



# Configuring Ethernet Interfaces

This chapter provides information about configuring the Gigabit Ethernet interface modules.

For more information about the commands used in this chapter, see the [Cisco IOS XE 3S Command References](#).

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## Configuring Ethernet Interfaces

This section describes how to configure the Gigabit and Ten Gigabit Ethernet interface modules and includes information about verifying the configuration.

### Limitations and Restrictions

- Conflicting VLAN ranges and the exact VLAN values on different EFPs for same interface is not supported. When the EFP of an interface has second-dot1q between the range from 1000 to 2000, then any no other service instance can have a second-dot1q within the same range.
- VRF-Aware Software Infrastructure (VASI) interface commands **interface vasileft** and **interface vasiright** are not supported.
- Interface modules have slot restrictions, see NCS 4200 Hardware Installation Guides.
- MPLS MTU is *not* supported.
- On the RSP3 module, MTU value configured for a BDI interface should match with the MTU configuration for all the physical interfaces, which have a service instance associated with this BDI.
- If the packet size is more than the configured MTU value and exceeds 1Mbps, packets are dropped. Packets are fragmented when the packet size is more than the configured MTU value and when traffic is lesser than 1Mbps.
- To replace the configured interface module with a different interface module in a particular slot, run the **hw-module subslot slot-num default** command.
- Giant counters are not supported.

- Ingress counters are not incremented for packets of the below packet format on the RSP3 module for the 10 Gigabit Ethernet interfaces, 100 Gigabit Ethernet interfaces, and 40 Gigabit Ethernet interfaces:

MAC header---->Vlan header---->Length/Type

When these packets are received on the RSP3 module, the packets are not dropped, but the counters are not incremented.

- If the IM is shutdown using **hw-module subslot shutdown** command, then the IM goes out-of-service. You should perform a Stateful Switchover (SSO) in the interim, as the IM needs to be re-inserted for successful reactivation.

- Following are some of the IMs that are not supported on certain slots when IPsec license is enabled:

- The below IMs are not supported on the Slot 11 on the Cisco ASR 907 router:

- SPA\_TYPE\_ETHER\_IM\_8x10GE
- SPA\_TYPE\_ETHER\_IM\_2x40GE

- The below IMs are not supported on the Slot 2 on the Cisco ASR 903 router for RSP3-200 and RSP3-400:

- SPA\_TYPE\_ETHER\_IM\_8xGE\_SFP\_1x10GE
- SPA\_TYPE\_ETHER\_IM\_8xGE\_CU\_1x10GE
- SPA\_TYPE\_ETHER\_IM\_1x10GE
- SPA\_TYPE\_ETHER\_IM\_8x10GE
- SPA\_TYPE\_OCX\_IM\_OC3OC12
- SPA\_TYPE\_ETHER\_IM\_8xGE\_SFP
- SPA\_TYPE\_ETHER\_IM\_8xGE\_CU

- CTS signal goes down, when control signal frequency is configured more than 5000 ms and timeout setting is more than 20,000 ms (4x control\_frequency), which is greater than the OIR time (~20s) for a selected subordinate to complete an OIR cycle. This results in the primary being unaware that the subordinate is down and CTS of all subordinates are down too. To avoid this situation, ensure that the timeout is shorter than the OIR time of the subordinate. Set the control frequency to less than or equal to 5000 ms and the timeout setting to less than or equal to 20,000 ms before you perform OIR.

- You may ignore the following error that is seen during IM OIR or while the router goes down:

```
%IOSXE-2-PLATFORM: R1/0: kernel: Address caused MCE = 0x0, DEAR = <>
```

- Interfaces with CU SFP flap twice during router boot up or IM OIR.

- In routers with Cu optics, physical SFP OIR, the following I2C error occurs:

```
%IOMD_IMFPGA-3-I2C_WRITE: C0/1: iomd: IM slot 1: An I2C write has failed for addr: 0x56 reg: 0x16 data: 0x0
```

As physical SFP OIR is an externally triggered event, it is not possible to prevent such errors. To avoid the error, we recommend to put the port in Shutdown state and do OIR.

## Configuring an Interface

This section lists the required configuration steps to configure Gigabit and Ten Gigabit Ethernet interface modules.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Router# configure terminal</pre>	Enters global configuration mode.
<b>Step 2</b>	<p>Do one of the following:</p> <ul style="list-style-type: none"> <li>• <b>interface gigabitethernet</b> <i>slot/subslot/port</i></li> <li>• <b>interface tengigabitethernet</b> <i>slot/subslot/port</i></li> </ul> <p><b>Example:</b></p> <pre>Router(config)# interface gigabitethernet 0/0/1</pre> <p><b>Example:</b></p> <pre>Router(config)# interface tengigabitethernet 0/0/1</pre>	<p>Specifies the Gigabit Ethernet or Ten Gigabit Ethernet interface to configure and enters interface configuration mode, where:</p> <p><b>Note</b> The slot number is always 0.</p>
<b>Step 3</b>	<p><b>ip address</b> <i>ip-address mask {secondary}   dhcp {client-id interface-name} {hostname host-name}</i>]</p> <p><b>Example:</b></p> <pre>Router(config-if)# ip address 192.168.1.1 255.255.255.255 dhcp hostname host1</pre>	<p>Sets a primary or secondary IP address for an interface that is using IPv4, where:</p> <ul style="list-style-type: none"> <li>• <i>ip-address</i>—The IP address for the interface.</li> <li>• <i>mask</i>—The mask for the associated IP subnet.</li> <li>• <b>secondary</b>—(Optional) Specifies that the configured address is a secondary IP address. If this keyword is omitted, the configured address is the primary IP address.</li> <li>• <b>dhcp</b>—Specifies that IP addresses will be assigned dynamically using DHCP.</li> <li>• <b>client-id</b> <i>interface-name</i>—Specifies the client identifier. The <i>interface-name</i> sets the client identifier to the hexadecimal MAC address of the named interface.</li> </ul>

	Command or Action	Purpose
		<ul style="list-style-type: none"> <li>• <b>hostname</b> <i>host-name</i>—Specifies the hostname for the DHCP purposes. The <i>host-name</i> is the name of the host to be placed in the DHCP option 12 field.</li> </ul>
<b>Step 4</b>	<p><b>no negotiation auto</b></p> <p><b>Example:</b></p> <pre>Router(config-if) # no negotiation auto</pre>	<p>(Optional) Disables automatic negotiation.</p> <p><b>Note</b> Use the <b>speed</b> command only when the mode is set to no negotiation auto.</p>
<b>Step 5</b>	<p><b>speed { 10   100   1000 }</b></p> <p><b>Example:</b></p> <pre>Router(config-if) # speed 1000</pre>	<p>(Optional) Specifies the speed for an interface to transmit at 10, 100, and 1000 Mbps (1 Gbps), where the default is 1000 Mbps.</p>
<b>Step 6</b>	<p><b>mtu bytes</b></p> <p><b>Example:</b></p> <pre>Router(config-if) # mtu 1500</pre>	<p>(As Required) Specifies the maximum packet size for an interface, where:</p> <ul style="list-style-type: none"> <li>• <i>bytes</i>—The maximum number of bytes for a packet.</li> </ul> <p>The default is 1500 bytes; the range is from 1500 to 9216.</p> <p>Effective Cisco IOS XE release 17.4.1, 9644 MTU bytes are supported on the Cisco RSP3 module.</p>
<b>Step 7</b>	<p><b>standby [group-number] ip [ip-address [secondary]]</b></p> <p><b>Example:</b></p> <pre>Router(config-if) # standby 250 ip 192.168.10.1</pre>	<p>Creates or enables the Hot Standby Router Protocol (HSRP) group using its number and virtual IP address, where:</p> <ul style="list-style-type: none"> <li>• (Optional) <i>group-number</i>—The group number on the interface for which HSRP is being enabled. The range is from 0 to 255; the default is 0. If there is only one HSRP group, you do not need to enter a group number.</li> <li>• (Optional on all but one interface if configuring HSRP) <i>ip-address</i>—The virtual IP address of the hot standby router interface. You must enter the virtual IP address for at least one of the interfaces; it can be learned on the other interfaces.</li> <li>• (Optional) <b>secondary</b>—Specifies that the IP address is a secondary hot standby router interface. If neither router is designated as a secondary or standby router and no priorities are set, the primary</li> </ul>

	Command or Action	Purpose
		<p>IP addresses are compared and the higher IP address is the active router, with the next highest as the standby router.</p> <p><b>Note</b> This command is required only for configurations that use HSRP.</p> <p><b>Note</b> This command enables HSRP but does not configure it further.</p>
<b>Step 8</b>	<p><b>no shutdown</b></p> <p><b>Example:</b></p> <pre>Router(config-if)# no shutdown</pre>	Enables the interface.

## Specifying the Interface Address on an Interface Module

To configure or monitor Ethernet interfaces, you need to specify the physical location of the interface module and interface in the CLI. The interface address format is slot/subslot/port, where:

- slot—The chassis slot number in the chassis where the interface module is installed.



**Note** The interface module slot number is always 0.

- subslot—The subslot where the interface module is installed. Interface module subslots are numbered from 0 to 5 for ASR 903 and from 0 to 15 for ASR 907, from bottom to top.
- port—The number of the individual interface port on an interface module.

The following example shows how to specify the first interface (0) on an interface module installed in the first interface module slot:

```
Router(config)# interface GigabitEthernet 0/0/0
no ip address
shutdown
negotiation auto
no cdp enable
```

## Configuring Hot Standby Router Protocol

Hot Standby Router Protocol (HSRP) provides high network availability because it routes IP traffic from hosts without relying on the availability of any single router. You can deploy HSRP in a group of routers to select an active router and a standby router. (An *active* router is the router of choice for routing packets; a *standby* router is a router that takes over the routing duties when an active router fails, or when preset conditions are met).

HSRP is enabled on an interface by entering the **standby** *[group-number]* **ip** *[ip-address]* **[secondary]** command. The **standby** command is also used to configure various HSRP elements. This document does not discuss more complex HSRP configurations. For additional information on configuring HSRP, see to the

HSRP section of the Cisco IP Configuration Guide publication that corresponds to your Cisco IOS XE software release. In the following HSRP configuration, standby group 2 on Gigabit Ethernet port 0/1/0 is configured at a priority of 110 and is also configured to have a preemptive delay should a switchover to this port occur:

```
Router(config)#interface GigabitEthernet 0/1/0
Router(config-if)#standby 2 ip 192.168.1.200
Router(config-if)#standby 2 priority 110
Router(config-if)#standby 2 preempt
```

The maximum number of different HSRP groups that can be created on one physical interface is 4. If additional groups are required, create 4 groups on the physical interface, and the remaining groups on the BDI or on another physical interface.




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**Note** TCAM space utilization changes when HSRP groups are configured on the router. If HSRP groups are configured the TCAM space is utilized. Each HSRP group takes 1 TCAM entry. The “Out of TCAM” message may be displayed if total number of TCAM space used by HSRP groups and prefixes on the router exceeds scale limit.

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**Note** HSRP state flaps with sub-second “Hello” or “Dead” timers.

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### Restrictions

HSRPv2 is not supported.

## Verifying HSRP

To verify the HSRP information, use the show standby command in EXEC mode:

```
Router# show standby
Ethernet0 - Group 0
Local state is Active, priority 100, may preempt
Hellotime 3 holdtime 10
Next hello sent in 0:00:00
Hot standby IP address is 198.92.72.29 configured
Active router is local
Standby router is 198.92.72.21 expires in 0:00:07
Standby virtual mac address is 0000.0c07.ac00
Tracking interface states for 2 interfaces, 2 up:
UpSerial0
UpSerial1
```

## Modifying the Interface MTU Size

Table 1: Feature History

Feature Name	Release	Description
Increase Maximum MTU Size	Cisco IOS XE Bengaluru 17.4.1	Maximum Transmission Unit (MTU) is increased to a maximum of 9644 bytes on the Cisco RSP3 module. You can configure the MTU bytes using the <b>mtu bytes</b> command.
Increase Maximum MTU Size	Cisco IOS XE Cupertino 17.8.1	Maximum Transmission Unit (MTU) is increased to a maximum of 9670 bytes on the Cisco RSP2 module. You can configure the MTU bytes using the <b>mtu bytes</b> command.



**Note** The maximum number of unique MTU values that can be configured on the physical interfaces on the chassis is 8. Use the **show platform hardware pp active interface mtu command** to check the number of values currently configured on the router. This is not applicable on Cisco ASR 900 RSP3 Module.

The Cisco IOS software supports three different types of configurable maximum transmission unit (MTU) options at different levels of the protocol stack:

- **Interface MTU**—The interface module checks the MTU value of incoming traffic. Different interface types support different interface MTU sizes and defaults. The interface MTU defines the maximum packet size allowable (in bytes) for an interface before drops occur. If the frame is smaller than the interface MTU size, but is not smaller than the minimum frame size for the interface type (such as 64 bytes for Ethernet), then the frame continues to process.
- **MPLS MTU**—If the MPLS MTU is set to a value, for example, 1500 bytes, the value is programmed as 1504 bytes at the hardware level to allow the addition of one label. Consider the case of pseudowire. If the packet size of Layer 2 traffic sent with four bytes of Frame Check Sequence (FCS) to the pseudowire is 1500 bytes, then and four bytes of pseudowire control word and one pseudowire label (label size is four bytes) is added to the packet, the packet size is now 1508 bytes with FCS. However, note that while calculating the packet size, FCS is not considered. So the calculated packet size is 1504 bytes, which is equal to the MPLS MTU programmed in the hardware. This packet is forwarded as expected.

However, if another label is added to this packet, the packet size becomes 1508 bytes without FCS. This value is greater than programmed MTU value, so this packet is dropped. This restriction applies not only to pseudowire, but to the entire MPLS network.

To ensure that packets are not dropped, MPLS MTUs should be set considering the maximum size of the label stack that is added to the packet in the network.

For the Gigabit Ethernet interface module on the chassis, the default MTU size is 1500 bytes. The interface module automatically adds an additional 22 bytes to the configured MTU size to accommodate some of the additional overhead.

### Increase Maximum MTU Size on RSP3 module

Effective Cisco IOS XE Bengaluru 17.4.1, a maximum of 9644 MTU bytes are supported on the Cisco RSP3 module.

Prior to Cisco IOS XE Bengaluru 17.4.1, you can configure a maximum of 9216 bytes on the Cisco RSP3 module.

### Increase Maximum MTU Size on RSP2 module

Effective Cisco IOS XE Cupertino 17.8.1, a maximum of 9644 MTU bytes are supported on the Cisco RSP2 module.

Prior to this release, you can configure a maximum of 9216 bytes on the Cisco RSP2 module.

### Limitations

- In EtherLike-MIB, the **dot3StatsFrameTooLong**s frames count in SNMP increases when the frame packet size is more than the default MTU.
- If the packet size is more than the configured MTU value and exceeds 1Mbps, packets are dropped. Packets are fragmented when the packet size is more than the configured MTU value and when traffic is lesser than 1Mbps.
- Due to hardware limitation on the Cisco RSP2 module, ping is not supported with MTU size of greater than 9215 bytes.

## Interface MTU Configuration Guidelines

When configuring the interface MTU size, we recommend you consider the following guidelines:




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**Note** The default interface MTU size always accommodates a 1500-byte packet, plus 22 additional bytes to cover the following additional overhead.

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- An interface (without tagging applied), sends a maximum of 1522 bytes of data. Here the interface sends 1508 (Data) bytes + 14 (Layer 2 header) bytes = 1522 bytes.
- An interface (with tagging applied) sends bytes as follows:
  - **dot1q tagging** — Interface sends 1504 (Data) bytes + 14 (Layer 2 header) + 4 (dot1q encapsulation header) bytes = 1522 bytes.
  - **double dot1q tagging** — Interface sends 1500 (Data) bytes + 14 (Layer 2 header) + 8 (double dot1q encapsulation header) bytes = 1522 bytes.
- Interface MTU is not supported on BDI Interface.
- If you are using MPLS labels, then you should increase the default interface MTU size to accommodate the number of MPLS labels. Each MPLS label adds 4 bytes of overhead to a packet.





**Note** If you are using MPLS, ensure that the **mpls mtu** command is configured for a value less than or equal to the interface MTU. This is not applicable on the RSP3 Module.

## Configuring Interface MTU

To modify the MTU size on an interface, use the following command in interface configuration mode:

Command	Purpose
<b>mtu bytes</b>  Router(config-if) # <b>mtu bytes</b>	Configures the maximum packet size for an interface, where: <ul style="list-style-type: none"> <li><i>bytes</i>— Specifies the maximum number of bytes for a packet.</li> </ul> The default is 1500 bytes and the maximum configurable MTU is 9216 bytes.

To return to the default MTU size, use the **no** form of the command.



**Note** When IP FRR over BDI is configured, the maximum allowed packet size is 1504 bytes.

When the BGP-PIC core is enabled, a packet destined to a prefix that is learnt through eBGP, is dropped if the packet size is greater than 1504 bytes. To work around this limitation, do one of the following:

- Disable the BGP-PIC core,
- Use the static route, or
- Use routed-port instead of BDI.

## Verifying the MTU Size

To verify the MTU size for an interface, use the **show interfaces gigabitethernet** privileged EXEC command and observe the value shown in the “MTU” field.

The following example shows an MTU size of 1500 bytes for interface port 0 (the second port) on the Gigabit Ethernet interface module installed in slot 1:

```
Router# show interfaces gigabitethernet 0/1/0
GigabitEthernet0/1/0 is up, line protocol is up
  Hardware is NCS4200-1T8LR-PS, address is d0c2.8216.0590 (bia d0c2.8216.0590)
  MTU 1500 bytes
, BW 1000000 Kbit/sec, DLY 10 usec,
  reliability 255/255, txload 1/255, rxload 22/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
```

## Configuring the Encapsulation Type

The only encapsulation supported by the interface modules is IEEE 802.1Q encapsulation for virtual LANs (VLANs).



**Note** VLANs are only supported on Ethernet Virtual Connection (EVC) service instances and Trunk Ethernet Flow Point (EFP) interfaces.

## Configuring Autonegotiation on an Interface

Gigabit Ethernet interfaces use a connection-setup algorithm called *autonegotiation*. Autonegotiation allows the local and remote devices to configure compatible settings for communication over the link. Using autonegotiation, each device advertises its transmission capabilities and then agrees upon the settings to be used for the link.

For the Gigabit Ethernet interfaces on the chassis, flow control is autonegotiated when autonegotiation is enabled. Autonegotiation is enabled by default.

When enabling autonegotiation, consider these guidelines:

- If autonegotiation is disabled on one end of a link, it must be disabled on the other end of the link. If one end of a link has autonegotiation disabled while the other end of the link does not, the link will not come up properly on both ends.
- Flow control is enabled by default.
- Flow control will be on if autonegotiation is disabled on both ends of the link.

### Enabling Autonegotiation

To enable autonegotiation on a Gigabit Ethernet interface, use the following command in interface configuration mode:

Command	Purpose
<b>negotiation auto</b>  Router(config-if) # <b>negotiation auto</b>	Enables autonegotiation on a Gigabit Ethernet interface. Advertisement of flow control occurs.

### Disabling Autonegotiation

Autonegotiation is automatically enabled and can be disabled on Gigabit Ethernet interfaces. During autonegotiation, advertisement for flow control, speed, and duplex occurs, depending on the media (fiber or copper) in use.

Speed and duplex configurations can be advertised using autonegotiation. The values that are negotiated are:

- For Gigabit Ethernet interfaces using RJ-45 ports and for Copper (Cu) SFP ports—10, 100, and 1000 Mbps for speed and full-duplex mode. Link speed is not negotiated when using fiber interfaces.

To disable autonegotiation, use the following command in interface configuration mode:

Command	Purpose
<b>no negotiation auto</b>  Router (config-if) # <b>no negotiation auto</b>	Disables autonegotiation on Gigabit Ethernet interfaces. No advertisement of flow control occurs.

## Configuring Carrier Ethernet Features

For information about configuring an Ethernet interface as a layer 2 Ethernet virtual circuit (EVC) or Ethernet flow point (EFP), see the Ethernet Virtual Connections.

## Saving the Configuration

To save your running configuration to NVRAM, use the following command in privileged EXEC configuration mode:

Command	Purpose
<b>copy running-config startup-config</b>  Router# <b>copy running-config startup-config</b>	Writes the new configuration to NVRAM.

For information about managing your system image and configuration files, refer to the [Cisco IOS Configuration Fundamentals Configuration Guide](#) and publications that correspond to your Cisco IOS software release.

## Shutting Down and Restarting an Interface

You can shut down and restart any of the interface ports on an interface module independently of each other. Shutting down an interface stops traffic and enters the interface into an “administratively down” state.

If you are preparing for an OIR of an interface module, it is not necessary to independently shut down each of the interfaces prior to deactivation of the module.

Command	Purpose
<p><b>shutdown</b></p> <pre>router#configure terminal Enter configuration commands, one per line. End with CNTL/Z. router(config) router(config)#interface GigabitEthernet 0/1/0 router(config-if)#shutdown</pre> <p><b>no shutdown</b></p> <pre>router#configure terminal Enter configuration commands, one per line. End with CNTL/Z. router(config) router(config)#interface GigabitEthernet 0/1/0 router(config-if)#no shutdown</pre>	<p>Restarts, stops, or starts an interface.</p>

## Verifying the Interface Configuration

Besides using the **show running-configuration** command to display the configuration settings, you can use the **show interfaces gigabitethernet** command to get detailed information on a per-port basis for your Gigabit Ethernet interface module.

## Verifying Per-Port Interface Status

To find detailed interface information on a per-port basis for the Gigabit Ethernet interface module, use the **show interfaces gigabitethernet** command.

The following example provides sample output for interface port 0 on the interface module located in slot 1:

```
Router# show interfaces GigabitEthernet0/1/0
GigabitEthernet0/1/0 is up, line protocol is up
  Hardware is NCS4200-1T8LR-PS, address is d0c2.8216.0590 (bia d0c2.8216.0590)
  MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  Full Duplex, 1000Mbps, link type is auto, media type is RJ45
  output flow-control is off, input flow-control is off
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 08:59:45, output hang never
  Last clearing of show interface counters 09:00:18
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    11 packets input, 704 bytes, 0 no buffer
    Received 11 broadcasts (0 IP multicasts)
    0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog, 0 multicast, 0 pause input
    0 packets output, 0 bytes, 0 underruns
```

```

0 output errors, 0 collisions, 0 interface resets
0 unknown protocol drops
0 babbles, 0 late collision, 0 deferred
0 lost carrier, 0 no carrier, 0 pause output
0 output buffer failures, 0 output buffers swapped out

```

## Verifying Interface Module Status

You can use various **show** commands to view information specific to SFP, XFP, CWDM, and DWDM optical transceiver modules.



**Note** The **show interface transceiver** command is *not* supported on the router.

To check or verify the status of an SFP Module or XFP Module, use the following **show** commands:

Use **show hw-module slot/subslot transceiver port status** or **show interfaces interface transceiver detail** to view the threshold values for temperature, voltage and so on.

For example, **show hw-module subslot 0/5 transceiver 1 status** or **show interfaces tenGigabitEthernet 0/5/1 transceiver detail**.

Command	Purpose
<b>show hw-module slot/subslot transceiver port idprom</b>	Displays information for the transceiver identification programmable read only memory (idprom).  <b>Note</b> Transceiver types must match for a connection between two interfaces to become active.
<b>show hw-module slot/subslot transceiver port idprom status</b>	Displays information for the transceiver initialization status.  <b>Note</b> The transmit and receive optical power displayed by this command is useful for troubleshooting Digital Optical Monitoring (DOM). For interfaces to become active, optical power must be within required thresholds.
<b>show hw-module slot/subslot transceiver port idprom dump</b>	Displays a dump of all EEPROM content stored in the transceiver.

The following **show hw-module subslot** command sample output is for 1000BASE BX10-U:

```

Router#show hw-module subslot 0/2 transceiver 0 idprom brief

IDPROM for transceiver GigabitEthernet0/2/0:
Description                               = SFP or SFP+ optics (type 3)
Transceiver Type:                          = 1000BASE BX10-U (259)
Product Identifier (PID)                    = GLC-BX-U
Vendor Revision                             = 1.0
Serial Number (SN)                          = NPH20441771
Vendor Name                                  = CISCO-NEO
Vendor OUI (IEEE company ID)                = 00.15.06 (5382)
CLEI code                                    = IPUAG5RAC
Cisco part number                           = 10-2094-03

```

```

Device State = Enabled.
Date code (yy/mm/dd) = 16/11/12
Connector type = LC.
Encoding = 8B10B (1)
Nominal bitrate = GE (1300 Mbits/s)
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
Router#

```

The following **show hw-module subslot** command sample output is for an SFP+ 10GBASE-SR:

```

Router#show hw-module subslot 0/2 transceiver 8 idprom brief

IDPROM for transceiver TenGigabitEthernet0/2/8:
Description = SFP or SFP+ optics (type 3)
Transceiver Type: = SFP+ 10GBASE-SR (273)
Product Identifier (PID) = SFP-10G-SR
Vendor Revision = 2
Serial Number (SN) = JUR2052G19W
Vendor Name = CISCO-LUMENTUM
Vendor OUI (IEEE company ID) = 00.01.9C (412)
CLEI code = COUIA8NCAA
Cisco part number = 10-2415-03
Device State = Enabled.
Date code (yy/mm/dd) = 16/12/21
Connector type = LC.
Encoding = 64B/66B (6)
Nominal bitrate = (10300 Mbits/s)
Minimum bit rate as % of nominal bit rate = not specified
Maximum bit rate as % of nominal bit rate = not specified
Router#

```




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**Note** VID for optics displayed in **show inventory** command and vendor revision shown in **idprom detail** command output are stored in different places in Idprom.

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## Configuring LAN/WAN-PHY Controllers

The LAN/WAN-PHY controllers are configured in the physical layer control element of the Cisco IOS XE software.

### Restrictions for LAN/WAN-PHY Mode

- Effective with Cisco IOS XE Release 3.18.1SP, A900-IMA8Z Interface Modules (IM) support LAN/WAN-PHY mode.
- The following A900-IMA8Z IM alarms are not supported:
  - NEWPTR
  - PSE
  - NSE
  - FELCDP

- FEAIISP

## Configuring LAN-PHY Mode

This section describes how to configure LAN-PHY mode on the Gigabit Ethernet interface modules.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<p><b>show controllers wanphy <i>slot/subslot/port</i></b></p> <p><b>Example:</b></p> <pre>Router# show controllers wanphy 0/1/0  TenGigabitEthernet0/1/0 Mode of Operation: WAN Mode SECTION LOF = 0                LOS    = 0                        BIP(B1) = 0  LINE AIS = 0                RDI    = 0 FEBE = 0               BIP(B2) = 0  PATH AIS = 0                RDI    = 0 FEBE = 0               BIP(B3) = 0 LOP = 0                NEWPTR = 0 PSE = 0                NSE     = 0  WIS ALARMS SER    = 0             FELCDP = 0 FEAIISP = 0  WLOS  = 0             PLCD   = 0 LFEBIP = 0           PBEC   = 0  Active Alarms[All defects]: SWLOF LAIS PAIS SER Active Alarms[Highest Alarms]: SWLOF Alarm reporting enabled for: SF SWLOF B1-TCA B2-TCA PLOP WLOS Rx(K1/K2): 00/00 Tx(K1/K2): 00/00 S1S0 = 00, C2 = 0x1A PATH TRACE BUFFER: UNSTABLE Remote J1 Byte : BER thresholds: SD = 10e-6 SF = 10e-3 TCA thresholds: B1 = 10e-6 B2 = 10e-6                 B3 = 10e-6</pre>	<p>Displays the configuration mode of the LAN/WAN-PHY controller. Default configuration mode is LAN.</p> <p>If the configuration mode is WAN, complete the rest of the procedure to change the configuration mode to LAN.</p> <ul style="list-style-type: none"> <li>• <i>slot /subslot /port</i>—The location of the interface.</li> </ul>
<b>Step 2</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Router# configure terminal</pre>	<p>Enters global configuration mode.</p>
<b>Step 3</b>	<p>Do the following:</p> <ul style="list-style-type: none"> <li>• <b>hw-module subslot <i>slot/subslot</i> interface <i>port</i> enable LAN</b></li> </ul> <p><b>Example:</b></p>	<p>Configures LAN-PHY mode for the Ethernet interface module.</p> <ul style="list-style-type: none"> <li>• <i>slot /subslot /port</i>—The location of the interface.</li> </ul>

	Command or Action	Purpose
	<pre>Router(config)# hw-module subslot 0/1 enable LAN</pre> <p><b>Example:</b></p> <pre>Router(config)# hw-module subslot 0/1 interface 1 enable LAN</pre>	Use the <b>hw-module subslot slot/subslot interface port enable LAN</b> command to configure the LAN-PHY mode for the Ethernet interface module.
<b>Step 4</b>	<p><b>exit</b></p> <p><b>Example:</b></p> <pre>Router(config)# exit</pre>	Exits global configuration mode and enters privileged EXEC mode.
<b>Step 5</b>	<p><b>show controllers wanphy slot/subslot/port</b></p> <p><b>Example:</b></p> <pre>Router# show controllers wanphy 0/1/2 TenGigabitEthernet0/1/2 Mode of Operation: LAN Mode</pre>	Displays configuration mode for the LAN/WAN-PHY controller. The example shows the mode of operation as LAN mode for the Cisco 8-Port 10 Gigabit Ethernet LAN/WAN-PHY Controller.

## Configuring WAN-PHY Mode

This section describes how to configure WAN-PHY mode on the Gigabit Ethernet interface modules.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<p><b>show controllers wanphy slot/subslot/port</b></p> <p><b>Example:</b></p> <pre>Router# show controllers wanphy 0/1/0 TenGigabitEthernet0/1/0 Mode of Operation: LAN Mode</pre>	<p>Displays the configuration mode of the WAN-PHY controller. Default configuration mode is LAN.</p> <ul style="list-style-type: none"> <li>• <i>slot /subslot /port</i>—The location of the interface.</li> </ul>
<b>Step 2</b>	<p><b>configure terminal</b></p> <p><b>Example:</b></p> <pre>Router# configure terminal</pre>	Enters global configuration mode.
<b>Step 3</b>	<p>Do the following:</p> <ul style="list-style-type: none"> <li>• <b>hw-module subslot slot/subslot interface port enable WAN</b></li> </ul> <p><b>Example:</b></p> <pre>Router(config)# hw-module subslot 0/1 enable WAN</pre> <p><b>Example:</b></p>	<p>Configures WAN-PHY mode for the Ethernet interface module.</p> <ul style="list-style-type: none"> <li>• <i>slot /subslot /port</i> —The location of the interface.</li> </ul> <p>Use the <b>hw-module subslot slot/subslot interface port enable WAN</b> command to configure the WAN-PHY mode for the Ethernet interface module.</p>



	Command or Action	Purpose
	Router(config)# hw-module subslot 0/1 interface 1 enable WAN	
<b>Step 4</b>	<b>exit</b> <b>Example:</b>  Router(config)# exit	Exits global configuration mode and enters privileged EXEC mode.
<b>Step 5</b>	<b>show controllers wanphy slot/subslot/port</b> <b>Example:</b>  Router# show controllers wanphy 0/1/5  TenGigabitEthernet0/1/5  <b>Mode of Operation: WAN Mode</b> SECTION LOF = 0 LOS = 0 BIP(B1) = 0 LINE AIS = 0 RDI = 0 FEBE = 0 BIP(B2) = 0 PATH AIS = 0 RDI = 0 FEBE = 0 BIP(B3) = 0 LOP = 0 NEWPTR = 0 PSE = 0 NSE = 0 WIS ALARMS SER = 0 FELCDP = 0 FEAISP = 0 WLOS = 0 PLCD = 0  LFEBIP = 0 PBEC = 0  Active Alarms[All defects]: SWLOF LAIS PAIS SER Active Alarms[Highest Alarms]: SWLOF Alarm reporting enabled for: SF SWLOF B1-TCA B2-TCA PLOP WLOS Rx(K1/K2): 00/00 Tx(K1/K2): 00/00 S1S0 = 00, C2 = 0x1A PATH TRACE BUFFER: UNSTABLE Remote J1 Byte : BER thresholds: SD = 10e-6 SF = 10e-3 TCA thresholds: B1 = 10e-6 B2 = 10e-6 B3 = 10e-6	Displays configuration mode for the LAN/WAN-PHY controller. The example shows the mode of operation as WAN mode for the Cisco 8-Port 10 Gigabit Ethernet LAN/WAN-PHY Controller.

## Configuring WAN-PHY Error Thresholds

This section describes how to configure WAN-PHY Signal Failure (SF) and Signal Degrade (SD) Bit Error Rate (BER) reporting and thresholds.

An SF alarm is triggered if the line bit error (B2) rate exceeds a user-provisioned threshold range (over the range of 10e-3 to 10e-9).

An SD alarm is declared if the line bit error (B2) rate exceeds a user-provisioned threshold range (over the range of 10e-3 to 10e-9). If the B2 errors cross the SD threshold, a warning about link quality degradation is triggered. The WAN-PHY alarms are useful for some users who are upgrading their Layer 2 core network from a SONET ring to a 10-Gigabit Ethernet ring.

### Before you begin

The controller must be in the WAN-PHY mode before configuring the SF and SD BER reporting and thresholds.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	<b>configure terminal</b> <b>Example:</b> <pre>Router# configure terminal</pre>	Enters global configuration mode.
<b>Step 2</b>	<b>controller wanphy slot/subslot/port</b> <b>Example:</b> <pre>Router(config)# controller wanphy 0/3/0</pre>	Enters WAN physical controller configuration mode in which you can configure a 10-Gigabit Ethernet WAN-PHY controller.  <i>slot /subslot /port</i> —The location of the interface.
<b>Step 3</b>	<b>wanphy {delay   flag   report-alarm   threshold {b1-tca   b2-tca   sd-ber   sf-ber [bit error rate]}}</b> <b>Example:</b> <pre>Router(config-controller)# wanphy threshold b1-tca 6</pre>	Configures WAN-PHY controller processing. <ul style="list-style-type: none"> <li>• delay—Delays WAN-PHY alarm triggers.</li> <li>• flag—Specifies byte values.</li> <li>• report-alarm—Configures WAN-PHY alarm reporting.</li> <li>• threshold—Sets BER threshold values. <ul style="list-style-type: none"> <li>• b1-tca—Sets B1 alarm BER threshold.</li> <li>• b2-tca—Sets B2 alarm BER threshold.</li> <li>• sd-ber—Sets Signal Degrade BER threshold.</li> <li>• sf-ber—Sets Signal Fail BER threshold.</li> </ul> </li> <li>• bit error rate— Specifies bit error rate.</li> </ul>
<b>Step 4</b>	<b>end</b> <b>Example:</b> <pre>Router(config-controller)# end</pre>	Exits controller configuration mode and enters privileged EXEC mode.

# Configuration Examples

## Example: Basic Interface Configuration

The following example shows how to enter the global configuration mode to configure an interface, configure an IP address for the interface, and save the configuration:

```
! Enter global configuration mode.

!

Router# configure terminal

! Enter configuration commands, one per line. End with CNTL/Z.

!

! Specify the interface address.

!

Router(config)# interface gigabitethernet 0/0/1

!

! Configure an IP address.

!

Router(config-if)# ip address 192.168.50.1 255.255.255.0

!

! Start the interface.

!

Router(config-if)# no shut

!

! Save the configuration to NVRAM.

!

Router(config-if)# exit
```

```
Router# copy running-config startup-config
```

## Example: MTU Configuration




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**Note** The maximum number of unique MTU values that can be configured on the physical interfaces on the chassis is eight. Use the **show platform hardware pp active interface mtu command** to check the number of values currently configured on the router.

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The following example shows how to set the MTU interface to 9216 bytes.




---

**Note** The interface module automatically adds an additional 38 bytes to the configured MTU interface size.

---

```
! Enter global configuration mode.

!

Router# configure terminal

! Enter configuration commands, one per line. End with CNTL/Z.

!

! Specify the interface address

!

Router(config)# interface gigabitethernet 0/0/1

!

! Configure the interface MTU.

!

Router(config-if)# mtu 9216
```

## Example: VLAN Encapsulation

The following example shows how to configure interface module port 2 (the third port) and configure the first interface on the VLAN with the ID number 268 using IEEE 802.1Q encapsulation:

```
! Enter global configuration mode.
```

```
!  
Router# configure terminal  
! Enter configuration commands, one per line. End with CNTL/Z.  
!  
! Enter configuration commands, one per line. End with CNTL/Z.  
!  
Router(config)# service instance 10 ethernet  
!  
! Configure dot1q encapsulation and specify the VLAN ID.  
Router(config-subif)# encapsulation dot1q 268  
!
```



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**Note** VLANs are supported only on EVC service instances and Trunk EFP interfaces.

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