

L2VPN Protocol-Based CLIs

The L2VPN Protocol-Based CLIs feature provides a set of processes and an improved infrastructure for developing and delivering Cisco IOS software on various Cisco platforms. This feature introduces new commands and modifies or replaces existing commands to achieve a consistent functionality across Cisco platforms and provide cross-Operating System (OS) support.

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Information About L2VPN Protocol-Based CLIs

Overview of L2VPN Protocol-Based CLIs

The L2VPN Protocol-Based CLIs feature introduces new commands and modifies or replaces existing commands to achieve a consistent functionality across Cisco platforms and provide cross-Operating System (OS) support.

Note The new, updated, and replacement commands are available in Cisco IOS XE Release 3.7S and Cisco IOS Release 15.3(1)S. However, the legacy commands that are being replaced will be deprecated in later releases.

Benefits of L2VPN Protocol-Based CLIs

The L2VPN Protocol-Based CLIs feature provides the following benefits:

- Consistent user experience across different operating systems.
- Consistent configuration for all Layer 2 VPN (L2VPN) scenarios.
- Enhanced functionality that is achieved by configuring pseudowires as virtual interfaces and monitoring the pseudowires as physical ports.
- Feature configuration such as quality of service (QoS) service policies on individual pseudowires .

- Redundant pseudowire configuration that is independent of the primary pseudowire to provide enhanced high availability.

These benefits are achieved through the following enhancements:

- New service contexts can be created for point-to-point and multipoint Layer 2 services by using the new L2VPN cross connect and L2VPN virtual forwarding interface (VFI) contexts.
  - The L2VPN cross connect context is used for configuring point-to-point pseudowires, pseudowire stitching, and local switching (hair pinning). Ethernet interfaces , Ethernet Flow Points (EFP), ATM interfaces and WAN interfaces (PPP,HDLC,Serial), and pseudowire interfaces can be defined as members of an L2VPN cross connect context.
  - The L2VPN VFI context instantiates Virtual Private LAN Services (VPLS) VFI for multipoint scenarios. Pseudowires can be defined as members of an L2VPN VFI context.
  - Bridge domains are used for multipoint scenarios. EFPs, pseudowires, or VFIs can be configured as members of a bridge domain. Pseudowires can be configured as member of a VFI. The VFI can be configured as a member of a .
- New port contexts can be created (dynamically or manually) for pseudowires by using the pseudowire interface.
- Pseudowire customization can be achieved using interface templates and pseudowire interfaces that are applied to L2VPN context members. Pseudowire customizations include following features:
  - Encapsulation type
  - Control word
  - Maximum Transmission Unit (MTU)
  - Pseudowire signaling type
  - Tunnel selection
- Interworking and redundancy group service attributes can be configured under the L2VPN service context. The redundancy groups are configured independently from the primary pseudowire, which helps achieve zero traffic interruptions while adding, modifying, or deleting backup pseudowires.

L2VPN Protocol-Based CLI Changes

The following commands are introduced in Cisco IOS XE Release 3.7S, Cisco IOS Release 15.3(1)S, and Cisco IOS Release 15.4(1)S:

- **debug l2vpn pseudowire**
- **l2vpn**
- **l2vpn pseudowire static-oam class**
- **monitor event-trace l2vpn**
- **show interface pseudowire**
- **show l2vpn service**

- **shutdown (MPLS)**
- **vc**

The following commands are modified in Cisco IOS XE Release 3.7S and Cisco IOS Release 15.3(1)S:

- **auto-route-target**
- **bridge-domain parameterized vlan**
- **debug condition xconnect fib**
- **debug condition xconnect interface**
- **debug condition xconnect peer**
- **debug condition xconnect segment**
- **description**
- **encapsulation (MPLS)**
- **forward permit l2protocol all**
- **interworking**
- **l2vpn subscriber authorization group**
- **l2vpn xconnect context**
- **load-balance flow**
- **monitor event-trace ac**
- **monitor event-trace atom**
- **monitor event-trace l2tp**
- **monitor peer bfd**
- **mtu**
- **preferred-path**
- **remote circuit id**
- **rd (VPLS)**
- **route-target (VPLS)**
- **sequencing**
- **status**
- **status admin-down disconnect**
- **status control-plane route-watch**
- **status decoupled**
- **status peer topology dual-homed**
- **status protocol notification static**

- **status redundancy**
- **switching tlv**
- **tlv**
- **tlv template**
- **vccv**
- **vccv bfd status signaling**
- **vccv bfd template**
- **vpls-id**
- **vpn id (MPLS)**

The table below lists the legacy commands that will be replaced in future releases. From Cisco IOS XE Release 3.7S and Cisco IOS Release 15.3(1)S both new and legacy commands will coexist until the legacy commands are deprecated in future releases.

Table 1: Replacement Commands Introduced in Cisco IOS XE Release 3.7S and Cisco IOS Release 15.3(1)S

Legacy Command	Replacement Command Introduced in Cisco IOS XE Release 3.7S and Cisco IOS Release 15.3(1)S
backup delay	**redundancy delay (under l2vpn xconnect context)**
bridge-domain (service instance)	**member (bridge-domain)**
clear mpls l2transport fsm state transition	**clear l2vpn atom fsm state transition**
clear mpls l2transport fsm event	**clear l2vpn atom fsm event**
clear xconnect	**clear l2vpn service**
connect (L2VPN local switching)	**l2vpn xconnect context**
debug acircuit	**debug l2vpn acircuit**
debug mpls l2transport checkpoint	**debug l2vpn atom checkpoint**
debug mpls l2transport event-trace	**debug l2vpn atom event-trace**
debug mpls l2transport fast-failure-detect	**debug l2vpn atom fast-failure-detect**
debug mpls l2transport signaling	**debug l2vpn atom signaling**
debug mpls l2transport static-oam	**debug l2vpn atom static-oam**
debug mpls l2transport vc subscriber	**debug l2vpn atom vc**
debug mpls l2transport vc	**debug l2vpn atom vc**
debug mpls l2transport vc vccv bfd event	**debug l2vpn atom vc vccv**
debug vfi	**debug l2vpn vfi**

Legacy Command	Replacement Command Introduced in Cisco IOS XE Release 3.7S and Cisco IOS Release 15.3(1)S
debug vfi checkpoint	**debug l2vpn vfi checkpoint**
debug xconnect	**debug l2vpn xconnect**
debug xconnect rib	**debug l2vpn xconnect rib**
description (L2VFI)	**description (L2VPN)**
l2 pseudowire routing	**pseudowire routing**
l2 router-id	**router-id**
l2 vfi	**l2vpn vfi context**
l2 subscriber	**l2vpn subscriber**
l2 vfi autodiscovery	**autodiscovery**
l2 vfi point-to-point	**l2vpn xconnect context**
local interface	**pseudowire type**
monitor event-trace st-pw-oam	**monitor event-trace pwoam**
mpls label	**label (pseudowire)**
mpls control-word	**control-word (encapsulation mpls under l2vpn connect context)**
neighbor (l2 vfi)	**member (l2vpn vfi)**
protocol	**signaling protocol**
pseudowire-static-oam class	**l2vpn pseudowire static-oam class**
pseudowire tlv template	**l2vpn pseudowire tlv template**
pw-class keyword in the **xconnect** command	**source template type pseudowire**
remote link failure notification	**l2vpn remote link failure notification**
show mpls l2transport binding	**show l2vpn atom binding**
show mpls l2transport checkpoint	**show l2vpn atom checkpoint**
show mpls l2transport hw-capability	**show l2vpn atom hw-capability**
show mpls l2transport static-oam	**show l2vpn atom static-oam**
show mpls l2transport summary	**show l2vpn atom summary**
show mpls l2transport pwid	**show l2vpn atom pwid**

Legacy Command	Replacement Command Introduced in Cisco IOS XE Release 3.7S and Cisco IOS Release 15.3(1)S
show mpls l2transport vc	**show l2vpn atom vc**
show xconnect pwmib	**show l2vpn pwmib**
show xconnect rib	**show l2vpn rib**
show xconnect	**show l2vpn service**
show vfi	**show l2vpn vfi**
xconnect	**l2vpn xconnect context** and **member**
xconnect logging pseudowire status global	**logging pseudowire status**
xconnect logging redundancy global	**logging redundancy**
xconnect *peer-ip vc-id*	**neighbor peer-ip vc-id (xconnect context)**

MPLS L2VPN Protocol-Based CLI: Examples

The examples in this section provide the new configurations that are introduced by the MPLS L2VPN Protocol-Based CLIs feature that replace the existing (legacy) MPLS L2VPN CLIs.

MPLS L2VPN VPWS Configuration Using Replacement (or New) Commands

The following example shows the configuration for Virtual Private Wired Service (VPWS)—Ethernet over Multiprotocol Label Switching (EoMPLS). In this example, L2VPN members point to peer ID or virtual circuit (VC) ID. This configuration is used in most cases except when features like quality of service (QoS), need to be applied at the pseudowire level.

```
l2vpn xconnect context foo
  member GigabitEthernet2/1/1 service-instance 300
  member 10.0.0.1 888 encapsulation mpls
!
interface GigabitEthernet2/1/1
  service instance 300
   encapsulation dot1q 30
   rewrite ingress tag pop 1 symmetric
  !
  service instance 400
   encapsulation dot1q 40
   rewrite ingress tag pop 1 symmetric

l2vpn xconnect context faa
  member GigabitEthernet2/1/1 service-instance 400
  member 10.0.0.1 999 encapsulation mpls
!
```

MPLS L2VPN Pseudowire Configuration Using Replacement (or New) Commands

In the following example, L2VPN members point to a pseudowire interface. The pseudowire interface is manually configured and includes peer ID and VC ID. This configuration is used in most cases except when features like quality of service (QoS), need to be applied at the pseudowire level.

```
l2vpn xconnect context foo
  member GigabitEthernet2/1/1 service-instance 300
```

```
  member Pseudowire888
!
interface Pseudowire 888
 encapsulation mpls
 neighbor 10.0.0.1 888
!
interface Pseudowire 999
 encapsulation mpls
 neighbor 10.0.0.1 999
!
interface GigabitEthernet2/1/1
  service instance 300
   encapsulation dot1q 30
   rewrite ingress tag pop 1 symmetric
  !
  service instance 400
   encapsulation dot1q 40
   rewrite ingress tag pop 1 symmetric

l2vpn xconnect context faa
  member GigabitEthernet2/1/1 service-instance 400
  member Pseudowire 999
!
```

MPLS L2VPN Pseudowire Redundancy Configuration Using Replacement (or New) Commands

The following example shows the configuration for pseudowire redundancy. The new configuration shows concise pseudowire redundancy with no submodes or separate groups. This configuration allows the addition of redundant members to a service without service disruption. This configuration also allows modifying or deleting redundant service configurations without service disruption.

```
l2vpn xconnect context sample-pw-redundancy
  member  service-instance 200
  member 10.1.1.1 180 encap mpls group Denver
  member 2.2.2.2 180180 encap mpls group Denver priority 1
  member 3.3.3.3 180181 encap mpls group Denver priority 2
  redundancy delay 1 20 group Denver
!
interface GigabitEthernet2/1/1
  service instance 200
   encapsulation dot1q 100
   rewrite ingress tag pop 1 symmetric
```

MPLS L2VPN Static Pseudowire Configuration Using Replacement (or New) Commands



Note The following configuration is shown for the Provider Edge (PE) 1 router in a network scheme where Customer Edge (CE) 1 and PE 1 and PE 2 and CE 2 traverse through a Provider core (P) router (CE 1—PE 1—P—PE 2—CE 2).

```
interface g2/1/1
service instance 300 ethernet
encapsulation dot1q 300
no shutdown
!
interface pseudowire 100
neighbor 10.4.4.4 121
encapsulation mpls
label 200 300
signaling protocol none
no shutdown
```

```
!
l2vpn xconnect context foo
  member GigabitEthernet2/1/1 service-instance 300
  member pseudowire 100
```

MPLS L2VPN Static Pseudowire Template Configuration Using Replacement (or New) Commands



Note The following configuration is shown for the Provider Edge (PE) 1 router in a network scheme where Customer Edge (CE) 1 and PE 1 and PE 2 and CE 2 traverse through a Provider core (P) router (CE 1—PE 1—P—PE 2—CE 2).

```
template type pseudowire test
encapsulation mpls
signaling protocol none
!
interface g2/1/1
service instance 300 ethernet
encapsulation dot1q 300
no shutdown
!
interface pseudowire 100
neighbor 10.4.4.4 121
source template type pseudowire test
label 200 300
no shutdown
!
l2vpn xconnect context foo
  member GigabitEthernet2/1/1 service-instance 300
  member pseudowire 100
```

MPLS L2VPN Dynamic Pseudowire Template Configuration Using Replacement (or New) Commands



Note The following configuration is shown for the Provider Edge (PE) 1 router in a network scheme where Customer Edge (CE) 1 and PE 1 and PE 2 and CE 2 traverse through a Provider core (P) router (CE 1—PE 1—P—PE 2—CE 2).

```
template type pseudowire test
encapsulation mpls
signaling protocol ldp
!
!
interface g2/1/1
service instance 300 ethernet
encapsulation dot1q 300
no shutdown
!
interface pseudowire 100
neighbor 10.4.4.4 121
source template type pseudowire test
no shutdown
!
l2vpn xconnect context foo
  member GigabitEthernet2/1/1 service-instance 300
  member pseudowire 100
```

MPLS L2VPN Multi-segment Static-Dynamic Pseudowire Template Configuration Using Replacement (or New) Commands

The following PE router configuration is for a multi-segment static-dynamic pseudowire:

```
l2vpn pseudowire tlv template TLV
 tlv mtu 1 4 dec 1500
!
interface pseudowire401
  source template type pseudowire staticTempl
encapsulation mpls
neighbor 10.4.4.4 101
signaling protocol none
label 4401 4301
pseudowire type 4
tlv template TLV
tlv 1 4 dec 1500
tlv vccv-flags C 4 hexstr 0110
!
interface pseudowire501
  source template type pseudowire dynTempl
encapsulation mpls
neighbor 10.2.2.2 101
signaling protocol ldp
```

Displaying MPLS L2VPN Pseudowire Template Configuration Using Replacement (or New) Commands

The following example displays output from the **show interface pseudowire** command:

```
PE1#show interface pseudowire 100
pseudowire100 is up
    Description: Pseudowire Interface
    MTU 1500 bytes, BW 10000000 Kbit
    Encapsulation mpls
    Peer IP 10.4.4.4, VC ID 121
    RX
      21 packets 2623 bytes 0 drops
    TX
      20 packets 2746 bytes 0 drops
```

The following example displays output from the **show template** command:

```
PE1#show template

Template        class/type    Component(s)
ABC             owner        interface pseudowire
 BOUND: pw1
```

Sourcing a Template Under an Interface Pseudowire Using Replacement (or New) Commands

The following example configures the interface pseudowire to inherit all attributes defined from a template on the PE 2 router.

```
PE2(config-subif)#interface pseudowire 100
PE2(config-if)#source template type pseudowire test
PE2(config-if)#neighbor 10.4.4.4 121
PE2(config-if)#no shutdown
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases

Related Topic	Document Title
MPLS commands	Multiprotocol Label Switching Command Reference

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for L2VPN Protocol-Based CLIs

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 2: Feature Information for L2VPN Protocol-Based CLIs

Feature Name	Releases	Feature Information
L2VPN Protocol-Based CLIs	Cisco IOS XE Release 3.7S	The L2VPN Protocol-Based CLIs feature provides a set of processes and an improved infrastructure for developing and delivering Cisco IOS software on various Cisco platforms. This feature introduces new commands and modifies or replaces existing commands to achieve a consistent functionality across Cisco platforms and provide cross-Operating System (OS) support. In Cisco IOS XE Release 3.7S, this feature was introduced on the Cisco ASR 903 Router.