



## Ethernet Interface Commands

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This module provides command line interface (CLI) commands for configuring Ethernet interfaces on the Cisco ASR 9000 Series Router.

To use commands of this module, you must be in a user group associated with a task group that includes appropriate task IDs. If the user group assignment is preventing you from using any command, contact your AAA administrator for assistance.

- [carrier-delay](#), on page 3
- [clear lldp](#), on page 5
- [clear mac-accounting \(Ethernet\)](#), on page 7
- [crc-ber auto-recover](#), on page 9
- [flow-control](#), on page 10
- [interface \(Ethernet\)](#), on page 12
- [lldp](#), on page 14
- [lldp \(interface\)](#), on page 15
- [lldp enable \(per-interface\)](#), on page 16
- [lldp holdtime](#), on page 17
- [lldp reinit](#), on page 18
- [lldp timer](#), on page 19
- [lldp tlv-select disable](#), on page 20
- [loopback \(Ethernet\)](#), on page 21
- [mac-accounting](#), on page 22
- [mac-address \(Ethernet\)](#), on page 24
- [mtu \(interface\)](#), on page 25
- [negotiation auto](#), on page 26
- [packet-gap non-standard](#), on page 27
- [report crc-ber](#), on page 28
- [show controllers \(Ethernet\)](#), on page 29
- [show lldp](#), on page 38
- [show lldp entry](#), on page 40
- [show lldp errors](#), on page 42
- [show lldp interface](#), on page 43
- [show lldp neighbors](#), on page 45
- [show lldp traffic](#), on page 48
- [show mac-accounting \(Ethernet\)](#), on page 50

- [small-frame-padding](#), on page 52
- [speed \(Fast Ethernet\)](#), on page 53
- [transport-mode \(UDLR\)](#) , on page 55

# carrier-delay

To delay the processing of hardware link down notifications, use the **carrier-delay** command in interface configuration mode.



## Note

- The **carrier-delay** command is active only when both **up** and **down** are configured from the host.
- If this configuration is not used, the default value is determined by the underlying driver, and may vary depending on whether auto-negotiation is enabled. The default value is chosen to provide enough time for the hardware link to stabilize after state change and to protect the system from excessive link flaps.
- If a value of 0 is set, carrier-delay is disabled in that direction.
- The range of carrier-delay on access port of ASR 9000v is 1 to 60000 msec. If a value of 0 is set, the default value of 100 msec is applied. A value greater than 60000 msec will be ignored and **show interfaces** output will display the previously configured msec.

```
carrier-delay {down milliseconds [up milliseconds] | up milliseconds [down milliseconds]}
```

## Syntax Description

**down milliseconds** Length of time, in milliseconds, to delay the processing of hardware link down notifications. Range is from 0 through 2147483648.

**up milliseconds** Length of time, in milliseconds, to delay the processing of hardware link up notifications. Range is from 0 through 2147483648.

## Command Default

No carrier-delay is manually configured, there is a default carrier-delay setting of 10 msec up and 0 msec down.

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 3.9.0	The default value used when there is no carrier-delay configuration changed from 0 to being defined by each driver.
Release 4.2.0	The range for both down and up was increased to 0 through 2147483648.
Release 3.7.2	This command was introduced.

## Usage Guidelines

When you delay the processing of hardware link down notifications, the higher layer routing protocols are unaware of a link until that link is stable.

If the **carrier-delay down milliseconds** command is configured on a physical link that fails and cannot be recovered, link down detection is increased, and it may take longer for the routing protocols to re-route traffic around the failed link.

In the case of very small interface state flaps, running the **carrier-delay down milliseconds** command prevents the routing protocols from experiencing a route flap.



**Note** Enter the **show interface** command to see the current state of the carrier-delay operation for an interface. When no carrier-delay is manually configured, carrier-delay displays the default information of 10 msec up.

### Task ID

#### Task ID Operations

interface read,  
write

### Examples

This example shows how to delay the processing of hardware link down notifications:

```
RP/0/RSP0/CPU0:router(config-if)# carrier-delay down 10
```

The following example shows how to delay the processing of hardware link up and down notifications:

```
RP/0/RSP0/CPU0:router(config-if)# carrier-delay up 100 down 100
```

### Related Commands

Command	Description
<a href="#">dampening</a>	Turns on event dampening.

# clear lldp

To reset Link Layer Discovery Protocol (LLDP) traffic counters or LLDP neighbor information, use the **clear lldp** command in EXEC mode.

```
clear lldp {counters | table}
```

## Syntax Description

<b>counters</b>	Specifies that LLDP traffic counters are cleared.
<b>table</b>	Specifies that LLDP information in the neighbor table is cleared.

## Command Default

LLDP traffic counters are not reset, and LLDP neighbor information is not cleared.

## Command Modes

EXEC mode

## Command History

Release	Modification
Release 4.1.0	This command was introduced.

## Usage Guidelines

To reset counters from the **show lldp traffic** command, use the **clear lldp counters** command. To clear neighbor information displayed by the **show lldp neighbors** command, use the **clear lldp table** command.

## Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to clear the LLDP counters and display LLDP traffic. The output from the **show lldp traffic** command shows that all the traffic counters have been reset to zero.

```
RP/0/RSP0/CPU0:router# clear lldp counters
RP/0/RSP0/CPU0:router# show lldp traffic
LLDP traffic statistics:
  Total frames out: 0
  Total entries aged: 0
  Total frames in: 0
  Total frames received in error: 0
  Total frames discarded: 0
  Total TLVs discarded: 0
  Total TLVs unrecognized: 0
```

The following example shows how to clear the LLDP table. The output of the **show lldp neighbors** command shows that all information has been deleted from the table.

```
RP/0/RSP0/CPU0:router# clear lldp table
RP/0/RSP0/CPU0:router# show lldp neighbors
Capability codes:
  (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
  (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other
```

**clear lldp**

Device ID	Local Intf	Hold-time	Capability	Port ID
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**Related Commands**

Command	Description
<a href="#">show lldp neighbors, on page 45</a>	Displays information about LLDP neighbors.
<a href="#">show lldp traffic, on page 48</a>	Displays statistics for LLDP traffic.

## clear mac-accounting (Ethernet)

To clear Media Access Control (MAC) accounting statistics, use the **clear mac-accounting** command in EXEC mode.

```
clear mac-accounting {GigabitEthernet | TenGigE} interface-path-id [location node-id]
```

<b>Syntax Description</b>	{ <b>GigabitEthernet</b>   <b>TenGigE</b> }	Type of Ethernet interface whose MAC accounting statistics you want to clear. Enter <b>GigabitEthernet</b> , <b>TenGigE</b> .
	<i>interface-path-id</i>	Physical interface or virtual interface.  <b>Note</b> Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.  For more information about the syntax for the router, use the question mark (?) online help function.
	<b>location</b> <i>node-id</i>	(Optional) Clears MAC accounting statistics for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

**Command Default** No default behavior or values

**Command Modes** EXEC mode

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 4.1.1	This command was introduced.

### Usage Guidelines

Task ID	Task ID	Operations
	interface	read, write
	basic-services	read, write

### Examples

This example shows how to clear all MAC accounting statistics for the TenGigE port at 1/0/0/1:

```
RP/0/RSP0/CPU0:router# clear mac-accounting TenGigE 0/1/5/0 location 1/0/0/1
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">mac-accounting, on page 22</a>	Generates accounting information for IP traffic based on the source and destination MAC addresses on LAN interfaces.

Command	Description
<a href="#">show mac-accounting (Ethernet), on page 50</a>	Displays MAC accounting statistics for an interface.



## crc-ber auto-recover

To enable Cyclic Redundancy Check (CRC) Bit Error Rate (BER) auto recover, use the **crc-ber auto-recover** command in wanphy configuration mode.

**crc-ber auto-recover**

### Syntax Description

This command has no keywords or arguments.

### Command Default

Cyclic Redundancy Check (CRC) Bit Error Rate (BER) auto recover is disabled by default.

### Command Modes

Wanphy configuration

### Command History

Release	Modification
Release 7.4.2	This command was introduced.

### Usage Guidelines

No specific guidelines impact the use of this command.

### Task ID

Task ID	Operations
interface	read, write

### Examples

This example shows how to enable Cyclic Redundancy Check (CRC) Bit Error Rate (BER) reporting.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/1/0/3
RP/0/RSP0/CPU0:router(config-wanphy)# crc-ber auto-recover
RP/0/RSP0/CPU0:router(config-wanphy)#
```

### Related Commands

Command	Description
<a href="#">report sf-ber disable</a>	Disables SF BER reporting.
<a href="#">show controllers wanphy</a>	Displays alarms, registers, and module information for a 10-Gigabit Ethernet WAN PHY controller.
<a href="#">threshold sf-ber</a>	Configures the threshold of the SF BER that is used to trigger a link state change.
<a href="#">report crc-ber</a>	

# flow-control

To enable the sending of flow-control pause frames, use the **flow-control** command in interface configuration mode. To disable flow control, use the **no** form of this command.

**flow-control** {**bidirectional** | **egress** | **ingress**}

## Syntax Description

<b>bidirectional</b>	Enables flow-control for egress and ingress direction.
<b>egress</b>	Pauses egress traffic if IEEE 802.3x PAUSE frames are received.
<b>ingress</b>	Sends IEEE 802.3x PAUSE frames in case of congestion with ingress traffic.

## Command Default

If auto-negotiate is enabled on the interface, then the default is negotiated.

If auto-negotiate is disabled on the interface, then the sending of flow-control pause frames is disabled for both egress and ingress traffic.

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 3.7.2	This command was first introduced.
Release 4.2.3	This command was supported on 1 Gigabit Ethernet optical and copper SFPs.

## Usage Guidelines



**Note** When you explicitly enable the sending of flow-control pause frames, the value you configured with the **flow-control** command overrides any auto-negotiated value. This prevents a link from coming up if the value you set with the **flow-control** command conflicts with the allowable settings on the other end of the connection.



**Note** The **flow-control** command is supported on Gigabit Ethernet, TenGigE interfaces only; the **flow-control** command is not supported on Management Ethernet Interfaces.



**Note** The **flow-control** command syntax options may vary, depending on the type of PLIM or SPA that is installed in your router.

## Task ID

### Task ID Operations

interface read,  
write

---

**Examples**

This example shows how to enable the sending of flow-control pause frames for ingress traffic on the TenGigE interface 0/3/0/0:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/3/0/0  
RP/0/RSP0/CPU0:router(config-if)# flow-control ingress
```

# interface (Ethernet)

To specify or create an Ethernet interface and enter interface configuration mode, use the **interface (Ethernet)** command in Global Configuration mode. Use the **no** form of the command to remove the configuration.

**interface** {**GigabitEthernet** | **TenGigE**} *interface-path-id*

## Syntax Description

**GigabitEthernet** Specifies or creates a Gigabit Ethernet (1000 Mbps) interface.

**TenGigE** Specifies or creates a Ten Gigabit Ethernet (10 Gbps) interface.

*interface-path-id* Physical interface.

**Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router.

For more information about the syntax for the router, use the question mark (?) online help function.

## Command Default

None

## Command Modes

Global Configuration mode

## Command History

### Release

Release 3.7.2

### Modification

This command was introduced.

## Usage Guidelines

To specify a physical interface, the notation for the *interface-path-id* is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

- *rack*: Chassis number of the rack.
- *slot*: Physical slot number of the line card.
- *module*: Module number. A physical layer interface module (PLIM) is always 0.
- *port*: Physical port number of the interface.



**Note** Ten GigE interfaces will not show egress statistics when loopback line is configured because the loopback is closed at the interface controller level, before the Network Processor (NP). But on One GigE interfaces the line loopback is closed in the NP.

## Task ID

### Task ID Operation

interface read,  
write

This example shows how to enter interface configuration mode for a Ten Gigabit Ethernet interface:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/4/0/0  
RP/0/RSP0/CPU0:router(config-if)#
```

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">interface (Ethernet), on page 12</a>	Specifies or creates an Ethernet interface and enters interface configuration mode.

---

# lldp

To enable the Link Layer Discovery Protocol (LLDP) globally for both transmit and receive operation on the system, use the **lldp** command in Global Configuration mode. To disable LLDP, use the **no** form of this command.

## lldp

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

**Command Default** LLDP is disabled.

**Command Modes** Global Configuration mode

Command History	Release	Modification
	Release 4.1.0	This command was introduced.
	Release 5.3.1	The <b>lldp subinterfaces enable</b> was introduced.

**Usage Guidelines** When you enable LLDP globally using the **lldp** command, LLDP is not enabled on subinterfaces or bundle subinterfaces by default. This is to prevent the LLDP process from consuming high CPU cycles. In order to enable LLDP on subinterfaces and bundle subinterfaces as well, the **lldp subinterfaces enable** command is introduced.



**Note** When you use this command, you must remember that as the scale of interfaces (with subinterfaces and bundle subinterfaces) becomes higher, it might cause the LLDP process to hog the CPU.

Task ID	Task ID	Operation
	ethernet-services	read, write

This example shows how to enable LLDP globally on the router:

```
RP/0/RSP0/CPU0:router(config)# lldp
```

This example shows how to enable LLDP on subinterfaces:

```
RP/0/RSP0/CPU0:router(config)# lldp subinterfaces enable
```

Related Commands	Command	Description
	<a href="#">show lldp, on page 38</a>	Displays the global LLDP operational characteristics on the system.

# lldp (interface)

To enter LLDP configuration mode, use the **lldp (interface)** command.

## lldp

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

**Command Default** None

**Command Modes** Interface configuration (config-if)

Command History	Release	Modification
	Release 4.1.0	This command was introduced.

## Usage Guidelines

Task ID	Task ID	Operation
	ethernet-services	read, write
	interface	read, write

This example shows how to enter LLDP configuration mode from Ethernet interface configuration mode:

```
RP/0/RSP0/CPU0:router(config)# interface GigabitEthernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# lldp
RP/0/RSP0/CPU0:router(config-lldp)#
```

Related Commands	Command	Description
	<a href="#">interface (Ethernet), on page 12</a>	Specifies or creates an Ethernet interface and enters interface configuration mode.
	<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.

## lldp enable (per-interface)

When LLDP is enabled globally, all interfaces that support LLDP are automatically enabled for both transmit and receive operations. However, if you want to enable LLDP per interface, use `lldp enable` command in interface configuration mode.

### lldp enable

<b>Command Default</b>	None	
<b>Command Modes</b>	Interface configuration (config-if)	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.5.1	This command was introduced.
<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	ethernet-services	read, write
	interface	read, write

To enable LLDP per interface:

```
RP/0/RSP0/CPU0:ios(config)# int gigabitEthernet 0/2/0/0
RP/0/RSP0/CPU0:ios(config-if)# no sh
RP/0/RSP0/CPU0:ios(config-if)#commit
RP/0/RSP0/CPU0:ios(config-if)#lldp ?
RP/0/RSP0/CPU0:ios(config-if)#lldp enable
RP/0/RSP0/CPU0:ios(config-if)#commit
```



# lldp holdtime

To specify the length of time that information from a Link Layer Discovery Protocol (LLDP) packet should be held by the receiving device before aging and removing it, use the **lldp holdtime** command in Global Configuration mode. To return to the default, use the **no** form of this command.

**lldp holdtime** *seconds*

<b>Syntax Description</b>	<i>seconds</i> Number from 0 to 65535 that specifies the amount of time (in seconds) to hold the packet information. The default is 120.						
<b>Command Default</b>	The packet hold time is 120 seconds (2 minutes).						
<b>Command Modes</b>	Global Configuration mode						
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 4.1.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 4.1.0	This command was introduced.		
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Release 4.1.0	This command was introduced.						
<b>Usage Guidelines</b>							
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>ethernet-services</td> <td>read, write</td> </tr> </tbody> </table> <p>This example shows how to change the default hold time to 1 minute:</p> <pre>RP/0/RSP0/CPU0:router(config)# lldp holdtime 60</pre>	Task ID	Operation	ethernet-services	read, write		
Task ID	Operation						
ethernet-services	read, write						
<b>Related Commands</b>	<table border="1"> <thead> <tr> <th>Command</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><a href="#">lldp, on page 14</a></td> <td>Enables LLDP globally for both transmit and receive operation on the system.</td> </tr> <tr> <td><a href="#">show lldp, on page 38</a></td> <td>Displays the global LLDP operational characteristics on the system.</td> </tr> </tbody> </table>	Command	Description	<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.	<a href="#">show lldp, on page 38</a>	Displays the global LLDP operational characteristics on the system.
Command	Description						
<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.						
<a href="#">show lldp, on page 38</a>	Displays the global LLDP operational characteristics on the system.						

# lldp reinit

To specify the length of time to delay initialization of the Link Layer Discovery Protocol (LLDP) on an interface, use the **lldp reinit** command in Global Configuration mode. To return to the default, use the **no** form of this command.

**lldp reinit** *seconds*

## Syntax Description

*seconds* Number from 2 to 5 that specifies the length of time (in seconds) that LLDP should delay initialization. The default is 2.

## Command Default

Initialization of LLDP is delayed for 2 seconds on an interface.

## Command Modes

Global Configuration mode

## Command History

Release	Modification
Release 4.1.0	This command was introduced.

## Usage Guidelines

### Task ID

Task ID	Operation
ethernet-services	read, write

The following example shows how to change the default initialization delay from 2 to 4 seconds:

```
RP/0/RSP0/CPU0:router(config)# lldp reinit 4
```

## Related Commands

Command	Description
<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.
<a href="#">show lldp, on page 38</a>	Displays the global LLDP operational characteristics on the system.

# lldp timer

To specify the Link Layer Discovery Protocol (LLDP) packet rate, use the **lldp timer** command in Global Configuration mode. To return to the default, use the **no** form of this command.

**lldp timer** *seconds*

<b>Syntax Description</b>	<i>seconds</i> Number from 5 to 65534 that specifies the rate (in seconds) at which to send LLDP packets. The default is 30.
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<b>Command Default</b>	LLDP packets are sent every 30 seconds.
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<b>Command Modes</b>	Global Configuration mode
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 4.1.0	This command was introduced.

## Usage Guidelines

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	ethernet-services	read, write

The following example shows how to change the default LLDP packet rate from 30 seconds to 1 minute:

```
RP/0/RSP0/CPU0:router(config)# lldp timer 60
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.
	<a href="#">show lldp, on page 38</a>	Displays the global LLDP operational characteristics on the system.

## lldp tlv-select disable

To disable transmission of the selected Type Length Value (TLV) in Link Layer Discovery Protocol (LLDP) packets, use the **lldp tlv-select disable** command in Global Configuration mode. To return to the default, use the **no** form of this command.

**lldp tlv-select** *tlv-name* **disable**

<b>Syntax Description</b>	<p><i>tlv-name</i> Name of the TLV to be suppressed from LLDP packets. The <i>tlv-name</i> can be one of the following LLDP TLV types:</p> <ul style="list-style-type: none"> <li>• <b>management-address</b></li> <li>• <b>port-description</b></li> <li>• <b>system-capabilities</b></li> <li>• <b>system-description</b></li> <li>• <b>system-name</b></li> </ul>
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<b>Command Default</b>	All TLVs are sent in LLDP packets.
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<b>Command Modes</b>	Global Configuration mode
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<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 4.1.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 4.1.0	This command was introduced.
Release	Modification				
Release 4.1.0	This command was introduced.				

<b>Usage Guidelines</b>	Certain TLVs are classified as mandatory in LLDP packets, such as the Chassis ID, Port ID, and Time to Live (TTL) TLVs. These TLVs must be present in every LLDP packet. You can use the <b>lldp tlv-select disable</b> command to suppress transmission of certain other optional TLVs in LLDP packets.
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<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>ethernet-services</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operation	ethernet-services	read, write
Task ID	Operation				
ethernet-services	read, write				

The following example shows how to disable transmission of the System Capabilities TLV from LLDP packets:

```
RP/0/RSP0/CPU0:router(config)# lldp tlv-select system-capabilities disable
```

# loopback (Ethernet)

To configure an Ethernet controller for loopback mode, use the **loopback** command in interface configuration mode. To disable loopback, use the **no** form of this command.

**loopback** {**external** | **internal** | **line**}

Syntax Description	
<b>external</b>	All IPv4 self-ping packets are sent out of the interface and looped back externally before being received on the ingress path.
<b>internal</b>	All packets are looped back internally within the router before reaching an external cable.
<b>line</b>	Incoming network packets are looped back through the external cable.

**Command Default** Loopback mode is disabled.

**Command Modes** Interface configuration

Command History	Release	Modification
	Release 3.7.2	This command was first introduced.

**Usage Guidelines** The **loopback** command is available for all Ethernet interface types (Gigabit Ethernet, 10-Gigabit Ethernet). Two loopback operation modes are supported for diagnostic purposes: internal and line. In the terminal (internal) loopback, the sent signal is looped back to the receiver. In the facility (line) loopback, the signal received from the far end is looped back and sent on the line. The two loopback modes cannot be active at the same time. In normal operation mode, neither of the two loopback modes is enabled.



**Tip** Use the **loopback external** command when an external loopback connector is attached to the interface.

Task ID	Task ID	Operations
	interface	read, write

**Examples** In the following example, all packets are looped back to the TenGigE controller:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/3/0/0
RP/0/RSP0/CPU0:router(config-if)# loopback internal
```

# mac-accounting

To generate accounting information for IP traffic based on the source and destination Media Access Control (MAC) addresses on LAN interfaces, use the **mac-accounting** command in interface configuration mode. To disable MAC accounting, use the **no** form of this command.

**mac-accounting** {egress | ingress}

## Syntax Description

**egress** Generates accounting information for IP traffic based on the destination MAC addresses (egress direction).

**ingress** Generates accounting information for IP traffic based on the source MAC addresses (ingress direction).

## Command Default

MAC accounting is disabled

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 4.1.1	This command was introduced.

## Usage Guidelines

The **mac-accounting** command calculates the total packet and byte counts for a LAN interface that receives or sends IPv4 packets to or from a unique MAC address.

## Task ID

### Task ID Operations

interface read,  
write

## Examples

This example shows how to enable MAC accounting for the source MAC address on the ingress direction:

```
RP/0/RSP0/CPU0:router#configure
RP/0/RSP0/CPU0:router#interface bundle-ether <bundle-id>
RP/0/RSP0/CPU0:router(config-if)# mac-accounting ingress
```

This example shows how to enable MAC accounting for the source MAC address on the egress direction:

```
RP/0/RSP0/CPU0:router#configure
RP/0/RSP0/CPU0:router#interface bundle-ether <bundle-id>
RP/0/RSP0/CPU0:router(config-if)# mac-accounting egress
```



---

**Note** In order to view the mac-accounting statistics for the configured bundle interface, use the **show mac-accounting bundle-ether <bundle id>** command.

---

---

**Related Commands**

Command	Description
<a href="#">clear mac-accounting (Ethernet), on page 7</a>	Clears MAC accounting statistics for an interface.
<a href="#">show mac-accounting (Ethernet), on page 50</a>	Displays MAC accounting statistics for an interface.

---

## mac-address (Ethernet)

To set the MAC layer address of an Ethernet interface, use the **mac-address** command in interface configuration mode. To return the device to its default MAC address, use the **no** form of this command.

**mac-address** *value1.value2.value3*

### Syntax Description

*value1*. High 2 bytes of the MAC address in hexadecimal format. Range is from 0 to ffff.

*value2*. Middle 2 bytes of the MAC address in hexadecimal. Range is from 0 to ffff.

*value3*. Low 2 bytes of the MAC address in hexadecimal. Range is from 0 to ffff.

### Command Default

The default MAC address is read from the hardware burned-in address (BIA).

### Command Modes

Interface configuration

### Command History

Release	Modification
Release 3.7.2	This command was first introduced.

### Usage Guidelines

The MAC address must be in the form of three 4-digit values (12 digits in dotted decimal notation).

The **mac-address** command is available for all types of line card Ethernet interfaces (Gigabit Ethernet, 10-Gigabit Ethernet) and for the Management Ethernet interface.

### Task ID

Task ID	Operations
interface	read, write

### Examples

This example shows how to set the MAC address of a Ten Gigabit Ethernet interface located at 0/3/0/0:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# mac-address 0001.2468.ABCD
```



## mtu (interface)

To configure maximum transmission unit (MTU) size on an Ethernet interface, use the **mtu** command in interface configuration mode.

**mtu** *size in bytes*

---

<b>Syntax Description</b>	<i>size in bytes</i> Specify the MTU size that you want to configure.
---------------------------	---

---

---

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

---

---

<b>Command Modes</b>	Interface configuration
----------------------	-------------------------

---

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 7.6.2	This command is a generic command.

---

---

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

---

### Example

This example shows how to configure the MTU size on an interface. *Bundle-Ether1* is the interface name.

```
Router(config)#interface Bundle-Ether1
Router(config-if)#mtu 9646
Router(config-if)#commit
```

# negotiation auto

To enable link autonegotiation on Gigabit Ethernet interfaces, use the **negotiation auto** command in interface configuration mode. To disable link autonegotiation, use the **no** form of this command.

## negotiation auto

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

**Command Default** Link auto-negotiation is disabled.

**Command Modes** Interface configuration

Command History	Release	Modification
	Release 3.7.2	This command was first introduced.
	Release 4.2.3	The <b>negotiation auto</b> command was supported on 1 Gigabit Ethernet interfaces.
	Release 7.4.1	This command was supported on the 1GE fiber optic plugged in Cisco ASR 9901 Router's dual-rate (1/10 GE) interface.

**Usage Guidelines** The **negotiation auto** command is available on Gigabit Ethernet interfaces only.

Task ID	Task ID	Operations
	interface read,	write

## Examples

This example shows how to enable link autonegotiation on an interface:

```
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/0/2/0
RP/0/RSP0/CPU0:router(config-if)# negotiation auto
```

This example shows how to disable link autonegotiation on an interface:

```
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/0/2/0
RP/0/RSP0/CPU0:router(config-if)# no negotiation auto
```

# packet-gap non-standard

To change the packet interval for traffic on an interface for improved interoperability with Cisco Catalyst 6000 series switches, use the **packet-gap non-standard** command in interface configuration mode. To use the standard packet interval as defined by the IEEE 802.ae specification, use the **no** form of this command.

## packet-gap non-standard

### Syntax Description

This command has no keywords or arguments.

### Command Default

The interface uses the standard packet interval as defined by the IEEE 802.ae specification.

### Command Modes

Interface configuration

### Command History

Release	Modification
Release 3.7.2	This command was first introduced.

### Usage Guidelines

An interface that is connected to a Cisco Catalyst 6000 series switch may experience packet loss problems that can be resolved by changing the packet interval of traffic from standard (as defined by the IEEE 802.ae specification) to nonstandard using the **packet-gap non-standard** command.



**Note** The **packet-gap non-standard** command is available on 10-Gigabit Ethernet interfaces only.

### Task ID

#### Task ID Operations

interface read,  
write

### Examples

This example shows how to change the packet interval for traffic on an interface from standard to nonstandard:

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/3/0/0
RP/0/RSP0/CPU0:router(config-if)# packet-gap non-standard
```

# report crc-ber

To enable Cyclic Redundancy Check (CRC) Bit Error Rate (BER) reporting, use the **report crc-ber** command in wanphy configuration mode.

**report**  **crc-ber**

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

**Command Default** Cyclic Redundancy Check (CRC) Bit Error Rate (BER) reporting is disabled by default.

**Command Modes** Wanphy configuration

Command History	Release	Modification
	Release 7.4.2	This command was introduced.

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

Task ID	Task ID	Operations
	interface	read, write

**Examples** This example shows how to enable Cyclic Redundancy Check (CRC) Bit Error Rate (BER) reporting.

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/1/0/3
RP/0/RSP0/CPU0:router(config-wanphy)# report crc-ber
RP/0/RSP0/CPU0:router(config-wanphy)#
```

Related Commands	Command	Description
	<a href="#">report sf-ber disable</a>	Disables SF BER reporting.
	<a href="#">show controllers wanphy</a>	Displays alarms, registers, and module information for a 10-Gigabit Ethernet WAN PHY controller.
	<a href="#">threshold sf-ber</a>	Configures the threshold of the SF BER that is used to trigger a link state change.
	<a href="#">crc-ber auto-recover</a>	

## show controllers (Ethernet)

To display status and configuration information about the Ethernet interfaces on a specific node, use the **show controllers** command in EXEC mode.

```
show controllers { GigabitEthernet | GigabitEthCtrlr | HundredGigE | HundredGigECtrlr |
TenGigE | TenGigECtrlr | FortyGigE } interface-path-id [{ all | bert | control | internal | mac |
periodic | phy | pm | priority-flow-control | regs | stats | xgxs }]
```

Syntax Description	
{ GigabitEthernet   GigabitEthCtrlr   HundredGigE   HundredGigECtrlr   TenGigE   TenGigECtrlr   FortyGigE }	Specifies the type of Ethernet interface or controller whose status and configuration information you want to display. Enter GigabitEthernet, GigabitEthernetCtrlr, HundredGigE, HundredGigECtrlr, TenGigE, or TenGigECtrlr.
<i>interface-path-id</i>	Physical interface or virtual interface.  <b>Note</b> Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.  For more information about the syntax for the router, use the question mark (?) online help function.
<b>all</b>	Displays detailed information for the specified interface.
<b>bert</b>	Displays BERT status information for the interface.
<b>control</b>	Displays configuration and control information.
<b>internal</b>	Displays internal information for the interface.
<b>mac</b>	Displays mac address information for the interface.
<b>periodic</b>	Displays performance monitoring data periodically.
<b>phy</b>	Displays physical information for the interface.
<b>pm</b>	Displays Ethernet performance monitoring.
<b>priority-flow-control</b>	Displays priority flow control information.
<b>regs</b>	Displays register information.
<b>stats</b>	Displays statistical information for the interface.
<b>xgxs</b>	Displays information about the 10 Gigabit Ethernet Extended Sublayer (XGXS).
<b>Command Default</b>	No default behavior or values
<b>Command Modes</b>	EXEC mode

Command History	Release	Modification
	Release 3.7.2	This command was first introduced.
	Release 6.0.x	This command was modified. The <b>GigabitCtrlr</b> , <b>TenGigECtrlr</b> , and <b>HundredGigECtrlr</b> keywords were added.
	Release 6.2.1	The command was updated to display receiving optical power threshold value configured, and the minimum and maximum threshold values, as part of Early Indication of Link Loss Change feature.
	Release 7.1.3	This command was modified. The <b>FortyGE</b> keyword was added.

**Usage Guidelines**

For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:
  - *rack*: Chassis number of the rack.
  - *slot*: Physical slot number of the line card.
  - *module*: Module number. A physical layer interface module (PLIM) is always 0.
  - *port*: Physical port number of the interface.
- If specifying a virtual interface, the number range varies, depending on interface type.

For controllers, use the following keywords only.

- all
- periodic
- pm
- stats

Task ID	Task ID	Operations
	cisco-support	read
		<b>Note</b> Required in addition to the interface (read) task ID to use the <b>control</b> keyword only.
	dwdm	read
	interface	read
	sonet-sdh	read

The port speed on QSFP-40/100G-SRBD dual-mode optic was changed from 100Gps to 40Gps. This example shows the QSFP-40/100G-SRBD dual-mode optic status on FortyGigE 0/0/0/21/0:

```
RP/0/RSP0/CPU0:router#show controllers FortyGigE0/0/0/21/0 internal
```

```

Wed Nov 11 06:34:26.861 UTC

Internal data for interface: FortyGigE0/0/0/21/0
Subport Number : 0
Port Number : 21
Bay Number : 0
Ifinst : 6
Ifinst Subport : 21
Board Type : 0x003d1013
Port Type : 40GE
Bandwidth(Kbps) : 40000000
Transport mode : LAN
BIA MAC addr : badb.ad03.a84d
Oper. MAC addr : badb.ad03.a84d
Egress MAC addr : badb.ad03.a84d
Port Available : true
Status polling is : enabled
Status events are : enabled
I/F Handle : 0x04001300
Cfg Link Enabled : tx/rx enabled
H/W Tx Enable : yes
MTU : 1514
H/W Speed : 40 Gbps
H/W Loopback Type : None
FEC : Disable
H/W FlowCtrl Type : None
H/W AutoNeg Enable : Off
Rx OPD : Not Supported
H/W Link Defects : (0x0000000000000000) none
H/W Raw Link Defects : (0x0000000000000000) none
Link Up : yes
Link Led Status : Link up -- Green/Amber
Serdes fw version : 100.0
Pluggable Present : yes
Pluggable Type : 100/40G SRBD
Pluggable PID : QSFP-40/100-SRBD
Pluggable Compl. : Compliant
Pluggable Type Supp.: Supported
Pluggable PID Supp. : Supported

```

This example shows the receiving optical power alarm status on HuGigE0/1/2/3:

```

RP/0/RSP0/CPU0:router#show controllers GigabitEthernet0/0/0/4
Operational data for interface HuGigE0/1/2/3:

State:
  Administrative state: Enabled
  Operational state: Up,
  LED state: Green On

Phy:
  Media type: 100GBASE-LR4, fiber over 4 Lane optics (long reach),
  Optics:
    Vendor: CISCO-AVAGO
    Part number: 10-2134-01 (ver.: V01)
    Serial number: IPUIALJRAA

  Digital Optical Monitoring:
    Transceiver Temp: 98.781 C
    Transceiver Voltage: 3.283 V

Alarms key: (H) Alarm high, (h) Warning high
(L) Alarm low, (l) Warning low

```

## show controllers (Ethernet)

Wavelength		Tx Power		Rx Power		Laser Bias
Lane	(nm)	(dBm)	(mW)	(dBm)	(mW)	(mA)
01	1270	-1.6	0.699h	-37.0	0.0002L	9.408
02	1290	-1.6	0.493	-37.0	0.0003L	9.406
03	1310	-1.6	0.501h	-37.0	0.0002L	9.407
04	1330	-1.6	0.400	-37.0	0.0003L	9.399

## DOM alarms:

Transceiver Temp: Alarm high  
 Transmit Power: Warning high  
 Receive Power: Alarm low

Alarm	Alarm	Warning	Warning	Alarm
Thresholds	High	High	Low	Low
Transceiver Temp (C):	90.000	85.000	-5.000	-10.000
Transceiver Voltage (V):	3.630	3.470	3.140	2.970
Laser Bias (mA):	15.000	15.000	2.000	2.000
Transmit Power (mW):	1.000	0.501	0.112	0.045
Receive Power (mW):	1.995	1.000	0.020	0.008

## Alarms:

## Current:

SD-BER  
 SF-BER

## Previous:

No alarms

## Statistics:

Sync Header Error Count: <count>  
 PCS BIP Error count: <count>  
 FEC:  
 Corrected Codeword Count: <count>  
 Uncorrected Codeword Count: <count>

## MAC address information:

Operational address: 0003.6cff.0c00  
 Burnt-in address: 0003.6cff.0c00  
 1 unicast address(es) in filter:  
 0012.3456.7890  
 Operating in multicast promiscuous mode

## Autonegotiation disabled

## Priority Flow Control:

Total Rx PFC Frames: 1030  
 Total Tx PFC Frames: 4440

CoS	Status	Rx Frames	Tx Frames
0	off	15	125
1	on	115	115
2	on	125	1225
3	on	135	135
4	off	145	1245
5	off	155	155
6	off	165	1265
7	off	175	175

## Operational values:

Speed: 10 Gbps,  
 Bandwidth utilization: 19.73%,  
 Duplex: Full Duplex,



```

Flowcontrol: None,
Priority flow control: On,
Loopback: None (or external),
MTU: 1514 bytes,
MRU: 1514 bytes,
Inter-packet gap: standard (12),
Forward error correction: Standard (Reed-Solomon)

```



**Note** A higher count of Bit Interleaved Parity (BIP) errors lead to Bit Error Rate (BER) errors. Ethernet interfaces must be continuously monitored in order to detect any link that is not working due to BER errors (bit error rate) and to bring down the interface connected to that link. BER informs you of the number of bit errors per unit time and helps you test cables and diagnose signal problems in the field. For more information on BER, see the *Interface and Hardware Component Configuration Guide for Cisco ASR 9000 Series Routers*.

This example shows the receiving optical power degrade threshold value configured on GigabitEthernet interface location 0/0/0/4:

```

RP/0/RSP0/CPU0:router#show controllers GigabitEthernet0/0/0/4 control
Management information for interface GigabitEthernet0/0/0/4:

```

```

Port number: 4
Interface handle: 0x08000400

```

```

Config:
  Auto-negotiation: Off
  Carrier delay (up): None
  Carrier delay (down): None
  Duplex: Not configured
  Flow Control: None
  Priority Flow Control: None
  Forward Error Correction: Standard (Reed-Solomon)
  IPG: Standard (12)
  Loopback: None
  MTU: Not configured
  Speed: Not configured
  Soft BW: Not configured
  MAC Address: Not configured
  Rx Optical Power Degrade Threshold: -10db

```

```

Driver constraints:
  Min MTU: 64 bytes
  Max MTU: 9000 bytes
  Max speed: 1Gbps
  Interface type: Gigabit Ethernet
  Mgmt interface: No
  Allowed config mask: 0x26f

```

```

Cached driver state:
  MTU: 1514 bytes
  Burnt-in MAC Address: 0001.0203.0404

```

Not a member of a bundle interface.

```

Port FSM state:
  Port is disabled due to an admin down condition.

```

```

Complete FSM state:
  Admin down
  Bundle admin up

```

## show controllers (Ethernet)

```

Client admin up
Client admin tx up
Port disabled
Port tx disabled
HW link down

IDB interface state information:
IDB bundle admin up
IDB client admin up
IDB client tx admin up
IDB error disable not set

0 Unicast MAC Addresses:

0 Multicast MAC Addresses:

```

The following example shows sample output from the **show controllers hundredGigE phy** command for A9K-2x100GE line card:

```
RP/0/RSP0/CPU0:router# show controller hundredGigE 0/9/0/0 phy
```

```
PHY data for interface: HundredGigE0/9/0/0:
```

Rx Service Lane	64B66B Block Lock	Lane Marker Sync	Sync Header Err Cnt	PCS Lane BIP Errors	Virt Lane Error	PCS Lane Mapping
--	-----	-----	-----	-----	-----	-----
0	Locked	Locked	0	0	Clean	0
1	Locked	Locked	0	0	Clean	10
2	Locked	Locked	0	0	Clean	1
3	Locked	Locked	0	0	Clean	11
4	Locked	Locked	0	0	Clean	12
5	Locked	Locked	0	0	Clean	2
6	Locked	Locked	0	0	Clean	3
7	Locked	Locked	0	0	Clean	13
8	Locked	Locked	0	0	Clean	14
9	Locked	Locked	0	0	Clean	4
10	Locked	Locked	0	0	Clean	15
11	Locked	Locked	0	0	Clean	5
12	Locked	Locked	0	0	Clean	6
13	Locked	Locked	0	0	Clean	16
14	Locked	Locked	0	0	Clean	17
15	Locked	Locked	0	0	Clean	7
16	Locked	Locked	0	0	Clean	8
17	Locked	Locked	0	0	Clean	18
18	Locked	Locked	0	0	Clean	9
19	Locked	Locked	0	0	Clean	19

```

CFP EEPROM port: 0
Xcvr Type: CFP
Ext Type: 8W,
Connector Type: MPO
Ethernet Application Codes: 100GE-SR10,
Number of Lanes: Network 10, Host 10
Max Bit Rate: Network Lane 10.4Gbit/s, Host Lane 10.4Gbit/s
Link Reaches: SM Fiber 0KM, MM Fiber: 100M, Copper: 0M
Device Tech1: VCSEL, DML,
Device Tech2: No WL, Uncool Xmtr, Xmtr not tunable, No VOA, PIN detector, No EDC,
Encoding: NRZ, Non-PSK,
Vendor Name: Reflex Photonics
Vendor OUI: 00.00.00
Vendor Part Number: CF-X12-C11801

```

```

Vendor Serial Number: X000A906
Date Code (yyyymmdd): 20110527, Lot Code 25
DDM Type: RX Avg Power, TX OMA,
Module DDM: Power Supply Voltage, Temperature,
Per Lane DDM: Laser Temp,
Enhanced Options:
MSA Data (CFP NVR 1 Table - addr 0x8000-0x807F)
0x0000: 0e 30 09 03 00 00 00 00 : 08 aa 4a 34 34 00 0a 00
0x0010: 0a 01 83 40 86 60 4e 20 : 00 04 40 3c 50 26 fa 46
0x0020: 00 52 65 66 6c 65 78 20 : 50 68 6f 74 6f 6e 69 63
0x0030: 73 00 00 00 43 46 2d 58 : 31 32 2d 43 31 31 38 30
0x0040: 31 20 20 20 58 30 30 30 : 41 39 30 36 20 20 20 20
0x0050: 20 20 20 20 32 30 31 31 : 30 35 32 37 32 35 20 20
0x0060: 20 20 20 20 20 20 20 20 : 0a 0d 04 14 04 05 0c 03
0x0070: 01 00 01 01 01 00 01 01 : 40 00 00 00 00 00 00 17

```

Part Number: (ver.: )

Product ID:

```

Vendor Specific Data (Vendor Cisco NVR 1 Table - address 0x8400-0x847F)
0x0100: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0110: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0120: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0130: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0140: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0150: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0160: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x0170: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00

```

Module	Alarm High	Warning High	Warning Low	Alarm
Thresholds:				
Low				
Temperature:	+0.273 C	+0.253 C	+0.019 C	+0.000
C				
Voltage:	5.031 Volt	5.338 Volt	0.013 Volt	2.879
Volt				

Temperature: +45.132 C

Voltage: 3.355 Volt

Lanes	Alarm High	Warning High	Warning Low
Thresholds:			
Alarm Low			
Temperature:	+0.273 C	+0.253 C	+0.019 C
+0.000 C			
Bias:	0.000 mAmps	0.000 mAmps	0.000 mAmps
0.000 mAmps			
Transmit Power: 0.000 mW (<-40.00 dBm)	0.000 mW (<-40.00 dBm)	0.000 mW (<-40.00 dBm)	0.000 mW (<-40.00 dBm)
0.000 mW (<-40.00 dBm)			
Receive Power: 0.000 mW (<-40.00 dBm)	0.000 mW (<-40.00 dBm)	0.000 mW (<-40.00 dBm)	0.000 mW (<-40.00 dBm)
0.000 mW (<-40.00 dBm)			

Rx Power	Lane	Temp	Bias	Tx Power
	0	+42.640 C	N/A	N/A
N/A				
	1	+42.640 C	N/A	N/A
N/A				
	2	+42.640 C	N/A	N/A
N/A				
	3	+42.640 C	N/A	N/A
N/A				
	4	+42.640 C	N/A	N/A

## show controllers (Ethernet)

```

N/A
5      +42.640 C      N/A      N/A
N/A
6      +42.640 C      N/A      N/A
N/A
7      +42.640 C      N/A      N/A
N/A
8      +42.640 C      N/A      N/A
N/A
9      +42.640 C      N/A      N/A
N/A

```

```

Threshold Data (CFP NVR 2 Table - address 0x8080-0x80ff)
0x0080: 00 46 00 41 00 05 00 00 : c4 86 d0 84 00 7d 70 7b
0x0090: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x00a0: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x00b0: 00 00 00 00 00 00 00 00 : 00 46 00 41 00 05 00 00
0x00c0: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x00d0: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x00e0: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 00
0x00f0: 00 00 00 00 00 00 00 00 : 00 00 00 00 00 00 00 1e

```

The following example shows sample output from the **show controllers hundredGigE phy** command for A9K-400G-DWDM-TR line card:

```
RP/0/RSP0/CPU0:router# show controller hundredGigE0/2/0/20/0 phy
```

Rx Service Lane	64B66B Block Lock	Lane Marker Sync	Sync Header Err Cnt	PCS Lane BIP Errors	Virt Lane Error	PCS Lane Mapping
0	Locked	Locked	0	0	Clean	1
1	Locked	Locked	0	0	Clean	2
2	Locked	Locked	0	0	Clean	4
3	Locked	Locked	0	0	Clean	7
4	Locked	Locked	0	0	Clean	9
5	Locked	Locked	0	0	Clean	10
6	Locked	Locked	0	0	Clean	12
7	Locked	Locked	0	0	Clean	14
8	Locked	Locked	0	0	Clean	17
9	Locked	Locked	0	0	Clean	18
10	Locked	Locked	0	0	Clean	0
11	Locked	Locked	0	0	Clean	3
12	Locked	Locked	0	0	Clean	5
13	Locked	Locked	0	0	Clean	6
14	Locked	Locked	0	0	Clean	8
15	Locked	Locked	0	0	Clean	11
16	Locked	Locked	0	0	Clean	13
17	Locked	Locked	0	0	Clean	15
18	Locked	Locked	0	0	Clean	16
19	Locked	Locked	0	0	Clean	19

```
*** PHY PCS PMA Statistics ***
```

Rx Service Lane	Rx Block Lock	Aligment Marker Lock	PCS Lane BIP Errors	PCS Lane Mapping
0	Locked	Locked	367	0
1	Locked	Locked	367	0
2	Locked	Locked	367	0
3	Locked	Locked	367	0
4	Locked	Locked	367	0
5	Locked	Locked	367	0
6	Locked	Locked	367	0
7	Locked	Locked	367	0

8	Locked	Locked	367	0
9	Locked	Locked	367	0
10	Locked	Locked	367	0
11	Locked	Locked	367	0
12	Locked	Locked	367	0
13	Locked	Locked	367	0
14	Locked	Locked	367	0
15	Locked	Locked	367	0
16	Locked	Locked	367	0
17	Locked	Locked	367	0
18	Locked	Locked	367	0
19	Locked	Locked	367	0

# show lldp

To display the global Link Layer Discovery Protocol (LLDP) operational characteristics on the system, use the **show lldp** command in EXEC mode.

## show lldp

<b>Syntax Description</b>	This command has no keywords or arguments.	
<b>Command Default</b>	None	
<b>Command Modes</b>	EXEC mode	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 4.1.0	This command was introduced.

**Usage Guidelines** The **show lldp** command displays the LLDP operational characteristics when LLDP is enabled globally on the system using the **lldp** command. The settings for the following commands are displayed:

- **lldp timer**
- **lldp holdtime**
- **lldp reinit**

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	ethernet-services	read

### Example 1

The following example shows the default LLDP operational characteristics when LLDP is enabled globally on the system:

```
RP/0/RSP0/CPU0:router# show lldp
Wed Apr 13 06:16:45.510 DST
Global LLDP information:
  Status: ACTIVE
  LLDP advertisements are sent every 30 seconds
  LLDP hold time advertised is 120 seconds
  LLDP interface reinitialisation delay is 2 seconds
```

### Example 2

The following example shows the output when LLDP is not enabled globally on the system:

```
RP/0/RSP0/CPU0:router# show lldp
Wed Apr 13 06:42:48.221 DST
% LLDP is not enabled
```

Related Commands	Command	Description
	<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.
	<a href="#">lldp timer, on page 19</a>	Specifies the LLDP packet rate.
	<a href="#">lldp holdtime, on page 17</a>	Specifies the length of time that information from an LLDP packet should be held by the receiving device before aging and removing it.
	<a href="#">lldp reinit, on page 18</a>	Specifies the length of time to delay initialization of LLDP on an interface.

# show lldp entry

To display detailed information about LLDP neighbors, use the **show lldp entry** command in EXEC mode.

**show lldp entry** *{\* name}*

<b>Syntax Description</b>	<b>*</b> Displays detailed information about all LLDP neighbors.
	<b>name</b> Name of a specific LLDP neighbor for which detailed information is displayed.

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

**Command Modes** EXEC mode

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 4.1.0	This command was introduced.

## Usage Guidelines

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	ethernet-services	read

The following example shows sample output for all LLDP neighbor table entries on the system:

```
RP/0/RSP0/CPU0:router# show lldp entry *
Wed Apr 13 10:29:40.342 UTC
Capability codes:
    (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
    (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

-----
Local Interface: GigabitEthernet0/0/0/8
Chassis id: 0026.9815.c3e6
Port id: Gi0/0/0/8
Port Description: GigabitEthernet0/0/0/8
System Name: asr9k-5

System Description:
Cisco IOS XR Software, Version 4.1.0.32I[Default]
Copyright (c) 2011 by Cisco Systems, Inc.

Time remaining: 102 seconds
Hold Time: 120 seconds
System Capabilities: R
Enabled Capabilities: R
Management Addresses:
    IPv4 address: 10.5.173.110

-----
Local Interface: GigabitEthernet0/0/0/8
```



```
Chassis id: 0026.9815.c3e6
Port id: Gi0/0/0/8.1
Port Description: GigabitEthernet0/0/0/8.1
System Name: asr9k-5

System Description:
Cisco IOS XR Software, Version 4.1.0.32I[Default]
Copyright (c) 2011 by Cisco Systems, Inc.

Time remaining: 96 seconds
Hold Time: 120 seconds
System Capabilities: R
Enabled Capabilities: R
Management Addresses:
  IPv4 address: 10.5.173.110
```

Total entries displayed: 2

Related Commands	Command	Description
	<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.

# show lldp errors

To display Link Layer Discovery Protocol (LLDP) error and overflow statistics, use the **show lldp errors** command in EXEC mode.

**show lldp errors** [**location** *location*]

<b>Syntax Description</b>	<b>location</b> <i>location</i> (Optional) Displays information about LLDP neighbors for the specified location. The <i>location</i> argument is entered in the <i>rack/slot/module</i> notation.
---------------------------	---

<b>Command Default</b>	Totals of LLDP error and overflow statistics for the system are displayed.
------------------------	--

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 4.1.0	This command was introduced.

## Usage Guidelines

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	ethernet-services	read

The following example shows sample output for the **show lldp errors** command:

```
RP/0/RSP0/CPU0:router# show lldp errors
Wed Apr 13 06:17:08.321 DST

LLDP errors/overflows:
  Total memory allocation failures: 0
  Total encapsulation failures: 0
  Total input queue overflows: 0
  Total table overflows: 0
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.
	<a href="#">show lldp traffic, on page 48</a>	Displays statistics for LLDP traffic.

# show lldp interface

To display Link Layer Discovery Protocol (LLDP) configuration and status information on an interface, use the **show lldp interface** command in EXEC mode.

**show lldp interface** [*type interface-path-id* | **location** *location*]

Syntax Description		
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.	
<i>interface-path-id</i>	Physical interface or virtual interface.	
	<b>Note</b>	Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
<b>location</b> <i>location</i>	(Optional) Displays information about LLDP neighbors for the specified location. The <i>location</i> argument is entered in the <i>rack/slot/module</i> notation.	

**Command Default** LLDP configuration and status information for all interfaces is displayed.

**Command Modes** EXEC mode

Command History	Release	Modification
	Release 4.1.0	This command was introduced.

**Usage Guidelines** When LLDP is enabled globally on the system, all supported interfaces are automatically enabled for both LLDP receive and transmit operations. You can individually disable interfaces for either LLDP receive or transmit operations using the **receive disable** command or **transmit disable** command in LLDP configuration mode under the interface.

Task ID	Task ID	Operation
	ethernet-services	read

The following example shows sample output for the **show lldp interface** command for the Gigabit Ethernet interface at 0/1/0/7:

```
RP/0/RSP0/CPU0:router# show lldp interface gigabitethernet 0/1/0/7
Wed Apr 13 13:22:30.501 DST
```

```
GigabitEthernet0/1/0/7:
  Tx: enabled
  Rx: enabled
  Tx state: IDLE
  Rx state: WAIT FOR FRAME
```

**Table 1: show lldp interface Field Descriptions**

Field	Description
Tx:	Configuration status of the interface to transmit LLDP advertisements.
Rx:	Configuration status of the interface to receive LLDP advertisements.
Tx state:	Status of the LLDP transmit process on the interface.
Rx state:	Status of the LLDP receive process on the interface.

**Related Commands**

Command	Description
<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.
<a href="#">lldp (interface), on page 15</a>	Enters LLDP configuration mode.

# show lldp neighbors

To display information about Link Layer Discovery Protocol (LLDP) neighbors, use the **show lldp neighbors** command in EXEC mode.

**show lldp neighbors** [*type interface-path-id* | **location** *location*] [**detail**]

Syntax Description		
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.	
<i>interface-path-id</i>	Physical interface or virtual interface.	
	<b>Note</b>	Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
<b>location</b> <i>location</i>	(Optional) Displays information about LLDP neighbors for the specified location. The <i>location</i> argument is entered in the <i>rack/slot/module</i> notation.	
<b>detail</b>	(Optional) Displays all available information about LLDP neighbors.	

**Command Default** Basic device information for LLDP neighbors is displayed.

**Command Modes** EXEC mode

Command History	Release	Modification
	Release 4.1.0	This command was introduced.

**Usage Guidelines** To clear the neighbor information displayed by the **show lldp neighbors** command, use the **clear lldp table** command.

Task ID	Task ID	Operation
	ethernet-services	read

The following example show sample output for the **show lldp neighbors** command:

```
RP/0/RSP0/CPU0:router# show lldp neighbors
Capability codes:
  (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
  (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

Device ID           Local Intf         Hold-time  Capability  Port ID
R1                   Et1/0              150        R           Et1/0

Total entries displayed: 1
```

Table 2: show lldp neighbors Field Descriptions

Field	Description
Device ID	Name of the neighbor device.  <b>Note</b> If the device ID has more than 20 characters, the ID will be truncated to 20 characters in command output because of display constraints.
Local Intf	Local interface through which this neighbor is connected.
Hold-time	Amount of time (in seconds) that the local device will hold the LLDP advertisement from a sending device before discarding it.
Capability	The device type of the neighbor, whose values correspond to the characters and definition displayed in the "Capability codes" section.
Port ID	Interface and port number of the neighboring device.

The following example shows sample output for the **show lldp neighbors detail** command:

```
RP/0/RSP0/CPU0:router# show lldp neighbors detail
Wed Apr 13 10:29:40.342 UTC
Capability codes:
    (R) Router, (B) Bridge, (T) Telephone, (C) DOCSIS Cable Device
    (W) WLAN Access Point, (P) Repeater, (S) Station, (O) Other

-----
Local Interface: GigabitEthernet0/0/0/8
Chassis id: 0026.9815.c3e6
Port id: Gi0/0/0/8
Port Description: GigabitEthernet0/0/0/8
System Name: asr9k-5

System Description:
Cisco IOS XR Software, Version 4.1.0.32I[Default]
Copyright (c) 2011 by Cisco Systems, Inc.

Time remaining: 102 seconds
Hold Time: 120 seconds
System Capabilities: R
Enabled Capabilities: R
Management Addresses:
    IPv4 address: 10.5.173.110

-----
Local Interface: GigabitEthernet0/0/0/8
Chassis id: 0026.9815.c3e6
Port id: Gi0/0/0/8.1
Port Description: GigabitEthernet0/0/0/8.1
System Name: asr9k-5

System Description:
Cisco IOS XR Software, Version 4.1.0.32I[Default]
```

Copyright (c) 2011 by Cisco Systems, Inc.

Time remaining: 96 seconds  
Hold Time: 120 seconds  
System Capabilities: R  
Enabled Capabilities: R  
Management Addresses:  
  IPv4 address: 10.5.173.110

Total entries displayed: 2

Related Commands	Command	Description
	<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.
	<a href="#">clear lldp, on page 5</a>	Resets LLDP traffic counters or LLDP neighbor information.

# show lldp traffic

To display statistics for Link Layer Discovery Protocol (LLDP) traffic, use the **show lldp traffic** command in EXEC mode.

**show lldp traffic** [**location** *location*]

<b>Syntax Description</b>	<b>location</b> <i>location</i> (Optional) Displays LLDP statistics for traffic at the specified location. The <i>location</i> argument is entered in the <i>rack/slot/module</i> notation.
---------------------------	---

<b>Command Default</b>	Totals of LLDP statistics for the system are displayed.
------------------------	---

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 4.1.0	This command was introduced.

<b>Usage Guidelines</b>	To reset the counters displayed by the <b>show lldp traffic</b> command, use the <b>clear lldp counters</b> command.
-------------------------	--

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	ethernet-services	read

The following example shows sample output for statistics for all LLDP traffic on the system:

```
RP/0/RSP0/CPU0:router# show lldp traffic
LLDP traffic statistics:
  Total frames out: 277
  Total entries aged: 0
  Total frames in: 328
  Total frames received in error: 0
  Total frames discarded: 0
  Total TLVs discarded: 0
  Total TLVs unrecognized: 0
```

**Table 3: show lldp traffic Field Descriptions**

Field	Description
Total frames out:	Number of LLDP advertisements sent from the device.
Total entries aged:	Number of LLDP neighbor entries removed due to expiration of the hold time.
Total frames in:	Number of LLDP advertisements received by the device.
Total frames received in error:	Number of times the LLDP advertisements contained errors of any type.



Field	Description
Total frames discarded:	Number of times the LLDP process discarded an incoming advertisement.
Total TLVs discarded:	Number of times the LLDP process discarded a Type Length Value (TLV) from an LLDP frame.
Total TLVs unrecognized:	Number of TLVs that could not be processed because the content of the TLV was not recognized by the device or the contents of the TLV were incorrectly specified.

**Related Commands**

Command	Description
<a href="#">lldp, on page 14</a>	Enables LLDP globally for both transmit and receive operation on the system.
<a href="#">clear lldp, on page 5</a>	Resets LLDP traffic counters or LLDP neighbor information.

## show mac-accounting (Ethernet)

To display MAC accounting statistics for an interface, use the **show mac-accounting** command in EXEC mode.

**show mac-accounting** {GigabitEthernet | TenGigE} *interface-path-id* [**location node-id**]

<b>Syntax Description</b>	{GigabitEthernet   TenGigEHundred GigEbundle-ether }	Indicates the type of Ethernet interface whose MAC accounting statistics you want to display. Enter <b>GigabitEthernet</b> , <b>TenGigE</b> , .
	<i>interface-path-id</i>	Physical interface or virtual interface.  <b>Note</b> Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.  For more information about the syntax for the router, use the question mark (?) online help function.
	<b>location node-id</b>	(Optional) Displays detailed MAC accounting information for the specified interface on the specified node. The <i>node-id</i> argument is entered in the <i>rack/slot/module/port</i> notation.

**Command Default** No default behavior or values

**Command Modes** EXEC mode

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 4.1.1	This command was introduced.

**Usage Guidelines** For the *interface-path-id* argument, use these guidelines:

- If specifying a physical interface, the naming notation is *rack/slot/module/port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:
  - *rack*: Chassis number of the rack.
  - *slot*: Physical slot number of the line card.
  - *module*: Module number. A physical layer interface module (PLIM) is always 0.
  - *port*: Physical port number of the interface.
- If specifying a virtual interface, the number range varies, depending on interface type.

<b>Task ID</b>	<b>Task ID Operations</b>
	interface read

## Examples

These examples show the outputs from the **show mac-accounting** command, which displays MAC accounting statistics on any specified interface:

```
RP/0/RSP0/CPU0:router# show mac-accounting TenGigE 0/2/0/4 location 0/1/CPU0

TenGigE0/2/0/4
  Input (511 free)
000b.4558.caca: 4 packets, 456 bytes
      Total: 4 packets, 456 bytes
```

**Table 4: show mac-accounting Field Descriptions**

Field	Description
Interface	The interface from which the statistics are generated.
Input	Heading for the ingress MAC accounting statistics. The number of MAC accounting entries still available is shown in parentheses.
Total	Total statistics for the traffic accounted for by MAC accounting. This excludes any traffic for which there is no MAC address entry, such as non-IP traffic from an unknown MAC source address. This output also excludes any MAC addresses that have 0 packets currently, even if that MAC address was accounted before. Such type of MAC addresses still contribute towards the maximum address limit.

## Related Commands

Command	Description
<a href="#">clear mac-accounting (Ethernet), on page 7</a>	Clears MAC accounting statistics for an interface.
<a href="#">mac-accounting, on page 22</a>	Generates accounting information for IP traffic based on the source and destination MAC addresses on LAN interfaces.

# small-frame-padding

To enable small frame padding on physical interfaces, use the **small-frame-padding** command in the interface configuration mode. To disable small frame padding, use the **no** form of this command.

**small-frame-padding** *interface-path-id*

<b>Syntax Description</b>	<i>interface-path-id</i> Physical interface type.
---------------------------	---

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

<b>Command Modes</b>	Interface Configuration mode
----------------------	------------------------------

Command History	Release	Modification
	Release 4.3.1	This command was introduced.
	Release 6.3.1	This command was enabled for Satellite nV access interfaces.
	Release 7.10.1	The command extended support with the following line cards: <ul style="list-style-type: none"> <li>• Fourth generation of the ASR 9000 Series Ethernet line cards</li> <li>• Fifth generation of the ASR 9000 Series Ethernet line cards</li> </ul>

<b>Usage Guidelines</b>	This command is applicable for all physical interfaces of the Cisco ASR 9000 series router line cards.
-------------------------	--

Task ID	Task ID	Operation
	interface	read, write

## Example

This example shows how to use the small-frame-padding command:

```
RP/0/RSP0/CPU0:router(config)# interface HundredGigE 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# small-frame-padding
```

## speed (Fast Ethernet)

To configure the speed for a Fast Ethernet interface, enter the **speed** command in interface configuration mode. To return the system to auto-negotiate speed, use the **no** form of this command.

```
speed {10 | 100 | 1000}
```

Syntax Description	
<b>10</b>	Configures the interface to transmit at 10 Mbps.
<b>100</b>	Configures the interface to transmit at 100 Mbps.
<b>1000</b>	Configures the interface to transmit at 1000 Mbps (1 Gbps).

**Command Default** If auto-negotiation is enabled on an interface, the default speed is negotiated.  
If auto-negotiation is disabled on an interface, the default speed is the maximum speed allowed on the interface.

**Command Modes** Interface configuration

Command History	Release	Modification
	Release 4.2.3	This command was introduced.

### Usage Guidelines



**Note** The **speed** command is available on Management Ethernet interfaces and Fast Ethernet interfaces only.



**Note** Keep in mind that both ends of a link must have the same interface speed. A manually configured interface speed overrides any auto-negotiated speed, which can prevent a link from coming up if the configured interface speed at one end of a link is different from the interface speed on the other end.



**Note** The **speed** configuration is supported for 1 Gigabit Ethernet copper SFPs and not supported for 1 Gigabit Ethernet optical SFPs.

Task ID	Task ID	Operations
	interface	read, write

### Examples

The following example shows how to configure the Fast Ethernet interface to transmit at one gigabit:

```
RP/0/RSP0/CPU0:router(config)# interface FastEthernet 0/0/2/0  
RP/0/RSP0/CPU0:router(config-if)# speed 1000
```

## transport-mode (UDLR)

To specify the Unidirectional Link Routing (UDLR) mode as receive-only or transmit-only for a 10-Gigabit Ethernet interface, use the **transport-mode** command in interface configuration mode. To return to the default mode, use the **no** form of this command.



**Note** The **signal-degrade** option specified is applicable only on 1 GigabitEthernet Cisco ASR 9000 Ethernet and Enhanced Ethernet line cards.

**transport-mode** {{rx-only | tx-only} | {signal-degrade}}

### Syntax Description

<b>rx-only</b>	Configures the 10GE UDLR mode as receive-only.
<b>tx-only</b>	Configures the 10GE UDLR mode as transmit-only.
<b>signal-degrade</b>	Configures the port as signal-degrade mode. When you configure <b>signal-degrade</b> on 1 GigabitEthernet Cisco ASR 9000 Ethernet and Enhanced Ethernet Line cards, it brings down the interface when low Rx power is detected. Once the signal is recovered, the interface comes up.

### Command Default

UDLR is disabled.

### Command Modes

Interface configuration

### Command History

Release	Modification
Release 4.2.2	This command was introduced.
Release 5.3.0	The <b>signal-degrade</b> keyword was added.

### Usage Guidelines

UDLR is supported in 10GE LAN mode only on these line cards:

- 24-Port 10-Gigabit Ethernet line card (A9K-24X10GE-SE/TR)
- 36-Port 10-Gigabit Ethernet line card (A9K-36X10GE-SE/TR)

### Task ID

Task ID	Operations
interface	read, write

### Examples

This example shows how to configure the 10GE interface for transmit-only mode:

```
RP/0/RSP0/CPU0:router# config
```

**transport-mode (UDLR)**

```
RP/0/RSP0/CPU0:router(config)# interface TenGigE 0/1/0/1  
RP/0/RSP0/CPU0:router(config-if)# transport-mode tx-only  
RP/0/RSP0/CPU0:router(config-if)# commit
```