Virtual Private Network Commands

For detailed information about virtual private network concepts, configuration tasks, and examples, refer to the *Virtual Private Network Configuration Guide for Cisco CRS Routers*

authentication (L2TP)

To enable L2TP authentication for a specified L2TP class name, use the **authentication** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

authentication
no authentication

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

L2TP 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 You can also enable L2TP authentication for a specified class name from L2TP class configuration submode. To enter this submode, enter the **l2tp-class** command followed by the class name.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure L2TP authentication for the specified L2TP class name “cisco”:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)# authentication
```

Related Commands

Command	Description
hello-interval (L2TP), on page 16	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), on page 17	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), on page 18	Defines the name used in the L2TP hostname AVP.
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), on page 35	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), on page 44	Configures the receive window size for the L2TP server.
retransmit (L2TP), on page 45	Configures retransmit retry and timeout values.

backup disable (L2VPN)

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

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

Syntax Description

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

Command Default

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

Command Modes

L2VPN pseudowire class configuration

Command History

Release	Modification
Release 3.8.0	This command was introduced.
Release 5.2.1	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

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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# pw-class class1
RP/0/RP0/CPU0:router(config-l2vpn-pwc)# backup disable delay 50
RP/0/RP0/CPU0:router(config-l2vpn-pwc)# exit
RP/0/RP0/CPU0:router(config-l2vpn)# xconnect group A
RP/0/RP0/CPU0:router(config-l2vpn-xc)# p2p rtrx
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor 10.1.1.1 pw-id 2
```

```
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p-pw)# pw-class class1
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p-pw)# backup neighbor 10.2.2.2 pw-id 5
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p-pw-backup)#
```

Related Commands

Command	Description
l2vpn, on page 26	Enters L2VPN configuration mode.
neighbor (L2VPN), on page 33	Configures a pseudowire for a cross-connect.
p2p, on page 43	Enters p2p configuration submode to configure point-to-point cross-connects.
pw-class (L2VPN), on page 36	Enters pseudowire class submode to define a pseudowire class template.
xconnect group, on page 100	Configures cross-connect groups.

clear l2tp counters control session

To clear L2TP control counters for a session, use the **clear l2tp counters control session** command in EXEC mode.

clear l2tp counters control session fsm [{**event** | **state transition**}]

Syntax Description

fsm	(Optional) Clears finite state machine counters.
event	(Optional) Clears state machine event counters.
state	(Optional) Clears state machine state counters.
transition	(Optional) Clears state machine transition counters.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.7.0	This command was introduced.
Release 5.2.1	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

The following example shows how to clear all L2TP state machine transition counters:

```
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p-pw-backup)## clear l2tp counters control session
fsm state transition
```

Related Commands

Command	Description
clear l2tp counters control tunnel, on page 6	Clears L2TP control counters for a tunnel.
clear l2vpn counters l2tp, on page 9	Clears L2VPN statistical information, such as, packets dropped.

clear l2tp counters control tunnel

To clear L2TP control counters for a tunnel, use the **clear l2tp counters control tunnel** command in EXEC mode.

clear l2tp counters control tunnel {**all** | **authentication** | **id** *tunnel id*}

Syntax Description

all	Clears all L2TP counters, except authentication counters
authentication	Clears tunnel authentication counters.
id *tunnel id*	Clears a specified counter. Range is 1 to 4294967295.

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 all L2TP control tunnel counters:

```
RP/0/RP0/CPU0:router# clear l2tp counters control tunnel all
```

Related Commands

Command	Description
clear l2tp counters control session, on page 5	Clears L2TP control counters for a session.
clear l2vpn counters l2tp, on page 9	Clears L2VPN statistical information, such as, packets dropped.

clear l2tp tunnel

To clear L2TP tunnels, use the **clear l2tp tunnel** command in EXEC mode.

clear l2tp tunnel {**all** | **id** *tunnel id* | **l2tp-class** *class name* | **local ipv4** *ipv4 address* | **remote ipv4** *ipv4 address*}

Syntax Description

all	Clears all L2TP tunnels.
id *tunnel id*	Clears a specified tunnel.
l2tp-class *class name*	Clears all L2TP tunnels based on L2TP class name.
local ipv4 *ipv4 address*	Clears all local tunnels based on the specified local IPv4 address.
remote ipv4 *ipv4 address*	Clears all remote tunnels based on the specified local IPv4 address.

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 all L2TP tunnels:

```
RP/0/RP0/CPU0:router# clear l2tp tunnel all
```

Related Commands

Command	Description
clear l2tp counters control session, on page 5	Clears L2TP control counters for a session.
clear l2tp counters control tunnel, on page 6	Clears L2TP control counters for a tunnel.

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 3.4.0	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 change counters for L2VPN collaborators:

```
RP/0/RP0/CPU0:router# clear l2vpn collaborators
```

Related Commands

Command	Description
show l2vpn collaborators, on page 58	Displays information about the state of the interprocess communications connections between l2vpn_mgr and other processes.

clear l2vpn counters l2tp

To clear L2VPN statistical information, such as, packets dropped, use the **clear l2vpn counters l2tp** command in EXEC mode.

clear l2vpn counters l2tp [**neighbor** *ip-address* [**pw-id** *value*]]

Syntax Description

l2tp	Clears all L2TP counters.
neighbor *ip-address*	(Optional) Clears all L2TP counters for the specified neighbor.
pw-id *value*	(Optional) Configures the pseudowire ID. The range is from 1 to 4294967295.

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 all L2TP counters:

```
RP/0/RP0/CPU0:router# clear l2vpn counters l2tp
```

Related Commands

Command	Description
show l2vpn collaborators, on page 58	Displays information about the state of the interprocess communications connections between l2vpn_mgr and other processes.

clear l2vpn counters bridge mac-withdrawal

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

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.0	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 the MAC withdrawal statistics over all the bridges:

```
RP/0/RP0/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 3.4.0	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 L2VPN forwarding counters:

```
RP/0/RP0/CPU0:router# clear l2vpn forwarding counters
```

Related Commands

Command	Description
show l2vpn forwarding, on page 62	Displays forwarding information from the layer2_fib manager on the line card.

clear l2vpn forwarding mac-address-table

To clear L2VPN forwarding MAC address tables, use the **clear l2vpn forwarding mac-address-table** command in EXEC mode.

clear l2vpn forwarding mac-address-table {**address** *address* | **bridge-domain name** | **interface** *type interface-path-id* | **location** *node-id*}

Syntax Description

address	Clears a specified MAC address.
bridge-domain *name*	Clears bridge domains learned from a MAC address table.
type	(Optional) 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 interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
location *node-id*	Clears L2VPN forwarding message counters for the specified location. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.5.0	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, execute

Examples

The following example shows how to clear L2VPN forwarding MAC address tables on a specified node:

```
RP/0/RP0/CPU0:router# clear l2vpn forwarding mac-address location 1/1/1
```

Related Commands

Command	Description
show l2vpn forwarding, on page 62	Displays forwarding information from the layer2_fib manager on the line card.

clear l2vpn forwarding message counters

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

clear l2vpn forwarding message counters location *node-id*

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.5.0	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 L2VPN forwarding message counters on a specified node:

```
RP/0/RP0/CPU0:router# clear l2vpn forwarding message counters location 0/6/CPU0
```

Related Commands

Command	Description
show l2vpn forwarding, on page 62	Displays forwarding information from the layer2_fib manager on the line card.

clear l2vpn forwarding table

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

clear l2vpn forwarding table location *node-id*

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.4.0	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/RP0/CPU0:router# clear l2vpn forwarding table location 1/2/3/5
```

Related Commands

Command	Description
show l2vpn forwarding, on page 62	Displays forwarding information from the layer2_fib manager on the line card.

digest (L2TP)

To configure digest options, use the **digest** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

digest {**check disable** | **hash** {**MD5** | **SHA1**} | **secret** {**0** | **7***word*}}
no digest {**check disable** | **hash** {**MD5** | **SHA1**} | **secret** {**0** | **7***word*}}

Syntax Description

check disable	Disables digest checking.
hash {**MD5** | **SHA1**}	Configures the digest hash method (MD5 or SHA1). Default is MD5.
secret {**0** | **7** | *word*}	Configures a shared secret for message digest.

Command Default

check disable: Digest checking is enabled by default.

hash: Default is MD5 if the **digest** command is issued without the secret keyword option and L2TPv3 integrity checking is enabled.

Command Modes

L2TP 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.

The digest secret and hash algorithm can be configured in the l2tp-class configuration for authentication of the control channel. For control channel authentication to work correctly, however, both sides of the L2TP control channel connection must share a common secret and hash algorithm.

To update of digest secret without network disruption, Cisco supports a maximum to two digest secrets. You can configure a new secret while keeping the old secret valid. You can safely remove the old secret after you update all affected peer nodes with a new secret,

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure digest options for L2TP:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)# digest check disable
RP/0/RP0/CPU0:router(config-l2tp-class)# digest secret cisco hash md5
```

Related Commands

Command	Description
authentication (L2TP), on page 2	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), on page 16	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), on page 17	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), on page 18	Defines the name used in the L2TP hostname AVP.
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), on page 35	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), on page 44	Configures the receive window size for the L2TP server.

Command	Description
retransmit (L2TP), on page 45	Configures retransmit retry and timeout values.

hello-interval (L2TP)

To configure the hello-interval value for L2TP (duration between control channel hello packets), use the **hello interval (L2TP)** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

hello-interval *interval*
no hello-interval *interval*

Syntax Description

interval	Interval (in seconds) between control channel hello packets. The range is from 0 to 1000. Default is 60 seconds.

Command Default

interval: 60 seconds

Command Modes

L2TP 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.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure the hello-interval value for L2TP to 22 seconds:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)# hello-interval 22
```

Related Commands

Command	Description
authentication (L2TP), on page 2	Enables L2TP authentication for a specified L2TP class name.
hidden (L2TP), on page 17	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), on page 18	Defines the name used in the L2TP hostname AVP.

Command	Description
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), on page 35	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), on page 44	Configures the receive window size for the L2TP server.
retransmit (L2TP), on page 45	Configures retransmit retry and timeout values.

hidden (L2TP)

To enable hidden attribute-value pairs (AVPs), use the **hidden** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

hidden
no hidden

Syntax Description

This command has no arguments or keywords.

Command Default

None

Command Modes

L2TP 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.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to enable hidden AVPs:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)# hidden
```

Related Commands

Command	Description
authentication (L2TP), on page 2	Enables L2TP authentication for a specified L2TP class name.

Command	Description
hello-interval (L2TP), on page 16	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hostname (L2TP), on page 18	Defines the name used in the L2TP hostname AVP.
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), on page 35	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), on page 44	Configures the receive window size for the L2TP server.
retransmit (L2TP), on page 45	Configures retransmit retry and timeout values.

hostname (L2TP)

To define the name used in the L2TP hostname AVP, use the **hostname** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

hostname *name*
no hostname *name*

Syntax Description

name	Hostname used to identify the router during L2TP control channel authentication.

Command Default

None

Command Modes

L2TP 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.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure a hostname using the word “cisco”:

```
RP/0/RP0/CPU0:router# configure
```

```
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)# hostname cisco
```

Related Commands

Command	Description
authentication (L2TP), on page 2	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), on page 16	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), on page 17	Enables hidden attribute-value pairs (AVPs).
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), on page 35	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), on page 44	Configures the receive window size for the L2TP server.
retransmit (L2TP), on page 45	Configures retransmit retry and timeout values.

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 3.4.0	This command was introduced.

Release	Modification
Release 4.2.1	The following keywords were added: • **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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# xconnect group gr1
RP/0/RP0/CPU0:router(config-l2vpn-xc)# p2p p001
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p)# interface TenGigE 1/1/1/1
```

Related Commands

Command	Description
p2p, on page 43	Enters p2p configuration submode to configure point-to-point cross-connects.

l2tp-class

To enter L2TP class configuration mode where you can define an L2TP signaling template, use the **l2tp-class** command in global configuration mode. To delete the L2TP class, use the **no** form of this command.

l2tp-class *l2tp-class-name*
no l2tp-class *l2tp-class-name*

Syntax Description

l2tp-class-name	L2TP class name.

Command Default

No L2TP classes are defined.

Command Modes

Global 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 An L2TP class name must be defined before configuring L2TP control plane configuration settings.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to enter L2TP configuration mode to create a template of L2TP control plane configuration settings that can be inherited by different pseudowire classes (in this case, the word “cisco” is used):

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)#
```

l2transport

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

l2transport
no l2transport

This command has no arguments or keywords.

Command Default

None

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.4.0	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.

The l2transport command and these configuration items are mutually exclusive:

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

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

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

Ethernet Port Mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0
RP/0/RP0/CPU0:router(config-if)# l2transport
```

Ethernet VLAN Mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0.900 l2transport
RP/0/RP0/CPU0:router(config-if)# encapsulation dot1q 100do1q vlan 999
```

Ethernet VLAN Mode (QinQ):

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0.900 l2transport
RP/0/RP0/CPU0:router(config-if)# encapsulation dot1q 20 second-dot1q 10vlan 999 888
```

Ethernet VLAN Mode (QinAny):

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0.900 l2transport
RP/0/RP0/CPU0:router(config-if)# encapsulation dot1q 30 second-dot1q do1q vlan 999 any
```

Related Commands

Command	Description
show l2vpn forwarding, on page 62	Displays forwarding information from the layer2_fib manager on the line card.

l2transport l2protocol

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

l2transport l2protocol {**cdp** | **pvst** | **stp** | **vtp**} {**drop** | **experimental** *bits* | **tunnel experimental** *bits*}
no l2transport l2protocol {**cdp** | **pvst** | **stp** | **vtp**} {**drop** | **experimental** *bits* | **tunnel experimental** *bits*}

Syntax Description

cdp	Configures Cisco Discovery Protocol (CDP).
pvst	Configures Per VLAN Spanning Tree protocol (PVST).
stp	Configures Spanning Tree Protocol (STP).
vtp	Configures VLAN Trunk Protocol (VTP).
drop	Drops the selected protocol packets.
experimental *bits*	Modifies the MPLS experimental bits.
tunnel experimental *bits*	Configures tunnel protocol packets.

Command Default

None

Command Modes

Interface 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.

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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0
RP/0/RP0/CPU0:router(config-if)# l2transport l2protocol cpsv reverse-tunnelstp drop
```

Related Commands

Command	Description
show l2vpn forwarding, on page 62	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 3.6.0	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.

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 CRS Routers*

Note This command is supported on the following Cisco CRS Router SPA cards:

- Cisco 1-Port 10 Gigabit Ethernet Shared Port Adapter, Version 2
- Cisco 2-port, 5-port, 8-port, and 10-port Gigabit Ethernet Shared Port Adapters
- Cisco 2-, 5-, 8-, and 10-Port Gigabit Ethernet Shared Port Adapters, Version 2
- Cisco 1-Port 10 Gigabit Ethernet LAN/WAN-PHY Shared Port Adapter

Any port on 6-10GE-WLO-FLEX (irrespective of SPA or fixed) does not support the **l2transport propagate** command.

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface GigabitEthernet 0/0/0/0
RP/0/RP0/CPU0:router(config-if)# l2transport propagate remote remote-status
```

Related Commands

Command	Description
show l2vpn forwarding, on page 62	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 3.9.0	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
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 62	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 3.4.0	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 enter L2VPN configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)#
```

Related Commands

Command	Description
show l2vpn forwarding, on page 62	Displays forwarding information from the layer2_fib manager on the line card.

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 4.2.0	This command was introduced.
Release 4.3.2	The **code** keyword 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.

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.

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/RP0/CPU0:router#config
RP/0/RP0/CPU0:router(config)#l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)#pw-class p1
RP/0/RP0/CPU0:router(config-l2vpn-pwc)#encapsulation
RP/0/RP0/CPU0:router(config-l2vpn-pwc)#encapsulation mpls
RP/0/RP0/CPU0:router(config-l2vpn-pwc-mpls)#load-balancing
RP/0/RP0/CPU0:router(config-l2vpn-pwc-mpls)#load-balancing flow-label
RP/0/RP0/CPU0:router(config-l2vpn-pwc-mpls)#load-balancing flow-label both
RP/0/RP0/CPU0:router(config-l2vpn-pwc-mpls)#load-balancing flow-label both static
```

Related Commands

Command	Description
pw-class encapsulation mpls, on page 39	Configures MPLS pseudowire encapsulation.

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 3.5.0	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 cross-connect logging:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# logging pseudowire status
```

Related Commands

Command	Description
l2vpn, on page 26	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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# logging nsr
```

Related Commands

Command	Description
l2vpn, on page 26	Enters L2VPN configuration mode.

monitor-session (l2vpn)

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

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

Syntax Description

session-name	Name of the monitor session to configure.

Command Default

No default behavior or values

Command Modes

Point-to-point cross connect configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

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

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

Related Commands

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

mpls static label (L2VPN)

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

mpls static label local *label* **remote** *value*
no mpls static label local *label* **remote** *value*

Syntax Description

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

Command Default

The default behavior is a dynamic label assignment.

Command Modes

L2VPN cross-connect P2P pseudowire configuration

Command History

Release	Modification
Release 3.7.0	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 static labels for MPLS L2VPN:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RP0/CPU0:router(config-xc-p2p)# neighbor 10.1.1.2 pw-id 1000
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p-pw)# mpls static label local 800 remote 500
```

Related Commands

Command	Description
l2vpn, on page 26	Enters L2VPN configuration mode.
neighbor (L2VPN), on page 33	Configures a pseudowire for a cross-connect.
p2p, on page 43	Enters p2p configuration submode to configure point-to-point cross-connects.

Command	Description
xconnect group, on page 100	Configures cross-connect groups.

neighbor (L2VPN)

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

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

Syntax Description

A.B.C.D	IP address of the cross-connect peer.
pw-id *value*	Configures the pseudowire ID and ID value. Range is 1 to 4294967295.
tag-impose	Optional Specifies a tag during a VLAN ID configuration.

Command Default

None

Command Modes

p2p configuration submode

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.4.1	The **vccv disable** keyword was added.
Release 3.7.0	These keywords were removed: • **control-word** • **pw-static-label local** • **remote** • **vccv** • **transport-mode**
Release 4.2.1	The keyword **tag-impose** was introduced.

Usage Guidelines

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

A cross-connect may have two segments:

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

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

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RP0/CPU0:router(config-xc-p2p)# neighbor 10.1.1.2 pw-id 1000 pw-class class12
RP/0/RP0/CPU0:router(config-xc-p2p)# neighbor 10.1.1.3 pw-id 1001 pw-class class13
RP/0/RP0/CPU0:router(config-xc)# p2p rtrC_to_rtrD
RP/0/RP0/CPU0:router(config-xc-p2p)# neighbor 10.2.2.3 pw-id 200 pw-class class23
RP/0/RP0/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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn xconnect group l2vpn
RP/0/RP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RP0/CPU0:router(config-xc-p2p)# neighbor 10.1.1.2 pw-id 1000 pw-class foo
RP/0/RP0/CPU0:router(config-xc)# p2p rtrC_to_rtrD
RP/0/RP0/CPU0:router(config-xc-p2p)# neighbor 20.2.2.3 pw-id 200 pw-class bar1
```

Related Commands

Command	Description
l2vpn, on page 26	Enters L2VPN configuration mode.
p2p, on page 43	Enters p2p configuration submode to configure point-to-point cross-connects.
pw-class (L2VPN), on page 36	Enters pseudowire class submode to define a pseudowire class template.
xconnect group, on page 100	Configures cross-connect groups.

nsr (L2VPN)

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

nsr
no nsr

Syntax Description This command has no keywords or arguments.

Command Default None

Command Modes L2VPN configuration submode

Command History

Release	Modification
Release 4.3.0	This command was introduced.

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

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

Task ID

Task ID	Operation
l2vpn	read, write

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# nsr
```

Related Commands

Command	Description
l2vpn, on page 26	Enters L2VPN configuration mode.

password (L2TP)

To define the password and password encryption type for control channel authentication, use the **password** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

password [{**0** | **7**}] *password*
no password

Syntax Description

0	(Optional) Specifies that an unencrypted password will follow.
7	(Optional) Specifies that an encrypted password will follow.
password	Unencrypted or clear text user password.

Command Default None

Command Modes Global 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.

Task ID

Task ID	Operations
l2vpn	read, write

Examples The following example shows how to define an unencrypted password using the word “cisco” for control channel authentication:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class sanjose
RP/0/RP0/CPU0:router(config-l2tp-class)# password 0 cisco
```

Related Commands

Command	Description
authentication (L2TP), on page 2	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), on page 16	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), on page 17	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), on page 18	Defines the name used in the L2TP hostname AVP.
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
receive-window (L2TP), on page 44	Configures the receive window size for the L2TP server.
retransmit (L2TP), on page 45	Configures retransmit retry and timeout values.

pw-class (L2VPN)

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

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

Syntax Description

class-name	Pseudowire class name.

Command Default

None

Command Modes

L2VPN configuration submode

Command History

Release	Modification
Release 3.5.0	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 a simple pseudowire class template:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# xconnect group l1vpn
RP/0/RP0/CPU0:router(config-l2vpn-xc)# p2p rtrA_to_rtrB
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p)# neighbor 10.1.1.2 pw-id 1000
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p-pw)# pw-class kanata01
```

Related Commands

Command	Description
p2p, on page 43	Enters p2p configuration submode to configure point-to-point cross-connects.

pw-class encapsulation l2tpv3

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

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

Syntax Description

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

Command Default

None

Command Modes

L2VPN pseudowire class configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to define L2TPV3 pseudowire encapsulation:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RP0/CPU0:router(config-l2vpn-pwc)# encapsulation l2tpv3
```

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RP0/CPU0:router(config-l2vpn-pwc)# encapsulation l2tpv3
RP/0/RP0/CPU0:router(config-l2vpn-pwc-l2tpv3)# protocol l2tpv3
```

Related Commands

Command	Description
pw-class (L2VPN), on page 36	Enters pseudowire class submode to define a pseudowire class template.
pw-class encapsulation mpls, on page 39	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** | **sequencing** | **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** | **sequencing** | **tag-rewrite** | **transport-mode** | **vccv verification-type none**}

Syntax Description

class-name	Encapsulation class name.
control word	Disables control word for MPLS encapsulation. Disabled by default.
ipv4	Sets the local source IPv4 address.
load-balancing 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.
sequencing	Configures sequencing on receive or transmit.
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 3.5.0	This command was introduced.
Release 3.8.0	The keywords **control word disable** and **vccv none** were replaced by the keywords **control word** and **vccv verification-type none** .
Release 3.9.0	The following keywords were added: • **preferred-path** • **sequencing** • **tag-rewrite** • **transport-mode**
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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
```

Related Commands

Command	Description
pw-class (L2VPN), on page 36	Enters pseudowire class submode to define a pseudowire class template.
pw-class encapsulation l2tpv3, on page 37	Configures L2TPv3 pseudowire encapsulation.

pw-ether

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

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

Syntax Description

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

Command Default

None

Command Modes

Global configuration

p2p configuration

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

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

Task ID

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

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface pw-ether 78
RP/0/RP0/CPU0:router(config-if)#  attach generic-interface-list interfacelist1
```

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# xconnect group xc1
RP/0/RP0/CPU0:router(config-l2vpn-xc)#p2p grp1
RP/0/RP0/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/RP0/CPU0:router# configure
```

```
RP/0/RP0/CPU0:router(config)# interface pw-ether 78
RP/0/RP0/CPU0:router(config-if)# l2overhead 32
```

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface pw-ether 78
RP/0/RP0/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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface pw-ether 78
RP/0/RP0/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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface pw-ether 78
RP/0/RP0/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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface pw-ether 78
RP/0/RP0/CPU0:router(config-if)# mtu 128
```

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface pw-ether 78
RP/0/RP0/CPU0:router(config-if)# bandwidth 256
```

Related Commands

Command	Description
p2p, on page 43	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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# pw-grouping
```

Related Commands

Command	Description
l2vpn, on page 26	Enters L2VPN configuration mode.
show l2vpn, on page 55	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 3.4.0	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.

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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# xconnect group group 1
RP/0/RP0/CPU0:router(config-l2vpn-xc)# p2p xc1
```

Related Commands

Command	Description
interface (p2p), on page 19	Configures an attachment circuit.

receive-window (L2TP)

To configure the receive window size for the L2TP server, use the **receive-window** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

receive-window *size*
no receive-window *size*

Syntax Description

size	Maximum number of packets that are received from a peer before back-off is applied. Default is 512.

Command Default

size: 512

Command Modes

L2TP 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.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure the receive window size for the L2TP server to 10 packets:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)# receive-window 10
```

Related Commands

Command	Description
authentication (L2TP), on page 2	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), on page 16	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), on page 17	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), on page 18	Defines the name used in the L2TP hostname AVP.
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), on page 35	Defines the password and password encryption type for control channel authentication.
retransmit (L2TP), on page 45	Configures retransmit retry and timeout values.

retransmit (L2TP)

To configure retransmit retry and timeout values, use the **retransmit** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

retransmit {**initial** *initial-retries* | **retries** *retries* | **timeout** {**max** | **min**} *timeout*}
no retransmit {**initial** *initial-retries* | **retries** *retries* | **timeout** {**max** | **min**} *timeout*}

Syntax Description

initial *initial-retries*	Configures the number of SCCRQ messages resent before giving up on a particular control channel. Range is 1 to 1000. Default is 2.
retries *retries*	Configures the maximum number of retransmissions before determining that peer router does not respond. Range is 5 to 1000. Default is 15.
timeout {**max** | **min**} *timeout*	Configures the maximum and minimum retransmission interval in seconds for control packets. Range is 1 to 8. Maximum timeout default is 8 seconds. Minimum timeout default is 1 second.

Command Default

initial retries: 2

retries: 15

min timeout: 1

max timeout: 8

Command Modes

L2TP 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.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure a retransmit retry value to 1:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)# retransmit initial retries 1
```

Related Commands

Command	Description
authentication (L2TP), on page 2	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), on page 16	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), on page 17	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), on page 18	Defines the name used in the L2TP hostname AVP.
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), on page 35	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), on page 44	Configures the receive window size for the L2TP server.

rollover (L3VPN)

To configure rollover times for a tunnel-template, use the **rollover** command in tunnel encapsulation l2tp configuration mode. To return to the default behavior, use the **no** form of this command.

rollover periodic *time* **holdown** *time*
no rollover periodic *time* **holdown** *time*

Syntax Description

periodic *time*	Configures the periodic rollover time in seconds. Range is 60 to 31536000.
holddown*time*	Configures the holddown time for old session cookie values.

Command Default

None

Command Modes

tunnel encapsulation l2tp configuration

Command History

Release	Modification
Release 3.5.0	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.

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 how to configure rollover times for a tunnel-template:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# tunnel-template kanata_9
RP/0/RP0/CPU0:router(config-tuntem) encapsulation l2tp
RP/0/RP0/CPU0:router(config-tunencap-l2tp)# rollover
```

Related Commands

Command	Description
interface (p2p), on page 19	Configures an attachment circuit.

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/RP0/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/RP0/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/RP0/CPU0:router# show generic-interface-list standby
    Thu Aug 2 14:25:01.749 CDT
    generic-interface-list: nsrIL (ID: 0, interfaces: 2)
    Bundle-Ether2 - items pending 0, NOT downloaded to FIB
    GigabitEthernet0/0/0/1 - items pending 0, NOT downloaded to FIB
    Number of items: 0
    List is not downloaded to FIB
```

Related Commands

Command	Description
l2vpn, on page 26	Enters L2VPN configuration mode.

show l2tp class

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

show l2tp class name *name*

Syntax Description

name *name*	Configures an L2TP class name.

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 sample output for the **show l2vtp session class** command:

```
RP/0/RP0/CPU0:router# show l2tp class name kanata_02

l2tp-class kanata_02
  manually configured class
  configuration parameters:
     (not) hidden
     (no) authentication
     (no) digest
     digest check enable
     hello 60
     (no) hostname
     (no) password
     (no) accounting
     (no) security crypto-profile
     (no) ip vrf
     receive-window 888
     retransmit retries 15
     retransmit timeout max 8
     retransmit timeout min 1
     retransmit initial retries 2
     retransmit initial timeout max 8
```

```
retransmit initial timeout min 1
timeout setup 300
```

This table describes the significant fields shown in the display.

Table 1: show l2tp class brief Field Descriptions

Field	Description
l2tp-class	Shows the L2TP class name and the manner of its creation. For example, manually configured class.
configuration parameters	Displays a complete list and state of all configuration parameters.

Related Commands

Command	Description
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.

show l2tp counters forwarding session

To display L2TP forward session counters, use the **show l2tp counter forwarding session** command in EXEC mode.

show l2tp counters forwarding session [{**id** *identifier* | **name** *local-name remote-name*}]

Syntax Description

id *identifier*	(Optional) Configures the session counter identifier.
name *local-name remote name*	(Optional) Configures the local and remote names for a session counter.

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 sample output for the **show l2tp counters forwarding session** command:

```
RP/0/RP00/CPU0:router(config-l2vpn)# pw-class kanata01show l2tp counters
forwarding session

LocID       RemID       TunID       Pkts-In     Pkts-Out    Bytes-In    Bytes-Out
22112       15584       14332           0           0           0           0
```

This table describes the significant fields shown in the display.

Table 2: show l2tp counters forwarding session Field Descriptions

Field	Description
LocID	Local session ID.
RemID	Remote session ID.
TunID	Local Tunnel ID for this session.
Pkts-In	Number of packets input in the session.
Pkts-Out	Number of packets output in the session.
Bytes-In	Number of bytes input in the session.
Bytes-Out	Number of bytes output in the session.

Related Commands

Command	Description
#unique_59	

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 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 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 3: 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_59	

show l2tp tunnel

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

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

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

```
RP/0/RP0/CPU0:router(config-l2vpn-encap-mpls)# show l2tp tunnel brief
Tue Jun 10 12:46:04.421 UTC
LocTunID   RemTunID   Remote Name   State  Vrf Name    Remote Address  Sessn L2TP Class/Count
 VPDN Group
1487464659 2064960537 ASR9K-PE2     est                26.26.26.26     2     L2TPV3_CLASS
```

This table describes the significant fields shown in the display.

Table 4: 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/RP0/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 51	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/RP0/CPU0:router# show l2vpn
 Mon May  7 15:01:17.963 BST
 PW-Status: disabled
 PW-Grouping: disabled
 Logging PW: disabled
 Logging BD state changes: disabled
 Logging VFI state changes: disabled
 Logging NSR state changes: disabled
 TCN propagation: disabled
 PWOAMRefreshTX: 30s
```

Related Commands

Command	Description
l2vpn, on page 26	Enters L2VPN configuration mode.
pw-grouping, on page 42	Enables Pseudowire Grouping

show l2vpn atom-db

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

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read

Examples

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

```
RP/0/RP0/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:

```
RP/0/RP0/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 3.4.0	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 sample output for the **show l2vpn collaborators** command:

```
RP/0/RP0/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 5: 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.
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 8	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/RP0/CPU0:router# show l2vpn database ac
    Bundle-Ether1.1:
          Other-Segment MTU: 0
          Other-Segment status flags: 0x0
          Signaled capability valid: No
          Signaled capability flags: 0x0
          Configured capability flags: 0x0
          XCID: 0xffffffff
          PSN Type: Undefined
          ETH data:
              Xconnect tags: 0
              Vlan rewrite tag: 0
        AC defn:
            ac-ifname: Bundle-Ether1.1
            capabilities: 0x00368079
            extra-capabilities: 0x00000000
            parent-ifh: 0x020000e0
            ac-type: 0x15
            interworking: 0x00
        AC info:
            seg-status-flags: 0x00000000
            segment mtu/l2-mtu: 1504/1518

    GigabitEthernet0/0/0/0.4096:
          Other-Segment MTU: 0
          Other-Segment status flags: 0x0
          Signaled capability valid: No
          Signaled capability flags: 0x0
          Configured capability flags: 0x0
```

```
      XCID: 0x0
      PSN Type: Undefined
      ETH data:
          Xconnect tags: 0
          Vlan rewrite tag: 0
    AC defn:
        ac-ifname: GigabitEthernet0_0_0_0.4096
        capabilities: 0x00368079
        extra-capabilities: 0x00000000
        parent-ifh: 0x040000c0
        ac-type: 0x15
        interworking: 0x00
    AC info:
        seg-status-flags: 0x00000003
        segment mtu/l2-mtu: 1504/1518
```

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

```
RP/0/RP0/CPU0:router# show l2vpn database node
    0/RSP0/CPU0
        MA: vlan_ma

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


        MA: ether_ma

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



    0/0/CPU0
        MA: vlan_ma

         AC event trace history [Total events: 4]
         ----------------------------------------
         Time                Event                          Num Rcvd        Num Sent
         ====                =====                          ========        ========
         07/27/2012 15:00:31 Process joined                 0               0
         07/27/2012 15:00:31 Process init success           0               0
         07/27/2012 15:00:31 Replay start rcvd              0               0
         07/27/2012 15:00:40 Replay end rcvd                6006            6001


        MA: ether_ma

         AC event trace history [Total events: 4]
         ----------------------------------------
         Time                Event                          Num Rcvd        Num Sent
         ====                =====                          ========        ========
```

```
07/27/2012 15:00:31 Process joined               0              0
07/27/2012 15:00:31 Process init success         0              0
07/27/2012 15:00:31 Replay start rcvd            0              0
07/27/2012 15:00:31 Replay end rcvd              1              0
```

show l2vpn forwarding

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

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

Syntax Description

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

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.7.0	Sample output was updated to add MAC information for the layer2_fib manager summary.

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/RP0/CPU0:router# show l2vpn forwarding bridge detail location 0/2/cpu0
Bridge-domain name: bg1:bd1, id: 0, state: up
 MAC learning: enabled
 Flooding:
   Broadcast & Multicast: enabled
   Unknown unicast: enabled
 MAC aging time: 300 s, Type: inactivity
 MAC limit: 4000, Action: none, Notification: syslog
 MAC limit reached: no
 Security: disabled
 DHCPv4 snooping: profile not known on this node
 IGMP snooping: disabled, flooding: disabled
 Bridge MTU: 1500 bytes
 Number of bridge ports: 1
 Number of MAC addresses: 0
 Multi-spanning tree instance: 0

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

```
      packets: broadcast 0, multicast 0, unknown unicast 0
      bytes: broadcast 0, multicast 0, unknown unicast 0


Bridge-domain name: bg1:bd2, id: 1, state: up
  Type:  pbb-edge, I-SID: 1234
  Core-bridge: pbb-bd2
 MAC learning: enabled
 Flooding:
   Broadcast & Multicast: enabled
   Unknown unicast: enabled
 MAC aging time: 300 s, Type: inactivity
 MAC limit: 4000, Action: none, Notification: syslog
 MAC limit reached: no
 Security: disabled
 DHCPv4 snooping: profile not known on this node
 IGMP snooping: disabled, flooding: disabled
 Bridge MTU: 1500 bytes
 Number of bridge ports: 0
 Number of MAC addresses: 0
 Multi-spanning tree instance: 0

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

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

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

  PBB Core, state: up
  Vlan-id: 1

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

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

```
RP/0/RP0/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/RP0/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/RP0/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/RP0/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/RP0/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/RP0/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/RP0/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/RP0/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/RP0/CPU0:router #show l2vpn forwarding summary location 0/7/CPU0
 Major version num:1, minor version num:0
Shared memory timestamp:0x31333944cf
Number of forwarding xconnect entries:2
  Up:2  Down:0
  AC-PW:1 (1 mpls)  AC-AC:0  AC-BP:0  AC-Unknown:0
  PW-BP:0  PW-Unknown:0 Monitor-Session-PW:1
Number of xconnects down due to:
  AIB:0  L2VPN:0  L3FIB:0
Number of p2p xconnects: 2
Number of bridge-port xconnects: 0
```

```
Number of nexthops:1
  MPLS:   Bound:1  Unbound:0  Pending Registration:0
Number of bridge-domains: 0
Number of static macs: 0
Number of locally learned macs: 0
Number of remotely learned macs: 0
Number of total macs: 0
```

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

```
RP/0/RP0/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/RP0/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/RP0/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
```

Related Commands

Command	Description
clear l2vpn forwarding counters, on page 11	Clears L2VPN forwarding counters.

show l2vpn forwarding l2tp

To display L2VPN forwarding information, use the **show l2vpn forwarding l2tp** command in EXEC mode.

show l2vpn forwarding l2tp disposition {**local session id** *session-ID* | **hardware** | **location** *node-id*} **location** *node-id*

Syntax Description

disposition	Displays forwarding disposition information.
session-ID	Displays L2TPv3-related forwarding information for the specified local session ID. Range is 1-4294967295.
hardware	Displays L2TPv3-related forwarding information read from hardware.
location	Displays L2TPv3-related forwarding information 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

Examples

The following example shows sample output for the **show l2vpn forwarding l2tp** command:

```
RP/0/RP0/CPU0:router# show l2vpn forwarding l2tp disposition hardware location 0/3/1
```

```
ID   Segment 1         Segment 2
-----------------------------------
1    Gi0/2/0/0 1       1.1.1.1   9)
```

Related Commands

Command	Description
clear l2vpn forwarding counters, on page 11	Clears L2VPN forwarding counters.

show l2vpn generic-interface-list

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

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read

Examples

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

```
RP/0/RP0/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/RP0/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/RP0/CPU0:router# show l2vpn generic-interface-list name l1 detail
generic-interface-list: l1 (ID: 2, interfaces: 2)
   GigabitEthernet0/1/0/0 - items pending 2
   GigabitEthernet0/1/0/1 - items pending 4
   Number of items: 20
    PW-Ether 1-10, 12-21
```

show l2vpn index

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

show l2vpn index [{**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	Modification
Release 4.3.0	The following keywords are introduced: • 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/RP0/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/RP0/CPU0:router# show l2vpn index standby
    Pool id: 0xfffc0000, 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: 0xfffc0002, 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: 0xfffc0003, 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.

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/RP0/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 26	Enters L2VPN configuration mode.
#unique_68	

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/RP0/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/RP0/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 26	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

detail	(Optional) Displays detailed information.
location	(Optional) Displays location specific information.

name *class-name*	(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 3.5.0	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 ID	Operations
l2vpn	read

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

```
RP/0/RP0/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/RP0/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 6: show l2vpn pw-class Command Field Descriptions

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

Field	Description
Protocol	Displays the protocol type.

Related Commands

Command	Description
clear l2vpn forwarding counters, on page 11	Clears L2VPN forwarding counters.

show l2vpn pwhe

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

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 4.2.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read

Examples

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

```
RP/0/RP0/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/RP0/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 3.4.0	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

Examples

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

```
RP/0/RP0/CPU0:router# show l2vpn resource

Memory: Normal
```

describes the significant fields shown in the display.Table 7: show l2vpn resource Command Field Descriptions, on page 79

Table 7: 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/RP0/CPU0:router# show l2vpn trace
    310 unique entries (1775 possible, 0 filtered)
    Jul 27 14:39:51.786 l2vpn/fwd-detail 0/RSP0/CPU0 2# t1  FWD_DETAIL:415: l2tp session
table rebuilt
    Jul 27 14:39:52.106 l2vpn/issu 0/RSP0/CPU0 1# t1  ISSU:788: ISSU - iMDR init called;
'infra/imdr' detected the 'informational' condition 'the service is not supported in the
node'
    Jul 27 14:39:52.107 l2vpn/issu 0/RSP0/CPU0 1# t1  ISSU:428: ISSU - attempt to start
COLLABORATOR wait timer while not in ISSU mode
    Jul 27 14:39:54.286 l2vpn/fwd-common 0/RSP0/CPU0 1# t1  FWD_COMMON:3257: show edm thread
 initialized
    Jul 27 14:39:55.270 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC|ERR:783: Mac aging init
    Jul 27 14:39:55.286 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:1765: l2vpn_gsp_cons_init
 returned No error
    Jul 27 14:39:55.340 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:1792: Client successfully
 joined gsp group
    Jul 27 14:39:55.340 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:779: Initializing the
txlist IPC thread
    Jul 27 14:39:55.341 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:2971: gsp_optimal_msg_size
 = 4832 (real: True)
    Jul 27 14:39:55.351 l2vpn/fwd-mac 0/RSP0/CPU0 1# t1  FWD_MAC:626: Entering mac aging
timer init
```

show l2vpn xconnect

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

show l2vpn xconnect [{**brief** | **detail** | **encapsulation** | **group** | **groups** | **interface** | **location** | **mp2mp** | **mspw** | **neighbor** | **pw-class** | **standby** | **state** | **summary** | **type** | **state unresolved | pw-id** *value*}]

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 the interface and subinterface.
location	(Optional) Displays location specific information.
mp2mp	(Optional) Displays MP2MP information.
mspw	(Optional) Displays ms_pw information.
neighbor	(Optional) Filters the neighbor.
pw-class	(Optional) Filters on pseudowire class
standby	(Optional) Displays standby node specific information.
state	(Optional) Filters the following xconnect state types: • up • down
summary	(Optional) Displays AC information from the AC Manager database.
type	(Optional) Filters the following xconnect types: • ac-pw • locally switched
state unresolved	(Optional) Displays information about unresolved cross-connects.
pw-id *value*	Displays the filter for the pseudowire ID. The range is from 1 to 4294967295.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.4.0	This command was introduced.
Release 3.4.1	VCCV-related show command output was added.
Release 3.6.0	Preferred-path-related show command output was added.
Release 3.7.0	Sample output was updated to display the backup pseudowire information.
Release 4.3.0	The following keywords were introduced: • brief • encapsulation • groups • location • mp2mp • mspw • pw-class • 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 Managment (CFM) over l2vpn cross-connect, the CFM Continuity Check Messages (CCM) packets are not accounted for in the cross-connect pseudowire packet counters displayed in this show command output.

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/RP0/CPU0:router# show l2vpn xconnect
Wed May 21 09:06:47.944 UTC
Legend: ST = State, UP = Up, DN = Down, AD = Admin Down, UR = Unresolved,
        SB = Standby, SR = Standby Ready, (PP) = Partially Programmed

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

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

```
RP/0/RP0/CPU0:router# show l2vpn xconnect detail

Group siva_xc, XC siva_p2p, state is up; Interworking none
  Monitor-Session: pw-span-test, state is configured
  AC: GigabitEthernet0/4/0/1, state is up
    Type Ethernet
    MTU 1500; XC ID 0x5000001; interworking none; MSTi 0
    Statistics:
      packet totals: send 90
      byte totals: send 19056
  PW: neighbor 10.1.1.1, PW ID 1, state is up ( established )
    PW class not set, XC ID 0x5000001
    Encapsulation MPLS, protocol LDP
    PW type Ethernet, control word enabled, interworking none
    PW backup disable delay 0 sec
    Sequencing not set
        MPLS         Local                          Remote
      ------------ ------------------------------ ------------------------------
      Label        30005                          16003
      Group ID     0x5000300                      0x5000400
      Interface    GigabitEthernet0/4/0/1         GigabitEthernet0/4/0/2
       Interface   pw-span-test                 GigabitEthernet0/3/0/1
      MTU          1500                           1500
      Control word enabled                        enabled
      PW type      Ethernet                       Ethernet
      VCCV CV type 0x2                            0x2
                   (LSP ping verification)        (LSP ping verification)
      VCCV CC type 0x3                            0x3
                    (control word)                 (control word)
                   (router alert label)           (router alert label)
      ------------ ------------------------------ ------------------------------
    Create time: 20/11/2007 21:45:07 (00:49:18 ago)
    Last time status changed: 20/11/2007 21:45:11 (00:49:14 ago)
    Statistics:
      packet totals: receive 0
      byte totals: receive 0

  Backup PW:
  PW: neighbor 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 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/RP0/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/RP0/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/RP0/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/RP0/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:
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                            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 21:45:44 (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/RP0/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                            0x2
                   (LSP ping verification)        (LSP ping verification)
      VCCV CC type 0x6                            0x6
                   (router alert label)           (router alert label)
                   (TTL expiry)                   (TTL expiry)
      ------------ ------------------------------ ------------------------------
Incoming Status (PW Status TLV):
Status code: 0x0 (Up) in Notification message
Outgoing Status (PW Status TLV):
Status code: 0x0 (Up) in Notification message
MIB cpwVcIndex: 4294705365
Create time: 21/09/2011 08:05:01 (00:14:01 ago)
Last time status changed: 21/09/2011 08:07:01 (00:12:01 ago)
Statistics:
packets: received 1336, sent 26392092
bytes: received 297928, sent 1583525520
```

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

```
RP/0/RP0/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                          unknown
      Group ID     0x2000600                      0x0
      Interface    PW-Ether1              unknown
      MTU          1500                           unknown
      Control word disabled                       unknown
      PW type      Ethernet VLAN                  unknown
      VCCV CV type 0x2                            0x0
                                                  (none)
                   (LSP ping verification)
```

```
      VCCV CC type 0x6                            0x0
                                                  (none)
                   (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/RP0/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 8: 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).

Related Commands

Command	Description
xconnect group, on page 100	Configures cross-connect groups.

show tunnel-template

To display tunnel template information, use the **show tunnel-template** command in the EXEC mode.

show tunnel-template *template-name*

Syntax Description

template-name	Name of the tunnel template.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

Task ID

Task ID	Operation
tunnel	read

Example

The following example shows the output of the **show tunnel-template test** command for Local PE Tunnel:

```
RP/0/RP0/CPU0:router# show tunnel-template test
Fri Jan 30 06:22:46.428 UTC

Tunnel template
--------------------------------------------------
Name:       test (ifhandle: 0x00080030)
MTU:        1464
TTL:        255
TOS:        0
Tunnel ID:  1
Source:     25.25.25.25
Session ID: 0x1D174108 Cookie: 8 bytes [0x24FD3ADAA4485333] being rolled into
    Session ID: 0x15A86E93 Cookie: 8 bytes [0xF486195660CCD522]
Next Session-id/Cookie rollover happens in 1 minute 49 seconds
Transmit:        14213298 pkts  1250770344 bytes
Cookie Mismatch: 0 pkts
MTU Violation:   0 pkts
```

The following example shows the output of the **show tunnel-template test** command for Remote PE Tunnel:

```
RP/0/RP0/CPU0:router# show tunnel-template test
Fri Jan 30 06:04:29.800 UTC

Tunnel template
--------------------------------------------------
Name:       test (ifhandle: 0x00080030)
MTU:        600
TTL:        255
TOS:        0
```

```
Tunnel ID:  1
Source:     35.35.35.35    Address Pool: 36.36.36.0/28
Session ID: 0x111F4312 Cookie: 8 bytes [0xB95A806145BE9BE7]
Transmit:        122168722 pkts  10750845295 bytes
Cookie Mismatch: 0 pkts
MTU Violation:   0 pkts
```

Related Commands

Command	Description
tunnel-template, on page 99	Enters tunnel-template configuration submode.

storm-control

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

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

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

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

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

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

Syntax Description

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

kbps *kbps-value*	Configures the storm control in kilo bits per second (kbps). The range is from 64 to 1280000.

Command Default

Storm control is disabled by default.

Command Modes

l2vpn bridge group bridge-domain access circuit configuration

Command History

Release	Modification
Release 3.7.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

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

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

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

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

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

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

Running Configuration

```
l2vpn
 bridge group BG1
  bridge-domain BD1
   storm-control unknown-unicast pps 100
   storm-control multicast pps 100
   storm-control broadcast pps 100
  !
  bridge-domain BD2
   interface Bundle-Ether9001.2001
    storm-control unknown-unicast pps 100
    storm-control multicast pps 100
    storm-control broadcast pps 100
   !
   neighbor 10.1.1.1 pw-id 20011001
    storm-control unknown-unicast pps 100
    storm-control multicast pps 100
    storm-control broadcast pps 100
   !
  !
 !
!
end
RP/0/RSP0/CPU0:a9k1(config)#
```

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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# xconnect group xc1
RP/0/RP0/CPU0:router(config-l2vpn-xc)#p2p grp1
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p)#neighbor 10.1.1.2 pw-id 78
RP/0/RP0/CPU0:router(config-l2vpn-xc-p2p-pw)#tag-impose vlan 8
```

Related Commands

Command	Description
pw-class (L2VPN), on page 36	Enters pseudowire class submode to define a pseudowire class template.

tag-rewrite

To configure VLAN tag rewrite, use the **tag-rewrite** command in Encapsulation MPLS configuration mode. To disable VLAN tag rewrite, use the **no** form of this command.

tag-rewrite ingress vlan *vlan-id*
no tag-rewrite ingress vlan *vlan-id*

Syntax Description

ingress	Configures ingress mode.
vlan	Configures VLAN tagged mode
vlan-id	Specifies the value of the ID of the VLAN.

Command Default

None

Command Modes

Encapsulation MPLS configuration

Command History

Release	Modification
Release 3.6.0	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.

The **tag-rewrite** command is applicable only to pseudowires with MPLS encapsulation.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure preferred-path tunnel settings:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
RP/0/RP0/CPU0:router(config-l2vpn-pwc-encap-mpls)# tag-rewrite vlan 2000
RP/0/RP0/CPU0:router(config-l2vpn-pwc-encap-mpls)#
```

Related Commands

Command	Description
show l2vpn xconnect, on page 80	Displays brief information on configured cross-connects.

timeout setup (L2TP)

To configure timeout definitions for L2TP session setup, use the **timeout setup** command in L2TP class configuration mode. To return to the default behavior, use the **no** form of this command.

timeout setup *seconds*
no timeout setup *seconds*

Syntax Description

seconds	Time, in seconds, to setup a control channel. Range is 60 to 6000 seconds. Default is 300 seconds.

Command Default

seconds: 300

Command Modes

L2TP 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.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

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

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2tp-class cisco
RP/0/RP0/CPU0:router(config-l2tp-class)# timeout setup 400
```

Related Commands

Command	Description
authentication (L2TP), on page 2	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), on page 16	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), on page 17	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), on page 18	Defines the name used in the L2TP hostname AVP.
l2tp-class, on page 20	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), on page 35	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), on page 44	Configures the receive window size for the L2TP server.
retransmit (L2TP), on page 45	Configures retransmit retry and timeout values.
show l2tp session, on page 51	Displays information about L2TP sessions.
show l2tp tunnel, on page 53	Displays information about L2TP tunnels.

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

Syntax Description

ethernet	Configures Ethernet port mode.

vlan	Configures VLAN tagged mode.

Command Default None

Command Modes L2VPN pseudowire class MPLS encapsulation

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 This example shows how to configure Ethernet transport mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# pw-class kanata01
RP/0/RP0/CPU0:router(config-l2vpn-pw)# encapsulation mpls
RP/0/RP0/CPU0:router(config-l2vpn-encap-mpls)# transport-mode ethernet
```

Related Commands

Command	Description
pw-class (L2VPN), on page 36	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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# bridge group bg1
RP/0/RP0/CPU0:router(config-l2vpn-bg)# bridge-domain bd1
RP/0/RP0/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.

tunnel-template

To enter tunnel-template configuration submode, use the **tunnel-template** command in global configuration mode.

tunnel-template *template name*
no tunnel-template *template-name*

Syntax Description

template-name	Configures a name for the tunnel template.

Command Default None

Command Modes Global configuration

Command History

Release	Modification
Release 3.5.0	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
tunnel	read, write

Examples The following example shows how to enter tunnel-template configuration submode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# tunnel-template template_01
```

Related Commands

Command	Description
xconnect group, on page 100	Configures cross-connect groups.

xconnect group

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

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

Syntax Description

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

Command Default None

Command Modes L2VPN configuration

Command History

Release	Modification
Release 3.4.0	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 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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# l2vpn
RP/0/RP0/CPU0:router(config-l2vpn)# xconnect group customer_atlantic
```

Related Commands

Command	Description
show l2vpn xconnect, on page 80	Displays brief information on configured cross-connects.