



# L2VPN: Pseudowire Preferential Forwarding

---

**First Published: February 27, 2009**  
**Last Updated: November 20, 2009**

The L2VPN: Pseudowire Preferential Forwarding feature allows you to configure pseudowires so that you can use **ping**, **show**, and **traceroute** commands to find status information of the pseudowires before, during, and after a switchover.

## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the “[Feature Information for L2VPN: Pseudowire Preferential Forwarding](#)” section on page 9.

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

## Contents

- [Prerequisites for L2VPN: Pseudowire Preferential Forwarding, page 2](#)
- [Restrictions for L2VPN: Pseudowire Preferential Forwarding, page 2](#)
- [Information About L2VPN: Pseudowire Preferential Forwarding, page 2](#)
- [How to Configure L2VPN: Pseudowire Preferential Forwarding, page 3](#)
- [Configuration Examples for L2VPN: Pseudowire Preferential Forwarding, page 5](#)
- [Additional References, page 7](#)
- [Feature Information for L2VPN: Pseudowire Preferential Forwarding, page 9](#)



---

**Americas Headquarters:**  
**Cisco Systems, Inc., 170 West Tasman Drive, San Jose, CA 95134-1706 USA**

© 2009 Cisco Systems, Inc. All rights reserved.

## Prerequisites for L2VPN: Pseudowire Preferential Forwarding

- Before configuring the L2VPN: Pseudowire Preferential Forwarding feature, you should understand the concepts in the following documents:
  - [Preferential Forwarding Status Bit Definition](#) (draft-ietf-pwe3-redundancy-bit-xx.txt)
  - [MPLS Pseudowire Status Signaling](#)
  - [L2VPN Pseudowire Redundancy](#)
  - [NSF/SSO—Any Transport over MPLS and AToM Graceful Restart](#)
  - [MPLS LSP Ping/Traceroute for LDP/TE, and LSP Ping for VCCV](#)
- The provider edge (PE) routers must be configured with the following features:
  - L2VPN Pseudowire Redundancy
  - NSF/SSO—AToM and AToM Graceful Restart
- The L2VPN: Pseudowire Preferential Forwarding feature requires that the following mechanisms be in place to enable you to detect a failure in the network:
  - LSP Ping/Traceroute and Any Transport over MPLS Virtual Circuit Connection Verification (AToM VCCV)
  - Local Management Interface (LMI)
  - Operation, Administration, and Maintenance (OAM)

## Restrictions for L2VPN: Pseudowire Preferential Forwarding

- Only ATM attachment circuits are supported.
- The following features are not supported:
  - Port mode cell relay
  - Any Transport over MPLS: AAL5 over MPLS
  - VC cell packing
  - OAM emulation
  - Integrated LMI/permanent virtual circuit (PVC)-D
  - PVC Range
  - L2TPv3 Pseudowire Redundancy
  - Local switching
  - Multiple backup pseudowires
  - Static pseudowires

## Information About L2VPN: Pseudowire Preferential Forwarding

The following section provides information about the L2VPN: Pseudowire Preferential Forwarding feature:

- [Overview of L2VPN: Pseudowire Preferential Forwarding, page 3](#)

## Overview of L2VPN: Pseudowire Preferential Forwarding

The L2VPN: Pseudowire Preferential Forwarding feature allows you to configure pseudowires so that you can use **ping**, **show**, and **traceroute** commands to find status information before, during, and after a switchover. The implementation of this feature is based on [Preferential Forwarding Status Bit Definition](#) (draft-ietf-pwe3-redundancy-bit-xx.txt). The L2VPN: Pseudowire Preferential Forwarding feature provides these enhancements for displaying information about the pseudowires:

- You can issue **ping mpls** commands on the backup pseudowires.
- You can display status of the pseudowires before, during, and after a switchover, using the **show xconnect** and **show mpls l2transport vc** commands.

**Note**

In a single-segment pseudowire, the PE routers at each end of the pseudowire serve as the termination points. In multisegment pseudowires, the terminating PE routers serve as the termination points.

## How to Configure L2VPN: Pseudowire Preferential Forwarding

The following section explains how to configure the L2VPN: Pseudowire Preferential Forwarding feature:

- [Configuring the Pseudowire, page 3](#) (required)

## Configuring the Pseudowire

You configure a connection, called a pseudowire, between the routers to transmit Layer 2 frames between PE routers.

As part of the pseudowire configuration, issue the **status redundancy master** command to make it the master. This enables the L2VPN: Pseudowire Preferential Forwarding feature to display the status of the active and backup pseudowires. By default, the PE router is in slave mode.

**Note**

One pseudowire must be the master and the other must be assigned the slave. You cannot configure both pseudowires as master or slave.

**Note**

You must specify the **encapsulation mpls** command as part of the pseudowire class for the Any Transport over MPLS (AToM) VCs to work properly. If you omit the **encapsulation mpls** command, you receive the following error:

```
% Incomplete command.
```

## Prerequisites

The PE routers must be configured for the L2VPN Pseudowire Redundancy and NSF/SSO—Any Transport over MPLS and AToM Graceful Restart features. See the following documents for configuration instructions:

- [L2VPN Pseudowire Redundancy](#)

- *NSF/SSO—Any Transport over MPLS and AToM Graceful Restart*

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **pseudowire-class** *name*
4. **encapsulation mpls**
5. **status redundancy** {**master** | **slave**}
6. **interworking** {**ethernet** | **ip**}

## DETAILED STEPS

|        | Command or Action   | Purpose   |
|--------|---|---|
| Step 1 | <b>enable</b><br><br><b>Example:</b><br>Router> enable  | Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>  |
| Step 2 | <b>configure terminal</b><br><br><b>Example:</b><br>Router# configure terminal  | Enters global configuration mode.   |
| Step 3 | <b>pseudowire-class</b> <i>name</i><br><br><b>Example:</b><br>Router(config)# pseudowire-class atom                             | Establishes a pseudowire class with a name that you specify, and enters pseudowire class configuration mode.  |
| Step 4 | <b>encapsulation mpls</b><br><br><b>Example:</b><br>Router(config-pw)# encapsulation mpls                                       | Specifies the tunneling encapsulation. <ul style="list-style-type: none"> <li>• For AToM, the encapsulation type is <b>mpls</b>.</li> </ul>   |
| Step 5 | <b>status redundancy</b> { <b>master</b>   <b>slave</b> }<br><br><b>Example:</b><br>Router(config-pw)# status redundancy master | Specifies the pseudowire as the master or slave. <ul style="list-style-type: none"> <li>• This enables the L2VPN: Pseudowire Preferential Forwarding feature to display the status of the active and backup pseudowires.</li> <li>• By default, the PE router is in slave mode.</li> </ul> <p><b>Note</b> One pseudowire must be the master and the other must be assigned the slave. You cannot configure both pseudowires as master or slave.</p> |
| Step 6 | <b>interworking</b> { <b>ethernet</b>   <b>ip</b> }<br><br><b>Example:</b><br>Router(config-pw)# interworking ip                | (Optional) Enables the translation between the different Layer 2 encapsulations.  |

# Configuration Examples for L2VPN: Pseudowire Preferential Forwarding

This section contains the following examples:

- [L2VPN: Pseudowire Preferential Forwarding Configuration: Example, page 5](#)
- [Displaying the Status of the Pseudowires: Example, page 5](#)

## L2VPN: Pseudowire Preferential Forwarding Configuration: Example

The following commands configure a PE router with the L2VPN: Pseudowire Preferential Forwarding feature:

```
mpls ldp graceful-restart
mpls ip
mpls label protocol ldp
mpls ldp router-id Loopback0 force
mpls ldp advertise-labels
!
pseudowire-class mpls
  encapsulation mpls
  status redundancy master

interface ATM0/2/0.1 multipoint
  logging event subif-link-status
  atm vpw 50 l2transport
    xconnect 10.1.1.2 100 encap mpls
    backup peer 10.1.1.3 100 encap mpls
end
```

## Displaying the Status of the Pseudowires: Example

The following examples show the status of the active and backup pseudowires before, during, and after a switchover.

The **show mpls l2transport vc** command on the active PE router displays the status of the pseudowires:

```
Router# show mpls l2transport vc
```

| Local intf | Local circuit   | Dest address | VC ID | Status  |
|------------|-----------------|--------------|-------|---------|
| AT0/2/0.1  | ATM VPC CELL 50 | 10.1.1.2     | 100   | UP      |
| AT0/2/0.1  | ATM VPC CELL 50 | 10.1.1.3     | 100   | STANDBY |

The **show mpls l2transport vc** command on the backup PE router displays the status of the pseudowires. The active pseudowire on the backup PE router has the HOTSTANDBY status.

```
Router-standby# show mpls l2transport vc
```

| Local intf | Local circuit   | Dest address | VC ID | Status     |
|------------|-----------------|--------------|-------|------------|
| AT0/2/0.1  | ATM VPC CELL 50 | 10.1.1.2     | 100   | HOTSTANDBY |
| AT0/2/0.1  | ATM VPC CELL 50 | 10.1.1.3     | 100   | DOWN       |

During a switchover, the status of the active and backup pseudowires changes:



```
Type escape sequence to abort.
! 1 10.193.33.22 4 ms [Labels: 23 Exp: 0]
    local 10.193.193.3 remote 10.193.193.22 vc id 331
```

## Additional References

The following sections provide references related to the L2VPN: Pseudowire Preferential Forwarding feature.

### Related Documents

| Related Topic                  | Document Title  |
|--------------------------------|---|
| Cisco IOS commands             | <a href="#">Cisco IOS Master Commands List, All Releases</a>  |
| MPLS commands                  | <a href="#">Cisco IOS Multiprotocol Label Switching Command Reference</a>   |
| L2VPN pseudowires              | <ul style="list-style-type: none"> <li>• <a href="#">MPLS Pseudowire Status Signaling</a></li> <li>• <a href="#">L2VPN Pseudowire Redundancy</a></li> </ul> |
| NSF/SSO for L2VPNs             | <a href="#">NSF/SSO—Any Transport over MPLS and AToM Graceful Restart</a>   |
| Ping and traceroute for L2VPNs | <a href="#">MPLS LSP Ping/Traceroute for LDP/TE, and LSP Ping for VCCV</a>  |

### Standards

| Standard                              | Title   |
|---------------------------------------|---|
| draft-ietf-pwe3-redundancy-bit-xx.txt | <a href="#">Preferential Forwarding Status Bit Definition</a> |

### MIBs

| MIB   | MIBs Link   |
|---|---|
| <ul style="list-style-type: none"> <li>• N/A</li> </ul> | <p>To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:</p> <p><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a></p> |

### RFCs

| RFC  | Title |
|------|-------|
| None | —     |

## Technical Assistance

| Description   | Link   |
|---|--|
| <p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p> | <p><a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a></p> |

# Feature Information for L2VPN: Pseudowire Preferential Forwarding

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



## Note

Table 1 lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

**Table 1** Feature Information for L2VPN: Pseudowire Preferential Forwarding

| Feature Name                              | Releases    | Feature Information  |
|---|-------------|--|
| L2VPN: Pseudowire Preferential Forwarding | 12.2(33)SRE | <p>This feature allows you to configure pseudowires so that you can use <b>ping</b>, <b>show</b>, and <b>traceroute</b> commands to find status information of the pseudowires before, during, and after a switchover.</p> <p>The following commands were introduced or modified by this feature: <b>show mpls l2transport vc</b>, <b>show xconnect</b>, <b>status redundancy</b>.</p> |

Cisco and the Cisco Logo are trademarks of Cisco Systems, Inc. and/or its affiliates in the U.S. and other countries. A listing of Cisco's trademarks can be found at [www.cisco.com/go/trademarks](http://www.cisco.com/go/trademarks). Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1005R)

Any Internet Protocol (IP) addresses used in this document are not intended to be actual addresses. Any examples, command display output, and figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses in illustrative content is unintentional and coincidental.

© 2009 Cisco Systems, Inc. All rights reserved.