Virtual Private Network Commands

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

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 the proper task IDs. If you suspect 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), page 21	Configures the hello-interval value for L2TP (duration between control channel hello packets).

Command	Description
hidden (L2TP), page 23	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), page 25	Defines the name used in the L2TP hostname AVP.
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), page 43	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), page 55	Configures the receive window size for the L2TP server.
retransmit (L2TP), page 57	Configures retransmit retry and timeout values.

backup disable (L2VPN)

To specify how long a backup pseudowire should wait before resuming operation after the primary pseudowire goes down, 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 primary pseudowire becomes nonfunctional before the Cisco IOS XR software attempts to activate the secondary 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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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, page 37	Enters L2VPN configuration mode.
neighbor (L2VPN), page 41	Configures a pseudowire for a cross-connect.
p2p, page 53	Enters p2p configuration submode to configure point-to-point cross-connects.
pw-class (L2VPN), page 47	Enters pseudowire class submode to define a pseudowire class template.
xconnect group, page 95	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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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, page 9	Clears L2TP control counters for a tunnel.

Command	Description
clear l2vpn counters l2tp, page 12	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 the proper task IDs. If you suspect 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, page 7	Clears L2TP control counters for a session.
clear l2vpn counters l2tp, page 12	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 the proper task IDs. If you suspect 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, page 7	Clears L2TP control counters for a session.
clear l2tp counters control tunnel, page 9	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 the proper task IDs. If you suspect 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, page 68	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 the proper task IDs. If you suspect 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, page 68	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 the proper task IDs. If you suspect 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 the proper task IDs. If you suspect 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, page 70	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 the proper task IDs. If you suspect 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 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, page 70	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 the proper task IDs. If you suspect 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, page 70	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 the proper task IDs. If you suspect 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, page 70	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 the proper task IDs. If you suspect 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), page 3	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), page 21	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), page 23	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), page 25	Defines the name used in the L2TP hostname AVP.
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), page 43	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), page 55	Configures the receive window size for the L2TP server.
retransmit (L2TP), page 57	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 the proper task IDs. If you suspect 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), page 3	Enables L2TP authentication for a specified L2TP class name.
hidden (L2TP), page 23	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), page 25	Defines the name used in the L2TP hostname AVP.

Command	Description
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), page 43	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), page 55	Configures the receive window size for the L2TP server.
retransmit (L2TP), page 57	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 the proper task IDs. If you suspect 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), page 3	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), page 21	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hostname (L2TP), page 25	Defines the name used in the L2TP hostname AVP.
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.

Command	Description
password (L2TP), page 43	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), page 55	Configures the receive window size for the L2TP server.
retransmit (L2TP), page 57	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 the proper task IDs. If you suspect 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), page 3	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), page 21	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), page 23	Enables hidden attribute-value pairs (AVPs).

Command	Description
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), page 43	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), page 55	Configures the receive window size for the L2TP server.
retransmit (L2TP), page 57	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*

no interface *type interface-path-id*

Syntax Description

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

Command Default

None

Command Modes

p2p configuration submode

Command History

Release	Modification
Release 3.4.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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, page 53	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 the proper task IDs. If you suspect 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 the proper task IDs. If you suspect 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, page 70	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 the proper task IDs. If you suspect 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, page 70	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 the proper task IDs. If you suspect 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

To display the state of l2transport events, use the show controller internal command in *Cisco IOS XR Interface and Hardware Component Configuration Guide for the Cisco CRS Router*

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

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, page 70	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 the proper task IDs. If you suspect 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, page 70	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 the proper task IDs. If you suspect 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, page 70	Displays forwarding information from the layer2_fib manager on the line card.

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 the proper task IDs. If you suspect 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, page 37	Enters L2VPN configuration mode.

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 the proper task IDs. If you suspect 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, page 37	Enters L2VPN configuration mode.

Command	Description
neighbor (L2VPN), page 41	Configures a pseudowire for a cross-connect.
p2p, page 53	Enters p2p configuration submode to configure point-to-point cross-connects.
xconnect group, page 95	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*

no neighbor *A.B.C.D* **pw-id** *value*

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.

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	The following keywords were removed: • **control-word** • **pw-static-label local** • **remote** • **vccv** • **transport-mode**

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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 a neighbor only.

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

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 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
```

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 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, page 37	Enters L2VPN configuration mode.
p2p, page 53	Enters p2p configuration submode to configure point-to-point cross-connects.
pw-class (L2VPN), page 47	Enters pseudowire class submode to define a pseudowire class template.
xconnect group, page 95	Configures cross-connect groups.

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 the proper task IDs. If you suspect 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), page 3	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), page 21	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), page 23	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), page 25	Defines the name used in the L2TP hostname AVP.
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.
receive-window (L2TP), page 55	Configures the receive window size for the L2TP server.
retransmit (L2TP), page 57	Configures retransmit retry and timeout values.

preferred-path

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

preferred-path interface tunnel-te *value* [**fallback disable**]

no preferred-path interface tunnel-te *value* [**fallback disable**]

Syntax Description

interface	Specifies the interface for the preferred path.
tunnel-te	Specifies the tunnel interface name for the preferred path.
value	Tunnel number for preferred path.
fallback disable	(Optional) Disables fallback for preferred path tunnel settings.

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 the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

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

Cisco IOS XR software supports only **fallback disable**. Traffic does not use the default LDP path if the tunnel is down.

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

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

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)# interfacetunnel-te 56 tunnel 6666fallback
 disable
```

Related Commands

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

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 the proper task IDs. If you suspect 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, page 53	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*]

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 the proper task IDs. If you suspect 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
```

Related Commands

Command	Description
pw-class (L2VPN), page 47	Enters pseudowire class submode to define a pseudowire class template.
pw-class encapsulation mpls, page 51	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 return to the default behavior, use the **no** form of this command.

pw-class *class-name* **encapsulation mpls** {**control word**| **preferred-path**| **protocol ldp**| **sequencing**| **tag-rewrite**| **transport-mode**| **vccv verification-type none**}

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

Syntax Description

class-name	Configures an encapsulation class name.
control word	Disables control word for MPLS encapsulation. The **control word** keyword is disabled by default.
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**

Release	Modification
	• **transport-mode**

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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 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), page 47	Enters pseudowire class submode to define a pseudowire class template.
pw-class encapsulation l2tpv3, page 49	Configures L2TPv3 pseudowire encapsulation.

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 the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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), page 27	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 the proper task IDs. If you suspect 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), page 3	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), page 21	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), page 23	Enables hidden attribute-value pairs (AVPs).

Command	Description
hostname (L2TP), page 25	Defines the name used in the L2TP hostname AVP.
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), page 43	Defines the password and password encryption type for control channel authentication.
retransmit (L2TP), page 57	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 the proper task IDs. If you suspect 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), page 3	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), page 21	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), page 23	Enables hidden attribute-value pairs (AVPs).
hostname (L2TP), page 25	Defines the name used in the L2TP hostname AVP.
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), page 43	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), page 55	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 the proper task IDs. If you suspect 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), page 27	Configures an attachment circuit.

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 the proper task IDs. If you suspect 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, page 29	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 the proper task IDs. If you suspect 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.

Field	Description
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
show l2tp tunnel, page 66	Displays information about L2TP tunnels.

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 the proper task IDs. If you suspect 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 l2vtp session brief** command:

```
RP/0/RP00/CPU0:router(config-l2vpn-pw)# encapsulation mplsshow l2tp session brief
```

```
L2TP Session Information Total tunnels 1 sessions 6

LocID       TunID       Peer-address    State      Vcid
                                        sess/cir
26093       43554       13.0.0.2        est,UP      60
26094       43554       13.0.0.2        est,UP      40
26095       43554       13.0.0.2        est,UP      50
26096       43554       13.0.0.2        est,UP      70
26097       43554       13.0.0.2        est,UP      20
26098       43554       13.0.0.2        est,UP      30
```

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.

Related Commands

Command	Description
show l2tp tunnel, page 66	Displays information about L2TP tunnels.

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 the proper task IDs. If you suspect 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** command:

```
RP/0/RP0/CPU0:router(config-l2vpn-encap-mpls)# sequencing bothshow l2tp tunnel

L2TP Tunnel Information Total tunnels 1 sessions 6

LocID RemID Remote Name   State  Remote Address  Port  Sessions L2TP Class
43554 6220  PE2           est    13.0.0.2        0     6        foo
```

This table describes the significant fields shown in the display.

Table 4: show l2tp tunnel Field Descriptions

Field	Description
LocID	Local session ID.
RemID	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.

Related Commands

Command	Description
show l2tp session, page 64	Displays information about L2TP sessions.

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 the proper task IDs. If you suspect 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.

Field	Description
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, page 11	Clears the state change counters for L2VPN collaborators.

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

Syntax Description

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

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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 sample output is from the **show l2vpn forwarding bridge detail location** command:

```
RP/0/RP0/CPU0:router# show l2vpn forwarding 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 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
….
```

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
```

Related Commands

Command	Description
clear l2vpn forwarding counters, page 14	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 the proper task IDs. If you suspect 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, page 14	Clears L2VPN forwarding counters.

show l2vpn pw-class

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

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

Syntax Description

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

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.5.0	This command was introduced.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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 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.

Field	Description
Encapsulation	Displays the encapsulation type.
Protocol	Displays the protocol type.

Related Commands

Command	Description
clear l2vpn forwarding counters, page 14	Clears L2VPN forwarding counters.

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 the proper task IDs. If you suspect 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, page 79

Table 7: show l2vpn resource Command Field Descriptions

Field	Description
Memory	Displays memory status.

show l2vpn xconnect

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

show l2vpn xconnect [**detail**| **group**| **interface**| **neighbor**| **state**| **summary**| **type**| **state unresolved**]

Syntax Description

brief	(Optional) Displays encapsulation brief information.
detail	(Optional) Displays detailed information.
encapsulation	(Optional) Filters on encapsulation type.
group	(Optional) Displays all cross-connects in a specified group.
groups	(Optional) Displays all groups information.
interface	(Optional) Filters on interface and subinterface.
mp2mp	(Optional) Displays MP2MP information.
mpsw	(Optional) Displays ms_pw information.
neighbor	(Optional) Filters on neighbor.
private	(Optional) Displays private information.
pw-class	(Optional) Filters on pseudowire class
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 • monitor-session-pw • ms-pw

Syntax Description

detail	(Optional) Displays detailed information.

group	(Optional) Displays all cross-connects in a specified group.
interface	(Optional) Filters the interface and subinterface.
neighbor	(Optional) Filters the neighbor.
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.

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.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect 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.

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

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

siva_xc    siva_p2p   UP    Gi0/4/0/1               UP   10.1.1.1          1      UP
                                                         Backup
                                                         10.2.2.2          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
  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 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, page 95	Configures cross-connect groups.

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 the proper task IDs. If you suspect 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, 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 the proper task IDs. If you suspect 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), page 3	Enables L2TP authentication for a specified L2TP class name.
hello-interval (L2TP), page 21	Configures the hello-interval value for L2TP (duration between control channel hello packets).
hidden (L2TP), page 23	Enables hidden attribute-value pairs (AVPs).

Command	Description
hostname (L2TP), page 25	Defines the name used in the L2TP hostname AVP.
l2tp-class, page 29	Enters L2TP class configuration mode where you can define an L2TP signaling template.
password (L2TP), page 43	Defines the password and password encryption type for control channel authentication.
receive-window (L2TP), page 55	Configures the receive window size for the L2TP server.
retransmit (L2TP), page 57	Configures retransmit retry and timeout values.
show l2tp session, page 64	Displays information about L2TP sessions.
show l2tp tunnel, page 66	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 return to the default behavior, 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 3.5.0	This command was introduced.
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 the proper task IDs. If you suspect 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 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 transport-mode ethernet
```

Related Commands

Command	Description
pw-class (L2VPN), page 47	Enters pseudowire class submode to define a pseudowire class template.

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 the proper task IDs. If you suspect 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, page 95	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 the proper task IDs. If you suspect 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, page 80	Displays brief information on configured cross-connects.