



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 .

- [address-family l2vpn mspw](#), on page 4
- [bgp](#), on page 5
- [backup \(L2VPN\)](#), on page 6
- [backup disable \(L2VPN\)](#), on page 8
- [clear l2vpn collaborators](#), on page 10
- [clear l2vpn counters bridge mac-withdrawal](#), on page 11
- [clear l2vpn forwarding counters](#), on page 12
- [clear l2vpn forwarding counters bridge-domain mirp-lite](#), on page 13
- [clear l2vpn forwarding message counters](#), on page 14
- [clear l2vpn forwarding table](#), on page 15
- [control-word](#), on page 16
- [dynamic-arp-inspection](#), on page 17
- [flood mode](#), on page 19
- [generic-interface-list](#), on page 21
- [global-id \(L2VPN\)](#), on page 22
- [interface \(p2p\)](#), on page 23
- [interworking ipv4](#), on page 25
- [ipv4 source](#), on page 26
- [l2tp static](#), on page 27
- [ip-source-guard](#), on page 30
- [l2transport](#), on page 32
- [l2transport l2protocol](#), on page 34
- [l2transport propagate](#), on page 36
- [l2transport service-policy](#), on page 37
- [l2vpn](#), on page 38
- [load-balancing flow](#), on page 39
- [load-balancing flow-label](#), on page 40
- [load-balancing pw-label](#), on page 42
- [logging \(l2vpn\)](#), on page 43

- [logging nsr](#), on page 44
- [monitor-session \(l2vpn\)](#), on page 45
- [mpls static label \(L2VPN\)](#), on page 47
- [neighbor \(L2VPN\)](#), on page 49
- [neighbor evpn](#), on page 52
- [neighbor routed](#), on page 53
- [nsr \(L2VPN\)](#), on page 54
- [pw-routing](#), on page 55
- [protocol l2tpv3](#), on page 56
- [pw-class \(L2VPN\)](#), on page 58
- [pw-class encapsulation l2tpv3](#), on page 59
- [pw-class encapsulation mpls](#), on page 61
- [pw-ether](#), on page 63
- [pw-grouping](#), on page 65
- [p2p](#), on page 66
- [rd \(L2VPN\)](#), on page 67
- [sequencing \(L2VPN\)](#), on page 69
- [show bgp l2vpn evpn](#), on page 71
- [show bgp l2vpn mspw](#), on page 73
- [show bgp vrf-db](#), on page 74
- [show evpn evi ead](#), on page 75
- [show evpn internal-label](#), on page 77
- [show dci-fabric-interconnect](#), on page 78
- [show generic-interface-list](#) , on page 81
- [show l2tp session](#), on page 83
- [show l2tp tunnel](#), on page 85
- [show l2vpn](#), on page 87
- [show l2vpn atom-db](#), on page 89
- [show l2vpn collaborators](#), on page 92
- [show l2vpn database](#), on page 94
- [show l2vpn discovery](#), on page 97
- [show l2vpn forwarding](#), on page 99
- [show l2vpn forwarding message counters](#), on page 114
- [show l2vpn generic-interface-list](#), on page 116
- [show l2vpn index](#), on page 118
- [show l2vpn nsr](#) , on page 120
- [show l2vpn process fsm](#), on page 122
- [show l2vpn provision queue](#), on page 124
- [show l2vpn pw-class](#), on page 126
- [show l2vpn pwhe](#), on page 128
- [show l2vpn resource](#), on page 130
- [show l2vpn trace](#), on page 131
- [show l2vpn xconnect](#), on page 133
- [source \(p2p\)](#), on page 146
- [storm-control](#) , on page 148
- [tag-impose](#), on page 151

- [tos \(l2vpn\)](#), on page 152
- [transport mode \(L2VPN\)](#), on page 154
- [transport mode vlan passthrough](#), on page 156
- [ttl \(l2vpn\)](#), on page 157
- [xconnect group](#), on page 159

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	Parameter	Description
	neighbor <i>IP-address</i>	Specifies the peer to cross connect. The <i>IP-address</i> argument is the IPv4 address of the peer.
	pw-id <i>value</i>	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 8	Specifies how long a backup pseudowire should wait before resuming operation after the primary pseudowire goes down.

Command	Description
l2vpn, on page 38	Enters L2VPN configuration mode.
neighbor (L2VPN), on page 49	Configures a pseudowire for a cross-connect.
p2p, on page 66	Enters p2p configuration submode to configure point-to-point cross-connects.
xconnect group, on page 159	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	never
	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.	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 38	Enters L2VPN configuration mode.
	neighbor (L2VPN), on page 49	Configures a pseudowire for a cross-connect.
	p2p, on page 66	Enters p2p configuration submode to configure point-to-point cross-connects.
	pw-class (L2VPN), on page 58	Enters pseudowire class submode to define a pseudowire class template.
	xconnect group, on page 159	Configures cross-connect groups.

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	Operations ID
	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 92	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 <i>group-name</i>	Clears the MAC withdrawal statistics over the specified group.
bd-name <i>bd-name</i>	Clears the MAC withdrawal statistics over the specified bridge.
neighbor <i>ip-address</i>	Clears the MAC withdrawal statistics over the specified neighbor.
pw-id <i>value</i>	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 99	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 <i>node-id</i> 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 12	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 <i>node-id</i>	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 99	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 <i>node-id</i>	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 99	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 pw1
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 occurred 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.
	<i>src-mac</i>	Source MAC address in the Ethernet header.
	<i>dst-mac</i>	Destination MAC address in the Ethernet header.
	<i>ipv4</i>	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 38	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. The 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. The Resilience Optimized Mode works like Bandwidth Optimized mode, except that it floods traffic to both primary and backup FRR links for a Pseudowire.

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 38	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	<i>list-name</i> Name of the interface list.
---------------------------	--

Command Default	None
------------------------	------

Command Modes	Global configuration
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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 116	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	<i>value</i> 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
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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 [PW-Ether | PW-IW]
no interface type interface-path-id [PW-Ether | PW-IW]
```

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.

PW-Ether (Optional) Configures an Ethernet Interface.

PW-IW (Optional) Configures an IP Interworking Interface.

Command Default

None

Command Modes

p2p configuration submode

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 4.2.1	The following keywords were added: <ul style="list-style-type: none"> • PW-Ether • PW-IW

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
```

interface (p2p)

```
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 66	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

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 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 66	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	<i>source-ip-address</i> 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 61	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.
<i>cookie value</i>	Value of the cookie. The cookie values are specified based on the configured cookie size: <ul style="list-style-type: none"> • 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.
<i>session id</i>	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 38	Enters L2VPN configuration mode.
	p2p, on page 66	Enters p2p configuration submode to configure point-to-point cross-connects.
	xconnect group, on page 159	Configures cross-connect groups.
	neighbor (L2VPN), on page 49	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	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 4.0.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 4.0.1	This command was introduced.
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	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operations</th> </tr> </thead> <tbody> <tr> <td>l2vpn</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operations	l2vpn	read, write
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 38	Enters L2VPN configuration mode.

I2transport

To configure a physical interface to operate in Layer 2 transport mode, use the **I2transport** command in interface configuration mode. To return to the default behavior, use the **no** form of this command.

I2transport
no I2transport

This command has no arguments or keywords.

Command Default	None				
Command Modes	Interface configuration				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 3.7.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 3.7.2	This command was introduced.
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 I2transport 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, **I2transport** is rejected.

Task ID	Task ID	Operations
	I2vpn	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)# I2transport
```


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 100dot1q 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 dot1q vlan 999 any
```

Related Commands

Command	Description
show l2vpn forwarding, on page 99	Displays forwarding information from the layer2_fib manager on the line card.

I2transport I2protocol

To configure Layer 2 protocol handling, use the **I2transport I2protocol** command in interface configuration mode. To return to the default behavior, use the **no** form of this command.

```
I2transport I2protocol cpsv {reverse-tunnel | tunnel}
no I2transport I2protocol 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 99	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.

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 99	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 99	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 99	Displays forwarding information from the layer2_fib manager on the line card.

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

Syntax Description

both	Inserts or discards flow labels on transmit or receive.
code	Specifies the flow label TLV (type-length-value) code. The code value is 17.
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.
Release 4.3.2	The code keyword was introduced.
Release 5.3.1	In the L2VPN bridge group bridge-domain vfi autodiscovery BGP signalling submode, the static keyword is optional.

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.

In the [draft-ietf-pwe3-fat-pw](#) document, the flow label sub-TLV identifier for the Flow Aware Transport Pseudowire (FAT PW) was 0x11. This value has been changed to 0x17, which is also the sub-TLV identifier assigned by the Internet Assigned Numbers Authority (IANA).

Use the **load-balancing flow label code** command to toggle between the sub-TLV identifiers—0x11 and 0x17. If there is a mismatch between two endpoints in the load-balancing flow label code, then the PWs will have a mismatched TLV value resulting in a load balancing failure.

The **no** form of the **load-balancing flow label code** command uses the flow label sub-TLV identifier 0x11.

In the L2VPN bridge group bridge-domain vfi autodiscovery bgp signaling-protocol submode, the static keyword is optional. If the static keyword is not used, flow load balancing is dynamic. In this case, the routers dynamically select ingress or egress or both traffic flows for load balancing, based on this command configuration on both endpoints of a pseudowire. Even if this command configuration on the pseudowire's endpoints mismatch, the least possible of the traffic flows is enabled for load balancing. For example, consider the following mismatched but dynamic flow load balancing configuration: if one endpoint is configured for egress traffic load balancing, while the other is configured for ingress as well as egress load balancing, then load balancing is enabled for egress on the first endpoint and only the ingress on the latter endpoint.

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 61	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 38	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 38	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	<i>session-name</i> 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
```

This example shows how an EFP is associated to a monitor session:

```
RP/0/RSP0/CPU0:router(config)# interface Gi0/0/0/4.2 l2transport
RP/0/RSP0/CPU0:router(config-subif)# monitor-session customer-foo
```

This example shows how L2 SPAN is supported on L3 interfaces, but the whole L2 frame is mirrored:

```
RP/0/RSP0/CPU0:router(config)# interface Gi0/0/0/4.2 l2transport
RP/0/RSP0/CPU0:router(config-subif)# ipv6 address 1111:3333::cdef
RP/0/RSP0/CPU0:router(config-subif)# monitor-session customer-foo
```

This example shows how SPAN is also supported on main interfaces:

```
RP/0/RSP0/CPU0:router(config)# interface Gi0/0/0/4.2 l2transport
RP/0/RSP0/CPU0:router(config-subif)# l2transport
RP/0/RSP0/CPU0:router(config-subif)# monitor-session customer-foo
```

This example shows creation of xconnect between the monitor-session and a L2TPv3 over IPv6 tunnel:

```
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# xconnect group span
RP/0/RSP0/CPU0:router(config-l2vpn-xc)# p2p span-foo
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# monitor-session customer-foo
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor ipv6 1111:3333::cdef pw-id 1001
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# pw-class ts
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# source 1111:3333::abcd
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# l2tp static local cookie size 8 value 0xabcd
0x1234
RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# l2tp static remote cookie size 8 value 0xcdef
0x5678
```

Related Commands

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

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
no mpls static label local label remote value
```

Syntax Description	<p>local label Configures a local pseudowire label. Range is 16 to 15999.</p> <p>remote value Configures a remote pseudowire label. Range is 16 to 15999.</p>								
Command Default	The default behavior is a dynamic label assignment.								
Command Modes	L2VPN cross-connect P2P pseudowire configuration								
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 3.7.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 3.7.2	This command was introduced.				
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	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operations</th> </tr> </thead> <tbody> <tr> <td>l2vpn</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operations	l2vpn	read, write				
Task ID	Operations								
l2vpn	read, write								
Examples	<p>The following example shows how to configure static labels for MPLS L2VPN:</p> <pre>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 RP/0/RSP0/CPU0:router(config-l2vpn-xc-p2p-pw)# mpls static label local 800 remote 500</pre>								
Related Commands	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>l2vpn, on page 38</td> <td>Enters L2VPN configuration mode.</td> </tr> <tr> <td>neighbor (L2VPN), on page 49</td> <td>Configures a pseudowire for a cross-connect.</td> </tr> <tr> <td>p2p, on page 66</td> <td>Enters p2p configuration submode to configure point-to-point cross-connects.</td> </tr> </tbody> </table>	Command	Description	l2vpn, on page 38	Enters L2VPN configuration mode.	neighbor (L2VPN), on page 49	Configures a pseudowire for a cross-connect.	p2p, on page 66	Enters p2p configuration submode to configure point-to-point cross-connects.
Command	Description								
l2vpn, on page 38	Enters L2VPN configuration mode.								
neighbor (L2VPN), on page 49	Configures a pseudowire for a cross-connect.								
p2p, on page 66	Enters p2p configuration submode to configure point-to-point cross-connects.								

Command	Description
xconnect group, on page 159	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 | ipv4 ipv4 address | ipv6 ipv6 address} pw-id value [{backup | l2tp static | mpls
| pw-class | source ipv6 address | tag-impose}]
no neighbor {A.B.C.D | ipv4 ipv4 address | ipv6 ipv6 address} pw-id value [{backup | l2tp static | mpls
| pw-class | source ipv6 address | tag-impose}]
```

Syntax Description

<i>A.B.C.D</i>	IP address of the cross-connect peer.
ipv4 <i>ipv4 address</i>	Assigns the IPv4 address of the cross-connect peer.
ipv6 <i>ipv6 address</i>	Assigns the IPv6 address of the cross-connect peer.
pw-id <i>value</i>	Configures the pseudowire ID and ID value. Range is 1 to 4294967295.
backup	(Optional) Specifies the backup pseudowire for the cross-connect.
l2tp static	(Optional) Configures the L2TP pseudowire static
mpls	(Optional) Configures an MPLS static label.
pw-class	(Optional) Configures the pseudowire class template name to use for this cross-connect.
source <i>ipv6 address</i>	(Optional) Specifies the source IPv6 address of the pseudowire. This option is available only for the IPv6 neighbor.
tag-impose	(Optional) Specifies a tag during a VLAN ID configuration

Command Default

None

Command Modes

p2p configuration submode

Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 4.2.1	The keyword tag-impose was introduced.
Release 4.3.1	The following keywords were added: <ul style="list-style-type: none"> • ipv4 • ipv6 • l2tp static • source

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
```

This example shows a point-to-point IPv6 cross-connect 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 ipv6 1111:2222::cdef pw-id 1
```

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 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)# source 1111:2222::abcd
```

Related Commands	Command	Description
	l2vpn, on page 38	Enters L2VPN configuration mode.
	p2p, on page 66	Enters p2p configuration submode to configure point-to-point cross-connects.
	pw-class (L2VPN), on page 58	Enters pseudowire class submode to define a pseudowire class template.
	xconnect group, on page 159	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 <i>vpn-id</i> Virtual Private Network Identifier where this p2p xconnect is setup.
	target <i>ac-id</i> 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/RP0RSP0/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		
	<i>global-id</i>	Targeted remote autonomous system number.
	<i>prefix</i>	Targeted remote PE IP address.
	<i>ac-id</i>	Specifies the targeted remote attachment circuit id.
	source <i>ac-id</i>	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-hel
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 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	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 38	Enters L2VPN configuration mode.

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
```

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
```

Related Commands	Command	Description
	pw-class (L2VPN), on page 58	Enters pseudowire class submode to define a pseudowire class template.
	pw-class encapsulation l2tpv3, on page 59	Configures L2TPv3 pseudowire encapsulation.

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	<i>class-name</i> 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 66	

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} | dfbit set | ipv4 source address | pmtu max 68-65535 | protocol l2tpv3 class name | sequencing both [{resync}] | tos {reflect value 0-255 | value 0-255} | transport-mode {ethernet vlan} | ttl value}]
```

```
no pw-class class name encapsulation l2tpv3 [{cookie size {0 | 4 | 8} | dfbit set | ipv4 source address | pmtu max 68-65535 | protocol l2tpv3 class name | sequencing both [{resync}] | tos {reflect value 0-255 | value 0-255} | transport-mode {ethernet vlan} | ttl value}]
```

Syntax Description	
class name	Configures an encapsulation class name.
cookie size {0 4 8}	(Optional) Configures the L2TPv3 cookie size setting: <ul style="list-style-type: none"> • 0—Cookie size is 0 bytes. • 4—Cookie size is 4 bytes. • 8—Cookie size is 8 bytes.
dfbit set	(Optional) Sets the Don't Fragment Bit (DFBIT)
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.
sequencing both	(Optional) Configures sequencing on both transmit and receive side
resync	(Optional) Sets the threshold for out-of-sequence packets before resync
transport-mode	(Optional) Configures the remote transport mode
ethernet	Sets the transport mode as ethernet port mode
vlan	Sets the transport mode as vlan tagged mode
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 58	Enters pseudowire class submode to define a pseudowire class template.
	pw-class encapsulation mpls, on page 61	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 flow-label |
preferred-path | protocol ldp | redundancy one-way | sequencing | switching tlv | tag-rewrite |
transport-mode | vccv verification-type none}
no pw-class class-name encapsulation mpls {control word | ipv4 | load-balancing flow-label |
preferred-path | protocol ldp | redundancy one-way | sequencing | switching tlv | tag-rewrite |
transport-mode | vccv verification-type none}
```

Syntax Description		
	<i>class-name</i>	Encapsulation class name.
	control word	Disables control word for MPLS encapsulation. Disabled by default.
	ipv4	Sets the local source IPv4 address.
	load-balancing flow-label	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.
	redundancy one-way	Configures one-way PW redundancy behavior in the Redundancy Group.
	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 3.9.0	The following keywords were added: <ul style="list-style-type: none"> • preferred-path • sequencing • switching tlv • tag-rewrite • transport-mode
	Release 4.2.0	The keyword redundancy one-way was introduced.
	Release 4.3.0	The keyword load-balancing flow-label 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 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 58	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 submodule. 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 submodule:

```
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 66	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 38	Enters L2VPN configuration mode.
	show l2vpn, on page 87	Displays L2VPN information

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 23	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		
	<i>ASN</i>	Specifies the 2-byte or 4-byte autonomous system number.
	<i>index</i>	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.
	<i>ipv4-address</i>	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.

Release	Modification
Release 5.3.1	For the L2VPN bridge domain VFI autodiscovery BGP and L2VPN cross-connect mp2mp autodiscovery BGP submodes, the index value associated with the IP address can take values higher than 32767 in the range from 0 to 65535.

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 58	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 <i>bridge-domain-name</i>	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.
<i>IPv4 address:nn</i>	Specifies the IPv4 address of the route distinguisher. nn: 16-bit number
<i>4-byte as-number:nn</i>	Specifies 4-byte AS number in asdot (X.Y) format or in asplain format. <ul style="list-style-type: none"> 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
<i>2-byte as-number:nn</i>	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

Example

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

show bgp l2vpn evpn bridge-domain bdl

```

Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 192.0.2.1:1 (default for vrf bdl)
*>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 vrf-db {all *vrf table id*}

Syntax Description	all	Displays all BGP VRF database table information.
	<i>vrf table id</i>	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	Parameter	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	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 Nextthop      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
```

show evpn evi ead

```

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.
evi	Enters the EVPN EVI configuration mode to configure optional BGP settings for a bridge domain or 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 <i>vrf name</i>	Displays DCI VRF database for a specific VRF.
fabric <i>fabric id</i>	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 <i>fabric id</i>	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
```

show generic-interface-list

```
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 38	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	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	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_102	

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	Option	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 <i>identifier</i>	Displays local control channel identifiers.
	name <i>local-name remote-name</i>	Displays the local and remote names of a control channel.

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	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-mppls)# 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.
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 83	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
```

This 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
Tue Oct 16 14:34:36.116 BST
PW-Status: enabled
PW-Grouping: disabled
Logging PW: disabled
```

show l2vpn

```
Logging BD state changes: disabled
Logging VFI state changes: disabled
Logging NSR state changes: disabled
TCN propagation: disabled
PW OAM transmit time: 30s
Multicast P2MP: enabled
```

Related Commands

Command	Description
l2vpn, on page 38	Enters L2VPN configuration mode.
pw-grouping, on page 65	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	Option	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 1.1.1.1** command:

```
RP/0/RSP0/CPU0:router# show l2vpn atom-db source 1.1.1.1
Peer ID      Source      VC ID      Encap      Signaling  FEC      Discovery
2.2.2.2      1.1.1.1     1          MPLS       LDP        128     none
```

This example shows the sample output of the **show l2vpn atom-db source 1.1.1.1 detail** command:

show l2vpn atom-db

```
RP/0/RSP0/CPU0:router# show l2vpn atom-db source 1.1.1.1 detail
```

```
PW: neighbor 2.2.2.2, PW ID 1, state is down ( provisioned )
PW class class1, XC ID 0x1
Encapsulation MPLS, protocol LDP
Source address 1.1.1.1
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 = 2.2.2.2, 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	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 10	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-iframe: 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

```

show l2vpn database

```
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_bdl, 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 | debug | detail | dhcp binding | ethernet
ring g8032 | gsp | hardware | inconsistent | interface | l2tp | l2tpv2 | location [node-id] | message |
monitor-session | mstp | neighbor | object-queues | pbb | protection | pwgroup | 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.
debug	Displays debug information.
detail	Displays detailed information from the layer2_fib manager.
dhcp binding	Displays DHCP binding related forwarding information
ethernet ring g8032	Displays Ethernet associated configuration information.
gsp	Displays GSP related forwarding information.
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.
l2tpv2	Displays l2tpv2 related forwarding information.
location <i>node-id</i>	Displays layer2_fib manager information for the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

message	Displays messages exchanged with collaborators.
monitor-session	Displays the match Monitor-session.
mstp	Displays multi-spanning tree related forwarding information.
neighbor	Displays the match neighbor IP address.
object-queues	Displays object queues related information.
pbb	Displays l2vpn provider backbone bridge information.
protection	Displays protection associated interfaces related forwarding information.
pwgroup	Displays PW-Group 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.
---------------	------------------------------

Release	Modification
Release 4.3.0	The following keywords were introduced: <ul style="list-style-type: none"> • debug • dhcp binding • ethernet ring g8032 • gsp • l2tpv2 • monitor-session • neighbor • object-queues • pbb • protection
Release 5.1	The pwgroup keyword was introduced.
Release 5.3.1	The show command output was enhanced to display VXLAN anycast gateway parameters.
Release 5.3.2	The show command output is enhanced to display MAC Move Counters information.
Release 6.1.2	The show command output is enhanced to display the Service Path Preference parameters.

Usage Guidelines

To use commands of this module, 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 any command, contact your AAA administrator for assistance.

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: bgl: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
```

show l2vpn forwarding

```

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 2.2.2.2 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 2.2.2.2 UP
pw-span-sess(monitor-session) mpls 3.3.3.3 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      2.2.2.2                               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: 2.2.2.2, 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=2.2.2.2, 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
```

show l2vpn forwarding

```

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       1.1.1.1  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

```

This example shows the sample output of a configured flow label:

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

```

Local interface: GigabitEthernet0/0/1/1, Xconnect id: 0x1000002, Status: up
  Segment 1
    AC, GigabitEthernet0/0/1/1, Ethernet port mode, status: Bound

  Segment 2
    MPLS, Destination address: 3.3.3.3, pw-id: 2, status: Bound, Active
    Pseudowire label: 16004    Control word disabled
    Backup PW
      MPLS, Destination address: 2.2.2.2, pw-id: 6, status: Bound
      Pseudowire label: 16000
      Flow label enabled

    Xconnect id: 0xff000014, Status: down
  Segment 1
    MPLS, Destination address: 2.2.2.2, pw-id: 1, status: Not bound
    Pseudowire label: UNKNOWN    Control word disabled
    Flow label enabled

```

```

Segment 2
  Bridge id: 0, Split horizon group id: 0
  Storm control: disabled
  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
  Security: disabled
  DHCPv4 snooping: profile not known on this node, disabled
  IGMP snooping profile: profile not known on this node
  Router guard disabled

```

This example shows sample output for the **show l2vpn forwarding location** command:

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding location 0/1/CPU0
LC/0/1/CPU0:JSegment 1                               Segment 2                               State
-----
PBB Edge                                             Bridge id 0, SHG id 0                   UP
Gi0/1/0/1.1(Eth VLAN)                               Bridge id 0, SHG id 0                   UP
Gi0/1/0/1.2(Eth VLAN)                               Bridge id 0, SHG id 0                   UP
mpls 1.2.3.4,22                                     Bridge id 1, SHG id 0                   DN
PBB Core                                             Bridge id 2, SHG id 0                   UP

```

This example shows sample output for the **show l2vpn forwarding summary location** command:

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding summary location 0/0/CPU0
Major version num:1, minor version num:0
Shared memory timestamp:0x4005e57a0
Number of forwarding xconnect entries:4
  Up:4  Down:0
  AC-PW:0  AC-AC:0  AC-BP:0  AC-Unknown:0
  PW-BP:0  PW-Unknown:0
  PBB-BP:4  PBB-Unknown:0
Number of xconnects down due to:
  AIB:0  L2VPN:0  L3FIB:0
Number of p2p xconnects: 0
Number of bridge-port xconnects: 4
Number of nexthops:0
Number of bridge-domains: 5
Number of static macs: 0
Number of locally learned macs: 0
Number of remotely learned macs: 0
Number of total macs: 0

```

This example shows sample output for the **show l2vpn forwarding detail location** command for IOS-XR 5.3.1 and earlier releases:

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding detail location 0/1/CPU0
Local interface: TenGigE0/0/0/1/0.1, Xconnect id: 0x80005, Status: up
Segment 1
  AC, TenGigE0/0/0/1/0.1, status: Bound
  Statistics:
    packets: received 0, sent 0
    bytes: received 0, sent 0
Segment 2
  Bridge id: 19, Split horizon group id: 0
  Storm control: disabled
  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, Accept-Shutdown: enabled
    DHCPv4 snooping: profile not known on this node, disabled
    Dynamic ARP Inspection: disabled, Logging: disabled
    IP Source Guard: disabled, Logging: disabled
    IGMP snooping profile: profile not known on this node
    MLD snooping profile: profile not known on this node
    Router guard disabled
    P2MP PW: disabled

Local interface: PBB Core, Xconnect id: 0x2000001, Status: up
Segment 1
  AC, TenGigE0/0/0/1/0.1, status: Bound
  Statistics:
    packets: received 0, sent 0
    bytes: received 0, sent 0
Segment 2
  Bridge id: 19, Split horizon group id: 0
  Statistics:
    packets: received 0, sent 0
    bytes: received 0, sent 0

```

This example shows sample output for the **show l2vpn forwarding detail location** command for IOS-XR 5.3.2 release

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding detail location 0/6/CPU0
Local interface: TenGigE0/0/0/1/0.1, Xconnect id: 0x80005, Status: up
Segment 1
  AC, TenGigE0/0/0/1/0.1, status: Bound
  Statistics:
    packets: received 0 (multicast 0, broadcast 0, unknown unicast 0, unicast 0), sent 0
    bytes: received 0 (multicast 0, broadcast 0, unknown unicast 0, unicast 0), sent 0
    MAC move: 0
    packets dropped: PLU 0, tail 0
    bytes dropped: PLU 0, tail 0
Segment 2
  Bridge id: 19, Split horizon group id: 0
  Storm control: disabled
  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, Accept-Shutdown: enabled
  DHCPv4 snooping: profile not known on this node, disabled
  Dynamic ARP Inspection: disabled, Logging: disabled
  IP Source Guard: disabled, Logging: disabled
  IGMP snooping profile: profile not known on this node
  MLD snooping profile: profile not known on this node
  Router guard disabled
  P2MP PW: disabled

```

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

```

RP/0/RSP0/CPU0:router# show l2vpn for location 0/0/CPU0

```

```

Fri May 18 13:56:35.957 EDT
Segment 1 Segment 2 State
-----
Gi0/0/0/4.2(Eth VLAN) l2tpv3 UP
1111:2222::cdef
Gi0/0/0/4.3(Eth VLAN) mpls 1.2.3.4 DN

```

The following sample output is from the **show l2vpn forwarding neighbor ipv6** command:

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding neighbor ipv6 1111:2222::cdef detail loc
0/0/cpu0

```

```

Fri May 18 13:58:14.720 EDT
Local interface: GigabitEthernet0/0/0/4.2, Xconnect id: 0x2, Status: up
Segment 1
AC, GigabitEthernet0/0/0/4.2, Ethernet VLAN mode, status: Bound
Statistics:
packets: received 0, sent 0
bytes: received 0, sent 0
Segment 2
L2TPv3-IPV6, Destination address: 1111:2222::cdef, status: Bound
Source address: 1111:2222::abcd
Local session:
Session ID: -1
Cookie: size 0 bytes
Remote session:
Session ID: -1
Cookie: size 0 bytes
Control word disabled
Sequencing not set
TOS 40 (reflect disabled), TTL 255, DF bit not set
Path MTU: disabled
Statistics:
packets: received 0, sent 0
bytes: received 0, sent 0
packets dropped: out of sequence 0, other 0

```

This example shows sample output for the **show l2vpn forwarding detail location** command with P2MP PW enabled on the PW BP for IOS-XR 5.3.1 and earlier releases.

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding detail location
Xconnect id: 0xffffc0003, Status: up
Segment 1
MPLS, Destination address: 2.2.2.2, pw-id: 101, status: Bound
Pseudowire label: 16002 Control word disabled
Statistics:
  packets: received 0, sent 0
  bytes: received 0, sent 0
Segment 2
Bridge id: 0, Split horizon group id: 1
Storm control: disabled
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, disabled
Dynamic ARP Inspection: disabled, Logging: disabled

```

show l2vpn forwarding

```

IP Source Guard: disabled, Logging: disabled
IGMP snooping profile: profile not known on this node
Router guard disabled
P2MP PW enabled

```

This example shows sample output for the **show l2vpn forwarding detail location** command with P2MP PW enabled on the PW BP for IOS-XR 5.3.2 release.

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding detail location
Xconnect id: 0xffffc0003, Status: up
Segment 1
  MPLS, Destination address: 2.2.2.2, pw-id: 101, status: Bound
  Pseudowire label: 16002   Control word disabled
  Statistics:
    packets: received 1000 (unicast 1000), sent 0
    bytes: received 128000 (unicast 128000), sent 0
    MAC move: 10
Segment 2
  Bridge id: 0, Split horizon group id: 1
  Storm control: disabled
  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, disabled
  Dynamic ARP Inspection: disabled, Logging: disabled
  IP Source Guard: disabled, Logging: disabled
  IGMP snooping profile: profile not known on this node
  Router guard disabled
  P2MP PW enabled

```

This example shows sample output for the **show l2vpn forwarding summary location** command displaying number of bridge-domains with P2MP PW enabled.

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding summary location
Mon Sep 9 22:07:54.000 EDT
Major version num:1, minor version num:0
Shared memory timestamp:0x547395c50
Global configuration:
Number of forwarding xconnect entries:5
  Up:0   Down:5
  AC-PW(atom):1 AC-PW(l2tpv2):0 AC-PW(l2tpv3):0
  (1 mpls) AC-AC:0 AC-BP:0 AC-Unknown:0
  PW-BP:4 PW-Unknown:0
  PBB-BP:0 PBB-Unknown:0
  Monitor-Session-PW:0 Monitor-Session-Unknown:0
Number of xconnects down due to:
  AIB:0 L2VPN:5 L3FIB:0 VPDN:0
Number of xconnect updates dropped due to:
  Invalid XID: 0 VPWS PW, 0 VPLS PW, 0 Virtual-AC, 0 PBB
  Exceeded max allowed: 0 VPLS PW, 0 Bundle-AC
Number of p2p xconnects: 1
Number of bridge-port xconnects: 4
Number of nexthops:2
  MPLS:   Bound:2 Unbound:0 Pending Registration:0
  P2MP MLDP: Bound:1 Unbound:0 Pending Registration:0
  P2MP TE: Bound:1 Unbound:0 Pending Registration:0

```

```

Number of bridge-domains: 2 (0 with routed interface, 2 with P2MP enabled)
Number of bridge-domain updates dropped: 0
Number of static macs: 0
Number of routed macs: 0
Number of locally learned macs: 0
Number of remotely learned macs: 0
Number of total macs: 0
Number of total P2MP Ptree entries: 2
  MLDP:1 (LMRIB:1) RSVP-TE:0 (LMRIB:0)

```

The example shows sample output for the **show l2vpn forwarding detail** command with PW grouping for multi-segment PWs.

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding detail location
Local interface: GigabitEthernet0/0/0/0.100, Xconnect id: 0x100009, Status: up
Segment 1
  AC, GigabitEthernet0/0/0/0.100, Ethernet VLAN mode, status: Bound
  Statistics:
    packets: received 0, sent 0
    bytes: received 0, sent 0
Segment 2
  MPLS, Destination address: 1.1.1.10, pw-id: 100, status: Bound, Active
  Pseudowire label: 16000 Control word disabled
  NHOP: 1.1.1.10, PW-Group Id: 0x1001
  Backup PW
    MPLS, Destination address: 3.3.3.30, pw-id: 300, status: Bound
    Pseudowire label: 16000
    NHOP: 3.3.3.30, Backup PW-Group Id: 0x1002
  Statistics:
    packets: received 0, sent 0
    bytes: received 0, sent 0

```

The example shows sample output for the **show l2vpn forwarding summary** command with PW grouping for multi-segment PWs.

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding summary location 0/0/CPU0
Tue Jun 18 22:29:47.815 DST
Major version num:1, minor version num:0
Shared memory timestamp:0x182a49b4f9
Global configuration:
Number of forwarding xconnect entries:31
  Up:19 Down:12
  AC-PW(atom):0 AC-PW(l2tpv2):0 AC-PW(l2tpv3):0
  AC-PW(l2tpv3-ipv6):0
  AC-AC:3 AC-BP:16 AC-Unknown:0
  PW-BP:12 PW-Unknown:0
  PBB-BP:0 PBB-Unknown:0
  Monitor-Session-PW:0 Monitor-Session-Unknown:0
Number of xconnects down due to:
  AIB:0 L2VPN:12 L3FIB:0 VPDN:0
Number of xconnect updates dropped due to:
  Invalid XID: 0 VPWS PW, 0 VPLS PW, 0 Virtual-AC, 0 PBB
  Exceeded max allowed: 0 VPLS PW, 0 Bundle-AC
Number of p2p xconnects: 1
Number of PW-Group Ids: 1
Number of PW-Group Ids Down: 0
Number of bridge-port xconnects: 28
Number of nexthops:5
  MPLS: Bound:0 Unbound:5 Pending Registration:0
  P2MP MLDP: Bound:0 Unbound:0 Pending Registration:0
  P2MP TE: Bound:0 Unbound:0 Pending Registration:0

```

```

Number of bridge-domains: 14
  2 with routed interface
  0 with PBB evpn enabled
  0 with p2mp enabled
Number of bridge-domain updates dropped: 0
Number of total macs: 0
  0 Static macs
  0 Routed macs
  0 BMAC
  0 Source BMAC
  0 Locally learned macs
  0 Remotely learned macs
Number of total P2MP Ptree entries: 0
Number of EVPN Multicast Replication lists: 0 (0 default)

```

The example shows sample output for the **show l2vpn forwarding pwgroup** command identifying the PWs of the same PW group as known by L2FIB.

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding pwgroup ?
debug      Include debug information(cisco-support)
detail     Detailed information
location   Specify a location
peer-addr  PW-Group peer IPv4 address
group-id   Provide information for the given PW-Group Id

```

The example shows sample output for the **show l2vpn forwarding pwgroup group-id** command with a specified group ID.

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding pwgroup group-id 0x1001 loc 0/0/cpu0
Xconnect ID 0x1080001
PW info:
  Base info: version=0xaabbcc12, flags=0x0, type=4, reserved=0
  pw_id=100, nh_valid=TRUE, sig_cap_flags=0x20, context=0x0,
  MPLS, Destination address: 1.1.1.10, pw-id: 100, status: Bound, Active
  Pseudowire label: 16000   Control word disabled
  Redundancy role: active, PW-Group Id 0x1001

Xconnect ID 0x1080008
PW info:
  Base info: version=0xaabbcc12, flags=0x0, type=4, reserved=0
  pw_id=108, nh_valid=TRUE, sig_cap_flags=0x20, context=0x0,
  MPLS, Destination address: 1.1.1.10, pw-id: 108, status: Bound, Active
  Pseudowire label: 16000   Control word disabled
  Redundancy role none, PW-Group Id 0x1001

```

The example shows sample output for the **show l2vpn forwarding xconnect** command.

```

RP/0/RSP0/CPU0:router# show l2vpn forwarding xconnect 0xffff8000f detail location 0/0/CPU0Mon
Jun 20 20:15:32.150 EDT
Xconnect id: 0xffff8000f, Status: up
Segment 1   MPLS, Destination address: 2.2.2.2, pw-id: 100:1001, status: Bound
  Pseudowire label: 24055
  Control word disabled
  Forward-class: 1
  Statistics:
    packets: received 0 (unicast 0), sent 0
    bytes: received 0 (unicast 0), sent 0
    MAC move: 0
Segment 2
  Bridge id: 0, Split horizon group id: 1

```



```
Storm control: disabled  
...
```

Related Commands

Command	Description
clear l2vpn forwarding counters, on page 12	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 <i>node-id</i>	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 14	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	Option	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 11 detail
generic-interface-list: 11 (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 [{location | private | standby}]

Syntax Description	location	(Optional) Displays index manager statistics for the specified location.
	private	(Optional) Detailed information about all indexes allocated for each pool.
	standby	(Optional) Displays Standby node specific information.

Command Default None

Command Modes EXEC

Command History	Release	Modification
	Release 4.2.1	This command was introduced.
	Release 4.3.0	The following keywords are introduced: <ul style="list-style-type: none"> • location • standby

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
```

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

```
RP/0/RSP0/CPU0:router# show l2vpn index standby
Pool id: 0xffffc0000, App: Global
  Max number of ID mgr instances: 1
  ID mgr instances in use: 1
  Pool size: 98304
  zombied IDs: 0
  allocated IDs: 0

Pool id: 0xffffc0002, App: BD
  Max number of ID mgr instances: 1
  ID mgr instances in use: 1
  Pool size: 8192
  zombied IDs: 0
  allocated IDs: 0

Pool id: 0xffffc0003, App: MP2MP
  Max number of ID mgr instances: 1
  ID mgr instances in use: 1
  Pool size: 65535
  zombied IDs: 0
  allocated IDs: 0
```

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.
	Release 6.1.2	The show command output was updated.

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 38	Enters L2VPN configuration mode.
	nsr (L2VPN), on page 54	Configures non-stop routing.

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 38	Enters L2VPN configuration mode.
nsr (L2VPN), on page 54	Configures non-stop routing.
show l2vpn index, on page 118	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 38	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** | **location** | **name** *class name* | **standby**}]

Syntax Description	Parameter	Description
	detail	(Optional) Displays detailed information.
	location	(Optional) Displays location specific information.
	name <i>class-name</i>	(Optional) Displays information about a specific pseudowire class name.
	standby	(Optional) Displays standby node specific information.

Command Default None

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 4.3.0	The keywords location and standby were 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	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 example shows sample output for the **show l2vpn pw-class detail** command:

```
RP/0/RSP0/CPU0:router# show l2vpn pw-class detail
  Encapsulation MPLS, protocol LDP
  Transport mode not set, control word unset (default)
  Sequencing not set
  Static tag rewrite not set
```

```
PW Backup disable delay: 0 sec
MAC withdraw message is sent over PW: no
IPv4 source address 1.1.1.1
```

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.
Protocol	Displays the protocol type.

Related Commands

Command	Description
clear l2vpn forwarding counters, on page 12	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	Parameter	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	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 130](#)

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
```

This example displays output with MIRP-Lite entries 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
Jul 27 14:39:55.361 l2vpn/fwd-common 0/RSP0/CPU0 t1 FWD_COMMON:1522:
#####MIRP_LITE_SPIO
Jul 27 14:39:55.362 l2vpn/fwd-common 0/RSP0/CPU0 t1 FWD_COMMON:1561: MIRP-lite init
finished
Jul 27 14:39:55.362 l2vpn/fwd-common 0/RSP0/CPU0 t1 FWD_COMMON:1563: MIRP-lite
```

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 | location | mp2mp | mspw | neighbor | pw-class | pw-id | standby | state | summary | | pw-id value | 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.
location	(Optional) Displays location specific information.
mp2mp	(Optional) Displays MP2MP information.
mspw	(Optional) Displays MSPW information.
neighbor	(Optional) Filters on neighbor.
pw-class	(Optional) Filters on pseudowire class
standby	(Optional) Displays standby node specific information.
state	(Optional) Filters the following xconnect state types: <ul style="list-style-type: none"> • up • down • unresolved
summary	(Optional) Displays AC information from the AC Manager database.
pw-id value	(Optional) Displays the filter for the pseudowire ID. The range is from 1 to 4294967295.
type	(Optional) Filters the following xconnect types: <ul style="list-style-type: none"> • ac-pw • locally switched • monitor-session-pw • ms-pw
Command Default	None

show l2vpn xconnect**Command Modes** EXEC**Command History****Release** **Modification**

Release 3.7.2 This command was introduced.

Release 4.3.0 The following keywords were introduced:

- location
- standby

Release 5.1.2 This command was modified to enable filtering the command output for a specific pseudowire with just the pseudowire ID.

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 Management (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.

**Note**

For Cisco IOS XR software Release 5.1.2 and above, you can filter the command output for specific pseudowire with just the pseudowire ID. However, for pseudowire configurations with FEC 129 Type 2 (in VPWS), filtering the output for a specific pseudowire can only be done with the combination of the neighbour filter and the pseudowire ID.

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 Group	Name	ST	Segment 1 Description	ST	Segment 2 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
                Interface pw-span-test
                MTU 1500
  Control word  enabled
  PW type      Ethernet
  VCCV CV type 0x2
                (LSP ping verification)
  VCCV CC type 0x3
                (control word)
                (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 2.2.2.2, PW ID 2, state is up ( established )
Backup for neighbor 1.1.1.1 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
                MTU 1500
  Control word  enabled
  PW type      Ethernet
  VCCV CV type 0x2
                (LSP ping verification)
  VCCV CC type 0x3
                (control word)
                (router alert label)
  -----

```

show l2vpn xconnect

```

                (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	2.2.2.2	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	1.1.1.1	1 UP
					Backup	
					2.2.2.2	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 1.1.1.1, 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
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 2.2.2.2, PW ID 2, state is up (established)

Backup for neighbor 1.1.1.1 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 1.1.1.1 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: 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 1.1.1.1, 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
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:

show l2vpn xconnect

```

PW: neighbor 2.2.2.2, PW ID 2, state is up ( established )
Backup for neighbor 1.1.1.1 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 (LSP ping verification)	0x2 (LSP ping verification)
VCCV CC type	0x3 (control word) (router alert label)	0x3 (control word) (router alert label)

```

Backup PW for neighbor 1.1.1.1 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: 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 3.3.3.3, 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 (LSP ping verification)	0x2 (LSP ping verification)
VCCV CC type	0x6 (router alert label)	0x6 (router alert label)

```

(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 example shows the sample output of a pseudowire headend (PWHE) cross connect:

```

RP/0/RSP0/CPU0:router# show l2vpn xconnect interface pw-ether 67 detail
Group g1, XC xc1, state is down; Interworking none
AC:PW-Ether1, state is up
  Type PW-Ether
  Interface-list: interfacelist1
  Replicate status:
    Gi0/2/0/1: success
    Gi0/3/0/1: pending
    Gi0/4/0/1: failed
  MTU 1500; interworking none
  Statistics:
    packets: received 0, sent 0
    bytes: received 0, sent 0
  PW: neighbor 130.130.130.130, PW ID 1234, state is down ( provisioned )
  PW class not set
  Encapsulation MPLS, protocol LDP
  PW type Ethernet VLAN, control word disabled, interworking none
  Sequencing not set
  Internal label: 16008
  VLAN id imposed: 101

      MPLS          Local          Remote
      -----
      Label          16001
      Group ID       0x2000600
      Interface      PW-Ether1          unknown
      MTU            1500
      Control word   disabled
      PW type        Ethernet VLAN
      VCCV CV type   0x2
                        (LSP ping verification)
      VCCV CC type   0x6
                        (router alert label)
                        (TTL expiry)
      -----
MIB cpwVcIndex: 2
Create time: 19/02/2010 23:13:01 (1w2d ago)
Last time status changed: 19/02/2010 23:13:16 (1w2d ago)
Statistics:
  packets: received 0, sent 0
  bytes: received 0, sent 0

```

This example shows the sample output of a configured flow label:

```

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

```

```

Group g1, XC p1, state is up; Interworking none
  AC: GigabitEthernet0/0/1/1, state is up
    Type Ethernet
    MTU 1500; XC ID 0x1000002; interworking none
    Statistics:
      packets: received 24688, sent 24686
      bytes: received 1488097, sent 1487926
  PW: neighbor 3.3.3.3, PW ID 2, state is up ( established )
    PW class class1, XC ID 0x1000002
    Encapsulation MPLS, protocol LDP
    PW type Ethernet, control word disabled, interworking none
    PW backup disable delay 0 sec
Sequencing not set
Flow label flags configured (Rx=1,Tx=1), negotiated (Rx=0,Tx=1)

```

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.
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).

This example shows the output of the **show l2vpn xconnect** command with IPv6 addresses listed:

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

```

Fri May 18 10:25:48.279 EDT
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
-----
g1 xc1 DN Gi0/0/0/4.3 UP 1.2.3.4 1 DN
-----
g1 xc2 UR Gi0/0/0/4.1 DN 1 UR
aaaa:bbbb::cdef
-----
g1 xc3 UP Gi0/0/0/4.2 UP 1 UP
1111:2222::cdef
-----
g1 xc4 UR Gi0/0/0/4.4 DN 1 UR
1111:3333::4444
-----

```

This example shows the output of the **show l2vpn xconnect interface** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect interface Gi0/0/0/4.4 detail
```

```

Fri May 18 10:34:28.263 EDT
Group g1, XC xc4, state is unresolved; Interworking none

```

```

Not provisioned reason(s):
IPv6 not supported for this service
AC: GigabitEthernet0/0/0/4.4, state is down (Segment-down)
Type VLAN; Num Ranges: 1
VLAN ranges: [4, 4]
MTU 1500; XC ID 0x4; interworking none
PW: neighbor 1111:3333::4444, PW ID 1, state is unresolved

```

This example shows the output of the **show running-config l2vpn xconnect group** command with IPv6 neighbor information:

```
RP/0/RSP0/CPU0:router# show running-config l2vpn xconnect group g1 p2p xc4
```

```

Fri May 18 10:35:51.734 EDT
l2vpn
xconnect group g1
p2p xc4
interface GigabitEthernet0/0/0/4.4
neighbor ipv6 1111:3333::4444 pw-id 1
!

```

This example shows the output of the **show l2vpn xconnect neighbor ipv4** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect neighbor ipv4 1.2.3.4
```

```

Fri May 18 10:28:22.289 EDT
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
-----
g1 xc1 DN Gi0/0/0/4.3 UP 1.2.3.4 1 DN
-----

```

This example shows the output of the **show l2vpn xconnect neighbor ipv6** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect neighbor ipv6 1111:2222::cdef
```

```

Fri May 18 10:32:46.332 EDT
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
-----
g1 xc3 UP Gi0/0/0/4.2 UP 1 UP
1111:2222::cdef
-----

```

This example shows the output of the **show l2vpn xconnect neighbor ipv6** command:

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect neighbor ipv6 1111:2222::cdef
```

```

Fri May 18 10:32:46.332 EDT
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
-----
g1 xc3 UP Gi0/0/0/4.2 UP 1 UP
1111:2222::cdef
-----

```

```
RP/0/RSP0/CPU0:router# show l2vpn xconnect neighbor ipv6 1111:2222::cdef detail
```

```
Fri May 18 10:33:57.813 EDT
```

show l2vpn xconnect

```

Group g1, XC xc3, state is up; Interworking none
AC: GigabitEthernet0/0/0/4.2, state is up
Type VLAN; Num Ranges: 1
VLAN ranges: [2, 2]
MTU 1500; XC ID 0x2; interworking none
Statistics:
packets: received 0, sent 0
bytes: received 0, sent 0
drops: MTU exceeded 0, other 0
PW: neighbor 1111:2222::cdef, PW ID 1, state is up
PW class ts, XC ID 0x2
Encapsulation L2TPv3, protocol none
Source address 1111:2222::abcd
PW type Ethernet VLAN, control word disabled, interworking none
PW backup disable delay 0 sec
Sequencing not set
L2TP class not set, IPv6 source address 1111:2222::abcd
TOS 40 (reflect disabled), TTL 255, DF bit not set
Path MTU: disabled
L2TPv3 Local Remote
-----

```

```

Session 1 1
Cookie size 0 bytes 0 bytes
Cookie unassigned unassigned
-----

```

```

Create time: 18/05/2012 07:40:08 (04:12:49 ago)
Last time status changed: 18/05/2012 07:40:08 (04:12:49 ago)
Statistics:
packets: received 0, sent 0
bytes: received 0, sent 0
drops: out of sequence 0, other 0

```

This example shows the output of the **show l2vpn xconnect state** commands:

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

```

Fri May 18 10:36:45.913 EDT
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
-----
g1 xc3 UP Gi0/0/0/4.2 UP 1 UP
1111:2222::cdef
-----

```

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

```

Fri May 18 10:37:25.113 EDT
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
-----
g1 xc1 DN Gi0/0/0/4.3 UP 1.2.3.4 1 DN
-----

```

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

```

Fri May 18 10:37:30.610 EDT
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
-----

```



```
g1 xc2 UR Gi0/0/0/4.1 DN 1 UR  
aaaa:bbb::cdef
```

```
-----  
g1 xc4 UR Gi0/0/0/4.4 DN 1 UR  
1111:3333::4444  
-----
```

Related Commands

Command	Description
xconnect group, on page 159	Configures cross-connect groups.

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	<i>ipv6_address</i> 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 66	Enters p2p configuration submode to configure point-to-point cross-connects.
	neighbor (L2VPN), on page 49	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. <ul style="list-style-type: none"> • 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 <i>pps-value</i>	Configures the packets-per-second (pps) storm control threshold for the specified traffic type. Valid values range from 1 to 160000.
kbps <i>kbps-value</i>	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 Operations ID**

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)#
```

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 58	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.
<i>tos value</i>	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
```

Related Commands

Command	Description
pw-class (L2VPN), on page 58	Enters pseudowire class submode to define a pseudowire class template.
pw-class encapsulation l2tpv3, on page 59	Configures L2TPv3 pseudowire encapsulation.

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.
<i>passthrough</i>	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 58	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
```

Related Commands

Command	Description
pw-class (L2VPN), on page 58	Enters pseudowire class submode to define a pseudowire class template.

Command	Description
pw-class encapsulation l2tpv3, on page 59	Configures L2TPv3 pseudowire encapsulation.

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	<i>group-name</i> 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 133	Displays brief information on configured cross-connects.

