



Virtual Private LAN Services Commands on Cisco IOS XR Software

This chapter describes the commands used to configure, monitor, and troubleshoot Virtual Private LAN Services (VPLS).

For detailed information about MPLS concepts, configuration tasks, and examples, refer to the *Cisco IOS XR MPLS Configuration Guide*.

action (VPLS)

To configure the bridge behavior when the number of learned MAC addresses exceed the MAC limit configured, use the **action** command in l2vpn bridge group bridge domain MAC limit configuration mode. To disable this feature, use the **no** form of this command.

action {flood | no-flood | shutdown}

no action {flood | no-flood | shutdown}

Syntax Description

flood	Configures the action to flood all unknown unicast packets when the MAC limit is reached. If the action is set to flood, all unknown unicast packets are flooded over the bridge.
no-flood	Configures the action to no-flood so all unknown unicast packets are dropped when the MAC limit is reached. If the action is set to no-flood, all unknown unicast packets are dropped.
shutdown	Stops forwarding when the MAC limit is reached. If the action is set to shutdown, all packets are dropped.

Defaults

No action is taken when the MAC address limit is reached.

Command Modes

l2vpn bridge group bridge domain MAC limit configuration

Command History

Release	Modification
Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **action** command to specify the type of action to be taken when the action is violated.

The configured action has no impact if the MAC limit has not been reached.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure the bridge bar to flood all unknown unicast packets when more than 10 MACs are learned on the bridge:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
```

```
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# limit
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-limit)# action flood
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-limit)# maximum 10
```

Related Commands	Command	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	limit (VPLS)	Sets the MAC address limit for action, maximum, and notification and enters l2vpn bridge group bridge domain MAC limit configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.
	maximum (VPLS)	Configures the specified action when the number of MAC addresses learned on a bridge is reached.
	notification (VPLS)	Specifies the type of notification that is sent when the number of learned MAC addresses exceeds the configured limit.

aging (VPLS)

To enter the MAC aging configuration submode to set the aging parameters such as time and type, use the **aging** command in l2vpn bridge group bridge domain configuration mode. To return to the default value for all parameters that are attached to this configuration submode, use the **no** form of this command.

aging

no aging

Syntax Description This command has no arguments or keywords.

Defaults No defaults are attached to this parameter since it is used as a configuration submode. See the defaults that are assigned to the [time \(VPLS\)](#) and the [type \(VPLS\)](#) parameters.

Command Modes l2vpn bridge group bridge domain configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **aging** command to enter l2vpn bridge group bridge domain MAC aging configuration mode.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to enter MAC aging configuration submode and to set the MAC aging time to 120 seconds:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# aging
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-aging)# time 120
```

Related Commands	Commands	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.
	time (VPLS)	Configures the maximum aging time.
	type (VPLS)	Configures the type for MAC address aging.

bridge-domain (VPLS)

To establish a bridge domain and to enter l2vpn bridge group bridge domain configuration mode, use the **bridge-domain** command in l2vpn bridge group configuration mode. To return to a single bridge domain, use the **no** form of this command.

bridge-domain *bridge-domain name*

no bridge-domain *bridge-domain name*

Syntax Description

bridge-domain name Name of the bridge domain.

Defaults

The default value is a single bridge domain.

Command Modes

l2vpn bridge group configuration

Command History

Release	Modification
Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **bridge-domain** command to enter l2vpn bridge group bridge domain configuration mode.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure a bridge domain:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)#
```

Related Commands

Commands	Description
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
l2vpn	Enters L2VPN configuration mode.

bridge group (VPLS)

To create a bridge group so that it can contain bridge domains and then to assign network interfaces to the bridge domain, use the **bridge group** command in l2vpn configuration mode. To remove all the bridge domains that are created under this bridge group and to remove all network interfaces that are assigned under this bridge group, use the **no** form of this command.

bridge group *bridge group name*

no bridge-group *bridge group name*

Syntax Description	<i>bridge group name</i>	Number of the bridge group to which the interface belongs. The range is from 1 to 255.
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Defaults	No bridge group is created.
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Command Modes	l2vpn configuration
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Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
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Use the **bridge group** command to enter l2vpn bridge group configuration mode.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following example shows that bridge group 1 is assigned:
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```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)#
```

■ bridge group (VPLS)

Related Commands	Command	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	l2vpn	Enters L2VPN configuration mode.

clear l2vpn bridge-domain (VPLS)

To clear the MAC addresses and to restart the bridge domains on the router, use the **clear l2vpn bridge-domain** command in EXEC mode.

```
clear l2vpn bridge-domain {all | bd-name name | group group}
```

Syntax Description	all	Clears and restarts all the bridge domains on the router.
	bd-name <i>name</i>	Clears and restarts the specified bridge domain. The <i>name</i> argument specifies the name of the bridge-domain.
	group <i>group</i>	Clears and restarts all the bridge domains that are part of the bridge group.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

This is the method that allows a bridge to forward again after it was put in Shutdown state as a result of exceeding the configured MAC limit.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to clear all the MAC addresses and to restart all the bridge domains on the router:

```
RP/0/0/CPU0:router# clear l2vpn bridge-domain all
```

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

flooding disable (VPLS)

To configure flooding for traffic at the bridge domain level or at the bridge port level, use the **flooding disable** command in l2vpn bridge group bridge domain configuration mode. To return the bridge to normal flooding behavior when all unknown unicast packets, all broadcast packets, and all multicast packets are flooded over all other bridge domain network interfaces, use the **no** form of this command.

flooding disable

no flooding disable

Syntax Description This command has no arguments or keywords.

Defaults The default behavior is that packets are flooded when their destination MAC address is not found.

Command Modes l2vpn bridge group bridge domain configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **flooding disable** command to override the parent bridge configuration.

By default, bridge ports inherit the flooding behavior of the bridge domain.

When flooding is disabled, all unknown unicast packets, all broadcast packets, and all multicast packets are discarded.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to disable flooding on the bridge domain called bar:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# flooding disable
```

Related Commands	Command	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mtu (VPLS)	Adjusts the maximum packet size or maximum transmission unit (MTU) size for the bridge domain.

interface (VPLS)

To add an interface to a bridge domain that allows packets to be forwarded and received from other interfaces that are part of the same bridge domain, use the **interface** command in l2vpn bridge group bridge domain configuration mode. To remove an interface from a bridge domain, use the **no** form of this command.

interface *interface name*

no interface*interface name*

Syntax Description	<i>interface name</i>	Configures the name of the interface or attachment circuit in <i>rack/slot/instance/port</i> format.
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Defaults	No default behavior or values
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Command Modes	l2vpn bridge group bridge domain configuration
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Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
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Use the **interface** command to enter l2vpn bridge group bridge domain attachment circuit configuration mode. In addition, the **interface** command enters the interface configuration submode to configure parameters specific to the interface.

By default, an interface is not part of a bridge.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following example shows how to configure the bundle Ethernet interface as an attachment circuit:
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```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# interface bundle-ether 5
RP/0/0/CPU0:router(config-l2vpn-bg-bd-ac)#
```

Related Commands	Command	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.

learning disable (VPLS)

To override the MAC learning configuration of a parent bridge or to set the MAC learning configuration of a bridge, use the **learning disable** command in l2vpn bridge group bridge domain MAC configuration mode. To disable this feature, use the **no** form of this command.

learning disable

no learning disable

Syntax Description This command has no arguments or keywords.

Defaults By default, learning is enabled on all bridge domains and all interfaces on that bridge inherits this behavior.

Command Modes l2vpn bridge group bridge domain MAC configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

When set, the **learning disable** command stops all MAC learning either on the specified interface or the bridge domain.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples In the following example, MAC learning is disabled on all ports in the bridge domain called bar, which is applied to all interfaces in the bridge unless the interface has its own MAC learning enable command.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# learning disable
```

Related Commands	Command	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.

limit (VPLS)

To set the MAC address limit for action, maximum, and notification and to enter l2vpn bridge group bridge domain MAC limit configuration mode, use the **limit** command in l2vpn bridge group bridge domain MAC configuration mode. To remove all limits that were previously configured under the MAC configuration submodes, use the **no** form of this command.

limit

no limit

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes l2vpn bridge group bridge domain MAC configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **limit** command to enter l2vpn bridge group bridge domain MAC limit configuration mode. The **limit** command specifies that one syslog message is sent or a corresponding trap is generated with the MAC limit when the action is violated.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how the MAC limit for the bridge bar is set to 100 with an action of shutdown. After the configuration, the bridge allows only up to 100 MAC addresses to be learned until the bridge stops all forwarding. When this happens, a syslog message and an SNMP trap are created.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# limit
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-limit)# maximum 100
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-limit)# action shutdown
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-limit)# notification both
```


Related Commands	Command	Description
	action (VPLS)	Configures the bridge behavior when the number of learned MAC addresses exceed the MAC limit configured.
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.
	maximum (VPLS)	Configures the specified action when the number of MAC addresses learned on a bridge is reached.
	notification (VPLS)	Specifies the type of notification that is sent when the number of learned MAC addresses exceeds the configured limit.

mac (VPLS)

To enter l2vpn bridge group bridge domain MAC configuration mode, use the **mac** command in l2vpn bridge group bridge domain configuration mode. To disable all configurations added under the MAC configuration submodes, use the **no** form of this command.

mac

no mac

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values

Command Modes l2vpn bridge group bridge domain configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **mac** command to enter l2vpn bridge group bridge domain MAC configuration mode.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to enter l2vpn bridge group bridge domain MAC configuration mode:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)#
```

Related Commands	Command	Description
	aging (VPLS)	Enters MAC aging configuration submode to set the aging parameters such as time and type.
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	learning disable (VPLS)	Overrides the MAC learning configuration of a parent bridge or sets the MAC learning configuration of a bridge.
	limit (VPLS)	Sets the MAC address limit for action, maximum, and notification and enters l2vpn bridge group bridge domain MAC limit configuration mode.
	static-address (VPLS)	Adds static entries to the MAC address for filtering.
	withdrawal (VPLS)	Enables MAC address withdrawal for a specified bridge domain.

maximum (VPLS)

To configure the specified action when the number of MAC addresses learned on a bridge is reached, use the **maximum** command in l2vpn bridge group bridge domain MAC limit configuration mode. To disable this feature, use the **no** form of this command.

maximum {value}

no maximum {value}

Syntax Description	value	Maximum number of learned MAC addresses. The range is from 5 to 65536.
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Defaults	The default maximum value is 4000.
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Command Modes	l2vpn bridge group bridge domain MAC limit configuration
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Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
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The action can either be flood, no flood, or shutdown. Depending on the configuration, a SYSDB, an SNMP trap notification, or both are issued.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following example shows when the number of MAC address learned on the bridge exceeds 5000 and the bridge stops learning but continues flooding:
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```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# limit
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-limit)# maximum 5000
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-limit)# action no-flood
```

Related Commands	Command	Description
	action (VPLS)	Configures the bridge behavior when the number of learned MAC addresses exceed the MAC limit configured.
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	limit (VPLS)	Sets the MAC address limit for action, maximum, and notification and enters l2vpn bridge group bridge domain MAC limit configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.
	notification (VPLS)	Specifies the type of notification that is sent when the number of learned MAC addresses exceeds the configured limit.

mpls static label (VPLS)

To configure the MPLS static labels and the static labels for the access pseudowire configuration, use the **mpls static label** command in l2vpn bridge group bridge domain VFI pseudowire configuration mode. To assign the dynamic MPLS labels to either the virtual forwarding interface (VFI) pseudowire or the access pseudowire, use the **no** form of this command.

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

```
no mpls static label {local value} {remote value}
```

Syntax Description	local value	Configures the local pseudowire label. The range is from 16 to 15999.
	remote value	Configures the remote pseudowire label. The range is from 16 to 15999.

Defaults By default, the router attempts to assign dynamic labels to the pseudowire.

Command Modes l2vpn bridge group bridge domain VFI pseudowire configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Ensure that both ends of the pseudowire have matching static labels.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to configure the VFI pseudowire 10.1.1.2 with pseudowire ID of 1000 to use MPLS label 800 and remote MPLS label 500:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# vfi model
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi)# neighbor 10.1.1.2 pw-id 1000
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi-pw)# mpls static label local 800 remote 500
```

Related Commands	Commands	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	neighbor (VPLS)	Adds an access pseudowire port to a bridge domain or a pseudowire to a bridge virtual forwarding interface (VFI).
	pw-class (VFI)	Configures the pseudowire class template name to use for the pseudowire.
	vfi (VPLS)	Configures virtual forwarding interface (VFI) parameters and enters l2vpn bridge group bridge domain VFI configuration mode.

mtu (VPLS)

To adjust the maximum packet size or maximum transmission unit (MTU) size for the bridge domain, use the **mtu** command in l2vpn bridge group bridge domain configuration mode. To disable this feature, use the **no** form of this command.

mtu bytes

no mtu

Syntax Description	bytes	MTU size, in bytes. The range is from 64 to 65535.
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Defaults	The default MTU value is 1500.
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Command Modes	l2vpn bridge group bridge domain configuration
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Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
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Each interface has a default maximum packet size or MTU size. This number generally defaults to the largest size possible for that interface type. On serial interfaces, the MTU size varies, but cannot be set smaller than 64 bytes.

The MTU for the bridge domain includes only the payload of the packet. For example, a configured bridge MTU of 1500 allows tagged packets of 1518 bytes (6 bytes DA, 6 bytes SA, 2 bytes ethertype, or 4 bytes qtag).

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following example specifies an MTU of 1000 bytes:
----------	---

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mtu 1000
```


Related Commands	Commands	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	flooding disable (VPLS)	Configures flooding for traffic at the bridge domain level or at the bridge port level.
	l2vpn	Enters L2VPN configuration mode.

neighbor (VPLS)

To add an access pseudowire port to a bridge domain or a pseudowire to a bridge virtual forwarding interface (VFI), use the **neighbor** command in the appropriate l2vpn bridge group bridge domain configuration submode. To remove the pseudowire either from the bridge or from the VFI, 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		
	<i>A.B.C.D</i>	IP address of the cross-connect peer.
	pw-id <i>value</i>	Configures the pseudowire ID and ID value. Range is 1 to 4294967295.

Defaults No default behavior or values

Command Modes l2vpn bridge group bridge domain configuration
l2vpn bridge group bridge domain VFI configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **neighbor** command to enter l2vpn bridge group bridge domain VFI pseudowire configuration mode. Alternatively, use the **neighbor** command to enter l2vpn bridge group bridge domain access pseudowire configuration mode.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to configure an access pseudowire directly under a bridge domain in l2vpn bridge group bridge domain configuration mode:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# neighbor 10.1.1.2 pw-id 1000
RP/0/0/CPU0:router(config-l2vpn-bg-bd-pw)#
```

The following example shows how to configure the parameters for any pseudowire in l2vpn bridge group bridge domain VFI configuration mode:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# vfi v1
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi)# neighbor 10.1.1.2 pw-id 1000
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi-pw)#
```

Related Commands	Commands	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mpls static label (VPLS)	Configures the MPLS static labels and the static labels for the access pseudowire configuration.
	pw-class (VFI)	Configures the pseudowire class template name to use for the pseudowire.
	static-mac-address (VPLS)	Configures the static MAC address to associate a remote MAC address with a pseudowire or any other bridge interface.
	vfi (VPLS)	Configures virtual forwarding interface (VFI) parameters and enters l2vpn bridge group bridge domain VFI configuration mode.

notification (VPLS)

To specify the type of notification that is sent when the number of learned MAC addresses exceeds the configured limit, use the **notification** command in l2vpn bridge group bridge domain MAC limit configuration mode. To use the notification as only a syslog entry, use the **no** form of this command.

notification { **both** | **none** | **trap** }

no notification { **both** | **none** | **trap** }

Syntax Description

both	Sends syslog and trap notifications when the action is violated.
none	Specifies no notification.
trap	Sends trap notifications when the action is violated.

Defaults

By default, only a syslog message is sent when the number of learned MAC addresses exceeds the maximum configured.

Command Modes

l2vpn bridge group bridge domain MAC limit configuration

Command History

Release	Modification
Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

A syslog message and an SNMP is generated. Alternatively, an SNMP is generated. Finally, no notification is generated.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how both a syslog message and an SNMP trap are generated with the bridge bar and learns more MAC addresses than the configured limit:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# limit
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-limit)# notification both
```

Related Commands

Command	Description
action (VPLS)	Configures the bridge behavior when the number of learned MAC addresses exceed the MAC limit configured.
bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
l2vpn	Enters L2VPN configuration mode.
mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.
maximum (VPLS)	Configures the specified action when the number of MAC addresses learned on a bridge is reached.

pw-class (VFI)

To configure the pseudowire class template name to use for the pseudowire, use the **pw-class** command in l2vpn bridge group bridge domain VFI pseudowire configuration mode. To delete the pseudowire class, use the **no** form of this command.

```
pw-class {class name}

no pw-class {class name}
```

Syntax Description	<i>class name</i>	Pseudowire class name.
Defaults	No default behavior or values	
Command Modes	l2vpn bridge group bridge domain VFI pseudowire configuration	
Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.
Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .	
Task ID	Task ID	Operations
	l2vpn	read, write

Examples

The following example shows how to attach the pseudowire class to the pseudowire:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# vfi v1
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi)# neighbor 10.1.1.2 pw-id 1000
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi-pw)# pw-class canada
```

Related Commands	Commands	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mpls static label (VPLS)	Configures the MPLS static labels and the static labels for the access pseudowire configuration.
	neighbor (VPLS)	Adds an access pseudowire port to a bridge domain or a pseudowire to a bridge virtual forwarding interface (VFI).
	vfi (VPLS)	Configures virtual forwarding interface (VFI) parameters and enters l2vpn bridge group bridge domain VFI configuration mode.

show l2vpn bridge-domain (VPLS)

To display information for the bridge ports such as attachment circuits and pseudowires for the specific bridge domains, use the **show l2vpn bridge-domain** command in EXEC mode.

show l2vpn bridge-domain [**bd-name** *bridge-domain name* | **brief** | **detail** | **group** *bridge-domain group name* | **interface** {*type interface-id*} | **neighbor** *IP address* [**pw-id** *value*] | **summary**]

Syntax Description	
bd-name <i>bridge-domain name</i>	(Optional) Displays the bridges by the bridge ID. The <i>bridge-domain name</i> argument is used to name a bridge domain.
brief	(Optional) Displays brief information about the bridges.
detail	(Optional) Displays the output for the Layer 2 VPN (L2VPN) to indicate whether or not the MAC withdrawal feature is enabled and the number of MAC withdrawal messages that are sent or received from the pseudowire.
group <i>bridge-domain group name</i>	(Optional) Displays filter information on the bridge-domain group name. The <i>bridge-domain group name</i> argument is used to name the bridge domain group.
interface	(Optional) Displays the filter information for the interface on the bridge domain.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-id</i>	Identifies a 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.
neighbor <i>IP address</i>	(Optional) Displays only the bridge domain that contains the pseudowires to match the filter for the neighbor. The <i>IP address</i> argument is used to configure IP address of the neighbor.
pw-id <i>value</i>	(Optional) Displays the filter for the pseudowire ID. The range is from 1 to 4294967295.
summary	(Optional) Displays the summary information for the bridge domain.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **interface** keyword to display only the bridge domain that contains the specified interface as an attachment circuit. In the sample output, only the attachment circuit matches the filter that is displayed. No pseudowires are displayed.

Task ID

Task ID	Operations
l2vpn	read

Examples

The following sample output shows information for the bridge ports such as attachment circuits and pseudowires for the specific bridge domains:

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

Bridge group: g1, bridge-domain: bd1, id: 0, state: up, ShgId: 0, MSTi: 0
Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 1, PWs: 1 (1 up)
List of ACs:
  Gi0/1/0/0, state: up, Static MAC addresses: 2, MSTi: 0 (unprotected)
List of Access PWs:
List of VFIs:
  VFI 1
    Neighbor 1.1.1.1 pw-id 1, state: up, Static MAC addresses: 0
```

Table 94 describes the significant fields shown in the display.

Table 94 show l2vpn bridge-domain Field Descriptions

Field	Description
Bridge group	Name of bridge domain group is displayed.
bridge-domain	Name of bridge domain is displayed.
id	ID assigned to this bridge domain is displayed.
state	Current state of the bridge domain is displayed.
ShgId	ID for the default Split Horizon Group assigned to all attachment circuits and access pseudowires that are part of this bridge domain is displayed. Note Members of the special Split Horizon Group ID 0 forwards to other members of the same SPG.

The following example shows sample output for a bridge named bd1:

```
RP/0/0/CPU0:router# show l2vpn bridge-domain bd-name bd1

Bridge group: g1, bridge-domain: bd1, id: 0, state: up, ShgId: 0, MSTi: 0
Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 1, PWs: 1 (1 up)
List of ACs:
  Gi0/1/0/0, state: up, Static MAC addresses: 2, MSTi: 0 (unprotected)
List of Access PWs:
```

show l2vpn bridge-domain (VPLS)

List of VFIs:

VFI 1

Neighbor 1.1.1.1 pw-id 1, state: up, Static MAC addresses: 0

The following sample output shows brief information about the bridges:

RP/0/0/CPU0:router# **show l2vpn bridge-domain brief**

```
Bridge Group/Bridge-Domain Name  ID      State      Num ACs/up  Num Pws/up
-----
g1/bd1                            0       up          1/1         1/1
```

Table 95 describes the significant fields shown in the display.

Table 95 *show l2vpn bridge-domain brief Field Descriptions*

Field	Description
Bridge Group/Bridge-Domain Name	Bridge domain group name followed by the bridge domain name are displayed.
ID	ID assigned to this bridge domain is displayed.
State	Current state of the bridge domain is displayed.
Num ACs/up	Total number of attachment circuits that are up in this bridge domain is displayed.
Num PWS/up	Total number of pseudowires that are up in this bridge domain is displayed. The count includes both VFI pseudowires and access pseudowires.

The following sample output shows detailed information:

RP/0/0/CPU0:router# **show l2vpn bridge-domain detail**

```
Bridge group: g1, bridge-domain: bd1, id: 0, state: up, ShgId: 0, MSTi: 0
MAC learning: enabled
MAC withdraw: disabled
Flooding:
  Broadcast & Multicast: enabled
  Unknown unicast: enabled
MAC aging time: 300 s, Type: inactivity
MAC limit: 4000, Action: none, Notification: syslog
MAC limit reached: yes
Security: disabled
DHCPv4 snooping: disabled
MTU: 1500
Filter MAC addresses:
ACs: 1 (1 up), VFIs: 1, PWS: 1 (1 up)
List of ACs:
  AC: GigabitEthernet0/1/0/0, state is up
  Type Ethernet
  MTU 1500; XC ID 0x2000001; interworking none; MSTi 0 (unprotected)
  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: yes
  Security: disabled
  DHCPv4 snooping: disabled
```

```

Static MAC addresses:
  0000.0000.0000
  0001.0002.0003
Statistics:
  packet totals: receive 3919680,send 9328
  byte totals: receive 305735040,send 15022146
List of Access PWs:
List of VFIs:
VFI 1
PW: neighbor 1.1.1.1, PW ID 1, state is up ( established )
PW class mpls, XC ID 0xff000001
Encapsulation MPLS, protocol LDP
PW type Ethernet, control word disabled, interworking none
PW backup disable delay 0 sec
Sequencing not set

```

	MPLS	Local	Remote
Label	16003		16003
Group ID	0x0		0x0
Interface	1		1
MTU	1500		1500
Control word	disabled		disabled
PW type	Ethernet		Ethernet
VCCV CV type	0x2		0x2
	(LSP ping verification)		(LSP ping verification)
VCCV CC type	0x2		0x2
	(router alert label)		(router alert label)

```

-----
Create time: 12/03/2008 14:03:00 (17:17:30 ago)
Last time status changed: 13/03/2008 05:57:58 (01:22:31 ago)
MAC withdraw message: send 0 receive 0
Static MAC addresses:
Statistics:
  packet totals: receive 3918814, send 3918024
  byte totals: receive 305667492, send 321277968
VFI Statistics:
  drops: illegal VLAN 0, illegal length 0

```

The following sample output shows that when a bridge operates in VPWS mode, the irrelevant information for MAC learning is suppressed:

```

RP/0/0/CPU0:router# show l2vpn bridge-domain detail

Bridge group: foo_group, bridge-domain: foo_bd, id: 0, state: up, ShgId: 0
VPWS Mode
MTU: 1500
ACs: 1 (0 up), VFIs: 1, PWs: 2 (2 up)
List of ACs:
AC: GigabitEthernet0/5/1/4, state is admin down
  Type Ethernet      MTU 1500; XC ID 1; interworking none
Static MAC addresses:
Statistics:
  packet totals: receive 0,send 0
  byte totals: receive 0,send 0
List of VFIs:
VFI foo_vfi
PW: neighbor 1.1.1.1, PW ID 1, state is up ( established )
PW class not set
Encapsulation MPLS, protocol LDP
PW type Ethernet, control word enabled, interworking none
Sequencing not set

```

	MPLS	Local	Remote
Label	16001		16001

show l2vpn bridge-domain (VPLS)

```

Group ID      unassigned                unknown
Interface     siva/vfi                    siva/vfi
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: 25/06/2007 05:29:42 (2w0d ago)
Last time status changed: 27/06/2007 06:50:35 (1w5d ago)
Static MAC addresses:
PW: neighbor 1.1.1.1, PW ID 2, state is up ( established )
PW class not set
Encapsulation MPLS, protocol LDP
PW type Ethernet, control word enabled, interworking none
Sequencing not set
MPLS          Local                Remote
-----
Label         16002                            16002
Group ID      unassigned                        unknown
Interface     siva/vfi                          siva/vfi
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: 25/06/2007 05:29:42 (2w0d ago)
Last time status changed: 27/06/2007 06:50:35 (1w5d ago)
Static MAC addresses:
Statistics:
drops: illegal VLAN 0, illegal length 0

```

Table 96 describes the significant fields shown in the display.

Table 96 show l2vpn bridge-domain detail Field Descriptions

Field	Description
Bridge group	Name of bridge domain group is displayed.
bridge-domain	Name of bridge domain is displayed.
ID	ID assigned to this bridge domain is displayed.
state	Current state of the bridge domain is displayed.
ShgId	ID for the default Split Horizon Group assigned to all attachment circuits and access pseudowires that are part of this bridge domain is displayed. Note Members of the special Split Horizon Group ID 0 forwards to other members of the same SPG.
MSTi	ID for the Multiple Spanning Tree.

The following sample output shows filter information about the bridge-domain group named g1:

```
RP/0/0/CPU0:router# show l2vpn bridge-domain group g1

Bridge group: g1, bridge-domain: bd1, id: 0, state: up, ShgId: 0, MSTi: 0
Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 1, PWs: 1 (1 up)
List of ACs:
  Gi0/1/0/0, state: up, Static MAC addresses: 2, MSTi: 0 (unprotected)
List of Access PWs:
List of VFIs:
  VFI 1
    Neighbor 1.1.1.1 pw-id 1, state: up, Static MAC addresses: 0
```

The following sample output shows display the filter information for the interface on the bridge domain:

```
RP/0/0/CPU0:router# show l2vpn bridge-domain interface gigabitEthernet 0/1/0/0

Bridge group: g1, bridge-domain: bd1, id: 0, state: up, ShgId: 0, MSTi: 0
Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 1, PWs: 1 (1 up)
List of ACs:
  Gi0/1/0/0, state: up, Static MAC addresses: 2, MSTi: 0 (unprotected)
```

The following sample output shows that the bridge domain contains the pseudowires to match the filter for the neighbor:

```
RP/0/0/CPU0:router# show l2vpn bridge-domain neighbor 1.1.1.1

Bridge group: g1, bridge-domain: bd1, id: 0, state: up, ShgId: 0, MSTi: 0
Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 1, PWs: 1 (1 up)
List of Access PWs:
List of VFIs:
  VFI 1
    Neighbor 1.1.1.1 pw-id 1, state: up, Static MAC addresses: 0
```

The following sample output shows the summary information for the bridge domain:

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

Number of groups: 1, bridge-domains: 1, Up: 1, Shutdown: 0
Number of ACs: 1 Up: 1, Down: 0
Number of PWs: 1 Up: 1, Down: 0
```

Table 97 describes the significant fields shown in the display.

Table 97 *show l2vpn bridge-domain summary Field Descriptions*

Field	Description
Number of groups	Number of configured bridge domain groups is displayed.
bridge-domains	Number of configured bridge domains is displayed.
Shutdown	Number of bridge domains that are in Shutdown state is displayed.

Table 97 *show l2vpn bridge-domain summary Field Descriptions (continued)*

Field	Description
Number of ACs	Number of attachment circuits that are in Up state and Down state are displayed.
Number of PWs	Number of pseudowires that are in Up state and Down state are displayed. This includes the VFI pseudowire and the access pseudowire.

Related Commands

Command	Description
clear l2vpn bridge-domain (VPLS)	Clears the MAC addresses and restarts the bridge domains on the router.

show l2vpn forwarding bridge-domain (VPLS)

To display information on the bridge that is used by the forwarding layer, use the **show l2vpn forwarding bridge-domain** command in EXEC mode.

```
show l2vpn forwarding bridge-domain [bridge-domain-name] {detail | hardware {egress |
  ingress}} {location node-id}
```

Syntax Description	
<i>bridge-domain-name</i>	(Optional) Name of a bridge domain.
detail	Displays all the detailed information on the attachment circuits and pseudowires.
hardware	Displays the hardware location entry.
egress	Reads information from the egress PSE.
ingress	Reads information from the ingress PSE.
location <i>node-id</i>	Displays the bridge-domain information for the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

For each bridge, you can display summary information about the number of bridge ports, number of MAC addresses, and so forth.

The **hardware** keyword displays detailed information, and is meant for field investigation by a specialized Cisco engineer.

Task ID	Task ID	Operations
	l2vpn	read

Examples

The following sample output shows bridge-domain information for location 0/1/CPU0:

```
RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain location 0/1/CPU0

Bridge-Domain Name          ID      Ports addr  Flooding Learning State
-----
g1:bd1

Bridge-domain name: g1: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: yes
Security: disabled
DHCPv4 snooping: profile not known on this node
Bridge MTU: 1500 bytes
Number of bridge ports: 2
Number of MAC addresses: 65536
Multi-spanning tree instance: 0

GigabitEthernet0/1/0/0, state: oper up
  Number of MAC: 32770
  Sent(Packets/Bytes): 0/21838568
  Received(Packets/Bytes): 5704781/444972918

Nbor 1.1.1.1 pw-id 1
  Number of MAC: 32766
  Sent(Packets/Bytes): 0/0
  Received(Packets/Bytes): 5703987/444910986
      0      2      65536 Enabled Enabled UP
```

The following sample output shows detailed information for hardware location 0/1/CPU0 from the egress pse:

```
RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain hardware egress detail location
0/1/CPU0

Bridge-domain name: g1: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: yes
Security: disabled
DHCPv4 snooping: profile not known on this node
Bridge MTU: 1500 bytes
Number of bridge ports: 2
Number of MAC addresses: 65536
Multi-spanning tree instance: 0

===== GSR HW Information =====

-----
SHG-TX rewrite details
-----

HW Rewrite 0 Detail :
-----
Rewrite HW Address : 0x00060000
```



```

    packets 0 bytes 0
Raw data:
[ 0x04018180 04018190 040181a0 040181b0 ]
[ 0x04018170 00000000 80360000 000bfff4 ]
[ 0x00000000 00000000 00000000 00000000 ]

-----
                SHG-TX encap details
-----
outer_etype:                0
outer_vlan_id:              0
gather_profile:             0
inner_vlan_id:              0
so_l2_len_adjust:          0
-----
                SHG-TX mgid details
-----
                Base MGIDs for default mgid
base_mgid[0]:               0x0003ffff
base_mgid[1]:               0x0003ffff
base_mgid[2]:               0x0003ffff
base_mgid[3]:               0x0003ffff
base_mgid[4]:               0x0003ffff
base_mgid[5]:               0x0003ffff
base_mgid[6]:               0x0003ffff
base_mgid[7]:               0x0003ffff
                MGID Entries for default mgid
oi[0]:                      0
oq[0]:                      16384
xc_id[0]:                   1
mgid_idx[0]:                0x00000000
next_mgid[0]:               0x00000000
-----
                VMR 0 Details
-----
vmrid: 0x5f002010
Value: 0xc0 0x00 0x1f 0xff 0xff 0xff 0xff 0xff 0xfd
Mask : 0x00 0x00 0x1f 0xff 0xff 0xff 0xff 0xff 0xe0
Result 0x32003000
=====

                GigabitEthernet0/1/0/0, state: oper up
                Number of MAC: 32770
                Sent (Packets/Bytes): 749/22989834
                Received (Packets/Bytes): 5732104/447104112

===== GSR HW Information =====

-----
                BP-TX-AC rewrite details
-----

BP is local

-----
                BP L2 Uidb Details
-----
l2fwd_enabled:              true
plim_enabled:               true
l2fwd_type:                 4
l2_ac_type:                 0
xconn_id:                   0
bridge_id:                  0

```

show l2vpn forwarding bridge-domain (VPLS)

```

shg id:                                0
unicast flooding enabled:               0
multicast flooding enabled:             0
broadcast flooding enabled:             0
mac learning enabled:                  0
Is AC Port mode?:                      0
-----
HW Rewrite 0 Detail :
-----
Rewrite HW Address : 0x59eff314
packets 0 bytes 0
HFA Bits 0x0 gp 0 mtu 1580 (REW)
OI 0x3fffc OutputQ 0 Output-port 0x36 local_outputq 0x0
Raw data:
[ 0x00000000 0036062c 0003fffc 00000000 ]
[ 0x00000000 00000000 0d103600 00000010 ]
[ 0x00000000 00000000 00000000 00000000 ]
-----
BP OI/OQ Details
-----
oi[0]:          0x00000000          oq[0]          16384
oi[1]:          0x00000000          oq[1]          65535
oi[2]:          0x00000000          oq[2]          65535
oi[3]:          0x00000000          oq[3]          65535
oi[4]:          0x00000000          oq[4]          65535
oi[5]:          0x00000000          oq[5]          65535
oi[6]:          0x00000000          oq[6]          65535
oi[7]:          0x00000000          oq[7]          65535
-----
Sram table entry details
-----
sram_data: 0xa000400c
=====

Nbor 1.1.1.1 pw-id 1
Number of MAC: 32766
Sent(Packets/Bytes): 0/0
Received(Packets/Bytes): 5731250/447037500

===== GSR HW Information =====

-----
BP-TX-AC rewrite details
-----
BP OI/OQ Details
-----
oi[0]:          0x00000000          oq[0]          65535
oi[1]:          0x00000000          oq[1]          65535
oi[2]:          0x00000000          oq[2]          65535
oi[3]:          0x00000000          oq[3]          65535
oi[4]:          0x00000000          oq[4]          65535
oi[5]:          0x00000000          oq[5]          65535
oi[6]:          0x00000000          oq[6]          65535
oi[7]:          0x00000000          oq[7]          65535
-----
BP Encap Info
-----
mac_length:    0
mac_string:
egress_slot:   2
num_tags:      1
tags:          {16001, }

```

```
if_handle:    0x03000500
=====
```

The following sample output shows the bridge-domain information for the specified location:

```
RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain g1:bd1 location 0/1/CPU0
```

```
Bridge-Domain Name      ID      Ports addr  Flooding Learning State
-----
g1:bd1                  0       2      65536  Enabled  Enabled  UP
```

Table 98 describes the significant fields shown in the display.

Table 98 *show l2vpn forwarding bridge-domain Field Descriptions*

Field	Description
Bridge-Domain Name	Name of bridge domain is displayed.
Bridge ID	ID assigned to this bridge domain is displayed.
Ports	Number of ports that are part of this bridge domain is displayed.
MAC Addr	Number of MAC addresses that are learned on this bridge domain is displayed.
Flooding	Flooding of packets are displayed if they are enabled on this bridge domain.
Learning	Learning of MAC addresses are displayed if they are enabled on this bridge domain.
State	Current state of the bridge domain is displayed.

Related Commands

Command	Description
show l2vpn forwarding bridge-domain mac-address (VPLS)	Displays the summary information for the MAC address.

show l2vpn forwarding bridge-domain mac-address (VPLS)

To display the summary information for the MAC address, use the **show l2vpn forwarding bridge-domain mac-address** command in EXEC mode.

```
show l2vpn forwarding bridge-domain [bridge-domain-name] mac-address {MAC address |
  detail | hardware {egress | ingress} | interface type instance | neighbor address {pw-id
  pw-id}} {location node-id}
```

Syntax Description

<i>bridge-domain-name</i>	(Optional) Name of a bridge domain.
<i>MAC address</i>	MAC address.
detail	Displays detailed information for the MAC address.
hardware	Reads information from the hardware.
egress	Reads information from the egress PSE.
ingress	Reads information from the ingress PSE.
interface	Displays the match for the attachment circuit subinterface.
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>instance</i>	<p>Either a physical interface instance or a virtual interface instance as follows:</p> <ul style="list-style-type: none"> Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash between values is required as part of the notation. <ul style="list-style-type: none"> <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the modular services card or line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. <p>Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0 or RP1) and the module is CPU0. Example: interface MgmtEth0/RP1/CPU0/0.</p> <ul style="list-style-type: none"> Virtual interface instance. Number range varies depending on interface type. <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>
neighbor <i>address</i>	Displays the match for the neighbor IP address.
pw-id <i>pw-id</i>	Displays the match for the pseudowire ID.
location <i>node-id</i>	Displays the bridge-domain information for the MAC address of the specified location. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Defaults

No default behavior or values

Command Modes EXEC

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	l2vpn	read

Examples The following sample output shows the specified location of the bridge-domain name g1:bd1 for the MAC address:

```
RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain g1:bd1 location 0/1/CPU0
          Bridge          MAC
Bridge-Domain Name      ID    Ports addr  Flooding Learning State
-----
g1:bd1                   0      2    65536  Enabled  Enabled  UP
```

The following sample output shows the list of MAC addresses that are learned on a specified bridge and summary information for the addresses:

```
RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain mac-address location 0/1/CPU0
Mac Address  Type  Learned from/Filtered on  LC learned Age
-----
0000.0000.0000 static Gi0/1/0/0                N/A          N/A
0000.0001.0101 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0102 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0103 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0104 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0105 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0106 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0107 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0108 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0109 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.010a dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.010b dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.010c dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.010d dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.010e dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.010f dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0110 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0111 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
0000.0001.0112 dynamic Gi0/1/0/0                0/1/CPU0    0d 0h 2m 22s
....
```

show l2vpn forwarding bridge-domain mac-address (VPLS)

The following sample output shows the MAC address on a specified interface on a specified bridge:

```
RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain g1:bd1 mac-address 1.2.3 location 0/1/CPU0
```

Mac Address	Type	Learned from/Filtered on	LC learned	Age
0001.0002.0003	static	Gi0/1/0/0	N/A	N/A

The following sample output shows the hardware information from the egress pse:

```
RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain g1:bd1 mac-address hardware egress location 0/1/CPU0
```

Mac Address	Type	Learned from/Filtered on	LC learned	Age
0000.0000.0000	static	Gi0/1/0/0	N/A	N/A
0000.0001.0101	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0102	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0103	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0104	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0105	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0106	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0107	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0108	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0109	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.010a	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.010b	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.010c	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.010d	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.010e	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.010f	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0110	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0111	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0112	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0113	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
0000.0001.0114	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 24s
...				

The following sample output shows the MAC addresses that are learned on a specified pseudowire on a specified bridge:

```
RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain mac-address neighbor 1.1.1.1 pw-id 1 location 0/1/CPU0
```

Mac Address	Type	Learned from/Filtered on	LC learned	Age
0000.0003.0101	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0102	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0103	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0104	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0105	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0106	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0107	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0108	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0109	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.010a	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.010b	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.010c	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.010d	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.010e	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.010f	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0110	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s
0000.0003.0111	dynamic	1.1.1.1, 1	0/1/CPU0	0d 0h 0m 30s

```

0000.0003.0112 dynamic 1.1.1.1, 1          0/1/CPU0 0d 0h 0m 30s
0000.0003.0113 dynamic 1.1.1.1, 1          0/1/CPU0 0d 0h 0m 30s
0000.0003.0114 dynamic 1.1.1.1, 1          0/1/CPU0 0d 0h 0m 30s
0000.0003.0115 dynamic 1.1.1.1, 1          0/1/CPU0 0d 0h 0m 30s
...

```

The following sample output shows the detailed information for MAC addresses that are learned on a specified interface and on specified bridge of a specified interface card. The sample output lists all the MAC addresses, the learned location, and the current age.

```

RP/0/0/CPU0:router# show l2vpn forwarding bridge-domain g1:bd1 mac-address interface
gigabitEthernet 0/1/0/0 location 0/1/CPU0

```

Mac Address	Type	Learned from/Filtered on	LC learned	Age
0000.0000.0000	static	Gi0/1/0/0	N/A	N/A
0000.0001.0101	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0102	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0103	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0104	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0105	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0106	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0107	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0108	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0109	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.010a	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.010b	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.010c	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.010d	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.010e	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.010f	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0110	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0111	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0112	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0113	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s
0000.0001.0114	dynamic	Gi0/1/0/0	0/1/CPU0	0d 0h 2m 14s

Related Commands

Command	Description
show l2vpn forwarding bridge-domain (VPLS)	Displays the list of bridges by the bridge ID.

shutdown (Bridge Domain)

To shut down a bridge domain to bring the bridge and all attachment circuits and pseudowires under it to admin down state, use the **shutdown** command in l2vpn bridge group bridge domain configuration mode. To re-enable the bridge domain, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Defaults By default, the bridge is not shutdown.

Command Modes l2vpn bridge group bridge domain configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

When a bridge domain is disabled, all VFIs associated with the bridge domain are disabled. You can still attach or detach members to or from the bridge domain as well as the VFIs associated with the bridge domain.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to disable the bridge domain named bar:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# shutdown
```


Related Commands	Commands	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.

shutdown (VFI)

To disable virtual forwarding interface (VFI), use the **shutdown** command in l2vpn bridge group bridge domain VFI configuration mode. To re-enable VFI, use the **no** form of this command.

shutdown

no shutdown

Syntax Description This command has no arguments or keywords.

Defaults By default, the VFI is not shutdown.

Command Modes l2vpn bridge group bridge domain VFI configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to disable VFI:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# vfi v1
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi)# shutdown
```

Related Commands	Commands	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.

Commands	Description
l2vpn	Enters L2VPN configuration mode.
mpls static label (VPLS)	Configures the MPLS static labels and the static labels for the access pseudowire configuration.
neighbor (VPLS)	Adds an access pseudowire port to a bridge domain or a pseudowire to a bridge virtual forwarding interface (VFI).

static-address (VPLS)

To add static entries to the MAC address for filtering, use the **static-address** command in l2vpn bridge group bridge domain MAC configuration mode. To remove entries profiled by the combination of a specified entry information, use the **no** form of this command.

```
static -address {MAC address} {drop}
```

```
no static -address {MAC address} {drop}
```

Syntax Description

<i>MAC address</i>	Static MAC address that is used to filter on the bridge domain.
drop	Drops all traffic that is going to the configured MAC address.

Defaults

No static MAC address is configured.

Command Modes

l2vpn bridge group bridge domain MAC configuration

Command History

Release	Modification
Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to add static MAC entries in l2vpn bridge group bridge domain MAC configuration mode. This entry causes all packets with destination MAC address 1.1.1 to be dropped.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# static-address 1.1.1 drop
```

Related Commands	Command	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.

static-mac-address (VPLS)

To configure the static MAC address to associate a remote MAC address with a pseudowire or any other bridge interface, use the **static-mac-address** command in the appropriate l2vpn bridge group bridge domain configuration submode. To disable this feature, use the **no** form of this command.

```
static-mac-address {MAC address}
```

```
no static-mac-address {MAC address}
```

Syntax Description	MAC address	Static address to add to the MAC address.
--------------------	-------------	---

Defaults	No default behavior or values
----------	-------------------------------

Command Modes	l2vpn bridge group bridge domain VFI pseudowire configuration l2vpn bridge group bridge domain attachment circuit configuration
---------------	--

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
------------------	--

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following example shows how to associate a remote MAC address with a pseudowire:
----------	--

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# vfi model
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi)# neighbor 10.1.1.2 pw-id 1000
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi-pw)# static-mac-address 1.1.1
```

The following example shows how to associate a GigabitEthernet interface from a bridge domain to static MAC address 1.1.1:

```
RP/0/0/CPU0RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
```

```
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# interface GigabitEthernet 0/1/0/0
RP/0/0/CPU0:router(config-l2vpn-bg-bd-ac)# static-mac-address 1.1.1
```

The following example shows how to associate an access pseudowire to static MAC address 2.2.2:

```
RP/0/0/CPU0RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# neighbor 10.1.1.2 pw-id 2000
RP/0/0/CPU0:router(config-l2vpn-bg-bd-pw)# static-mac-address 2.2.2
```

Related Commands

Commands	Description
bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
l2vpn	Enters L2VPN configuration mode.
mpls static label (VPLS)	Configures the MPLS static labels and the static labels for the access pseudowire configuration.
neighbor (VPLS)	Adds an access pseudowire port to a bridge domain or a pseudowire to a bridge virtual forwarding interface (VFI).
vfi (VPLS)	Configures virtual forwarding interface (VFI) parameters and enters l2vpn bridge group bridge domain VFI configuration mode.

time (VPLS)

To configure the maximum aging time, use the **time** command in l2vpn bridge group bridge domain MAC aging configuration mode. To disable this feature, use the **no** form of this command.

time {seconds}

no time {seconds}

Syntax Description	<i>seconds</i>	MAC address table entry maximum age. The range is from 120 to 1000000 seconds. Aging time is counted from the last time that the switch saw the MAC address. The default value is 300 seconds.
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Defaults	<i>seconds: 300</i>
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Command Modes	l2vpn bridge group bridge domain MAC aging configuration
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Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

If no packets are received from the MAC address for the duration of the maximum aging time, the dynamic MAC entry previously learned is removed from the forwarding table.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples

The following example shows how to increase the maximum aging time to 600 seconds. After 600 seconds of inactivity from a MAC address, the MAC address is removed from the forwarding table.

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# aging
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-aging)# time 600
```


Related Commands	Commands	Description
	aging (VPLS)	Enters MAC aging configuration submode to set the aging parameters such as time and type.
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.
	type (VPLS)	Configures the type for MAC address aging.

type (VPLS)

To configure the type for MAC address aging, use the **type** command in l2vpn bridge group bridge domain MAC aging configuration mode. To disable this feature, use the **no** form of this command.

type {absolute | inactivity}

no type {absolute | inactivity}

Syntax Description	absolute	Configures the absolute aging type.
	inactivity	Configures the inactivity aging type.

Defaults By default, the inactivity type is configured.

Command Modes l2vpn bridge group bridge domain MAC aging configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

In general, the type is set to inactivity. With an inactivity type configuration, a MAC address is removed from the forwarding table after the MAC address is inactive for the configured aging time.

With an absolute type configuration, a MAC address is always removed from the forwarding table after the aging time has elapsed once it is initially learned.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to configure the MAC address aging type to absolute for every member of the bridge domain named bar:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# aging
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac-aging)# type absolute
```

Related Commands	Commands	Description
	aging (VPLS)	Enters MAC aging configuration submode to set the aging parameters such as time and type.
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.
	time (VPLS)	Configures the maximum aging time.

vfi (VPLS)

To configure virtual forwarding interface (VFI) parameters and to enter l2vpn bridge group bridge domain VFI configuration mode, use the **vfi** command in l2vpn bridge group bridge domain configuration mode. To remove all configurations that are made under the specified VFI, use the **no** form of this command.

```
vfi {vfi name}
```

```
no vfi {vfi name}
```

Syntax Description	<i>vfi name</i>	Name of the specified virtual forwarding interface.
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Defaults	No default behavior or values
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Command Modes	l2vpn bridge group bridge domain configuration
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Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
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Use the **vfi** command to enter l2vpn bridge group bridge domain VFI configuration mode.

On the Cisco XR 12000 Series Router, you cannot configure a pseudowire directly under a bridge domain. Therefore, a pseudowire must be configured under a VFI, which is configured under a bridge domain.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples	The following example shows how to create a VFI:
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```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# vfi v1
RP/0/0/CPU0:router(config-l2vpn-bg-bd-vfi)#
```

Related Commands	Commands	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mpls static label (VPLS)	Configures the MPLS static labels and the static labels for the access pseudowire configuration.
	neighbor (VPLS)	Adds an access pseudowire port to a bridge domain or a pseudowire to a bridge virtual forwarding interface (VFI).

withdrawal (VPLS)

To enable MAC address withdrawal for a specified bridge domain, use the **withdrawal** command in l2vpn bridge group bridge domain MAC configuration mode. To disable this feature, use the **no** form of this command.

withdrawal

no withdrawal

Syntax Description This command has no arguments or keywords.

Defaults By default, MAC address withdrawal is disabled.

Command Modes l2vpn bridge group bridge domain MAC configuration

Command History	Release	Modification
	Release 3.7.0	This command was introduced on the Cisco XR 12000 Series Router.

Usage Guidelines To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Cisco IOS XR supports only the wildcard MAC address withdrawal.

Task ID	Task ID	Operations
	l2vpn	read, write

Examples The following example shows how to enable MAC withdrawal:

```
RP/0/0/CPU0:router# configure
RP/0/0/CPU0:router(config)# l2vpn
RP/0/0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/0/CPU0:router(config-l2vpn-bg)# bridge-domain bar
RP/0/0/CPU0:router(config-l2vpn-bg-bd)# mac
RP/0/0/CPU0:router(config-l2vpn-bg-bd-mac)# withdrawal
```

Related Commands	Command	Description
	bridge-domain (VPLS)	Establishes a bridge domain and enters l2vpn bridge group bridge domain configuration mode.
	bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then assigns network interfaces to the bridge domain.
	l2vpn	Enters L2VPN configuration mode.
	mac (VPLS)	Enters l2vpn bridge group bridge domain MAC configuration mode.

■ withdrawal (VPLS)