Point to Point Layer 2 Services Commands

This module describes the commands used to configure, monitor, and troubleshoot a Layer 2 or Layer 3 virtual private network (VPN).

For detailed information about virtual private network concepts, configuration tasks, and examples, refer to the .

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advertise-mac

To advertise local MAC to the peers, use **advertise-mac** command in the EVPN configuration mode. The local MAC is advertised to the peer in control plane using BGP.

advertise-mac

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EVPN

Command History

Release	Modification
Release 6.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The following example shows how to advertise local MAC.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# evi 1
RP/0/RSP0/CPU0:router(config-evpn-evi)# bgp
RP/0/RSP0/CPU0:router(config-evpn-evi-bgp)# table-policy spp-basic-6
RP/0/RSP0/CPU0:router(config-evpn-evi-bgp)# route-target import 100:6005
RP/0/RSP0/CPU0:router(config-evpn-evi-bgp)# route-target export 100:6005
RP/0/RSP0/CPU0:router(config-evpn-evi-bgp)# exit
RP/0/RSP0/CPU0:router(config-evpn-evi)# advertise-mac
```

address-family l2vpn mspw

To specify the L2VPN address family of the neighbor and to enter the address family configuration mode, use the **address-family l2vpn mspw** in the BGP configuration mode.

address-family l2vpn mspw

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

BGP configuration

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bgp	read, write

The following example shows how to enter the address family configuration mode.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router bgp 100
RP/0/RSP0/CPU0:router(config-bgp)# address-family l2vpn mspw
RP/0/RSP0/CPU0:router(config-bgp-af)#
```

bgp

To enable the BGP pseudowire routing capabilities and enter the bgp configuration submode, use the **bgp** command in the L2VPN routing configuration submode.

bgp

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

L2VPN routing configuration submode

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The following example shows how to enable BGP pseudowire routing capabilities.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# router 2.2.2.2
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-routing
RP/0/RSP0/CPU0:router(config-l2vpn-pwr)# global-id 1000
RP/0/RSP0/CPU0:router(config-l2vpn-pwr)# bgp
RP/0/RSP0/CPU0:router(config-l2vpn-pwr-bgp)# rd 192.168.1.3:10
```

backup (L2VPN)

To configure the backup pseudowire for the cross-connect, use the **backup** command in L2VPN xconnect p2p pseudowire configuration mode. To disable this feature, use the **no** form of this command.

backup neighbor *IP-address* **pw-id** *value*
no backup neighbor *IP-address* **pw-id** *value*

Syntax Description

neighbor *IP-address*	Specifies the peer to cross connect. The *IP-address* argument is the IPv4 address of the peer.
pw-id *value*	Configures the pseudowire ID. The range is from 1 to 4294967295.

Command Default

None

Command Modes

L2VPN xconnect p2p pseudowire configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Use the **backup** command to enter L2VPN xconnect p2p pseudowire backup configuration mode.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure backup pseudowires:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group gr1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p p001
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor 10.1.1.1 pw-id 2
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# backup neighbor 10.2.2.2 pw-id 5
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw-backup)#
```

Related Commands

Command	Description
backup disable (L2VPN), on page 9	Specifies how long a backup pseudowire should wait before resuming operation after the primary pseudowire goes down.

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
neighbor (L2VPN), on page 53	Configures a pseudowire for a cross-connect.
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.
xconnect group, on page 156	Configures cross-connect groups.

backup disable (L2VPN)

To specify how long a backup pseudowire should wait before resuming primary pseudowire operation after the failure with primary pseudowire has been cleared, use the **backup disable** command in L2VPN pseudowire class configuration mode. To disable this feature, use the **no** form of this command.

backup disable {**delay** *value* | **never**}
no backup disable {**delay** *value* | **never**}

Syntax Description

delay *value*	Specifies the number of seconds that elapse after the failure with primary pseudowire has been cleared before the Cisco IOS XR software attempts to activate the primary pseudowire. The range, in seconds, is from 0 to 180. The default is 0.
never	Specifies that the secondary pseudowire does not fall back to the primary pseudowire if the primary pseudowire becomes available again, unless the secondary pseudowire fails.

Command Default

The default disable delay is the value of 0, which means that the primary pseudowire is activated immediately when it comes back up.

Command Modes

L2VPN pseudowire class configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how a backup delay is configured for point-to-point pseudowire in which the backup disable delay is set to 50 seconds:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class class1
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# backup disable delay 50
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# exit
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group A
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrx
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor 10.1.1.1 pw-id 2
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# pw-class class1
```

```
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# backup neighbor 10.2.2.2 pw-id 5
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw-backup)#
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
neighbor (L2VPN), on page 53	Configures a pseudowire for a cross-connect.
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.
pw-class (L2VPN), on page 63	Enters pseudowire class submode to define a pseudowire class template.
xconnect group, on page 156	Configures cross-connect groups.

clear l2route evpn ipv4

To clear either duplicate or frozen flags, or both, from EVPN MAC-IPv4 routes and re-enable local route learning for the corresponding IPv4 addresses, use **clear l2route evpn ipv4** command in EXEC mode.

clear l2route evpn ipv4 { *ipv4-address* } | **all** [**evi** *evi*] **frozen-flag**

Syntax Description

mac *mac-address*	Clears the route for the specified IPv4 address.
all	Clears all EVPN MAC-IPv4 routes that are marked as duplicate or permanently frozen.
evi *evi*	Clears EVPN MAC -IPv4 routes for the specified topology only.
frozen-flag	Clears either duplicate or frozen flag for the MAC-IPv4 routes that are identified by the specified options.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.1	This command was introduced.

Usage Guidelines

None

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to clear duplicate or frozen flags, or both from EVPN MAC-IPv4 routes:

```
Router# clear l2route evpn ipv4 192.0.2.1 evi 1 frozen-flag
```

clear l2route evpn ipv6

To clear either duplicate or frozen flags, or both, from EVPN MAC-IPv6 routes and re-enable local route learning for the corresponding IPv6 addresses, use **clear l2route evpn ipv6** command in EXEC mode.

clear l2route evpn ipv6 {*ipv6-address*} | **all** [**evi** *evi*] **frozen-flag**

Syntax Description

mac *mac-address*	Clears the route for the specified IPv6 address.
all	Clears all EVPN MAC-IPv6 routes that are marked as duplicate or permanently frozen.
evi *evi*	Clears EVPN MAC-IPv6 routes for the specified topology only.
frozen-flag	Clear duplicate or frozen flag for the MAC-IPv6 routes that are identified by the specified options.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.1	This command was introduced.

Usage Guidelines

None

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to clear either duplicate or frozen flags, or both, from EVPN MAC-IPv6 routes:

```
Router# clear l2route evpn IPv6 2001:DB8::1 evi 1 frozen-flag
```

clear l2route evpn mac

To clear either duplicate or frozen flags, or both, from EVPN MAC routes and re-enable local route learning for the corresponding MAC addresses, use **clear l2route evpn mac** command in EXEC mode.

clear l2route evpn mac {*mac-address*} | **all** [**evi** *evi*] **frozen-flag**

Syntax Description

mac *mac-address*	Clears the route for the specified MAC address.
all	Clears all EVPN MAC routes that are marked as duplicate or permanently frozen.
evi *evi*	Clears EVPN MAC routes for the specified topology only.
frozen-flag	Clears duplicate or frozen flag for the MAC routes that are identified by the specified options.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.6.1	This command was introduced.

Usage Guidelines

None

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to clear duplicate or frozen flags, or both, from EVPN MAC routes:

```
Router# clear l2route evpn mac 0.12.3456 evi 1 frozen-flag
```

clear l2vpn collaborators

To clear the state change counters for L2VPN collaborators, use the **clear l2vpn collaborators** command in EXEC mode.

clear l2vpn collaborators

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to clear change counters for L2VPN collaborators:

```
RP/0/RSP0/CPU0:router# clear l2vpn collaborators
```

Related Commands

Command	Description
show l2vpn collaborators, on page 97	Displays information about the state of the interprocess communications connections between l2vpn_mgr and other processes.

clear l2vpn counters bridge mac-withdrawal

To clear the MAC withdrawal statistics for the counters of the bridge domain, use the **clear l2vpn counters bridge mac-withdrawal** command in EXEC mode.

clear l2vpn counters bridge mac-withdrawal {**all** | **group** *group-name* **bd-name** *bd-name* | **neighbor** *ip-address* **pw-id** *value*}

Syntax Description

all	Clears the MAC withdrawal statistics over all the bridges.
group *group-name*	Clears the MAC withdrawal statistics over the specified group.
bd-name *bd-name*	Clears the MAC withdrawal statistics over the specified bridge.
neighbor *ip-address*	Clears the MAC withdrawal statistics over the specified neighbor.
pw-id *value*	Clears the MAC withdrawal statistics over the specified pseudowire. The range is from 1 to 4294967295.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to clear the MAC withdrawal statistics over all the bridges:

```
RP/0/RSP0/CPU0:router# clear l2vpn counters bridge mac-withdrawal all
```

clear l2vpn forwarding counters

To clear L2VPN forwarding counters, use the **clear l2vpn forwarding counters** command in EXEC mode.

clear l2vpn forwarding counters

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to clear L2VPN forwarding counters:

```
RP/0/RSP0/CPU0:router# clear l2vpn forwarding counters
```

Related Commands

Command	Description
show l2vpn forwarding, on page 104	Displays forwarding information from the layer2_fib manager on the line card.

clear l2vpn forwarding counters bridge-domain mirp-lite

To clear L2VPN forwarding MIRP counters, use the **clear l2vpn forwarding counters bridge-domain mirp-lite** command in EXEC mode.

clear l2vpn forwarding counters bridge-domain mirp-lite {**location** *node-id*}

Syntax Description

location *node-id*	Clears the L2VPN forwarding MIRP counters for the specified location.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write, execute

This example shows how to clear all the MIRP counters:

```
RP/0/RSP0/CPU0:router# clear l2vpn forwarding counters bridge-domain mirp-lite location
0/1/CPU0
```

This example shows how to clear bridge-domain specific MIRP counters:

```
RP/0/RSP0/CPU0:router# clear l2vpn forwarding counters bridge-domain bg1:bd1 mirp-lite
location 0/1/CPU0
```

Related Commands

Command	Description
clear l2vpn forwarding counters, on page 16	Clears L2VPN forwarding counters.

clear l2vpn forwarding message counters

To clear L2VPN forwarding message counters, use the **clear l2vpn forwarding message counters** command in EXEC mode.

clear l2vpn forwarding message counters location *node-id*

Syntax Description

location *node-id*	Clears L2VPN forwarding message counters for the specified location.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to clear L2VPN forwarding message counters on a specified node:

```
RP/0/RSP0/CPU0:router# clear l2vpn forwarding message counters location 0/6/CPU0
```

Related Commands

Command	Description
show l2vpn forwarding, on page 104	Displays forwarding information from the layer2_fib manager on the line card.

clear l2vpn forwarding table

To clear an L2VPN forwarding table at a specified location, use the **clear l2vpn forwarding table** command in EXEC mode.

clear l2vpn forwarding table location *node-id*

Syntax Description

location *node-id*	Clears L2VPN forwarding tables for the specified location.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to clear an L2VPN forwarding table from a specified location:

```
RP/0/RSP0/CPU0:router# clear l2vpn forwarding table location 1/2/3/5
```

Related Commands

Command	Description
show l2vpn forwarding, on page 104	Displays forwarding information from the layer2_fib manager on the line card.

control-word

To enable control word for MPLS encapsulation, use the **control-word** command in L2VPN pseudowire class encapsulation submode. To disable the control word, use the **no** form of this command.

control-word
no control-word

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

L2VPN pseudowire class encapsulation configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to enable control word for MPLS encapsulation:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class pwc1
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)# control-word
```

dynamic-arp-inspection

To validate Address Resolution Protocol (ARP) packets in a network, use the **dynamic-arp-inspection** command in the l2vpn bridge group bridge domain configuration mode. To disable dynamic ARP inspection, use the **no** form of this command.

dynamic-arp-inspection {**logging** | **address-validation** {*src-macdst-macipv4*}}
no dynamic-arp-inspection {**logging** | **address-validation** {*src-macdst-macipv4*}}

Syntax Description

logging	(Optional) Enables logging. **Note** When you use the logging option, the log messages indicate the interface on which the violation has occured along with the IP or MAC source of the violation traffic. The log messages are rate limited at 1 message per 10 seconds. **Caution** Not all the violation events are recorded in the syslog.
address-validation	(Optional) Performs address-validation.
src-mac	Source MAC address in the Ethernet header.
dst-mac	Destination MAC address in the Ethernet header.
ipv4	IP addresses in the ARP body.

Command Default

Dynamic ARP inspection is disabled.

Command Modes

l2vpn bridge group bridge domain configuration

Command History

Release	Modification
Release 4.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to enable dynamic ARP inspection on bridge bar:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group b1
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# dynamic-arp-inspection
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-dai)#
```

This example shows how to enable dynamic ARP inspection logging on bridge bar:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group b1
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# dynamic-arp-inspection logging
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-dai)#
```

This example shows how to enable dynamic ARP inspection address validation on bridge bar:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group b1
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# dynamic-arp-inspection address-validation
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-dai)#
```

Related Commands

Command	Description
bridge-domain (VPLS)	Establishes a bridge domain, and enters L2VPN bridge group bridge domain configuration mode.
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then to assign network interfaces to the bridge domain.
l2vpn, on page 42	Enters L2VPN configuration mode.

flood mode

To change the flood mode from Bandwidth Optimized to Convergence Optimized, use the **flood mode convergence-optimized** command in the l2vpn bridge group bridge domain configuration mode. To return the bridge to normal flooding behavior (when all unknown unicast, broadcast and multicast packets are flooded over other bridge domain network interfaces), use the **no** form of this command.

flood mode {**resilience-optimized** | **convergence-optimized**}
no flood mode {**resilience-optimized** | **convergence-optimized**}

Syntax Description

resilience-optimized	Configures bridge to use Resilience Optimized mode.
convergence-optimized	Configures bridge to use Convergence Optimized mode.

Command Default

The bridge domain operates in the Bandwidth Optimized Mode.

Command Modes

l2vpn bridge group bridge domain configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **flood mode** command allows you to change the flood optimization mode to either Convergence Optimized mode or Resilience Optimized mode.

- Convergence Optimized mode floods all traffic to all line cards; all unknown unicast packets, all broadcast packets, and all multicast packets are flooded over all other bridge domain network interfaces.
- Resilience Optimized mode works like Bandwidth Optimized mode, except that it floods traffic to both primary and backup FRR links for a Pseudowire.

Changing the bridge domain flood mode requires removing and reconfiguring the bridge domain.

To avoid the loss of BUM traffic over L2 service when L3 FRR is triggered, configure **flood mode resilience optimized** command under L2VPN.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to clear an L2VPN forwarding table from a specified location:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group MyGroup
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain MyDomain
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# flood mode convergence-optimized
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)#
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
bridge-domain (VPLS)	Establishes a bridge domain, and enters L2VPN bridge group bridge domain configuration mode.
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then to assign network interfaces to the bridge domain.

generic-interface-list

To configure generic interface list, use the **generic-interface-list** command in global configuration mode.

generic-interface-list *list-name*

Syntax Description

list-name	Name of the interface list.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to configure generic interface list:

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# generic-interface-list interfacelist1
RP/0/RSP0/CPU0:router(config-if-list)# interface GigabitEthernet 0/2/0/1
RP/0/RSP0/CPU0:router(config-if-list)# interface GigabitEthernet 0/3/0/1
RP/0/RSP0/CPU0:router(config-if-list)# exit
```

Related Commands

Command	Description
show l2vpn generic-interface-list, on page 113	Displays all the L2VPN virtual interfaces.

global-id (L2VPN)

To configure the L2VPN global ID value for the router, use the **global-id** command in the L2VPN routing configuration submode.

global-id *value*

Syntax Description

value	Specifies the global-id value. Range is from 1 to 4294967295.

Command Default

If BGP is used as the redistribution L2 protocol, then the default value is the BGP AS number. Otherwise, the default value is 0.

Command Modes

L2VPN routing configuration submode

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

This command overwrites the AS number from BGP.

Task ID

Task ID	Operation
l2vpn	read, write

The following example shows how to configure L2VPN global ID value:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)#router-id 2.2.2.2
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-routing
RP/0/RSP0/CPU0:router(config-l2vpn-pwr)# global-id 1000
RP/0/RSP0/CPU0:router(config-l2vpn-pwr)# bgp
RP/0/RSP0/CPU0:router(config-l2vpn-pwr-bgp)# rd 192.168.1.3:10
```

interface (p2p)

To configure an attachment circuit, use the **interface** command in p2p configuration submode. To return to the default behavior, use the **no** form of this command.

interface *type interface-path-id*
no interface *type interface-path-id*

Syntax Description

type	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or a virtual interface. **Note** Use the **show interfaces** command to see a list of all possible interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.

Command Default

None

Command Modes

p2p configuration submode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure an attachment circuit on a TenGigE interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group gr1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p p001
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# interface TenGigE 1/1/1/1
```

Related Commands

Command	Description
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.

interworking ipv4

To configure IPv4 interworking, use the **interworking ipv4** command in the p2p configuration submode. To return to the default behavior, use the **no** form of this command.

interworking ipv4
no interworking ipv4

Syntax Description

ipv4	Sets IPv4 interworking.

Command Default

None

Command Modes

p2p configuration submode

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure an attachment circuit on a TenGigE interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group gr1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p gr1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# interworking ipv4
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)#
```

Related Commands

Command	Description
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.

ipv4 source

To configure source IP address for the pseudowire class with encapsulation mpls, use the **ipv4 source** command in the L2VPN pseudowire class encapsulation mpls configuration mode.

ipv4 **source** *source-ip-address*

Syntax Description

source-ip-address	Source IP address.

Command Default

None

Command Modes

L2VPN pseudowire class encapsulation mpls configuration

Command History

Release	Modification
Release 4.2.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to configure the source ip address:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)#l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)#pw-class kant1
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)#encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)#ipv4 source 112.22.1.4
```

Related Commands

Command	Description
pw-class encapsulation mpls, on page 66	Configures MPLS pseudowire encapsulation.

l2tp static

To enable the Layer 2 Tunneling Protocol (L2TP) static submode, and perform L2TP pseudowire configurations, use the **l2tp static** command in p2p pseudowire configuration submode. To disable the L2TP static submode, use the **no** form of this command.

l2tp static [**local** {**cookie** {**secondary size** | **size**} {**0** | **4** | **8**} **value** *value* | **session** *session id*} | **remote** {**cookie size** {**0** | **4** | **8**} **value** *value* | **session** *session id*}]
no l2tp static [**local** {**cookie** {**secondary size** | **size**} {**0** | **4** | **8**} **value** *cookie value* | **session** *session id*} | **remote** {**cookie size** {**0** | **4** | **8**} **value** *cookie value* | **session** *session id*}]

Syntax Description

local	(Optional) Configures local cookies and sessions.
cookie	Sets L2TP pseudowire static local or remote cookie.
secondary size	Sets L2TP pseudowire static local cookie secondary size.
size	Sets L2TP pseudowire static local cookie size.
value	Sets the value of the cookie.
cookie value	Value of the cookie. The cookie values are specified based on the configured cookie size: • Cookie size 0—No cookie value is set. • Cookie size 4—Lower 4 bytes value (<0x0-0xffffffff>) is set. • Cookie size 8—Lower 4 bytes value and higher 4 bytes values (<0x0-0xffffffff> <0x0-0xffffffff>) are set.
session	Sets L2TP pseudowire static local or remote session.
session id	Session ID. Range is from 1 to 65535.
remote	(Optional) Configures remote cookies and sessions.

Command Default

None

Command Modes

p2p pseudowire configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to enter the l2tp static configuration sub mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor ipv6 1111:2222::cdef pw-id 1
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static
```

This example shows how to configure local and remote session-id:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor ipv6 1111:2222::cdef pw-id 1
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static local session 1
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static remote session 1
```

This example shows how to configure cookie size and values:

This example is with cookie size 0:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor ipv6 1111:2222::cdef pw-id 1
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static local cookie size 0
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static remote cookie size 0
```

This example is with cookie size 4:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor ipv6 1111:2222::cdef pw-id 1
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static local cookie size 4 value
<0x0-0xffffffff>
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static remote cookie size 4 value
<0x0-0xffffffff>
```

This example is with cookie size 8 (lower 4 bytes entered first and then higher 4 bytes):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor ipv6 1111:2222::cdef pw-id 1
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static local cookie size 8 value
<0x0-0xffffffff> <0x0-0xffffffff>
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static remote cookie size 8 value
<0x0-0xffffffff> <0x0-0xffffffff>
```

This example show how to configure a secondary local cookie:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor ipv6 1111:2222::cdef pw-id 1
RP/0/RSP0/CPU0:router(config-xc-p2p-pw)# l2tp static local cookie secondary size 8 value
<0x0-0xffffffff> <0x0-0xffffffff>
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.
xconnect group, on page 156	Configures cross-connect groups.
neighbor (L2VPN), on page 53	Configures a pseudowire for a cross-connect.

ip-source-guard

To enable source IP address filtering on a layer 2 port, use the **ip-source-guard** command in l2vpn bridge group bridge domain configuration mode. To disable source IP address filtering, use the **no** form of this command.

ip-source-guard logging
no ip-source-guard logging

Syntax Description

logging	(Optional) Enables logging.

Command Default

IP Source Guard is disabled.

Command Modes

l2vpn bridge group bridge domain configuration

Command History

Release	Modification
Release 4.0.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to enable ip source guard on bridge bar:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group b1
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# ip-source-guard
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-ipsg)#
```

This example shows how to enable ip source guard logging on bridge bar:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group b1
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
```

```
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# ip-source-guard logging
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-ipsg)#
```

Related Commands

Command	Description
bridge-domain (VPLS)	Establishes a bridge domain, and enters L2VPN bridge group bridge domain configuration mode.
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then to assign network interfaces to the bridge domain.
l2vpn, on page 42	Enters L2VPN configuration mode.

l2transport

To configure a physical interface to operate in Layer 2 transport mode, use the **l2transport** command in interface configuration mode. To return to the default behavior, use the **no** form of this command.

l2transport
no l2transport

This command has no arguments or keywords.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The l2transport command and these configuration items are mutually exclusive:

- IPv4 address and feature (for example, ACL) configuration
- IPv4 enable, address and feature (for example, ACL) configuration
- Bundle-enabling configuration
- L3 subinterfaces
- Layer 3 QoS Policy

Note After an interface or connection is set to Layer 2 switched, commands such as **ipv4 address** are not usable. If you configure routing commands on the interface, **l2transport** is rejected.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure an interface or connection as Layer 2 switched under several different modes:

Ethernet Port Mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0
RP/0/RSP0/CPU0:router(config-if)# l2transport
```

Ethernet VLAN Mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0.900 l2transport
RP/0/RSP0/CPU0:router(config-if)# encapsulation dot1q 100do1q vlan 999
```

Ethernet VLAN Mode (QinQ):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0.900 l2transport
RP/0/RSP0/CPU0:router(config-if)# encapsulation dot1q 20 second-dot1q 10vlan 999 888
```

Ethernet VLAN Mode (QinAny):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0.900 l2transport
RP/0/RSP0/CPU0:router(config-if)# encapsulation dot1q 30 second-dot1q do1q vlan 999 any
```

Related Commands

Command	Description
show l2vpn forwarding, on page 104	Displays forwarding information from the layer2_fib manager on the line card.

l2transport l2protocol

To configure Layer 2 protocol handling, use the **l2transport l2protocol** command in interface configuration mode. To return to the default behavior, use the **no** form of this command.

l2transport l2protocol cpsv {**reverse-tunnel** | **tunnel**}
no l2transport l2protocol cpsv {**reverse-tunnel** | **tunnel**}

Syntax Description

cpsv	Enables L2PT for the interface. L2PT is enabled for the following protocols only: • CDP • STP • VTP **Note** STP includes all Spanning Tree protocol derivatives (RSTP, MSTP, etc.)
tunnel	Performs L2PT encapsulation on frames as they enter the interface. Also, performs L2PT de-encapsulation on frames as they exit they interface. L2PT encapsulation rewrites the destination MAC address with the L2PT destination MAC address. L2PT deencapsulation replaces the L2PT destination MAC address with the original destination MAC address.
reverse-tunnel	Performs L2PT encapsulation on frames as they exit the interface. Also, perform L2PT deencapsulation on frames as they enter the interface.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

These L2 protocols are available:

- Cisco Discovery Protocol (CDP)—CDP is protocol-independent and is used to obtain protocol addresses, platform information, and other data about neighboring devices.
- PVST maintains a spanning tree instance for each VLAN configured in the network and permits a VLAN trunk to be forwarding for some VLANs and not for others. It can also load balance Layer 2 traffic by forwarding some VLANs on one trunk and other VLANs n others.

- Spanning-Tree Protocol (STP)—STP is a link management protocol that provides path redundancy in the network. For Ethernet networks to function properly, only one active path can exist between two stations.
- VLAN Trunk Protocol (VTP)—VTP is a Cisco-proprietary protocol that reduces administration in a switched network. When you configure a new VLAN on one VTP server, the VLAN is distributed through all switches in the domain.

Task ID

Task ID	Operations
l2vpn	read, write
atm	read, write

Examples

The following example shows how to configure Layer 2 protocol handling:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0
RP/0/RSP0/CPU0:router(config-if)# l2transport l2protocol cpsv reverse-tunnelstp drop
```

Related Commands

Command	Description
show l2vpn forwarding, on page 104	Displays forwarding information from the layer2_fib manager on the line card.

l2transport propagate

To propagate Layer 2 transport events, use the **l2transport propagate** command in interface configuration mode. To return to the default behavior, use the **no** form of this command.

l2transport propagate remote-status
no l2transport propagate remote-status

Syntax Description

remote-status	Propagates remote link status changes.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **l2transport propagate** command provides a mechanism for the detection and propagation of remote link failure for port mode EoMPLS.

Note If you configure the propagate Layer 2 transport using this command on both ends of the PW (head and tail end), the PW might flap continuously. Use the **carrier-delay** command on the attachment circuit to stabilize the PW.

To display the state of l2transport events, use the **show controller internal** command in *Interface and Hardware Component Configuration Guide for Cisco ASR 9000 Series Routers*

For more information about the Ethernet remote port shutdown feature, see *MPLS Configuration Guide for Cisco ASR 9000 Series Routers*.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to propagate remote link status changes:

```
RP/0/RSP0/CPU0:router# configure
```

```
RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0
RP/0/RSP0/CPU0:router(config-if)# l2transport propagate remote remote-status
```

Related Commands

Command	Description
show l2vpn forwarding, on page 104	Displays forwarding information from the layer2_fib manager on the line card.

l2transport service-policy

To configure a Layer 2 transport quality of service (QoS) policy, use the **l2transport service-policy** command in interface configuration mode. To return to the default behavior, use the **no** form of this command.

l2transport service-policy {**input** *policy-name* | **output** *policy-name*}
no l2transport service-policy {**input** *policy-name* | **output** *policy-name*}

Syntax Description

input *policy-name*	Configures the direction of service policy application: input.
output *policy-name*	Configures the direction of service policy application: output.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write
atm	read, write

Examples

The following example shows how configure an L2 transport quality of service (QoS) policy:

```
RP/0/RSP0RP00/CPU0:router# configure
RP/0/RSP0RP00/CPU0:router(config)# interface GigabitEthernet 0/0/0/0
RP/0/RSP0RP00/CPU0:router(config-if)# l2transport service-policy input sp_0001
```

Related Commands

Command	Description
show l2vpn forwarding, on page 104	Displays forwarding information from the layer2_fib manager on the line card.

l2vpn

To enter L2VPN configuration mode, use the **l2vpn** command in global configuration mode. To return to the default behavior, use the **no** form of this command.

l2vpn
no l2vpn

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configuration can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to enter L2VPN configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)#
```

Related Commands

Command	Description
show l2vpn forwarding, on page 104	Displays forwarding information from the layer2_fib manager on the line card.

l2vpn switchover

To force a manual pseudowire switchover, use the **l2vpn switchover** command in EXEC mode.

l2vpn switchover xconnect neighbor *IP-address* **pw-id** *value*

Syntax Description

xconnect	Configures the switchover for the cross-connect.
neighbor *IP-address*	Configures the peer for the cross-connect.
pw-id *value*	Configures the pseudowire ID. The range is from 1 to 4294967295.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If the backup exists, you can switch a primary router over to the backup router. You can use the **l2vpn switchover** command to reactivate the primary router.

Task ID

Task ID	Operations
l2vpn	read, write, execute

Examples

The following example shows how to switch a primary pseudowire to a backup pseudowire:

```
RP/0/RSP0/CPU0:router# l2vpn switchover xconnect neighbor 10.1.1.1 pw-id 2
```

Related Commands

Command	Description
backup disable (L2VPN), on page 9	Specifies how long a backup pseudowire should wait before resuming operation after the primary pseudowire goes down.

load-balancing flow

To enable all bundle EFPs and PW to use either L2 flow based or L3 flow based balancing, use the **load-balancing flow** command in L2VPN configuration mode.

load-balancing flow [**src-dst-mac** | **src-dst-ip**]

Syntax Description

src-dst-mac	Enables global flow load balancing hashed on source and destination MAC addresses.
src-dst-ip	Enables global flow load balancing hashed on source and destination IP addresses.

Command Default

The default load balancing is based on the source and destination MAC addresses.

Command Modes

L2VPN configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to set the L3 flow based load balancing:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# load-balancing flow src-dst-ip
```

load-balancing flow-label

To balance the load based on flow-labels, use the **load-balancing flow label** command in the l2vpn pseudowire class mpls configuration submode or l2vpn bridge group bridge-domain vfi autodiscovery bgp or ldp signaling submodes. To undo flow-label based load-balancing, use the **no** form of this command.

load-balancing flow-label {**both** | **receive** | **transmit**}[**static**]
no load-balancing flow-label {**both** | **receive** | **transmit**}[**static**]

Syntax Description

both	Inserts or discards flow labels on transmit or receive.
receive	Discards flow label on receive.
transmit	Inserts flow label on transmit.
static	Sets flow label parameters statically.

Command Default

None

Command Modes

L2vpn pseudowire class mpls configuration submode

L2vpn bridge group bridge-domain vfi autodiscovery bgp signaling submode

L2vpn bridge group bridge-domain vfi autodiscovery ldp signaling submode

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows the output of the **load-balancing flow-label** command of the **both** keyword.

```
RP/0/RSP0/CPU0:router#config
RP/0/RSP0/CPU0:router(config)#l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)#pw-class p1
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)#encapsulation
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)#encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)#load-balancing
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)#load-balancing flow-label
```

```
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)#load-balancing flow-label both
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)#load-balancing flow-label both static
```

Related Commands

Command	Description
pw-class encapsulation mpls, on page 66	Configures MPLS pseudowire encapsulation.

load-balancing pw-label

To enable all pseudowires using the defined class to use virtual circuit based load balancing, use the **load-balancing pw-label** command in pseudowire class configuration mode.

load-balancing pw-label

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

Pseudowire class configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to set the bridge ID:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class abc
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)# load-balancing pw-label
```

logging (l2vpn)

To enable cross-connect logging, use the **logging** command in L2VPN configuration submode. To return to the default behavior, use the **no** form of this command.

logging pseudowire status
no logging pseudowire status

Syntax Description

pseudowire status	Enables pseudowire state change logging.

Command Default

None

Command Modes

L2VPN configuration submode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configuration can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to enable cross-connect logging:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# logging pseudowire status
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.

logging nsr

To enable non-stop routing logging, use the **logging nsr** command in L2VPN configuration submode. To return to the default behavior, use the **no** form of this command.

logging nsr
no logging nsr

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

L2VPN configuration submode

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configuration can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to enable non-stop routing logging:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# logging nsr
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.

monitor-session (l2vpn)

To attach a traffic monitoring session as one of the segments for a cross connect, use the **monitor-session** command in point-to-point cross connect configuration mode. To remove the association between a traffic mirroring session and a cross connect, use the **no** form of this command.

monitor-session *session-name*
no monitor-session *session-name*

Syntax Description

session-name	Name of the monitor session to configure.

Command Default

No default behavior or values

Command Modes

Point-to-point cross connect configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

Before you can attach a traffic mirroring session to a cross connect, you must define it using the **monitor-session** global configuration command. Once the traffic mirroring session is defined, use the **monitor-session** point-to-point cross connect configuration command to attach this session as one of the segments for the cross connect. Once attached, all traffic replicated from the monitored interfaces (in other words, interfaces that are associated with the monitor-session) is replicated to the pseudowire that is attached to the other segment of the cross-connect.

The *session-name* argument should be different than any interface names currently used in the system.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to attach a traffic mirroring session as segment for the xconnect:

```
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group g1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p xcon1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# monitor-session mon1
```

Related Commands

Command	Description
See the **monitor session** command in the *Interface and Hardware Component Command Reference for Cisco ASR 9000 Series Routers*.	

mpls static label (L2VPN)

To configure static labels for MPLS L2VPN, use the **mpls static label** command in L2VPN cross-connect P2P pseudowire configuration mode. To have MPLS assign a label dynamically, use the **no** form of this command.

mpls static label { **local** *label* **remote** *value* }

Syntax Description

local *label*	Configures a local pseudowire label. Range is 16 to 15999.
remote *value*	Configures a remote pseudowire label. Range is 16 to 15999.

Command Default

The default behavior is a dynamic label assignment.

Command Modes

L2VPN cross-connect P2P pseudowire configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure static labels for MPLS L2VPN:

```
Router# configure
Router(config)# l2vpn xconnect group l2vpn
Router(config-l2vpn-xc)# p2p rtrA_to_rtrB
Router(config-xc-p2p)# neighbor 10.1.1.2 pw-id 1000
Router(config-l2vpn-xc-p2p-pw)# mpls static label local 800 remote 500
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
neighbor (L2VPN), on page 53	Configures a pseudowire for a cross-connect.
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.

Command	Description
xconnect group, on page 156	Configures cross-connect groups.

neighbor (L2VPN)

To configure a pseudowire for a cross-connect, use the **neighbor** command in p2p configuration submode. To return to the default behavior, use the **no** form of this command.

neighbor *A.B.C.D* **pw-id** *value* [**backup** | **mpls** | | **pw-class**]
no neighbor *A.B.C.D* **pw-id** *value* [**backup** | **mpls** | | **pw-class**]

Syntax Description

A.B.C.D	IP address of the cross-connect peer.
pw-id *value*	Configures the pseudowire ID and ID value. Range is 1 to 4294967295.
backup	(Optional) Specifies the backup pseudowire for the cross-connect.
mpls	(Optional) Configures an MPLS static label.
pw-class	(Optional) Configures the pseudowire class template name to use for this cross-connect.

Command Default

None

Command Modes

p2p configuration submode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

A cross-connect may have two segments:

1. An Attachment Circuit (AC)
2. An second AC or a pseudowire

Note The pseudowire is identified by two keys: neighbor and pseudowire ID. There may be multiple pseudowires going to the same neighbor. It is not possible to configure only a neighbor.

All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows a point-to-point cross-connect configuration (including pseudowire configuration):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor 10.1.1.2 pw-id 1000 pw-class class12
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor 10.1.1.3 pw-id 1001 pw-class class13
RP/0/RSP0/CPU0:router(config-xc)# p2p rtrC_to_rtrD
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor 10.2.2.3 pw-id 200 pw-class class23
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor 10.2.2.4 pw-id 201 pw-class class24
```

This example shows a point-to-point cross-connect configuration (including pseudowire configuration):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor 10.1.1.2 pw-id 1000 pw-class foo
RP/0/RSP0/CPU0:router(config-xc)# p2p rtrC_to_rtrD
RP/0/RSP0/CPU0:router(config-xc-p2p)# neighbor 20.2.2.3 pw-id 200 pw-class bar1
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.
pw-class (L2VPN), on page 63	Enters pseudowire class submode to define a pseudowire class template.
xconnect group, on page 156	Configures cross-connect groups.

neighbor evpn

To enable EVPN-VPWS endpoint on the p2p cross-connect, use the **neighbor evpn** command in the p2p configuration submode.

neighbor evpn evi *vpn-id***target** *ac-id*

Syntax Description

evi	*vpn-id*	Virtual Private Network Identifier where this p2p xconnect is setup.
target	*ac-id*	Specifies the targeted remote attachment circuit id of the EVPN.

Command Default

None

Command Modes

p2p configuration submode

Command History

Release	Modification
Release 6.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

The following example shows how to enable EVPN-VPWS endpoint on the p2p cross-connect.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:routerRP/0/RP00RSP0/CPU0:router# interface TenGigE0/1/0/12
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group xc1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p vpws
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# interface gigabitethernet 0/1/0/9
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor evpn evi 100 target 80
```

neighbor routed

To enable pseudowire routing configuration submode for the p2p cross-connect, use the **neighbor routed** command in the p2p configuration submode.

neighbor routed *global-id*:*prefix*:*ac-id* **source** *ac-id*

Syntax Description

global-id	Targeted remote autonomous system number.
prefix	Targeted remote PE IP address.
ac-id	Specifies the targeted remote attachment circuit id.
source *ac-id*	Specifies the local attachment circuit ID.

Command Default

None

Command Modes

p2p configuration submode

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

The following example shows how to enable pseudowire routing configuration submode for the p2p cross-connect.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group pw-he1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p pw-ss
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# interface gigabitethernet 0/1/0/9
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor routed 100:2.2.2.2:10 source 10
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pwr)# pw-class dynamic_sspw
```

nsr (L2VPN)

To configure non-stop routing, use the **nsr** command in L2VPN configuration submode. To return to the default behavior, use the **no** form of this command.

nsr
no nsr

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

L2VPN configuration submode

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

All L2VPN configuration can be deleted using the **no l2vpn** command.

Note NSR is enabled by default for L2VPN On Cisco IOS XR 64 bit operating system. You cannot configure the **nsr** command under L2VPN configuration submode.

Task ID

Task ID	Operation
l2vpn	read, write

The following example shows how to configure non-stop routing:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# nsr
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.

option-b-asbr-only

To enter option-b-asbr-only configuration mode, use the **option-b-asbr-only** command under the address-family L2VPN EVPN global configuration mode.

option-b-asbr-only

Syntax Description

option-b-asbr-only	Enables Inter-AS option-B for L2VPN EVPN address-family identifier (AFI) and subsequent address-family identifier (SAFI).

Syntax Description

This command has no keywords or arguments.

Command Default

None.

Command Modes

Global configuration mode

Command History

Release	Modification
Release 7.4.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Example

This example shows how to enable the ASBR router for option-B label exchange:

```
Router(config)# router bgp 300
Router(config-bgp)# address-family l2vpn evpn
Router(config-bgp-af)# option-b-asbr-only
Router(config-evpn-instance)# commit
```

pw-routing

To enable pseudowire routing capabilities and enter the pseudowire routing configuration submode, use the **pw-routing** command in the L2VPN routing configuration submode.

pw-routing

Syntax Description

This command has no keywords or arguments.

Command Default

None.

Command Modes

L2VPN routing configuration submode

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

The following example shows how to enable pseudowire routing capabilities:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)#router-id 2.2.2.2
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-routing
RP/0/RSP0/CPU0:router(config-l2vpn-pwr)# global-id 1000
RP/0/RSP0/CPU0:router(config-l2vpn-pwr)# bgp
RP/0/RSP0/CPU0:router(config-l2vpn-pwr-bgp)# rd 192.168.1.3:10
```

preferred-path

To configure an MPLS TE tunnel to be used for L2VPN traffic, use the **preferred-path** command in Encapsulation MPLS configuration mode. To delete the preferred-path, use the **no** form of this command.

preferred-path interface {**tunnel-ip** | **tunnel-te** | }*value* [**fallback disable**]
no preferred-path interface {**tunnel-ip** | **tunnel-te** | }*value* [**fallback disable**]

Syntax Description

interface	Interface for the preferred path.
tunnel-ip	IP tunnel interface name for the preferred path.
value	Tunnel number for preferred path.
tunnel te	Specifies the TE tunnel interface name for the preferred path.

Command Default

None

Command Modes

Encapsulation MPLS configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The **preferred-path** command is applicable only to pseudowires with MPLS encapsulation.

Use the **show l2vpn xconnect detail** command to show the status of fallback (that is, enabled or disabled).

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to configure preferred-path tunnel settings:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-encap-mpls)# preferred-path interface tunnel-tp 345
```

```
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-encap-mpls)# preferred-path interface tunnel-tp 345
 fallback disable
```

Related Commands

Command	Description
show l2vpn xconnect, on page 130	Displays brief information on configured cross-connects.

protocol l2tpv3

To configure Layer 2 Tunneling Protocol Version 3 (L2TPv3) as the signaling protocol for a pseudowire class, use the **protocol l2tpv3** command in L2VPN pseudowire class encapsulation L2TPv3 configuration mode. To disable L2TPv3 as the signaling protocol for a pseudowire class, use the **no** form of this command.

protocol l2tpv3[**class** *class_name*]
no protocol l2tpv3[**class** *class_name*]

Syntax Description

class	Specifies the L2TPv3 class.
class_name	The L2TPv3 class name.

Command Default

None

Command Modes

L2VPN pseudowire class encapsulation L2TPv3 configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to set the encapsulation and protocol to L2TPv3:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation l2tpv3
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# protocol l2tpv3
```

pw-class (L2VPN)

To enter pseudowire class submode to define a pseudowire class template, use the **pw-class** command in L2VPN configuration submode. To delete the pseudowire class, use the **no** form of this command.

pw-class *class-name*
no pw-class *class-name*

Syntax Description

class-name	Pseudowire class name.

Command Default

None

Command Modes

L2VPN configuration submode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to define a simple pseudowire class template:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group l1vpn
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor 10.1.1.2 pw-id 1000
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# pw-class kanata01
```

Related Commands

Command	Description
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.

pw-class encapsulation l2tpv3

To configure L2TPv3 pseudowire encapsulation, use the **pw-class encapsulation l2tpv3** command in L2VPN pseudowire class configuration mode. To return to the default behavior, use the **no** form of this command.

pw-class class name encapsulation l2tpv3 [**cookie size** {**0** | **4** | **8**} | **ipv4 source** *address* | **pmtu max** *68-65535* | **protocol l2tpv3 class** *name* | **tos** {**reflect value** *0-255* | **value** *0-255*} | **ttl** *value*]
no pw-class class name encapsulation l2tpv3 [**cookie size** {**0** | **4** | **8**} | **ipv4 source** *address* | **pmtu max** *68-65535* | **protocol l2tpv3 class** *name* | **tos** {**reflect value** *0-255* | **value** *0-255*} | **ttl** *value*]

Syntax Description

class name	Configures an encapsulation class name.
cookie size {0 | 4 | 8}	(Optional) Configures the L2TPv3 cookie size setting: • 0—Cookie size is 0 bytes. • 4—Cookie size is 4 bytes. • 8—Cookie size is 8 bytes.
ipv4 source *address*	(Optional) Configures the local source IPv4 address.
pmtu max *68-65535*	(Optional) Configures the value of the maximum allowable session MTU.
protocol l2tpv3 class *name*	(Optional) Configures L2TPv3 as the signaling protocol for the pseudowire class.
tos {**reflect value** *0-255* | **value** *0-255*}	(Optional) Configures TOS and the TOS value. Range is 0 to 255.
ttl *value*	Configures the Time-to-live (TTL) value. Range is 1 to 255.

Command Default

None

Command Modes

L2VPN pseudowire class configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to define L2TPV3 pseudowire encapsulation:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation l2tpv3
```

The following example shows how to set the encapsulation and protocol to L2TPV3:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation l2tpv3
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# protocol l2tpv3
```

Related Commands

Command	Description
pw-class (L2VPN), on page 63	Enters pseudowire class submode to define a pseudowire class template.
pw-class encapsulation mpls, on page 66	Configures MPLS pseudowire encapsulation.

pw-class encapsulation mpls

To configure MPLS pseudowire encapsulation, use the **pw-class encapsulation mpls** command in L2VPN pseudowire class configuration mode. To undo the configuration, use the **no** form of this command.

pw-class *class-name* **encapsulation mpls** {**control word** | **ipv4** | **load-balancing** | **preferred-path** | **protocol ldp** | **sequencing** | **switching tlv** | **tag-rewrite** | **transport-mode** | **vccv verification-type none**}
no pw-class *class-name* **encapsulation mpls** {**control word** | **ipv4** | **load-balancing** | **preferred-path** | **protocol ldp** | **sequencing** | **switching tlv** | **tag-rewrite** | **transport-mode** | **vccv verification-type none**}

Syntax Description

class-name	Encapsulation class name.
control word	Disables control word for MPLS encapsulation. Disabled by default.
ipv4	Sets the local source IPv4 address.
load-balancing	Sets flow label-based load balancing.
preferred-path	Configures the preferred path tunnel settings.
protocol ldp	Configures LDP as the signaling protocol for this pseudowire class.
sequencing	Configures sequencing on receive or transmit.
switching tlv	Configures switching TLV to be hidden or not.
tag-rewrite	Configures VLAN tag rewrite.
transport-mode	Configures transport mode to be either Ethernet or VLAN.
vccv none	Enables or disables the VCCV verification type.

Command Default

None

Command Modes

L2VPN pseudowire class configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Release	Modification
Release 3.9.0	The following keywords were added: • **preferred-path** • **sequencing** • **switching tlv** • **tag-rewrite** • **transport-mode**

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to define MPLS pseudowire encapsulation:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
```

Related Commands

Command	Description
pw-class (L2VPN), on page 63	Enters pseudowire class submode to define a pseudowire class template.

pw-ether

To configure a PWHE Ethernet interface, use the **pw-ether** command in global configuration mode or in p2p configuration submode. To return to the default behavior, use the **no** form of this command.

pw-ether *value*
no pw-ether *value*

Syntax Description

value	Value of the PWHE Ethernet interface. The range is from 1 to 32768.

Command Default

None

Command Modes

Global configuration

p2p configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
interface (global configuration)	read, write
l2vpn (p2p configuration)	read, write

This example shows the sample output of a PWHE Ethernet interface configuration in global configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface pw-ether 78
RP/0/RSP0/CPU0:router(config-if)#  attach generic-interface-list interfacelist1
```

This example shows the sample output of a PWHE Ethernet interface configuration in p2p configuration submode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group xc1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)#p2p grp1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)#interface pw-ether 78
```

This example shows the sample output of L2 overhead configuration for the PW-HE interface:

```
RP/0/RSP0/CPU0:router# configure
```

```
RP/0/RSP0/CPU0:router(config)# interface pw-ether 78
RP/0/RSP0/CPU0:router(config-if)# l2overhead 32
```

This example shows the sample output of Load-interval configuration for the PW-HE interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface pw-ether 78
RP/0/RSP0/CPU0:router(config-if)# load-interval 60
```

This example shows the sample output of how to set logging of interface state change for the PW-HE interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface pw-ether 78
RP/0/RSP0/CPU0:router(config-if)# logging events link-status
```

This example shows the sample output of MAC address configuration for the PW-HE interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface pw-ether 78
RP/0/RSP0/CPU0:router(config-if)# mac-address 44-37-E6-89-C3-93
```

This example shows the sample output of MTU configuration for the PW-HE interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface pw-ether 78
RP/0/RSP0/CPU0:router(config-if)# mtu 128
```

This example shows the sample output of bandwidth configuration for the PW-HE interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface pw-ether 78
RP/0/RSP0/CPU0:router(config-if)# bandwidth 256
```

Related Commands

Command	Description
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.

pw-grouping

To enable Pseudowire Grouping, use the **pw-grouping** command in L2vpn configuration submode. To return to the default behavior, use the **no** form of this command.

pw-grouping
no pw-grouping

Syntax Description

pw-grouping	Enables Pseudowire Grouping.

Command Default

PW-grouping is disabled by default.

Command Modes

L2VPN configuration submode

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows the sample output of pw-grouping configuration in L2VPN configuration submode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-grouping
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
show l2vpn, on page 93	Displays L2VPN information

pw-iw

To configure a PWHE IP Interworking interface, use the **pw-iw** command in p2p configuration submode. To return to the default behavior, use the **no** form of this command.

pw-iw *value*
no pw-iw *value*

Syntax Description

value	Value of the PWHE IP interface. The range is from 1 to 32768.

Command Default

None

Command Modes

p2p configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows the sample output of a PWHE IP interface:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group xc1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)#p2p grp1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)#interface pw-iw 78
```

Related Commands

Command	Description
pw-ether, on page 68	Configures a Pseudowire Headend (PWHE) Ethernet interface.

p2p

To enter p2p configuration submode to configure point-to-point cross-connects, use the **p2p** command in L2VPN xconnect mode. To return to the default behavior, use the **no** form of this command.

p2p *xconnect-name*
no p2p *xconnect-name*

Syntax Description

xconnect-name	(Optional) Configures the name of the point-to-point cross- connect.

Command Default

None

Command Modes

L2VPN xconnect

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

The name of the point-to-point cross-connect string is a free format description string.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows a point-to-point cross-connect configuration (including pseudowire configuration):

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group group 1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p xc1
```

Related Commands

Command	Description
interface (p2p), on page 27	Configures an attachment circuit.

rd (L2VPN)

To configure BGP route distinguisher, use the **rd** command in the L2VPN pseudowire routing bgp configuration submode or the L2VPN bridge domain VFI autodiscovery bgp submode or the L2VPN cross-connect mp2mp autodiscovery bgp sub-mode, as applicable.

rd {*ASN* **:** *index* | *ipv4-address* **:** *index*}

Syntax Description

ASN	Specifies the 2-byte or 4-byte autonomous system number.
index	Specifies the index value. If the ASN is 2-byte, then the index value is 4-byte. If the ASN is 4-byte or the index is preceded by an IPv4 address, then the index value is 2-byte.
ipv4-address	Indicates the IP address (4 bytes). The index value associated with the IP address is 2-byte.

Command Default

Default value is auto-generated in the format IPv4 address : nn; where, IPv4 address is set to the BGP router-id for all features or to L2VPN router-id for pseudowire routing only, and nn is the index value that is auto-generated.

Command Modes

L2VPN pseudowire routing BGP configuration submode

L2VPN bridge domain VFI autodiscovery BGP submode

L2VPN cross-connect mp2mp autodiscovery BGP submode

Command History

Release	Modification
Release 3.7.2	This command is introduced for the L2VPN bridge domain VFI autodiscovery BGP and L2VPN cross-connect mp2mp autodiscovery BGP submodes.
Release 5.1.2	This command is introduced for the L2VPN pseudowire routing BGP configuration submode.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read, write

The following example shows how to configure BGP route distinguisher.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)#router-id 2.2.2.2
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-routing
RP/0/RSP0/CPU0:router(config-l2vpn-pwr)# global-id 1000
RP/0/RSP0/CPU0:router(config-l2vpn-pwr)# bgp
RP/0/RSP0/CPU0:router(config-l2vpn-pwr-bgp)# rd 192.168.1.3:10
```

sequencing (L2VPN)

To configure L2VPN pseudowire class sequencing, use the **pw-class sequencing** command in L2VPN pseudowire class encapsulation mode. To return to the default behavior, use the **no** form of this command.

sequencing {**both** | **receive** | **transmit** **{resynch** **5-65535}**}
no sequencing {**both** | **receive** | **transmit** **{resynch** **5-65535}**}

Syntax Description

both	Configures transmit and receive side sequencing.
receive	Configures receive side sequencing.
transmit	Configures transmit side sequencing.
resynch *5-65535*	Configures the threshold for out-of-sequence packets before resynchronization. Range is 5 to 65535.

Command Default

None

Command Modes

L2VPN pseudowire class encapsulation mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Do not configure **sequence resynch** on high speed circuits. On low speed circuits, do not configure a threshold lower than 10 to 20 seconds of traffic.

Note This command is not supported on the Cisco ASR 9000 Series Aggregation Services Router.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure L2VPN pseudowire class sequencing:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pw)# encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn-encap-mpls)# sequencing both
```

Related Commands

Command	Description
pw-class (L2VPN), on page 63	Enters pseudowire class submode to define a pseudowire class template.

show bgp l2vpn evpn

To display BGP routes associated with EVPN under L2VPN address family, use the **show bgp l2vpn evpn** command in EXEC mode.

show bgp l2vpn evpn { **bridge-domain** *bridge-domain-name* | **rd** { **all** *IPv4 address:nn 4-byte as-number:nn 2-byte as-number:nn* } }

Syntax Description

bridge-domain *bridge-domain-name*	Displays the bridges by the bridge ID. The bridge-domain-name argument is used to name a bridge domain.
rd	Displays routes with specific route distinguisher.
all	Displays specified routes in all RDs.
IPv4 address:nn	Specifies the IPv4 address of the route distinguisher. nn: 16-bit number
4-byte as-number:nn	Specifies 4-byte AS number in asdot (X.Y) format or in asplain format. • For 4-byte AS number in asdot (X.Y) format, the range is from 1 to 65535. The format is: <1-65535>.<0-65535>:<0-65535> • For 4-byte AS number in asplain format, the range is from 65536 to 4294967295. The format is: <65536-4294967295>: nn: 32-bit number
2-byte as-number:nn	Specifies 2-byte as-number. The range is from 1 to 65535. nn: 32-bit number

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bgp	read

This sample output shows the BGP routes associated with EVPN with bridge-domain filter:

```
show bgp l2vpn evpn bridge-domain bd1
Network            Next Hop            Metric LocPrf Weight Path
Route Distinguisher: 192.0.2.1:1 (default for vrf bd1)
*>i[1][0077.0000.0000.0000.0001][0]/120
                     198.51.100.1                  100      0 i
*>i[1][0077.0000.0000.0000.0001][4294967295]/120
                     198.51.100.1                  100      0 i
*>i[1][0088.0000.0000.0000.0001][0]/120
                     203.0.113.1                   100      0 i
* i                  209.165.200.225               100      0 i
*>i[1][0088.0000.0000.0000.0001][4294967295]/120
                     203.0.113.1                   100      0 i
* i                  209.165.200.225               100      0 I
*  [2][0][48][0001.0000.0001][0]/104
*>                   209.165.201.1                          0 101 i
*>i[2][0][48][0002.0000.0001][0]/104
                     203.0.113.1                   100      0 102 i
* i                  209.165.200.225               100      0 102 i
*>i[3][0][32][203.0.113.1]/80
                     203.0.113.1                   100      0 i
*>i[3][0][32][209.165.200.225]/80
                     209.165.200.225               100      0 i
```

show bgp l2vpn mspw

To display the information about L2VPN single-segment pseudowires, use the **show bgp l2vpn mspw** command in the EXEC mode.

show bgp l2vpn mspw

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
bgp	read

The following example displays the information about L2VPN Single-Segment Pseudowires

```
RP/0/0/CPU0:PE2#show bgp l2vpn mspw
Mon Apr 13 16:27:18.878 PDT
BGP router identifier 200.200.200.200, local AS number 100
BGP generic scan interval 100 secs
BGP table state: Active
Table ID: 0x0   RD version: 14
BGP main routing table version 5
BGP scan interval 60 secs

Status codes: s suppressed, d damped, h history, * valid, > best
              i - internal, r RIB-failure, S stale
Origin codes: i - IGP, e - EGP, ? - incomplete
   Network            Next Hop            Metric LocPrf Weight Path
Route Distinguisher: 4.3.2.1:0
*> [100][200.200.200.200]/64
                      0.0.0.0                                  0 i
Route Distinguisher: 4.3.2.1:1
*> [100][100.100.100.100][200]/96
                      10.10.10.2
```

show bgp vrf-db

To display the BGP VRF database information, use the **show bgp vrf-db** command in the EXEC mode.

show bgp vfr-db {**all** *vrf table id*}

Syntax Description

all	Displays all BGP VRF database table information.
vrf table id	Displays the BGP VRF database information for the specific VRF table ID.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

Example

This sample output shows the BGP VRF database information with the VRF table ID filter:

```
#show bgp vrf-db table 0x00000001
Tue Jun 14 14:39:32.468 EDT

VRF-TBL: bd1 (L2VPN EVPN)
  TBL ID: 0x00000001
  RSI Handle: 0x0
  Refcount: 24
  Import:
    RT-List: RT:100:1
    Stitching RT-List: RT:101:1
  Export:
    RT-List: RT:100:1
    Stitching RT-List: RT:101:1
```

show evpn evi ead

To display the EVPN E-VPN ID information, use the **show evpn evi ead** command in the EXEC mode.

show evpn evi ead detail

Syntax Description

evi	Specifies the EVPN Instance Identifier. This is used to derive the default Route Distinguisher and Route Targets.
ead	Specifies the EVPN ead routes.
detail	Displays detailed information.

Command Default

None.

Command Modes

EXEC

Command History

Release	Modification
Release 6.0.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

Example

This sample output shows the EVPN EVI detailed information:

```
RP/0/RSP0/CPU0:router#show evpn evi ead detail
Mon Apr 18 13:19:44.311 EDT

EVI   Ethernet Segment Id      EtherTag Nexthop                                Label
----- ----------------------- -------- ------------------------------------- --------
1     00a1.a2a3.a4a5.a6a7.a8a9 0        ::                                    24006
                                       2.2.2.2                               24007
   Source: Local, Remote, MPLS, VXLAN
1     00a1.a2a3.a4a5.a6a7.a8a9 ffffffff 2.2.2.2                               0
   Source: Remote, Unknown encap
200   0000.0000.0000.0000.0000 1        ::                                    24025
   Source: Local, MPLS
200   0000.0000.0000.0000.0000 4        ::                                    24026
   Source: Local, MPLS
200   0000.0000.0000.0000.0000 11       ::                                    24027
   Source: Local, MPLS
```

```
300   00a1.a2a3.a4a5.a6a7.a8a9 0        ::                                      24004
                                        2.2.2.2                                 24005
   Source: Local, Remote, MPLS, VXLAN
300   00a1.a2a3.a4a5.a6a7.a8a9 ffffffff 2.2.2.2                                 0
   Source: Remote, Unknown encap
302   00a1.a2a3.a4a5.a6a7.a8a9 0        ::                                      24008
   Source: Local, MPLS, VXLAN
400   00b1.b2b3.b4b5.b6b7.b8b9 0        ::                                      24010
   Source: Local, MPLS
```

Related Commands

Command	Description
evpn	Enters EVPN configuration mode.
evpn evi	

show evpn internal-label

To display EVPN internal label associated configuration information, use the **show evpn internal-label** command in the EXEC mode.

show evpn internal-label [**vpn-id** *evi* [**detail**]]

Syntax Description

vpn-id *evi*	Displays information for a specified E-VPN Identifier.
detail	Displays detailed information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

Example

This sample output shows the EVPN internal label associated configuration information.

```
show evpn internal-label vpn-id 1 detail
Tue Jun 14 16:18:51.563 EDT

EVI   Ethernet Segment Id                      EtherTag Label
----- ---------------------------------------- -------- --------
1     0088.0000.0000.0000.0001                 0        24036
   Multi-paths resolved: TRUE
   Multi-paths local label: 24036
   Pathlists:
      MAC     1 entries
      EAD/ES  203.0.113.1                              0
              209.165.200.225                          0
      EAD/EVI 203.0.113.1                              24001
              209.165.200.225                          24001
      Summary 203.0.113.1                              24001
              209.165.200.225                          24001
```

show dci-fabric-interconnect

To display the DCI fabric tenant interconnect information, use the **show dci-fabric-interconnect** command in the EXEC mode.

show dci-fabric-interconnect {**auto-configuration-pools** | **dci-vrf-db** [**vrf** *vrfname*] | **fabric** [*fabric id* | **opflex-session**] | **fabric-vrf-db** [**fabric** *fabric id*]}

Syntax Description

auto-configuration-pools	Displays auto configuration pool parameters.
dci-vrf-db	Displays DCI VRF database information.
vrf *vrf name*	Displays DCI VRF database for a specific VRF.
fabric *fabric id*	Displays fabric information for fabric ID. The range is from 1000 to 9999.
opflex-session	Displays opflex session information.
fabric-vrf-db	Displays fabric VRF database information.
fabric *fabric id*	Displays fabric VRF database for a fabric ID.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

Example

This sample output shows the DCI fabric interconnect information with the auto-configuration-pools filter:

```
RP/0/RSP0/CPU0:router# show dci-fabric-interconnect auto-configuration-pools
Sat May 28 08:12:24.192 PDT
Auto Configuration Pool Info
-------------------------------------------------
Pool:Min-Max          Used Num Bits    Used Range
-------------------------------------------------
```

```
VNI-Pool:0001-1000    Used:10          Used:1-10
BD-Pool :0001-1000    Used:10          Used:1-10
BVI-Pool:0001-1000    Used:10          Used:1-10
-------------------------------------------------
```

Example

This sample output shows the DCI fabric interconnect information with the fabric opflex-session filter:

```
RP/0/RSP0/CPU0:router# show dci-fabric-interconnect fabric opflex-session
Sat May 28 08:12:09.326 PDT
Fabric Id: 1000
State: Config Complete(Sat May 28 08:09:01.813 PDT)
       Active (Healthy)(Wed Dec 31 16:00:00.000 PST)

Peers:
Peer-IP            Peer-Port    Peer-Status /Timestamp
===============    =========    ========================================
209.165.200.225    8009         Ready     /(Wed Dec 31 16:00:01.000 PST)
================================================================================
```

Example

This sample output shows the DCI fabric interconnect information with the fabric-vrf-db filter:

```
RP/0/RSP0/CPU0:router# show dci-fabric-interconnect fabric-vrf-db
Tue Jul 26 16:13:30.101 PDT
Flags: S = STALE
--------------------------------------------------------------------------------
Fabric Id: 1000  Number of VRFs: 0010
--------------------------------------------------------------------------------
Fabric-VRF:FV1000_2  DCI VRF:DV2  Flags:
         v4 Import RTs:(100:19333144)
         v4 Export RTs:(100:19333144)
         v6 Import RTs:(100:19333144)
         v6 Export RTs:(100:19333144)

Fabric-VRF:FV1000_3  DCI VRF:DV3  Flags:
         v4 Import RTs:(100:19333144)
         v4 Export RTs:(100:19333144)
         v6 Import RTs:(100:19333144)
         v6 Export RTs:(100:19333144)

Fabric-VRF:FV1000_4  DCI VRF:DV4  Flags:
         v4 Import RTs:(100:19333144)
         v4 Export RTs:(100:19333144)
         v6 Import RTs:(100:19333144)
         v6 Export RTs:(100:19333144)

Fabric-VRF:FV1000_5  DCI VRF:DV5  Flags:
         v4 Import RTs:(100:19333144)
         v4 Export RTs:(100:19333144)
         v6 Import RTs:(100:19333144)
         v6 Export RTs:(100:19333144)
```

Example

This sample output shows the DCI fabric interconnect information with the dci-vrf-db filter:

```
RP/0/RSP0/CPU0:router# show  dci-fabric-interconnect dci-vrf-db
Sat May 28 08:12:17.401 PDT
Flags: AP = ADD_PENDING, DP = DELETE_PENDING, C = CONFIG_APPLIED, S = STALE
------------------------------------------------------------------------------
DCI VRF:DV6  Flags:C
         Number of Fabric VRFs: 0002
         Fabric VRFs: (1000,FV1000_6); (2000,FV2000_6)
         v4 RT: (Import:1000:1000, Export:         )/Flags:C
                (Import:1000:2000, Export:         )/Flags:C
         v6 RT: (Import:2000:1000, Export:         )/Flags:C
                (Import:2000:2000, Export:         )/Flags:C
         VNI Id:0007 ; BD-Name:fti-bd-7
         BVI-ID:0007 ; BVI-IP:169.254.1.30 ; BVI-IPV6: Enabled
------------------------------------------------------------------------------
DCI VRF:DV7  Flags:C
         Number of Fabric VRFs: 0002
         Fabric VRFs: (1000,FV1000_7); (2000,FV2000_7)
         v4 RT: (Import:1000:1000, Export:         )/Flags:C
                (Import:1000:2000, Export:         )/Flags:C
         v6 RT: (Import:2000:1000, Export:         )/Flags:C
                (Import:2000:2000, Export:         )/Flags:C
         VNI Id:0008 ; BD-Name:fti-bd-8
         BVI-ID:0008 ; BVI-IP:169.254.1.30 ; BVI-IPV6: Enabled
------------------------------------------------------------------------------
```

show generic-interface-list

To display information about interface-lists, use the **show generic-interface-list** in EXEC mode.

show generic-interface-list [**location** | **name** | **retry** | **standby**]

Syntax Description

location	(Optional) Displays information about interface-lists for the specified location.
name	(Optional) Displays information about interface-lists for the specified interface list name.
retry	(Optional) Displays retry-list information.
standby	(Optional) Displays Standby node specific information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

The following example displays output for the **show generic-interface-list** command:

```
RP/0/RSP0/CPU0:router# show generic-interface-list
    Thu Aug  2 13:48:57.462 CDT
    generic-interface-list: nsrIL (ID: 1, interfaces: 2)
       Bundle-Ether2 - items pending 0, downloaded to FIB
       GigabitEthernet0/0/0/1 - items pending 0, downloaded to FIB
     Number of items: 400
     List is downloaded to FIB
```

The following example displays output for the **show generic-interface-list retry private** command:

```
RP/0/RSP0/CPU0:router# show generic-interface-list retry private
    Thu Aug  2 14:20:42.883 CDT
    total: 0 items
```

The following example displays output for the **show generic-interface-list standby** command:

```
RP/0/RSP0/CPU0:router# show generic-interface-list standby
```

```
Thu Aug 2 14:25:01.749 CDT
generic-interface-list: nsrIL (ID: 0, interfaces: 2)
Bundle-Ether2 - items pending 0, NOT downloaded to FIB
GigabitEthernet0/0/0/1 - items pending 0, NOT downloaded to FIB
Number of items: 0
List is not downloaded to FIB
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.

show l2tp session

To display information about L2TP sessions, use the **show l2tp session** command in EXEC mode.

show l2tp session [**detail** | **brief** | **interworking** | **circuit** | **sequence** | **state**] {**id** *id* | **name** *name*}

Syntax Description

brief	(Optional) Displays summary output for a session.
circuit	(Optional) Displays attachment circuit information for a session.
detail	(Optional) Displays detailed output for a session.
interworking	(Optional) Displays interworking information for a session.
sequence	(Optional) Displays data packet sequencing information for a session.
state	(Optional) Displays control plane state information for a session.
id *id*	Configures the local tunnel ID. Range is 0 to 4294967295.
name *name*	Configures the tunnel name.

Command Default

None

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following sample output is from the **show l2tp session brief** command:

```
RP/0/RP00/CPU0:router(config-l2vpn-pw)# show l2tp session brief
Tue Jun 10 12:51:30.901 UTC
LocID      TunID      Peer-address    State     Username, Intf/sess/cir  Vcid, Circuit

1606803058 1487464659 26.26.26.26     est,UP    101, Gi0/2/0/1.101
3663696887 1487464659 26.26.26.26     est,UP    100, Gi0/2/0/1.100
```

This table describes the significant fields shown in the display.

Table 1: show l2tp session brief Field Descriptions

Field	Description
LocID	Local session ID.
TunID	Local tunnel ID for this session.
Peer-address	The IP address of the other end of the session.
State	The state of the session.
Vcid	The Virtual Circuit ID of the session. This is the same value of the pseudowire ID for l2vpn.

The following sample output is from the **show l2tp session detail** command:

```
RP/0/RP00/CPU0:router(config-l2vpn-pw)# show l2tp session detail
Tue Jun 10 12:53:19.842 UTC
Session id 1606803058 is up, tunnel id 1487464659, logical session id 131097
  Remote session id is 2602674409, remote tunnel id 2064960537
  Remotely initiated session
Call serial number is 4117500017
Remote tunnel name is ASR9K-PE2
  Internet address is 26.26.26.26:1248
Local tunnel name is PRABHRAM-PE1
  Internet address is 25.25.25.25:4272
IP protocol 115
  Session is L2TP signaled
  Session state is established, time since change 00:07:28
  UDP checksums are disabled
  Session cookie information:
    local cookie, size 4 bytes, value 6d 3e 03 67
    remote cookie, size 4 bytes, value 0d ac 7a 3b
  Tie breaker is 0xfee65781a2fa2cfd, enabled TRUE.
  Sequencing is off
  Conditional debugging is disabled
  Unique ID is 101
Session Layer 2 circuit
  Payload type is Ethernet, Name is GigabitEthernet0_2_0_1.101
  Session vcid is 101
  Circuit state is UP
    Local circuit state is UP
    Remote circuit state is UP
```

Related Commands

Command	Description
#unique_113	

show l2tp tunnel

To display information about L2TP tunnels, use the **show l2tp tunnel** command in EXEC mode.

show l2tp tunnel {**detail** | **brief** | **state** | **transport**} {**id** *identifier* | **name** *local-name remote-name*}

Syntax Description

detail	Displays detailed output for L2TP tunnels.
brief	Displays summary information for the tunnel.
state	Displays control plane state information.
transport	Displays transport information (IP) for each selected control channel.
id *identifier*	Displays local control channel identifiers.
name *local-name remote-name*	Displays the local and remote names of a control channel.

Command Default

None

Command Modes

EXEC

Command History

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following sample output is from the **show l2tp tunnel brief** command:

```
RP/0/RSP0/CPU0:router(config-l2vpn-encap-mpls)# show l2tp tunnel brief
Tue Jun 10 12:46:04.421 UTC
LocTunID   RemTunID   Remote Name   State  Vrf Name    Remote Address  Sessn L2TP Class/Count
 VPDN Group
1487464659 2064960537 ASR9K-PE2     est                26.26.26.26     2     L2TPV3_CLASS
```

This table describes the significant fields shown in the display.

Table 2: show l2tp tunnel Field Descriptions

Field	Description
LocTunID	Local session ID.
RemTunID	Remote session ID.

Field	Description
Remote Name	Remote name of the session.
State	State of the session.
Remote Address	Remote address of the session.
Port	Session port.
Sessions	Number of sessions.
L2TP	L2TP class name.

The following sample output is from the **show l2tp tunnel detail** command:

```
RP/0/RSP0/CPU0:router(config-l2vpn-encap-mpls)# show l2tp tunnel detail
Tue Jun 10 12:47:36.638 UTC
Tunnel id 1487464659 is up, remote id is 2064960537, 2 active sessions
  Remotely initiated tunnel
  Tunnel state is established, time since change 4d19h
  Tunnel transport is IP  (115)
  Remote tunnel name is ASR9K-PE2
    Internet Address 26.26.26.26, port 0
  Local tunnel name is PRABHRAM-PE1
    Internet Address 25.25.25.25, port 0
  VRF table id is 0xe0000000
  Tunnel group id
  L2TP class for tunnel is L2TPV3_CLASS
  Control Ns 4178, Nr 4181
  Local RWS 512 (default), Remote RWS 512
  Control channel Congestion Control is disabled
  Tunnel PMTU checking disabled
  Retransmission time 1, max 1 seconds
  Unsent queuesize 0, max 0
  Resend queuesize 0, max 1
  Total resends 0, ZLB ACKs sent 4177
  Total out-of-order dropped pkts 0
  Total out-of-order reorder pkts 0
  Total peer authentication failures 0
  Current no session pak queue check 0 of 5
  Retransmit time distribution: 0 0 0 0 0 0 0 0 0
  Control message authentication is disabled
```

Related Commands

Command	Description
show l2tp session, on page 89	Displays information about L2TP sessions.

show l2vpn

To display L2VPN information, use the **show l2vpn** command in EXEC mode.

show l2vpn

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

Example

The following example displays output for the **show l2vpn** command. The output provides an overview of the state of the globally configured features.

```
RP/0/RSP0/CPU0:router# show l2vpn
 Mon May  7 15:01:17.963 BST
 PW-Status: disabled
 PW-Grouping: disabled
 Logging PW: disabled
 Logging BD state changes: disabled
 Logging VFI state changes: disabled
 Logging NSR state changes: disabled
 TCN propagation: disabled
 PWOAMRefreshTX: 30s
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
pw-grouping, on page 70	Enables Pseudowire Grouping

show l2vpn atom-db

To display AToM database information, use the **show l2vpn atom-db** command in EXEC mode.

show l2vpn atom-db [**detail** | **l2-rid** | **ldp-rid** | **local-gid** | **neighbor** | **preferred-path** | **remote-gid** | **source**]

Syntax Description

detail	Specifies the details of the database.
l2-rid	Specifies the AToM database walking the L2 RID thread.
ldp-rid	Specifies the AToM database walking the LDP RID thread.
local-gid	Specifies the AToM database walking the Local GID thread.
neighbor	Specifies the details of the neighbor database.
preferred-path	Specifies the preferred path (tunnel) of the database
remote-gid	Specifies the AToM database walking the Remote GID thread.
source	Specifies the details of the source database.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read

Examples

This example shows the sample output of the **show l2vpn atom-db source 10.0.0.1** command:

```
RP/0/RSP0/CPU0:router# show l2vpn atom-db source 10.0.0.1
Peer ID         Source        VC ID      Encap    Signaling   FEC     Discovery
172.16.0.1         10.0.0.1       1          MPLS     LDP         128     none
```

This example shows the sample output of the **show l2vpn atom-db source 10.0.0.1 detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn atom-db source 10.0.0.1 detail
  PW: neighbor 172.16.0.1, PW ID 1, state is down ( provisioned )
```

```
PW class class1, XC ID 0x1
Encapsulation MPLS, protocol LDP
Source address 10.0.0.1
PW type Ethernet, control word disabled, interworking none
PW backup disable delay 0 sec
Sequencing not set

  MPLS         Local                          Remote
  ------------ ------------------------------ ------------------------------
  Label        16000                          unknown
  Group ID     0x20000060                     0x0
  Interface    GigabitEthernet0/0/0/1.1       unknown
  MTU          1504                           unknown
  Control word disabled                       unknown
  PW type      Ethernet                       unknown
  VCCV CV type 0x2                            0x0
                                              (none)
               (LSP ping verification)
  VCCV CC type 0x6                            0x0
                                              (none)
               (router alert label)
               (TTL expiry)
  ------------ ------------------------------ ------------------------------
MIB cpwVcIndex: 4278194081
Create time: 13/12/2010 15:28:26 (20:32:27 ago)
Last time status changed: 13/12/2010 15:28:26 (20:32:27 ago)
Configuration info:
  PW class: class1
  Peer ID = 172.16.0.1, pseudowire ID = 1
  Control word is not set
  Transport mode: not set
    Configured (Static) Encapsulation: not set
    Provisioned Encapsulation: MPLS
  Static tag rewrite: not set
  MTU: 1504
  Tunnel interface: None
  IW type: 0
  PW type: Dynamic
  Pref path configured: No
  Bridge port: No
  BP learning disabled: No
  BP ucast flooding disabled: No
  BP bcast flooding disabled: No
  CW is mandatory: No
  Label: local unassigned, remote unassigned
  L2 Router-ID: 0.0.0.0
  LDP Router-ID: 0.0.0.0
  GR stale: No
LDP Status: local established, remote unknown
LDP tag rewrite: not set
Force switchover: inactive
MAC trigger: inactive
VC sane: Yes
Use PW Status: No
Local PW Status: Up(0x0); Remote PW Status: Up(0x0)
Peer FEC Failed: No
LSP: Down
Operational state:
  LDP session state: down
  TE tunnel transport: No
  VC in gr mode: No
  Peer state: up
  Transport LSP down: Yes
  Advertised label to LDP: No
```

```
  Received a label from LSD: Yes
  Need to send standby bit: No
  VC created from rbinding: No
  PW redundancy dampening on : No
  Notified up : No
Detailed segment state: down
 PW event trace history [Total events: 8]
 ----------------------------------------
 Time                Event                          Value
 ====                =====                          ==========
 12/13/2010 15:28:26 LSP Down                       0
 12/13/2010 15:28:26 Provision                      0
 12/13/2010 15:28:26 LSP Down                       0
 12/13/2010 15:28:26 Connect Req                    0
 12/13/2010 15:28:26 Rewrite create                 0x100000
 12/13/2010 15:28:26 Got label                      0x3e80
 12/13/2010 15:28:26 Local Mtu                      0x5e0
12/13/2010 15:28:26 Peer Up                        0
```

show l2vpn collaborators

To display information about the state of the interprocess communications connections between l2vpn_mgr and other processes, use the **show l2vpn collaborators** command in EXEC mode.

show l2vpn collaborators

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows sample output for the **show l2vpn collaborators** command:

```
RP/0/RSP0/CPU0:router# show l2vpn collaborators
L2VPN Collaborator stats:
Name                  State       Up Cnts      Down Cnts
--------------------  ----------  -----------  -----------
IMC                    Down           0            0
LSD                    Up             1            0
```

This table describes the significant fields shown in the display.

Table 3: show l2vpn collaborators Field Descriptions

Field	Description
Name	Abbreviated name of the task interacting with l2vpn_mgr.
State	Indicates if l2vpn_mgr has a working connection with the other process.
Up Cnts	Number of times the connection between l2vpn_mgr and the other process has been successfully established.

Field	Description
Down Cnts	Number of times that the connection between l2vpn_mgr and the other process has failed or been terminated.

Related Commands

Command	Description
clear l2vpn collaborators, on page 14	Clears the state change counters for L2VPN collaborators.

show l2vpn database

To display L2VPN database, use the **show l2vpn database** command in EXEC mode.

show l2vpn database {**ac** | **node**}

Syntax Description

ac	Displays L2VPN Attachment Circuit (AC) database
node	Displays L2VPN node database.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Even when xSTP (extended spanning tree protocol) operates in the PVRST mode, the output of the show or debug commands flag prefix is displayed as MSTP or MSTi, instead of PVRST.

Task ID

Task ID	Operation
l2vpn	read

The following example displays output for the **show l2vpn database ac** command:

```
RP/0/RSP0/CPU0:router# show l2vpn database ac
    Bundle-Ether1.1:
          Other-Segment MTU: 0
          Other-Segment status flags: 0x0
          Signaled capability valid: No
          Signaled capability flags: 0x0
          Configured capability flags: 0x0
          XCID: 0xffffffff
          PSN Type: Undefined
          ETH data:
              Xconnect tags: 0
              Vlan rewrite tag: 0
        AC defn:
            ac-ifname: Bundle-Ether1.1
            capabilities: 0x00368079
            extra-capabilities: 0x00000000
            parent-ifh: 0x020000e0
            ac-type: 0x15
            interworking: 0x00
        AC info:
```

```
          seg-status-flags: 0x00000000
          segment mtu/l2-mtu: 1504/1518

    GigabitEthernet0/0/0/0.4096:
          Other-Segment MTU: 0
          Other-Segment status flags: 0x0
          Signaled capability valid: No
          Signaled capability flags: 0x0
          Configured capability flags: 0x0
          XCID: 0x0
          PSN Type: Undefined
          ETH data:
              Xconnect tags: 0
              Vlan rewrite tag: 0
        AC defn:
            ac-ifname: GigabitEthernet0_0_0_0.4096
            capabilities: 0x00368079
            extra-capabilities: 0x00000000
            parent-ifh: 0x040000c0
            ac-type: 0x15
            interworking: 0x00
        AC info:
            seg-status-flags: 0x00000003
            segment mtu/l2-mtu: 1504/1518
```

The following example displays output for the **show l2vpn database node** command:

```
RP/0/RSP0/CPU0:router# show l2vpn database node
    0/RSP0/CPU0
        MA: vlan_ma

         AC event trace history [Total events: 4]
         ----------------------------------------
         Time                Event                       Num Rcvd        Num Sent
         ====                =====                       ========        ========
         07/27/2012 15:00:31 Process joined              0               0
         07/27/2012 15:00:31 Process init success        0               0
         07/27/2012 15:00:31 Replay start rcvd           0               0
         07/27/2012 15:00:31 Replay end rcvd             2               0


        MA: ether_ma

         AC event trace history [Total events: 4]
         ----------------------------------------
         Time                Event                       Num Rcvd        Num Sent
         ====                =====                       ========        ========
         07/27/2012 15:00:31 Process joined              0               0
         07/27/2012 15:00:31 Process init success        0               0
         07/27/2012 15:00:31 Replay start rcvd           0               0
         07/27/2012 15:00:31 Replay end rcvd             0               0



    0/0/CPU0
        MA: vlan_ma

         AC event trace history [Total events: 4]
         ----------------------------------------
         Time                Event                       Num Rcvd        Num Sent
         ====                =====                       ========        ========
         07/27/2012 15:00:31 Process joined              0               0
         07/27/2012 15:00:31 Process init success        0               0
         07/27/2012 15:00:31 Replay start rcvd           0               0
```

```
 07/27/2012 15:00:40 Replay end rcvd                6006            6001


MA: ether_ma

 AC event trace history [Total events: 4]
 ----------------------------------------
 Time                Event                          Num Rcvd        Num Sent
 ====                =====                          ========        ========
 07/27/2012 15:00:31 Process joined                 0               0
 07/27/2012 15:00:31 Process init success           0               0
 07/27/2012 15:00:31 Replay start rcvd              0               0
 07/27/2012 15:00:31 Replay end rcvd                1               0
```

show l2vpn discovery

To display discovery label block information, use the **show l2vpn discovery** command in EXEC mode.

show l2vpn discovery {**bridge-domain** | **xconnect** | **summary** | **private**}

Syntax Description

bridge-domain	Displays bridge domain related forwarding information.
xconnect	Displays VPWS edge information.
summary	Displays summary information.
private	Displays private log or trace information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following examples display output for the **show l2vpn discovery** command with bridge-domain filter:

```
RP/0/RSP0/CPU0:router#show l2vpn discovery bridge-domain

Service Type: VPLS,  Connected
  List of VPNs (8001 VPNs):

  Bridge group: bg1, bridge-domain: bg1_bd1, id: 0, signaling protocol: LDP
    VPLS-ID: (auto) 1:101
    Local L2 router id: 10.10.10.10
    List of Remote NLRI (3 NLRIs):
    Local Addr      Remote Addr     Remote L2 RID   Time Created
    --------------- --------------- --------------- -------------------
    10.10.10.10     20.20.20.20     20.20.20.20     03/13/2010 21:27:05
    10.10.10.10     30.30.30.30     30.30.30.30     03/13/2010 21:27:05
    10.10.10.10     40.40.40.40     40.40.40.40     03/13/2010 21:27:05
```

The following examples display output for the **show l2vpn discovery summary** command:

```
RP/0/RSP0/CPU0:router#show l2vpn discovery summary
Sun Mar 14 15:13:31.240 EDT
BGP: connected=yes,  active=yes,  stdby=yes
Services
  Bridge domain: registered=yes, Num VPNs=8001
   Num Local Edges=8001, Num Remote Edges=24001, Num Received NLRIs=24001
  Xconnect: registered=yes, Num VPNs=0
   Num Local Edges=0, Num Remote Edges=0, Num Received NLRIs=0
```

Related Commands

Command	Description
show l2vpn bridge-domain (VPLS)	Display information for the bridge ports such as attachment circuits and pseudowires for the specific bridge domains.

show l2vpn forwarding

To display forwarding information from the layer2_fib manager on the line card, use the **show l2vpn forwarding** command in EXEC mode.

show l2vpn forwarding {**xconnect** | **bridge-domain** | **counter** | **detail** | **hardware** | **inconsistent** | **interface** | **l2tp** | **location** [*node-id*] | **message** | **mstp** | **resource** | **retry-list** | **summary** | **unresolved**}

Syntax Description

xconnect	Displays the cross-connect related information.
bridge-domain	Displays bridge domain related forwarding information.
counter	Displays the cross-connect counters.
detail	Displays detailed information from the layer2_fib manager.
hardware	Displays hardware-related layer2_fib manager information.
inconsistent	Displays inconsistent entries only.
interface	Displays the match AC subinterface.
l2tp	Displays L2TPv3 related forwarding information.
location *node-id*	Displays layer2_fib manager information for the specified location. The *node-id* argument is entered in the *rack/slot/module* notation.
message	Displays messages exchanged with collaborators.
mstp	Displays multi-spanning tree related forwarding information.
resource	Displays resource availability information in the layer2_fib manager.
retry-list	Displays retry list related information.

summary	Displays summary information about cross-connects in the layer2_fib manager.
unresolved	Displays unresolved entries only.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following sample output is from the **show l2vpn forwarding bridge detail location** command for IOS-XR releases 5.3.1 and earlier:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding bridge detail location 0/2/cpu0
Bridge-domain name: bg1:bd1, id: 0, state: up
 MAC learning: enabled
 Flooding:
   Broadcast & Multicast: enabled
   Unknown unicast: enabled
 MAC aging time: 300 s, Type: inactivity
 MAC limit: 4000, Action: none, Notification: syslog
 MAC limit reached: no
 Security: disabled
 DHCPv4 snooping: profile not known on this node
 IGMP snooping: disabled, flooding: disabled
 Bridge MTU: 1500 bytes
 Number of bridge ports: 1
 Number of MAC addresses: 0
 Multi-spanning tree instance: 0

  GigabitEthernet0/1/0/1.2, state: oper up
    Number of MAC: 0
    Statistics:
      packets: received 0, sent 0
      bytes: received 0, sent 0
    Storm control drop counters:
      packets: broadcast 0, multicast 0, unknown unicast 0
      bytes: broadcast 0, multicast 0, unknown unicast 0


Bridge-domain name: bg1:bd2, id: 1, state: up
  Type:  pbb-edge, I-SID: 1234
  Core-bridge: pbb-bd2
 MAC learning: enabled
 Flooding:
   Broadcast & Multicast: enabled
```

```
    Unknown unicast: enabled
  MAC aging time: 300 s, Type: inactivity
  MAC limit: 4000, Action: none, Notification: syslog
  MAC limit reached: no
  Security: disabled
  DHCPv4 snooping: profile not known on this node
  IGMP snooping: disabled, flooding: disabled
  Bridge MTU: 1500 bytes
  Number of bridge ports: 0
  Number of MAC addresses: 0
  Multi-spanning tree instance: 0

  PBB Edge, state: up
     Number of MAC: 0
  GigabitEthernet0/1/0/1.3, state: oper up
     Number of MAC: 0
     Storm control drop counters:
       packets: broadcast 0, multicast 0, unknown unicast 0
       bytes: broadcast 0, multicast 0, unknown unicast 0

Bridge-domain name: bg1:bd3, id: 2, state: up
   Type:  pbb-core
   Number of associated pbb-edge BDs: 1

MAC learning: enabled
  Flooding:
    Broadcast & Multicast: enabled
    Unknown unicast: enabled
  MAC aging time: 300 s, Type: inactivity
  MAC limit: 4000, Action: none, Notification: syslog
  MAC limit reached: no
  Security: disabled
  DHCPv4 snooping: profile not known on this node
  IGMP snooping: disabled, flooding: disabled
  Bridge MTU: 1500 bytes
  Number of bridge ports: 0
  Number of MAC addresses: 0
  Multi-spanning tree instance: 0

   PBB Core, state: up
   Vlan-id: 1

   GigabitEthernet0/1/0/1.4, state: oper up
     Number of MAC: 0
     Storm control drop counters:
       packets: broadcast 0, multicast 0, unknown unicast 0
       bytes: broadcast 0, multicast 0, unknown unicast 0
```

The following sample output is from the **show l2vpn forwarding bridge detail location** command for IOS-XR 5.3.2 release:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding bridge detail location 0/0/CPU0

Bridge-domain name: pbb:pbb_core1, id: 10, state: up
  Type: pbb-core
  Number of associated pbb-edge BDs: 1
  MAC learning: enabled
  MAC port down flush: enabled
  Flooding:
    Broadcast & Multicast: enabled
    Unknown unicast: enabled
  MAC aging time: 300 s, Type: inactivity
  MAC limit: 4000, Action: none, Notification: syslog
```

```
 MAC limit reached: no
 MAC Secure: disabled, Logging: disabled
 DHCPv4 snooping: profile not known on this node
 Dynamic ARP Inspection: disabled, Logging: disabled
 IP Source Guard: disabled, Logging: disabled
 IGMP snooping: disabled, flooding: enabled
 MLD snooping: disabled, flooding: disabled
 MMRP Flood Optimization: disabled
 Storm control: disabled
 P2MP PW: disabled
 Bridge MTU: 1500 bytes
 Number of bridge ports: 1
 Number of MAC addresses: 5
 Multi-spanning tree instance: 0
 PBB-EVPN: enabled
 Statistics:
   packets: received 0, sent 963770
   bytes: received 0, sent 263433178

  PBB Core, state: Up
    Vlan-id: 1
    XC ID: 0x80000010
    Number of MAC: 0
    Statistics:
      packets: received 0 (unicast 0), sent 0
      bytes: received 0 (unicast 0), sent 0
      MAC move: 0
    Storm control drop counters:
      packets: broadcast 0, multicast 0, unknown unicast 0
      bytes: broadcast 0, multicast 0, unknown unicast 0
```

The following sample outputs shows the backup pseudowire information:

```
RP/0/RSP0/CPU0:router#show l2vpn forwarding detail location 0/2/CPU0
Local interface: GigabitEthernet0/2/0/0.1, Xconnect id: 0x3000001, Status: up
  Segment 1
    AC, GigabitEthernet0/2/0/0.1, Ethernet VLAN mode, status: Bound
    RG-ID 1, active
    Statistics:
      packets: received 0, sent 0
      bytes: received 0, sent 0
  Segment 2
    MPLS, Destination address: 101.101.101.101, pw-id: 1000, status: Bound
    Pseudowire label: 16000
    Statistics:
      packets: received 0, sent 0
      bytes: received 0, sent 0
  Backup PW
    MPLS, Destination address: 102.102.102.102, pw-id: 1000, status: Bound
    Pseudowire label: 16001
    Statistics:
      packets: received 0, sent 0
      bytes: received 0, sent 0


RP/0/RSP0/CPU0:router#show l2vpn forwarding bridge-domain detail location 0/2/CPU0
Bridge-domain name: bg1:bd1, id: 0, state: up
….
  GigabitEthernet0/2/0/0.4, state: oper up
    RG-ID 1, active
    Number of MAC: 0
    …..
```

```
  Nbor 101.101.101.101 pw-id 5000
    Backup Nbor 101.101.101.101 pw-id 5000
    Number of MAC: 0
….
```

```
RP/0/RSP0/CPU0:router#show l2vpn forwarding bridge-domain detail location 0/2/CPU0
Bridge-domain name: bg1:bd1, id: 0, state: up
….
GigabitEthernet0/2/0/0.4, state: oper up
XC ID: 0x1880002
Number of MAC: 0
Statistics:
packets: received 0 (multicast 0, broadcast 0, unknown unicast 0, unicast 0), sent 963770
bytes: received 0 (multicast 0, broadcast 0, unknown unicast 0, unicast 0), sent 263433178
MAC move: 0
Storm control drop counters:
packets: broadcast 0, multicast 0, unknown unicast 0
bytes: broadcast 0, multicast 0, unknown unicast 0
Dynamic arp inspection drop counters:
packets: 0, bytes: 0
IP source guard drop counters:
packets: 0, bytes: 0



….
```

The following sample outputs displays the SPAN segment information of the xconnect:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding counter location 0/7/CPU0
Legend: ST = State, DN = Down

Segment 1                             Segment 2           ST     Byte
                                                                                Switched
----------------------------- -----------------------    --      ---------
pw-span-test (Monitor-Session) mpls  172.16.0.1  UP       0


RP/0/RSP0/CPU0:router #Show l2vpn forwarding monitor-session location 0/7/CPU0
Segment 1                            Segment 2                            State
------------------------------------ ------------------------------------ ------
pw-span-test(monitor-session)  mpls    172.16.0.1                      UP
pw-span-sess(monitor-session)  mpls    192.168.0.1                      UP


RP/0/RSP0/CPU0:router #Show l2vpn forwarding monitor-session pw-span-test location 0/7/CPU0
Segment 1                                  Segment 2                             State
------------------------------------ ------------------------------------ ------
pw-span-test(Monitor-Session) mpls    172.16.0.1                      UP


Example 4:
RP/0/RSP0/CPU0:router #show l2vpn forwarding detail location 0/7/CPU0
  Xconnect id: 0xc000001, Status: up
  Segment 1
    Monitor-Session, pw-span-test, status: Bound
  Segment 2
    MPLS, Destination address: 172.16.0.1, pw-id: 1, status: Bound
    Pseudowire label: 16001
    Statistics:
      packets: received 0, sent 11799730
      bytes: received 0, sent 707983800
```

```
Example 5:
show l2vpn forwarding private location 0/11/CPU0
  Xconnect ID 0xc000001
  Xconnect info:
   Base info: version=0xaabbcc13, flags=0x0, type=2, reserved=0
    xcon_bound=TRUE, switching_type=0, data_type=3

  AC info:
   Base info: version=0xaabbcc11, flags=0x0, type=3, reserved=0
    xcon_id=0xc000001, ifh= none, subifh= none, ac_id=0, ac_type=SPAN,
    ac_mtu=1500, iw_mode=none, adj_valid=FALSE, adj_addr none


  PW info:
   Base info: version=0xaabbcc12, flags=0x0, type=4, reserved=0
    pw_id=1, nh_valid=TRUE, sig_cap_flags=0x20, context=0x0,
     MPLS, pw_label=16001
    Statistics:
      packets: received 0, sent 11799730
      bytes: received 0, sent 707983800

   Object: NHOP
   Event Trace History [Total events: 5]
------------------------------------------------------------------
     Time                Event               Flags
     ====                =====               =====


------------------------------------------------------------------


  Nexthop info:
   Base info: version=0xaabbcc14, flags=0x10000, type=5, reserved=0
    nh_addr=172.16.0.1, plat_data_valid=TRUE, plat_data_len=128, child_count=1

   Object: XCON
   Event Trace History [Total events: 16]
------------------------------------------------------------------
     Time                Event               Flags
     ====                =====               =====

 ------------------------------------------------------------------
RP/0/RSP0/CPU0:router #show l2vpn forwarding summary location 0/7/CPU0
 Major version num:1, minor version num:0
Shared memory timestamp:0x31333944cf
Number of forwarding xconnect entries:2
  Up:2  Down:0
  AC-PW:1 (1 mpls)  AC-AC:0  AC-BP:0  AC-Unknown:0
  PW-BP:0  PW-Unknown:0 Monitor-Session-PW:1
Number of xconnects down due to:
  AIB:0  L2VPN:0  L3FIB:0
Number of p2p xconnects: 2
Number of bridge-port xconnects: 0
Number of nexthops:1
  MPLS:   Bound:1  Unbound:0  Pending Registration:0
Number of bridge-domains: 0
Number of static macs: 0
Number of locally learned macs: 0
Number of remotely learned macs: 0
Number of total macs: 0
```

The following sample output is from the **show l2vpn forwarding** command:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding location 0/2/cpu0
```

```
ID   Segment 1         Segment 2
-----------------------------------
1    Gi0/2/0/0 1       10.0.0.1   9)
```

The following sample output shows the MAC information in the layer2_fib manager summary:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding summary location 0/3/CPU0

Major version num:1, minor version num:0
Shared memory timestamp:0x66ff58e894
Number of forwarding xconnect entries:2
  Up:1  Down:0
  AC-PW:0  AC-AC:0  AC-BP:1 PW-BP:1
Number of xconnects down due to:
  AIB:0  L2VPN:0  L3FIB:0
Number of nexthops:1
Number of static macs: 5
Number of locally learned macs: 5
Number of remotely learned macs: 0
Number of total macs: 10
```

Related Commands

Command	Description
clear l2vpn forwarding counters, on page 16	Clears L2VPN forwarding counters.

show l2vpn forwarding message counters

To display L2VPN forwarding messages exchanged with L2FIB Collaborators, use the **show l2vpn forwarding message counters** command in EXEC mode.

show l2vpn forwarding message counters {**hardware** | **location** *node-id*}

Syntax Description

hardware	Displays message counter information from hardware.
location *node-id*	Displays message counter information for the specified location.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Even when xSTP (extended spanning tree protocol) operates in the PVRST mode, the output of the show or debug commands flag prefix is displayed as MSTP or MSTi, instead of PVRST.

Task ID

Task ID	Operation
l2vpn	read

The following examples shows the output from the **show l2vpn forwarding message counters location** command:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding message counters location 0/1/CPU0
Messages exchanged with L2FIB Collaborators:
-------------------------------------------------------------------------------------
     Message                                                Count       Info1        Info2
    Time
     =======                                                =====       =====        =====
    ====
     l2vpn provision messages received:                      0          0x0          0x0
    -
     l2vpn unprovision messages received:                    0          0x0          0x0
    -
     l2vpn bridge provision messages received:               2          0x1          0x0
    Jan  8 14:49:19.283
     l2vpn bridge unprovision messages received:             0          0x0          0x0
    -
     l2vpn bridge main port update messages received:        1          0x2000300    0x0
    Jan  8 12:02:15.628
     l2vpn bridge main port update w/ action=MSTI_DELETE 0          0x0          0x0
```

```
-
 l2vpn bridge main port update ACK sent:             1           0x2000300     0x0
Jan  8 12:02:15.628
 l2vpn bridge port provision messages received:      1           0x2000002     0x0
Jan  8 12:02:15.629
 l2vpn bridge port unprovision messages received:    0           0x0           0x0
-
 l2vpn shg provision messages received:              0           0x0           0x0
-
 l2vpn shg unprovision messages received:            0           0x0           0x0
-
 l2vpn static mac provision messages received:       1           0x0           0x0
Jan  9 08:41:36.668
 l2vpn static mac unprovision messages received:     1           0x0           0x0
Jan  9 08:44:24.208
 l2vpn dynamic mac local learning messages received: 0           0x0           0x0
-
 l2vpn dynamic mac remote learning messages received 0           0x0           0x0
-
 l2vpn dynamic mac refresh messages received:        0           0x0           0x0
-
 l2vpn dynamic mac unprovision messages received:    0           0x0           0x0
-
 AIB update messages received:                       4           0x2000102     0x2000300
Jan  8 12:02:15.622
 AIB delete messages received:                       0           0x0           0x0
-
 FIB nhop registration messages sent:                0           0x0           0x0
-
 FIB nhop unregistration messages sent:              0           0x0           0x0
-
 FIB ecd ldi update messages received:               0           0x0           0x0
-
 FIB invalid NHOP prov messages received:            0           0x0           0x0
-
 Backbone-source-mac prov messages received:         0           0x0           0x0
-
 Backbone-source-mac unprov messages received:       0           0x0           0x0
-
```

Related Commands

Command	Description
clear l2vpn forwarding message counters, on page 18	Clears L2VPN forwarding message counters.

show l2vpn generic-interface-list

To display all the L2VPN virtual interfaces, use the **show l2vpn generic-interface-list** command in EXEC mode.

show l2vpn generic-interface-list {**detail** | **name** | **private** | **summary**}

Syntax Description

detail	Specifies the details of the interface.
name	Specifies the name of the interface.
private	Specifies the private details of the interface.
summary	Specifies the summary information of the interface.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read

Examples

This example shows the sample output of the **show l2vpn generic-interface-list** command:

```
RP/0/RSP0/CPU0:router# show l2vpn generic-interface-list
generic-interface-list: l1 (ID: 2, interfaces: 2)  Number of items: 20
generic-interface-list: l2 (ID: 3, interfaces: 4)  Number of items: 15
```

This example shows the sample output of the **show l2vpn generic-interface-list detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn generic-interface-list detail
generic-interface-list: l1 (ID: 2, interfaces: 2)
   GigabitEthernet0/1/0/0 - items pending 2
   GigabitEthernet0/1/0/1 - items pending 4
   Number of items: 27
    PW-Ether: 1-10, 12-21
    PW-IW: 1-7

generic-interface-list: l2 (ID: 3, interfaces: 4)
```

```
   GigabitEthernet0/1/0/0 - items pending 2
   GigabitEthernet0/1/0/1 - items pending 4
   GigabitEthernet0/1/0/2 - items pending 1
   GigabitEthernet0/1/0/3 - items pending 0
   Number of items: 20
    PW-Ether: 1-15
    PW-IW: 1-7
```

This example shows the sample output of the **show l2vpn generic-interface-list name | detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn generic-interface-list name l1 detail
generic-interface-list: l1 (ID: 2, interfaces: 2)
   GigabitEthernet0/1/0/0 - items pending 2
   GigabitEthernet0/1/0/1 - items pending 4
   Number of items: 20
    PW-Ether 1-10, 12-21
```

show l2vpn index

To display statistics about the index manager, use the **show l2vpn index** command in EXEC mode.

show l2vpn index private

Syntax Description

private	(Optional) Detailed information about all indexes allocated for each pool.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read

Examples

This example shows the sample output of the **show l2vpn index** command:

```
RP/0/RSP0/CPU0:router# show l2vpn index
   Pool id: 0x4, App: RD
   Pool size: 32767
   zombied IDs: 0
   allocated IDs: 0

   Pool id: 0x5, App: IFLIST
   Pool size: 65535
   zombied IDs: 0
   allocated IDs: 2

   Pool id: 0xff000001, App: PW/PBB/Virtual AC
   Pool size: 40960
   zombied IDs: 0
   allocated IDs: 1

   Pool id: 0xff000002, App: BD
   Pool size: 4095
   zombied IDs: 0
   allocated IDs: 2
```

```
Pool id: 0xff000003, App: MP2MP
Pool size: 65535
zombied IDs: 0
allocated IDs: 1
```

show l2vpn nsr

To display the status of l2vpn non-stop routing, use the **show l2vpn nsr** command in EXEC mode.

show l2vpn nsr [**location** | **standby**]

Syntax Description

location	(Optional) Displays non-stop routing information for the specified location.
standby	(Optional) Displays Standby node specific information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

The following example displays output for the **show l2vpn nsr** command:

```
RP/0/RSP0/CPU0:router# show l2vpn nsr

Mon May 30 19:32:01.045 UTC
L2VPN NSR information
  NSR Status:
    NSR Ready               : Fri May 27 10:50:59 UTC 2016 (3d08h ago)
    Last NSR Withdraw Time  : Fri May 27 10:50:59 UTC 2016 (3d08h ago)
    Standby Connected       : Fri May 27 10:50:59 UTC 2016 (3d08h ago)
    IDT Done                : Fri May 27 10:50:59 UTC 2016 (3d08h ago)
    Number of XIDs sent     : Virtual AC: 0
                              AC        : 1
                              PW        : 1
                              BD        : 0
                              MP2MP     : 0
                              RD        : 0
                              PBB       : 0
                              IFLIST    : 0
                              ATOM      : 1
                              Global    : 0
                              PWGroup   : 0
```

```
EVPN        : 0
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
#unique_122	

show l2vpn process fsm

To display the status of the l2vpn process finite state machine, use the **show l2vpn process fsm** command in EXEC mode. It displays the current process role and state, NSR status, ISSU status, role change status, and status of collaborators.

show l2vpn process fsm [**location** | **standby**]

Syntax Description

location	(Optional) Displays non-stop routing information for the specified location.
standby	(Optional) Displays Standby node specific information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.1.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

The following example displays output for the **show l2vpn process fsm** command:

```
RP/0/RSP0/CPU0:router# show l2vpn process fsm

Mon May 16 10:20:30.967 PDT
L2VPN Process FSM
  Current process role      : Primary Active (Master)
  Current process state     : Run
  S/w install in progress   : No
  NSR Status:
    NSR Ready               : No
    Last NSR Withdraw Time  : Mon May 16 10:19:58 PDT 2016 (00:00:33 ago)
    Standby Connected       : No
    IDT Done                : Never
    Number of XIDs sent     : Virtual AC: 0
                              AC        : 1
                              PW        : 1
                              BD        : 0
                              MP2MP     : 0
                              RD        : 0
                              PBB       : 0
                              IFLIST    : 0
```

```
                              ATOM      : 1
                              Global    : 0
                              PWGroup   : 0
                              EVPN      : 0
  Process Role Change Status:
    Role Change Triggered   : No Role Change
    Role Change Start       : No
    Role Change End         : No
  Process State Transition Time:
    Process-Start           : Mon May 16 10:19:29 PDT 2016 (00:01:02 ago)
    Process-Init            : Mon May 16 10:19:30 PDT 2016 (00:01:01 ago)
    Role-based Init         : Mon May 16 10:19:31 PDT 2016 (00:01:00 ago)
    Wait-Collab-Conn        : Mon May 16 10:19:31 PDT 2016 (00:01:00 ago)
    Run                     : Mon May 16 10:19:58 PDT 2016 (00:00:33 ago)
  Process Collaborator Report Card:
    Collaborator        Connection Status (Since)                              IDT Done
(At)
-------------------------------------------------------------------------------------------

    NSR-INFRA           Up   (Mon May 16 10:19:30 PDT 2016 (00:01:01 ago))      N/A
    NSR-PEER            Down (Never came Up)                                    No
    ISSU-PEER           Down (Never came Up)                                    No
    SYSDB-CONFIG        Up   (Mon May 16 10:19:30 PDT 2016 (00:01:01 ago))      Mon May 16
 10:19:58 PDT 2016 (00:00:33 ago)
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.
#unique_122	
show l2vpn index, on page 115	Displays statistics about the index manager.

show l2vpn provision queue

To display L2VPN configuration provisioning queue information, use the **show l2vpn provision queue** command in EXEC mode.

show l2vpn provision queue [**location** | **standby**]

Syntax Description

location	(Optional) Displays L2VPN configuration provisioning queue information for the specified location.
standby	(Optional) Displays Standby node specific information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

The following example displays output for the **show l2vpn provision queue** command:

```
RP/0/RSP0/CPU0:router# show l2vpn provision queue

    Legend: P/P/R = Priority/Provisioned/Require Provisioning.
    Configuration Item         Object Type             Class                  P/P/R Object
 Key
    -------------------------- ----------------------- ---------------------- -----
----------
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS01
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS02
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS03
```

The following example displays output for the **show l2vpn provision queue standby** command:

```
RP/0/RSP0/CPU0:router# show l2vpn provision queue standby
    Legend: P/P/R = Priority/Provisioned/Require Provisioning.
    Configuration Item         Object Type             Class                  P/P/R Object
 Key
```

```
    -------------------------- ------------------------ ---------------------- -----
----------
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS01
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS02
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS03
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS04
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS05
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS06
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS07
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS08
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS09
    BD_NAME                    bd_t                     vpls_bd_class          0/0/0 BD
VPLS010
```

Related Commands

Command	Description
l2vpn, on page 42	Enters L2VPN configuration mode.

show l2vpn pw-class

To display L2VPN pseudowire class information, use the **show l2vpn pw-class** command in EXEC mode.

show l2vpn pw-class [**detail** | **name** *class name*]

Syntax Description

detail	(Optional) Displays detailed information.
name *class-name*	(Optional) Displays information about a specific pseudowire class name.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows sample output for the **show l2vpn pw-class** command:

```
RP/0/RSP0/CPU0:router# show l2vpn pw-class

Name                        Encapsulation     Protocol
--------------------------  ----------        ----------
mplsclass_75                MPLS              LDP
l2tp-dynamic                L2TPv3            L2TPv3
```

This table describes the significant fields shown in the display.

Table 4: show l2vpn pw-class Command Field Descriptions

Field	Description
Name	Displays the name of the pseudowire class.
Encapsulation	Displays the encapsulation type.

Field	Description
Protocol	Displays the protocol type.

Related Commands

Command	Description
clear l2vpn forwarding counters, on page 16	Clears L2VPN forwarding counters.

show l2vpn pwhe

To display the pseudowire headend (PWHE) information, use the **show l2vpn pwhe** command in EXEC mode.

show l2vpn pwhe {**detail** | **interface** | **summary**}

Syntax Description

detail	Specifies the details of the interface.
interface	Specifies the name of the interface.
summary	Specifies the summary information of the interface.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read

Examples

This example show the sample output for **show l2vpn pwhe detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn pwhe detail
Interface: PW-Ether1   Interface State: Down, Admin state: Up
  Interface handle 0x20000070
  MTU:  1514
  BW:   10000 Kbit
  Interface MAC addresses: 0279.96e9.8205
  Label: 16000
  L2-overhead: 0
  VC-type: 5
  CW: N
  Generic-interface-list: ifl1 (id: 1)
   Gi0/2/0/1, in bundle BE3, state: Up, replication: success
   Gi0/2/0/0, in bundle BE5, state: Up, replication: success
   Gi0/2/0/2, in bundle BE5, state: Up, replication: success
   Gi0/2/0/3, state: Up, replication: success

Interface: PW-IW1   Interface State: Up, Admin state: Up
  Interface handle 0x20000070
```

```
  MTU:  1514
  BW:   10000 Kbit
  VC-type: 11
  CW: N
  Generic-interface-list: ifl2 (id: 2)
   Gi0/3/0/1, in bundle BE6, state: Up, replication: success
   Gi0/3/0/0, in bundle BE6, state: Up, replication: success
   Gi0/3/0/2, state: Up, replication: success
   Gi0/3/0/3, state: Up, replication: success
```

This example show the sample output for **show l2vpn pwhe summary** command:

```
RP/0/RSP0/CPU0:router# show l2vpn pwhe summary
  Number of PW-HE interface: 1600
  Up: 1300 Down: 300 Admindown: 0
  Number of PW-Ether interfaces: 900
  Up: 700  Down: 200  Admindown: 0
  Number of PW-IW interfaces: 700
  Up: 600  Down: 100  Admindown: 0
```

show l2vpn resource

To display the memory state in the L2VPN process, use the **show l2vpn resource** command in EXEC mode.

show l2vpn resource

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows sample output for the **show l2vpn resource** command:

```
RP/0/RSP0/CPU0:router# show l2vpn resource

Memory: Normal
```

describes the significant fields shown in the display.Table 5: show l2vpn resource Command Field Descriptions, on page 127

Table 5: show l2vpn resource Command Field Descriptions

Field	Description
Memory	Displays memory status.

show l2vpn trace

To display trace data for L2VPN, use the **show l2vpn trace** command in EXEC mode.

show l2vpn trace [**checker** | **file** | **hexdump** | **last** | **location** | **reverse** | **stats** | **tailf** | **unique** | **usec** | **verbose** | **wide** | **wrapping**]

Syntax Description

checker	Displays trace data for the L2VPN Uberverifier.
file	Displays trace data for the specified file.
hexdump	Display traces data in hexadecimal format.
last	Display last <n> entries
location	Displays trace data for the specified location.
reverse	Display latest traces first
stats	Display trace statistics
tailf	Display new traces as they are added
unique	Display unique entries with counts
usec	Display usec details with timestamp
verbose	Display internal debugging information
wide	Display trace data excluding buffer name, node name, tid
wrapping	Display wrapping entries

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operation
l2vpn	read

This example displays output for the **show l2vpn trace** command:

```
RP/0/RSP0/CPU0:router# show l2vpn trace
    310 unique entries (1775 possible, 0 filtered)
    Jul 27 14:39:51.786 l2vpn/fwd-detail 0/RSP0/CPU0 2# t1  FWD_DETAIL:415: l2tp session
table rebuilt
    Jul 27 14:39:52.106 l2vpn/issu 0/RSP0/CPU0 1# t1  ISSU:788: ISSU - iMDR init called;
'infra/imdr' detected the 'informational' condition 'the service is not supported in the
node'
    Jul 27 14:39:52.107 l2vpn/issu 0/RSP0/CPU0 1# t1  ISSU:428: ISSU - attempt to start
COLLABORATOR wait timer while not in ISSU mode
    Jul 27 14:39:54.286 l2vpn/fwd-common 0/RSP0/CPU0 1# t1  FWD_COMMON:3257: show edm thread
 initialized
    Jul 27 14:39:55.270 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC|ERR:783: Mac aging init
    Jul 27 14:39:55.286 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:1765: l2vpn_gsp_cons_init
 returned No error
    Jul 27 14:39:55.340 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:1792: Client successfully
 joined gsp group
    Jul 27 14:39:55.340 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:779: Initializing the
txlist IPC thread
    Jul 27 14:39:55.341 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:2971: gsp_optimal_msg_size
 = 4832 (real: True)
    Jul 27 14:39:55.351 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:626: Entering mac aging
timer init
```

show l2vpn xconnect

To display brief information on configured cross-connects, use the **show l2vpn xconnect** command in EXEC mode.

show l2vpn xconnect [**brief** | **detail** | **encapsulation** | **group** | **groups** | **interface** | **mp2mp** | **mspw** | **neighbor** | **pw-class** | **pw-id** | **state** | **summary** | **type**]

Syntax Description

brief	(Optional) Displays encapsulation brief information.
detail	(Optional) Displays detailed information.
encapsulation	(Optional) Filters on encapsulation type.
group	(Optional) Displays all cross-connects in a specified group.
groups	(Optional) Displays all groups information.
interface	(Optional) Filters on interface and subinterface.
mp2mp	(Optional) Displays MP2MP information.
mspw	(Optional) Displays MSPW information.
neighbor	(Optional) Filters on neighbor.
pw-class	(Optional) Filters on pseudowire class
state	(Optional) Filters the following xconnect state types: • up • down • unresolved
summary	(Optional) Displays AC information from the AC Manager database.
type	(Optional) Filters the following xconnect types: • ac-pw • locally switched • monitor-session-pw • ms-pw

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

If a specific cross-connect is specified in the command (for instance, AC_to_PW1) then only that cross-connect will be displayed; otherwise, all cross-connects are displayed.

When configuring Ethernet Connectivity Fault Managment (CFM) over l2vpn cross-connect, the CFM Continuity Check Messages (CCM) packets are not accounted for in the cross-connect pseudowire packet counters displayed in this show command output.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows sample output for the **show l2vpn xconnect** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect
Wed May 21 09:06:47.944 UTC
Legend: ST = State, UP = Up, DN = Down, AD = Admin Down, UR = Unresolved,
        SB = Standby, SR = Standby Ready, (PP) = Partially Programmed

XConnect                    Segment 1                       Segment 2
Group      Name       ST    Description            ST       Description             ST
------------------------    ------------------------------   ----------------------------
L2TPV3_V4_XC_GRP
           L2TPV3_P2P_1
                      UP    Gi0/2/0/1.2            UP       26.26.26.26     100     UP
------------------------------------------------------------------------------------------
L2TPV3_V4_XC_GRP
           L2TPV3_P2P_2
                      UP    Gi0/2/0/1.3            UP       26.26.26.26     200     UP
------------------------------------------------------------------------------------------
```

The following sample output shows that the backup is in standby mode for the **show l2vpn xconnect detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect detail

Group siva_xc, XC siva_p2p, state is up; Interworking none
  Monitor-Session: pw-span-test, state is configured
  AC: GigabitEthernet0/4/0/1, state is up
    Type Ethernet
    MTU 1500; XC ID 0x5000001; interworking none; MSTi 0
    Statistics:
      packet totals: send 90
      byte totals: send 19056
  PW: neighbor 10.1.1.1, PW ID 1, state is up ( established )
    PW class not set, XC ID 0x5000001
    Encapsulation MPLS, protocol LDP
    PW type Ethernet, control word enabled, interworking none
    PW backup disable delay 0 sec
    Sequencing not set
        MPLS         Local                          Remote
      ------------ ------------------------------ ------------------------------
      Label        30005                          16003
```

```
    Group ID     0x5000300                      0x5000400
    Interface    GigabitEthernet0/4/0/1         GigabitEthernet0/4/0/2
     Interface   pw-span-test                 GigabitEthernet0/3/0/1
    MTU          1500                           1500
    Control word enabled                        enabled
    PW type      Ethernet                       Ethernet
    VCCV CV type 0x2                            0x2
                 (LSP ping verification)        (LSP ping verification)
    VCCV CC type 0x3                            0x3
                  (control word)                 (control word)
                 (router alert label)           (router alert label)
    ------------ ------------------------------ ------------------------------
  Create time: 20/11/2007 21:45:07 (00:49:18 ago)
  Last time status changed: 20/11/2007 21:45:11 (00:49:14 ago)
  Statistics:
    packet totals: receive 0
    byte totals: receive 0

Backup PW:
PW: neighbor 172.16.0.1, PW ID 2, state is up ( established )
  Backup for neighbor 10.0.0.1 PW ID 1 ( standby )
  PW class not set, XC ID 0x0
  Encapsulation MPLS, protocol LDP
  PW type Ethernet, control word enabled, interworking none
  PW backup disable delay 0 sec
  Sequencing not set
      MPLS         Local                          Remote
    ------------ ------------------------------ ------------------------------
    Label        30006                          16003
    Group ID     unassigned                     0x5000400
    Interface    unknown                        GigabitEthernet0/4/0/2
    MTU          1500                           1500
    Control word enabled                        enabled
    PW type      Ethernet                       Ethernet
    VCCV CV type 0x2                            0x2
                 (LSP ping verification)        (LSP ping verification)
    VCCV CC type 0x3                            0x3
                  (control word)                 (control word)
                 (router alert label)           (router alert label)
    ------------ ------------------------------ ------------------------------
  Backup PW for neighbor 10.1.1.1 PW ID 1
  Create time: 20/11/2007 21:45:45 (00:48:40 ago)
  Last time status changed: 20/11/2007 21:45:49 (00:48:36 ago)
  Statistics:
    packet totals: receive 0
    byte totals: receive 0
```

The following sample output shows that the backup is active for the **show l2vpn xconnect detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect detail

Group siva_xc, XC siva_p2p, state is down; Interworking none
  Monitor-Session: pw-span-test, state is configured
  AC: GigabitEthernet0/4/0/1, state is up
    Type Ethernet
    MTU 1500; XC ID 0x5000001; interworking none; MSTi 0
    Statistics:
      packet totals: send 98
      byte totals: send 20798
  PW: neighbor 10.1.1.1, PW ID 1, state is down ( local ready )
    PW class not set, XC ID 0x5000001
    Encapsulation MPLS, protocol LDP
    PW type Ethernet, control word enabled, interworking none
```

```
  PW backup disable delay 0 sec
  Sequencing not set
      MPLS         Local                          Remote
    ------------ ------------------------------ ------------------------------
    Label        30005                          unknown
    Group ID     0x5000300                      0x0
    Interface    GigabitEthernet0/4/0/1         unknown
     Interface     pw-span-test                      GigabitEthernet0/3/0/1
    MTU          1500                           unknown
    Control word enabled                        unknown
    PW type      Ethernet                       unknown
    VCCV CV type 0x2                            0x0
                                                (none)
                 (LSP ping verification)
    VCCV CC type 0x3                            0x0
                                                (none)
                  (control word)
                 (router alert label)
    ------------ ------------------------------ ------------------------------
  Create time: 20/11/2007 21:45:06 (00:53:31 ago)
  Last time status changed: 20/11/2007 22:38:14 (00:00:23 ago)
  Statistics:
    packet totals: receive 0
    byte totals: receive 0

Backup PW:
PW: neighbor 10.2.2.2, PW ID 2, state is up ( established )
  Backup for neighbor 10.1.1.1 PW ID 1 ( active )
  PW class not set, XC ID 0x0
  Encapsulation MPLS, protocol LDP
  PW type Ethernet, control word enabled, interworking none
  PW backup disable delay 0 sec
  Sequencing not set
      MPLS         Local                          Remote
    ------------ ------------------------------ ------------------------------
    Label        30006                          16003
    Group ID     unassigned                     0x5000400
    Interface    unknown                        GigabitEthernet0/4/0/2
    MTU          1500                           1500
    Control word enabled                        enabled
    PW type      Ethernet                       Ethernet
    VCCV CV type 0x2                            0x2
                 (LSP ping verification)        (LSP ping verification)
    VCCV CC type 0x3                            0x3
                  (control word)                 (control word)
                 (router alert label)           (router alert label)
    ------------ ------------------------------ ------------------------------
  Backup PW for neighbor 10.1.1.1 PW ID 1
  Create time: 20/11/2007 21:45:44 (00:52:54 ago)
  Last time status changed: 20/11/2007 21:45:48 (00:52:49 ago)
  Statistics:
    packet totals: receive 0
    byte totals: receive 0
```

The following sample output displays the xconnects with switch port analyzer (SPAN) as one of the segments:

```
Show l2vpn xconnect type minotor-session-pw
Legend: ST = State, UP = Up, DN = Down, AD = Admin Down, UR = Unresolved,
        LU = Local Up, RU = Remote Up, CO = Connected

XConnect                        Segment 1                   Segment 2
Group             Name       ST     Description           ST   Description            ST
```

```
------------------------------   --------------------------  -------------------------
g1                x1        UP    pw-span-test          UP   172.16.0.1         1      UP
-----------------------------------------------------------------------------------------
```

The following sample output shows that one-way redundancy is enabled:

```
Group g1, XC x2, state is up; Interworking none
  AC: GigabitEthernet0/2/0/0.2, state is up, active in RG-ID 1
    Type VLAN; Num Ranges: 1
    VLAN ranges: [2, 2]
    MTU 1500; XC ID 0x3000002; interworking none
    Statistics:
      packets: received 103, sent 103
      bytes: received 7348, sent 7348
      drops: illegal VLAN 0, illegal length 0
  PW: neighbor 101.101.101.101, PW ID 2000, state is up ( established )
    PW class class1, XC ID 0x3000002
    Encapsulation MPLS, protocol LDP
    PW type Ethernet VLAN, control word disabled, interworking none
PW backup disable delay 0 sec
One-way PW redundancy mode is enabled
    Sequencing not set
…..
    Incoming Status (PW Status TLV):
      Status code: 0x0 (Up) in Notification message
    Outgoing Status (PW Status TLV):
      Status code: 0x0 (Up) in Notification message
…..
  Backup PW:
  PW: neighbor 102.102.102.102, PW ID 3000, state is standby ( all ready )
    Backup for neighbor 101.101.101.101 PW ID 2000 ( inactive )
    PW class class1, XC ID 0x3000002
    Encapsulation MPLS, protocol LDP
    PW type Ethernet VLAN, control word disabled, interworking none
    Sequencing not set
…..
    Incoming Status (PW Status TLV):
      Status code: 0x26 (Standby, AC Down) in Notification message
    Outgoing Status (PW Status TLV):
      Status code: 0x0 (Up) in Notification message
```

The following example shows sample output for the **show l2vpn xconnect** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect

Legend: ST = State, UP = Up, DN = Down, AD = Admin Down, UR = Unresolved,
              LU = Local Up, RU = Remote Up, CO = Connected

XConnect                   Segment 1                   Segment 2
Group      Name       ST   Description            ST   Description            ST
------------------------   --------------------------   -----------------------
siva_xc    siva_p2p   UP   Gi0/4/0/1              UP   10.0.0.1         1     UP
                                                       Backup
                                                       172.16.0.1       2     UP
-----------------------------------------------------------------------------
```

The following sample output shows that the backup is in standby mode for the **show l2vpn xconnect detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect detail

Group siva_xc, XC siva_p2p, state is up; Interworking none
  AC: GigabitEthernet0/4/0/1, state is up
```

```
    Type Ethernet
    MTU 1500; XC ID 0x5000001; interworking none; MSTi 0
    Statistics:
      packet totals: received 90, sent 90
      byte totals: received 19056, sent 19056
  PW: neighbor 10.0.0.1, PW ID 1, state is up ( established )
    PW class not set, XC ID 0x5000001
    Encapsulation MPLS, protocol LDP
    PW type Ethernet, control word enabled, interworking none
    PW backup disable delay 0 sec
    Sequencing not set
        MPLS         Local                          Remote
      ------------ ------------------------------ ------------------------------
      Label        30005                          16003
      Group ID     0x5000300                      0x5000400
      Interface    GigabitEthernet0/4/0/1         GigabitEthernet0/4/0/2
      MTU          1500                           1500
      Control word enabled                        enabled
      PW type      Ethernet                       Ethernet
      VCCV CV type 0x2                            0x2
                   (LSP ping verification)        (LSP ping verification)
      VCCV CC type 0x3                            0x3
                    (control word)                 (control word)
                   (router alert label)           (router alert label)
      ------------ ------------------------------ ------------------------------
    Create time: 20/11/2007 21:45:07 (00:49:18 ago)
    Last time status changed: 20/11/2007 21:45:11 (00:49:14 ago)
    Statistics:
      packet totals: received 0, sent 0
      byte totals: received 0, sent 0

  Backup PW:
  PW: neighbor 172.16.0.1, PW ID 2, state is up ( established )
    Backup for neighbor 10.0.0.1 PW ID 1 ( standby )
    PW class not set, XC ID 0x0
    Encapsulation MPLS, protocol LDP
    PW type Ethernet, control word enabled, interworking none
    PW backup disable delay 0 sec
    Sequencing not set
        MPLS         Local                          Remote
      ------------ ------------------------------ ------------------------------
      Label        30006                          16003
      Group ID     unassigned                     0x5000400
      Interface    unknown                        GigabitEthernet0/4/0/2
      MTU          1500                           1500
      Control word enabled                        enabled
      PW type      Ethernet                       Ethernet
      VCCV CV type 0x2                            0x2
                   (LSP ping verification)        (LSP ping verification)
      VCCV CC type 0x3                            0x3
                    (control word)                 (control word)
                   (router alert label)           (router alert label)
      ------------ ------------------------------ ------------------------------
    Backup PW for neighbor 10.0.0.1 PW ID 1
    Create time: 20/11/2007 21:45:45 (00:48:40 ago)
    Last time status changed: 20/11/2007 21:45:49 (00:48:36 ago)
    Statistics:
      packet totals: received 0, sent 0
      byte totals: received 0, sent 0
```

The following sample output shows that the backup is active for the **show l2vpn xconnect detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect detail
```

```
Group siva_xc, XC siva_p2p, state is down; Interworking none
  AC: GigabitEthernet0/4/0/1, state is up
    Type Ethernet
    MTU 1500; XC ID 0x5000001; interworking none; MSTi 0
    Statistics:
      packet totals: send 98
      byte totals: send 20798
  PW: neighbor 10.0.0.1, PW ID 1, state is down ( local ready )
    PW class not set, XC ID 0x5000001
    Encapsulation MPLS, protocol LDP
    PW type Ethernet, control word enabled, interworking none
    PW backup disable delay 0 sec
    Sequencing not set
        MPLS         Local                          Remote
      ------------ ------------------------------ ------------------------------
      Label        30005                          unknown
      Group ID     0x5000300                      0x0
      Interface    GigabitEthernet0/4/0/1         unknown
      MTU          1500                           unknown
      Control word enabled                        unknown
      PW type      Ethernet                       unknown
      VCCV CV type 0x2                            0x0
                                                  (none)
                   (LSP ping verification)
      VCCV CC type 0x3                            0x0
                                                  (none)
                    (control word)
                   (router alert label)
      ------------ ------------------------------ ------------------------------
    Create time: 20/11/2007 21:45:06 (00:53:31 ago)
    Last time status changed: 20/11/2007 22:38:14 (00:00:23 ago)
    Statistics:
      packet totals: received 0, sent 0
      byte totals: received 0, sent 0

  Backup PW:
  PW: neighbor 172.16.0.1, PW ID 2, state is up ( established )
    Backup for neighbor 10.0.0.1 PW ID 1 ( active )
    PW class not set, XC ID 0x0
    Encapsulation MPLS, protocol LDP
    PW type Ethernet, control word enabled, interworking none
    PW backup disable delay 0 sec
    Sequencing not set
        MPLS         Local                          Remote
      ------------ ------------------------------ ------------------------------
      Label        30006                          16003
      Group ID     unassigned                     0x5000400
      Interface    unknown                        GigabitEthernet0/4/0/2
      MTU          1500                           1500
      Control word enabled                        enabled
      PW type      Ethernet                       Ethernet
      VCCV CV type 0x2                            0x2
                   (LSP ping verification)        (LSP ping verification)
      VCCV CC type 0x3                            0x3
                    (control word)                 (control word)
                   (router alert label)           (router alert label)
      ------------ ------------------------------ ------------------------------
    Backup PW for neighbor 10.0.0.1 PW ID 1
    Create time: 20/11/2007 21:45:44 (00:52:54 ago)
    Last time status changed: 20/11/2007 21:45:48 (00:52:49 ago)
    Statistics:
      packet totals: received 0, sent 0
```

```
      byte totals: received 0, sent 0
```

This example shows that the PW type changes to Ethernet, which is Virtual Circuit (VC) type 5, on the interface when a double tag rewrite option is used.

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect pw-class pw-class1 detail

Group VPWS, XC ac3, state is up; Interworking none
AC: GigabitEthernet0/7/0/5.3, state is up
Type VLAN; Num Ranges: 1
VLAN ranges: [12, 12]
MTU 1508; XC ID 0x2440096; interworking none
Statistics:
packets: received 26392092, sent 1336
bytes: received 1583525520, sent 297928
drops: illegal VLAN 0, illegal length 0
PW: neighbor 192.168.0.1, PW ID 3, state is up ( established )
PW class VPWS1, XC ID 0x2440096
Encapsulation MPLS, protocol LDP
PW type Ethernet, control word disabled, interworking none
PW backup disable delay 0 sec
Sequencing not set

Preferred path tunnel TE 3, fallback disabled
PW Status TLV in use
      MPLS         Local                          Remote
      ------------ ------------------------------ ------------------------------
      Label        16147                          21355
      Group ID     0x120001c0                     0x120001c0
      Interface    GigabitEthernet0/7/0/5.3       GigabitEthernet0/7/0/5.3
      MTU          1508                           1508
      Control word disabled                       disabled
      PW type      Ethernet                       Ethernet
      VCCV CV type 0x2                            0x2
                   (LSP ping verification)        (LSP ping verification)
      VCCV CC type 0x6                            0x6
                   (router alert label)           (router alert label)
                   (TTL expiry)                   (TTL expiry)
      ------------ ------------------------------ ------------------------------
Incoming Status (PW Status TLV):
Status code: 0x0 (Up) in Notification message
Outgoing Status (PW Status TLV):
Status code: 0x0 (Up) in Notification message
MIB cpwVcIndex: 4294705365
Create time: 21/09/2011 08:05:01 (00:14:01 ago)
Last time status changed: 21/09/2011 08:07:01 (00:12:01 ago)
Statistics:
packets: received 1336, sent 26392092
bytes: received 297928, sent 1583525520
```

This table describes the significant fields shown in the display.

Table 6: show l2vpn xconnect Command Field Descriptions

Field	Description
XConnect Group	Displays a list of all configured cross-connect groups.
Group	Displays the cross-connect group number.

Field	Description
Name	Displays the cross-connect group name.
Description	Displays the cross-connect group description. If no description is configured, the interface type is displayed.
ST	State of the cross-connect group: up (UP) or down (DN).

Related Commands

Command	Description
xconnect group, on page 156	Configures cross-connect groups.

show tech-support l2vpn platform no-statistics

To automatically run show commands that display information specific to Layer 2 Virtual Private Network (L2VPN) platform without debugging statistics, use the **show tech-support l2vpn platform no-statistics** command in the EXEC mode.

show tech-support l2vpn platform no-statistics [**file** | **list-CLIs** | **location** | **rack**]

Syntax Description

file	Specifies that the command output is saved to a specified file.
list-CLIs	Specifies the list of CLIs but not executed.
location	Specifies a location.
rack	Specifies a rack.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 6.3.2	This command was introduced.

Usage Guidelines

This command collects information for Layer 2 VPN platform related issues that is useful for Cisco Technical Support representatives when troubleshooting a router.

Note The **show tech-support l2vpn platform** command does not collect all bridge domains information when there is large scale values associated with bridge domains. Hence, use the **show tech-support l2vpn platform no-statistics** command.

Task ID

Task ID	Operation
l2vpn	read

Example

The following example shows the output of **show tech-support l2vpn platfrom no-statistics** command.

```
RP/0/RSP0/CPU0:router#show tech-support l2vpn platfrom no-statistics

Tue Jan  8 02:40:56.007 UTC
++ Show tech start time: 2019-Jan-08.024056.UTC ++
Tue Jan 08 02:40:56 UTC 2019 Waiting for gathering to complete
...........................
```

```
Tue Jan 08 02:43:03 UTC 2019 Compressing show tech output
Show tech output available at 0/RSP1/CPU0 :
/net/node0_RSP1_CPU0/harddisk:/showtech/showtech-RR-l2vpn_platform-2019-Jan-08.024056.UTC.tgz
++ Show tech end time: 2019-Jan-08.024303.UTC ++
```

source (p2p)

To configure source IPv6 address of the pseudowire, use the **source** command in p2p pseudowire configuration mode. To disable the source IPv6 address configuration, use the **no** form of this command.

source *ipv6_address*
no source *ipv6_address*

Syntax Description

ipv6_address	Source IPv6 address of pseudowire

Command Default

None

Command Modes

p2p pseudowire configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to set a source IPv6 address to a point-to-point IPv6 cross-connect:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group g1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p xc3
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# interface GigabitEthernet0/0/0/4.2
```

```
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor ipv6 1111:2222::cdef pw-id 1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# source 1111:2222::abcd
```

Related Commands

Command	Description
p2p, on page 72	Enters p2p configuration submode to configure point-to-point cross-connects.
neighbor (L2VPN), on page 53	Configures a pseudowire for a cross-connect.

storm-control

Storm control on ASR 9000 Series Routers can be applied at the following service attachment points:

- Bridge domain (BD)
- Attachment Circuit (AC)
- Access pseudowire (PW)

To enable storm control on all access circuits (AC) and access pseudowires (PW) in a VPLS bridge, use the **storm-control** command in l2vpn bridge group bridge-domain configuration mode. To disable storm control, use the **no** form of this command.

To enable storm control on an access circuit (AC) under a VPLS bridge, use the **storm-control** command in l2vpn bridge group bridge-domain access circuit configuration mode. To disable storm control, use the **no** form of this command.

To enable storm control on an access pseudowire (PW) in a VPLS bridge, use the **storm-control** command in l2vpn bridge group bridge-domain neighbor configuration mode. To disable storm control, use the **no** form of this command.

storm-control {**broadcast** | **multicast** | **unknown-unicast**} {**pps** *pps-value* | **kbps** *kbps-value*}
no storm-control {**broadcast** | **multicast** | **unknown-unicast**} {**pps** *pps-value* | **kbps** *kbps-value*}

Syntax Description

broadcast	Configures storm control for broadcast traffic.
multicast	Configures storm control for multicast traffic.
unknown-unicast	Configures storm control for unknown unicast traffic. • Storm control does not apply to bridge protocol data unit (BPDU) packets. All BPDU packets are processed as if traffic storm control is not configured. • Storm control does not apply to internal communication and control packets, route updates, SNMP management traffic, Telnet sessions, or any other packets addressed to the router.
pps *pps-value*	Configures the packets-per-second (pps) storm control threshold for the specified traffic type. Valid values range from 1 to 160000.
kbps *kbps-value*	Configures the storm control in kilo bits per second (kbps). The range is from 64 to 1280000.

Command Default

Storm control is disabled by default.

Command Modes

l2vpn bridge group bridge-domain access circuit configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

- Bridge Protocol Data Unit (BPDU) packets are not filtered through the storm control feature.
- The traffic storm control monitoring interval is set in the hardware and is not configurable. On Cisco ASR 9000 Series Router, the monitoring interval is always one second.
- When there is a mix of kbps and pps storm control on bridge or bridge port, the pps value is translated to kbps inside the policer using 1000 bytes per packet as an average.
- The hardware can only be programmed with a granularity of 8 pps, so values are not divisible by eight. These are rounded to the nearest increment of eight.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example enables storm control thresholds throughout the bridge domain:

```
RP/0/RSP0/CPU0:a9k1# configure
RP/0/RSP0/CPU0:a9k1(config)# l2vpn
RP/0/RSP0/CPU0:a9k1(config-l2vpn)# bridge group BG1
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg)# bridge-domain BD1
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd)# storm-control unknown-unicast pps 100
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd)# storm-control multicast pps 100
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd)# storm-control broadcast pps 100
```

The following example enables storm control thresholds on an access circuit:

```
RP/0/RSP0/CPU0:a9k1# configure
RP/0/RSP0/CPU0:a9k1(config)# l2vpn
RP/0/RSP0/CPU0:a9k1(config-l2vpn)# bridge group BG1
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd)# bridge-domain BD2
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd)# interface Bundle-Ether9001.2001
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd-ac)# storm-control unknown-unicast pps 100
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd-ac)# storm-control multicast pps 100
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd-ac)# storm-control broadcast pps 100
```

The following example enables storm control thresholds on an access pseudowire:

```
RP/0/RSP0/CPU0:a9k1# configure
RP/0/RSP0/CPU0:a9k1(config)# l2vpn
RP/0/RSP0/CPU0:a9k1(config-l2vpn)# bridge group BG1
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd)# bridge-domain BD2
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd-ac)# neighbor 10.1.1.1 pw-id 20011001
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd-pw)# storm-control unknown-unicast pps 100
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd-pw)# storm-control multicast pps 100
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd-pw)# storm-control broadcast pps 100
RP/0/RSP0/CPU0:a9k1(config-l2vpn-bg-bd-pw)# commit
```

Running Configuration

```
l2vpn
 bridge group BG1
  bridge-domain BD1
   storm-control unknown-unicast pps 100
```

```
   storm-control multicast pps 100
   storm-control broadcast pps 100
  !
  bridge-domain BD2
   interface Bundle-Ether9001.2001
    storm-control unknown-unicast pps 100
    storm-control multicast pps 100
    storm-control broadcast pps 100
   !
   neighbor 10.1.1.1 pw-id 20011001
    storm-control unknown-unicast pps 100
    storm-control multicast pps 100
    storm-control broadcast pps 100
   !
  !
 !
!
end
RP/0/RSP0/CPU0:a9k1(config)#
```

switching-tlv (L2VPN)

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

switching tlv hide
no switching tlv

Syntax Description

hide	Hides TLV.

Command Default

Switching point TLV data is advertised to peers.

Command Modes

L2VPN pseudowire class encapsulation mode

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

The pseudowire switching point TLV information includes the following information:

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

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure a timeout value for L2TP session setup of 400 seconds:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class cisco
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
```

```
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)# switching-tlv hide
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-mpls)#
```

Related Commands

Command	Description
pw-class (L2VPN), on page 63	Enters pseudowire class submode to define a pseudowire class template.

tag-impose

To specify a tag for a VLAN ID configuration, use the **tag-impose** command in l2vpn configuration submode. To remove the tag, use the **no** form of this command.

tag-impose vlan *value*
no tag-impose vlan *value*

Syntax Description

vlan	VLAN in tagged mode.
value	Tag value. The range is from 1 to 4094. The default value is 0.

Command Default

None

Command Modes

L2VPN configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to specify a tag for a VLAN:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group xc1
RP/0/RSP0/CPU0:router(config-l2vpn-xc)#p2p grp1
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)#neighbor 10.1.1.2 pw-id 78
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)#tag-impose vlan 8
```

Related Commands

Command	Description
pw-class (L2VPN), on page 63	Enters pseudowire class submode to define a pseudowire class template.

tos (l2vpn)

To configure Type of Service (TOS) reflection or to set TOS value, use the **tos** command in L2VPN pseudowire class encapsulation L2TPv3 configuration mode. To reset the TOS value, use the **no** form of this command.

tos {**reflect** [**value** *tos value*] | **value** *tos value* [**reflect**]}
no tos {**reflect** [**value** *tos value*] | **value** *tos value* [**reflect**]}

Syntax Description

reflect	Enables TOS reflection.
value	Sets the TOS value for L2TPv3 pseudowire class.
tos value	Value of the TOS.

Command Default

By default, the TOS is copied over, from the class of service (COS) fields of the VLAN header. If the underlying packet is not an IPv4 or IPv6 packet, the COS fields are copied from the VLAN header, even if TOS reflection is configured.

Command Modes

L2VPN pseudowire class encapsulation L2TPv3 configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to configure TOS reflection:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation l2tpv3
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# protocol l2tpv3
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# tos reflect
```

The following example shows how to set a TOS value:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation l2tpv3
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# protocol l2tpv3
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# tos value 64
```

transport mode (L2VPN)

To configure L2VPN pseudowire class transport mode, use the **transport mode** command in L2VPN pseudowire class MPLS encapsulation mode. To disable the L@VPN pseudowire class transport mode configuration, use the **no** form of this command.

transport mode {**ethernet** | **vlan** *passthrough* }
no transport mode {**ethernet** | **vlan** *passthrough* }

Syntax Description

ethernet	Configures Ethernet port mode.
vlan	Configures VLAN tagged mode.
passthrough	Enables the pseudowires to pass through the incoming tags.

Command Default

None

Command Modes

L2VPN pseudowire class MPLS encapsulation

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 4.1.0	The variable **passthrough** was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to configure Ethernet transport mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pw)# encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn-encap-mpls)# transport-mode ethernet
```

The following example shows how to configure pseudowires in a VLAN tagged mode with the passthrough variable:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class pwc1
RP/0/RSP0/CPU0:router(config-l2vpn-pw)# encapsulation mpls
RP/0/RSP0/CPU0:router(config-l2vpn-encap-mpls)# transport-mode vlan passthrough
```

Related Commands

Command	Description
pw-class (L2VPN), on page 63	Enters pseudowire class submode to define a pseudowire class template.

transport mode vlan passthrough

To configure L2VPN bridge domain transport mode, use the **transport mode vlan passthrough** command in L2VPN bridge domain configuration mode. To disable the L2VPN bridge domain transport mode configuration, use the **no** form of this command.

transport mode vlan passthrough
no transport mode vlan passthrough

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

L2VPN bridge domain configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

This example shows how to configure transport mode vlan passthrough:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group bg1
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain bd1
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# transport mode vlan passthrough
```

Related Commands

Command	Description
bridge-domain (VPLS)	Establishes a bridge domain, and enters L2VPN bridge group bridge domain configuration mode.

ttl (l2vpn)

To configure Time to Live (TTL) for Pseudowire class, use the **ttl** command in L2VPN pseudowire class encapsulation L2TPv3 configuration mode. To disable the TTL configuration, use the **no** form of this command.

ttl *ttl _value*
no ttl *ttl_value*

Syntax Description

ttl_value	The TTL Value. Range is from 1 to 255.

Command Default

None

Command Modes

L2VPN pseudowire class encapsulation L2TPv3 configuration

Command History

Release	Modification
Release 4.3.1	This command was introduced

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note All L2VPN configurations can be deleted using the **no l2vpn** command.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to configure TTL:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation l2tpv3
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# protocol l2tpv3
RP/0/RSP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# ttl 40
```

vpws-seamless-integration

To enable EVPN-VPWS seamless integration, use the **vpws-seamless-integration** command in L2VPN configuration mode. To disable EVPN-VPWS seamless integration, use the **no** form of this command.

vpws-seamless-integration

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

L2VPN configuration mode

Command History

Release	Modification
Release 7.4.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
L2VPN	read, write

Examples

The following example shows how to enable EVPN-VPWS integration on an edge device for BGP PW.

```
Router# configure
Router(config)# l2vpn xconnect group 1
Router(config-l2vpn-xc)# mp2mp 2
Router(config-l2vpn-xc-mp2mp)# autodiscovery bgp
Router(config-l2vpn-xc-mp2mp-ad)# signaling-protocol bgp
Router(config-l2vpn-xc-mp2mp-ad-sig)# ce-id 3
Router(config-l2vpn-xc-mp2mp-ad-sig-ce)# vpws-seamless-integration
Router(config-l2vpn-xc-mp2mp-ad-sig-ce)#
```

The following example shows how to enable EVPN-VPWS integration for TLDP PW.

```
Router# configure
Router(config)# l2vpn xconnect group 1
Router(config-l2vpn-xc)# p2p p1
Router(config-l2vpn-xc-p2p)# interface BE1.1
Router(config-l2vpn-xc-p2p)# neighbor 1.1.1.1 pw-id 1
Router(config-l2vpn-xc-p2p)# vpws-seamless-integration
```

xconnect group

To configure cross-connect groups, use the **xconnect group** command in L2VPN configuration mode. To return to the default behavior, use the **no** form of this command.

xconnect group *group-name*
no xconnect group *group-name*

Syntax Description

group-name	Configures a cross-connect group name using a free-format 32-character string.

Command Default

None

Command Modes

L2VPN configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Note You can configure up to a maximum of 16K cross-connects per box.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to group all cross -connects for customer_atlantic:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group customer_atlantic
```

Related Commands

Command	Description
show l2vpn xconnect, on page 130	Displays brief information on configured cross-connects.