standby, AC-ready, LnuRnd
     Last local dataplane   status rcvd: No fault
     Last BFD dataplane     status rcvd: Not sent
     Last local SSS circuit status rcvd: No fault
     Last local SSS circuit status sent: DOWN(Hard-down, not-ready)
     Last local  LDP TLV    status sent: None
     Last remote LDP TLV    status rcvd: None (no remote binding)
     Last remote LDP ADJ    status rcvd: None (no remote binding)
   MPLS VC labels: local 1698, remote unassigned
   PWID: 4608
   Group ID: local 0, remote unknown
   MTU: local 9600, remote unknown
   Remote interface description:
 Sequencing: receive disabled, send disabled
 Control Word: On
 VC statistics:
   transit packet totals: receive 0, send 0
   transit byte totals:   receive 0, send 0
   transit packet drops:  receive 0, seq error 0, send 0
```

Related Commands

Command	Description
show mpls l2transport binding	Displays virtual circuit (VC) label binding information.

status redundancy

To designate one pseudowire as the master or slave to display status information for both active and backup pseudowires, use the **status redundancy** command in pseudowire class configuration mode. To disable the pseudowire as the master or slave, use the **no** form of this command.

status redundancy {master | slave}

no status redundancy {master | slave}

Syntax Description

master	Designates the pseudowire to work as the master.
slave	Designates the pseudowire to work as the slave.

Command Default

The pseudowire is in slave mode.

Command Modes

Pseudowire-class configuration mode (config-pw)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

One pseudowire must be the master and the other must be assigned the slave. You cannot configure both the pseudowires as master or slave.

Examples

The following example shows how to designate the pseudowire as the master.

```
Router(config-pw)# status redundancy master
```

status (pseudowire class)

To enable the router to send pseudowire status messages to a peer router, even when the attachment circuit is down, use the **status** command in pseudowire class configuration mode. To disable the pseudowire status messages, use the **no** form of this command.

status

no status

Syntax Description

This command has no arguments or keywords.

Command Default

Pseudowire status messages are sent and received if both routers support the messages.

Command Modes

Pseudowire class configuration (config-pw)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

Both the peer routers must support the ability to send and receive pseudowire status messages in label advertisement and label notification messages. If both peer routers do not support pseudowire status messages, it is recommended that you disable the messages with the **no status** command.

Examples

The following example shows how to enable the router to send pseudowire status messages to a peer router.

```
Router> enable
Router# configure terminal
Router(config)# pseudowire-class test1
Router(config-pw)# status
Router(config-pw)# encapsulation mpls
```

Related Commands

Command	Description
show mpls l2transport vc	Displays information about virtual circuits (VCs) and static pseudowires that have been enabled to route Layer 2 packets on a router.

switching tlv

To advertise the stitching point type, length, variable (TLV) in the label binding, use the **switching tlv** command in pseudowire class configuration mode. To disable the stitching point TLV, use the **no** form of this command.

switching tlv

no switching tlv

Syntax Description

This command has no arguments or keywords.

Command Default

Stitching point TLV data is advertised to peers.

Command Modes

Pseudowire class configuration (config-pw-class)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

The pseudowire stitching point TLV information includes the following information:

- Pseudowire ID of the last pseudowire segment traversed
- Pseudowire stitching point description
- Local IP address of the pseudowire stitching point
- Remote IP address of the last pseudowire stitching point that was crossed or the T-PE router

By default, stitching point TLV data is advertised to peers.

Examples

The following example shows how to enable the display of the pseudowire stitching TLV.

```
Router(config)# pseudowire-class class1
Router(config-pw-class)# switching tlv
```

Related Commands

Command	Description
show mpls l2transport binding	Displays stitching point TLV information.
show mpls l2transport vc	Displays information about virtual circuits (VCs) and static pseudowires that have been enabled to route Layer 2 packets on a router.

vccv

To configure the pseudowire Virtual Circuit Connection Verification (VCCV) control channel (CC) type for pseudowires, use the **vccv** command in pseudowire class configuration mode. To disable a pseudowire VCCV CC type, use the **no** form of this command.

vccv {**control-word** | **router-alert** | **ttl**}

no vccv {**control-word** | **router-alert** | **ttl**}

Syntax Description

control-word	Specifies the CC Type 1: control word.
router-alert	Specifies the CC Type 2: MPLS router alert label.
ttl	Specifies the CC Type 3: MPLS pseudowire label with Time to Live (TTL).

Command Default

The pseudowire VCCV CC type is set to Type 1 (control word).

Command Modes

Pseudowire-class configuration (config-pw-class)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

When an initiating provider edge (PE) device sends a setup request message to a remote PE device, the message includes VCCV capability information. This capability information is a combination of the CC type and the control verification (CV) type. Use the **vccv** command to configure the CC type capabilities of the MPLS pseudowire.

If the CV type for the MPLS pseudowire is set to a type that does not use IP/UDP headers, then you must set the CC type to the CC Type 1: control word.

Examples

The following example shows how to configure the MPLS pseudowire class to use CC Type 1.

```
Router(config)# pseudowire-class bfdclass
Router(config-pw-class)# encapsulation mpls
Router(config-pw-class)# protocol none
Router(config-pw-class)# vccv control-word
```

Related Commands

Command	Description
bfd-template	Creates a BFD template and enters BFD configuration mode.
pseudowire-class	Specifies the name of the pseudowire class and enters pseudowire class configuration mode.
vccv bfd status signaling	Enables status signaling for VCCV BFD.
vccv bfd template	Enables VCCV BFD for a pseudowire class.

vccv bfd status signaling

To enable status signaling for Bidirectional Forwarding Detection (BFD) over Virtual Circuit Connection Verification (VCCV), use the **vccv bfd status signaling** command in pseudowire class configuration mode. To disable status signaling, use the **no** form of this command.

vccv bfd status signaling

no vccv bfd status signaling

Syntax Description

This command has no arguments or keywords.

Command Default

VCCV BFD status signaling is disabled.

Command Modes

Pseudowire-class configuration (config-pw-class)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

Use this command to allow BFD to provide status signaling functionality that indicates the fault status of an attachment circuit (AC).

Examples

The following example shows how to enable VCCV BFD status signaling for a pseudowire class.

```
Router(config)# pseudowire-class bfdclass
Router(config-pw-class)# encapsulation mpls
Router(config-pw-class)# protocol none
Router(config-pw-class)# vccv control-word
Router(config-pw-class)# vccv bfd template bfdtemplate raw-bfd
Router(config-pw-class)# vccv bfd status signaling
```

Related Commands

Command	Description
bfd-template	Creates a BFD template and enters BFD configuration mode.
pseudowire-class	Specifies the name of the pseudowire class and enters pseudowire class configuration mode.
vccv	Configures the pseudowire VCCV CC type for MPLS pseudowires.

Command	Description
vccv bfd template	Enables VCCV BFD for a pseudowire class.

vccv bfd template

To enable BFD over VCCV for a pseudowire class, use the **vccv bfd template** command in pseudowire class configuration mode. To disable VCCV BFD, use the **no** form of this command.

vccv bfd template *name* {**udp** | **raw-bfd**}

no vccv bfd template *name* {**udp** | **raw-bfd**}

Syntax Description

name	Name of the BFD template to use.
udp	(Optional) Enables support for BFD with IP or User Datagram Protocol (UDP) header encapsulation.
raw-bfd	(Optional) Enables support for BFD without IP/UDP header encapsulation.

Command Default

VCCV BFD is not enabled for a pseudowire class.

Command Modes

Pseudowire-class configuration (config-pw-class)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

The BFD template specified by the *name* argument is created using the **bfd-template** command, and contains settings for the BFD interval values.

VCCV defines two types encapsulation for VCCV messages to differentiate them from data packets: BFD with IP/UDP headers and BFD without IP/UDP headers. Support for BFD without IP/UDP headers can be enabled only for pseudowires that use a control word.

If the VCCV carries raw BFD, the control word must be set to BFD without IP/UDP headers. BFD without IP/UDP headers enables the system to identify the BFD packet when demultiplexing the control channel.

Examples

The following example shows how to enable the BFD template without support for IP/UDP header encapsulation.

```
Router(config)# pseudowire-class bfdclass
Router(config-pw-class)# encapsulation mpls
Router(config-pw-class)# protocol none
Router(config-pw-class)# vccv control-word
Router(config-pw-class)# vccv bfd template bfdtemplate raw-bfd
Router(config-pw-class)# vccv bfd status signaling
```

Related Commands

Command	Description
bfd-template	Creates a BFD template and enters BFD configuration mode.
pseudowire-class	Specifies the name of the pseudowire class and enters pseudowire class configuration mode.
vccv	Configures the pseudowire VCCV CC type for pseudowires.
vccv bfd status signaling	Enables status signaling for VCCV BFD.

xconnect

To bind an attachment circuit to a pseudowire, and to configure a static pseudowire, use the **xconnect** command in one of the supported configuration modes. To restore the default values, use the **no** form of this command.

xconnect *peer-ip-address vcid* {**encapsulation** {**mpls** [**manual**]} | **pw-class** *pw-class-name*}[**pw-class** *pw-class-name*] [**sequencing** {**transmit** | **receive** | **both**}]

no xconnect

Syntax Description

peer-ip-address	IP address of the remote provider edge (PE) peer. The remote router ID can be any IP address, as long as it is reachable.
vcid	32-bit identifier of the virtual circuit (VC) between the PE routers.
encapsulation mpls	Specifies MPLS as the tunneling method to encapsulate the data in the pseudowire.
pw-class *pw-class-name*	(Optional) Specifies the pseudowire class for advanced configuration.
sequencing	(Optional) Sets the sequencing method to be used for packets received or sent.
transmit	(Optional) Sequences data packets received from the attachment circuit.
receive	(Optional) Sequences data packets sent into the attachment circuit.
both	(Optional) Sequences data packets that are both sent and received from the attachment circuit.

Command Default

The attachment circuit is not bound to the pseudowire.

Command Modes

Xconnect configuration(config-if-xconn)

Interface configuration (config-if)

Command History

Release	Modification
9.3.0	This command was introduced.

Usage Guidelines

The combination of the *peer-ip-address* and *vcid* arguments must be unique on the router. Each xconnect configuration must have a unique combination of *peer-ip-address* and *vcid* configuration.

The same *vcid* value that identifies the attachment circuit must be configured using the **xconnect** command on the local and remote PE router. The VC ID creates the binding between a pseudowire and an attachment circuit.

The **pw-class** keyword with the *pw-class-name* value binds the xconnect configuration of an attachment circuit to a specific pseudowire class. In this way, the pseudowire class configuration serves as a template that contains settings used by all the attachment circuits bound to it with the **xconnect** command.

Examples

The following example shows how to configure a xconnect service for a TenGigabitEthernet4/1 interface by binding the Ethernet circuit to the pseudowire named 123 with a remote peer 209.165.200.225. The configuration settings in the pseudowire class named vlan-xconnect are used.

```
Router(config)# interface TenGigabitEthernet4/1
Router(config-if)# xconnect 209.165.200.225 123 pw-class vlan-xconnect
```

Related Commands

Command	Description
encapsulation (pseudowire)	Specifies an encapsulation type for tunneling Layer 2 traffic over a pseudowire.
mpls control-word	Enables the MPLS control word in a static pseudowire connection.
mpls label	Configures a static pseudowire connection by defining local and remote pseudowire labels.
pseudowire-class	Configures a template of pseudowire configuration settings used by the attachment circuits transported over a pseudowire.