Configuring Ethernet Interfaces

This module describes the configuration of Ethernet interfaces.

The following distributed ethernet architecture delivers network scalability and performance, while enabling service providers to offer high-density, high-bandwidth networking solutions.

- 10-Gigabit

- 40-Gigabit

- 100-Gigabit

These solutions are designed to interconnect the router with other systems in point-of-presence (POP)s, including core and edge routers and Layer 2 and Layer 3 switches.

Restrictions

Router does not support configuration of the static mac address.

Configuring Gigabit Ethernet Interfaces

Use this procedure to create a basic Ethernet interface configuration.

SUMMARY STEPS

1. **show version**
2. **show interfaces** [**GigE** | **TenGigE** | | | **HundredGigE**] *interface-path-id*
3. **configure**
4. **interface** [**GigE** | **TenGigE** | | | **HundredGigE**] *interface-path-id*
5. **ipv4 address** *ip-address mask*
6. **mtu** *bytes*
7. **no shutdown**
8. **end** or **commit**
9. **show interfaces** [**GigE TenGigE HundredGigE**] *interface-path-id*

DETAILED STEPS

Step 1   **show version**

Example:

```
RP/0/RP0/CPU0:router# show version
```

(Optional) Displays the current software version, and can also be used to confirm that the router recognizes the line card.

Step 2   **show interfaces** [**GigE** |**TenGigE** | | |**HundredGigE**] *interface-path-id*

Example:

```
RP/0/RP0/CPU0:router# show interface HundredGigE 0/1/0/1
```

(Optional) Displays the configured interface and checks the status of each interface port.

Step 3   **configure**

Example:

```
RP/0/RP0/CPU0:router# configure terminal
```

Enters global configuration mode.

Step 4   **interface** [**GigE** |**TenGigE**| | |**HundredGigE**] *interface-path-id*

Example:

```
RP/0/RP0/CPU0:router(config)# interface HundredGigE 0/1/0/1
```

Enters interface configuration mode and specifies the Ethernet interface name and notation *rack/slot/module/port*. Possible interface types for this procedure are:

- GigE

- 10GigE

- 100GigE

    Note   • The example indicates a 100-Gigabit Ethernet interface in the line card in slot 1.

Step 5   **ipv4 address** *ip-address mask*

Example:

```
RP/0/RP0/CPU0:router(config-if)# ipv4 address 172.18.189.38 255.255.255.224
```

Assigns an IP address and subnet mask to the interface.

- Replace *ip-address* with the primary IPv4 address for the interface.

- Replace *mask* with the mask for the associated IP subnet. The network mask can be specified in either of two ways:

- The network mask can be a four-part dotted decimal address. For example, 255.0.0.0 indicates that each bit equal to 1 means that the corresponding address bit belongs to the network address.

    • The network mask can be indicated as a slash (/) and number. For example, /8 indicates that the first 8 bits of the mask are ones, and the corresponding bits of the address are network address.

Step 6   **mtu** *bytes*

Example:

```
RP/0/RP0/CPU0:router(config-if)# mtu 2000
```

(Optional) Sets the MTU value for the interface.

    • The configurable range for MTU values is 1514 bytes to 9646 bytes.

    • The default is 1514 bytes for normal frames and 1518 bytes for 802.1Q tagged frames.

Step 7   **no shutdown**

Example:

```
RP/0/RP0/CPU0:router(config-if)# no shutdown
```

Removes the shutdown configuration, which forces an interface administratively down.

Step 8   **end** or **commit**

Example:

```
RP/0/RP0/CPU0:router(config-if)# end
```

or

```
RP/0/RP0/CPU0:router(config-if)# commit
```

Saves configuration changes.

    • When you issue the **end** command, the system prompts you to commit changes:

```
Uncommitted changes found, commit them before exiting(yes/no/cancel)?
[cancel]:
```

    • Entering **yes** saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode.

    • Entering **no** exits the configuration session and returns the router to EXEC mode without committing the configuration changes.

    • Entering **cancel** leaves the router in the current configuration session without exiting or committing the configuration changes.

    • Use the **commit** command to save the configuration changes to the running configuration file and remain within the configuration session.

Step 9   **show interfaces** [**GigE TenGigE HundredGigE**] *interface-path-id*

Example:

```
RP/0/RP0/CPU0:router# show interfaces HundredGigE 0/1/0/1
```

(Optional) Displays statistics for interfaces on the router.

Example

This example shows how to configure an interface for a 100-Gigabit Ethernet line card:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface HundredGigE 0/1/0/1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 172.18.189.38 255.255.255.224

RP/0/RP0/CPU0:router(config-if)# mtu 2000

RP/0/RP0/CPU0:router(config-if)# no shutdown
RP/0/RP0/CPU0:router(config-if)# end
Uncommitted changes found, commit them? [yes]: yes


RP/0/RP0/CPU0:router# show interfaces HundredGigE 0/5/0/24
HundredGigE0/5/0/24 is up, line protocol is up
  Interface state transitions: 1
  Hardware is HundredGigE, address is 6219.8864.e330 (bia 6219.8864.e330)
  Internet address is 3.24.1.1/24
  MTU 9216 bytes, BW 100000000 Kbit (Max: 100000000 Kbit)
     reliability 255/255, txload 3/255, rxload 3/255
  Encapsulation ARPA,
  Full-duplex, 100000Mb/s, link type is force-up
  output flow control is off, input flow control is off
  Carrier delay (up) is 10 msec
  loopback not set,
  Last link flapped 10:05:07
  ARP type ARPA, ARP timeout 04:00:00
  Last input 00:08:56, output 00:00:00
  Last clearing of "show interface" counters never
  5 minute input rate 1258567000 bits/sec, 1484160 packets/sec
  5 minute output rate 1258584000 bits/sec, 1484160 packets/sec
     228290765840 packets input, 27293508436038 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 15 broadcast packets, 45 multicast packets
            0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     212467849449 packets output, 25733664696650 bytes, 0 total output drops
     Output 23 broadcast packets, 15732 multicast packets
     39 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions


RP/0/RP0/CPU0:router# show running-config interface HundredGigE 0/5/0/24

interface HundredGigE 0/5/0/24
 mtu 9216
 service-policy input linerate
 service-policy output elinerate
 ipv4 address 3.24.1.1 255.255.255.0
 ipv6 address 3:24:1::1/64
 flow ipv4 monitor perfv4 sampler fsm ingress
!
```

Information About Configuring Ethernet

This section provides the following information sections:

Default Configuration Values for 100-Gigabit Ethernet

This table describes the default interface configuration parameters that are present when an interface is enabled on a 100-Gigabit Ethernet line card.

Note You must use the **shutdown** command to bring an interface administratively down. The interface default is **no shutdown**. When a line card is first inserted into the router, if there is no established preconfiguration for it, the configuration manager adds a shutdown item to its configuration. This shutdown can be removed only be entering the **no shutdown** command.

Table 1: 100-Gigabit Ethernet line card Default Configuration Values

Parameter	Configuration File Entry	Default Value
MTU	**mtu**	• 1514 bytes for normal frames • 1518 bytes for 802.1Q tagged frames. • 1522 bytes for Q-in-Q frames.
MAC address	**mac address**	Hardware burned-in address (BIA)

Ethernet MTU

The Ethernet maximum transmission unit (MTU) is the size of the largest frame, minus the 4-byte frame check sequence (FCS), that can be transmitted on the Ethernet network. Every physical network along the destination of a packet can have a different MTU.

Cisco IOS XR software supports two types of frame forwarding processes:

• Fragmentation for IPV4 packets–In this process, IPv4 packets are fragmented as necessary to fit within the MTU of the next-hop physical network.

Note IPv6 does not support fragmentation.

• MTU discovery process determines largest packet size–This process is available for all IPV6 devices, and for originating IPv4 devices. In this process, the originating IP device determines the size of the largest IPv6 or IPV4 packet that can be sent without being fragmented. The largest packet is equal to the smallest MTU of any network between the IP source and the IP destination devices. If a packet is larger

than the smallest MTU of all the networks in its path, that packet will be fragmented as necessary. This process ensures that the originating device does not send an IP packet that is too large.

Jumbo frame support is automatically enable for frames that exceed the standard frame size. The default value is 1514 for standard frames and 1518 for 802.1Q tagged frames. These numbers exclude the 4-byte frame check sequence (FCS).

How to Configure Interfaces in Breakout Mode

Information About Breakout

The router supports transmission of traffic in the breakout mode. The breakout mode enables a 40 Gigabit Ethernet port to be split into four independent and logical 10 Gigabit Ethernet ports.

Configure Breakout in a Port

Configuring breakout in a port:

```
RP/0/RP0/CPU0:uut# configure
Fri Oct 11 23:58:47.165 UTC
RP/0/RP0/CPU0:uut(config)# controller optics 0/1/0/28
RP/0/RP0/CPU0:uut(config-Optics)# breakout 4x10
RP/0/RP0/CPU0:uut(config-Optics)# commit
Fri Oct 11 23:59:51.261 UTC
RP/0/RP0/CPU0:uut(config-Optics)# end
RP/0/RP0/CPU0:uut#
```

Remove the Breakout Configuration

Removing the breakout configuration:

```
RP/0/RP0/CPU0:uut# configure
Sat Oct 12 00:01:38.673 UTC
RP/0/RP0/CPU0:uut(config)# controller optics 0/1/0/28
RP/0/RP0/CPU0:uut(config-Optics)# no breakout 4x10
RP/0/RP0/CPU0:uut(config-Optics)# commit
Sat Oct 12 00:01:55.864 UTC
RP/0/RP0/CPU0:uut(config-Optics)# end
```

Verify a Breakout Configuration

Verifying a breakout configuration:

```
RP/0/RP0/CPU0:uut# show running-config controller optics 0/1/0/28
Sat Oct 12 00:11:33.962 UTC
controller Optics0/1/0/28
breakout 4x10
!

RP/0/RP0/CPU0:uut# show int br location 0/1/CPU0 | i Te0/1/0/28
Sat Oct 12 00:11:38.609 UTC
        Te0/1/0/27/0          up          up                    ARPA 10000   10000000
        Te0/1/0/27/1          up          up                    ARPA 10000   10000000
        Te0/1/0/27/2          up          up                    ARPA 10000   10000000
```

```
Te0/1/0/27/3          up          up               ARPA 10000   10000000
Te0/1/0/28/0          up          up               ARPA 10000   10000000
Te0/1/0/28/1          up          up               ARPA 10000   10000000
Te0/1/0/28/2          up          up               ARPA 10000   10000000
Te0/1/0/28/3          up          up               ARPA 10000   10000000
```

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