



## EVPN Commands

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This section describes the commands used to configure Ethernet VPN (EVPN) services for Layer 2 VPNs.



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**Note** All commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router that is introduced from Cisco IOS XR Release 6.3.2. References to earlier releases in Command History tables apply to only the Cisco NCS 5500 Series Router.

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**Note**

- Starting with Cisco IOS XR Release 6.6.25, all commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 560 Series Routers.
- Starting with Cisco IOS XR Release 6.3.2, all commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router.
- References to releases before Cisco IOS XR Release 6.3.2 apply to only the Cisco NCS 5500 Series Router.
- Cisco IOS XR Software Release 7.0.1 specific updates are not applicable for the following variants of Cisco NCS 540 Series Routers:
  - N540-28Z4C-SYS-A
  - N540-28Z4C-SYS-D
  - N540X-16Z4G8Q2C-A
  - N540X-16Z4G8Q2C-D
  - N540X-16Z8Q2C-D
  - N540-12Z20G-SYS-A
  - N540-12Z20G-SYS-D
  - N540X-12Z16G-SYS-A
  - N540X-12Z16G-SYS-D

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For detailed information about concepts, configuration tasks, and examples, see the *EVPN Features* chapter in the *L2VPN and Ethernet Services Configuration Guide for Cisco NCS 5500 Series Routers*.

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# ac-aware-vlan-bundling

To configure AC-aware VLAN bundling, use the **ac-aware-vlan-bundling** command in the EVPN configuration mode.

## ac-aware-vlan-bundling

**Syntax Description** This command has no keywords or arguments.

**Command Default** None.

**Command Modes** EVPN configuration mode

Command History	Release	Modification
	Release 6.6.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to configure AC-aware VLAN bundling :

```
Router(config)# evpn
Router(config-evpn)# evi 1
Router(config-evpn-instance)# ac-aware-vlan-bundling
Router(config-evpn-instance)# commit
```

## access-signal out-of-service

To override the default signal sent to bring down the AC and to transition the interface to Out-of-Service (OOS) state, use the **access-signal out-of-service** command in the EVPN interface configuration mode. To return to the default behavior, use the **no** form of this command.

**access-signal out-of-service**

**Command Default** None

**Command Modes** EVPN interface configuration

Command History	Release	Modification
	Release 7.10.1	This command was introduced.

**Usage Guidelines** Starting from Cisco IOS XR Release 7.10.1, the EVPN port-active configuration supports hot standby where all the main and subinterfaces up in a Standby node. To revert to the previous behavior of transitioning through the OOS state, use this command.

Task ID	Task	Operation
	l2vpn	read, write

### Example

The following example shows how to configure the access signal mode to enable the OOS functionality.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface Bundle-Ether1
Router(config-evpn-ac)# ethernet-segment
Router(config-evpn-ac-es)# identifier type 0 01.00.01.00.01.09.01.00.09
Router(config-evpn-ac-es)# load-balancing-mode port-active
Router(config-evpn-ac-es)# exit
Router(config-evpn-ac)# access-signal out-of-service
Router(config-evpn-ac)# commit
```

# access-signal

To configure control signaling messages in access circuits, use the **access-signal** command in the EVPN configuration mode.

**access-signal** [ **bundle-down** | **out-of-service** ]

<b>Syntax Description</b>	<b>bundle-down</b>	Initiates Access Signal Bundle Down.
	<b>out-of-service</b>	Initiates Access signal bundle out of service.
<b>Command Default</b>	None.	
<b>Command Modes</b>	EVPN configuration mode	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 7.9.1	This command was introduced.
<b>Usage Guidelines</b>	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.	
<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	l2vpn	read, write

This example shows how to configure **access-signal** command in EVPN configuration mode:

```
RP/0/RP0/CPU0:R1#config
RP/0/RP0/CPU0:R1(config)#evpn
RP/0/RP0/CPU0:R1(config-evpn)#interface Bundle-Ether 1
RP/0/RP0/CPU0:R1(config-evpn-ac)#access-signal bundle-down
```

# advertise gateway-ip-disable

To disable advertisement of non-zero EVPN gateway IP address, use the **advertise gateway-ip-disable** command in the EVPN address-family configuration mode.

## advertise gateway-ip-disable

**Syntax Description** This command has no keywords or arguments.

**Command Default** None.

**Command Modes** EVPN address-family configuration mode

Command History	Release	Modification
	Release 7.9.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to disable advertisement of non-zero EVPN gateway IP address:

```
Router(config)# router bgp 100
Router(config-bgp)# neighbor 10.10.10.10
Router(config-bgp-nbr)# remote-as 200
Router(config-bgp-nbr)# update-source Loopback 0
Router(config-bgp-nbr)# address-family l2vpn evpn
Router(config-bgp-nbr-af)# advertise gateway-ip-disable
Router(config-bgp-nbr-af)# commit
```

# advertise-mac

To advertise local MAC to the peers, use **advertise-mac** command in the EVPN configuration mode. The local MAC is advertised to the peer in control plane using BGP.

## advertise-mac

**Syntax Description** This command has no keywords or arguments.

**Command Default** None

**Command Modes** EVPN

Command History	Release	Modification
	Release 6.2.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

The following example shows how to advertise local MAC.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# evi 1
Router(config-evpn-evi)# bgp
Router(config-evpn-evi-bgp)# route-target import 100:6005
Router(config-evpn-evi-bgp)# route-target export 100:6005
Router(config-evpn-evi-bgp)# exit
Router(config-evpn-evi)# advertise-mac
```



# bgp-gateway

To enable BGP gateway monitoring for host tracking on the Bridge-Group Virtual Interface (BVI) and the bridge domain , use the **bgp-gateway** command on the interface configuration mode on the BVI.

## bgp-gateway

**Syntax Description** This command has no keywords or arguments.

**Command Default** BVI does not monitor the status of the BGP gateways.

**Command Modes** Host-tracking configuration

Command History	Release	Modification
	Release 24.1.1	This command was introduced.

**Usage Guidelines** You must configure the **host-tracking** command before you configure the **bgp-gateway** command.

Task ID	Task ID	Operation
	bfd	read, write

## Example

The following example shows how to create a BVI interface, enable host tracking, and enable BVI to monitor the status of the BGP gateways:

```
Router#(config)# interface BVI1
Router#(config-if)# host-routing
Router#(config-if)# vrf vrf_1
Router#(config-if)# ipv4 address 10.0.0.1 255.255.0.0
Router#(config-if)# mac-address 0.dc1.dc2
Router#(config-if)# host-tracking
Router#(config-if-host-tracking)# bgp-gateway
```

## clear l2route evpn ipv4

To clear either duplicate or frozen flags, or both, from EVPN MAC-IPv4 routes and re-enable local route learning for the corresponding IPv4 addresses, use **clear l2route evpn ipv4** command in EXEC mode.

**clear l2route evpn ipv4** { *ipv4-address* } | **all** [ *evi evi* ] **frozen-flag**

Syntax Description	
<b>ipv4</b> <i>ipv4-address</i>	Clears the route for the specified IPv4 address.
<b>all</b>	Clears all EVPN MAC-IPv4 routes that are marked as duplicate or permanently frozen.
<b>evi</b> <i>evi</i>	Clears EVPN MAC -IPv4 routes for the specified topology only.
<b>frozen-flag</b>	Clears either duplicate or frozen flag for the MAC-IPv4 routes that are identified by the specified options.

**Command Default** None

**Command Modes** EXEC

Command History	Release	Modification
	Release 6.6.1	This command was introduced.

**Usage Guidelines** None

Task ID	Task ID	Operation
	l2vpn	read, write

### Example

This example shows how to clear duplicate or frozen flags, or both from EVPN MAC-IPv4 routes:

```
Router# clear l2route evpn ipv4 192.0.2.1 evi 1 frozen-flag
```

## clear l2route evpn ipv6

To clear either duplicate or frozen flags, or both, from EVPN MAC-IPv6 routes and re-enable local route learning for the corresponding IPv6 addresses, use **clear l2route evpn ipv6** command in EXEC mode.

**clear l2route evpn ipv6** {*ipv6-address*} [**all** [**evi** *evi* ] **frozen-flag**]

Syntax Description	
<b>ipv6</b> <i>ipv6-address</i>	Clears the route for the specified IPv6 address.
<b>all</b>	Clears all EVPN MAC-IPv6 routes that are marked as duplicate or permanently frozen.
<b>evi</b> <i>evi</i>	Clears EVPN MAC-IPv6 routes for the specified topology only.
<b>frozen-flag</b>	Clear duplicate or frozen flag for the MAC-IPv6 routes that are identified by the specified options.

**Command Default** None

**Command Modes** EXEC

Command History	Release	Modification
	Release 6.6.1	This command was introduced.

**Usage Guidelines** None

Task ID	Task ID	Operation
	l2vpn	read, write

### Example

This example shows how to clear either duplicate or frozen flags, or both, from EVPN MAC-IPv6 routes:

```
Router# clear l2route evpn IPv6 2001:DB8::1 evi 1 frozen-flag
```

## clear l2route evpn mac

To clear either duplicate or frozen flags, or both, from EVPN MAC routes and re-enable local route learning for the corresponding MAC addresses, use **clear l2route evpn mac** command in EXEC mode.

**clear l2route evpn mac** {*mac-address*} | **all** [**evi** *evi* ] **frozen-flag**

Syntax Description	
<b>mac</b> <i>mac-address</i>	Clears the route for the specified MAC address.
<b>all</b>	Clears all EVPN MAC routes that are marked as duplicate or permanently frozen.
<b>evi</b> <i>evi</i>	Clears EVPN MAC routes for the specified topology only.
<b>frozen-flag</b>	Clears duplicate or frozen flag for the MAC routes that are identified by the specified options.

**Command Default** None

**Command Modes** EXEC

Command History	Release	Modification
	Release 6.6.1	This command was introduced.

**Usage Guidelines** None

Task ID	Task	Operation
	l2vpn	read, write

### Example

This example shows how to clear duplicate or frozen flags, or both, from EVPN MAC routes:

```
Router# clear l2route evpn mac 0.12.3456 evi 1 frozen-flag
```

# convergence

To enable the switchover of a failed primary link from one PE device to another, use the **convergence** command in the EVPN configuration submenu.

**convergence** { **mac-mobility** | **reroute** | **nexthop-tracking** }

Syntax Description	mac-mobility	Enables the MAC mobility convergence.
	<b>reroute</b>	Redirects the unicast traffic to backup peer.
	<b>nexthop-tracking</b>	Enables the EVPN procedures to be influenced by BGP nexthop reachability.

**Command Default** None

**Command Modes** EVPN configuration submenu

Command History	Release	Modification
	Release 7.3.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to enable mac-mobility reconvergence:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# ethernet-segment
Router(config-evpn-es)# load-balancing-mode single-flow-active
Router(config-evpn-es)# convergence mac-mobility
```

This example shows how to redirect the unicast traffic to backup peer.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface Bundle-Ether100
Router(config-evpn-ac)# ethernet-segment
Router(config-evpn-ac-es)# identifier type 0 00.00.00.00.00.00.05.01.02
Router(config-evpn-ac-es)# convergence
Router(config-evpn-ac-es-conv)# reroute
```

## core-de-isolation

To configure the recovery time for the EVPN core isolation group after the core interfaces recover from a network failure, use the **core-de-isolation** command in the EVPN Timers configuration mode.

**core-de-isolation** *timer value*

<b>Syntax Description</b>	<b>core-de-isolation</b> <i>timer value</i> Specifies the core isolation group recovery delay timer. The range is from 60 to 300 seconds. The default timer value is 60 seconds.				
<b>Command Default</b>	None.				
<b>Command Modes</b>	EVPN Timers configuration mode				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 7.6.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 7.6.1	This command was introduced.
Release	Modification				
Release 7.6.1	This command was introduced.				
<b>Usage Guidelines</b>	When the core links recover, the default recovery delay timer begins. The access interfaces become active after the core-de-isolation timer expires.				

### Example

This example shows how to configure the recovery time for the EVPN core isolation group.

```
Router# configure
Router(config)# evpn timers
Router(config-evpn-timers)# core-de-isolation 120
Router(config-evpn-timers)# commit
```

## cost-out

To bring down all the bundle interfaces belonging to an Ethernet VPN (EVPN) Ethernet segments on a node, use the **cost-out** command in EVPN configuration mode. To bring up the node into service, use the **no** form of this command.

**cost-out**  
**no cost-out**

---

### Command Default

None

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### Command Modes

EVPN configuration mode

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### Command History

Release	Modification
Release 6.1.31	This command was introduced.

---

### Usage Guidelines

No specific guidelines impact the use of this command.

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### Task ID

Task ID	Operations
EVPN	read, write

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### Examples

The following example shows how to bring up or bring down the bundle Ethernet Segments on a node:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# cost-out
Router(config-evpn) commit

Router# configure
Router(config)# evpn
Router(config-evpn)# no cost-out
Router(config-evpn) commit
```

# delete extcommunity evpn-link-bandwidth

To remove an existing extended community set for EVPN link bandwidth from a route policy, use the **delete extcommunity evpn-link-bandwidth** in route-policy configuration mode.

**delete extcommunity evpn-link-bandwidth** { **all** | *extcommunity-set* }

<b>Syntax Description</b>	<b>all</b>	All the existing extended community set.
	<i>extcommunity-set</i>	The extended community set for EVPN link bandwidth. The set is enclosed in parentheses.
<b>Command Default</b>	None.	
<b>Command Modes</b>	Route-policy configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 7.10.1	This command was introduced.
<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.	
<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	route-policy	read, write

## Example

The following example shows how to remove an extended community set for EVPN link bandwidth from a route policy.

```
Router(config)# route-policy evpn-rpl
Router(config-rpl)# delete extcommunity evpn-link-bandwidth all
Router(config-rpl)# end-policy
```



# evi

To enter the EVPN EVI configuration mode and configure 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
```

<b>Syntax Description</b>	<i>evi-id</i> Specifies the Ethernet VPN ID to set. The range is from 1 to 65534.
---------------------------	---

<b>Command Default</b>	None.
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<b>Command Modes</b>	EVPN configuration mode
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.1.21	This command was introduced.

<b>Usage Guidelines</b>	Use this command to configure static BGP route distinguisher or BGP route target for an EVI.
-------------------------	--

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	l2vpn	read, write

## Example

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

```
Router# configure
Router(config)# evpn
Router(config-evpn)# evi 2
```

# 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	
<b>bgp</b>	Configures BGP.
<b>evi</b>	Configures Ethernet VPN ID (EVI).
<b>interface</b>	Assigns an interface to EVPN.
<b>timers</b>	Configures global EVPN timers.

**Command Default** None.

**Command Modes** Global configuration

Command History	Release	Modification
	Release 6.1.21	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to enter the EVPN configuration mode:

```
Router# configure
Router(config)# evpn
Router(config-evpn)#
```

# evpn evi

To configure EVPN instance (EVI) use the **evpn evi** command in the global configuration mode. To remove the configuration, use the **no** form of this command.

**evpn evi** *evi-id*

<b>Syntax Description</b>	<i>evi-id</i> Specifies the Ethernet VPN ID to set. The range is from 1 to 65534.
---------------------------	---

<b>Command Default</b>	None.
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<b>Command Modes</b>	Global configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.6.3	This command was introduced.

<b>Usage Guidelines</b>	The EVI is represented by the virtual network identifier (VNI). An EVI represents a VPN on a PE router. It serves the same role of an IP VPN Routing and Forwarding (VRF), and EVIs are assigned to import/export Route Targets. This command configures the EVI and enters the EVPN Instance configuration mode, where you can configure EVPN settings.
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<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	l2vpn	read, write

## Example

This example shows how to configure EVPN EVI that enters the EVPN Instance configuration mode.

```
Router# configure
Router(config)# evpn evi 10
Router((config-evpn-instance)#
```

## evpn evi multicast source-connected

To configure EVPN multicast instance with a locally connected multicast source, use the **evpn evi *evi-id* multicast source-connected** command in the Global configuration mode or EVPN instance configuration mode. To remove the configuration, use the **no** form of this command.

```
evpn evi evi-id [ multicast ] [ source-connected ]
```

Syntax Description		
	<i>evi-id</i>	Specifies the Ethernet VPN ID to set. The range is from 1 to 65534.
	<b>multicast</b>	(Optional) Configures EVPN instance multicast.
	<b>source-connected</b>	(Optional) Connects multicast traffic source.

**Command Default** None.

**Command Modes** Global configuration  
EVPN instance configuration mode

Command History	Release	Modification
	Release 6.6.3	This command was introduced.
	Release 24.1.1	This command is deprecated

**Usage Guidelines** This command is used in all-active dual-homed PE scenarios with BVI interfaces and host-routing for EVPN enabled networks.

This command installs an IPv4 or IPv6 host route in the routing table when a locally connected multicast source is available. This ensures that the Protocol Independent Multicast (PIM) has correct Reverse Path Forwarding (RPF) towards the local source and not to the EVPN-injected host route of the other PE.

Task ID	Task ID	Operation
	l2vpn	read, write

### Example

This example shows how to configure a multicast instance in global configuration mode.

```
Router# configure
Router(config)# evpn evi 10 multicast source-connected
Router(config)#
```

This example shows how to configure a multicast instance in EVPN Instance configuration mode.

```
Router# configure
Router(config)# evpn evi 10
Router(config-evpn-instance)# multicast source-connected
Router(config-evpn-instance)#
```

# 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		
	<b>backbone-source-mac</b>	Specifies Backbone Source MAC.
	<b>identifier</b>	Specifies Ethernet Segment Identifier.
	<b>load-balancing-mode</b>	Specifies load balancing mode.
	<b>service-carving</b>	Specifies service carving.

**Command Default** None.

**Command Modes** EVPN interface configuration

Command History	Release	Modification
	Release 6.1.21	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task	Operation
	l2vpn	read, write

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

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface bundle-ether 1
Router(config-evpn-ac)# ethernet-segment
Router(config-evpn-ac-es)#
```

# ethernet-segment (evpn)

To disable ESI auto-generation value for LACP ESI type 1, use the **ethernet-segment** command in the EVPN configuration mode. To enable ESI auto-generation, use the **no** form of this command.

**ethernet-segment type 1 auto-generation-disable**  
**no ethernet-segment type 1 auto-generation-disable**

<b>Syntax Description</b>	<b>type 1</b> Specifies LACP ESI-auto-generation for ESI type 1.				
	<b>auto-generation-disable</b> Disables ESI auto-generation.				
<b>Command Default</b>	By default, EVPN auto-generates an ESI value for the bundle interfaces by retrieving LACP information.				
<b>Command Modes</b>	EVPN configuration mode				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.3.2</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.3.2	This command was introduced.
Release	Modification				
Release 6.3.2	This command was introduced.				
<b>Usage Guidelines</b>	This command allows mLACP to decide to either forward or stop EVPN multipath resolution on remote ESI.				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>l2vpn</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operation	l2vpn	read, write
Task ID	Operation				
l2vpn	read, write				

## Example

This example shows how to disable auto-generation ESI type 1:

```
Router# configure
Router(config)# evpn
Router(config-evpn)#ethernet-segment
Router(config-evpn-es)#type 1 auto-generation-disable
```

# etree leaf

To enable EVPN Ethernet Tree (E-Tree) services on an EVPN Instance VPN ID and enable an EVPN Instance VPN ID as E-Tree leaf, use the **etree leaf** command in the EVPN configuration mode.

## etree leaf

**Syntax Description** This command has no keywords or arguments.

**Command Default** None.

**Command Modes** EVPN configuration mode

Command History	Release	Modification
	Release 6.6.1	This command was introduced.

**Usage Guidelines** If a PE is not configured as E-Tree leaf, it is considered as root by default.

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to configure EVPN E-Tree leaf:

```
Router(config)# evpn
Router(config-evpn)# evi 1
Router(config-evpn-instance)# etree leaf
Router(config-evpn-instance)# commit
```



## etree rt-leaf

To enable EVPN all-active multihoming support with EVPN E-Tree using BGP Route Target (RT) import and export policies, use the **etree rt-leaf** command in the EVPN EVI configuration submode.

**etree rt-leaf**

**no etree rt-leaf**

**Syntax Description** This command has no keywords or arguments.

**Command Default** None.

**Command Modes** EVI configuration submode

Command History	Release	Modification
	Release 7.2.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read, write

### Example

This example shows how to designate EVPN instance as EVPN E-Tree Route-Target leaf site.

```
Router(config)# evpn
Router(config-evpn)# evi 15
Router(config-evpn-instance)# etree
Router(config-evpn-instance-etree)# rt-leaf
```

## host ipv4-address duplicate-detection

To enable duplicate detection of host IPv4 address, use the **host ipv4-address duplicate-detection** command in the EVPN configuration mode.

**host ipv4-address duplicate-detection** [ **freeze-time** *freeze-time* | **move-count** *move-count* | **move-interval** *move-interval* | **retry-count** *retry-count* | **infinity** | **reset-freeze-count-interval** *interval* ] **disable**

Syntax Description		
<b>freeze-time</b> <i>freeze-time</i>		Length of time to lock the IPv4 address after it has been detected as duplicate. Default is 30 seconds.
<b>move-count</b> <i>move-count</i>		Number of moves to occur within the specified <b>move-interval</b> before freezing the IPv4 address. Default is 5.
<b>move-interval</b> <i>move-interval</i>		Interval to watch for subsequent MAC moves before freezing the IPv4 address. Default is 180 seconds.
<b>retry-count</b> <i>retry-count</i>		Number of times to unfreeze an IPv4 address before freezing it permanently. Default is three times.
<b>infinite</b>		Infinite retry count. Prevents freezing of the duplicate IP address permanently.
<b>reset-freeze-count-interval</b> <i>interval</i>		Interval after which the count of duplicate detection events is reset. Default is 24 hours. The range is from 1 hour to 48 hours.
<b>disable</b>		Disable duplicate detection of IPv4 addresses.

**Command Default** None

**Command Modes** EVPN configuration mode

Command History	Release	Modification
	Release 6.6.1	This command was introduced.
	Release 7.2.1	<b>infinite</b> and <b>reset-freeze-count-interval</b> keywords were added.

**Usage Guidelines** None

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to enable duplicate detection of host IPv4 address:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host ipv4-address duplicate-detection
Router(config-evpn-host-ipv4-addr)# move-count 2
Router(config-evpn-host-ipv4-addr)# freeze-time 10
Router(config-evpn-host-ipv4-addr)# retry-count 2
Router(config-evpn-host-ipv4-addr)# commit
```

This example shows how to prevent permanent freezing of duplicate host IPv4 address:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host ipv4-address duplicate-detection
Router(config-evpn-host-ipv4-addr)# retry-count infinity
Router(config-evpn-host-ipv4-addr)# commit
```

This example shows how to reset the interval after which the count of duplicate detection events are permanently frozen.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host ipv4-address duplicate-detection
Router(config-evpn-host-ipv4-addr)# reset-freeze-count-interval 20
Router(config-evpn-host-ipv4-addr)# commit
```

## host ipv6-address duplicate-detection

To enable duplicate detection of host IPv6 address, use the **host ipv6-address duplicate-detection** command in the EVPN configuration mode.

**host ipv6-address duplicate-detection** [ **freeze-time** *freeze-time* | **move-count** *move-count* | **move-interval** *move-interval* | **retry-count** *retry-count* | **infinity** | **reset-freeze-count-interval** *interval* ] **disable**

Syntax Description		
<b>freeze-time</b> <i>freeze-time</i>		Length of time to lock the IPv6 address after it has been detected as duplicate. Default is 30 seconds.
<b>move-count</b> <i>move-count</i>		Number of moves to occur within the specified <b>move-interval</b> before freezing the IPv6 address. Default is 5.
<b>move-interval</b> <i>move-interval</i>		Interval to watch for subsequent MAC moves before freezing the IPv6 address. Default is 180 seconds.
<b>retry-count</b> <i>retry-count</i>		Number of times to unfreeze an IPv6 address before freezing it permanently. Default is three times.
<b>infinite</b>		Infinite retry count. Prevents freezing of the duplicate IP address permanently.
<b>reset-freeze-count-interval</b> <i>interval</i>		Interval after which the count of duplicate detection events is reset. Default is 24 hours. The range is from 1 hour to 48 hours.
<b>disable</b>		Disable duplicate detection of IPv6 addresses.

**Command Default** None

**Command Modes** EVPN configuration mode

Command History	Release	Modification
	Release 6.6.1	This command was introduced.
	Release 7.2.1	<b>infinite</b> and <b>reset-freeze-count-interval</b> keywords were added.

**Usage Guidelines** None

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to enable duplicate detection of host IPv6 address:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host ipv6-address duplicate-detection
Router(config-evpn-host-ipv6-addr)# move-count 2
Router(config-evpn-host-ipv6-addr)# freeze-time 10
Router(config-evpn-host-ipv6-addr)# retry-count 2
Router(config-evpn-host-ipv6-addr)# commit
```

This example shows how to prevent permanent freezing of duplicate host IPv6 address:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host ipv6-address duplicate-detection
Router(config-evpn-host-ipv6-addr)# retry-count infinity
Router(config-evpn-host-ipv6-addr)# commit
```

This example shows how to reset the interval after which the count of duplicate detection events are permanently frozen.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host ipv6-address duplicate-detection
Router(config-evpn-host-ipv6-addr)# reset-freeze-count-interval 20
Router(config-evpn-host-ipv6-addr)# commit
```

# evpn-link-bandwidth

To configure EVPN link bandwidth, use the **evpn-link-bandwidth** command in VRF neighbor address family configuration mode.

**evpn-link-bandwidth** [ **per-path** *unit* ]

Syntax Description	
<b>per-path</b>	(Optional) EVPN link bandwidth uses per path.
<i>unit</i>	Unit value per path. The range is from 1 to 65535.

**Command Default** None.

**Command Modes** VRF neighbor address family configuration

Command History	Release	Modification
	Release 7.10.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	bgp	read, write

## Example

The following example shows configuration of EVPN link bandwidth on a VRF neighbor.

```
Router(config)# router bgp 100
Router(config-bgp)# vrf vrf1
Router(config-bgp-vrf)# neighbor 172.16.1.3
Router(config-bgp-vrf-nbr)# evpn-link-bandwidth per-path 100
```

# host mac-address duplicate-detection

To enable duplicate detection of host MAC address, use the **host mac-address duplicate-detection** command in the EVPN configuration mode.

**host mac-address duplicate-detection** [ **freeze-time** *freeze-time* | **move-count** *move-count* | **move-interval** *move-interval* | **retry-count** *retry-count* | **infinity** | **reset-freeze-count-interval** *interval* ] **disable**

Syntax Description	Parameter	Description
	<b>freeze-time</b> <i>freeze-time</i>	Length of time to lock the MAC address after it has been detected as duplicate. Default is 30 seconds.
	<b>move-count</b> <i>move-count</i>	Number of moves to occur within the specified <b>move-interval</b> before freezing the MAC address. Default is 5.
	<b>move-interval</b> <i>move-interval</i>	Interval to watch for subsequent MAC moves before freezing the MAC address. Default is 180 seconds.
	<b>retry-count</b> <i>retry-count</i>	Number of times to unfreeze an MAC address before freezing it permanently. Default is three times.
	<b>infinity</b>	Infinite retry count. Prevents freezing of the duplicate MAC address permanently.
	<b>reset-freeze-count-interval</b> <i>interval</i>	Interval after which the count of duplicate detection events is reset. Default is 24 hours. The range is from 1 hour to 48 hours.
	<b>disable</b>	Disable duplicate detection of MAC addresses.

**Command Default** None

**Command Modes** EVPN configuration mode

Command History	Release	Modification
	Release 6.6.1	This command was introduced.
	Release 7.2.1	<b>infinity</b> and <b>reset-freeze-count-interval</b> keywords were added.

**Usage Guidelines** None

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to enable duplicate detection of host MAC address:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host MAC-address duplicate-detection
Router(config-evpn-host-mac-addr-dup-detection)# move-count 2
Router(config-evpn-host-mac-addr-dup-detection)# freeze-time 10
Router(config-evpn-host-mac-addr-dup-detection)# retry-count 2
Router(config-evpn-host-mac-addr-dup-detection)# commit
```

This example shows how to prevent permanent freezing of duplicate host MAC address:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host MAC-address duplicate-detection
Router(config-evpn-host-mac-addr-dup-detection)# retry-count infinity
Router(config-evpn-host-mac-addr-dup-detection)# commit
```

This example shows how to reset the interval after which the count of duplicate detection events are permanently frozen.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# host MAC-address duplicate-detection
Router(config-evpn-host-mac-addr-dup-detection)# reset-freeze-count-interval 20
Router(config-evpn-host-mac-addr-dup-detection)# commit
```



## hw-module l2-replication core-optimized

By default, the BUM traffic from the core is replicated not only towards the attachment circuits (AC) but also towards the remote PEs in the Ingress pipeline. The packets replicated towards the remote PEs are dropped in the Egress Pipeline by applying the Split-Horizon rule. Even though these replicated packets get dropped in the Egress Pipeline, it results in recycle bandwidth being utilised.

For optimising the recycle bandwidth utilization, enable the **hw-module l2-replication core-optimized** command in the global configuration mode. Once you enable this command, the BUM traffic received from the core will:

- No longer be replicated to remote PEs in the Ingress pipeline.
- Only be replicated to the attachment circuits.

To return to the default behaviour, use **no hw-module l2-replication core-optimized**.

### hw-module l2-replication core-optimized

<b>Command Default</b>	None	
<b>Command Modes</b>	Global configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 7.10.1	This command was introduced.
<b>Usage Guidelines</b>	You must manually reload the router to activate the <b>hw-module l2-replication core-optimized</b> command.	
<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	root-lr	read, write

### Example

The following example shows how to enable the command for optimising the recycle bandwidth utilization during the BUM traffic replication from the core.

```
Router# configure
Router(config)# hw-module l2-replication core-optimized
```

# host-tracking

To enable host tracking on a Bridged Virtual Interface (BVI), allowing a device to keep track of hosts directly connected to it, use the **host-tracking** command.

**host-tracking** [ *bgp-gateway* ]

<b>Syntax Description</b>	<b>bgp-gateway</b> Specifies that the BVI monitors the status of hosts that are considered to be gateways for BGP and adjusts its behavior based on the availability or reachability of those gateways.				
<b>Command Default</b>	Disabled by default.				
<b>Command Modes</b>	Interface configuration				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 24.1.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 24.1.1	This command was introduced.
Release	Modification				
Release 24.1.1	This command was introduced.				
<b>Usage Guidelines</b>	None.				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>bfd</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operation	bfd	read, write
Task ID	Operation				
bfd	read, write				

## Example

The following example shows how to create a BVI and enable host tracking:

```
Router#(config)# interface BVI1
Router#(config-if)# host-tracking
Router#(config-if-host-tracking)# bgp-gateway
Router#(config-if-host-tracking)# arp
Router#(config-if-host-tracking-arp)# bfd fast-detect
```

# flood mode ac-shg-optimized

To avoid the replication of BUM flood traffic towards attachment circuits (AC) in a split-horizon group (SHG), use the **flood mode ac-shg-optimized** command in the L2VPN bridge group bridge domain configuration mode. To return to the default behavior, use the **no** form of this command.

## flood mode ac-shg-optimized

<b>Command Default</b>	None	
<b>Command Modes</b>	L2VPN bridge group bridge domain configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 7.10.1	This command was introduced.

**Usage Guidelines** To enable the optimization of AC-to-AC replication of BUM flood traffic, ensure that all the ACs are available in a split-horizon group. In addition, ensure that you have already configured the **hw-module l2-replication core-optimized** command and restarted the router, so that the command takes effect.



**Note** The **flood mode ac-shg-optimized** command works only after you configure the **hw-module l2-replication core-optimized** command and restart the router.

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	l2vpn	read, write

## Example

The following example shows configuration of flood mode optimization, which avoids the AC-to-AC replication of BUM flood traffic.

```
Router# configure
Router(config)# l2vpn
Router(config-l2vpn)# bridge group bg0
Router(config-l2vpn-bg)# bridge-domain bd0
Router(config-l2vpn-bg-bd)# flood mode ac-shg-optimized
```

# 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**

<b>Command Default</b>	None	
<b>Command Modes</b>	Global configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.0.1	This command was introduced.

**Usage Guidelines** All EVPN-based access redundancy (EVLAG) designated forwarder elections are disregarded in favor of the legacy MLAG 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 MLAG redundancy group.

Specifically, the ESI assignment to the interface is no longer used for EVPN-based access redundancy and protection mechanisms and the MLAG 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 MLAG 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 MLAG 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
```

# import from bridge-domain

To import IPv4 or IPv6 host routes from all the EVPN bridge domains in a router, use the **import from bridge-domain** in BGP address family configuration mode. To remove the configuration, use the **no** form of this command.

## import from bridge-domain

### Command Default

None.

### Command Modes

BGP address family configuration

### Command History

Release	Modification
Release 7.10.1	This command was introduced.

### Usage Guidelines

No specific guidelines impact the use of this command.

### Task ID

Task ID	Operation
bgp	read, write

### Example

The following example shows configuration to import IPv4 host routes as IPv4 unicast routes from EVPN bridge domains.

```
Router(config)# router bgp
Router(config-bgp)# address-family ipv4 unicast
Router(config-bgp-af)# import from bridge-domain
```

## import from bridge-domain advertise-as-vpn

To import EVPN route type-2 routes from EVI bridge domain into the L3VPN VRF, and advertise as VPNv4 or VPNv6 routes, use the **import from bridge-domain advertise-as-vpn** command in the global configuration mode.

### **import from bridge-domain advertise-as-vpn**

**Syntax Description** This command has no keywords or arguments.

**Command Default** None

**Command Modes** Global configuration

Command History	Release	Modification
	Release 6.6.1	This command was introduced.

**Usage Guidelines** The route target of the EVI (BD) must match with at least one import route-target of the L3 VRF.

If the remote node uses BGP VPNv4 or VPNv6 address-family instead of EVPN address-family, use the **import from bridge-domain advertise-as-vpn** command under VRF address-family that allows you to advertise the host-route as BGP VPNv4 or VPNv6 instead of EVPN address-family.

The following example shows how to configure import from bridge-domain advertise-as-vpn.

```
Router# configure
Router(config)# vrf A
Router(config-vrf)# address-family ipv4 unicast
Router(config-vrf-af)# import from bridge-domain advertise-as-vpn
Router(config-vrf-af)# import route-target 30:30
Router(config-vrf-af)# export route-target 30:30
Router(config-vrf-af)# commit
```

# implicit-import

To import EVPN routes in BGP routing table, use **implicit-import** command in the EVPN configuration mode.

## implicit-import

**Syntax Description** This command has no keywords or arguments.

**Command Default** None

**Command Modes** EVPN configuration mode

Command History	Release	Modification
	Release 7.9.1	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	Operation
	l2vpn	read, write

This example shows how to configure **implicit-import** command in EVPN configuration mode.

```
RP/0/RP0/CPU0:R1#config
RP/0/RP0/CPU0:R1(config)#evpn
RP/0/RP0/CPU0:R1(config-evpn)#evi 1
RP/0/RP0/CPU0:R1(config-evpn-instance)#bgp
RP/0/RP0/CPU0:R1(config-evpn-instance-bgp)#implicit-import
```

## 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
```

<b>Syntax Description</b>	<i>type</i>	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.
	<i>interface path-id</i>	Physical port name or main bundle name.  The range for the bundle name is from 1 to 65535.  <b>Note</b> Use the <b>show interfaces</b> 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.
<b>Command Default</b>	None.	
<b>Command Modes</b>	EVPN configuration mode	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.1.21	This command was introduced.

**Usage Guidelines** 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:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface bundle-ether 1
Router(config-evpn-ac)#
```

# l2vpn evpn

To execute EVPN commands in L2VPN mode, use the **l2vpn evpn** command in the EXEC mode.

```
l2vpn evpn { compute-hrw neighbor neighbor-ip-address esi esi-value service-id evi-value |
ethernet-segment interface interface-name revert }
```

Syntax Description	
<b>compute-hrw neighbor</b> <i>neighbor-ip-address</i> <b>esi</b> <i>esi-value</i> <b>service-id</b> <i>evi-value</i>	Generates Highest Random Weight (HRW) for a PE, which would be used during the DF election.
<b>ethernet-segment interface</b> <i>interface-name</i> <b>revert</b>	Disables the non-revertive mode and returns to the revertive mode of DF election.

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	EXEC
----------------------	------

Command History	Release	Modification
	Release 6.0.1	This command was introduced.
	Release 24.1.1	The <b>ethernet-segment interface</b> <i>interface-name</i> <b>revert</b> keyword was added.

<b>Usage Guidelines</b>	None
-------------------------	------

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows configuration to compute HRW.

```
Router# l2vpn evpn compute-hrw neighbor 10.1.1.1 esi 11.1111.1111.0011.1111 service-id 10
```

This example shows configuration to disable the non-revertive mode of DF election.

```
Router# l2vpn evpn ethernet-segment interface Bundle-Ether1 revert
```

# load-balancing-mode

To enable the load-balancing mode, use the **load-balancing-mode** command in the EVPN interface configuration mode. To disable the load-balancing mode, use the **no** form of this command.

**load-balancing-mode** { **port-active** | **single-active** | **single-flow-active** }

Syntax Description	port-active	single-active	single-flow-active
	Enables the port-active load-balancing mode	Enables the single-active load-balancing mode.	Enables the single-flow-active load-balancing mode.

**Command Default** None

**Command Modes** EVPN configuration mode

Command History	Release	Modification
	Release 6.2.1	This command was introduced.
	Release 7.1.15	Port-active keyword was added.
	Release 7.3.1	single-flow-active keyword was added.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read, write

## Example

This example shows how to enable the single-active load-balancing mode:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# ethernet-segment
Router(config-evpn-es)# load-balancing-mode single-active
```

This example shows how to enable the single-flow-active load-balancing mode:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# ethernet-segment
Router(config-evpn-es)# load-balancing-mode single-flow-active
```

# mac-flush

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

Starting from Cisco IOS XR Release 7.11.2, the command has been replaced as follows:

**mac-flush-message** { **mvrp** | **disable** }

### Syntax Description

**mvrp** Specifies the MAC flush over MVRP.

**disable** Disables the MAC flush messages.

### Command Default

STP-TCN

### Command Modes

EVPN interface configuration

### Command History

Release	Modification
Release 4.3.2	This command was introduced.
Release 7.11.2	This command was replaced by the <b>mac-flush-message</b> command. The keyword <b>disable</b> was added.

### 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:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface bundle-ether 1
Router(config-evpn-ac)# ethernet-segment
Router(config-evpn-ac-es)# identifier type 0 36.37.00.00.00.00.00.11.00
Router(config-evpn-ac-es)# exit
Router(config-evpn-ac)# mac-flush mvrp
Router(config-evpn-ac)#
```

This example shows how to perform the MAC flush over MVRP on an Ethernet segment, starting from release 7.11.2:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface bundle-ether 1
Router(config-evpn-ac)#ethernet-segment
Router(config-evpn-ac-es)#identifier type 0 36.37.00.00.00.00.11.00
Router(config-evpn-ac-es)#exit
Router(config-evpn-ac)# mac-flush-message mvrp
Router(config-evpn-ac)#
```

This example shows how to disable the MAC flush messages on an Ethernet segment:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface bundle-ether 1
Router(config-evpn-ac)#ethernet-segment
Router(config-evpn-ac-es)#identifier type 0 36.37.00.00.00.00.11.00
Router(config-evpn-ac-es)#load-balancing-mode single-active
Router(config-evpn-ac-es)#exit
Router(config-evpn-ac)# mac-flush-message disable
Router(config-evpn-ac)#
```

## neighbor evpn

To enable EVPN-VPWS endpoint on the p2p cross-connect, use the **neighbor evpn** command in the p2p configuration submode.

**neighbor evpn evi** *vpn-id* **target** *ac-id*

<b>Syntax Description</b>	<b>evi</b> <i>vpn-id</i> Virtual Private Network Identifier where this p2p xconnect is setup.
	<b>target</b> <i>ac-id</i> Specifies the targeted remote attachment circuit id of the EVPN.

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	p2p configuration submode
----------------------	---------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.1.21	This command was introduced.

<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.
-------------------------	--

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	l2vpn	read, write

The following example shows how to enable EVPN-VPWS endpoint on the p2p cross-connect.

```
Router# configure
Router# interface TenGigE0/1/0/12
Router(config)# l2vpn
Router(config-l2vpn)# xconnect group xc1
Router(config-l2vpn-xc)# p2p vpws
Router(config-l2vpn-xc-p2p)# interface gigabitethernet 0/1/0/9
Router(config-l2vpn-xc-p2p)# neighbor evpn evi 100 target 80
```

## non-revertive

To enable the non-revertive mode of DF election, use the **non-revertive** command in the EVPN ethernet segment service carving configuration mode.

### non-revertive

#### Command Default

None

#### Command Modes

EVPN interface Ethernet segment service carving configuration mode

#### Command History

Release	Modification
Release 24.1.1	This command was introduced.

#### Usage Guidelines

You can enable the non-revertive mode only on preference-based DF election. It is recommended to configure the non-revertive mode on all the nodes in the network.

#### Task ID

Task ID	Operation
l2vpn	read, write

### Example

This example shows how to enable non-revertive mode:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface Bundle-Ether1
Router(config-evpn-ac)# ethernet-segment
Router(config-evpn-ac-es)# identifier type 0 01.11.00.00.00.00.00.01
Router(config-evpn-ac-es)# load-balancing-mode port-active
Router(config-evpn-ac-es)# service-carving preference-based
Router(config-evpn-ac-es-sc-pref)# non-revertive
Router(config-evpn-ac-es-sc-pref)# weight 100
Router(config-evpn-ac-es-sc-pref)# commit
```

## option-b-asbr-only

To enter option-b-asbr-only configuration mode, use the **option-b-asbr-only** command under the address-family L2VPN EVPN global configuration mode.

### option-b-asbr-only

<b>Syntax Description</b>	<b>option-b-asbr-only</b> Enables Inter-AS option-B for L2VPN EVPN address-family identifier (AFI) and subsequent address-family identifier (SAFI).
---------------------------	---

<b>Syntax Description</b>	This command has no keywords or arguments.
---------------------------	--

<b>Command Default</b>	None.
------------------------	-------

<b>Command Modes</b>	Global configuration mode
----------------------	---------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 7.4.1	This command was introduced.

<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.
-------------------------	--

### Example

This example shows how to enable the ASBR router for option-B label exchange:

```
Router(config)# router bgp 300
Router(config-bgp)# address-family l2vpn evpn
Router(config-bgp-af)# option-b-asbr-only
Router(config-evpn-instance)# commit
```



# preferred-next-hop

To choose a particular remote PE in a dual-homed mode to be the next-hop, use the **preferred-next-hop** command in the EVPN configuration submode.

**preferred-next-hop** [ **highest-ip** | **lowest-ip** | **modulo** ]

Syntax Description	highest-ip	Selects the highest IP address as the primary next-hop.
	lowest-ip	Selects the lowest IP address as the primary next-hop.
	modulo	Determines which remote is primary using the formula $EVI \% 2$ .

**Command Default** None

**Command Modes** EVPN configuration submode

Command History	Release	Modification
	Release 7.3.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read, write

This example shows how to configure the highest IP address as the primary next-hop.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# evi 100
Router(config-evpn-evi)# preferred-next-hop highest-ip
Router(config-evpn-evi)# commit
```

This example shows how to configure the lowest IP address as the backup next-hop.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# evi 100
Router(config-evpn-evi)# preferred-next-hop lowest-ip
Router(config-evpn-evi)# commit
```

This example shows how to configure the primary next-hop using the modulo keyword.

```
Router# configure
```

```
Router(config)# evpn  
Router(config-evpn)# evi 100  
Router(config-evpn-evi)# preferred-next-hop modulo  
Router(config-evpn-evi)# commit
```

# revert

To set a timer to switchover from non-revertive mode to revertive mode of DF election, use the **revert timer** command in the EVPN configuration mode or EVPN interface configuration mode.

**revert timer**

<b>Syntax Description</b>	<i>timer</i> Specify the time interval for the revert timer in seconds. The range is 0 to 3600.				
<b>Command Default</b>	None				
<b>Command Modes</b>	<ul style="list-style-type: none"> <li>• EVPN configuration mode</li> <li>• EVPN interface configuration mode</li> </ul>				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 24.1.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 24.1.1	This command was introduced.
Release	Modification				
Release 24.1.1	This command was introduced.				
<b>Usage Guidelines</b>	None				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>l2vpn</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operation	l2vpn	read, write
Task ID	Operation				
l2vpn	read, write				

## Example

This example shows revert timer configuration for a specific interface:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface Bundle-Ether1
Router(config-evpn-ac)# ethernet-segment
Router(config-evpn-ac-es)# identifier type 0 01.11.00.00.00.00.00.01
Router(config-evpn-ac-es)# load-balancing-mode port-active
Router(config-evpn-ac-es)# service-carving preference-based
Router(config-evpn-ac-es-sc-pref)# non-revertive
Router(config-evpn-ac-es-sc-pref)# weight 100
Router(config-evpn-ac-es-sc-pref)# exit
Router(config-evpn-ac-es)# exit
Router(config-evpn-ac)# timers
Router(config-evpn-ac-timers)# revert 300
Router(config-evpn-ac-es)# commit
```

This example shows global configuration for revert timer:

```
Router# configure
```

```
Router(config)# evpn  
Router(config-evpn)# timers  
Router(config-evpn-timers)# revert 300  
Router(config-evpn-timers)# commit
```

## route-target

To specify a route target for the EVPN bridge domain, use the **route-target** command in the EVPN EVI BGP configuration mode. To return to the default value, use the **no** form of this command.

```
route-target {as-number:nn ip-address:nn }
no route-target {as-number:nn ip-address:nn }
```

### Syntax Description

*as-number:nn* Autonomous system (AS) number of the route distinguisher.

- *as-number*—16-bit AS number

Range for 2-byte numbers is 1 to 65535. Range for 4-byte numbers is 1.0 to 65535.65535.

- *nn*—32-bit number

*ip-address:nn* IP address of the route distinguisher.

- *ip-address*—32-bit IP address

- *nn*—16-bit number

### Command Default

None.

### Command History

#### Task ID

Task ID	Operations
l2vpn	read, write

### Examples

# service-carving

To specify a list of service identifiers as active and standby services, use the **service-carving** command in the EVPN Ethernet segment configuration mode.

```
service-carving { manual [ primary service-id-range secondary service-id-range ] } | {
preference-based [ access-driven | weight preference-df-weight ] }
```

## Syntax Description

<b>manual</b>	Specifies service identifiers or EVI-list services manually.
<b>primary</b>	Specifies the primary services list.
<b>secondary</b>	Specifies the secondary services list.
<i>service-id-range</i>	Specifies the services list notation in the range 100, 201-300, 401. The range is within 256 to 16777214.
<b>preference-based</b>	Specifies preference-based service carving.
<b>access-driven</b>	Specifies access-driven DF election.
<b>weight</b>	Specifies the preference value.
<i>preference-df-weight</i>	Specifies the preference DF weight. The range is from 0 to 65535 unless <b>access-driven</b> is configured, in which case it will be 0 to 32767. Default is 32767 when not configured.

## Command Default

Automatic service carving

## Command Modes

EVPN interface Ethernet segment configuration mode

## Command History

Release	Modification
Release 6.1.2	This command was introduced.
Release 7.3.1	The following keywords are added: <ul style="list-style-type: none"> <li>• <b>preference-based</b></li> <li>• <b>access-driven</b></li> </ul>

## Usage Guidelines

None

## 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:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface bundle-ether 1
Router(config-evpn-ac)# ethernet segment
Router(config-evpn-ac-es)# service-carving manual primary 201-300 secondary 400-500
Router(config-evpn-ac-es)# commit
```

### Example

This example shows how to specify EVPN access-driven DF election:

```
Router#configure
Router(config)#evpn
Router(config-evpn)#interface Bundle-Ether1
Router(config-evpn-ac)#ethernet-segment
Router(config-evpn-ac-es)#identifier type 0 01.11.00.00.00.00.00.01
Router(config-evpn-ac-es)#load-balancing-mode port-active
Router(config-evpn-ac-es)#service-carving preference-based
Router(config-evpn-ac-es-sc-pref)#weight 100
Router(config-evpn-ac-es-sc-pref)#access-driven
Router(config-evpn-ac-es-sc-pref)#commit
```

## set advertise-evpn-gw-ip

To advertise the EVPN gateway IP address as a next-hop IP address,, use the **set advertise-evpn-gw-ip** command in the route-policy configuration mode.

```
set advertise-evpn-gw-ip { A.B.C.D | X:X::X | parameter | use-next-hop }
```

Syntax Description		
<b>A.B.C.D</b>	Specify an IPv4 address.	
<b>X:X::X</b>	Specify an IPv6 address.	
<b>parameter</b>	Identifier specified in the format: '\$' followed by alphanumeric characters	
<b>use-next-hop</b>	Set advertise EVPN gateway IP as next-hop IP address.	

**Command Default** None

**Command Modes** Route-policy configuration

Command History	Release	Modification
	Release 7.9.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	route-policy	read, write

### Example

This example shows how to configure EVPN gateway IP address as a next-hop IP address:

```
Router(config)# route-policy gw
Router(config-rpl)# set advertise-evpn-gw-ip use-next-hop
Router(config-rpl)# end-policy
Router(config)# vrf VRF1
Router(config-vrf)# address-family ipv4 unicast
Router(config-vrf-af)# import route-target
Router(config-vrf-import-rt)# 10:10
Router(config-vrf-import-rt)# exit
Router(config-vrf-af)# export route-policy gw
Router(config-vrf-af)# export route-target
Router(config-vrf-export-rt)# 10:10
Router(config-vrf-export-rt)#commit
```



# set extcommunity evpn-link-bandwidth

To set the extended community attribute for EVPN link bandwidth, use the **set extcommunity evpn-link-bandwidth** in route-policy configuration mode.

**set extcommunity evpn-link-bandwidth** { *extcommunity-set* | *parameter* }

## Syntax Description

*extcommunity-set* The extended community set for EVPN link bandwidth. The set is enclosed in parentheses.

*parameter* Parameter name. The parameter name must be preceded by a "\$."

## Command Default

None.

## Command Modes

Route-policy configuration

## Command History

Release	Modification
Release 7.10.1	This command was introduced.

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

Task ID	Operation
route-policy	read, write

## Example

The following example shows how to set the extended community attribute for EVPN link bandwidth using an extended community set.

```
Router(config)# route-policy evpn-rpl
Router(config-rpl)# set extcommunity evpn-link-bandwidth (1 : 8000)
Router(config-rpl)# end-policy
```

## show bgp l2vpn evpn

To display BGP routes associated with EVPN under L2VPN address family, use the **show bgp l2vpn evpn** command in EXEC mode.

```
show bgp l2vpn evpn {bridge-domain bridge-domain-name | rd {all IPv4 address:nn 4-byte
as-number:nn 2-byte as-number:nn } | gateway-track { interface BVI identifier | standby } }
```

Syntax Description		
<b>bridge-domain</b> <i>bridge-domain-name</i>	Displays the bridges by the bridge ID. The <i>bridge-domain-name</i> argument is used to name a bridge domain.	
<b>rd</b>	Displays routes with specific route distinguisher.	
<b>all</b>	Displays specified routes in all RDs.	
<i>IPv4 address:nn</i>	Specifies the IPv4 address of the route distinguisher. nn: 16-bit number	
<i>4-byte as-number:nn</i>	Specifies 4-byte AS number in asdot (X.Y) format or in asplain format. <ul style="list-style-type: none"> <li>For 4-byte AS number in asdot (X.Y) format, the range is from 1 to 65535. The format is: &lt;1-65535&gt;.&lt;0-65535&gt;.&lt;0-65535&gt;</li> <li>For 4-byte AS number in asplain format, the range is from 65536 to 4294967295. The format is: &lt;65536-4294967295&gt;:</li> </ul> nn: 32-bit number	
<i>2-byte as-number:nn</i>	Specifies 2-byte as-number. The range is from 1 to 65535. nn: 32-bit number	
<b>gateway-track</b>	Displays tracking status of the EVPN gateways.	
<b>interface</b>	Displays the interface.	
<b>BVI</b>	Displays the Bridge-Group Virtual Interface (BVI).	
<i>identifier</i>	BVI Identifier	
<b>standby</b>	Displays information related to standby gateways.	
<b>Command Default</b>	None	
<b>Command Modes</b>	EXEC	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.1.21	This command was introduced.

Release	Modification
Release 7.11.1	The control word and flow label signaling attributes were added.
Release 24.1.1	This command was modified. The keywords: <b>gateway-track</b> , <b>interface</b> , <b>BVI identifier</b> , and <b>standby</b> were added.

**Usage Guidelines**

No specific guidelines impact the use of this command.

**Task ID**

Task ID	Operation
bgp	read

**Example**

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

```

show bgp l2vpn evpn bridge-domain bd1
Network          Next Hop          Metric LocPrf Weight Path
Route Distinguisher: 192.0.2.1:1 (default for vrf bd1)
*>i [1] [0077.0000.0000.0000.0001] [0]/120
      198.51.100.1          100      0 i
*>i [1] [0077.0000.0000.0000.0001] [4294967295]/120
      198.51.100.1          100      0 i
*>i [1] [0088.0000.0000.0000.0001] [0]/120
      203.0.113.1           100      0 i
* i          209.165.200.225         100      0 i
*>i [1] [0088.0000.0000.0000.0001] [4294967295]/120
      203.0.113.1           100      0 i
* i          209.165.200.225         100      0 I
* [2] [0] [48] [0001.0000.0001] [0]/104
*>          209.165.201.1          0 101 i
*>i [2] [0] [48] [0002.0000.0001] [0]/104
      203.0.113.1           100      0 102 i
* i          209.165.200.225         100      0 102 i
*>i [3] [0] [32] [203.0.113.1]/80
      203.0.113.1           100      0 i
*>i [3] [0] [32] [209.165.200.225]/80
      209.165.200.225         100      0 i

```

**Example**

The following sample output displays the control word and flow label signaling attributes. Mismatch in EVPN L2 attributes between the local and remote nodes can impact the EVPN-VPWS PW or E-LAN service.

The following table describes the EVPN L2 attributes.

EVPN L2 Attributes	Description
0x01	Indicates that the PE functions a backup router.
0x02	Indicates that the PE functions as a primary router.

EVPN L2 Attributes	Description
0x04	Indicates that the control word is enabled and flow label signalling is disabled on the PE.
0x08	Indicates that the flow label signalling is enabled and control word is disabled on the PE.

The following output indicates that the control word is enabled and flow label signalling is disabled on the PE.

```
Router# show bgp l2vpn evpn rd 192.168.10.1:2705 [3][0][32][192.168.10.1]/80 detail
BGP routing table entry for [3][0][32][192.168.10.1]/80, Route Distinguisher:
192.168.10.1:2705
Versions:
  Process          bRIB/RIB  SendTblVer
  Speaker          286721    286721
  Flags: 0x00140001+0x00000000;
Paths: (1 available, best #1)
  Advertised to update-groups (with more than one peer):
    0.2
  Path #1: Received by speaker 0
  Flags: 0x202000000504000b+0x00, import: 0x000, EVPN: 0x0
  Advertised to update-groups (with more than one peer):
    0.2
  Local
    0.0.0.0 from 0.0.0.0 (192.168.1.1), if-handle 0x00000000
    Origin IGP, localpref 100, valid, redistributed, best, group-best, import-candidate
    Received Path ID 0, Local Path ID 1, version 286721
    Extended community: EVPN L2 ATTRS:0x04:0 RT:64600:2705
    IMET PMSI Originator Nexthop Address : 192.168.10.1 (reachable)
    PMSI: flags 0x00, type 6, label 24004, ID 0xc0a80a01
```

The following output indicates that the EVPN gateway is enabled. The output displays the interface identifier, the bridge associated with the interface, and the VRF instance associated with the interface.

```
Router# show bgp l2vpn evpn gateway-track interface BVI 1
Interface      Bridge          VRF
BVI1         evpn1         vrfl
```

# 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** | **carving** ]

Syntax Description	Option	Description
	<b>detail</b>	Displays detailed information.
	<b>esi</b>	Filters by Ethernet Segment identifier.
	<b>interface</b>	Filters by interface name.
	<b>location</b>	Displays location specific information.
	<b>private</b>	Displays private information.
	<b>standby</b>	Displays standby node specific information.
	<b>carving</b>	Filters by carving details.

**Command Default** None.

**Command Modes** EXEC

Command History	Release	Modification
	Release 6.1.21	This command was introduced.
	Release 7.3.1	The <b>carving</b> keyword was added.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read

## Example

This sample output shows the EVPN Ethernet segment detailed information:

```
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,
```

## show evpn ethernet-segment

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 carving detailed information with Single-Flow-Active mode enabled.

Router# show evpn ethernet-segment carving detail

Thu Aug 6 13:00:37.988 IST

Legend:

- B - No Forwarders EVPN-enabled,
- C - Backbone Source MAC missing (PBB-EVPN),
- RT - ES-Import Route Target missing,
- E - ESI missing,
- H - Interface handle missing,
- I - Name (Interface or Virtual Access) 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
- SHG - No local split-horizon-group label allocated

```

Ethernet Segment Id      Interface      Nexthops
-----
0000.0000.0000.0000.0001 BE1
                                10.0.0.1
                                172.16.0.1

ES to BGP Gates      : Ready
ES to L2FIB Gates   : Ready
Main port           :
  Interface name    : Bundle-Ether1
  Interface MAC     : 008a.96ee.88dc
  IfHandle          : 0x20005f5c
  State             : Up
  Redundancy        : Not Defined
ESI type            : 0
  Value             : 00.0000.0000.0000.0001
ES Import RT        : 0000.0000.0001 (Local)
Source MAC           : 0000.0000.0000 (N/A)
Topology            :
  Operational       : MH, Single-flow-active
  Configured        : Single-flow-active
Service Carving     : Auto-selection
  Multicast         : Disabled
Convergence          : MAC-Mobility,
  Mobility-Flush    : Debounce 13 sec, Count 1, Skip 1499
                   : Last 01/01 05:57:42.468
Peering Details     : 2 Nexthops
10.0.0.1[MOD:P:00:T]
172.16.0.1 [MOD:P:7fff:T]
Service Carving Synchronization:
  Mode              : NONE
  Peer Updates      :
Service Carving Results:
  Forwarders        : 1000
  Elected           : 1000
    EVI E           :      1,      2,      3,      4,      5,      6
    EVI E           :      7,      8,      9,     10,     11,     12,
    EVI E           :     13,     14,     15,     16,     17,     18,
    EVI E           :     19,     20,     21,     22,     23,     24,
[.....]
    EVI E           :     979,    980,    981,    982,    983,    984,
    EVI E           :     985,    986,    987,    988,    989,    990,
    EVI E           :     991,    992,    993,    994,    995,    996,
    EVI E           :     997,    998,    999,   1000
  Not Elected      : 0
EVPN-VPWS Service Carving Results:
  Primary           : 0
  Backup            : 0
    
```

## show evpn ethernet-segment

```
Non-DF          : 0
MAC Flushing mode : STP-TCN
Peering timer   : 3 sec [not running]
Recovery timer  : 30 sec [not running]
Carving timer   : 0 sec [not running]
Local SHG label : 29096
Remote SHG labels : 1
                 29096 : nexthop 10.0.0.1
Access signal mode: Bundle OOS (Default)
```



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

**Command Default** None.

**Command Modes** EXEC

Command History	Release	Modification
	Release 6.1.21	This command was introduced.
	Release 7.11.1	The control word and flow label signaling attributes were added.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read

## Example

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

```
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:

```
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:

```
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:

```
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:

```
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          tbl-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          tbl-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

```

### Example

The following sample output displays the control word and flow label signaling attributes. The output shows whether the control word and flow label signaling are locally enabled.

```

Router# show evpn evi vpn-id 2705 inclusive-multicast detail
VPN-ID      Encap  EtherTag  Originating IP
-----
2705       MPLS    0         192.168.10.1
  TEPid    : 0xffffffff
  PMSI Type: 6
  Nexthop:  ::
  Label    : 24004
  SR-TE Info: N/A
  Source   : Local
  E-Tree   : Root
  Layer 2 Attributes:
    DF Role : Not Specified
    CW      : Disabled
    FL      : Disabled
    MTU     : 0
    Sig DF  : Not Specified
2705       MPLS    0         192.168.20.1
  TEPid    : 0x02000002
  PMSI Type: 6
  Nexthop: 192.168.20.1

```

```

Label : 24004
SR-TE Info: N/A
Source : Remote
E-Tree : Root
Layer 2 Attributes:
  DF Role : NDF
  CW      : Disabled
  FL      : Disabled
  MTU     : 0
  Sig DF  : NDF
2705     MPLS 0          192.168.30.1
TEPid   : 0x02000001
PMSI Type: 6
Nexthop: 192.168.30.1
Label   : 24004
SR-TE Info: N/A
Source  : Remote
E-Tree  : Root
Layer 2 Attributes:
  DF Role : NDF
CW      : enabled
FL      : enabled
  MTU     : 0
  Sig DF  : NDF

```

```

Router# show evpn evi inclusive-multicast detail
18     MPLS 0000.0000.0000.0000.0000 0x2  :: 24222
EtherTag: 2
Source: Local, MPLS
Local:
  FRR Label: 0
  Layer 2 Attributes:
    DF Role : Primary
    CW      : Enabled
    FL      : Not Specified
  MTU     : 0
Num Nexthops: 0
Path Attributes:

```

# show evpn evi ead

To display the EVPN instance (EVI) information, use the **show evpn evi ead** command in the EXEC mode.

```
show evpn evi ead [ detail ! private ]
```

Syntax Description	Parameter	Description
	<b>evi</b>	Specifies the EVPN Instance Identifier. This is used to derive the default Route Distinguisher and Route Targets.
	<b>ead</b>	Specifies the EVPN ead routes.
	<b>detail</b>	Displays detailed information.
	<b>private</b>	Displays private information.

**Command Default** None.

**Command Modes** EXEC

Command History	Release	Modification
	Release 6.1.21	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task	Operation
	l2vpn	read

## Example

This sample output shows the EVPN EVI detailed information:

```
Router#show evpn evi ead detail
Mon Apr 18 13:19:44.311 EDT

EVI   Ethernet Segment Id      EtherTag Nexthop                               Label
-----
1     00a1.a2a3.a4a5.a6a7.a8a9  0          ::
                                           2.2.2.2
                                           24006
                                           24007
      Source: Local, Remote, MPLS, VXLAN
1     00a1.a2a3.a4a5.a6a7.a8a9  ffffffff  2.2.2.2                                0
      Source: Remote, Unknown encap
200   0000.0000.0000.0000.0000  1          ::
                                           24025
      Source: Local, MPLS
200   0000.0000.0000.0000.0000  4          ::
                                           24026
      Source: Local, MPLS
200   0000.0000.0000.0000.0000  11         ::
                                           24027
      Source: Local, MPLS
300   00a1.a2a3.a4a5.a6a7.a8a9  0          ::
                                           24004
```

## show evpn evi ead

```

                2.2.2.2                                24005
Source: Local, Remote, MPLS, VXLAN
300 00a1.a2a3.a4a5.a6a7.a8a9 ffffffff 2.2.2.2        0
Source: Remote, Unknown encap
302 00a1.a2a3.a4a5.a6a7.a8a9 0                ::          24008
Source: Local, MPLS, VXLAN
400 00b1.b2b3.b4b5.b6b7.b8b9 0                ::          24010
Source: Local, MPLS

```

This sample output shows the EVPN EVI EAD private information:

```

Router#show evpn evi ead private
Mon Apr 18 13:20:31.465 EDT

```

```

EVI   Ethernet Segment Id   EtherTag Nexthop                               Label
-----
1     00a1.a2a3.a4a5.a6a7.a8a9 0       ::          2.2.2.2                                24006
                                           24007

```

```

Source: Local, Remote, MPLS, VXLAN
EVI: 1
Num Nexthops: 1

```

```

Object: EVPN EAD
Base info: version=0xdbdb0013, flags=0x6100, type=24832, reserved=0
EVPN EAD event history [Num events: 16]

```

```

-----
Time           Event           Flags           Flags
====           =====
Apr 18 10:55:49.248 Got BGP update  00000000, 00000001 - -
Apr 18 10:55:49.248 Modify_RED      00000000, 00000000 M -
Apr 18 10:55:49.248 Got BGP update  00000000, 00000001 - -
Apr 18 10:55:49.248 Modify_RED      00000000, 00000000 - -
Apr 18 12:03:48.352 Got BGP update  00000000, 00000001 - -
Apr 18 12:04:39.552 Modify_RED      00000000, 00000000 M -
Apr 18 12:04:39.552 Got BGP update  00000000, 00000001 - -
Apr 18 12:04:39.552 Modify_RED      00000000, 00000000 - -
Apr 18 12:15:08.800 Got BGP update  00000000, 00000001 - -
Apr 18 12:15:08.800 Modify_RED      00000000, 00000000 - -
Apr 18 12:15:59.488 Got BGP update  00000000, 00000001 - -
Apr 18 12:19:34.016 Modify_RED      00000000, 00000000 M -
Apr 18 12:19:34.528 Got BGP update  00000000, 00000001 - -
Apr 18 12:19:34.528 Modify_RED      00000000, 00000000 - -
Apr 18 12:19:34.528 Got BGP update  00000000, 00000001 - -
Apr 18 12:19:34.528 Modify_RED      00000000, 00000000 - -
-----

```

```

1     00a1.a2a3.a4a5.a6a7.a8a9 ffffffff 2.2.2.2        0
Source: Remote, Unknown encap
EVI: 1
Num Nexthops: 1

```

```

Object: EVPN EAD
Base info: version=0xdbdb0013, flags=0x4000, type=16384, reserved=0
EVPN EAD event history [Num events: 16]

```

```

-----
Time           Event           Flags           Flags
====           =====
Apr 18 10:55:49.248 Got ESI LABEL  00000000, 00000000 - -
Apr 18 10:55:49.248 Got BGP update  00000000, 00000001 - -
Apr 18 10:55:49.248 Modify_RED      00000000, 00000000 - -
Apr 18 10:55:49.248 Got ESI LABEL  00000000, 00000000 - -
Apr 18 12:03:48.352 Got BGP update  00000000, 00000001 - -
Apr 18 12:03:48.352 Modify_RED      00000000, 00000000 - -
Apr 18 12:03:48.352 Got ESI LABEL  00000000, 00000000 - -
Apr 18 12:04:39.552 Got BGP update  00000000, 00000001 - -
-----

```

```

Apr 18 12:04:39.552 Modify_RED          00000000, 00000000 - -
Apr 18 12:04:39.552 Got ESI LABEL      00000000, 00000000 - -
Apr 18 12:15:08.800 Got BGP update    00000000, 00000001 - -
Apr 18 12:15:08.800 Modify_RED          00000000, 00000000 - -
Apr 18 12:15:08.800 Got ESI LABEL      00000000, 00000000 - -
Apr 18 12:19:34.528 Got BGP update    00000000, 00000001 - -
Apr 18 12:19:34.528 Modify_RED          00000000, 00000000 - -
Apr 18 12:19:34.528 Got ESI LABEL      00000000, 00000000 - -
-----

```

200 0000.0000.0000.0000.0000 1 :: 24025

Source: Local, MPLS  
 EVI: 200  
 Num Nexthops: 0

Object: EVPN EAD  
 Base info: version=0xdbdb0013, flags=0x2100, type=8448, reserved=0  
 EVPN EAD event history [Num events: 4]

```

-----
Time          Event          Flags          Flags
=====
Apr 18 10:55:45.664 Create          00000001, 00000000 - -
Apr 18 10:55:45.664 Adv to BGP filtered 00002100, 00000000 - -
Apr 18 10:55:49.248 EVI REPLAY TO BGP 00000000, 00000000 - -
Apr 18 10:55:49.248 Advertise to BGP 00002110, 00000000 - -
-----

```

200 0000.0000.0000.0000.0000 4 :: 24026

Source: Local, MPLS  
 EVI: 200  
 Num Nexthops: 0

Object: EVPN EAD  
 Base info: version=0xdbdb0013, flags=0x2100, type=8448, reserved=0  
 EVPN EAD event history [Num events: 4]

```

-----
Time          Event          Flags          Flags
=====
Apr 18 10:55:45.664 Create          00000001, 00000000 - -
Apr 18 10:55:45.664 Adv to BGP filtered 00002100, 00000000 - -
Apr 18 10:55:49.248 EVI REPLAY TO BGP 00000000, 00000000 - -
Apr 18 10:55:49.248 Advertise to BGP 00002110, 00000000 - -
-----

```

200 0000.0000.0000.0000.0000 11 :: 24027

Source: Local, MPLS  
 EVI: 200  
 Num Nexthops: 0

Object: EVPN EAD  
 Base info: version=0xdbdb0013, flags=0x2100, type=8448, reserved=0  
 EVPN EAD event history [Num events: 4]

```

-----
Time          Event          Flags          Flags
=====
Apr 18 10:55:45.664 Create          00000001, 00000000 - -
Apr 18 10:55:45.664 Adv to BGP filtered 00002100, 00000000 - -
Apr 18 10:55:49.248 EVI REPLAY TO BGP 00000000, 00000000 - -
Apr 18 10:55:49.248 Advertise to BGP 00002110, 00000000 - -
-----

```

# show evpn internal-label

To display EVPN internal label associated configuration information, use the **show evpn internal-label** command in the EXEC mode.

```
show evpn internal-label [vpn-id evi [detail]]
```

Syntax Description	vpn-id evi	Displays information for a specified E-VPN Identifier.
	detail	Displays detailed information.

**Command Default** None

**Command Modes** EXEC

Command History	Release	Modification
	Release 6.1.21	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operation
	l2vpn	read

## Example

This sample output shows the EVPN internal label associated configuration information.

```
show evpn internal-label vpn-id 1 detail
```

```
Tue Jun 14 16:18:51.563 EDT
```

```

EVI   Ethernet Segment Id                               EtherTag Label
-----
1     0088.0000.0000.0000.0001                             0           24036
Multi-paths resolved: TRUE
Multi-paths local label: 24036
Pathlists:
  MAC      1 entries
  EAD/ES   203.0.113.1                                     0
           209.165.200.225                               0
  EAD/EVI  203.0.113.1                                     24001
           209.165.200.225                               24001
  Summary  203.0.113.1                                     24001
           209.165.200.225                               24001

```



# show 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	<b>location</b> Displays location specific information.				
	<b>private</b> Displays private information.				
	<b>standby</b> Displays standby node specific information.				
Command Default	None.				
Command Modes	EXEC				
Command History	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.1.21</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.1.21	This command was introduced.
Release	Modification				
Release 6.1.21	This command was introduced.				
Usage Guidelines	No specific guidelines impact the use of this command.				
Task ID	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>l2vpn</td> <td>read</td> </tr> </tbody> </table>	Task ID	Operation	l2vpn	read
Task ID	Operation				
l2vpn	read				

## Example

This sample output shows the EVPN summary:

```
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
```

# staggered-bringup-timer

To stagger the bring-up of bundle interfaces after startup-cost-in timer expiry, use the **staggered-bringup-timer** command in the EVPN configuration mode.



**Note** The **staggered-bringup-timer** command is supported in Cisco NCS 5500 Series and Cisco NCS 540 Series Routers.

**staggered-bringup-timer** *duration*

<b>Syntax Description</b>	<i>duration</i> Specify the stagger time period. By default, the stagger time is 5000ms and maximum configurable stagger time is 300s.				
<b>Command Default</b>	By default, the stagger time is 5000 milliseconds.				
<b>Command Modes</b>	EVPN configuration mode				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 7.2.1</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 7.2.1	This command was introduced.
Release	Modification				
Release 7.2.1	This command was introduced.				
<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>l2vpn</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operation	l2vpn	read, write
Task ID	Operation				
l2vpn	read, write				

This example shows how to configure stagger period:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# staggered-bringup-timer 200s
Router(config-evpn-es)# commit
```

# startup-cost-in

To bring up the node into service after the specified time on reload, use the **startup-cost-in** command in EVPN configuration mode. To stop the startup-cost-in timer, use the **no** form of this command.

```
startup-cost-in timer
no startup-cost-in
```

<b>Syntax Description</b>	<b>startup-cost-in timer</b>	Brings up the node into service after the specified time on reload. Specify the time in seconds. Range is from 30 to 86400 seconds.
---------------------------	------------------------------	---

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	EVPN configuration mode
----------------------	-------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.1.31	This command was introduced.

<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.
-------------------------	--

<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	EVPN	read, write

**Examples** The following example shows how to bring up the node into service after the specified time on reload:

```
Router# configure
Router(config)# evpn
Router(config-evpn)# startup-cost-in 6000
Router(config) commit
```

# vpws-seamless-integration

To enable EVPN-VPWS seamless integration, use the **vpws-seamless-integration** command in L2VPN configuration mode. To disable EVPN-VPWS seamless integration, use the **no** form of this command.

## vpws-seamless-integration

**Syntax Description** This command has no arguments or keywords.

**Command Default** None

**Command Modes** L2VPN configuration mode

Command History	Release	Modification
	Release 7.4.1	This command was introduced.

**Usage Guidelines** No specific guidelines impact the use of this command.

Task ID	Task ID	Operations
	L2VPN	read, write

## Examples

The following example shows how to enable EVPN-VPWS integration on an edge device for BGP PW.

```
Router# configure
Router(config)# l2vpn xconnect group 1
Router(config-l2vpn-xc)# mp2mp 2
Router(config-l2vpn-xc-mp2mp)# autodiscovery bgp
Router(config-l2vpn-xc-mp2mp-ad)# signaling-protocol bgp
Router(config-l2vpn-xc-mp2mp-ad-sig)# ce-id 3
Router(config-l2vpn-xc-mp2mp-ad-sig-ce)# vpws-seamless-integration
Router(config-l2vpn-xc-mp2mp-ad-sig-ce)#
```

The following example shows how to enable EVPN-VPWS integration for TLDP PW.

```
Router# configure
Router(config)# l2vpn xconnect group 1
Router(config-l2vpn-xc)# p2p p1
Router(config-l2vpn-xc-p2p)# interface BE1.1
Router(config-l2vpn-xc-p2p)# neighbor 1.1.1.1 pw-id 1
Router(config-l2vpn-xc-p2p)# vpws-seamless-integration
```

# weight

To configure the weight of a PE that can be used for EVPN Designated Forwarder (DF) election, use the **weight** command in the EVPN interface Ethernet segment service carving configuration mode.

**weight** *weight-value*

<b>Syntax Description</b>	<i>weight-value</i> Specifies the preference DF weight. The range is from 0 to 65535 unless access-driven is configured, in which case it will be 0 to 32767. Default is 32767 when not configured.
---------------------------	---

<b>Command Default</b>	None
------------------------	------

<b>Command Modes</b>	EVPN interface Ethernet segment service carving configuration mode
----------------------	--

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 7.3.1	This command was introduced.

<b>Usage Guidelines</b>	None
-------------------------	------

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	l2vpn	read, write

## Example

The following example shows configuration of DF weight.

```
Router# configure
Router(config)# evpn
Router(config-evpn)# interface Bundle-Ether1
Router(config-evpn-ac)# ethernet-segment
Router(config-evpn-ac-es)# identifier type 0 01.11.00.00.00.00.00.01
Router(config-evpn-ac-es)# load-balancing-mode port-active
Router(config-evpn-ac-es)# service-carving preference-based
Router(config-evpn-ac-es-sc-pref)# weight 100
Router(config-evpn-ac-es-sc-pref)# commit
```