Provider Backbone Bridge Commands

The IEEE 802.1ah standard (Ref [4]) provides a means for interconnecting multiple provider bridged networks inorder to build a large scale end-to-end Layer 2 provider bridged network.

For detailed information about PBB concepts, configuration tasks, and examples, see the *L2VPN and Ethernet Services Configuration Guide for Cisco ASR 9000 Series Routers*.

backbone-source-mac

To configure the backbone source MAC address, use the **backbone-source-mac** command in pbb configuration mode or in the EVPN Interface Ethernet segment configuration mode. To return to the default behavior, use the **no** form of this command.

Note If the backbone source MAC address is not configured then one of the reserved addresses from the Chassis MAC pool is chosen automatically. To view the reserved address, use the **show l2vpn pbb backbone-source-mac** command.

backbone-source-mac *mac-address*
no backbone-source-mac *mac-address*

Syntax Description

mac address	Backbone source MAC address in hexadecimal format.

Command Default

None

Command Modes

PBB configuration

EVPN Interface Ethernet segment configuration

Command History

Release	Modification
Release 3.9.1	This command was introduced.
Release 4.3.2	Support for this command in the EVPN Interface Ethernet segment configuration was introduced.

Usage Guidelines

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

The command default in the EVPN Interface Ethernet segment configuration is the CE system-id with administrative bit flip. Use this command to overwrite the CE-system id of an Ethernet Segment. The backbone source MAC can be configured only on a bundle interface.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

In the following example, the backbone source MAC address is set to 0045.1200.04:

```
config
l2vpn
```

```
  pbb
    backbone-source-mac 0045.1200.0400
 !
!
```

This example shows how to set the backbone source MAC address in the EVPN Interface Ethernet segment configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# ethernet segment
RP/0/RSP0/CPU0:router(config-evpn-ac-es)# backbone-source-mac 0045.1200.0400
RP/0/RSP0/CPU0:router(config-evpn-ac-es)#
```

Related Commands

Command	Description
pbb, on page 33	Configures the provider backbone bridge core or edge.
evpn, on page 15	Enters EVPN configuration mode.
interface (EVPN), on page 24	Enters the EVPN Interface configuration mode.
ethernet-segment, on page 12	Enters EVPN interface ethernet segment configuration mode.

bgp (EVPN)

To enable Border Gateway Protocol (BGP) in the PBB EVPN configuration, use the **bgp** command in the EVPN configuration or EVPN EVI configuration mode. To disable the BGP configuration, use the **no** form of this command.

bgp [**rd**]
bgp [{**rd** | **route-target** }]
no bgp

Syntax Description

rd	Sets the Route Distinguisher.
route-target	Sets the Route Target.

Command Default

None.

Command Modes

EVPN configuration

EVPN EVI configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

The keyword **route-target** is supported only in the EVPN EVI BGP configuration.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to enable BGP in the EVPN configuration mode:

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

This example shows how to enable BGP in the EVPN EVI configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# evi 2
```

```
RP/0/RSP0/CPU0:router(config-evpn-evi)# bgp
RP/0/RSP0/CPU0:router(config-evpn-evi-bgp)#
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
evi, on page 14	Enters the EVPN EVI configuration mode to configure optional BGP settings for a bridge domain or EVI.
route-target	Specifies a route target for the VFI, PBB EVPN or EVPN bridge domain.
rd	

bgp route-target

To configure the BGP Import Route-Target for an ethernet segment, use the **bgp route-target** command in EVPN interface ethernet-segment configuration submode. To undo this command, use the **no** form of this command.

bgp route-target *ipv4/v6-address*

Syntax Description

ipv4/v6-address	Specifies the route target value as an IPv4 or IPv6 address. The value 0000.0000.0000 is not allowed.

Command Default

None

Command Modes

EVPN interface ethernet-segment configuration submode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines

This command configuration is mandatory for Ethernet Segment Identifier (ESI) type 0. For ESI type 1, the default route-target is computed from the high-order 6-octet portion of the 9 bytes ESI value. You can use this command to overwrite this computed value for ESI type 1.

Task ID

Task ID	Operation

Example

The following example configuration shows how to configure BGP Import Route-Target for an ethernet segment.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# ethernet-segment
RP/0/RSP0/CPU0:router(config-evpn-ac-es)# bgp route-target ce01.ce01.ce01
```

clear mmrp-flood-optimization statistics

To clear the stored MRP protocol statistics on all the pseudowires or a specific pseudowire, use the **clear mmrp-flood-optimization statistics** command in the EXEC mode.

clear mmrp-flood-optimization statistics {**all** | **pw** *pw-ID neighbor*}

Syntax Description

all	Clear the stored MRP protocol statistics on all the pseudowires.
pw	Indicates a specific pseudowire.
neighbor	Indicates the IP address of the neighbor.
pw-id	Indicates the pseudowire ID.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
ethernet-services	read, write

The following command shows how to clear the MMRP flood optimization statistics:

```
RP/0/RSP0/CPU0:router#clear mmrp-flood-optimization statistics all
```

clear l2vpn forwarding counters bridge-domain mmrp location

To clear the MMRP flood statistics on a given bridge-domain on a specified location, use the **clear l2vpn forwarding counters bridge-domain mmrp location** command in the EXEC command.

clear l2vpn forwarding counters bridge-domain mmrp location *location*

Syntax Description

location	Specifies the location in rack/slot/module notation.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
ethernet-services	read, write

The following command shows how to clear the mmrp flood statistics on a given bridge-domain on a specified location:

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

debug mmrp-flood-optimization packets

To debug the flood optimization for PBB VPLS feature at the packet level, use the **debug mmrp-flood-optimization packets** command in the EXEC mode.

debug mmrp-flood-optimization packets {**brief** | **full** | **hexdump**} [**direction** {**received** | **sent**}] [**pw** *neighbor pw-id*]

Syntax Description

brief	Brief packet debug.
full	Full packet debug.
hexdump	Raw packet output.
direction	Restricts output to a packet direction.
received	Packets received.
sent	Packets sent.
pw	Specifies a pseudowire to filter.
neighbor	IP address of the neighbor
pw-id	Pseudowire ID.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
ethernet-services	read, write

The following command shows how to use the **debug mmrp-flood-optimization packets** command:

```
RP/0/RSP0/CPU0:router#debug mmrp-flood-optimization packets brief
```

debug mmrp-flood-optimization protocol

To debug the flood optimization for PBB VPLS feature at the protocol level, use the **debug mmrp-flood-optimization protocol** command in the EXEC mode.

debug mmrp-flood-optimization protocol [**isid** *isid*]

Syntax Description

isid	Specifies the service instance identifier.
isid	Service instance identifier.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
ethernet-services	read, write

The following command shows how to use the debug mmrp-flood-optimization protocol command:

```
RP/0/RSP0/CPU0:router#debug mmrp-flood-optimization protocol isid 3
```

ethernet-segment

To enter the EVPN interface ethernet segment configuration mode, use the **ethernet-segment** command in the EVPN interface configuration mode. To disable the Ethernet segment configuration, use the **no** form of this command.

ethernet-segment [{**backbone-source-mac** | **identifier** | **load-balancing-mode** | **service-carving**}]
no ethernet-segment [{**backbone-source-mac** | **identifier** | **load-balancing-mode** | **service-carving**}]

Syntax Description

backbone-source-mac	Specifies Backbone Source MAC.
identifier	Specifies Ethernet Segment Identifier.
load-balancing-mode	Specifies load balancing mode.
service-carving	Specifies service carving.

Command Default

None.

Command Modes

EVPN interface configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to enter the EVPN interface ethernet segment configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# ethernet-segment
RP/0/RSP0/CPU0:router(config-evpn-ac-es)#
```

Related Commands

Command	Description
interface (EVPN), on page 24	Enters the EVPN Interface configuration mode.
backbone-source-mac, on page 3	Configures the backbone source MAC address.

Command	Description
load-balancing-mode, on page 28	Sets the load balancing mode of a physical port or bundle to active-active.
service-carving, on page 44	Specifies the list of service identifiers as active and standby services.

evi

To enter the EVPN EVI configuration mode and configure optional BGP settings for a bridge domain or EVI, use the **evi** command in the EVPN configuration mode. To return to the EVPN configuration mode, use the **no** form of this command.

evi *evi-id*
no evi *evi-id*

Syntax Description

evi-id	Specifies the Ethernet VPN ID to set. The range is from 1 to 65534.

Command Default

None.

Command Modes

EVPN configuration mode

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Use this command to configure static BGP route distinguisher or BGP route target for an EVI.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to enter the EVPN EVI configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# evi 2
RP/0/RSP0/CPU0:router(config-evpn-evi)#
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
bgp (EVPN), on page 5	Enables BGP in the PBB EVPN configuration.

evpn

To enter EVPN configuration mode, use the **evpn** command in the global configuration mode. To return to the global configuration mode, use the **no** form of this command.

evpn [{**bgp** | **evi** | **interface** | **timers**}]
no evpn [{**bgp** | **evi** | **interface** | **timers**}]

Syntax Description

bgp	Configures BGP.
evi	Configures Ethernet VPN ID (EVI).
interface	Assigns an interface to EVPN.
timers	Configures global EVPN timers.

Command Default

None.

Command Modes

Global configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to enter the EVPN configuration mode:

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

Related Commands

Command	Description
evi, on page 14	Enters the EVPN EVI configuration mode to configure optional BGP settings for a bridge domain or EVI.
bgp (EVPN), on page 5	Enables BGP in the PBB EVPN configuration.

Command	Description
interface (EVPN), on page 24	Enters the EVPN Interface configuration mode.
timers, on page 70	Configures timers that affect the convergence of PBB EVPN in failure scenarios.

evpn evi

To enable PBB EVPN and set the EVI for the bridge, use the **evpn evi** command in the L2VPN bridge group bridge domain PBB-core configuration mode. To disable PBB EVPN and reset the EVI, use the **no** form of this command.

evpn evi *evi-id*
no evpn evi *evi-id*

Syntax Description

evi-id	Specifies the Ethernet VPN ID to set. The range is from 1 to 65534.

Command Default

None.

Command Modes

L2VPN bridge group bridge domain PBB core configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

The VPN ID must be unique globally per network.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to enable PBB EVPN and set the EVI for the bridge:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group 1
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain 1
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# pbb core
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-pbb-core)# evpn evi 2
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-pbb-core)#
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
l2vpn	Enters L2VPN configuration mode.
pbb, on page 33	Configures the provider backbone bridge core or edge.

flushagain

To configure the MAC flush again timer, use the **flushagain** command in the EVPN Interface Timers configuration or in the EVPN Timers configuration mode. To reset the MAC flushagain timer, use the **no** form of this command.

flushagain *seconds*
no flushagain *seconds*

Syntax Description

seconds	Specifies the value in seconds ranging from 0 to 120 seconds. The default value is 60 seconds.

Command Default

None.

Command Modes

EVPN Interface Timers configuration

EVPN Timers configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to configure the MAC flushagain timer in the EVPN Interface Timers configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# timers
RP/0/RSP0/CPU0:router(config-evpn-ac-timers)# flushagain 20
RP/0/RSP0/CPU0:router(config-evpn-ac-timers)#
```

This example shows how to configure the MAC flushagain timer in the EVPN Timers configuration mode:

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

```
RP/0/RSP0/CPU0:router(config-evpn-timers)# flushagain 30
RP/0/RSP0/CPU0:router(config-evpn-timers)#
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
interface (EVPN), on page 24	Enters the EVPN Interface configuration mode.
timers, on page 70	Configures timers that affect the convergence of PBB EVPN in failure scenarios.
recovery, on page 40	Configures the recovery timer.
peering, on page 35	Configures the peering timer.
programming, on page 38	Configures the programming timer.

flood-time

To enable flooding of traffic to the entire core bridge when the PBB-VPLS Flood Optimization feature is enabled on the core bridge, use the **flood-time** command in the flood optimization for PBB over VPLS global configuration submode.

flood-time *seconds*

Syntax Description

seconds	Specifies the flood-time in seconds. Range is from 3 to 600 seconds.

Command Default

Flooding is disabled during convergence events.

Command Modes

Flood optimization for PBB over VPLS global configuration submode.

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

Enables flooding of traffic on the entire core bridge when flood-time is enabled on the core bridge. This provides time for MMRP to converge with the affected peer(s) before pruning the traffic. Flooding will be disabled and the core bridge will start pruning the traffic when the flood-time has expired.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to set the flood-time:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# mmrp-flood-optimization
RP/0/RSP0/CPU0:router(config-mmrp-flood-opt)# flood-time 80
```

force single-homed

To configure force single-homed, use **force single-homed** command in the global configuration mode. To return to the default behavior, use the **no** form of this command.

force single-homed
no force single-homed

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

All EVPN-based access redundancy (EVLAG) designated forwarder elections are disregarded in favor of the legacy MCLAG access protection protocol.

When CE is directly connected to a PE through a physical or bundle port and the redundant connection to another PE is operating an MCLAG redundancy group.

Specifically, the ESI assignment to the interface is no longer used for EVPN-based access redundancy and protection mechanisms and the MCLAG redundancy protocol will control the state of this interface.

With this command only the access protection is relinquished, and EVPN core mechanisms remain operational including any core functionality requiring the use of an ESI. This command is different than assigning ESI-0 to the interface, and functions also with an assigned ESI. With MCLAG control of the interface state, those EVPN core procedures that depend on interface state remain the same.

Use this command to force the interface into single homed EVPN mode and interoperate with MCLAG access protection.

The following example shows how to configure force single-homed.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface GigabitEthernet0/0/0/0
Router(config-evpn-ac)# ethernet-segment force single-homed
```

identifer type

To configure the Ethernet Segment Identifier (ESI) value for an ethernet segment, use the **identifier type** command in EVPN interface ethernet-segment configuration submode. To undo this command, use the **no** form of this command.

identifier type *esi-type esi-value*
no identifier type *esi-type esi-value*

Syntax Description

esi-type	Specifies the ESI type in the range 0 to 5. The ESI types 0 and 1 are supported. The ESI type 1 is auto-configured.
esi-value	Specifies the Ethernet Segment Identifier value. It is a 9 byte value that depends on the ESI type.

Command Default

None

Command Modes

EVPN interface ethernet-segment configuration submode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines

This is an optional command to configure the ESI value for a non-bundle interface or to overwrite the computed ESI value.

Example

The following example configuration shows how to configure ESI value for an ethernet segment.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# ethernet-segment
RP/0/RSP0/CPU0:router(config-evpn-ac-es)# identifier type 0 ce.01.ce.01.ce.01.ce.01.01
```

join-time (PBB)

To set the join-time for all active ports, use the **join-time** command in the flood optimization for PBB over VPLS global configuration submode.

join-time *milliseconds*

Syntax Description

milliseconds	Specifies the maximum time for the join timer parameter for all active ports in milliseconds. Range is from 100 to 1000 milliseconds.

Command Default

200 milliseconds

Command Modes

Flood optimization for PBB over VPLS global configuration submode.

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

The join-time parameter is used to jitter the sending of MMRPDUs on multi-point LANs, allowing any transmitted messages to take into account received MMRPDUs from multiple peers if they arrive close together. Transmit opportunities are actually uniformly jittered within the range of 0 to join-time.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to set the join time on all active ports:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# mmrp-flood-optimization
RP/0/RSP0/CPU0:router(config-mmrp-flood-opt)# join-time 300
```

interface (EVPN)

To enter the physical port interface or the bundle name interface configuration mode, use the **interface** command in the EVPN configuration mode. To return to the EVPN configuration mode, use the **no** form of this command.

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

Syntax Description

type	Specifies the physical ethernet interface or bundle ethernet Interface type connected to the CE device. For more information about the syntax for the router, use the question mark (**?**) online help function.
interface path-id	Physical port name or main bundle name. The range for the bundle name is from 1 to 65535. **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.

Command Default

None.

Command Modes

EVPN configuration mode

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

To specify a physical interface, the notation for the *interface-path-id* is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

- *rack*: Chassis number of the rack.
- *slot*: Physical slot number of the line card.
- *module*: Module number. A physical layer interface module (PLIM) is always 0.
- *port*: Physical port number of the interface.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to enter the EVPN Interface configuration mode for bundle-ether 1:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)#
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
ethernet-segment, on page 12	Enters EVPN interface ethernet segment configuration mode.
mac-flush mvrp, on page 31	Performs a MAC flush on an Ethernet-segment.
timers, on page 70	Configures timers that affect the convergence of PBB EVPN in failure scenarios.

leaveall-time (PBB)

To set the leave-all-time for all active ports, use the **leaveall-time** command in the flood optimization for PBB over VPLS global configuration submode.

leaveall-time *seconds*

Syntax Description

seconds	Sets the minimum time in seconds for the leave-all timer parameter for all active ports. Range is from 5 to 30 seconds.

Command Default

10 seconds

Command Modes

Flood optimization for PBB over VPLS global configuration submode.

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

The leave-all timer parameter controls how often the leave-all messages are sent. This forces all the peers to re-declare all the attributes, thereby replaying any registrations or deregistrations that may be lost.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to set the leave-all time on all active ports:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# mmrp-flood-optimization
RP/0/RSP0/CPU0:router(config-mmrp-flood-opt)# leaveall-time 20
```

leave-time (PBB)

To set the leave-time for all active ports, use the **leave-time** command in the flood optimization for PBB over VPLS global configuration submode.

leave-time *seconds*

Syntax Description

seconds	Sets the leave time for all active ports. Range is from 1 to 90 seconds.

Command Default

30 seconds

Command Modes

Flood optimization for PBB over VPLS global configuration submode.

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

The **leave-time** command controls how long registrations stay in the leaving state before being removed; that is, it controls when the garbage collection of stale registrations is performed after unregistration.

The **leaveall-time** and the **leave-time** commands together control the garbage collection.

The IEEE specification states that the value of the **leave-time** command must be less than the value of the **leaveall-time** command.

However, in Cisco IOS-XR, processing outages of several seconds can occur during a process restart or Router Processor Fail-Over (RPFO) leading to a loss of messages.

Therefore, a greater default **leave-time** *value* (thrice that of the **leaveall-time** *value* command) increases the robustness of the Multiple MAC Registration Protocol (MMRP) during packet loss or system outage.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to set the leave-time on all active ports:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# mmrp-flood-optimization
RP/0/RSP0/CPU0:router(config-mmrp-flood-opt)# leave-time 80
```

load-balancing-mode

To set the load balancing mode of a physical port or bundle to active-active, use the **load-balancing-mode** command in the EVPN Interface Ethernet segment configuration mode. To disable the load balancing mode from active-active, use the **no** form of this command.

load-balancing-mode per-service
no load-balancing-mode per-service

Syntax Description

per-service	Specifies the per-service load balancing.

Command Default

Active-active per-flow

Command Modes

EVPN interface Ethernet segment configuration mode

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Use this command in a multi-homing configuration to set the redundancy mode to active-active per service.

In this mode, services that are active on one PoA are not active on the other PoA. Services can be represented by an ISID in case of PBB EVPN.

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to set the load balancing mode of a physical port or bundle to active-active:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# ethernet segment
RP/0/RSP0/CPU0:router(config-evpn-ac-es)# load-balancing-mode per-service
RP/0/RSP0/CPU0:router(config-evpn-ac-es)#
```

Related Commands

Command	Description
ethernet-segment, on page 12	Enters EVPN interface ethernet segment configuration mode.

Command	Description
service-carving, on page 44	Specifies the list of service identifiers as active and standby services.
backbone-source-mac, on page 3	Configures the backbone source MAC address.

mmrp-flood-optimization

To enable flood optimization for PBB over VPLS, use the **mmrp-flood-optimization** command on the core bridge in the PBB core configuration submode. To disable the flood optimization for PBB over VPLS, use the **no** form of this command.

mmrp-flood-optimization
no mmrp-flood-optimization

Syntax Description

This command has no keywords or arguments.

Command Default

Disabled.

Command Modes

PBB core configuration

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

Flood optimization is enabled on all the pseudo-wires in the VFI associated with the core bridge domain. This feature is supported only in the standard full mesh topology of a VPLS network.

Task ID

Task ID	Operation
l2vpn	read, write

The following example shows how to enable flood optimization for PBB over VPLS:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# l2vpn
RP/0/RSP0/CPU0:router(config-l2vpn)# bridge group pbb
RP/0/RSP0/CPU0:router(config-l2vpn-bg)# bridge-domain pbb-core
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd)# pbb core
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-pbb-core)# mmrp-flood-optimization
RP/0/RSP0/CPU0:router(config-l2vpn-bg-bd-pbb-core)# end
```

mac-flush mvrp

To perform a MAC flush on an Ethernet-segment, use the **mac-flush** command in the EVPN interface configuration mode. To disable the MAC flush setting, use the **no** form of this command.

mac-flush mvrp
no mac-flush mvrp

Syntax Description

mvrp	Specifies the MAC flush over MVRP.

Command Default

STP-TCN

Command Modes

EVPN interface configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to perform the MAC flush over MVRP on an Ethernet segment:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# mac-flush mvrp
RP/0/RSP0/CPU0:router(config-evpn-ac)#
```

Related Commands

Command	Description
interface (EVPN), on page 24	Enters the EVPN Interface configuration mode.

mode singleton

To enable singleton ICCP mode, use the **mode singleton** command in the Redundancy ICCP group configuration mode. To disable singleton ICCP mode, use the **no** form of this command.

mode singleton
no mode singleton

Syntax Description

This command has no arguments or keywords.

Command Default

None.

Command Modes

Redundancy ICCP group configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to enable singleton ICCP mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# redundancy
RP/0/RSP0/CPU0:router(config-redundancy)# iccp
RP/0/RSP0/CPU0:router(config-redundancy-iccp)# group 1
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)# mode singleton
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)#
```

pbb

To configure the provider backbone bridge core or edge, use the **pbb** command in the bridge domain configuration submode. To return to the default behavior, use the **no** form of this command.

pbb {**edge i-sid** *service-id* **core-bridge** *core-bridge-domain-name* | **core**}
no pbb {**edge i-sid** *service-id* **core-bridge** *core-bridge-domain-name* | **core**}

Syntax Description

edge	Configures the PBB edge.
i-sid	Specifies the service instance identifier. The ranges is from 256 to 16777214. **Note** The 16777215 (0xFFFFFF) service instance identifier is reserved for wildcard.
service-id	Service instance identifier.
core-bridge	Specifies the name of the core-bridge domain connected to that edge-bridge domain.
core-bridge-domain-name	Core bridge domain name.
core	Configures the PBB core.

Command Default

None

Command Modes

L2VPN bridge group bridge domain configuration

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

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

This command allows you to enter pbb edge configuration mode or pbb core configuration mode.

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure the PBB edge component:

```
config
l2vpn
```

```
  bridge group PBB
    bridge-domain PBB-EDGE
      interface GigabitEthernet0/0/0/38.100
      !
      interface GigabitEthernet0/2/0/30.150
      !
      pbb edge i-sid 1000 core-bridge PBB-CORE
   !
 !
!
```

The following example shows how to configure the PBB core component:

```
config
l2vpn
 bridge group PBB
  bridge-domain PBB-CORE
   interface G0/5/0/10.100
   !
   interface G0/2/0/20.200
   !
   pbb core
  !
 !
!
```

Related Commands

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

peering

To configure the peering timer, use the **peering** command in the EVPN Timers configuration mode. To delete the peering timer, use the **no** form of this command.

peering *seconds*
no peering *seconds*

Syntax Description

seconds	Specifies the value in seconds ranging from 0 to 300 seconds. The default value is 45 seconds.

Command Default

None.

Command Modes

EVPN Timers configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

In a single homed Ethernet segment, wait for this timer to expire before advertising BGP route target, Ethernet segment identifier (ESI), and local MAC.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to configure the peering timer in the EVPN Timers configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# timers
RP/0/RSP0/CPU0:router(config-evpn-timers)# peering 30
RP/0/RSP0/CPU0:router(config-evpn-timers)#
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
timers, on page 70	Configures timers that affect the convergence of PBB EVPN in failure scenarios.
flushagain, on page 18	Configures the MAC flushagain timer.
recovery, on page 40	Configures the recovery timer.

Command	Description
programming, on page 38	Configures the programming timer.

periodic transmit (PBB)

To enable periodic Multiple MAC Registration Protocol Data Units (MMRPDUs), use the **periodic transmit** command in the flood optimization for PBB over VPLS global configuration submode.

periodic transmit [**interval** *seconds*]

Syntax Description

interval	*seconds*	Specifies the periodic transmit interval in seconds. Range is from 2 to 10. If the **interval** keyword is not specified, then the value defaults to 3 seconds.

Command Default

Periodic MMRPDUs are disabled.

Command Modes

Flood optimization for PBB over VPLS global configuration submode.

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

This command can optionally be used to configure the protocol to replay data periodically. This is in addition to the periodic replay triggered by the leave-all timer. The use of this command will not be necessary in the vast majority of deployments and enabling it can cause a significant increase in CPU usage.

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to enable periodic MMRPDUs transmitted on all active ports:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# mmrp-flood-optimization
RP/0/RSP0/CPU0:router(config-mmrp-flood-opt)# periodic transmit interval 3
```

programming

To configure the programming timer, use the **programming** command in the EVPN Timers configuration mode. To delete the programming timer, use the **no** form of this command.

programming *microseconds*
no programming *microseconds*

Syntax Description

microseconds	Specifies the value in microseconds ranging from 0 to 100000 seconds. The default value is 1500 microseconds.

Command Default

None.

Command Modes

EVPN Timers configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Every time the ES Manager runs DF election, it starts a programming timer to account for the time needed by the hardware to apply the new carving. At the expiry time, the next ES route object is processed or carved, restarting the timer.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to configure the programming timer in the EVPN Timers configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# timers
RP/0/RSP0/CPU0:router(config-evpn-timers)# programming 5000
RP/0/RSP0/CPU0:router(config-evpn-timers)#
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
timers, on page 70	Configures timers that affect the convergence of PBB EVPN in failure scenarios.

Command	Description
flushagain, on page 18	Configures the MAC flushagain timer.
recovery, on page 40	Configures the recovery timer.
peering, on page 35	Configures the peering timer.

recovery

To configure the recovery timer, use the **recovery** command in the EVPN Interface Timers configuration or in the EVPN Timers configuration mode. To delete the recovery timer, use the **no** form of this command.

recovery *seconds*
no recovery *seconds*

Syntax Description

seconds	Specifies the value in seconds ranging from 20 to 3600 seconds. The default value is 20 seconds.

Command Default

None.

Command Modes

EVPN Interface Timers configuration

EVPN Timers configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

This timer is used to wait before processing the port state UP event in order to give the CE running STP to converge. If the interface is up and all conditions are already met, this timer is skipped to not add any more delays.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to configure the recovery timer in the EVPN Interface Timers configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# timers
RP/0/RSP0/CPU0:router(config-evpn-ac-timers)# recovery 50
RP/0/RSP0/CPU0:router(config-evpn-ac-timers)#
```

This example shows how to configure the recovery timer in the EVPN Timers configuration mode:

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

```
RP/0/RSP0/CPU0:router(config-evpn-timers)# recovery 300
RP/0/RSP0/CPU0:router(config-evpn-timers)#
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
interface (EVPN), on page 24	Enters the EVPN Interface configuration mode.
timers, on page 70	Configures timers that affect the convergence of PBB EVPN in failure scenarios.
flushagain, on page 18	Configures the MAC flushagain timer.
peering, on page 35	Configures the peering timer.
programming, on page 38	Configures the programming timer.

rewrite ingress tag push

To configure the backbone VLAN ID for a PBB core bridge, use the **rewrite ingress tag push** command in the PBB core configuration mode. To return to the default behavior, use the **no** form of this command.

rewrite ingress tag push dot1ad *vlan-id* **symmetric**

Syntax Description

dot1ad	Indicates that the IEEE 802.1ad provider bridges encapsulation type is used.
vlan-id	VLAN ID. Range is from 1 to 4094.
symmetric	Specifies that all rewrites must be symmetric.

Command Default

None

Command Modes

PBB core configuration

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure the backbone VLAN ID for the PBB core bridge:

```
config
l2vpn
  bridge group PBB
    bridge-domain PBB-CORE
      interface G0/5/0/10.100
      !
      interface G0/2/0/20.200
      !
      pbb core
       rewrite ingress tag push dot1ad 100 symmetric
   !
```

```
  !
!
```

Related Commands

Command	Description
bridge-domain (VPLS)	Establishes a bridge domain, and enters L2VPN bridge group bridge domain configuration mode.
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then to assign network interfaces to the bridge domain.
l2vpn	Enters L2VPN configuration mode.
pbb, on page 33	Configures the provider backbone bridge core or edge.

service-carving

To specify a list of service identifiers as active and standby services, use the **service-carving** command in the EVPN Interface Ethernet segment configuration mode. To delete service carving of a list of service identifiers, use the **no** form of this command.

service-carving manual[**primary** *service-id -range* **secondary** *service-id-range*]
no service-carving manual[**primary** *service-id-range* **secondary** *service-id-range*]

Syntax Description

manual	Specifies service identifiers or EVI-list services manually.
primary	Specifies the primary services list.
secondary	Specifies the secondary services list.
service-id-range	Specifies the services list notation in the range 100, 201-300, 401. The range is within 256 to 16777214.

Command Default

Automatic service carving

Command Modes

EVPN interface Ethernet segment configuration mode

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read, write

Example

This example shows how to specify a list of service identifiers as active and standby services:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# ethernet segment
RP/0/RSP0/CPU0:router(config-evpn-ac-es)# service-carving manual primary 201-300 secondary
```

```
 400-500
RP/0/RSP0/CPU0:router(config-evpn-ac-es)#
```

Related Commands

Command	Description
ethernet-segment, on page 12	Enters EVPN interface ethernet segment configuration mode.
load-balancing-mode, on page 28	Sets the load balancing mode of a physical port or bundle to active-active.
backbone-source-mac, on page 3	Configures the backbone source MAC address.

show evpn ethernet-segment

To display the EVPN Ethernet segment information, use the **show evpn ethernet-segment** command in the EXEC mode.

show evpn ethernet-segment[{**detail** | **esi** | **interface** | **location** | **private** | **standby** }]

Syntax Description

detail	Displays detailed information.
esi	Filters by Ethernet Segment identifier.
interface	Filters by interface name.
location	Displays location specific information.
private	Displays private information.
standby	Displays standby node specific information.

Command Default

None.

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.2	This command was introduced.
Release 6.0	The show command output is updated to provide RFC 7432 compliant Ethernet Segment Identifier (ESI) details.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read

Example

This sample output shows the EVPN Ethernet segment with interface filter:

```
RP/0/RSP0/CPU0:router#show evpn ethernet-segment interface gigabitethernet 0/3/0/0 detail
Ethernet Segment Id      Interface      Nexthops
------------------------ -------------- ----------------------------------------
0210.0300.9e00.0210.0000 Gi0/3/0/0      1.100.100.100
                                        2.100.100.100
be01.0300.be01.ce00.0001 BE1            1.100.100.100
```

```
                                        2.100.100.100
be02.0300.be02.0101.0002 BE2            1.100.100.100
                                        2.100.100.100
N/A                      Gi0/3/0/3      N/A
```

This sample output shows the EVPN Ethernet segment detailed information:

```
RP/0/RSP0/CPU0:router#show evpn ethernet-segment detail
Tue Jun 25 14:17:09.610 EDT
Legend:
  A- PBB-EVPN load-balancing mode and Access Protection incompatible,
  B- no Bridge Ports PBB-EVPN enabled,
  C- Backbone Source MAC missing,
  E- ESI missing,
  H- Interface handle missing,
  I- Interface name missing,
  M- Interface in Down state,
  O- BGP End of Download missing,
  P- Interface already Access Protected,
  Pf-Interface forced single-homed,
  R- BGP RID not received,
  S- Interface in redundancy standby state,
  X- ESI-extracted MAC Conflict

Ethernet Segment Id      Interface      Nexthops
------------------------ -------------- ----------------------------------------
0210.0300.9e00.0210.0000 Gi0/3/0/0      1.100.100.100
                                        2.100.100.100
  ES to BGP Gates   : Ready
  ES to L2FIB Gates : Ready
  Main port         :
     Interface name : GigabitEthernet0/3/0/0
     IfHandle       : 0x1800300
     State          : Up
     Redundancy     : Not Defined
  Source MAC        : 0001.ed9e.0001 (PBB BSA)
  Topology          :
     Operational    : MHN
     Configured     : A/A per service (default)
  Primary Services  : Auto-selection
  Secondary Services: Auto-selection
  Service Carving Results:
     Bridge ports   : 3
     Elected        : 0
     Not Elected    : 3
          I-Sid NE  :  1450101, 1650205, 1850309
  MAC Flushing mode : STP-TCN
  Peering timer     : 45 sec [not running]
  Recovery timer    : 20 sec [not running]
  Flushagain timer  : 60 sec

be01.0300.be01.ce00.0001 BE1            1.100.100.100
                                        2.100.100.100
  ES to BGP Gates   : Ready
  ES to L2FIB Gates : Ready
  Main port         :
     Interface name : Bundle-Ether1
     IfHandle       : 0x000480
     State          : Up
     Redundancy     : Active
  Source MAC        : 0024.be01.ce00 (Local)
  Topology          :
     Operational    : MHN
```

```
    Configured     : A/A per flow (default)
  Primary Services  : Auto-selection
  Secondary Services: Auto-selection
  Service Carving Results:
     Bridge ports   : 3
     Elected        : 3
          I-Sid E   :  1450102, 1650206, 1850310
     Not Elected    : 0
  MAC Flushing mode : STP-TCN
  Peering timer     : 45 sec [not running]
  Recovery timer    : 20 sec [not running]
  Flushagain timer  : 60 sec
```

This sample output shows the EVPN Ethernet segment detailed information with ESI types 0 and 1:

```
RP/0/RSP0/CPU0:router#show evpn ethernet-segment detail

Ethernet Segment Id      Interface      Nexthops
------------------------ -------------- ----------------------------------------
0099.1020.9900.0000.0001 Gi0/0/0/0      10.10.10.10
                                        20.20.20.20
                                        50.50.50.50
  ES to BGP Gates   : Ready
  ES to L2FIB Gates : Ready
  Main port         :
     Interface name : GigabitEthernet0/0/0/0
     Interface MAC  : d867.d93e.0c8c
     IfHandle       : 0x40000c0
     State          : Up
     Redundancy     : Not Defined
  ESI type          : 0
     Value          : 99.1020.9900.0000.0001
  ES Import RT      : 9900.0000.0001 (Local)
  Source MAC        : 0000.0050.0010 (Local)
  Topology          :
     Operational    : MHN
     Configured     : Single-active (AApS) (default)
  Primary Services  : Auto-selection
  Secondary Services: Auto-selection


RP/0/RSP0/CPU0:router#show evpn ethernet-segment detail

0100.1020.0025.0000.1900 BE25           10.10.10.10
                                        20.20.20.20
  ES to BGP Gates   : Ready
  ES to L2FIB Gates : Ready
  Main port         :
     Interface name : Bundle-Ether25
     Interface MAC  : 0026.51cc.4e44
     IfHandle       : 0x0006a0
     State          : Up
     Redundancy     : Active
  ESI type          : 1
     System-id      : 0010.2000.2500
     Port key       : 0019
  ES Import RT      : 0010.2000.2500 (from ESI)
  Source MAC        : 0210.2000.2500 (from ESI)
  Topology          :
     Operational    : MHN
     Configured     : All-active (AApF) (default)
  Primary Services  : Auto-selection
```

```
Secondary Services: Auto-selection
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
ethernet-segment, on page 12	Enters EVPN interface ethernet segment configuration mode.

show evpn evi

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

show evpn evi [{**bridge-domain** | **detail** | **inclusive-multicast** | **location** | **mac** | **standby** | **vpn-id** }]

Syntax Description

bridge-domain	Displays information for a specified bridge-domain..
detail	Displays detailed information.
inclusive-multicast	Displays EVPN Inclusive Multicast information.
location	Displays location specific information.
mac	Displays EVI MAC route associated configuration information.
standby	Displays standby node specific information.
vpn-id	Displays information for a specified E-VPN Identifier.

Command Default

None.

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.2	This command was introduced.
Release 6.1.2	The show command output is enhanced to display the Service Path Preference parameters.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read

Example

This sample output shows the EVPN EVI information with the VPN-ID and MAC address filter:

```
RP/0/RSP0/CPU0:router#show evpn evi vpn-id 185 mac 0024.be03.ce01
MAC address    Nexthop                                 Label    vpn-id
-------------- --------------------------------------- -------- --------
0024.be03.ce01 3.100.100.100                           16004    185
               4.100.100.100                           16004    185
```

```
   ESI port key : 0x0000
   Source       : Remote
   Flush Count  : 0
```

This sample output shows the EVPN EVI information with the VPN-ID and inclusive-multicast filter:

```
RP/0/RSP0/CPU0:router#show evpn evi vpn-id 185 inclusive-multicast service-id 1850312 orig-ip
 1.100.100.100
ISID           Originating IP                vpn-id
-------------- ----------------------------- ----------
1850312        1.100.100.100                           185
1850312        2.100.100.100                           185
1850312        3.100.100.100                           185
1850312        4.100.100.100                           185
```

This sample output shows the EVPN EVI inclusive-multicast information:

```
RP/0/RSP0/CPU0:router#show evpn evi inclusive-multicast detail
ISID: 1850312, Originating IP: 1.100.100.100                           185
    Nexthop: ::
    Label  : 16005
    Source : Local
ISID: 1850312, Originating IP: 2.100.100.100                           185
    Nexthop: 2.100.100.100
    Label  : 16005
    Source : Remote
ISID: 1850312, Originating IP: 3.100.100.100                           185
    Nexthop: 3.100.100.100
    Label  : 16005
    Source : Remote
ISID: 1850312, Originating IP: 4.100.100.100                           185
    Nexthop: 4.100.100.100
    Label  : 16005
    Source : Remote
```

This sample output shows the EVPN EVI information with the bridge-domain filter:

```
RP/0/RSP0/CPU0:router#show evpn evi bridge-domain tb1-core1 detail
EVI        Bridge Domain                 Type
---------- ----------------------------- -------
145        tb1-core1                     PBB
165        tb1-core2                     PBB
185        tb1-core3                     PBB
65535      ES:GLOBAL                     BD
```

This sample output shows the EVPN EVI detailed information:

```
RP/0/RSP0/CPU0:router#show evpn evi detail
EVI        Bridge Domain                 Type
---------- ----------------------------- -------
145        tb1-core1                     PBB
   Unicast Label  : 16000
   Multicast Label: 16001
   RD Config: none
   RD Auto  : (auto) 1.100.100.100:145
   RT Auto  : 100:145
   Route Targets in Use           Type
```

```
   ------------------------------ -------
   100:145                        Import
   100:145                        Export

165        tb1-core2                    PBB
   Unicast Label  : 16002
   Multicast Label: 16003
   RD Config: none
   RD Auto  : (auto) 1.100.100.100:165
   RT Auto  : 100:165
   Route Targets in Use           Type
   ------------------------------ -------
   100:165                        Import
   100:165                        Export

185        tb1-core3                    PBB
   Unicast Label  : 16004
   Multicast Label: 16005
   RD Config: none
   RD Auto  : (auto) 1.100.100.100:185
   RT Auto  : 100:185
   Route Targets in Use           Type
   ------------------------------ -------
   100:185                        Import
   100:185                        Export

65535      ES:GLOBAL                    BD
   Unicast Label  : 0
   Multicast Label: 0
   RD Config: none
   RD Auto  : (auto) 1.100.100.100:0
   RT Auto  : none
   Route Targets in Use           Type
   ------------------------------ -------
   0100.9e00.0210                 Import
   0100.be01.ce00                 Import
   0100.be02.0101                 Import
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
evi, on page 14	Enters the EVPN EVI configuration mode to configure optional BGP settings for a bridge domain or EVI.

show evpn summary

To display the EVPN summary, use the **show evpn summary** command in the EXEC mode.

show evpn summary[{**location** | **private** | **standby**}]

Syntax Description

location	Displays location specific information.
private	Displays private information.
standby	Displays standby node specific information.

Command Default

None.

Command Modes

EXEC

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
l2vpn	read

Example

This sample output shows the EVPN summary:

```
RP/0/RSP0/CPU0:router#show evpn summary
Thu Jul  4 01:34:58.838 DST
----------------------------
Global Information
----------------------------
Number of EVIs                : 1
Number of Local MAC Routes    : 1
Number of Remote MAC Routes   : 0
Number of Local IMCAST Routes : 0
Number of Remote IMCAST Routes: 0
Number of Internal Labels     : 0
Number of ES Entries          : 0
BGP Router ID                 : ::
BGP ASN                       : Invalid
PBB BSA MAC address           : f866.f214.abd7
Global peering timer          :     45 seconds
Global recovery timer         :     20 seconds
```

```
Global programming timer      :   1500 microseconds
Global flushagain timer       :     60 seconds
-----------------------------
High Availability Information
-----------------------------
BGP EOD                       : N
Number of Marked MAC Routes   : 0
Number of Swept MAC Routes    : 0
Number of Marked IMCAST Routes: 0
Number of Swept IMCAST Routes : 0
```

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.

show l2vpn bridge-domain pbb

To display the provider backbone bridge details, use the **show l2vpn bridge-domain pbb** command in EXEC mode.

show l2vpn bridge-domain pbb {**core** [{**brief** | **detail** | **hardware** | **private**}] | **edge** [{**brief** | **core-bridge** | **detail** | **hardware** | **private**}] | **i-sid** *service-id* [{**brief** | **detail** | **hardware** | **private**}]}

Syntax Description

core	Displays the PBB core.
edge	Displays the PBB edge.
i-sid	Displays the service instance identifier.
service-id	Service ID.
brief	Displays brief information about the PBB core, edge or service instance identifier.
detail	Displays detailed information about the PBB core, edge or service instance identifier.
hardware	Displays hardware information.
private	Displays private information about the PBB core, edge or service instance identifier.
core-bridge	Displays the name of the core-bridge domain connected to the edge-bridge domain.

Command Default

None

Command Modes

l2vpn

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read

Examples

The following examples shows the output from the **show l2vpn bridge-domain pbb** command:

```
#show l2vpn bridge-domain isid 1234
Bridge group: g2, bridge-domain: pbb-bd1, id: 1, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-edge, I-SID: 1234
  Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
```

```
  Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
List of PBBs:
    PBB Edge, state: up, Static MAC addresses: 0
    List of ACs:
    Gi0/2/0/0, state: up, Static MAC addresses: 2, MSTi: 0
```

For IOS-XR 5.3.1 and earlier releases.

```
#show l2vpn bridge-domain detail isid 1234
Bridge group: g2, bridge-domain: pbb-bd1, id: 1, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-edge, I-SID: 1234
  Core-bridge: pbb-bd2
  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: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
 List of PBBs:
    PBB Edge, state is up
      XC ID 0x2000001
      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
      Split Horizon Group: none
      DHCPv4 snooping: disabled
      IGMP Snooping profile:
      Storm Control: disabled
      Unknown-unicast-bmac: 666.777.888
      CMAC to BMAC Mapping Table:
         CMAC              |    BMAC
         -------------------------------------------------
         222.333.444     |    777.888.999
         333.444.555     |    888.999.111
      Statistics:
        packet totals: receive 3919680,send 9328
        byte totals: receive 305735040,send 15022146

  List of ACs:
    AC: GigabitEthernet0/1/0/0, state is up
      Type Ethernet
      MTU 1500; XC ID 0x2000001; interworking none; MSTi 0
      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
```

For IOS-XR 5.3.2 release.

```
#show l2vpn bridge-domain detail isid 1234
Bridge group: g2, bridge-domain: pbb-bd1, id: 1, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-edge, I-SID: 1234
  Core-bridge: pbb-bd2
  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: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
 List of PBBs:
    PBB Edge, state is up
      XC ID 0x2000001
      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
      Split Horizon Group: none
      DHCPv4 snooping: disabled
      IGMP Snooping profile:
      Storm Control: disabled
      Unknown-unicast-bmac: 666.777.888
      CMAC to BMAC Mapping Table:
         CMAC             |    BMAC
         -------------------------------------------------
         222.333.444      |    777.888.999
         333.444.555      |    888.999.111
     Statistics:
        packets: received 1000 (unicast 1000), sent 0
        bytes: received 128000 (unicast 128000), sent 0
        MAC move: 10

  List of ACs:
    AC: GigabitEthernet0/1/0/0, state is up
      Type Ethernet
      MTU 1500; XC ID 0x2000001; interworking none; MSTi 0
      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:
         packets: received 3919680, (multicast 0, broadcast 0, unknown unicast 0, unicast
3919680,), sent 9328
         bytes: received 305735040 (multicast 0, broadcast 0, unknown unicast 0, unicast
0), sent 15022146
         MAC move: 0


#show l2vpn bridge-domain pbb edge
Bridge group: g2, bridge-domain: pbb-bd1, id: 1, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-edge, I-SID: 1234
  Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
  Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
List of PBBs:
    PBB Edge, state: up, Static MAC addresses: 2
List of ACs:
    Gi0/2/0/0, state: up, Static MAC addresses: 2, MSTi: 0

Bridge group: g2, bridge-domain: pbb-bd3, id: 3, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-edge, I-SID: 2345
  Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
  Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
List of PBBs:
     EDGE, state: up, Static MAC addresses: 2
List of ACs:
    Gi0/2/0/0, state: up, Static MAC addresses: 2, MSTi: 0


Bridge group: g2, bridge-domain: pbb-bd4, id: 4, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-edge, I-SID: 3456
  Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
  Filter MAC addresses: 0
ACs: 1 (1 up), VFIs: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
List of PBBs:
     PBB Edge, state: up, Static MAC addresses: 2
List of ACs:
    Gi0/2/0/0, state: up, Static MAC addresses: 2, MSTi: 0
```

For IOS-XR 5.3.2 release.

```
#show l2vpn bridge-domain pbb-edge detail
Bridge group: g2, bridge-domain: pbb-bd1, id: 1, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-edge, I-SID: 1234
  Core-bridge: pbb-bd2
  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: 0, PWs: 0 (0 up), PBBs: 1 (1 up
  List of PBBs:
```

```
    PBB Edge, state is up
      XC ID 0x2000001
      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
      Split Horizon Group: none
      DHCPv4 snooping: disabled
      IGMP Snooping profile:
      Storm Control: disabled
      Unknown-unicast-bmac: 666.777.888

      CMAC to BMAC Mapping Table:
         CMAC             |    BMAC
         -------------------------------------------------
         222.333.444      |    777.888.999
         333.444.555      |    888.999.111
     Statistics:
        packets: received 1000 (unicast 1000), sent 0
        bytes: received 128000 (unicast 128000), sent 0
        MAC move: 10

  List of ACs:
    AC: GigabitEthernet0/1/0/0, state is up
      Type Ethernet
      MTU 1500; XC ID 0x2000001; interworking none; MSTi 0
      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:
        packets: received 1000 (unicast 1000), sent 0
        bytes: received 128000 (unicast 128000), sent 0
        MAC move: 10


#show l2vpn bridge-domain pbb-core
Bridge group: g2, bridge-domain: pbb-bd2, id: 2, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-core
  Number of associated pbb-edge BDs: 1
  Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
  Filter MAC addresses: 0
  ACs: 1 (1 up), VFIs: 0, PWs: 0 (0 up), PBBs: 1 (1 up
  List of PBBs:
    PBB Core, state: up
  List of ACs:
    Gi0/2/0/0, state: up, Static MAC addresses: 2, MSTi: 0


#show l2vpn bridge-domain pbb-core detail
Bridge group: g2, bridge-domain: pbb-bd2, id: 2, state: up, ShgId: 0, MSTi: 0
  Type:  pbb-core
  Number of associated pbb-edge BDs: 1
  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), PBB: 1
List of PBBs:
    PBB Core, state is up
      Vlan-id: 1; XC ID 0x2000001
      MAC learning: enabled
      Flooding:
        Broadcast & Multicast: enabled
        Unknown unicast: enabled
      MAC aging time: 300 s, Type: inactivity
      MAC limit: 600, Action: none, Notification: syslog
      MAC limit reached: no
      Security: disabled
      Split Horizon Group: none
      DHCPv4 snooping: profile foo
      IGMP Snooping profile:
      Storm Control: disabled
  List of ACs:
    AC: GigabitEthernet0/1/0/0, state is up
      Type Ethernet
      MTU 1500; XC ID 0x2000001; interworking none; MSTi 0
      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


#show l2vpn bridge-domain pbb-edge core-bridge core-bd brief
Bridge Group/?????????????????????? ID    State      Num ACs/up     Num PWs/up
Bridge-Domain Name
---------------------------------------- ------ ------- ----------------------
bg/pbb-bd1 ??????????????????????????1      up           0/0 ?????????0/0
bg/pbb-bd2 ??????????????????????????2      up           0/0 ?????????0/0
bg/pbb-bd3 ??????????????????????????3      up           0/0 ?????????0/0


RP/0/0/CPU0:ios#show l2vpn bridge-domain pbb edge core-bridge bd
Bridge group: bg, bridge-domain: pbb-bd1, id: 1, state: up, ShgId: 0, MSTi: 0
  Type: pbb-edge, I-SID: 4001
  Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
  Filter MAC addresses: 0
  ACs: 0 (0 up), VFIs: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
  List of PBBs:
    PBB Edge, state: up, Static MAC addresses: 2
```

```
   …

Bridge group: bg, bridge-domain: pbb-bd2, id: 2, state: up, ShgId: 0, MSTi: 0
  Type: pbb-edge, I-SID: 4002
  Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
  Filter MAC addresses: 0
  ACs: 0 (0 up), VFIs: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
  List of PBBs:
    PBB Edge, state: up, Static MAC addresses: 1
  …

Bridge group: bg, bridge-domain: pbb-bd3, id: 3, state: up, ShgId: 0, MSTi: 0
  Type: pbb-edge, I-SID: 4003
  Aging: 300 s, MAC limit: 4000, Action: none, Notification: syslog
  Filter MAC addresses: 0
  ACs: 0 (0 up), VFIs: 0, PWs: 0 (0 up), PBBs: 1 (1 up)
  List of PBBs:
    PBB Edge, state: up, Static MAC addresses: 0
  …
```

Related Commands

Command	Description
pbb, on page 33	Configures the provider backbone bridge core or edge.

show l2vpn forwarding bridge pbb

To display the PBB bridge forwarding information, use the **show l2vpn forwarding bridge pbb** command in EXEC mode.

show l2vpn forwarding bridge pbb core [{**debug** | **detail** | **hardware** | **location** | **private**}] | **edge** [{**core-bridge** | **debug** | **detail** | **hardware** | **location** | **private**}] | **i-sid** *service-id* [{**debug** | **detail** | **hardware** | **location** | **private**}]

Syntax Description

debug	Displays the debug information.
core	Displays the PBB core.
edge	Displays the PBB edge.
i-sid *service-id*	Displays the service instance identifier.
brief	Displays brief information about the PBB core, edge or service instance identifier.
detail	Displays detailed information about the PBB core, edge or service instance identifier.
hardware	Displays hardware information.
private	Displays private information about the PBB core, edge or service instance identifier.
core-bridge	Displays the name of the core-bridge domain connected to the edge-bridge domain.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows the output from the **show l2vpn forwarding pbb backbone-source-mac** command:

```
#show l2vpn forwarding backbone-source-mac location 0/1/CPU0
333.444.555
```

The following example shows the output from the **show l2vpn forwarding bridge-domain pbb edge location** command:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding bridge-domain pbb edge location 0/1/CPU0
                                Bridge       MAC
Bridge-Domain Name              ID     Ports addr   Flooding Learning State
------------------------------- ------ ----- ------ -------- -------- ------
bg1:bd2                         1      1     0      Enabled  Enabled  UP
bg1:bd4                         3      1     0      Enabled  Enabled  UP
bg1:bd5                         4      1     0      Enabled  Enabled  UP
```

The following example shows the output from the **show l2vpn forwarding bridge-domain pbb edge core-bridge bg1:bd3 location** command:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding bridge-domain pbb edge core-bridge bg1:bd3
location 0/1/CPU0
                                Bridge       MAC
Bridge-Domain Name              ID     Ports addr   Flooding Learning State
------------------------------- ------ ----- ------ -------- -------- ------
bg1:bd2                         1      1     0      Enabled  Enabled  UP
bg1:bd4                         3      1     0      Enabled  Enabled  UP
bg1:bd5                         4      1     0      Enabled  Enabled  UP
```

The following example shows the output from the **show l2vpn forwarding bridge-domain pbb core location** command:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding bridge-domain pbb core location 0/1/CPU0
                                Bridge       MAC
Bridge-Domain Name              ID     Ports addr   Flooding Learning State
------------------------------- ------ ----- ------ -------- -------- ------
bg1:bd3                         1      1     0      Enabled  Enabled  UP
```

The following example shows the output from the **show l2vpn forwarding bridge-domain pbb i-sid 1000 location** command:

```
RP/0/RSP0/CPU0:router# show l2vpn forwarding bridge-domain pbb i-sid 1000 location 0/0/CPU0
Thu Aug 13 12:08:16.492 EDT
                                Bridge       MAC
Bridge-Domain Name              ID     Ports addr   Flooding Learning State
------------------------------- ------ ----- ------ -------- -------- ---------
PBB:PBB-EDGE                    1      4     2      Enabled  Enabled  UP
```

Related Commands

Command	Description
pbb, on page 33	Configures the provider backbone bridge core or edge.

show l2vpn forwarding pbb backbone-source-mac

To display the provider backbone source MAC forwarding information, use the **show l2vpn forwarding pbb backbone-source-mac** command in EXEC mode.

show l2vpn forwarding pbb backbone-source-mac {**debug** [{**detail** | **location** | **private**}] | **detail** [{**debug** | **location** *node-id*}] | **location** *node-id* | **private**}

Syntax Description

debug	Displays the debug information.
detail	Displays the detailed PBB forwarding information.
location	Specifies the location.
node-id	Node ID.
private	Displays private information.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows the output from the **show l2vpn forwarding pbb backbone-source-mac** command:

```
#show l2vpn forwarding backbone-source-mac location 0/1/CPU0
333.444.555
```

Related Commands

Command	Description
pbb, on page 33	Configures the provider backbone bridge core or edge.

show l2vpn pbb backbone-source-mac

To display the provider backbone source MAC information, use the **show l2vpn pbb backbone-source-mac** command in EXEC mode.

show l2vpn pbb backbone-source-mac

Syntax Description

This command has no keywords or arguments.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read

Examples

The following example shows the output from the **show l2vpn pbb backbone-source-mac** command:

```
#show l2vpn pbb backbone-source-mac
0111.0222.0333
```

Related Commands

Command	Description
pbb, on page 33	Configures the provider backbone bridge core or edge.

show mmrp-flood-optimization

To display the MMRP flood optimization information, use the **show mmrp-flood-optimization** command in the EXEC mode.

show mmrp-flood-optimization [{**summary** | **mad** [**pw** *neighbor pw-id*] | **statistics** [**pw** *neighbor pw-id*] | **registrations [received]** [**core-bridge** *bridge-domain-name*:*group-name*] [**isid** *isid*]}]

Syntax Description

summary	Displays the summary of the current timer values, total number of core bridges, pseudowires, I-SIDs configured, declarations, and registrations.
mad	Displays the current state of the MRP Attribute Declaration (MAD) component on a pseudowire, for each active attribute value (that is, group B-MAC).
pw	Indicates the pseudowire.
neighbor	Indicates the IP address of the neighbor.
pw-id	Indicates the pseudowire ID.
statistics	Displays the packet statistics per pseudowire.
registrations	Displays the I-SIDs that are declared and a list of peers that have made registrations for those I-SIDs
received	Displays all the I-SIDs where registrations have been received, even if those I-SIDs are not configured locally.
core-bridge	Displays the information about a specific core-bridge.
bridge-domain-name	Core bridge domain name.
group-name	Group name.
isid	Displays information of a specific service instance identifier.
isid	Service instance identifier.

Command Default

None

Command Modes

EXEC

Command History

Release	Modification
Release 5.1.2	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows the output from the **show mmrp-flood-optimization summary** command.

```
RP/0/RSP0/CPU0:router#show mmrp-flood-optimization summary
Core Bridges:            4
Pseudowires:             100
I-SIDs configured:       2000
Total MMRP declarations: 200000
Registrations received:  220000

Flood Time:      disabled
Leaveall Time:   10000 ms
Leave Time:      30000 ms
Join Time:       200 ms
Transmit Period: 1000 ms
```

The following example shows the output from the **show mmrp-flood-optimization mad** command.

```
RP/0/RSP0/CPU0:router#show mmrp-flood-optimization mad
Core-Bridge: PBB-VPLS-Core1 PW: neighbor 1.2.3.4, pwid 87
  Participant Type: Full; Point-to-Point: Yes
  Admin Control: Applicant Normal; Registrar Normal

  LeaveAll Passive (next in 5.92s); periodic disabled
  Leave in 25.70s; Join not running
  Last peer 0293.6926.9585; failed registrations: 0

I-SID      B-MAC           Applicant              Registrar
---------  --------------  ---------------------  ---------
        1  001E.8300.0001  Very Anxious Observer  Leaving
 16777216  001E.83FF.FFFF  Quiet Passive          Empty
```

static-mac-address

To map a customer destination MAC address to backbone destination MAC address, use the **static-mac-address** command in the PBB edge configuration mode. To return to the default behavior, use the **no** form of this command.

static-mac-address *cust-mac-address* **bmac** *bmac-mac-address*
no static-mac-address *cust-mac-address* **bmac** *bmac-mac-address*

Syntax Description

cust-mac-address	Customer destination MAC address in hexadecimal format.
bmac	Specifies that the static backbone MAC address must be mapped with the customer MAC address.
bmac-mac-address	Static backbone MAC address in hexadecimal format.

Command Default

None

Command Modes

PBB edge configuration mode

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to map the customer MAC address with the backbone MAC address:

```
interface GigabitEthernet0/0/0/0.1 l2transport  encapsulation dot1q 10 !
interface GigabitEthernet0/0/0/0.2 l2transport  encapsulation dot1q 2 !
interface GigabitEthernet0/0/0/1
 shutdown
!
interface GigabitEthernet0/0/0/2
 shutdown
!
interface GigabitEthernet0/0/0/3
 shutdown
!
interface GigabitEthernet0/0/0/4
```

```
 shutdown
!
l2vpn
 bridge group bg12
  bridge-domain bd1
   interface GigabitEthernet0/0/0/0.1
    static-mac-address 0002.0003.0004
   !
   interface GigabitEthernet0/0/0/0.2
   !
   pbb edge i-sid 1000 core-bridge bd2
    static-mac-address 0006.0007.0008 bmac 0004.0005.0006
   !
  !
 !
!
end
!
```

The following example shows the output of the **show l2vpn bridge-domain** command:

```
##sh l2vpn bridge-domain m mac-address  mroute

Mac Address    Type    Learned from/         LC learned         Mapped to
              Filtered on          Resync Age
-------------------------------------------------------------------------------------------
0002.0003.0004 static  Gi0/0/0/0.1                N/A          N/A       N/A
0006.0007.0008 static  BD id: 0                   N/A          N/A    0004.0005.0006
```

Note To resynchronize the MAC table from the network processors, use the **l2vpn resynchronize forwarding mac-address-table location** <*r/s/i*> command.

Related Commands

Command	Description
bridge-domain (VPLS)	Establishes a bridge domain, and enters L2VPN bridge group bridge domain configuration mode.
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then to assign network interfaces to the bridge domain.
pbb, on page 33	Configures the provider backbone bridge core or edge.
l2vpn	Enters L2VPN configuration mode.

timers

To configure timers that affect the convergence of PBB EVPN in failure scenarios, use the **timers** command in the EVPN interface configuration or in the EVPN configuration mode. To delete the timer configuration, use the **no** form of this command.

timers [{**flushagain** | **recovery** | **peering** | **programming**}]
no timers [{**flushagain** | **recovery** | **peering** | **programming**}]

Syntax Description

flushagain	Specifies the MAC flush again timer.
recovery	Specifies the recovery timer.
peering	Specifies the peering timer.
programming	Specifies the programming timer.

Command Default

None.

Command Modes

EVPN interface configuration

EVPN configuration

Command History

Release	Modification
Release 4.3.2	This command was introduced.

Usage Guidelines

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

The timers are configured globally in the EVPN configuration mode whereas in the EVPN interface configuration mode, the timers are configured per Ethernet.

The keywords **peering** and **programming** are supported only in the EVPN configuration mode.

Task ID

Task ID	Operation
l2vpn	read, write

This example shows how to configure timers in the EVPN Interface configuration mode:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# evpn
RP/0/RSP0/CPU0:router(config-evpn)# interface bundle-ether 1
RP/0/RSP0/CPU0:router(config-evpn-ac)# timers
RP/0/RSP0/CPU0:router(config-evpn-ac-timers)#
```

This example shows how to configure timers in the EVPN configuration mode:

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

Related Commands

Command	Description
evpn, on page 15	Enters EVPN configuration mode.
interface (EVPN), on page 24	Enters the EVPN Interface configuration mode.
recovery, on page 40	Configures the recovery timer.
flushagain, on page 18	Configures the MAC flushagain timer.
peering, on page 35	Configures the peering timer.
programming, on page 38	Configures the programming timer.

unknown-unicast-bmac

To configure the unknown unicast backbone MAC address for a PBB edge bridge, use the **unknown-unicast-bmac** command in the PBB edge configuration mode. To return to the default behavior, use the **no** form of this command.

unknown-unicast-bmac *mac-address*
no unknown-unicast-bmac *mac-address*

Syntax Description

mac-address	Unknown unicast backbone MAC address in hexadecimal format.

Command Default

None

Command Modes

PBB edge configuration

Command History

Release	Modification
Release 3.9.1	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples

The following example shows how to configure the unknown unicast backbone MAC address for a PBB edge bridge:

```
config
l2vpn
  bridge group PBB
    bridge-domain PBB-EDGE
      interface GigabitEthernet0/0/0/38.100
      !
      interface GigabitEthernet0/2/0/30.150
      !
      pbb edge i-sid 1000 core-bridge PBB-CORE
        unknown-unicast-bmac 0123.8888.8888
   !
```

```
  !
!
```

Related Commands

Command	Description
bridge-domain (VPLS)	Establishes a bridge domain, and enters L2VPN bridge group bridge domain configuration mode.
bridge group (VPLS)	Creates a bridge group so that it can contain bridge domains and then to assign network interfaces to the bridge domain.
l2vpn	Enters L2VPN configuration mode.
pbb, on page 33	Configures the provider backbone bridge core or edge.