



## MPLS Optical User Network Interface Commands on Cisco IOS XR Software

---

This chapter describes the commands used to configure, monitor, and troubleshoot an Optical User Network Interface (O-UNI). It provides a description of the Static Link Management Protocol (LMP) commands. LMP is a user-configured version of the Internet Engineering Task Force's (IETF) LMP; hence, the keyword **lmp** is used in the management commands.

The Unified Control Plane (UCP) (sometimes referred to as the Optical Control Plane [OCP]) is a standards-based approach toward an open architecture for the control and provisioning of optical transport elements and capacity. It allows customers to establish standards-based Optical Internetworking Forum (OIF) connections through heterogeneous optical networks (OTNs) based on the Synchronous Optical Network (SONET) and Synchronous Digital Hierarchy (SDH) specifications. These connections are made across OTNs comprising Cisco equipment or third-party vendor equipment.

For detailed information about MPLS concepts, configuration tasks, and examples, refer to the *Cisco IOS XR MPLS Configuration Guide*.

# destination address ipv4

To establish an O-UNI connection to a specific destination transport network address (TNA), use the **destination address ipv4** command in MPLS O-UNI interface mode. To return to the default behavior, use the **no** form of this command.

**destination address ipv4** *destination-TNA*

**no destination address ipv4** *destination-TNA*

## Syntax Description

<i>destination-TNA</i>	Destination TNA to which a connection is created.
------------------------	---

## Defaults

No default behavior or values

## Command Modes

MPLS O-UNI interface

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **destination address ipv4** command whenever an O-UNI connection is established by the router. Both O-UNI-C sides participating in an O-UNI connection is configured with the **destination address ipv4** command. In this case, the destination TNA specified by each side must correspond to the TNA configured by the other side.



### Note

Based on the contention detection and backoff mechanisms defined in O-UNI 1.0, one of the routers acts as though configured with the **passive** command.

## Task ID

Task ID	Operations
ouni	read, write

---

**Examples**

The following example shows how to configure the interface to initiate an O-UNI connection to TNA 10.10.10.10:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# interface POS 0/1/0/1
RP/0/RP0/CPU0:router(config-mpls-ouni-if)# destination address ipv4 10.10.10.10
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">passive (MPLS O-UNI)</a>	Configures an interface to terminate an O-UNI connection.

---

# ipcc routed

To configure an Internet Protocol Control Channel (IPCC) that is routable, use the **ipcc routed** command in O-UNI LMP neighbor configuration mode. To return to the default behavior, use the **no** form of this command.

**ipcc routed**

**no ipcc routed**

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

**Defaults** No default behavior or values

**Command Modes** O-UNI LMP neighbor configuration

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

This type of IPCC is IPv4 routed to the O-UNI neighbor to which it is connected. Ensure that the O-UNI neighbor is configured with a reachable IPv4 node ID.

When a routed IPCC is configured to a given neighbor, control traffic destined to that neighbor is IP routed to the configured remote router ID for that neighbor. A correctly configured routed IPCC to a given LMP neighbor is required before an O-UNI label switched path (LSP) connection to that neighbor is established.

Task ID	Task ID	Operations
	ouni	read, write

---

**Examples**

The following example shows how to configure a routed IPCC for O-UNI neighbor router1 where the destination IP address is the node ID of the neighbor router1 on an interface determined dynamically by an IP routing protocol:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# lmp neighbor router1
RP/0/RP0/CPU0:router(config-ouni-nbr-router1)# ipcc routed
```

# Imp neighbor

To configure or update a new or existing O-UNI specific LMP neighbor and its associated parameters, use the **imp neighbor** command in MPLS O-UNI configuration mode. To return to the default behavior, use the **no** form of this command.

**imp neighbor** *neighbor-name*

**no imp neighbor** *neighbor-name*

## Syntax Description

<i>neighbor-name</i>	Text string representing the name of the LMP neighbor.
----------------------	--

## Defaults

No default behavior or values

## Command Modes

MPLS O-UNI configuration

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Neighbor names must be unique. A neighbor does not become operational until both the remote node ID and a routed Internet Protocol Control Channel (IPCC) are configured for that neighbor.



### Note

You can configure up to ten LMP neighbors for each router.

## Task ID

Task ID	Operations
ouni	read, write

---

**Examples**

The following example shows how to enter LMP neighbor configuration mode for neighbor router 1, and create the LMP neighbor if it does not already exist.

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# lmp neighbor router 1
```

---

**Related Commands**

Command	Description
<a href="#">neighbor (O-UNI)</a>	Associates an interface with an LMP neighbor.

# neighbor (O-UNI)

To associate an interface with a given LMP neighbor, use the **neighbor** command in O-UNI LMP datalink adjacency configuration mode. To return to the default behavior, use the **no** form of this command.

**neighbor** *neighbor-name*

**no neighbor** *neighbor-name*

Syntax Description	<i>neighbor-name</i>	String of alphanumeric characters that defines the name of the LMP neighbor to create or modify.
--------------------	----------------------	--

Defaults	No default behavior or values
----------	-------------------------------

Command Modes	O-UNI LMP datalink adjacency configuration
---------------	--

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

You can specify a forward reference to a neighbor that you have not yet configured. A neighbor does not become operational until both the remote node ID and a routed Internet Protocol Control Channel (IPCC) is configured for that neighbor. LMP neighbors are configured under the MPLS O-UNI configuration mode.

Task ID	Task ID	Operations
	ouni	read, write

---

**Examples**

The following example shows how to associate the neighbor router1 with the datalink PoS interface 0/1/0/1:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# interface POS 0/1/0/1
RP/0/RP0/CPU0:router(config-mpls-ouni-if)# lmp data-link adjacency
RP/0/RP0/CPU0:router(config-mpls-ouni-if-adj)# neighbor router1
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">lmp neighbor</a>	Configures or updates a new or existing O-UNI specific LMP neighbor and its associated parameters.

---

## passive (MPLS O-UNI)

To terminate an O-UNI connection, use the **passive** command in the MPLS O-UNI interface configuration mode. To return to the default behavior, use the **no** form of this command.

**passive**

**no passive**

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

**Defaults** No default behavior or values

**Command Modes** MPLS O-UNI interface configuration

### Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

### Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **passive** command whenever the router is to terminate an O-UNI connection. The interface accepts the incoming connection request of any O-UNI-C. The router does not actively attempt to create a connection, but rather waits for an incoming connection request.



#### Note

If a **destination address ipv4** command is configured, you must enter the **no destination address ipv4** command before attempting to configure the **passive** command. Otherwise, you receive an error.

### Task ID

Task ID	Operations
ouni	read, write

---

**Examples**

The following example shows how to configure PoS interface 0/1/0/1 as the passive end of an O-UNI:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# interface POS 0/1/0/1
RP/0/RP0/CPU0:router(config-mpls-ouni-if)# passive
```

---

**Related Commands**

Command	Description
<a href="#">remote interface-id</a>	Configures the remote datalink interface ID.

## remote interface-id

To configure the remote datalink interface ID, use the **remote interface-id** command in O-UNI LMP neighbor adjacency configuration mode. To return to the default behavior, use the **no** form of this command.

**remote interface-id** *remote-interface-id*

**no remote interface-id** *remote-interface-id*

### Syntax Description

*remote-interface-id* Interface ID of the neighbor's datalink. Range is 1 to 4294967295.

### Defaults

No remote datalink interface ID is configured.

### Command Modes

O-UNI LMP neighbor adjacency configuration

### Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

### Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The remote interface ID must be set to the local interface ID at the neighbor end of the datalink.

### Task ID

Task ID	Operations
ouni	read, write

---

**Examples**

The following example shows how to configure the interface ID for the remote neighbor of the datalink that is associated with PoS interface 0/1/0/1:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# interface pos 0/2/0/0 lmp data-link adjacency
RP/0/RP0/CPU0:router(config-mpls-ouni-if)# lmp data-link adjacency
RP/0/RP0/CPU0:router(config-mpls-ouni-if-adj)# remote interface-id 2
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">passive (MPLS O-UNI)</a>	Terminates an O-UNI connection.

---

# remote node-id

To configure the remote node ID for an O-UNI LMP neighbor, use the **remote node-id** command in LMP neighbor configuration mode.

**remote node-id** *A.B.C.D.*

<b>Syntax Description</b>	<i>A.B.C.D.</i>	The address to which routed control messages are sent.
---------------------------	-----------------	--

<b>Defaults</b>	No default behavior or values
-----------------	-------------------------------

<b>Command Modes</b>	LMP neighbor configuration
----------------------	----------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

The remote node ID must be set to the local LMP node ID of the neighbor.

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

**Examples**

The following example shows how to configure the node ID for a neighbor node:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# lmp neighbor router1
RP/0/RP0/CPU0:router(config-ouni-nbr-router1)# remote node-id 192.168.20.10
```

Related Commands	Command	Description
	<a href="#">passive (MPLS O-UNI)</a>	Terminates an O-UNI connection.

## router-id (MPLS O-UNI)

To configure the local O-UNI LMP node ID, also known as a router ID, on a router, use the **router-id** command in MPLS O-UNI configuration mode.

```
router-id {A.B.C.D. | interface-name}
```

Syntax Description		
	<i>A.B.C.D.</i>	IPv4 address to use as the router ID.
	<i>interface-name</i>	Name of an interface whose address is used as the LMP node ID.

**Defaults** No default behavior or values

**Command Modes** MPLS O-UNI configuration

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Task ID	Task ID	Operations
	ouni	read, write

**Examples** The following example shows how to configure the node ID for a neighbor node:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# router-id pos 0/6/4/1
```

# show mpls lmp clients

To display information about LMP clients, use the **show mpls lmp clients** command in EXEC mode.

**show mpls lmp clients**

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

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use this command to display a list of LMP client names with associated job IDs, the nodes on which the client is running, and the client uptime.

Task ID	Task ID	Operations
	ouni	read

**Examples** The following is sample output from the **show mpls lmp clients** command:

```
RP/0/RP0/CPU0:router# show mpls lmp clients

Current time: Thu Jun 20 6 07:26:27 2006
Total Number of Clients = 2
  Client  | Job ID | Node  | Uptime  | Since
-----+-----+-----+-----+-----
      rsvp  114   node0_0_0  36m13s  Tue Jun 20 11:22:39 2006
 ucp_0-UNI 116   node0_0_0  28m51s  Tue Feb 20 11:30:01 2006
```

Table 71 describes the significant fields shown in the display.

**Table 71** *show mpls ldp clients Field Descriptions*

<b>Field</b>	<b>Description</b>
Client	Process name registered with LMP OLM <sup>1</sup> server.
Job ID	Job ID of the client process.
Node	Node ID of the client.
Uptime	Time connection has been established.
Since	Time when the connection was successfully established. This field is empty until a connection is established.

1. Optical Link Manager

# show mpls lmp interface-id

To display the local LMP interface ID (also known as port ID, or component interface ID) for a given interface, use the **show mpls lmp interface-id** command in EXEC mode.

```
show mpls lmp interface-id type interface-id
```

## Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-id</i>	Identifies a physical interface or a virtual interface.  <b>Note</b> Use the show interfaces command to see a list of all possible interfaces currently configured on the router.  For more information about the syntax for the router, use the question mark (?) online help function.

## Command Modes

EXEC

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

## Task ID

Task ID	Operations
ouni	read

## show mpls lmp interface-id

### Examples

The following is sample output from the **show mpls lmp interface-id** command:

```
RP/0/RP0/CPU0:router# show mpls lmp interface-id pos 0/7/0/0
```

```
Local LMP interface ID: Hex = 0xa, Dec = 10
```

[Table 72](#) describes the significant fields shown in the display.

**Table 72** *show mpls lmp inference-id Field Descriptions*

Field	Description
Local LMP interface ID	32-bit value which uniquely identifies a router interface.
Hex	Value in hexadecimal notation (base 16).
Dec	Value in decimal notation (base 10).

### Related Commands

Command	Description
<a href="#">show mpls optical-uni interface</a>	Displays O-UNI information for an interface.

# show mpls optical-uni

To display information about the state of O-UNI connections, use the **show mpls optical-uni** command in EXEC mode.

**show mpls optical-uni**

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

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show mpls optical-uni** command to display brief information for the state of O-UNI connection states.

Task ID	Task ID	Operations
	ouni	read

**Examples**

The following is sample output from the **show mpls optical-uni** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni

Index of abbreviations:
-----
M=O-UNI configuration Mode.
P=Passive
AR =active/receiver
AS=active/sender
U=Unknown

Interface  TunID      M   Sig State      CCT Up Since      Remote Addr
-----
POS2/0/0/0 000001    AS  Connected      27/02/2002 05:20:35    10.3.4.2
```

[Table 73](#) describes the significant fields shown in the display.

**Table 73** *show mpls optical-uni Field Descriptions*

Field	Description
Interface	Name of the O-UNI configured interface.
TunID	Tunnel ID used in performing the signaling operation.
M	Mode of operation for the interface, as follows: <ul style="list-style-type: none"> <li>• P—Interface is configured with the O-UNI <b>passive (MPLS O-UNI)</b> command.</li> <li>• AS—Router is acting as the connection initiator.</li> <li>• AR—Router is acting as the connection termination endpoint.</li> <li>• U—An O-UNI internal error has occurred. Normally, the value U is not seen under this column.</li> </ul>

**Table 73** *show mpls optical-uni Field Descriptions (continued)*

Field	Description
Sig State	<p>Indicates the signaling state of the O-UNI connection. The following states exist:</p> <p>No Connection—A connection could not be initiated on the interface</p> <p>Wait Resv—A Path message was sent, and a Resv message is awaited.</p> <p>Connected—A O-UNI connection is established.</p> <p>Wait PErr PSR—The graceful deletion procedure has been initiated from the interface acting as the O-UNI-C source, a Path(D&amp;R) message has been sent towards the destination O-UNI-C node, and a PathErr(PSR) message is awaited.</p> <p>Wait Path—A path is awaited to initiate the O-UNI connection establishment procedures.</p> <p>Wait Resvconf—At an O-UNI-C destination side, a Path message has been received, a Resv message has been sent towards the O-UNI-C source and now the O-UNI system awaits the ResvConf message to complete the connection setup.</p> <p>Wait PTear—The graceful deletion procedure has been initiated from the interface acting as an O-UNI-C destination, a Resv(D&amp;R) message has been sent towards source O-UNI-C, and the O-UNI system waits for a PathTear message to complete the deletion.</p> <p>Path Retry—A previous attempt to establish a connection on the interface as an O-UNI-C source has failed, and the O-UNI system waits for a Retry timer to expire to make the next attempt.</p>
CCT Up Since	The time at which a connection was successfully established. This field is empty until a connection is established.
Remote Addr	The remote address of a connection. If the interface has a passive configuration, this field is populated only after a connection is established.

**Related Commands**

Command	Description
<a href="#">show mpls optical-uni interface</a>	Displays detailed O-UNI information for a specific interface.

# show mpls optical-uni checkpoint

To display O-UNI information used during restart operations, use the **show mpls optical-uni checkpoint** command in EXEC mode.

**show mpls optical-uni checkpoint**

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

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show mpls optical-uni checkpoint** command to display O-UNI information used during restart operations.



**Note**

In general, this command is not used during normal operation. This command is used to diagnose problem conditions within the O-UNI process and are used only when an O-UNI internal error occurs.

Task ID	Task ID	Operations
	ouni	read

**Examples**

The following is sample output from the **show mpls optical-uni checkpoint** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni checkpoint

Interface          TunID  LspID CCT Up Since
-----
POS0_2_0_2         00004  00004 04/11/2006 15:01:07
```

[Table 74](#) describes the significant fields shown in the display.

**Table 74** *show mpls optical-uni checkpoint Field Descriptions*

Field	Description
Interface	Interface associated with the O-UNI connection.
TunID	ID of the tunnel associated with the O-UNI connection.
LspID	ID of the label switched path associated with the connection.
CCT Up Since	Time when a connection was successfully established. This field is empty until a connection is established.

# show mpls optical-uni diagnostics

To display diagnostics information for an O-UNI connection for a specific interface, use the **show mpls optical-uni diagnostics** command in EXEC mode.

**show mpls optical-uni diagnostics** [**interface** *type interface-id* | **all**]

Syntax Description	interface	(Optional) Displays O-UNI diagnostics information related to the interface specified by <i>type interface</i> .
	<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
	<i>interface-id</i>	Identifies a physical interface or a virtual interface.  <b>Note</b> Use the show interfaces command to see a list of all possible interfaces currently configured on the router.  For more information about the syntax for the router, use the question mark (?) online help function.
	<b>all</b>	(Optional) The diagnostics information is displayed for all O-UNI interfaces.

Command Modes	EXEC
---------------	------

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show mpls optical-uni diagnostics** command to display O-UNI diagnostics information for a specific interface.

Task ID	Task ID	Operations
	ouni	read

**Examples**

The following is sample output from the **show mpls optical-uni diagnostics** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni diagnostics interface POS 0/2/0/2

Interface [POS0/2/0/2]

Configuration: Active->User
Signaling State: [Path Retry]

Connection to OLM/LMP established? Yes
O-UNI to OLM/LMP DB sync. status: Synchronized

Connection to RSVP established? Yes
RSVP to OLM/LMP DB sync. status: Synchronized

The neighbor [router1] has been configured, and has the node id [55.56.
57.58]
Found a route to the neighbor [router1]

Remote switching capability is TDM.
TNA [10.0.0.5] configured.

All required configs have been entered.

Global Code: No Error/ Success @ unknown time
Datalink Code: PathErr Received @ 04/11/2006 17:06:48
```

[Table 75](#) describes the significant fields in the sample display shown above.

**Table 75** *show mpls optical-uni diagnostics Field Descriptions*

Field	Description
Interface	Interface name for which the diagnostics information is displayed.
Configuration	Indicates if the interface is acting as the O-UNI-C source and in this case “Active” is displayed, or as the O-UNI-C destination and in this case “Passive” is displayed.

**Table 75** *show mpls optical-uni diagnostics Field Descriptions (continued)*

Field	Description
Signaling State	<p>Indicates the signaling state of the O-UNI connection. The following states exist:</p> <p>No Connection—A connection could not be initiated on the interface</p> <p>Wait Resv—A Path message was sent, and a Resv message is awaited.</p> <p>Connected—A O-UNI connection is established.</p> <p>Wait PErr PSR—The graceful deletion procedure has been initiated from the interface acting as the O-UNI-C source, a Path(D&amp;R) message has been sent towards the destination O-UNI-C node, and a PathErr(PSR) message is awaited.</p> <p>Wait Path—A path is awaited to initiate the O-UNI connection establishment procedures.</p> <p>Wait Resvconf—At an O-UNI-C destination side, a Path message has been received, a Resv message has been sent towards the O-UNI-C source and now the O-UNI system awaits the ResvConf message to complete the connection setup.</p> <p>Wait PTear—The graceful deletion procedure has been initiated from the interface acting as an O-UNI-C destination, a Resv(D&amp;R) message has been sent towards source O-UNI-C, and the O-UNI system waits for a PathTear message to complete the deletion.</p> <p>Path Retry—A previous attempt to establish a connection on the interface as an O-UNI-C source has failed, and the O-UNI system waits for a Retry timer to expire to make the next attempt.</p>
Connection to OLM/LMP	Indicates if the communication with the LMP collaborator is established.
O-UNI to OLM/LMP DB sync. status	Indicates if the O-UNI client interaction with LMP is functioning correctly.
Connection to RSVP	Indicates if the communication with the RSVP collaborator is established.
RSVP to OLM/LMP DB sync. status	Indicates if the RSVP client interaction with LMP is functioning correctly.
Neighbor	Diagnostic information about the neighbor node with respect to the interface. Also diagnostics for the O-UNI link is displayed and missing configuration is flagged.
Global Code	Indicates if a signaling error that may pertain to this interface has occurred.
Datalink Code	Indicates if an error has occurred in processing a signaling message associated with this interface.

**Related Commands**

Command	Description
<a href="#">show mpls optical-uni</a>	Displays information about the state of O-UNI connections.

# show mpls optical-uni interface

To display detailed O-UNI information for a specific interface, use the **show mpls optical-uni interface** command in EXEC mode.

**show mpls optical-uni interface** *type interface-id*

## Syntax Description

<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-id</i>	Identifies a physical interface or a virtual interface.  <b>Note</b> Use the show interfaces command to see a list of all possible interfaces currently configured on the router.  For more information about the syntax for the router, use the question mark (?) online help function.

## Command Modes

EXEC

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use this command to display O-UNI information for a specific interface.

## Task ID

Task ID	Operations
ouni	read

**Examples**

The following is sample output from the **show mpls optical-uni interface** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni interface POS 0/2/0/2

Interface POS0/2/0/2
Configuration: Active->User
Signaling State: Connected since 04/11/2006 15:01:07
TNA: 10.0.0.5
Sender NodeID/Tunnel ID: 11.12.13.14/4
Local Data Link ID: 2
Remote Data Link ID: 2
Local Switching Capability: PSC 1
Remote Switching Capability: TDM
Primary IPCC: Interface: Routed
                  Local IP Address: 0.0.0.0
                  Remote IP Address: 55.56.57.58
```

Table 76 describes the significant fields shown in the display.

**Table 76** *show mpls optical-uni interface Field Descriptions*

Field	Description
Configuration	Indicates if the interface is acting as the O-UNI-C source and in this case “Active” is displayed, or as the O-UNI-C destination and in this case “Passive” is displayed.
Signaling State	Indicates the signaling state of the O-UNI connection. The following states exist: No Connection—A connection could not be initiated on the interface Wait Resv—A Path message was sent, and a Resv message is awaited. Connected—A O-UNI connection is established. Wait PErr PSR—The graceful deletion procedure has been initiated from the interface acting as the O-UNI-C source, a Path(D&R) message has been sent towards the destination O-UNI-C node, and a PathErr(PSR) message is awaited. Wait Path—A path is awaited to initiate the O-UNI connection establishment procedures. Wait Resvconf—At an O-UNI-C destination side, a Path message has been received, a Resv message has been sent towards the O-UNI-C source and now the O-UNI system awaits the ResvConf message to complete the connection setup. Wait PTear—The graceful deletion procedure has been initiated from the interface acting as an O-UNI-C destination, a Resv(D&R) message has been sent towards source O-UNI-C, and the O-UNI system waits for a PathTear message to complete the deletion. Path Retry—A previous attempt to establish a connection on the interface as an O-UNI-C source has failed, and the O-UNI system waits for a Retry timer to expire to make the next attempt.
TNA	The local transport network address of the O-UNI Link
Sender NodeID/Tunnel ID	Node ID of the sender/tunnel ID associated with the O-UNI connection.

**Table 76** *show mpls optical-uni interface Field Descriptions (continued)*

Field	Description
Local Data Link ID	Number associated with the local interface configured for the O-UNI connection.
Remote Data Link ID	Number associated with the remote interface configured for the O-UNI connection.
Primary IPCC	Configuration for the primary IPCC.
Interface	IPCC type, only routed type supported.
Local IP	Local IPCC IP address assigned by LMP. For routed IPCCs, this value is address is 0.0.0.0.
Remote IP	Remote IPCC IP address assigned by LMP.

**Related Commands**

Command	Description
<a href="#">show mpls optical-uni</a>	Displays information about the state of all O-UNI connections.

# show mpls optical-uni lmp

To display information related to the LMP, use the **show mpls optical-uni lmp** command in EXEC mode.

```
show mpls optical-uni lmp [neighbor [neighbor-name] | ipcc | interface type interface-id]
```

## Syntax Description

<b>neighbor</b>	(Optional) Displays detailed information about all or a specific LMP neighbor identified by <i>neighbor-name</i> .
<i>neighbor-name</i>	(Optional) A string of alphanumeric characters that defines the name of the LMP neighbor. When not specified, information about all neighbors is displayed.
<b>ipcc</b>	(Optional) Displays configured IP control channels (IPCCs) and the status of each.
<b>interface</b>	(Optional) Displays LMP information related to the interface specified by <i>type interface</i> .
<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
<i>interface-id</i>	Identifies a physical interface or a virtual interface.
	<b>Note</b> Use the show interfaces command to see a list of all possible interfaces currently configured on the router.
	For more information about the syntax for the router, use the question mark (?) online help function.

## Command Modes

EXEC

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show mpls optical-uni lmp** command to display information about LMP.

Task ID	Task ID	Operations
	ouni	read

### Examples

The following is sample output from the **show mpls optical-uni lmp neighbor** command for a neighbor named router1:

```
RP/0/RP0/CPU0:router# show mpls optical-uni lmp neighbor router1
```

```
LMP Neighbor
Name: router1, IP: 10.33.44.11, Owner: Optical UNI
  IPCC ID: 1, State Up
  Known via      : Configuration
  Type           : Routed
  Destination IP : 10.33.44.11
  Source IP      : None
```

```
Data Link I/F | Lcl Data Link ID | Link TNA Addr | Data Link LMP state
-----+-----+-----+-----
      POS0/1/0/0 | 2 | 10.0.0.20 | Up Alloc
```

Table 77 describes the significant fields shown in the display.

**Table 77** *show mpls optical-uni lmp neighbor Field Descriptions*

Field	Description
Name	Name of the neighbor.
IP	Destination address of the neighbor. This is the router ID of the neighbor.
Owner	Protocol that is using this LMP neighbor.
IPCC ID	IPCC identifier.
State	Operational state of the IPCC.
Known via	Indicates how the IPCC is learned (for example, user configuration).
Type	IPCC is routed or bound to a specific interface. Only routed IPCCs are supported at this release.
Destination IP	Destination IP address of the IPCC to which you are binding. For routed IPCCs, this specifies the remote router-id.
Source IP	Source IP address (None if the IPCC is routed).
Data Link I/F	Interface name corresponding to the data link used by the neighbor.
Lcl Data Link ID	Local unnumbered ID assigned to the data link.
Link TNA Addr	Local TNA <sup>1</sup> of the data link.
Data Link LMP state	Data link state and allocation status from LMP view point, for example, <i>up alloc</i> means that the LMP state of the data link is up and that it has been allocated.

1. Transport Network Address

■ **show mpls optical-uni lmp**

The following is sample output from the **show mpls optical-uni lmp ipcc** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni lmp ipcc
```

Id	Type	IPCC IP	Status	Neighbor Name
2	Routed	10.21.21.21	Up	router1
1	Routed	10.42.8.4	Up	router12

[Table 78](#) describes the significant fields shown in the display.

**Table 78** *show mpls optical-uni lmp ipcc Field Descriptions*

Field	Description
Id	Number that identifies the IPCC.
Type	Type of the IPCC.
IP	Destination IP address of the IPCC.
Status	Operational status of the IPCC.
Neighbor Name	Neighbor name of the associated IPCC.

The following is sample output from the **show mpls optical-uni lmp** command, which summarizes all LMP information about neighbors and IPCCs. In addition, it displays the local LMP router ID:

```
RP/0/RP0/CPU0:router# show mpls optical-uni lmp
```

Local O-UNI CLI LMP Node ID: 10.3.3.3  
(Source: O-UNI LMP CLI configuration, I/F: Loopback0)

LMP Neighbor  
Name: router1, IP: 10.33.44.11, Owner: Optical UNI  
IPCC ID: 1, State Up  
Known via : Configuration  
Type : Routed  
Destination IP : 30.31.32.33  
Source IP : None

Data Link I/F	Lcl Data Link ID	Link TNA Addr	Data Link LMP state
POS0/4/0/2	1	10.4.4.4	UP

[Table 79](#) describes the significant fields shown in the display. For other field descriptions, see [Table 77](#).

**Table 79** *show mpls optical-uni lmp Field Descriptions*

Field	Description
Local node-id	Local router ID value used by LMP.

The following is sample output from the **show mpls optical-uni lmp interface** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni lmp interface POS0/2/0/0

      Interface: POS0/2/0/0
      Owner: Optical UNI
      Local data link ID type: Unnumbered
      Local data link ID: Hex = 0x1, Dec = 1
      TNA address type: IPv4
      TNA address: 10.0.0.50
      Local TE link switching capability: Packet-Switch Capable-1 (PSC-1)
      Remote neighbor name: router1
      Remote neighbor node ID: 10.33.44.11
      Remote data link ID type: Unnumbered
      Remote data link ID: Dec = 1, Hex = 0x1
      Remote TE link switching capability: Time-Division-Multiplex Capable (TDM)
      Data link I/F state: Up
      Data link LMP state: Up/Allocated
      TE link LMP state: Up
      Data link allocation status: Allocated
      IPCC ID: 2
      IPCC type: Routed
      IPCC destination IP address: 10.41.11.1
```

Table 80 describes the significant fields shown in the display.

**Table 80** *show mpls optical-uni lmp interface Field Descriptions*

Field	Description
Interface	Interface associated with this datalink.
Owner	Protocol using this LMP neighbor.
Local data link ID type	Local data link identifier type: numbered or unnumbered. Unnumbered interfaces are identified by the local node ID and the local interface ID, and the numbered interfaces are identified by the IP address assigned to them.
Local data link ID	Interface identifier assigned to the local data link. This value is unique amongst all data links identifiers on this router.
TNA address type	Local TNA <sup>1</sup> address type (IPv4/ IPv6/ NSAP) provisioned on the link.
TNA address	Local TNA address assigned to the datalink.
Local TE link switching capability	Switching capability of the local datalink.
Remote neighbor name	LMP neighbor connected by this datalink.
Remote neighbor node ID	Router ID of the neighbor node attached at the other end of the datalink.
Remote data link ID type	Local data link identifier type: numbered or unnumbered. Unnumbered interfaces are identified by the local node ID and the local interface ID, while the numbered interfaces are identified by the IP address assigned to them.
Remote data link ID	Datalink identifier assigned to the remote data link.
Remote TE link switching capability	Switching capability of the remote datalink.
Data link I/F state	State of the data link interface.
Data link LMP state	State and allocation status of the data link from LMP perspective.

**Table 80** *show mpls optical-uni lmp interface Field Descriptions (continued)*

Field	Description
TE link LMP state	LMP state of the datalink.
Data-link allocation status	Application data link allocation status.
IPCC id	Identifier of the IPCC associated with this datalink.
IPCC type	IPCC type associated with the datalink.
IPCC destination IP address	Destination address for the IPCC associated with this datalink.

1. Transport Network Address

**Related Commands**

Command	Description
<a href="#">show mpls optical-uni</a>	Displays general information about O-UNI connections.

# show mpls optical-uni timers all

To display the state of all timers running within the O-UNI process, use the **show mpls optical-uni timers all** command in EXEC mode.

**show mpls optical-uni timers all**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

EXEC

## Command History

Release	Modification
Release 2.0	This command was introduced on the Cisco CRS-1.
Release 3.0	No modification.
Release 3.2	No modification.
Release 3.3.0	No modification.
Release 3.4.0	No modification.
Release 3.5.0	No modification.
Release 3.6.0	No modification.
Release 3.7.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show mpls optical-uni timers all** command to display a list of all timers running within the O-UNI process. The output of the command also displays the associated interface name, the type and name of the timer, the time the timer was set, and how long the timer runs before expiring.



### Note

This command is used during normal operational conditions in order to determine the time left until a timer expires.

## Task ID

Task ID	Operations
ouni	read

## show mpls optical-uni timers all

### Examples

The following is sample output from the **show mpls optical-uni timers all** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni timers all
Present Time: 04/11/2006 15:59:45

O-UNI timers presently active for nodes:

IP addr.      Type      Name          Set@          Timeout
-----
55.56.57.5   Node Id   NBRREFR       04/11/2006 15:59:35  0000120

Present Time: 04/11/2006 15:59:45

O-UNI timers presently active on interfaces:

Ifname        Type      Name          Set@          Timeout
-----
POS0/2/0/2    Interface RETRY       04/11/2006 15:59:26  0000060

Present Time: 04/11/2006 15:59:45
O-UNI global timers presently active:

Type      Name          Set@          Timeout
-----
```

Table 81 describes the significant fields shown in the display.

**Table 81** *show mpls optical-uni timers all Field Descriptions*

Field	Description
IP addr.	IP address of the node.
Type	Type of timer.
Name	Name of the timer.
Set @	Time the timer was set.
Timeout	Time (in seconds) before the timer expires.
Ifname	Name of the interface.

### Related Commands

Command	Description
<b>show mpls optical-uni timers global</b>	Displays a list of global timers running within the O-UNI process.
<b>show mpls optical-uni timers interfaces</b>	Displays a list of interface timers running within the O-UNI process.
<b>show mpls optical-uni timers nodes</b>	Displays a list of internal process node timers running within the O-UNI process.

# show mpls optical-uni timers global

To display a list of global timers running within the O-UNI process, use the **show mpls optical-uni timers global** command in EXEC mode.

**show mpls optical-uni timers global**

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

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show mpls optical-uni timers global** command to determine the state of O-UNI internal global process timers.

Task ID	Task ID	Operations
	ouni	read

**Examples** The following is sample output from the **show mpls optical-uni timers global** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni timers global
```

```
Present Time: 04/11/2006 16:45:38
```

```
O-UNI global timers presently active:
```

Type	Name	Set@	Timeout
Global	OLM Registra	04/11/2006 16:45:38	0000005

Table 82 describes the significant fields shown in the display.

**Table 82** *show mpls optical-uni timers global Field Descriptions*

Field	Description
Type	Type of timer (in the example, Global).
Name	Name of timer. The following global timers are implemented: <ul style="list-style-type: none"> <li>• CHPTCONF (60 sec.)—When running, O-UNI waits for confirmation of checkpointed entries; when expires, unconfirmed entries are cleaned.</li> <li>• OLM<sup>1</sup> Registration (5sec.)—Activated when communication with LMP/OLM has been lost; when fires, a connection with LMP/OLM collaborator retries.</li> </ul>
Set@	Time the timer was set.
Timeout	Time (in seconds) before the timer expires.

1. Optical Link Manager

#### Related Commands

Command	Description
<a href="#">show mpls optical-uni timers all</a>	Displays a list of all timers running within the O-UNI process.
<a href="#">show mpls optical-uni timers interfaces</a>	Displays a list of interface timers running within the O-UNI process.
<a href="#">show mpls optical-uni timers nodes</a>	Displays a list of node timers running within the O-UNI process.

# show mpls optical-uni timers interfaces

To display interface timers running within the O-UNI process, use the **show mpls optical-uni timers interfaces** command in EXEC mode.

**show mpls optical-uni timers interfaces**

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

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show mpls optical-uni timers interfaces** command to determine the state of O-UNI internal interface process timers.

Task ID	Task ID	Operations
	ouni	read

**Examples** The following is sample output from the **show mpls optical-uni timers interfaces** command:

```
RRP/0/RP0/CPU0:router# show mpls optical-uni timers interfaces
Present Time: 04/11/2006 16:54:57
```

O-UNI timers presently active on interfaces:

Ifname	Type	Name	Set@	Timeout
-----	-----	-----	-----	-----
POS0/2/0/2	Interface	RETRY	04/11/2006 16:54:38	0000060

Table 83 describes the significant fields shown in the display.

**Table 83** *show mpls optical-uni timers interfaces Field Descriptions*

Field	Descriptions
Ifname	Name of the interface on which the timers are set.
Type	The type of interface timer. Interface is displayed in this case.
Name	Name of the interface timer. The following interface level timers are implemented: <ul style="list-style-type: none"> <li>• WAITRESV (120 sec.)—While running, O-UNI waits for a Resv message in response to Path; active at source O-UNI-C.</li> <li>• RETRY (60 sec.)—When fires, O-UNI retries connection establishment (60 sec); active at source O-UNI-C.</li> <li>• PATHTEAR (60 sec.)—While running, O-UNI waits for a PathTear in response to Resv(D&amp;R); used when connection deletion is initiated by destination O-UNI-C; active at destination O-UNI-C.</li> <li>• PATHERR (60 sec.)—While running, O-UNI waits for a PathErr(PSR) in response to PathTear; used when connection deletion is initiated by source O-UNI-C; active at source O-UNI-C.</li> <li>• RESVCONF (60 sec.)—While running, O-UNI waits for a ResvConf message to complete connection establishment; active at destination O-UNI-C.</li> </ul>
Set@	Time the interface timer was set.
Timeout	Time (in seconds) before the interface timer expires.

#### Related Commands

Command	Description
<a href="#">show mpls optical-uni timers all</a>	Displays a list of all timers running within the O-UNI process.
<a href="#">show mpls optical-uni timers global</a>	Displays a list of global timers running within the O-UNI process.
<a href="#">show mpls optical-uni timers nodes</a>	Displays a list of node timers running within the O-UNI process.

# show mpls optical-uni timers nodes

To display the state of O-UNI internal process node timers, use the **show mpls optical-uni timers nodes** command in EXEC mode.

**show mpls optical-uni timers nodes**

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

**Command Modes** EXEC

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the *Configuring AAA Services on Cisco IOS XR Software* module of the *Cisco IOS XR System Security Configuration Guide*.

Use the **show mpls optical-uni timers nodes** command to display O-UNI internal process node timers.

Task ID	Task ID	Operations
	ouni	read

**Examples** The following is sample output from the **show mpls optical-uni timers nodes** command:

```
RP/0/RP0/CPU0:router# show mpls optical-uni timers nodes

Present Time: 04/11/2006 17:02:34

O-UNI timers presently active for nodes:

IP addr.      Type      Name          Set@          Timeout
-----
55.56.57.5   Node Id   NBRREFR      04/11/2006 17:02:21  0000120
```

Table 84 describes the significant fields shown in the display.

**Table 84** *show mpls optical-uni timers nodes Field Descriptions*

Field	Description
IP address	IP address of the node.
Type	Type of node timer. The following node level timer is implemented: NBRREFR (120 sec. with RSVP-GR enabled, 360 otherwise)—Activated when communications with local RSVP process is lost; when fires O-UNI connections are cleaned;
Name	Name of the node timer.
Set@	Time the node was set.
Timeout	Time (in seconds) before the node timer expires.

#### Related Commands

Command	Description
<a href="#">show mpls optical-uni timers all</a>	Displays a list of all timers running within the O-UNI process.
<a href="#">show mpls optical-uni timers global</a>	Displays a list of global timers running within the O-UNI process.
<a href="#">show mpls optical-uni timers interfaces</a>	Displays a list of interface timers running within the O-UNI process.

# tna ipv4

To configure the transport network address (TNA) for an O-UNI datalink, use the **tna ipv4** command in LMP datalink adjacency configuration mode.

```
tna ipv4 A.B.C.D.
```

Syntax Description	A.B.C.D.	The O-UNI TNA. This address is assigned by the optical transport network (OTN) operator.
--------------------	----------	--

Defaults	No default behavior or values
----------	-------------------------------

Command Modes	LMP datalink adjacency configuration
---------------	--------------------------------------

Command History	Release	Modification
	Release 2.0	This command was introduced on the Cisco CRS-1.
	Release 3.0	No modification.
	Release 3.2	No modification.
	Release 3.3.0	No modification.
	Release 3.4.0	No modification.
	Release 3.5.0	No modification.
	Release 3.6.0	No modification.
	Release 3.7.0	No modification.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. For detailed information about user groups and task IDs, see the <i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration Guide</i> .
------------------	--

Task ID	Task ID	Operations
	ouni	read, write

Examples	The following example shows how to configure the datalink for POS interface 0/1/0/1 to the TNA 192.168.4.5:
----------	---

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# mpls optical-uni
RP/0/RP0/CPU0:router(config-mpls-ouni)# interface pos 0/1/0/1
RP/0/RP0/CPU0:router(config-mpls-ouni-if)# lmp data-link adjacency
RP/0/RP0/CPU0:router(config-mpls-ouni-if-adj)# tna ipv4 192.168.4.5
```

■ tna ipv4