



# MPLS Pseudowire Status Signaling

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The MPLS Pseudowire Status Signaling feature enables you to configure the router so it can send pseudowire status to a peer router, even when the attachment circuit is down.

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and 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 table at the end of this module.

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Prerequisites for MPLS Pseudowire Status Signaling

- Before configuring this feature, make sure that both peer routers are capable of sending and receiving pseudowire status messages.

## Restrictions for MPLS Pseudowire Status Signaling

- Both peer routers must support the ability to send and receive pseudowire status messages in label advertisement and label notification messages. If both peer routers do not support pseudowire status messages, Cisco recommends that you disable the messages with the **no status** command.
- This feature is not integrated with Any Transport over MPLS (AToM) Virtual Circuit Connection Verification (VCCV).
- This feature is not integrated with Bidirectional Forwarding Detection (BFD).
- The standby and required switchover values from IETF draft-muley-pwe3-redundancy-02.txt are not supported.

## Information About MPLS Pseudowire Status Signaling

### How MPLS Pseudowire Status Switching Works

The pseudowire status messages are sent in label advertisement and label notification messages if the peer also supports the MPLS Pseudowire Status Signaling feature. You can issue the **show mpls l2transport vc detail** command to show that both the local and remote routers support pseudowire status messages. The following example shows the line of output to look for:

```
Router# show mpls l2transport vc detail
.
.
.
status TLV support (local/remote): enabled/supported
```

### How MPLS Pseudowire Status Switching Works using the commands associated with the L2VPN Protocol-Based CLIs feature

The pseudowire status messages are sent in label advertisement and label notification messages if the peer also supports the MPLS Pseudowire Status Signaling feature. You can issue the **show l2vpn atom vc detail** command to show that both the local and remote routers support pseudowire status messages. The following example shows the line of output to look for:

```
Device# show l2vpn atom vc detail
.
.
.
status TLV support (local/remote): enabled/supported
```

## When One Router Does Not Support MPLS Pseudowire Status Signaling

The peer routers must support the ability to send and receive pseudowire status messages in label advertisement and label notification messages. If one router does not support pseudowire status messages, Cisco recommends that you disable the messages with the **no status** command. This returns the router to label withdraw mode.

If the peer does not support the MPLS Pseudowire Status Signaling feature, the local router changes its mode of operation to label withdraw mode. You can issue the **show mpls l2transport vc detail** command to show that the remote router does not support pseudowire status messages. The following example shows the line of output to look for:

```
Router# show mpls l2transport vc detail
.
.
.
status TLV support (local/remote): enabled/not supported
```

When you issue the following **debug mpls l2transport vc** commands, the messages show that the peer router does not support the MPLS Pseudowire Status Signaling feature and that the local router is changing to withdraw mode, as shown in bold in the following example:

```
Router# debug mpls l2transport vc event Router# debug mpls l2transport vc status event Router# debug mpls l2transport vc status fsm Router# debug mpls l2transport vc ldp
*Feb 26 13:41:40.707: AToM LDP [10.1.1.2]: Sending label withdraw msg *Feb 26 13:41:40.707: AToM LDP [10.1.1.2]: VC Type 5, mtu 1500 *Feb 26 13:41:40.707: AToM LDP [10.1.1.2]: VC ID 100, label 18
*Feb 26 13:41:40.707: AToM LDP [10.1.1.2]: Status 0x0000000A [PW Status NOT supported]
```

## When One Router Does Not Support MPLS Pseudowire Status Signaling using the commands associated with the L2VPN Protocol-Based CLIs feature

The peer routers must support the ability to send and receive pseudowire status messages in label advertisement and label notification messages. If one router does not support pseudowire status messages, we recommend that you disable the messages with the **no status** command. This returns the router to label withdraw mode.

If the peer does not support the MPLS Pseudowire Status Signaling feature, the local router changes its mode of operation to label withdraw mode. You can issue the **show l2vpn atom vc detail** command to show that the remote router does not support pseudowire status messages. The following example shows the line of output to look for:

```
Device# show l2vpn atom vc detail
.
.
.
status TLV support (local/remote): enabled/not supported
```

When you issue the following **debug l2vpn atom vc** commands, the messages show that the peer router does not support the MPLS Pseudowire Status Signaling feature and that the local router is changing to withdraw mode, as shown in the following example:

```
Device# debug l2vpn atom vc event
Device# debug l2vpn atom vc status event
Device# debug l2vpn atom vc status fsm
Device# debug l2vpn atom vc ldp

*Feb 26 13:41:40.707: ATOM LDP [110.1.1.2]: Sending label withdraw msg
*Feb 26 13:41:40.707: ATOM LDP [110.1.1.2]: VC Type 5, mtu 1500
*Feb 26 13:41:40.707: ATOM LDP [110.1.1.2]: VC ID 100, label 18
*Feb 26 13:41:40.707: ATOM LDP [110.1.1.2]: Status 0x0000000A [PW Status NOT supported]
```

## Status Messages Indicating That the Attachment Circuit Is Down

When the attachment circuit is down between the two routers, the output of the **show mpls l2transport vc detail** command shows the following status:

```
Router# show mpls l2transport vc detail
.
.
.

Last remote LDP TLV      status rcvd: AC DOWN(rx,tx faults)
```

The debug messages also indicate that the attachment circuit is down, as shown in bold in the command output:

```
Router# debug mpls l2transport vc event Router# debug mpls l2transport vc status event Router# debug mpls l2transport vc status fsm Router# debug mpls l2transport vc ldp
```

```
*Feb 26 11:51:42.427: ATOM LDP [10.1.1.1]: Received notif msg, id 88
*Feb 26 11:51:42.427: ATOM LDP [10.1.1.1]: Status 0x00000007 [PW Status]
*Feb 26 11:51:42.427: ATOM LDP [10.1.1.1]: PW Status 0x00000006 [AC DOWN(rx,tx faults)]
Other pseudowire status messages include not-forwarding, pw-tx-fault, and pw-rx-fault.
```

## Status Messages Indicating That the Attachment Circuit Is Down using the commands associated with the L2VPN Protocol-Based CLIs feature

When the attachment circuit is down between the two routers, the output of the **show l2vpn atom vc detail** command shows the following status:

```
Device# show l2vpn atom vc detail
.
.
.

Last remote LDP TLV      status rcvd: AC DOWN(rx,tx faults)
```

The debug messages also indicate that the attachment circuit is down, as shown in bold in the command output:

```
Device# debug l2vpn atom vc event
Device# debug l2vpn atom vc status event
```

```

Device# debug l2vpn atom vc status fsm
Device# debug l2vpn atom vc ldp

*Feb 26 11:51:42.427: AToM LDP [10.1.1.1]: Received notif msg, id 88
*Feb 26 11:51:42.427: AToM LDP [10.1.1.1]: Status 0x00000007 [PW Status]
*Feb 26 11:51:42.427: AToM LDP [10.1.1.1]: PW Status 0x00000006 [AC DOWN(rx,tx faults)]
Other pseudowire status messages include not-forwarding, pw-tx-fault, and pw-rx-fault.

```

## Message Codes in the Pseudowire Status Messages

The `debug mpls l2transport vc` and the `show mpls l2transport vc detail` commands show output that contains message codes. For example:

```

Label/status state machine: established, LruRru

AToM MGR [10.9.9.9, 100]: S:Evt local up, LndRru->LnuRru

```

The message codes (LruRru, LndRru, and LnuRru) indicate the status of the local and remote routers. You can use the following key to interpret the message codes:

- L--local router
- R--remote router
- r or n--ready (r) or not ready (n)
- u or d--up (u) or down (d) status

The output also includes other values:

- D--Dataplane
- S--Local shutdown

## Message Codes in the Pseudowire Status Messages using the commands associated with the L2VPN Protocol-Based CLIs feature

The `debug l2vpn atom vc` and the `show l2vpn atom vc detail` commands show output that contains message codes. For example:

```

Label/status state machine: established, LruRru

AToM MGR [10.9.9.9, 100]: S:Evt local up, LndRru->LnuRru

```

The message codes (LruRru, LndRru, and LnuRru) indicate the status of the local and remote routers. You can use the following key to interpret the message codes:

- L—local router
- R—remote router
- r or n—ready (r) or not ready (n)
- u or d—up (u) or down (d) status

The output also includes other values:

D—Dataplane

S—Local shutdown

# How to Configure MPLS Pseudowire Status Signaling

## Enabling MPLS Pseudowire Status Signaling

Perform the following task to enable the router to send pseudowire status to a peer router even when the attachment circuit is down. If both routers do not support pseudowire status messages, then disable the messages with the **no status** command.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **pseudowire-class *name***
4. **status**
5. **encapsulation mpls**
6. **exit**
7. **exit**
8. **show mpls l2transport vc detail**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>pseudowire-class <i>name</i></b>  <b>Example:</b> Router(config)# pseudowire-class atom	Establishes a pseudowire class with a name that you specify and enters pseudowire class configuration mode.

	Command or Action	Purpose
<b>Step 4</b>	<b>status</b>  <b>Example:</b> Router(config-pw)# status	(Optional) Enables the router to send pseudowire status messages to the peer router through label advertisement and label notification messages.  <b>Note</b> By default, status messages are enabled. This step is included only in case status messages have been disabled. If you need to disable status messages because both peer routers do not support this functionality, enter the <b>no status</b> command.
<b>Step 5</b>	<b>encapsulation mpls</b>  <b>Example:</b> Router(config-pw)# encapsulation mpls	Specifies the tunneling encapsulation.
<b>Step 6</b>	<b>exit</b>  <b>Example:</b> Router(config-pw)# exit	Exits pseudowire class configuration mode.
<b>Step 7</b>	<b>exit</b>  <b>Example:</b> Router(config)# exit	Exits global configuration mode.
<b>Step 8</b>	<b>show mpls l2transport vc detail</b>  <b>Example:</b> Router# show mpls l2transport vc detail	Validates that pseudowire messages can be sent and received.

## Enabling MPLS Pseudowire Status Signaling using the commands associated with the L2VPN Protocol-Based CLIs feature

Perform this task to enable the router to send pseudowire status to a peer router even when the attachment circuit is down. If both routers do not support pseudowire status messages, then disable the messages with the **no status** command.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface pseudowire** *number*
4. **status**
5. **encapsulation mpls**
6. **neighbor** *peer-address* *vcid-value*
7. **exit**
8. **exit**
9. **show l2vpn atom vc detail**

## DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode.  • Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b>  <b>Example:</b> Device# configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>interface pseudowire</b> <i>number</i>  <b>Example:</b> Device(config)# interface pseudowire 1	Establishes an interface pseudowire with a value that you specify and enters pseudowire configuration mode.
<b>Step 4</b>	<b>status</b>  <b>Example:</b> Device(config-pw)# status	(Optional) Enables the router to send pseudowire status messages to the peer router through label advertisement and label notification messages.  <b>Note</b> By default, status messages are enabled. This step is included only in case status messages have been disabled. If you need to disable status messages because both peer routers do not support this functionality, enter the <b>no status</b> command.
<b>Step 5</b>	<b>encapsulation mpls</b>  <b>Example:</b> Device(config-pw)# encapsulation mpls	Specifies the tunneling encapsulation.



	Command or Action	Purpose
Step 6	<b>neighbor</b> <i>peer-address</i> <i>vcid-value</i>  <b>Example:</b> Device(config-pw)# neighbor 10.0.0.1 123	Specifies the peer IP address and virtual circuit (VC) ID value of a Layer 2 VPN (L2VPN) pseudowire.
Step 7	<b>exit</b>  <b>Example:</b> Device(config-pw)# exit	Exits pseudowire class configuration mode.
Step 8	<b>exit</b>  <b>Example:</b> Device(config)# exit	Exits global configuration mode.
Step 9	<b>show l2vpn atom vc detail</b>  <b>Example:</b> Device# show l2vpn atom vc detail	Validates that pseudowire messages can be sent and received.

## Configuration Examples for MPLS Pseudowire Status Signaling

### Example MPLS Pseudowire Status Signaling

The following example configures the MPLS Pseudowire Status Signaling feature on two PE routers. By default, status messages are enabled. The **status** command is included in this example in case status messages have been disabled.

#### PE1

```
interface Loopback0
  ip address 10.1.1.1 255.255.255.255
  !
  pseudowire-class atomstatus
    encapsulation mpls
    status
  !
interface GigabitEthernet0/0/1
  xconnect 10.1.1.2 123 pw-class atomstatus
```

#### PE2

```
interface Loopback0
```

## Example MPLS Pseudowire Status Signaling using the commands associated with the L2VPN Protocol-Based CLIs feature

```

ip address 10.1.1.2 255.255.255.255
!
pseudowire-class atomstatus
encapsulation mpls
status
!
interface GigabitEthernet3/3/0
xconnect 10.1.1.1 123 pw-class atomstatus

```

## Example MPLS Pseudowire Status Signaling using the commands associated with the L2VPN Protocol-Based CLIs feature

The following example configures the MPLS Pseudowire Status Signaling feature on two PE routers. By default, status messages are enabled. The **status** command is included in this example in case status messages have been disabled.

### PE1

```

interface Loopback0
ip address 10.1.1.1 255.255.255.255
!
template type pseudowire atomstatus
encapsulation mpls
status
!
interface pseudowire 100
source template type pseudowire atomstatus
interface GigabitEthernet0/0/1
service instance 300 ethernet
l2vpn xconnect context con1
member GigabitEthernet2/1/1 service-instance 300
member Pseudowire 100

```

### PE2

```

interface Loopback0
ip address 10.1.1.2 255.255.255.255
!
template type pseudowire atomstatus
encapsulation mpls
status
!
interface Pseudowire 100
source template type pseudowire atomstatus
interface GigabitEthernet3/3/0
service instance 300 ethernet
l2vpn xconnect context con1
member GigabitEthernet2/1/1 service-instance 300
member Pseudowire 100

```

## Example Verifying That Both Routers Support Pseudowire Status Messages

You can issue the `show mpls l2transport vc detail` command to show that both the local and remote routers support pseudowire status messages. The following example shows the line of output to look for:

```
Router# show mpls l2transport vc detail
.
.
.
status TLV support (local/remote): enabled/supported
```

## Example Verifying That Both Routers Support Pseudowire Status Messages using the commands associated with the L2VPN Protocol-Based CLIs feature

You can issue the `show l2vpn atom vc detail` command to show that both the local and remote routers support pseudowire status messages. The following example shows the line of output to look for:

```
Device# show l2vpn atom vc detail
.
.
.
status TLV support (local/remote): enabled/supported
```

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Commands List, All Releases</a>
Description of commands associated with MPLS and MPLS applications	<i>Cisco IOS Multiprotocol Label Switching Command Reference</i>
Any Transport over MPLS	Any Transport over MPLS

### Standards

Standard	Title
draft-ietf-pwe3-control-protocol-15.txt	Pseudowire Setup and Maintenance Using LDP

Standard	Title
draft-ietf-pwe3-iana-allocation-08.txt	IANA Allocations for Pseudo Wire Edge to Edge Emulation (PWE3)
draft-martini-pwe3-pw-switching-03.txt	Pseudo Wire Switching

**MIBs**

MIB	MIBs Link
Pseudowire Emulation Edge-to-Edge MIBs for Ethernet, Frame Relay, and ATM Services	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

**RFCs**

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	--

**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.	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

## Feature Information for

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](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

**Table 1: Feature Information for MPLS Pseudowire Status Signaling**

Feature Name	Releases	Feature Information
MPLS Pseudowire Status Signaling	Cisco IOS XE Release 2.3	<p>The MPLS Pseudowire Status Signaling feature enables you to configure the router so it can send pseudowire status to a peer router, even when the attachment circuit is down.</p> <p>The following commands were introduced or modified: <b>debug mpls l2transport vc</b>, <b>show mpls l2transport vc status</b> (pseudowire class).</p>

