



## **Interface and Hardware Component Command Reference for Cisco NCS 5000 Series Routers**

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## Preface

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This command reference describes the Cisco IOS XR Interfaces commands.

The preface for the *Interface and Hardware Component Command Reference for Cisco NCS 5000 Series Routers* contains the following sections:

- [Changes to This Document, on page vii](#)
- [Communications, Services, and Additional Information, on page viii](#)

## Changes to This Document



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**Note** *This software release has reached end-of-life status. For more information, see the [End-of-Life and End-of-Sale Notices](#).*

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**Table 1: Changes to This Document**

Date	Summary
Nov 2017	Initial release of the cumulative command reference document that covers all updates from Release 4.3.0 onwards.
March 2018	Republished for Release 6.3.2
March 2018	Republished for Release 6.4.1
July 2018	Republished for Release 6.5.1
December 2018	Republished for Release 6.6.1
January 2019	Republished for Release 6.5.2
May 2019	Republished for Release 6.6.25
August 2019	Republished for Release 7.0.1
December 2019	Republished for Release 6.6.3

Date	Summary
January 2020	Republished for Release 7.1.1
August 2020	Republished for Release 7.1.2
November 2020	Republished for Release 7.1.3
February 2021	Republished for Release 7.3.1
July 2021	Republished for Release 7.4.1
November 2021	Republished for Release 7.5.1
July 2022	Republished for Release 7.7.1
November 2022	Republished for Release 7.8.1
March 2023	Republished for Release 7.5.4
April 2023	Republished for Release 7.9.1
August 2023	Republished for Release 7.10.1

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# Ethernet Interface Commands

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This module provides command line interface (CLI) commands for configuring Ethernet interfaces on the Cisco NCS 5000 Series Router.

For detailed information about Ethernet interfaces concepts, configuration tasks, and examples, refer to the *Interface and Hardware Component Configuration Guide for Cisco NCS 5000 Series Routers*

- [carrier-delay](#), on page 2
- [clear error-disable](#), on page 4
- [error-disable recovery cause](#) , on page 5
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- [small-frame-padding](#), on page 27

# carrier-delay

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

**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 2147483647.

**up** *milliseconds* Length of time, in milliseconds, to delay the processing of hardware link up notifications. Range is from 0 through 2147483647.

## Command Default

No carrier-delay is used, and the upper layer protocols are notified as quickly as possible when a physical link goes down.

## Command Modes

Interface configuration

## Command History

### Release Modification

Release	Modification
Release 6.0	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. No carrier-delay information is displayed if carrier-delay has not been configured on an interface.

## Task ID

### Task ID Operations

interface read, write
--------------------------

## Examples

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

```
RP/0/RP0/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/RP0/CPU0:router(config-if)# carrier-delay up 100 down 100
```

# clear error-disable

To clear error-disable reason of an interface, use the **clear error-disable** command in the EXEC mode.

**clear error-disable** { **interface**<interface> | { **all** | <location > } }

## Syntax Description

*interface* The interface for which you want to clear the error-disable reason.

*location* Clear error-disable for all interfaces on a specific card, or on all cards.

## Command Default

An interface, location o

## Command Modes

XR EXEC mode

## Command History

Release	Modification
Release 3.7.3	This command was introduced.

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

Task ID	Operation
interface	exec

## Example

The following example shows how to clear error-disable reason for an interface:

```
RP/0/0/CPU0:ios#sh error-disable
Interface          Error-Disable reason          Retry (s)  Time disabled
-----
Gi0/0/0/0          ethernet-oam-link-fault      ---       01:00 01 Jan

RP/0/0/CPU0:ios#
RP/0/0/CPU0:ios#clear error-disable interface G 0/0/0/0
```

# error-disable recovery cause

To configure error-disable to automatically attempt recovery, use the **error-disable recovery cause** command.

**error-disable recovery cause** { **ethernet-oam-critical-event** | **ethernet-oam-link-fault** | . . . } [**interval**<30 – 1,000,000 >]

Syntax Description	link-oam-critical-event	Used when a critical event is detected by Ethernet Link OAM.
	<i>cause</i>	One of the defined error-disable causes, for example: ethernet-oam-link-fault.
	<i>interval</i>	Specifies the interval, in seconds, at which retries are attempted. The range is 30 to 1,000,000.
	<b>link-oam-link-fault</b>	Used when a unidirectional link is detected by Ethernet Link OAM.

**Command Default** Default interval period is 300 seconds.

**Command Modes** XR Config mode

Command History	Release	Modification
	Release 3.7.3	This command was introduced.

**Usage Guidelines** When error disable recovery is enabled, the interface automatically recovers from the error-disabled state, and the device retries bringing the interface up.

Task ID	Task ID	Operation
	interface	write

## Example

The following example shows the full list of error-disable recovery causes:

```
RP/0/0/CPU0:ios(config)#error-disable recovery cause ?
cluster-udld           Used when UDLD is enabled on a Cluster port and UDLD is in
  aggressive mode and UDLD goes uni directional
link-oam-capabilities-conflict  Used when Ethernet Link OAM configuration conflicts with
the peer
link-oam-critical-event      Used when a critical event is detected by Ethernet Link OAM
link-oam-discovery-timeout   Used when an Ethernet Link OAM session fails to come up in
  time
link-oam-dying-gasp         Used when a dying gasp is detected by Ethernet Link OAM
link-oam-link-fault         Used when a unidirectional link is detected by Ethernet
Link OAM
link-oam-miswired           Used when a mis-wiring is detected with Ethernet Link OAM
link-oam-session-down       Used when an Ethernet Link OAM session goes down
link-oam-threshold-breached  Used when a configured error threshold has been breached
pvrst-pvid-mismatch        Used when a PVRST BPDU packet is tagged with a VLAN ID which
  is different from the VLAN ID on which it was sent.
stp-bpdu-guard             Used when an STP BPDU is received on a port on which BPDU
```

Guard is configured	
stp-legacy-bpdu	Used when a legacy BPDU is received on a port. Only MSTP
and RSTP BPDUs are supported	
udld-loopback	Used when UDLD detects that the port is in loopback mode (i.e.
its Tx is directly connected to its Rx)	
udld-neighbor-mismatch	Used when mismatched neighbors are detected by UDLD
udld-timeout	Used when all UDLD neighbors on the link have timed out
udld-unidirectional	Used when a link is detected to be unidirectional

# 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}
no flow-control ingress {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 autonegotiate is enabled on the interface, then the default is negotiated.

If autonegotiate 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 6.0	This command was introduced.

## Usage Guidelines

When you explicitly enable the sending of flow-control pause frames, the value you configured with the **flow-control** command overrides any autonegotiated 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.

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

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/RP0/CPU0:router(config)# interface TenGigE 0/0/0/3
RP/0/RP0/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 XR Config mode.

```
interface {TenGigE | HundredGigE} interface-path-id
no interface {TenGigE | HundredGigE} interface-path-id
```

## Syntax Description

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

**HundredGigE** Specifies or creates a Hundred Gigabit Ethernet (100 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 History

Release	Modification
Release 6.0	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. Always 0.
- *port*: Physical port number of the interface.

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

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/0/0/4
RP/0/RP0/CPU0:router(config-if)#
```



# 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 }
no loopback
```

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 6.0	This command was 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.

## Examples

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

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/0/0/3
RP/0/RP0/CPU0:router(config-if)# loopback internal
```

## 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
no mac-address
```

### 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 6.0	This command was 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 (HundredGigabit 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 Ethernet interface located at 0/1/0/0:

```
RP/0/RP0/CPU0:router(config)# interface HundredGigE 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# mac-address 0001.2468.ABCD
```

## 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 802.3 specification, use the **no** form of this command.

**packet-gap non-standard**  
**no 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 802.3 specification.

**Command Modes** Interface configuration

Command History	Release	Modification
	Release 6.0	This command was 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 802.3 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/RP0/CPU0:router(config)# interface TenGigE 0/0/0/3
RP/0/RP0/CPU0:router(config-if)# packet-gap non-standard
```

## show controllers (Ethernet)

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

```
show controllers { TenGigE | TwentyFiveGigE | FortyGigE | HundredGigE | FourHundredGigE
} interface-path-id [{ all | description | periodic | pm | bert | internal | mac | phy | stats | xgxs }]
```

### Syntax Description

<b>{TenGigE HundredGigE}</b>	Specifies the type of Ethernet interface whose status and configuration information you want to display.
<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>internal</b>	Displays internal information for the interface.
<b>mac</b>	Displays mac information for the interface.
<b>phy</b>	Displays physical information for the interface.
<b>stats</b>	Displays statistical information for the interface.
<b>xgxs</b>	Displays information about the 10 Gigabit Ethernet Extended Sublayer (XGXS).

### Command Default

No default behavior or values

### Command Modes

XR EXEC mode

### Command History

Release	Modification
Release 6.0	This command was introduced.

### 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. Always 0.

- *port*: Physical port number of the interface.
- If specifying a virtual interface, the number range varies, depending on interface type.



**Note** When the NC57-MPA-1FH1D-S modular port adapter is plugged into the NC57-MOD-S line card, the Forward Error Correction (FEC) is disabled for 100GE for optics.



**Note** The Forward Error Correction (FEC) is disabled for 25GE, and 100GE optics in the NCS57-MOS-S line card.

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

## Examples

The following example shows sample output from the **show controllers TenGigE** command:

```
RP/0/RP0/CPU0:router# show controllers TenGigE 0/0/0/3
PHY:
XENPAK device registers:
=====

Vendor Name: CISCO-SUMITOMO
Vendor PN: SXP3101NV-C1
Vendor Rev: A1
Vendor SN: ECL120701L2

Package OUI: 0041f426
Vendor OUI: 00137b11
Vendor Date Code: 2004071200
nvr_control_status = 0x0007
nvr_version = 0x1e
nvr_size0 = 0x01
nvr_size1 = 0x00
mem_used0 = 0x01
mem_used1 = 0x00
basic_addr = 0x0b
cust_addr = 0x77
vend_addr = 0xa7
ext_vend_addr0= 0x00
ext_vend_addr1= 0xff
reserved0 = 0x00
tcvr_type = 0x01
connector = 0x01
```

## show controllers (Ethernet)

```

encoding = 0x01
bitrate0 = 0x27
bitrate1 = 0x10
protocol = 0x01
x_gbe_code_byte_0 = 0x02
x_gbe_code_byte_1 = 0x00
sonet_sdh_code_byte_0 = 0x00
sonet_sdh_code_byte_1 = 0x00
sonet_sdh_code_byte_2 = 0x00
sonet_sdh_code_byte_3 = 0x00
x_gfc_code_byte_0 = 0x00
x_gfc_code_byte_1 = 0x00
x_gfc_code_byte_2 = 0x00
x_gfc_code_byte_3 = 0x00
range0 = 0x03
range1 = 0xe8
fibre_type_byte_0 = 0x20
fibre_type_byte_1 = 0x00

Center Wavelength:
chan0 = 1310.00 nm

chan1 = 0.00 nm
chan2 = 0.00 nm
chan3 = 0.00 nm

basic_checksum = 0x00

Link Alarm Status Registers:
rx_alarm_control = 0x0019
tx_alarm_control = 0x0059
lasi_control = 0x0000
rx_alarm_status = 0x0018
tx_alarm_status = 0x0058
lasi_status = 0x0005

Digital Optical Monitoring:
Transceiver Temp: 34.246 C
Laser Bias Current: 4.8640 mA
Laser Output Power: 0.5059 mW, -3.0 dBm
Receive Optical Power: 0.0000 mW, -inf dBm

Quake: devid 0x0043a400
10GE PMA/PMD Registers:
Control = 0x2040 Status = 0x0082 Dev ID 0 = 0x0043 Dev ID 1 = 0xa400 Speed Ability =
0x0001 Devices 1 = 0x001a Devices 2 = 0x0000 Control 2 = 0x0006 Status 2 = 0xb541 Tx
Disable = 0x0000 Rx Signal Detect = 0x0000 OUI 0 = 0x0041 OUI 1 = 0xf426
Quake (1.c001) = 0x0003

10GE PCS Registers:
Control = 0x2040 Status = 0x0082 Dev ID 0 = 0x0043 Dev ID 1 = 0xa400 Speed Ability =
0x0001 Devices 1 = 0x001a Devices 2 = 0x0000 Control 2 = 0x0000 Status 2 = 0x8401 PKG ID 0
= 0x0000 PKG ID 1 = 0x0000 Base X Status = 0x0000 Base X Control = 0x0000 Base R Status 1
= 0x0004 Base R Status 2 = 0x0000 Base R jitter seed a0 = 0x0000 Base R jitter seed a1 =
0x0000 Base R jitter seed a2 = 0x0000 Base R jitter seed a3 = 0x0000 Base R jitter seed b0
= 0x0000 Base R jitter seed b1 = 0x0000 Base R jitter seed b2 = 0x0000 Base R jitter seed
b3 = 0x0000 Base R jitter test control = 0x0000 Base R jitter test counter = 0x0000

10GE XS/XS Registers:
Control = 0x2040 Status = 0x0002
Dev ID 0 = 0x0043 Dev ID 1 = 0xa400
Speed Ability = 0x0001 Devices 1 = 0x001a Devices 2 = 0x0000 Status 2 = 0x8000 PKG ID 0 =

```

```

0x0000 PKG ID 1 = 0x0000 Lane Status = 0x1c0f Test Control = 0x0000

DTE XGXS (BCM8011):
Control = 0x0000 Status = 0x801f
Dev ID 0 = 0x0040 Dev ID 1 = 0x6092
Control 2 = 0x202f
Status 2 = 0x8b01

Speed Ability = 0x0001 Devices 1 = 0x001a Devices 2 = 0x0000 Status 2 = 0x8000 PKG ID 0 =
0x0000 PKG ID 1 = 0x0000 Lane Status = 0x1c0f Test Control = 0x0000

DTE XGXS (BCM8011):
Control = 0x0000 Status = 0x801f
Dev ID 0 = 0x0040 Dev ID 1 = 0x6092
Control 2 = 0x202f
Status 2 = 0x8b01

MAC (PLA):
Unicast MAC Address entries = 0

MAC (PLA) device is enabled
MAC (PLA) device is in promiscuous mode
MAC (PLA) device loopback is disabled

MAC (PLA) device MTU = 8226

8x10GE PLIM Registers:
local_regs_id = 0xa6602000 local_regs_inter_stat = 0x00000000 local_regs_inter_stat_alias
= 0x00000000 local_regs_inter_enbl_woset = 0x0000ff00 local_regs_inter_enbl_woclr =
0x0000ff00 local_regs_chip_reset = 0x00000000 local_regs_reset = 0xff000000
local_regs_misc_io = 0x00010000 sn_link_framed = 0x00000001 sn_link_crc_errors =
0x00000000 sn_link_force_reframe = 0x00000000 sn_link_error_reframe = 0x00000001
sn_link_force_error = 0x00000000 sn_link_error_cause = 0x00000000
sn_link_error_interrupt_mask = 0x00000003 channel0_control = 0x000000a6 channel1_control =
0x000000a6 channel2_control = 0x0000008e channel3_control = 0x0000008e channel4_control =
0x0000008e channel5_control = 0x000000a6 channel6_control = 0x000000a6 channel7_control =
0x0000008e

```

The following example shows sample output from the base form of the **show controllers TenGigE all** command:

```

RP/0/RP0/CPU0:router# show controllers TenGigE 0/0/0/4 all
Operational data for interface TenGigE0/0/0/4:

State:
  Administrative state: disabled
  Operational state: Down (Reason: The optics for the port are not present)
  LED state: Yellow On

Media:
  Media type: Initializing, true state or type not yet known
  No optics present

MAC address information:
  Operational address: 001d.353b.975e
  Burnt-in address: 001d.353b.975e
  No unicast addresses in filter
  No multicast addresses in filter

Autonegotiation disabled.

Operational values:
  Speed: 10Gbps

```

## show controllers (Ethernet)

```

Duplex: Full Duplex
Flowcontrol: None
Loopback: None (or external)
MTU: 1526
MRU: 1526
Inter-packet gap: standard (12)

BERT status for TenGigE0/0/0/4:
BERT State           :      DISABLED
Test Pattern         :      None test pattern
Time Remaining       :      0
Time Interval        :      0
Statistics for interface TenGigE0/0/0/4 (cached values):

Ingress:
  Input total bytes      = 0
  Input good bytes       = 0

  Input total packets    = 0
  Input 802.1Q frames    = 0
  Input pause frames     = 0
  Input pkts 64 bytes    = 0
  Input pkts 65-127 bytes = 0
  Input pkts 128-255 bytes = 0
  Input pkts 256-511 bytes = 0
  Input pkts 512-1023 bytes = 0
  Input pkts 1024-1518 bytes = 0
  Input pkts 1519-Max bytes = 0

  Input good pkts        = 0
  Input unicast pkts     = 0
  Input multicast pkts   = 0
  Input broadcast pkts   = 0

  Input drop overrun     = 0
  Input drop abort       = 0
  Input drop unknown 802.1Q = 0
  Input drop other       = 0

  Input error giant      = 0
  Input error runt       = 0
  Input error jabbers    = 0
  Input error fragments  = 0
  Input error CRC        = 0
  Input error collisions = 0
  Input error symbol     = 0
  Input error other      = 0

  Input MIB giant        = 0
  Input MIB jabber       = 0
  Input MIB CRC          = 0

Egress:
  Output total bytes     = 0
  Output good bytes      = 0

  Output total packets   = 0
  Output 802.1Q frames   = 0
  Output pause frames    = 0
  Output pkts 64 bytes   = 0
  Output pkts 65-127 bytes = 0
  Output pkts 128-255 bytes = 0
  Output pkts 256-511 bytes = 0
  Output pkts 512-1023 bytes = 0

```



```
Output pkts 1024-1518 bytes = 0
Output pkts 1519-Max bytes = 0

Output good pkts = 0
Output unicast pkts = 0
Output multicast pkts = 0
Output broadcast pkts = 0

Output drop underrun = 0
Output drop abort = 0
Output drop other = 0

Output error other = 0
```

Management information for interface TenGigE0/0/0/4:

```
Port number: 2
Bay number: 0
Interface handle: 0x100000c0
```

Config:

```
Auto-negotiation: Configuration not supported (Off)
Carrier delay (up): Not configured
Carrier delay (down): Not configured
Speed: Configuration not supported (10Gbps)
Duplex: Configuration not supported (Full Duplex)
Flow Control: Not configured (None)
IPG: Not configured (standard (12))
Loopback: Not configured (None)
MTU: Not configured
Soft Bandwidth: Not configured
```

Driver constraints:

```
Min MTU: 64 bytes
Max MTU: 9216 bytes
Max speed: 10Gbps
Interface type: TenGigE
Management interface: No
Promiscuous mode: Yes
Allowed config mask: 0x27b
```

Cached driver state:

```
MTU: 1522 bytes
Burnt-in MAC address: 001d.353b.975e
```

Bundle settings:

```
Aggregated: No
Bundle MTU: 1514 bytes
Bundle MAC address: 001d.353b.975e
```

Port FSM state:

```
Port is disabled, due to an admin down condition.
```

Complete FSM state:

```
Admin down
Bundle admin up
Client admin up
Client admin tx not disabled
Port disabled
Port tx disabled
Hardware link down
```

IDB interface state information:

```
IDB bundle admin up
IDB client admin up
IDB client tx admin up
```

## show controllers (Ethernet)

```

IDB error disable not set

0 Unicast MAC Addresses:

0 Multicast MAC Addresses:

0 Unicast Bundle MAC Addresses:

0 Multicast Bundle MAC Addresses:

Current Data
NP(01) Version      : 0003
Structure Version   : 2582
XAUI Interface      : B
MAC addr            : 00.1d.35.3b.97.5e
RX enabled          : False
TX enabled          : True
Obey Pause Frames   : False
TX Pause Frames     : False
Pause Re-TX Period : 3000000
Min Frame Len       : 60
Max Frame Len       : 1526
Ignore Errors       : False
Add CRC             : True
Strip CRC           : True
Ignore CRC Errors   : False
DMA Add CRC         : False
DMA Strip CRC       : False
Ignore Length Error: True
Pad Short Frames    : True
Min TX IFG         : 12
Min RX IFG         : 4
IFG Rate Control    : False
Hi Gig Mode        : False
Discard Ctrl Frames: True
Enable Stats Update: True
RX Stats Int Mask  : 0x00000000
TX Stats Int Mask  : 0x00000000

Port Number        : 2
Port Type          : 10GE
Transport mode     : LAN
BIA MAC addr      : 001d.353b.975e
Oper. MAC addr    : 001d.353b.975e
Port Available     : true
Status polling is  : enabled
Status events are  : enabled
I/F Handle        : 0x100000c0
Cfg Link Enabled   : disabled
H/W Tx Enable     : yes
MTU               : 1526
H/W Speed         : 10 Gbps
H/W Duplex        : Full
H/W Loopback Type : None
H/W FlowCtrl type : None
H/W AutoNeg Enable: Off
H/W Link Defects  : interface is admin down
Link Up           : no
Link Led Status   : Shutdown
Symbol errors     : 0
Serdes version    : 14.42
Input good underflow : 0
Input ucast underflow : 0

```

```

Output ucast underflow      : 0
Input unknown opcode underflow: 0
Pluggable Present          : no
Pluggable Type              : Unknown pluggable optics
Pluggable Compl.           : Not Checked
Pluggable Type Supp.:      Not Checked
Pluggable PID Supp.        : Not Checked
Pluggable Scan Flg: false

```

XFP #2 is not present

```

Serdes Registers and info port: 2
  EDC Status      : 000000050 - EDC Acquiring
  Rx detected     : No
  Block lock      : No
  Tx aligned      : Yes

```

The following example shows sample output from the **show controllers TenGigE bert** command:

```
RP/0/RP0/CPU0:router# show controllers TenGigE 0/0/0/2 bert
```

BERT status for TenGigE0/0/0/2:

```

BERT State           :      DISABLED
Test Pattern         :      None test pattern
Time Remaining       :      0
Time Interval        :      0

```

The following example shows sample output from the **show controllers TenGigE control** command:

```
RP/0/RP0/CPU0:router# show controllers TenGigE 0/0/0/2 control
Management information for interface TenGigE0/0/0/2:
```

```

Port number: 2
Bay number: 0
Interface handle: 0x100000c0

```

Config:

```

  Auto-negotiation: Configuration not supported (Off)
  Carrier delay (up): Not configured
  Carrier delay (down): Not configured
  Speed: Configuration not supported (10Gbps)
  Duplex: Configuration not supported (Full Duplex)
  Flow Control: Not configured (None)
  IPG: Not configured (standard (12))
  Loopback: Not configured (None)
  MTU: Not configured
  Soft Bandwidth: Not configured

```

Driver constraints:

```

  Min MTU: 64 bytes
  Max MTU: 9216 bytes
  Max speed: 10Gbps
  Interface type: TenGigE
  Management interface: No
  Promiscuous mode: Yes

```

## show controllers (Ethernet)

```

Allowed config mask: 0x27b

Cached driver state:
  MTU: 1522 bytes
  Burnt-in MAC address: 001d.353b.975e

Bundle settings:
  Aggregated: No
  Bundle MTU: 1514 bytes
  Bundle MAC address: 001d.353b.975e

Port FSM state:
  Port is disabled, due to an admin down condition.
Complete FSM state:
  Admin down
  Bundle admin up
  Client admin up
  Client admin tx not disabled
  Port disabled
  Port tx disabled
  Hardware 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:

0 Unicast Bundle MAC Addresses:

0 Multicast Bundle MAC Addresses:

```

The following example shows sample output from the **show controllers TenGigE internal** command:

```

RP/0/RP0/CPU0:router#show controllers TenGigE 0/0/0/4 internal

Port Number      : 0
Port Type        : 10GE
Transport mode   : LAN
BIA MAC addr     : 001b.53ff.a780
Oper. MAC addr   : 001b.53ff.a780
Port Available   : true
Status polling is : enabled
Status events are : enabled
I/F Handle       : 0x0c000040
Cfg Link Enabled : tx/rx enabled
H/W Tx Enable    : yes
MTU              : 9112
H/W Speed        : 10 Gbps
H/W Duplex       : Full
H/W Loopback Type : None
H/W FlowCtrl type : None
H/W AutoNeg Enable: Off
H/W Link Defects : (0x0000) None
Link Up          : yes
Link Led Status  : Link up
Symbol errors    : 255
Serdes version   : 14.42
Input good underflow : 0
Input ucast underflow : 0
Output ucast underflow : 0

```

```

Input unknown opcode underflow: 0
Pluggable Present      : yes
Pluggable Type        : 10GBASE-LR
Pluggable Compl.      : Compliant
Pluggable Type Supp.  : Supported
Pluggable PID Supp.   : Supported
Pluggable Scan Flg:   false

```

The following example shows sample output from the **show controllers TenGigE stats** command:

```
RP/0/RP0/CPU0:router# show controllers TenGigE 0/0/0/4 stats
```

```
Statistics for interface TenGigE0/0/0/0 (cached values):
```

```

Ingress:
  Input total bytes           = 9614339316
  Input good bytes           = 9614339316

  Input total packets        = 106713557
  Input 802.1Q frames        = 0
  Input pause frames         = 0
  Input pkts 64 bytes        = 103907216
  Input pkts 65-127 bytes    = 2494185
  Input pkts 128-255 bytes   = 3410
  Input pkts 256-511 bytes   = 3406
  Input pkts 512-1023 bytes  = 2
  Input pkts 1024-1518 bytes = 0
  Input pkts 1519-Max bytes  = 305338

  Input good pkts            = 106713557
  Input unicast pkts         = 105627141
  Input multicast pkts       = 1086414
  Input broadcast pkts       = 2

  Input drop overrun         = 0
  Input drop abort           = 0
  Input drop unknown 802.1Q  = 0
  Input drop other           = 0

  Input error giant          = 0
  Input error runt           = 0
  Input error jabbers        = 0
  Input error fragments      = 0
  Input error CRC            = 0
  Input error collisions     = 0
  Input error symbol         = 0
  Input error other          = 0

  Input MIB giant            = 305338
  Input MIB jabber           = 0
  Input MIB CRC               = 0

Egress:
  Output total bytes         = 15202682421
  Output good bytes          = 15202682421

  Output total packets       = 107534855
  Output 802.1Q frames       = 0
  Output pause frames        = 0
  Output pkts 64 bytes       = 103862713
  Output pkts 65-127 bytes   = 2448054
  Output pkts 128-255 bytes  = 308716
  Output pkts 256-511 bytes  = 6
  Output pkts 512-1023 bytes = 13
  Output pkts 1024-1518 bytes = 0

```

```
Output pkts 1519-Max bytes = 915353

Output good pkts           = 107534855
Output unicast pkts        = 105321133
Output multicast pkts      = 1298368
Output broadcast pkts      = 1

Output drop underrun       = 0
Output drop abort          = 0
Output drop other          = 0

Output error other         = 0
```

# show efd database

To display complete information about all interfaces brought down due to **EFD**, use the `show efd database` command in EXEC mode.

**show efd database** [**server** | **client**] [**interface** ]

## Syntax Description

<i>client</i>	Displays all interfaces brought down by EFD filtered by a specific client protocol.
<i>server</i>	Displays all interfaces brought down by EFD filtered by interface owner.
<i>interface</i>	Displays a specific EFD state for the EFD state, if applicable.

## Command Default

This command display all interfaces brought down by EFD.

## Command Modes

EXEC mode

## Command History

Release	Modification
Release 3.9.1	

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

Task ID	Operation
ethernet-services	read

## Example

The following example shows how to display the error disable information.

```
# show efd database
Client CFM
=====
Interface          Since                Success  Msg Req  Del
-----
GigE0/0/0/0.0     07/08/09 14:53     Yes      No      No

Server VLAN MA
=====
Interface          Clients
-----
GigE0/0/0/0.0     CFM
```

# show error-disable

To display the error-disabled state of interfaces, use the **show error-disable** command in the EXEC mode.

```
show error-disable [recovery] [interface <interface> ]
```

Syntax Description	
<b>recovery</b>	Enables error disabled recovery on an interface.
<b>interface</b>	Displays error-disable state for a single interface.

**Command Default** This command includes all the error-disabled interfaces.

**Command Modes** EXEC mode

Command History	Release	Modification
	Release	
	3.7.3	

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

Task ID	Task ID	Operation
	interface	read

## Example

The following example shows how to display the error disable information.

```
show error-disable
 [ recovery ]
 [ interface <interface> ]
```

Interface	Error-Disable reason	Retry (s)	Time disabled
Gi0/1/0/3	ethernet-oam-link-fault	1020000	17:12:23 04/31
Gi0/2/0/1	ethernet-oam-critical-event	---	20:04 04/31/06
Gi10/11/0/12.1234	ethernet-oam-high-threshold	245	20:02:42

```
show error-disable trace
 [ essential | non-essential ]
```



## show ethernet oam summary

To display the summary of all the active OAM sessions across all the interfaces, use the **show ethernet oam summary** command in XR EXEC mode.

The summary output hides the fields for which the field count is zero (0).

**show ethernet oam summary**

**Command Default** This command displays the summary of all the active OAM sessions for all the interfaces.

Command History	Release	Modification
	Release 5.2.1	This command was introduced.

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

Task ID	Task ID	Operations
	ethernet-services	read

### Examples

The following example shows how to display the summary for all the active OAM sessions across all the interfaces.

```
Router#show ethernet oam summary
Wed Apr 29 09:32:19.874 PDT
Link OAM System Summary
=====
Profiles:                               1
Interfaces:                              4
  Interface states
    Port down:                            4
    Passive wait:                          0
    Active send:                           0
    Operational:                           0
    Loopback mode:                         0
  Miswired connections:                    1
Events:                                    0
  Local:
    Symbol period:                         0
    Frame:                                  0
    Frame period:                           0
    Frame seconds:                          0
  Remote:
    Symbol period:                         0
    Frame:                                  0
    Frame period:                           0
    Frame seconds:                          0

Event Logs
=====
Local Action Taken:
  N/A    - No action needed                EFD    - Interface brought down using EFD
  None   - No action taken                 Err.D  - Interface error-disabled
```

## show ethernet oam summary

Logged - System logged

Interface	Time	Type	Loc'n	Action
Gi0/0/0/0	Wed Apr 29 08:56:54 PDT	Dying gasp	Local	Err.D
Gi0/0/0/0	Wed Apr 29 08:56:54 PDT	Link fault	Remote	Err.D
Gi0/0/0/1	Wed Apr 29 08:56:51 PDT	Dying gasp	Local	Err.D
Gi0/0/0/1	Wed Apr 29 08:56:51 PDT	Link fault	Remote	Err.D
Gi0/0/0/2	Wed Apr 29 08:56:50 PDT	Dying gasp	Local	Err.D
Gi0/0/0/2	Wed Apr 29 08:56:50 PDT	Dying gasp	Remote	Err.D
Gi0/0/0/3	Wed Apr 29 08:56:46 PDT	Dying gasp	Local	Err.D
Gi0/0/0/3	Wed Apr 29 08:56:46 PDT	Link fault	Remote	Err.D

# 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*  
**nosmall-frame-padding**

## Syntax Description

*interface-path-id* Physical interface type.

## Command Default

None

## Command Modes

Interface Configuration mode

## Command History

Release	Modification
Release 6.0	This command was introduced.

## Usage Guidelines

This command is applicable for all physical interfaces on all types of Cisco ASR 9000 Series Router line cards except Cisco ASR 9000 Ethernet line cards.

## Task ID

Task ID	Operation
interface	read, write

## Example

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

```
RP/0/RP0/CPU0:router(config)# interface hundredGigE 0/0/0/4
RP/0/RP0/CPU0:router(config-if)# small-frame-padding
```





## Global Interface Commands

---

This module describes the global command line interface (CLI) commands for configuring interfaces on the Cisco NCS 5000 Series Router.

For detailed information about Global interfaces concepts, configuration tasks, and examples, refer to the *Interface and Hardware Component Configuration Guide for Cisco NCS 5000 Series Routers*

- [bandwidth \(global\), on page 30](#)
- [bundle wait-while, on page 31](#)
- [clear interface, on page 32](#)
- [dampening, on page 33](#)
- [interface \(global\), on page 35](#)
- [lACP system , on page 36](#)
- [mtu, on page 37](#)
- [replace, on page 39](#)
- [show im dampening, on page 42](#)
- [show interfaces, on page 45](#)
- [shutdown \(global\), on page 55](#)

# bandwidth (global)

To configure the bandwidth of an interface, use the **bandwidth** command in interface configuration mode.

**bandwidth** *rate*

<b>Syntax Description</b>	<i>rate</i> Amount of bandwidth to be allocated on the interface, in Kilobits per second (kbps). Range is from 0 through 4294967295.
---------------------------	--

<b>Command Default</b>	The default bandwidth depends on the interface type.
------------------------	--

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.0	This command was introduced.

<b>Usage Guidelines</b>	To obtain the default bandwidth for a specific interface, use the <b>show interfaces</b> command after you first bring up the interface. The default interface bandwidth is displayed in the <b>show interfaces</b> command output.
-------------------------	---

<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	interface	execute
	basic-services	read, write

## Examples

This example shows how to configure the bandwidth on a TenGigE Ethernet interface:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router# interface TenGigE 0/4/0/1
RP/0/RP0/CPU0:router# bandwidth 4000000
```

# bundle wait-while

To specify the duration of the wait-while timer for a bundle, use the **bundle wait-while** command in the bundle interface configuration mode. To disable waiting, use the **no** form of the command.

**bundle wait-while** *time*  
**no bundle wait-while** *time*

## Syntax Description

*time* Wait-while time in milliseconds, range is 0-2000.

## Command Default

2000 milliseconds

## Command Modes

Bundle Interface Configuration

## Command History

Release	Modification
Release 6.0	This command was introduced.

## Usage Guidelines

To obtain the default bandwidth for a specific interface, use the **show interfaces** command after you first bring up the interface. The default interface bandwidth is displayed in the **show interfaces** command output.

## Task ID

Task ID	Operation
bundle	read, write
interface	read, write

In the following example, the while-while time is configured for 20 seconds:

```
RP/0/(config-if)#bundle wait-while 20
```

# clear interface

To clear interface statistics or packet counters, use the **clear interface** command in XR EXEC mode.

**clear interface** *type interface-path-id*

## Syntax Description

*type* Interface type. For more information, use the question mark (?) online help function.

*interface-path-id* Physical interface or virtual 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

No default behavior or values

## Command Modes

XR EXEC mode

## Command History

Release	Modification
Release 6.0	This command was introduced.

## Usage Guidelines

No specific guidelines impact the use of this command.

## Task ID

Task ID	Operations
interface	execute
basic-services	read, write

## Examples

This example shows how to use the **clear interface** command to clear the loopback interface 2:

```
RP/0/RP0/CPU0:router# clear interface loopback 2
```



# dampening

To limit propagation of transient or frequently changing interface states on Interface Manager (IM) clients, turn on event dampening by using the **dampening** command in interface configuration mode. To turn dampening off, use the **no** form of this command.

**dampening** [*half-life* [*reuse suppress max-suppress-time*]]

Syntax Description		
<i>half-life</i>	(Optional) Time (in minutes) after which a penalty is decreased. Once the interface has been assigned a penalty, the penalty is decreased by half after the half-life period. The process of reducing the penalty happens every 5 seconds. The range of the half-life period is 1 to 45 minutes. The default is 1 minute.	
<i>reuse</i>	(Optional) Penalty value below which a stable interface is unsuppressed. Range is from 1 through 20000. Default value is 750.	
<i>suppress</i>	(Optional) Limit at which an interface is suppressed when its penalty exceeds that limit. Range is from 1 through 20000, and must be greater than the reuse threshold. The default value is 2000.	
<i>max-suppress-time</i>	(Optional) Maximum time (in minutes) that an interface can be suppressed. This value effectively acts as a ceiling that the penalty value cannot exceed. Default value is four times the half-life period.	

**Command Default** Dampening is turned off by default. When you use the **dampening** command, the following default values are enabled for any optional parameters that you do not enter:

- *half-life*: 1 minute
- *reuse*: 750
- *suppress*: 2000
- *max-suppress-time*: Four times the half-life

**Command Modes** Interface configuration

Command History	Release	Modification
	Release 6.0	This command was introduced.

**Usage Guidelines** Event dampening suppresses a constantly unstable interface until it remains stable for a period of time. Enabling dampening on an interface that already has dampening configured has the effect of resetting the penalty associated with that interface to zero. The reuse threshold must always be less than the suppress threshold.

Consider the following guidelines when configuring event dampening:

- Configuring dampening on both a subinterface and its parent is usually unnecessary because their states are almost always the same and dampening would be triggered at the same time on each interface.
- If all subinterfaces require dampening, then apply dampening to the main interface only. Applying configuration to large numbers of subinterfaces requires an abundance of memory and increases the time required to process the configuration during boot and failover.

- When dampening is enabled, an interface has a penalty value associated with it. The value starts at 0 and is increased by 1000 whenever the underlying state of the interface changes from up to down.
- The penalty value decreases exponentially while the interface state is stable. If the penalty value exceeds a configured suppress threshold, then the state of the interface is suppressed and IM will not notify upper layers of further state transitions. The suppressed state remains until the penalty value decreases past a configured reuse threshold.

Task ID	Task ID	Operations
	interface	read, write

### Examples

This example shows how to enable dampening with default values on an interface:

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/4/0/0
RP/0/RP0/CPU0:router(config-if)# dampening
```

# interface (global)

To configure an interface or to create or configure a virtual interface, use the **interface** command in XR Config mode. To delete the interface configuration, use the **no** form of this command.

**interface** *type interface-path-id*

<b>Syntax Description</b>	<i>type</i>	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.

**Command Default** No interfaces are configured

**Command Modes** XR Config mode

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.0	This command was introduced.

**Usage Guidelines** The **interface** command enters interface configuration mode to allow you to configure interfaces. If a virtual interface is configured, then the interface is created if it did not already exist.

The **no** form of this command applies only to virtual interfaces or to subinterfaces (that is, interfaces that have been created in global configuration mode).

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

## Examples

In the following example, the **interface** command is given for the card in location 0/2/0/1, and interface configuration mode is entered for that interface:

```
RP/0/RP0/CPU0:router(config)# interface POS 0/2/0/1
```

# lACP system

To set the default system parameters for the Link Aggregation Control Protocol (LACP) bundles, use the **lACP system** command in XR Config mode.

**lACP system** { **mac** | **priority** }

Syntax Description	
<b>mac</b>	Unique MAC address used to identify the system in LACP negotiations.
<b>priority</b>	Priority for this system. Lower value is higher priority. Range is from 1 to 65535.

**Command Default** System priority is 32768. MAC address is automatically assigned from the backplane pool.

**Command Modes** XR Config mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

**Usage Guidelines** The parameters are the system MAC address and the priority of the system. The MAC address must be unique to the system (if it matches a partner system, LACP negotiations fail). The combination of the MAC address and the set system priority determine the priority of the LACP bundles.

Task ID	Task ID	Operation
	bundle read, write	

## Example

The following example shows how to configure the MAC address on an LACP system:

```
RP/0/RP0/CPU0:router (config) lACP system mac 000c.15c0.bd15
```

# mtu

To adjust the maximum transmission unit (MTU) value for packets on an interface, use the **mtu** command in interface configuration mode.

To return to the default MTU for the interface type, use the **no** form of this command.

**mtu** *bytes*

---

## Syntax Description

*bytes* Maximum number of bytes in a Layer 2 frame. Range is from 64 through 65535.

---

## Command Default

The default MTU for each interface is as follows:

- Ethernet—1514 bytes
- Tunnel—1500 bytes
- Loopback—1514 bytes

---

## Command Modes

Interface configuration

---

## Command History

Release	Modification
Release 6.0	This command was introduced.

---



---

## Usage Guidelines

Use the **mtu** command to set a specific MTU value for an interface, or use the **no mtu** command to return the interface to the default MTU value for that interface type. The MTU value can be increased or decreased using the **mtu** command, subject to minimum and maximum MTU limits for the interface type.

If the MTU value is not configured, then each interface will have a default MTU value that is specific to the interface type. The default MTU value is generally the largest Layer 2 frame size possible for the interface type.

The default/configured MTU value on an atm interface includes the L2 header.

The Ethernet interface is the Layer 3 datagram plus 14 bytes.

You can use the **show interfaces** command to determine if the MTU value has been changed. The **show interfaces** command output displays the MTU size for each interface in the MTU (byte) field. Note that the MTU size that is displayed includes the Layer 2 header bytes used for each encapsulation type.




---

**Note** You can use the **show interfaces** command to determine if the MTU value has been changed. The **show interfaces** command output displays the MTU size for each interface in the MTU (byte) field. Note that the MTU size that is displayed includes the Layer 2 header bytes used for each encapsulation type.

---



**Note** Changing the MTU on an interface triggers a change on the protocols and encapsulations configured on that interface, although some protocol-specific configurations can override the interface MTU. For example, specifically changing the interface MTU configuration does not affect the IP MTU configuration, but may affect the resulting MTU on that node.

**Task ID****Task ID Operations**

```
interface read,
write
```

**Examples**

In this example, the MTU value for all interfaces is verified. The MTU value is shown in the next-to-last column:

```
RP/0/RP0/CPU0:router# show interfaces all brief
```

Intf Name	Intf State	LineP State	Encap Type	MTU (byte)	BW (Kbps)
Nu0	up	up	Null	1500	Unknown
TenGigE0/6/0/0	up	up	HDLC	4474	2488320
TenGigE0/6/0/1	up	up	HDLC	4474	2488320
TenGigE0/6/0/2	admin-down	admin-down	HDLC	4474	2488320
TenGigE0/6/0/3	admin-down	admin-down	HDLC	4474	2488320
Mg0//CPU0/0	up	up	ARPA	1514	100000

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

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/6/0/0
```

```
RP/0/RP0/CPU0:router(config-if)# mtu 1000
```

# replace

To substitute any configuration in the router with new settings, use the **replace** command in XR Config mode.

**replace interface** *interface\_name\_before* **with** *interface\_name\_after*

**replace pattern** *string\_before* **with** *string\_after* [ **dry-run** ]

Syntax Description	
<b>interface</b>	Specifies the details of interface configuration replacement follows.
<i>interface_name_before</i>	Specifies the name of an interface in the router that you want to replace. For more information about the syntax for the router, use the question mark (?) online help function.
<i>interface_name_after</i>	Specifies the new interface name that replaces the current interface name specified in the <i>interface_name_before</i> variable. For more information about the syntax for the router, use the question mark (?) online help function.
<b>pattern</b>	Specifies that the details of string replacement follow.
<i>string_before</i>	Specify the configuration string in the router that you need to replace. The <i>string_before</i> can be any regular expression that specifies a match pattern in text. <b>Note</b> You must specify the <i>string_before</i> in a single quote.
<i>string_after</i>	Specify the new string that replaces the configuration matching the <i>string_before</i> variable. <b>Note</b> You must specify the <i>string_after</i> in a single quote.
<b>dry-run</b>	Displays the configuration after the pattern replacement without preparing the config changes for a commit. This option facilitates verifying the pattern replacement changes and provides an extra layer of protection to avoid accidentally committing unwanted configuration changes.

**Command Default** No default behavior or values.

**Command Modes** XR Config

Command History	Release	Modification
	Release 7.0.1	This command was introduced.

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

Task ID	Task ID Operations
	interface read, write

### Examples

The following example shows how to use the **replace** command:

```
Router# config
Router(config)# replace interface gigabitEthernet 0/0/0/0 with loopback 450
Loading.
4 bytes parsed in 1 sec (3)bytes/sec
```

```
Router# config
Router(config)# replace pattern '10\.20\.30\.40' with '100.200.250.225'
Loading.
232 bytes parsed in 1 sec (230)bytes/sec
```

### Examples

The following example details configuration changes on using the **replace** command:

Original Configuration:

```
Router(config-ospf-ar-if)#show configuration
Building configuration...
!! IOS XR Configuration 0.0.0
interface GigabitEthernet0/0/0/0
  description first
  ipv4 address 10.20.30.40 255.255.0.0
  shutdown
!
router ospf 10
  cost 100
  area 200
  cost 200
  interface GigabitEthernet0/0/0/0
    transmit-delay 5
  !
```

Using **replace** command:

```
Router(config-ospf-ar-if)# replace interface gigabitEthernet 0/0/0/0 with loopback 450
Building configuration...
Loading.
232 bytes parsed in 1 sec (230)bytes/sec
```

Configuration changes on using **replace** command:

```
Router(config-ospf-ar-if)#show configuration
Building configuration...
!! IOS XR Configuration 0.0.0
interface Loopback450
  description first
  ipv4 address 10.20.30.40 255.255.0.0
  shutdown
```



```
!  
no interface GigabitEthernet0/0/0/0  
router ospf 10  
area 200  
    interface Loopback450  
        transmit-delay 5  
    !  
no interface GigabitEthernet0/0/0/0
```

## Examples

The following example shows how to use the **dry-run** option in the **replace** command:

```
Router# config  
Router(config)# replace pattern 'vrf thr' with 'vrf three' dry-run  
no vrf thr  
vrf three  
    address-family ipv4 unicast  
        import route-target  
            65321:3  
        !  
        export route-target  
            65321:3  
        !  
    !  
exit  
router static  
    no vrf thr  
    vrf three  
        address-family ipv4 unicast  
            192.168.3.0/24 vrf one 192.168.1.1  
            192.168.3.0/24 vrf two 192.168.2.2  
        !  
exit  
end  
Router(config)# commit  
No configuration changes to commit.
```

# show im dampening

To display the state of all interfaces on which dampening has been configured, use the **show im dampening** command in XR EXEC mode.

```
show im dampening [{interface type | ifhandle handle}]
```

<b>Syntax Description</b>	<b>interface type</b> (Optional) Interface type. For more information, use the question mark (?) online help function.				
	<b>ifhandle handle</b> (Optional) Identifies the caps node whose Interface Manager (IM) dampening information you want to display.				
<b>Command Default</b>	If you do not specify an interface, then the system displays brief details about all dampened interfaces.				
<b>Command Modes</b>	XR EXEC mode				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				

<b>Usage Guidelines</b>	<p>If you do not specify an interface, then the system displays brief details about all dampened interfaces.</p> <p>The physical hardware (layer 1) is not the only part of an interface that can change state. L2 keepalive failure event is one of the many instances that can have a similar impact on routing protocols despite the underlying interface state staying UP. To take account of such events, when dampening is configured on an interface, it is applied independently to every layer. They all use the same parameters as the interface but they have their own penalty value which is incremented when that layer changes state.</p> <p>Capsulations that may be dampened in this way include:</p> <ul style="list-style-type: none"> <li>• L3 capsulations (for example ipv4, ipv6). These may be brought down if another link has a conflicting IP address configured.</li> </ul>
-------------------------	---

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

**Examples** This example shows the output from the **show im dampening** command issued with default values:

```
RP/0/RP0/CPU0:router(config)# interface HundredGigE 0/4/0/0
RP/0/RP0/CPU0:router(config-if)# no shutdown
RP/0/RP0/CPU0:router(config-if)# dampening
RP/0/RP0/CPU0:router# show im dampening
```

Interface	Proto	Caps	Penalty Suppressed
-----	-----	----	-----

```

TenGigE0/4/0/0          0          0          0          NO

RP/0/RP0/CPU0:router# show im dampening interface TenGigE 0/4/0/0

TenGigE0/4/0/0 (0x05000d00)
Dampening enabled: penalty 0, not suppressed
  underlying state: Up
  half_life: 1      reuse:          750
  suppress: 3000   max-suppress-time: 4
  restart-penalty: 0

RP/0/RP0/CPU0:router# show interfaces TenGigE 0/4/0/0

TenGigE0/4/0/0 is up, line protocol is down
  Dampening enabled: penalty 0, not suppressed
  half_life: 1      reuse:          750
  suppress: 3000   max-suppress-time: 4
  restart-penalty: 0
  Hardware is Ten Gigabit Ethernet
  Description: ensoft-gsr5 TenGigE 4\2
  Internet address is Unknown
  MTU 4474 bytes, BW 155520 Kbit
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation HDLC, crc 16, controller loopback not set, keepalive set (10 sec)
  Last clearing of "show interface" counters never
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 total input drops
    0 drops for unrecognized upper-level protocol
  Received 0 broadcast packets, 0 multicast packets
    0 runts, 0 giants, 0 throttles, 0 parity
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  48 packets output, 1504 bytes, 0 total output drops
  Output 0 broadcast packets, 0 multicast packets
  0 output errors, 0 underruns, 0 applique, 0 resets
  0 output buffer failures, 0 output buffers swapped out

```



**Note** When dampening is configured on an interface it is also applied independently to all encapsulations on that interface. For example, the ppp or hdlc basecaps state can flap even while the interface stays up and if keepalives fail. The **show im dampening interface** command contains one line for each such encapsulation as well as the interface itself.

**Table 2: show im dampening Field Descriptions**

Field	Description
Dampening	Indicates the dampening state and penalty value: not suppressed, suppressed.
underlying state	Underlying state of the interface: up, down, administratively down (if an interface has been configured to be “shutdown”).
half_life	This is the time (in minutes) at which the penalty on the interface would be half that of the original penalty (of 1000) when the interface transitions from UP to DOWN. It ranges from 1 to 45 minutes and the default is 1 minute.

Field	Description
reuse	Penalty value below which a stable interface is unsuppressed. It ranges from 1 to 20000 and the default value is 750.
suppress	Limit at which an unstable interface is suppressed when the penalty value exceeds the suppress value. It ranges from 1 to 20000 and the default value is 2000.
max-suppress-time	Maximum time (in minutes) that an interface can be suppressed. The default is 4 minutes.
restart-penalty	Penalty assigned to the interface when it flaps.

# show interfaces

To display statistics, state and other information such as mac address etc. for all interfaces configured on the router or for a specific node, use the **show interfaces** command in XR EXEC mode.

**show interfaces** [ **summary** | [ *type interface-path-id* | **all** | **local** ] [ **non-dynamic** ] [ **brief** | **description** | **detail** | **sparse** | **accounting** ] ] [ **location** *node-id* ]

Syntax Description		
<i>type</i>		(Optional) Specifies the type of interface for which you want to display statistics. 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 brief</b> command to see a list of all interfaces configured on the router.  For more information about the syntax for the router, use the question mark (?) online help function.
<b>all</b>		(Optional) Displays interface information for all interfaces. This is the default.
<b>local</b>		(Optional) Displays interface information for all interfaces in the local card.
<b>location</b> <i>node-id</i>		(Optional) Displays information about all interfaces on the specified node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
<b>accounting</b>		(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
<b>brief</b>		(Optional) Displays brief information of each interface (one line per interface).

<b>description</b>	(Optional) Displays the status, protocol, and description of each interface (one line per interface).
<b>detail</b>	(Optional) Displays detailed information about each interface. This is the default.
<b>summary</b>	(Optional) Displays a summary of interface information by interface type.
<b>sparse</b>	(Optional) Displays sparse per interface information excluding interface statistics.
<b>non-dynamic</b>	(Optional) Displays interface information excluding dynamic interfaces.

**Command Default** By default, executing **show interface** command without any option works similar as **show interface all**, and it displays the information for all interfaces in the system.

**Command Modes** XR EXEC mode

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.0	This command was introduced.

**Usage Guidelines** The **show interfaces** command displays statistics, state and other information such as mac address etc. for the network interfaces.

For example, if you type the **show interfaces** command without an interface type, you receive information for all the interfaces installed in the networking device. Only by specifying the interface *type*, *slot*, and *port* arguments can you display information for a particular interface.

If you enter a **show interfaces** command for an interface type that has been removed from the networking device, an error message is displayed: “Interface not found.”

The output displayed depends on the network for which an interface has been configured.



**Note** Executing **show interfaces** command without filters obtains and displays interface statistics for all interfaces. Hence, it is recommended to execute the command with filters to select specific interfaces or interface types of interest for a faster response. Executing **show interfaces** with options **brief** or **sparse** excludes interface statistics thus providing a faster response.



**Note** The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average is within 2 percent of the instantaneous rate of a uniform stream of traffic over that period.

**Task ID****Task ID Operations**

```
interface read
```

**Examples**

This example shows the output from the **show interfaces** command. The output displayed depends on the type and number of interface cards in the networking device.

```
Router# show interfaces HundredGigE 0/3/0/35

HundredGigE0/3/0/35 is up, line protocol is up
  Interface state transitions: 1
  Hardware is HundredGigE, address is e666.9aa0.223c (bia e666.9aa0.223c)
  Description: **To RouterX Hu0/7/0/2**
  Internet address is 192.168.1.29/30
  MTU 1514 bytes, BW 100000000 Kbit (Max: 100000000 Kbit)
    reliability 255/255, txload 239/255, rxload 238/255
  Encapsulation ARPA,
  Full-duplex, 100000Mb/s, unknown, 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 3w3d
  ARP type ARPA, ARP timeout 04:00:00
  Last input 00:00:00, output 00:00:00
  Last clearing of "show interface" counters never
  30 second input rate 93725392000 bits/sec, 32528692 packets/sec
  30 second output rate 93726416000 bits/sec, 32527860 packets/sec
  68118736643563 packets input, 24783244282360579 bytes, 0 total input drops
  0 drops for unrecognized upper-level protocol
  Received 0 broadcast packets, 0 multicast packets
    0 runts, 0 giants, 0 throttles, 0 parity
  174 input errors, 174 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  68115867305777 packets output, 24782409845763776 bytes, 0 total output drops
  Output 0 broadcast packets, 0 multicast packets
  0 output errors, 0 underruns, 0 applique, 0 resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions
```

This example shows bundle member links whose link interface status is “err-disable” and line protocol state is “admin-down” after the bundle interface has been administratively shut down using the **shutdown** command:

```
Router# show interfaces brief

Thu May  6 06:30:55.797 DST

      Intf      Intf      LineP      Encap  MTU      BW
      Name      State     State     Type   (byte)   (Kbps)
-----
```

## show interfaces

```

          BE10          down          down          ARPA 1514          0
          BE100         up            up            ARPA 1514 100000000
          BE101         up            up            ARPA 1514 100000000
          Lo0           up            up            Loopback 1500      0
          Nu0           up            up            Null 1500          0
Fo0/3/0/26 admin-down admin-down ARPA 1514 40000000
Hu0/3/0/0  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/1  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/2  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/3  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/4  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/5  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/6  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/7  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/8  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/9  admin-down admin-down ARPA 1514 100000000
Hu0/3/0/10 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/11 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/12 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/13          down          down          ARPA 1514 100000000
Hu0/3/0/14          up            up            ARPA 1514 100000000
Hu0/3/0/15          up            up            ARPA 1514 100000000
Hu0/3/0/16 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/17 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/18          up            up            ARPA 1514 100000000
Hu0/3/0/19          up            up            ARPA 1514 100000000
Hu0/3/0/20 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/21 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/22 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/23 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/24          up            up            ARPA 1514 100000000
Hu0/3/0/25 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/27 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/28 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/29 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/30 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/31 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/32 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/33 admin-down admin-down ARPA 1514 100000000
Hu0/3/0/34          down          down          ARPA 1514 100000000
Hu0/3/0/35          up            up            ARPA 1514 100000000
Mg0/RP0/CPU0/0          up            up            ARPA 1514 1000000
Mg0/RP1/CPU0/0          up            up            ARPA 1514 1000000

```

This example shows the output from the **show interfaces interface-path-id sparse** command.

```

Router#show interfaces gigabitEthernet 0/1/0/0 sparse
Wed Apr 5 18:05:34.000 IST

```

```

Interface name : GigabitEthernet0/1/0/0
Operational state : administratively down
Admin state : administratively down
MAC address : 02:7d:42:e9:bd:36
Burned In Address : 027d.42e9.bd36
IPv4 Address : 2.2.2.2/24
Max. Bandwidth (Kbit) : 1000000
Effective Bandwidth (Kbit) : 1000000
MTU (in bytes) : 1514
Duplexity : Full-duplex
Link type : force-up

```



Table 3: show interfaces Field Descriptions

Field	Description
Interface name	Displays the name of the current interface. In the example, the interface name is TenGigE0/1/0/1.
Interface state	Displays the state of the interface. In the example, the interface is in the administratively down state.
Interface state transitions	<p>Displays the number of times the interface has changed the state.</p> <p><b>Note</b></p> <ul style="list-style-type: none"> <li>• Interface state transitions command counts only if the interface stays up. If the line protocol flaps, then it is not counted.</li> <li>• Interface state transitions counts the state when the line protocol state changes the state from up to down/admin-down or admin-down/down to up. If an interface changes the state from down to admin-down or admin-down to down, the counter is not incremented.</li> <li>• Use the <b>clear state-transitions</b> command to clear the counter for the current or all interfaces.</li> </ul>
line protocol state	<p>Displays the state of the Layer 2 line protocol. This field may be different from the interface state if, for example, a keepalive failure has brought down the Layer 2.</p> <p><b>Note</b></p> <p>The line protocol state is not the same as the protocol state displayed in the <b>show ip interfaces</b> command, because it is the state of Layer 2 (media) rather than Layer 3 (IP protocol).</p>
Hardware	Displays the current hardware type.
address is <i>n.n.n.n/n</i>	<p>Displays the Layer 2 address (MAC address for Ethernet interfaces).</p> <p><b>Note</b></p> <p>Enter the <b>mac-address</b> command to configure the hardware address.</p>

Field	Description
bia	<p>Displays the burned-in address (BIA) for the interface. The BIA is the default L2 (MAC) address for the interface.</p> <p><b>Note</b> The BIA is not configurable.</p>
description	<p>Displays the user-defined string that is associated with the interface.</p> <p><b>Note</b> Enter the <b>description</b> command to configure the description associated with the interface.</p>
Internet address	<p>Displays the Layer 3 (IP) address for the interface.</p> <p><b>Note</b> Enter the <b>ipv4 address</b> command to configure the internet address for the interface.</p>
MTU	<p>Displays the maximum transmission unit (MTU) for the interface. The MTU is the maximum packet size that can be transmitted over the interface.</p> <p><b>Note</b> The MTU field indicates the interface MTU. Enter the <b>mtu</b> command to configure a lower MTU value at the Layer 3 level.</p>
BW	<p>Displays the bandwidth of the interface in kbps.</p>
reliability	<p>Displays the proportion of packets that are not dropped and do not have errors.</p> <p><b>Note</b> The reliability is shown as a fraction of 255.</p>
txload	<p>Indicates the traffic flowing out of the interface as a proportion of the bandwidth.</p> <p><b>Note</b> The txload is shown as a fraction of 255.</p>
rxload	<p>Indicates the traffic flowing into the interface as a proportion of the bandwidth.</p> <p><b>Note</b> The rxload is shown as a fraction of 255.</p>
Encapsulation	<p>Layer 2 encapsulation installed on the interface.</p>

Field	Description
CRC	<p>Indicates the length of the cyclic redundancy check (CRC), in bytes.</p> <p><b>Note</b> The CRC is not present for all interface types.</p> <p><b>Note</b> Enter the <b>pos crc</b> command to configure the CRC.</p>
loopback or controller loopback	<p>Indicates whether the hardware has been configured to be looped back.</p> <p><b>Note</b> Enter the <b>loopback</b> command to configure the loopback or controller loopback.</p>
keepalive	<p>Displays the configured keepalive value, in seconds.</p> <p><b>Note</b> Enter the <b>keepalive</b> command to configure the value of the keepalive field.</p> <p><b>Note</b> The <i>keepalive</i> field may not be present if it is not applicable to the interface type.</p>
Duplexity	<p>Displays the duplexity of the link.</p> <p><b>Note</b> This field is present only for shared media.</p> <p><b>Note</b> For some interface types, you can configure the duplexity by entering the <b>full-duplex</b> and <b>half-duplex</b> commands.</p>
Speed	Speed and bandwidth of the link in Mbps. This field is present only when other parts of the media info line are also displayed (see duplexity and media type).
Media Type	Media type of the interface.
output flow control	Whether output flow control is enabled on the interface.
input flow control	See output flow control.
ARP type	Address Resolution Protocol (ARP) type used on the interface. This value is not displayed on interface types that do not use ARP.

Field	Description
ARP timeout	ARP timeout in <i>hours:mins:secs</i> . This value is configurable using the <b>arp timeout</b> command.
Last clearing of counters	Time since the following counters were last cleared using the <b>clear counters</b> exec command in <i>hours:mins:secs</i> .
Input rate	<p>Average number of bits and packets received per second during the load-interval. If the interface is not in promiscuous mode, it senses network traffic that it sends and receives (rather than all network traffic).</p> <p><b>Note</b> Load duration is based on load-interval configured under the interface. The default load duration is 5 minutes, if load-interval is not configured under the interface.</p> <p><b>Note</b> The input rate should be used only as an approximation of traffic per second during a given load duration. This rate is exponentially weighted average with a time constant of load duration. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.</p>
packets input	Number of packets received on the interface that were successfully delivered to higher layers.
bytes input	<p>Total number of bytes successfully received on the interface.</p> <p><b>Note</b> This does not include FCS bytes.</p>
total input drops	Total number of packets that were dropped after they were received. This includes packets that were dropped due to configured quality of service (QoS) or access control list (ACL) policies. This does not include drops due to unknown Layer 3 protocol.
drops for unrecognized upper-level protocol	Total number of packets that could not be delivered because the necessary protocol was not configured on the interface.
Received broadcast packets	Total number of Layer 2 broadcast packets received on the interface. This is a subset of the total input packet count.

Field	Description
Received multicast packets	Total number of Layer 2 multicast packets received on the interface. This is a subset of the total input packet count.
runt	Number of received packets that were too small to be handled. This is a subset of the input errors count.
giants	Number of received packets that were too large to be handled. This is a subset of the input errors count.
throttles	Number of packets dropped due to throttling (because the input queue was full).
parity	Number of packets dropped because the parity check failed.
input errors	Total number of received packets that contain errors and hence cannot be delivered. Compare this to total input drops, which counts packets that were not delivered despite containing no errors.
CRC	Number of packets that failed the CRC check.
frame	Number of packets with bad framing bytes.
overrun	Number of overrun errors experienced by the interface. Overruns represent the number of times that the receiver hardware is unable to send received data to a hardware buffer because the input rate exceeds the receiver's ability to handle the data.
ignored	Total number of ignored packet errors. Ignored packets are those that are discarded because the interface hardware does not have enough internal buffers. Broadcast storms and bursts of noise can result in an increased number of ignored packets.
abort	Total number of abort errors on the interface.
packets output	Number of packets received on the interface that were successfully delivered to higher layers.
bytes output	Total number of bytes successfully received on the interface. <b>Note</b> This does not include FCS bytes.
total output drops	Number of packets that were dropped before being transmitted

Field	Description
Received broadcast packets	Number of Layer 2 broadcast packets transmitted on the interface. This is a subset of the total input packet count.
Received multicast packets	Total number of Layer 2 multicast packets transmitted on the interface. This is a subset of the total input packet count.
output errors	Number of times that the receiver hardware was unable to handle received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data.
underruns	Number of underrun errors experienced by the interface. Underruns represent the number of times that the hardware is unable to transmit data to a hardware buffer because the output rate exceeds the transmitter's ability to handle the data.
applique	Number of applique errors.
resets	Number of times that the hardware has been reset. The triggers and effects of this event are hardware-specific.
output buffer failures	Number of times that a packet was not output from the output hold queue because of a shortage of MEMD shared memory.
output buffers swapped out	Number of packets stored in main memory when the output queue is full; swapping buffers to main memory prevents packets from being dropped when output is congested. The number is high when traffic is bursty.
carrier transitions	Number of times the carrier detect (CD) signal of a serial interface has changed state.

# shutdown (global)

To disable an interface (to force an interface to be administratively down), use the **shutdown** command in interface configuration mode. To enable an interface that has been shut down, use the **no** form of this command.

## shutdown

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

**Command Default** The interface is enabled by default and is disabled only when shutdown is configured.



**Note** When you add an interface to the system, or when all the configuration for an interface is lost or deleted, the interface is put in the shutdown state by the system adding the interface.

**Command Modes** Interface configuration

Command History	Release	Modification
	Release 6.0	This command was introduced.

**Usage Guidelines** Use the **shutdown** command to move the state of an interface to administratively down, which stops traffic flowing through the interface. This state does not stop other action from happening on the interface such as changes in configuration, protocols, encapsulations, and so forth.

The **shutdown** command also marks the interface as unavailable. To check whether the state of an interface is down, use the **show interfaces** command in XR EXEC mode, which displays the current state of the interface. An interface that has been shut down is shown as administratively down in the display from the **show interfaces** command.

Task ID	Task ID	Operations
	interface	read, write

## Examples

In this example, TenGigE interface 0/4/0/2 is turned off:

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/4/0/2
RP/0/RP0/CPU0:router(config-if)# shutdown
```

shutdown (global)





## Link Bundling Commands

---

This module provides command line interface (CLI) commands for configuring Link Bundle interfaces on the Cisco NCS 5000 Series Router.

For detailed information about Link Bundle interfaces concepts, configuration tasks, and examples, refer to the *Interface and Hardware Component Configuration Guide for Cisco NCS 5000 Series Routers*

- [bundle-hash](#), on page 58
- [bundle id](#), on page 62
- [bundle lacp-fallback](#), on page 64
- [bundle maximum-active links](#), on page 65
- [bundle minimum-active bandwidth](#), on page 67
- [bundle port-priority](#), on page 68
- [clear lacp counters](#), on page 69
- [interface \(bundle\)](#), on page 71
- [lacp fast-switchover](#), on page 72
- [lacp non-revertive](#), on page 73
- [lacp packet-capture](#), on page 74
- [mlacp node](#), on page 76
- [mlacp system priority](#), on page 77
- [show bundle brief](#), on page 78
- [show bundle](#), on page 81
- [show bundle infrastructure](#), on page 94
- [show lacp bundle-ether](#), on page 95
- [show lacp counters](#), on page 97
- [show lacp io](#), on page 99
- [show lacp packet-capture](#), on page 102
- [show lacp port](#), on page 104
- [show lacp system-id](#), on page 106

# bundle-hash

To display the source and destination IP addresses for the member links, distributed by the load balancing feature, in a multilink interface bundle, use the **bundle-hash** command in .

**bundle-hash** {**Bundle-Ether** *bundle-id*}

<b>Syntax Description</b>	<b>Bundle-Ether</b> <i>bundle-id</i> Specifies an Ethernet bundle for which you want to calculate load balancing. Range is 1- 65535.				
	<i>ibundle-id</i> Number from 1 to 65535 that identifies a particular bundle.				
<b>Command Default</b>	No default behavior or values				
<b>Command Modes</b>					
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				

## Usage Guidelines

Bundle interface traffic is distributed over the various member links of a bundle according to a hash function. The **bundle-hash** command allows you to determine which bundle member link will carry a particular flow of traffic.

You can use the **bundle-hash** command to get these information:

- Which members are used for a specified source/destination address pair, such as 10.10.10.1 20.20.20.1

The **bundle-hash** command does not display all possible IP addresses in an entire series. It stops displaying addresses after all the addresses for all the members of the bundle have been displayed once.

The **bundle-hash** command invokes a utility that initially prompts you to select some options. Based on the options you select, the utility prompts you more options to select. The initial options to select are as follows:

- L3/3-tuple or L4/7-tuple
- Single pair or Range
- IPv4 or IPv6

The **bundle-hash** command utility prompts you for these options as follows:

- Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4):
- Single SA/DA pair (IPv4,IPv6) or range (IPv4 only): S/R [S]:
- Enter bundle type IP V4 (1) or IP V6 (2):
- Enter source IP V4 address:
- Enter destination IP V4 address:
- Compute destination address set for all members? [y/n]:
- Enter subnet prefix for destination address set:
- Enter bundle IP V4 address [10.10.10.10]:

You may also be prompted to make further option choices depending on your selections.

You can use the **show bundle** command to get IP address information.

The below table provides a general summary of the options and the information you need to provide for each selected option. The actual information that you need to provide depends on the selections you make and may vary from the information provided in the below table.

**Table 4: bundle-hash Command Options**

Option	Information You Need to Provide
L3/3-tuple	L3 information: <ul style="list-style-type: none"> <li>• Source IP address</li> <li>• Destination IP address</li> <li>• Destination subnet prefix</li> <li>• Bundle IP address</li> </ul>
L4/7-tuple	L3 information: <ul style="list-style-type: none"> <li>• Source IP address</li> <li>• Destination IP address</li> <li>• Protocol</li> </ul> L4 information: <ul style="list-style-type: none"> <li>• Source port</li> <li>• Destination port</li> </ul> Platform-related information: <ul style="list-style-type: none"> <li>• Router ID</li> <li>• Ingress interface</li> </ul>
Single pair	Information for a single source port and destination port. The utility uses this information to calculate the hash and display the bundle load-balance distribution among the user-provided physical/bundle links.  The default is single mode.  While in single mode, you may receive the following prompt:
Range	Information for sets of source and destination addresses to generate a packet flow for each set. The utility uses this information to calculate the hash for the generated packet flows and display the user-provided egress member links/bundle interfaces and the number of packet flows on each link.
IPv4	IPv4 addresses
IPv6	IPv6 addresses

```
Compute destination address set for all members [y|n]:
```

If you enter y(es), several sample IPv4 addresses in the destination subnet are generated, and the link is calculated for each sample address. During this calculation, the destination network address is derived from the destination IPv4 address and the subnet prefix.

Task ID	Task ID	Operations
	bundle	read

### Examples

The following example shows how to calculate load balancing across the members of a link bundle (bundle-ether 28) using the 3-tuple hash algorithm, a single source and destination, and IPv4 addresses:

```
RP/0/RP0/CPU0:router# bundle-hash bundle-ether 28

Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): 13
Single SA/DA pair (IPv4,IPv6) or range (IPv4 only): S/R [S]: s

Enter bundle type IP V4 (1) or IP V6 (2): 1
Enter source IP V4 address: 10.12.28.2
Enter destination IP V4 address: 10.12.28.1
Compute destination address set for all members? [y/n]: y
Enter subnet prefix for destination address set: 8
Enter bundle IP V4 address [10.12.28.2]: 10.12.28.2

Link hashed to is HundredGigE0/6/0/7

Destination address set for subnet 10.0.0.0:
 10.0.0.6 hashes to link HundredGigE0/1/0/0
 10.0.0.8 hashes to link HundredGigE0/6/0/5
 10.0.0.12 hashes to link HundredGigE0/6/0/6
 10.0.0.2 hashes to link HundredGigE0/6/0/7
 10.0.0.1 hashes to link HundredGigE0/1/0/1
```

The following example shows how to calculate load balancing across the members of a link bundle (bundle-ether 28) using the 3-tuple hash algorithm, a range of source and destinations, and IPv4 addresses:

```
RP/0/RP0/CPU0:router# bundle-hash bundle-ether 28

Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): 13
Single SA/DA pair (IPv4,IPv6) or range (IPv4 only): S/R [S]: r

Maximum number of flows (num src addr * num dst addr): 65536

Enter first source IP address: 10.12.28.2
Enter subnet prefix for source address set: 8
Enter number of source addresses (1-245): 20
Enter source address modifier (1-12) [def:1]: 5

Enter destination IP address: 10.12.28.1
Enter subnet prefix for destination address set: 8
Enter number of destination addresses (1-245): 20
Enter destination address modifier (1-12) [1]: 5
Many to many (M) or simple pairs (S)? [M]: s

Calculating simple pairs...

Total number of hits 20
Member HundredGigE0/1/0/0 has 6 hits
Member HundredGigE0/6/0/5 has 2 hits
```

```
Member HundredGigE0/6/0/6 has 2 hits
Member HundredGigE0/6/0/7 has 9 hits
Member HundredGigE0/1/0/1 has 1 hits
```

The following example shows how to calculate load balancing across the members of a link bundle (bundle-ether 202) using the 7-tuple hash algorithm, a single source and destination, and IPv4 addresses:

```
RP/0/RP0/CPU0:router# bundle-hash bundle-ether 202

Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): 14
Single SA:SP/DA:SP pair (IPv4,IPv6) or range (IPv4 only): S/R [S]: s

Enter bundle type IP V4 (1) or IP V6 (2): 1
Enter source IP V4 address: 172.20.180.167
Enter destination IP V4 address: 172.30.15.42

  Ingress interface --
  - physical interface format: [ TenGigE | HundredGigE]R/S/I/P
  - bundle interface format: [ Bundle-Ether]bundle-id
  Enter ingress interface: HundredGigE0/2/0/3

  Enter L4 protocol (TCP,UDP,SCTP,L2TPV3,NONE): UDP
  Enter src port: 1000
  Enter destination port: 2000
  Compute destination address set for all members? [y/n]: n

S/D pair 172.20.180.167:1000/172.30.15.42:2000 -- Link hashed to is HundredGigE0/3/0/6

Another? [y]: y

Enter bundle type IP V4 (1) or IP V6 (2): 1
Enter source IP V4 address [172.20.180.167]: 172.20.180.167
Enter destination IP V4 address [172.30.15.42]: 172.30.15.42

  Ingress interface --
  - physical interface format: [HundredGigE | TenGigE ]R/S/I/P
  - bundle interface format: [ Bundle-Ether ]bundle-id
  Enter ingress interface [HundredGigE0/2/0/3]: HundredGigE0/2/0/3

  Enter L4 protocol (TCP,UDP,SCTP,L2TPV3,NONE) [udp]: UDP
  Enter src port [1000]: 1000
  Enter destination port [2000]: 2000
  Compute destination address set for all members? [y/n]: y
  Enter subnet prefix for destination address set: 24
  Enter bundle IP V4 address [172.20.180.167]: 209.165.200.225

S/D pair 172.20.180.167:1000/172.30.15.42:2000 -- Link hashed to is HundredGigE0/3/0/6

Destination address set for subnet 172.30.15.0:
S/D pair 172.20.180.167:1000/172.30.15.1:2000 hashes to link HundredGigE0/3/0/6
S/D pair 172.20.180.167:1000/172.30.15.6:2000 hashes to link HundredGigE0/2/0/1
S/D pair 172.20.180.167:1000/172.30.15.3:2000 hashes to link HundredGigE0/2/0/2
S/D pair 172.20.180.167:1000/172.30.15.5:2000 hashes to link HundredGigE0/2/0/3

Another? [y]: n
```

# bundle id

To add a port to an aggregated interface (or bundle), enter the **bundle id** command in interface configuration mode.

**bundle id** *bundle-id* [**mode** {**active** | **on** | **passive**}]  
**no bundle id** *bundle-id*

## Syntax Description

*bundle-id* Number of the bundle (from 1 to 65535) on which you want to add a port.

**mode** (Optional) Specifies the mode of operation, as follows:

- **active**—Use the **mode active** keywords to run Link Aggregation Control Protocol (LACP) in active mode over the port. When you specify **active**, the port joins the bundle and is activated if LACP determines that it is compatible.
- **on**—Use the **mode on** keywords to configure an Etherchannel link over the port (no LACP running over the port).
- **passive**—Use the **mode passive** keywords to run LACP in passive mode over the port. When you specify **passive**, LACP packets are sent only if the other end of the link is using active LACP. The link joins the bundle and is activated if LACP packets are exchanged and the port is compatible.

## Command Default

The default setting is **mode on**.

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 6.0	This command was introduced.

## Usage Guidelines

If you enter the **bundle id** command and specify a port that is already bound to a bundle, the port unbinds from the original bundle and becomes attached to the new bundle. If the bundle numbers are the same, then the port does not unbind, but the mode changes to mode you specified with the **bundle id** command.

## Task ID

Task ID	Operations
bundle	read, write

## Examples

This example shows how to add a port onto a bundle:

```
RP/0/RP0/CPU0:router (config) # interface TenGigE 0/1/0/0
RP/0/RP0/CPU0:router (config-if) # bundle id 1
```

This example shows how to add an active LACP port onto an aggregated interface (or bundle):

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/6/0/1  
RP/0/RP0/CPU0:router(config-if)# bundle id 5 mode active
```

# bundle lacp-fallback

To enable the LACP fallback feature for the members of a bundle, use the **bundle lacp-fallback** command in interface configuration mode. To disable this feature, use the **no** form of the command.

**bundle lacp-fallback** [**timeout** *number-of-seconds*]  
**no bundle lacp-fallback** [**timeout** *number-of-seconds*]

<b>Syntax Description</b>	<i>number-of-seconds</i> The length of timeout, in seconds. Range: 1 to 120. Default: 5.
---------------------------	--

<b>Command Default</b>	The LACP Fallback feature is not enabled.
------------------------	---

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.1.2	This command was introduced.

<b>Task ID</b>	<b>Task ID</b>	<b>Operation</b>
	bundle	read, write

The following example configures load balancing on bundle members based on source IP address:

```
RP/0/ (config) #interface Bundle-Ether 100
RP/0/ (config-if) # bundle lacp-fallback timeout 50
```



## bundle maximum-active links

To designate one active link and one link in standby mode that can take over immediately for a bundle if the active link fails, use the **bundle maximum-active links** command in interface configuration mode. To return to the default maximum active links value, use the **no** form of this command.

**bundle maximum-active links** *links* **hot-standby**  
**no bundle maximum-active links** *links*

<b>Syntax Description</b>	<p><i>links</i> Number of active links you want to bring up in the specified bundle, up to the maximum supported on the platform. The range is 1 to 64.</p> <p><b>hot-standby</b> Modifies some default timeouts, such as wait-while timer and suppress-flaps, to avoid bundle-level flaps when the highest priority link fails or recovers.</p>				
<b>Command Default</b>	No default behavior or values				
<b>Command Modes</b>	Interface configuration				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
<b>Usage Guidelines</b>	<p>The misconfiguration or inconsistent configuration with a remote side can be causing traffic loss even though the bundle is up. We recommend that you use LACP protocol to better protect against the misconfiguration.</p> <p>If the <b>bundle maximum-active links</b> command is issued, then only the highest-priority link within the bundle is active. The priority is based on the value from the <b>bundle port-priority</b> command, where a lower value is a higher priority. Therefore, we recommend that you configure a higher priority on the link that you want to be the active link.</p> <ul style="list-style-type: none"> <li>• Another Cisco IOS XR device using the same option.</li> <li>• Another device using an IEEE standard-based switchover. (Cisco does not recommend using this option because unexpected behavior, such as the peer sending traffic on the standby link, can occur.)</li> </ul>				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operations</th> </tr> </thead> <tbody> <tr> <td>bundle</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operations	bundle	read, write
Task ID	Operations				
bundle	read, write				
<b>Examples</b>	<p>The following example shows how to set the number of active links required to bring up a specific bundle. In this example, the user sets the required number of active links required to bring up Ethernet bundle 5 to 2:</p> <pre>RP/0/RP0/CPU0:router(config)# interface Bundle-Ether 5</pre>				

**bundle maximum-active links**

```
RP/0/RP0/CPU0:router(config-if)# bundle maximum-active links 1
```

The following example shows how to set default values for timeouts, to avoid bundle-level flaps when the highest priority link fails or recovers:

```
RP/0/RP0/CPU0:router(config-if)# bundle maximum-active links 1 hot-standby
```

# bundle minimum-active bandwidth

To set the minimum amount of bandwidth required before a user can bring up a specific bundle, use the **bundle minimum-active bandwidth** command in interface configuration mode.

**bundle minimum-active bandwidth** *kbps*

<b>Syntax Description</b>	<i>kbps</i> Minimum bandwidth required before you can bring up a bundle. Range is from 1 through a number that is equivalent to the combined bandwidths of 8 TenGigabitEthernet interfaces.				
<b>Command Default</b>	The default setting is <i>kbps</i> = 1.				
<b>Command Modes</b>	Interface configuration				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operations</th> </tr> </thead> <tbody> <tr> <td>bundle</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operations	bundle	read, write
Task ID	Operations				
bundle	read, write				

## Examples

This example shows how to set the minimum amount of bandwidth required before a user can bring up a specific bundle. In this example, the user sets the minimum amount of bandwidth required to bring up Ethernet bundle 1 to 620000:

```
RP/0/RP0/CPU0:router(config)# interface Bundle-Ether 1
RP/0/RP0/CPU0:router(config-if)# bundle minimum-active bandwidth 620000
```

# bundle port-priority

To configure Link Aggregation Control Protocol (LACP) priority for a port, enter the **bundle port-priority** command in interface configuration mode. To return to the default LACP priority value, use the **no** form of this command.

**bundle port-priority** *priority*  
**no bundle port-priority** *priority*

<b>Syntax Description</b>	<i>priority</i> Priority for this port, where a lower value equals a higher priority. Replace the <i>priority</i> argument with a number. Range is from 1 through 65535.
---------------------------	--

<b>Command Default</b>	<i>priority</i> : 32768
------------------------	-------------------------

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

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.0	This command was introduced.

<b>Usage Guidelines</b>	The LACP priority value forms part of the port ID, which is transmitted within the LACP packets that are exchanged with the peer. The peer uses the LACP packets to determine whether a given port should carry traffic for the bundle.
-------------------------	---

For Multi-Gigabit Service Control Point (MGSCP), the **bundle port-priority** command applies to working links.



<b>Note</b>	A lower LACP value is a higher LACP priority for the port.
-------------	--

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

## Examples

The following example shows how to configure LACP priority on a port:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface HundredGigE 0/1/0/1
RP/0/RP0/CPU0:router(config-if)# bundle port-priority 1
```

# clear lacp counters

To clear Link Aggregation Control Protocol (LACP) counters for all members of all bundles, all members of a specific bundle, or for a specific port, enter the **clear lacp counters** command in .

```
clear lacp counters [{bundle Bundle-Ether bundle-id | port {HundredGigE interface-path-id | TenGigE interface-path-id}]
```

Syntax Description	
<b>bundle</b>	(Optional) Clears LACP counters for all members of a bundle.
<b>Bundle-Ether</b> <i>node-id</i>	(Optional) Ethernet bundle. Use the <i>node-id</i> argument to specify the node ID number of the LACP counters you want to clear. Range is 1 through 65535.
<b>port</b>	(Optional) Clears all LACP counters on the specified bundle or interface.
<b>HundredGigE</b>	(Optional) Hundred Gigabit Ethernet interface. Use the <i>interface-path-id</i> argument to specify the interface whose LACP counters you want to clear.
<b>TenGigE</b>	(Optional) Ten Gigabit Ethernet interface. Use the <i>interface-path-id</i> argument to specify the interface whose LACP counters you want to clear.
<i>interface-path-id</i>	Physical interface or virtual interface.
	<p><b>Note</b> Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.</p> <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>

**Command Default** No default behavior or values

**Command Modes**

Command History	Release	Modification
	Release 6.0	This command was introduced.

**Usage Guidelines** 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.

Task ID	Task ID	Operations
	bundle	execute
	basic-services	read, write

**Examples** The following example shows how to clear LACP counters:

**clear lacp counters**

```
RP/0/RP0/CPU0:router# clear lacp counters
```

# interface (bundle)

To create a new bundle and enter interface configuration mode for that bundle, use the **interface (bundle)** command in XR Config mode. To delete a bundle, use the **no** form of this command.

**interfaceBundle-Ether***bundle-id*  
**no interfaceBundle-Ether***bundle-id*

<b>Syntax Description</b>	<b>Bundle-Ether</b> Specifies or creates an Ethernet bundle interface.				
	<i>bundle-id</i> Number from 1 to 65535 that identifies a particular bundle.				
<b>Command Default</b>	No bundle interface is configured.				
<b>Command Modes</b>	XR Config mode				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>bundle</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operation	bundle	read, write
Task ID	Operation				
bundle	read, write				

This example shows how to create an Ethernet bundle and enter interface configuration mode:

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface Bundle-Ether 3
RP/0/RP0/CPU0:router(config-if)#
```

# lacp fast-switchover

To disable the wait-while timer in the LACP state machine, use the **lacp fast-switchover** command in interface configuration mode. To re-enable the wait-while timer, use the **no** form of this command.

**lacp fast-switchover**  
**no lacp fast-switchover**

<b>Syntax Description</b>	This command has no keywords or arguments.				
<b>Command Default</b>	The wait-while timer in the LACP state machine is enabled.				
<b>Command Modes</b>	Interface configuration (config-if)				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				

**Usage Guidelines** If you have 1:1 link protection enabled (you set the value of the **bundle maximum-active links** command to 1) on a bundle with member links running LACP, you can optionally disable the wait-while timer in the LACP state machine. Disabling this timer causes a bundle member link in standby mode to expedite its normal state negotiations, thereby enabling a faster switchover from a failed active link to the standby link.

Regardless of the type of switchover you are using, the default IEEE standard-based or the faster proprietary optimized switchover, the state negotiations of the standby link is expedited. (For more information about the switchover types, refer to the [bundle maximum-active links, on page 65](#) command.) However, enabling the **lacp fast-switchover** command provides a greater benefit if used with the IEEE standard-based switchover.

## Examples

The following example shows how to disable the wait-while timer for LACP-enabled member links of Bundle-Ether 28:

```
RP/0/(config)# interface Bundle-Ether 28
RP/0/(config-if)# lacp fast-switchover
```

The following example shows how to re-enable the wait-while timer for LACP-enabled member links of Bundle-Ether 28:

```
RP/0/(config)# interface Bundle-Ether 28
RP/0/(config-if)# no lacp fast-switchover
```



# lACP non-revertive

To configure the currently active but lower priority port to remain active port even after a higher priority port is capable of being operational, use the **lACP non-revertive** command in the bundle interface configuration mode. To revert to the default configuration, use the **no** form of this command.

**lACP non-revertive**

**no lACP non-revertive**

This command has no keywords or arguments.

---

**Command Default** A higher priority port would become the active port after it becomes operational again.

---

**Command Modes** Bundle interface configuration mode

---

Command History	Release	Modification
	Release 6.0	This command was introduced.

---



---

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

---

Task ID	Task ID	Operation
		read, write

---

## Example

The following example shows how to configure the non-revertive behaviour on an LACP bundle interface.

```
RP/0/# configure
RP/0/(config)# interface bundle-ether 1
RP/0/(config-if)# lACP non-revertive
```

# lACP packet-capture

To capture LACP packets so that their information can be displayed by the **show lACP packet-capture** command, use the **lACP packet-capture** command in .

```
{lACP packet-capture HundredGigE interface-path-id | TenGigE interface-path-id number-of-packets}
```

To stop capturing LACP packets or to clear captured LACP packets, use the **lACP packet-capture stop** or **lACP packet-capture clear** command in .

```
{lACP packet-capture [bundle-ether bundle-id][HundredGigE interface-path-id] [TenGigE interface-path-id] clear | stop}
```

## Syntax Description

<b>bundle-ether</b>	Ethernet bundle interface specified by <i>bundle-id</i> .
<b>HundredGigE</b>	Hundred Gigabit Ethernet interface specified by <i>interface-path-id</i> .
<b>TenGigE</b>	Ten Gigabit Ethernet interface specified by <i>interface-path-id</i> .
<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.
<i>bundle-id</i>	Number specifying the bundle interface. The range is 1 to 65535.
<i>number-of-packets</i>	Number of packets to capture.
<b>clear</b>	Clears all currently captured packets.
<b>stop</b>	Stops capturing packets.

## Command Default

The default (no parameters) executes globally for all interfaces on the line card.

## Command Modes

## Command History

Release	Modification
Release 6.0	This command was introduced.

## Usage Guidelines

The **lACP packet-capture** command captures transmitted and received LACP packets on a single bundle member interface. The contents of these packets can then be displayed by the **show lACP packet-capture** command. If the **lACP packet-capture** command is not issued, the **show lACP packet-capture** command does not display any information.

The **lACP packet-capture** command continues capturing LACP packets until the **stop** keyword is issued for that port or that bundle. Captured packets are stored and continue to be displayed until the **clear** keyword is issued for that port or that bundle.

LACP packets can only be captured for one port on a line card at a time. Starting a packet capture on a port implicitly stops and clears all packet-captures on all other ports on that line card.

To **stop** capturing LACP packets before the specified number of packets have been captured, issue the **stop** keyword.

If **stop** is specified for a single interface, packet capturing is stopped only on that interface.

If **stop** is specified for a bundle interface, packet capturing is stopped on all members of that bundle.

If **stop** is specified globally (the default - no parameters), packet capturing is stopped on all bundle interfaces on the router.

To **clear** all captured LACP packets that are stored for an interface, issue the **clear** keyword.

If **clear** is specified for a single interface, packets are cleared only on that interface.

If **clear** is specified for a bundle interface, packets are cleared on all members of that bundle.

If **clear** is specified globally (the default - no parameters), packets are cleared on all bundle interfaces on the router.

Task ID	Task ID	Operations
	bundle	read

### Examples

This example shows how to stop LACP packets on an interface:

```
RP/0/RP0/CPU0:router# lACP packet-capture HundredGigE 0/2/0/0 100
```

The following example shows how to stop capturing LACP packets on a Gigabit Ethernet interface:

```
RP/0/RP0/CPU0:router# lACP packet-capture HundredGigE 0/2/0/0 stop
```

# mlacp node

To configure the mLACP node ID to be used in the ICCP group, use the **mlacp node** command in the redundancy ICCP group configuration mode. To return to the default value, use the **no** form of this command.

**mlacp node** *node-id*  
**no mlacp node** *node-id*

<b>Syntax Description</b>	<i>node-id</i> Specifies the unique node ID in the ICCP group for this system. The node-id value ranges between 0 to 7.
---------------------------	---

<b>Command Default</b>	No default behavior or values
------------------------	-------------------------------

<b>Command Modes</b>	Redundancy ICCP group configuration
----------------------	-------------------------------------

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.0	This command was introduced.

<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.
-------------------------	--

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

**Examples** This example shows how to configure the mLACP node ID to be used in the ICCP group:

```
RP/0/# configure
RP/0/(config)# redundancy iccp group 10
RP/0/(config-redundancy-iccp-group)# mlacp node 3
```

# mlacp system priority

To configure the LACP system priority to be used in the ICCP group, use the **mlacp system priority** command in the redundancy ICCP group configuration mode. To return to the default value, use the **no** form of this command.

**mlacp system priority** *priority*  
**no mlacp system priority** *priority*

<b>Syntax Description</b>	<i>priority</i> Specifies the priority for the system.
---------------------------	--

<b>Note</b>	Lower value indicates higher priority.
-------------	--

<b>Command Default</b>	No default behavior or values
------------------------	-------------------------------

<b>Command Modes</b>	Redundancy ICCP group configuration
----------------------	-------------------------------------

<b>Command History</b>	<table border="1"> <thead> <tr> <th style="width: 15%;">Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				

<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.
-------------------------	--

<b>Task ID</b>	<table border="1"> <thead> <tr> <th style="width: 15%;">Task ID</th> <th>Operations</th> </tr> </thead> <tbody> <tr> <td>bundle</td> <td>read, write</td> </tr> </tbody> </table>	Task ID	Operations	bundle	read, write
Task ID	Operations				
bundle	read, write				

<b>Examples</b>	This example shows how to configure the LACP system priority to be used in the ICCP Group:
-----------------	--

```
RP/0/# configure
RP/0/(config)# redundancy iccp group 10
RP/0/(config-redundancy-iccp-group)# mlacp system priority 10
```

# show bundle brief

To display summary information about all configured bundles, use the **show bundle brief** command in XR EXEC mode.

## show bundle brief

<b>Syntax Description</b>	This command has no keywords or arguments.				
<b>Command Default</b>	Information for all configured bundles is displayed.				
<b>Command Modes</b>	XR EXEC mode				
<b>Command History</b>	<table border="1"> <thead> <tr> <th>Release</th> <th>Modification</th> </tr> </thead> <tbody> <tr> <td>Release 6.0</td> <td>This command was introduced.</td> </tr> </tbody> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
<b>Usage Guidelines</b>	No specific guidelines impact the use of this command.				
<b>Task ID</b>	<table border="1"> <thead> <tr> <th>Task ID</th> <th>Operation</th> </tr> </thead> <tbody> <tr> <td>bundle</td> <td>read</td> </tr> </tbody> </table>	Task ID	Operation	bundle	read
Task ID	Operation				
bundle	read				

These examples shows the status of two bundles, BE16 and BE100, that are configured on the router. Both are Ethernet bundles and only bundle 16 is Up:

```
RP/0/RP0/CPU0:router# show bundle brief
Thu Mar 3 14:40:35.167 PST
```

Name	IG	State	LACP	BFD	Links act/stby/cfgd	Local b/w, kbps
BE1		- Up	On	Off	2 / 0 / 2	20000000
BE2		- Down	Off	Off	0 / 0 / 0	0
BE3		- Admin down	Off	Off	0 / 0 / 1	0
BE100		- Up	On	Off	3 / 0 / 6	30000000

The below table describes the fields shown in the display.

**Table 5: show bundle brief Field Descriptions**

Field	Description
Name	Abbreviated name of the bundle interface, with the following possible formats: <ul style="list-style-type: none"> <li>• BE<math>x</math>—Ethernet bundle with ID number <math>x</math>.</li> </ul>
IG	Interchassis group ID (if configured) of which the bundle is a member.

Field	Description
State	<p>State of the bundle on the local device, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Admin down—The bundle has been configured to be shut down.</li> <li>• Bundle shut—The bundle is holding all links in Standby state and will not support any traffic.</li> <li>• Down—The bundle is operationally down. It has no Active members on the local device.</li> <li>• mLACP cold standby—The bundle is acting as a multichassis LACP Standby device, but the higher layers are not synchronized.</li> <li>• mLACP hot standby—The bundle is Up on the mLACP peer device, and the local device is ready to take over if that bundle goes down on the peer.</li> <li>• Nak—The local and peer devices cannot resolve a configuration error.</li> <li>• Partner down—The partner system indicates that the bundle is unable to forward traffic at its end.</li> <li>• PE isolated—The bundle is isolated from the core.</li> <li>• Up—The bundle has Active members on this device.</li> </ul>
LACP	<p>Status of the Link Aggregation Control Protocol (LACP) on the bundle, with the following possible values:</p> <ul style="list-style-type: none"> <li>• On—LACP is in use on the bundle.</li> <li>• Off—LACP is not active.</li> </ul>

Field	Description
BFD	<p>When BFD is enabled, displays the state of BFD sessions on the bundle from the sessions running on bundle members that is communicated to interested protocols, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Down—The configured minimum threshold for active links or bandwidth for BFD bundle members is not available so BFD sessions are down.</li> <li>• Off—BFD is not configured on bundle members.</li> <li>• Up—BFD sessions on bundle members are up because the minimum threshold for the number of active links or bandwidth is met.</li> </ul>
Links act/stby/cfgd	<p>Number of links on the bundle with a particular status in the format <math>x/y/z</math>, with the following values:</p> <ul style="list-style-type: none"> <li>• <math>x</math>—Number of links in Active state on the bundle for the local device (from 1 to the maximum number of links supported on the bundle).</li> <li>• <math>y</math>—Number of links in Standby state on the bundle for the local device (from 1 to the maximum number of links supported on the bundle).</li> <li>• <math>z</math>—Total number of links configured on the bundle for the local device (from 1 to the maximum number of links supported on the bundle).</li> </ul>
Local b/w, kbps	<p>Current bandwidth of the bundle on the local device (this effective bandwidth might be limited by configuration).</p>



# show bundle

To display information about all bundles or a specific bundle of a particular type, use the **show bundle** command in XR EXEC mode.

**show bundle** [**Bundle-Ether***bundle-id*]

## Syntax Description

**Bundle-Ether** Displays information for the specified Ethernet bundle.

*bundle-id* Number from 1 to 65535 that identifies a particular bundle.

## Command Default

Information is displayed for all configured bundles.

## Command Modes

XR EXEC mode

## Command History

Release	Modification
Release 6.0	This command was introduced.

## Usage Guidelines

To see information for all bundles configured on the router, use the **show bundle** form of the command.

To see information for a specific bundle, use the **show bundle Bundle-Ether***bundle-id* form of the command with the number of the configured bundle.

## Task ID

Task ID	Operation
bundle	read

**Table 6: show bundle Field Descriptions**

Field	Description
Bundle- <i>typenumber</i>	Full name of the bundle interface, where <i>type</i> is Ether (Ethernet), followed by the configured <i>number</i> of the bundle.

Field	Description
Status:	<p>State of the bundle on the local device, with one of the following possible values:</p> <ul style="list-style-type: none"> <li>• Admin down—The bundle has been configured to be shut down.</li> <li>• Bundle shut—The bundle is holding all links in Standby state and will not support any traffic.</li> <li>• Down—The bundle is operationally down. It has no Active members on the local device.</li> <li>• mLACP cold standby—The bundle is acting as a multichassis LACP Standby device, but the higher layers are not synchronized.</li> <li>• mLACP hot standby—The bundle is Up on the mLACP peer device, and the local device is ready to take over if that bundle goes down on the peer.</li> <li>• Nak—The local and peer devices cannot resolve a configuration error.</li> <li>• Partner down—The partner system indicates that the bundle is unable to forward traffic at its end.</li> <li>• PE isolated—The bundle is isolated from the core.</li> <li>• Up—The bundle has Active members on this device.</li> </ul>
Local links <active/standby/configured>:	<p>The number of links on the device (from 0 to the maximum number of supported links for the bundle) in the format</p> <p><math>x/y/z</math>, with the following values:</p> <ul style="list-style-type: none"> <li>• <math>x</math>—Number of links in Active state on the bundle.</li> <li>• <math>y</math>—Number of links in Standby state on the bundle.</li> <li>• <math>z</math>—Total number of links configured on the bundle.</li> </ul>

Field	Description
Local bandwidth <effective/available>:	<p>Bandwidth characteristics on the bundle in kilobits per second (kbps) in the format <math>x/y</math>, with the following values:</p> <ul style="list-style-type: none"> <li>• <math>x</math>—Current bandwidth of the bundle (this effective bandwidth might be limited by configuration).</li> <li>• <math>y</math>—Available bandwidth of the bundle that is the sum of the bandwidths of all of the locally active links.</li> </ul>
MAC address (source):	<p>Layer 2 MAC address on the bundle interface in the format xxxx.xxxx.xxxx. The (<i>source</i>) of the address is shown in parentheses with the following possible values:</p> <ul style="list-style-type: none"> <li>• Interface name—The MAC address is from the displayed member interface type and path.</li> <li>• Configured—The MAC address is explicitly configured.</li> <li>• Chassis pool—The MAC address is from the available pool of addresses for the chassis.</li> <li>• [unknown MAC source 0]—No MAC address could be assigned to the bundle. (You might see this display if you have not completed your bundle configuration.)</li> </ul>
Minimum active links / bandwidth:	<p>Displays the following information in the format <math>x/y</math> kbps, with the following values:</p> <ul style="list-style-type: none"> <li>• <math>x</math>—Minimum number of active links (from 1 to the maximum number of links supported on the bundle) that are required for the bundle to be operative.</li> <li>• <math>y</math>—Minimum total bandwidth on active links (in kbps) that is required for the bundle to be operative.</li> <li>• (partner)—Shows that the peer system's value is in use.</li> </ul>
Maximum active links:	<p>Maximum number of links (from 1 to the maximum supported on a bundle) that can be active on the bundle.</p>

Field	Description
Wait-while timer:	Amount of time (in milliseconds) that the system allows for the Link Aggregation Control Protocol (LACP) to negotiate on a “working” link, before moving a “protect” or backup link to Standby state.
Load balancing:	<p>Type of load balancing in use on the bundle, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Default—The default load balancing method for the system is used on the bundle, and the load balancing sub-fields are not displayed.</li> <li>• No value—Another load balancing method is in use on the bundle, with information shown in the related sub-fields of the display.</li> </ul>
Link order signaling:	<p>Displays whether or not link order signaling is operating on the bundle, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Operational—Link ordering for load balancing is working through the exchange of an additional, Cisco-specific LACP type length value (TLV) that contains the ordering information.</li> <li>• Not operational—A consistent set of link ordering numbers (LONs) has not been received by a higher priority partner, or the LONs to be made active are not consistent with the maximum number of active links supported by the bundle.</li> </ul>
Hash type:	<p>The information to be used for the load balancing hash on the bundle, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Dst-IP—The load balancing on the bundle is based on the packet's destination IP address.</li> <li>• Src-IP—The load balancing on the bundle is based on the packet's source IP address.</li> </ul>

Field	Description
LACP:	<p>Displays whether or not Link Aggregation Control Protocol (LACP) is active on the bundle, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Operational—All required configuration has been committed and LACP is in use on active members.</li> <li>• Not operational—LACP is not working because some mandatory configuration is missing on the bundle or on the active members of the bundle.</li> <li>• Not configured—None of the mandatory configuration for LACP has been committed on the bundle, and the LACP sub-fields are not displayed.</li> </ul>
Flap suppression timer:	<p>Displays the status of the flap suppression timer, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Off—The flap suppression timer is not configured using the <b>lacp switchover suppress-flaps</b> command.</li> <li>• <i>x</i> ms—Amount of time allowed (in milliseconds) for standby links to activate after a working link fails, before putting the link in Down state.</li> </ul>
Cisco extensions:	<p>Displays whether or not the Cisco-specific TLVs for LACP are enabled. The possible values are "Enabled" and "Disabled".</p>
Non-revertive:	<p>Displays whether non-revertive behavior for the bundle interface is enabled or not. The possible values are "Enabled" and "Disabled".</p>
mLACP:	<p>Displays whether or not the bundle is operating using Multichassis Link Aggregation (MC-LAG), with the following possible values:</p> <ul style="list-style-type: none"> <li>• Operational—All required configuration has been committed for MC-LAG and mLACP is in use on the bundle.</li> <li>• Not operational—mLACP is not working because some mandatory configuration for MC-LAG is missing on the bundle or on the active members of the bundle.</li> <li>• Not configured—None of the mandatory configuration for MC-LAG has been committed on the bundle, and the mLACP sub-fields are not displayed.</li> </ul>

Field	Description
ICCP group:	Number of the Interchassis Communication Protocol group (if configured) in which the bundle participates. Otherwise, “Not configured” is displayed.
Role	ICCP redundancy role of the local device for this mLACP bundle, with the following possible values: <ul style="list-style-type: none"> <li>• Active—Bundle is currently active locally.</li> <li>• Standby—Bundle is a backup locally.</li> </ul>
Foreign links <active/configured>:	The number of links on the remote device in the format $x/y$ , with the following values: <ul style="list-style-type: none"> <li>• <math>x</math>—Number of links in Active state on the remote bundle.</li> <li>• <math>y</math>—Total number of links configured on the remote bundle.</li> </ul>
Switchover type:	Method of performing an mLACP switchover on the bundle with the following possible values: <ul style="list-style-type: none"> <li>• Brute force— Trigger the failover by marking member(s) as Not Aggregatable instead of using dynamic priority management. This is the only possible method of control when the dual-homed device (DHD) is the higher-priority system. Only applies to mLACP bundles.</li> <li>• Non-revertive—This is the default. Dynamic priority management is used, where the bundle does not fail back to the originally active point of attachment (PoA) except when a subsequent failure occurs.</li> <li>• Revertive—Dynamic priority management is used, but the higher-priority device (based on the configured port priorities for the bundle) is always Active unless it has encountered a failure. This means that if a failure is encountered triggering a switchover, once the failure condition is cleared the initially-active links become active again.</li> </ul> <p>The switchover type can be changed from the default behavior using the <b>mlacp switchover type</b> command,</p>

Field	Description
Recovery delay:	<p>Number of seconds (s) to delay becoming the active mLACP device after recovering from a failure, using the <b>mlacp switchover recovery delay</b> command. “None” is displayed when the <b>mlacp switchover recovery delay</b> command is not configured.</p>
Maximize threshold:	<p>Threshold value below which mLACP switchovers are triggered to allow the bundle to reach the configured maximum number of active links or bandwidth (using the <b>mlacp switchover maximize</b> command), with the following possible values:</p> <ul style="list-style-type: none"> <li>• <i>x</i> links—Number of active links used as the maximum threshold target to be maintained as a trigger for an mLACP switchover on a bundle.</li> <li>• <i>y</i> kbps—Bandwidth in kilobits per second used as the target threshold to be maintained as a trigger for an mLACP switchover on a bundle.</li> <li>• Not configured—The <b>mlacp switchover maximize</b> command is not configured. mLACP switchovers are based on the minimum active links or bandwidth for the bundle.</li> </ul>
IPv4 BFD:	<p>Displays whether or not IPv4-based bidirectional forwarding (BFD) is operating on the bundle interface, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Operational—All required configuration has been committed for IPv4 BFD, and it is in use on the bundle.</li> <li>• Not operational—IPv4 BFD is not working because some mandatory configuration is missing on the bundle or on the active members of the bundle.</li> <li>• Not configured—None of the mandatory configuration for IPv4 BFD has been committed on the bundle, and the BFD sub-fields are not displayed.</li> </ul>

Field	Description
State:	<p>When BFD is enabled, displays the state of BFD sessions on the bundle from the sessions running on bundle members that is communicated to interested protocols, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Down—The configured minimum threshold for active links or bandwidth for BFD bundle members is not available so BFD sessions are down.</li> <li>• Off—BFD is not configured on bundle members.</li> <li>• Up—BFD sessions on bundle members are up because the minimum threshold for the number of active links or bandwidth is met.</li> </ul>
Fast detect:	<p>Displays whether or not BFD fast detection is configured on the bundle, with the following possible values:</p> <ul style="list-style-type: none"> <li>• Enabled—The <b>bfd fast-detect</b> command is configured on the bundle.</li> <li>• Disabled—The <b>bfd fast-detect</b> command is not configured on the bundle.</li> </ul>
Start timer:	<p>Displays status of the BFD start timer that is configured using the <b>bfd address-family ipv4 timers start</b> command, with the following possible values:</p> <ul style="list-style-type: none"> <li>• <i>x s</i>—Number of seconds (from 60 to 3600) after startup of a BFD member link session to wait for the expected notification from the BFD peer to be received, so that the session can be declared up. If the SCN is not received after that period of time, the BFD session is declared down.</li> <li>• Off—The start timer is not configured, and a BFD session is only declared Down upon notification from the BFD server.</li> </ul>



Field	Description
Neighbor-unconfigured timer:	<p>Displays status of the BFD start timer that is configured using the <b>bfd address-family ipv4 timers nbr-unconfig</b> command, with the following possible values:</p> <ul style="list-style-type: none"> <li>• <i>x s</i>—Number of seconds (from 60 to 3600) to wait after receipt of notification that the BFD configuration has been removed by a BFD neighbor, so that any configuration inconsistency between the BFD peers can be fixed. If the BFD configuration issue is not resolved before the specified timer is reached, the BFD session is declared down.</li> <li>• Off—The neighbor-unconfigured timer is not configured, and a BFD session is only declared Down upon notification from the BFD server.</li> </ul>
Preferred min interval:	<p>Number of milliseconds (in the format <i>x ms</i>) as the minimum control packet interval for BFD sessions. The range is 15 to 30000.</p>
Preferred multiple:	<p>Value of the multiplier (from 2 to 50) that is used for echo failure detection, which specifies the maximum number of echo packets that can be missed before a BFD session is declared Down.</p>
Destination address:	<p>Destination IP address for BFD sessions on bundle member links that is configured using the <b>bfd address-family ipv4 destination</b> command. “Not configured” is displayed when no destination IP address is configured.</p>
Port	<p>Name of the local interface port that is configured to be a bundle member, or a foreign interface received by an mLACP peer device. The possible values are the shortened interface name or a text string.</p>
Device	<p>Label Distribution Protocol (LDP) address of the device where the interface port is located, with the following possible values:</p> <ul style="list-style-type: none"> <li>• <i>address</i>—IP address of the device.</li> <li>• Local—Interface port is on the local device.</li> </ul>

Field	Description
State	<p>Status of the port, with one of the following possible values</p> <ul style="list-style-type: none"> <li>• Active—Link can send and receive traffic.</li> <li>• BFD Running—Link is inactive because BFD is down or has not been fully negotiated.</li> <li>• Configured—Link is not operational or remains down due to a configuration mismatch. The link is not available for switchover from failure of an active link.</li> <li>• Hot Standby—Link is ready to take over if an active link fails and can immediately transition to Active state without further exchange of LACP protocol data units (PDUs).</li> <li>• Negotiating—Link is in the process of LACP negotiation and is being held in a lower LACP state by the peer (for example, because the link is Standby on the peer.)</li> <li>• Standby—Link is not sending or receiving traffic, but is available for switchover from failure of an active link.</li> </ul>
Port ID	<p>ID of the interface port in the format <math>x/y</math>, with the following values:</p> <ul style="list-style-type: none"> <li>• <math>x</math>—Port priority as a 2-byte hexadecimal value.</li> <li>• <math>y</math>—Link ID as a 2-byte hexadecimal value.</li> </ul>
B/W, kbps	Bandwidth of the interface port in kilobits per second.
State reason	Text string that is displayed beneath the bundle member listing explaining why a link has not reached Active state.

Table 7: State Reasons

Reason	Description
BFD session is unconfigured on the remote end	The link is in BFD Running state because LACP is negotiated but the BFD session from the remote device has been unconfigured.
BFD state of this link is Down	The link is in BFD Running state because LACP is negotiated but the BFD session between the local system and the remote device is Down.

Reason	Description
Bundle has been shut down	The link is in Configured state because the bundle it is configured as a member of is administratively down.
Bundle interface is not present in configuration	The link is in Configured state because the bundle it is configured as a member of has not itself been configured.
Bundle is in the process of being created	The link is in Configured state because the bundle it is configured as a member of is still being created.
Bundle is in the process of being deleted	The link is in Configured state because the bundle it is configured as a member of is being deleted.
Bundle is in the process of being replicated to this location	The link is in Configured state because the bundle it is configured as a member of is still being replicated to the linecard where the link is located.
Forced switchover to the mLACP peer	The link is in Configured state because it has been brought down as part of a forced switchover to the mLACP peer PoA. This happens only when brute force switchovers are configured.
ICCP group is isolated from the core network	The link is in Configured state because there is no connectivity through the network core for the ICCP group that the link and its bundle are part of. Therefore, the link has been brought down to prevent any traffic being sent by the LACP partner device.
Incompatible with other links in the bundle (bandwidth out of range)	The link is in Configured state because its bandwidth is incompatible with other links configured to be in the same bundle. The bandwidth may be too high or too low.
LACP shutdown is configured for the bundle	The link is in Standby state because the bundle is configured with LACP shutdown.
Incompatible with other links in the bundle (LACP vs non-LACP)	The link is in Configured state because its use of LACP is incompatible with other links configured in the same bundle. Some links might be running LACP while others are not.
Link is Attached and has not gone Collecting (reason unknown)	The link is in Negotiating state because the mLACP peer PoA has not indicated that the link has gone Collecting in the Mux machine. This could be because of an issue between the mLACP peer and its LACP partner or because this state has not been communicated to the local system.

Reason	Description
Link is Collecting and has not gone Distributing (reason unknown)	The link is in Negotiating state because the mLACP peer PoA has not indicated that the link has gone Distributing in the Mux machine. This could be because of an issue between the mLACP peer and its LACP partner or because this state has not been communicated to the local system.
Link is being removed from the bundle	The link is being removed from the bundle and remains in Configured state while this happens.
Link is Defaulted; LACPDU are not being received from the partner	The link is in Configured state because no LACPDUs are being received from the LACP partner device. Either the partner is not transmitting or the packets are getting lost.
Link is down	The link is in Configured state because it is operationally or administratively down.
Link is Expired; LACPDUs are not being received from the partner	The link is in Negotiating state because no LACPDUs have been received from the LACP Partner device in the Current-While period and the link is now marked as Expired in the Receive machine.
Link is in the process of being created	The link is in Configured state because the member configuration is still being processed.
Link is marked as Standby by mLACP peer	The link is in Standby state because this has been indicated by the mLACP peer PoA.
Link is Not Aggregatable (reason unknown)	The link is in Configured state because it is marked as an Individual link by the mLACP peer PoA.
Link is not operational as a result of mLACP negotiations	mLACP negotiations with the peer have led to this link being kept in Configured state. This is likely to indicate a misconfiguration between the two peer devices.
Link is Standby; bundle has more links than are supported	The link is in Standby state because the number of links in Selected state has already reached the hard platform limit on the number of active links.
Link is Standby due to maximum-active links configuration	The link is in Standby state because the number of links in Selected state has already reached the configured maximum active links threshold.
Link is waiting for BFD session to start	The link is in BFD Running state because LACP is negotiated but the BFD session has not started from the remote device.

Reason	Description
Loopback: Actor and Partner have the same System ID and Key	The link is in Configured state because a loopback condition has been detected on the link—two links configured to be members of the bundle are actually connected to each other.
Not enough links available to meet minimum-active threshold	The link is in Standby state because there are not enough selectable links (i.e. links which meet the criteria to be marked Selected within the bundle) to meet the minimum active links/bandwidth threshold.
Partner has marked the link as Not Aggregatable	The link is in Configured state because it is marked as an Individual link by the LACP partner device.
Partner has not advertised that it is Collecting	The link is in Negotiating state because the LACP partner device has not advertised that the link is in Collecting state in its LACPDUs.
Partner has not echoed the correct parameters for this link	The link is in Negotiating state because the LACP partner device has not correctly echoed the local system's port information in the LACPDUs it is sending.
Partner is not Synchronized (Waiting, not Selected, or out-of-date)	The link is in Negotiating state because the mLACP peer PoA has not indicated that its LACP partner device is Synchronized. This could be because the devices are genuinely not Synchronized or because this state has not been communicated to the local system.
Partner is not Synchronized (Waiting, Standby, or LAG ID mismatch)	The link is in Negotiating state because the LACP partner device has not indicated that it is Synchronized in the LACPDUs it is sending. On the partner device the link could still be waiting for the Wait-While timer to expire, it could be held in Standby state, or there could be a misconfiguration leading to a LAG ID mismatch between links configured to be within the same bundle.
Partner System ID/Key do not match that of the Selected links	The link is in Configured state because the System ID or Operational Key specified by the LACP partner device does not match that seen on other Selected links within the same bundle. This probably indicates a misconfiguration.
Wait-while timer is running	The link is in Configured state because the Wait-While timer is still running and the new state has not yet been determined.

# show bundle infrastructure

To display the state of the bundle manager, use the **show bundle infrastructure** command in EXEC mode.

**show bundle infrastructure database ma**

Syntax Description	
<b>database</b>	Displays the information from the bundle manager database.
<b>ma</b>	Displays the MA information from the bundle manager.

**Command Default** None.

**Command Modes** EXEC modeXR EXEC mode

Command History	Release	Modification
	Release 6.1.2	This command was introduced.

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

Task ID	Task ID	Operations
	bundle	read

**Examples** The following examples show how to use the **show bundle load-balancing** command and its various keywords:

```
RP/0/# show bundle infrastructure database ma

Bundle-Ether1

  In LACP-Fallback mode?      TRUE
  LACP fallback timeout      15
  LACP fallback timeout cfgd? TRUE

TengE0/0/0/0
  LACP Fallback member?      TRUE

RP/0/0/CPU0#
```

# show lacp bundle-ether

To display detailed information about Link Aggregation Control Protocol (LACP) ports and their peers, enter the **show lacp bundle** command in XR EXEC mode.

**show lacp** {**Bundle-Ether**} *bundle-id*

This command has no keywords or arguments.

**Command Default** No default behavior or values

**Command Modes** XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

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

Task ID	Task ID	Operations
	bundle	read

## Examples

This example shows how to display LACP information for a specific Ethernet Bundle:

```
RP/0/RP0/CPU0:router# show lacp Bundle-Ether 1

Wed Jun 22 20:34:58.085 UTC
State: a - Port is marked as Aggregatable.
       s - Port is Synchronized with peer.
       c - Port is marked as Collecting.
       d - Port is marked as Distributing.
       A - Device is in Active mode.
       F - Device requests PDUs from the peer at fast rate.
       D - Port is using default values for partner information.
       E - Information about partner has expired.

Bundle-Ether1

  Port          (rate)  State   Port ID          Key           System ID
  -----
Local
  Te0/0/0/0/0   30s     ascdA--- 0x8000,0x0006 0x0001 0x8000,ea-74-b3-bd-f4-85
  Partner       30s     ascdA--- 0x8000,0x0002 0x0001 0x8000,1c-df-0f-39-d1-05
  Te0/0/0/0/1   30s     ascdA--- 0x8000,0x0005 0x0001 0x8000,ea-74-b3-bd-f4-85
  Partner       30s     ascdA--- 0x8000,0x0001 0x0001 0x8000,1c-df-0f-39-d1-05

  Port          Receive  Period Selection Mux           A Churn P Churn
  -----
Local
  Te0/0/0/0/0   Current  Slow   Selected  Distrib  None   None
```

```

Te0/0/0/0/1          Current   Slow   Selected   Distrib   None   None
RP/0/RP0/CPU0:vpnPE1#

```

**Table 8: show lacp bundle Field Descriptions**

Field	Description
Flags	Describes the possible flags that may apply to a device or port, under the “Flags” field.
State	Describes the possible flags that may apply the port state, under the “State” field.
Port	Port identifier, in the <i>rack/slot/module/port</i> notation.
State	Provides information about the state of the specified port. Possible flags are: <ul style="list-style-type: none"> <li>• 0—Port is not aggregatable.</li> <li>• 1—Port is out of sync with peer.</li> <li>• 2—Port is in sync with peer.</li> <li>• 3—Port is collecting.</li> <li>• 4—Port is collecting and distributing.</li> </ul>
Flags	Provides information about the state of the specified device or port. Possible flags are: <ul style="list-style-type: none"> <li>• A—Device is in Active mode.</li> <li>• P—Device is in Passive mode.</li> <li>• S—Device requests peer to send PDUs at a slow rate.</li> <li>• F—Device requests peer to send PDUs at a fast rate.</li> <li>• D—Port is using default values for partner information.</li> <li>• E—Information about partner has expired.</li> </ul>
Port ID	Port identifier, expressed in the format <i>Nxnnnn</i> . <i>N</i> is the port priority, and <i>nnnn</i> is the port number assigned by the sending router.
Key	Two-byte number associated with the specified link and aggregator. Each port is assigned an operational key. The ability of one port to aggregate with another is summarized by this key. Ports which have the same key select the same bundled interface. The system ID, port ID and key combine to uniquely define a port within a LACP system.
System-ID	System identifier. The system ID is a LACP property of the system which is transmitted within each LACP packet together with the details of the link.



# show lacp counters

To display Link Aggregation Control Protocol (LACP) statistics, enter the **show lacp counters** command in

```
show lacp counters {Bundle-Ether} bundle-id
```

This command has no keywords or arguments.

**Command Default** No default behavior or values

**Command Modes**

**Command History**

Release	Modification
Release 6.0	This command was introduced.

**Usage Guidelines**

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.

**Task ID**

Task ID	Operations
bundle	read

**Examples**

The following example shows how to display LACP counters on an Ethernet bundle:

```
RP/0/# show lacp counters bundle-ether 1
```

```
Bundle-Ether1
```

Port	LACPDUs		Marker		Last Cleared
	Sent	Received	Received	Resp. Sent	
Gi0/0/2/0	12	0	0	0	never

Port	Excess	Excess	Pkt Errors
Gi0/0/2/0	0	0	0

Table 9: show lacp counters Field Descriptions

Field	Description
LACPDU	<p>Provides the following statistics for Link Aggregation Control Protocol data units (LACPDU):</p> <ul style="list-style-type: none"> <li>• Port</li> <li>• Sent</li> <li>• Received</li> <li>• Last Cleared</li> <li>• Excess</li> <li>• Pkt Errors</li> </ul>
Marker	<p>Provides the following statistics for marker packets:</p> <ul style="list-style-type: none"> <li>• Received</li> <li>• Resp. Sent</li> <li>• Last Cleared</li> <li>• Excess</li> <li>• Pkt Errors</li> </ul> <p><b>Note</b> The Marker Protocol is used by IEEE 802.3ad bundles to ensure that data no longer is transmitted on a link when a flow is redistributed away from that link.</p>

# show lacp io

To display the Link Aggregation Control Protocol (LACP) transmission information that used by the transmitting device for sending packets on an interface, use the **show lacp io** command in XR EXEC mode.

**show lacp io** {**Bundle-Ether**} *bundle-id* {**TenGigE** | **HundredGigE**} *interface-path-id*

Syntax Description	
<b>Bundle-Ether</b> <i>bundle-id</i>	(Optional) Displays information for the Ethernet bundle interface with the specified <i>bundle-id</i> . The range is 1 through 65535.
<b>HundredGigE</b>	(Optional) Displays information for the HundredGigabit Ethernet interface with the specified <i>interface-path-id</i> .
<b>TenGigE</b>	(Optional) Displays information for the TenGigabit Ethernet interface with the specified <i>interface-path-id</i> .
<i>interface-path-id</i>	Physical interface or virtual interface.
	<p><b>Note</b> Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.</p> <p>For more information about the syntax for the router, use the question mark (?) online help function.</p>

**Command Default** The default takes no parameters and displays information for all actively transmitting interfaces.

**Command Modes** XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

**Usage Guidelines** 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.

Task ID	Task ID	Operations
	bundle	read

**Examples** The following example shows how to display Link Aggregation Control Protocol (LACP) information for the Ethernet bundle interface with bundle ID 28.

```
RP/0/RP0/CPU0:router# show lacp io bundle-ether 28
```

```
Thu Jun 18 16:28:54.068 PST
```

## show lacp io

```

Bundle-Ether28

Interface TenGigE0/1/5/6
=====
Interface handle:      0x01180100
Interface media type:  Ethernet
Fast periodic interval: 1000ms
Source MAC address:   0015.63c0.b3b8
Actor system:         0x8000, 00-15-63-c0-b0-04
Actor key:            0x001c
Actor port:           0x8000, 0x0001
Actor state:          Act (T/o) Agg Sync Coll Dist (Def) (Exp)
Partner system:       0x8000, 00-15-63-58-b9-04
Partner key:          0x001c
Partner port:         0x0001, 0x0003
Partner state:        Act (T/o) Agg Sync Coll Dist (Def) (Exp)

Interface TenGigE0/1/5/7
=====
Interface handle:      0x01180120
Interface media type:  Ethernet
Fast periodic interval: 1000ms
Source MAC address:   0015.63c0.b3b9
Actor system:         0x8000, 00-15-63-c0-b0-04
Actor key:            0x001c
Actor port:           0x8000, 0x0002
Actor state:          Act (T/o) Agg Sync (Coll) (Dist) (Def) (Exp)
Partner system:       0x8000, 00-15-63-58-b9-04
Partner key:          0x001c
Partner port:         0x0002, 0x0004
Partner state:        Act (T/o) Agg (Sync) (Coll) (Dist) (Def) (Exp)

```

The following example shows how to display Link Aggregation Control Protocol (LACP) information for all actively transmitting interfaces:

```

RP/0/RP0/CPU0:router# show lacp io

Thu Jun 18 16:33:57.330 PST

Bundle-Ether28

Interface TenGigE0/1/5/6
=====
Interface handle:      0x01180100
Interface media type:  Ethernet
Fast periodic interval: 1000ms
Source MAC address:   0015.63c0.b3b8
Actor system:         0x8000, 00-15-63-c0-b0-04
Actor key:            0x001c
Actor port:           0x8000, 0x0001
Actor state:          Act (T/o) Agg Sync Coll Dist (Def) (Exp)
Partner system:       0x8000, 00-15-63-58-b9-04
Partner key:          0x001c
Partner port:         0x0001, 0x0003
Partner state:        Act (T/o) Agg Sync Coll Dist (Def) (Exp)

Interface TenGigE0/1/5/7
=====
Interface handle:      0x01180120
Interface media type:  Ethernet
Fast periodic interval: 1000ms
Source MAC address:   0015.63c0.b3b9

```

```
Actor system: 0x8000, 00-15-63-c0-b0-04
Actor key:    0x001c
Actor port:   0x8000, 0x0002
Actor state:  Act (T/o) Agg Sync (Coll) (Dist) (Def) (Exp)
Partner system: 0x8000, 00-15-63-58-b9-04
Partner key:   0x001c
Partner port:  0x0002, 0x0004
Partner state: Act (T/o) Agg (Sync) (Coll) (Dist) (Def) (Exp)
```

# show lacp packet-capture

To display the contents of Link Aggregation Control Protocol (LACP) packets that are sent and received on an interface, use the **show lacp packet-capture** command in XR EXEC mode.

**show lacp packet-capture** [**decoded**] [{**in** | **out**}] {**GigabitEthernet** | **TenGigE**} *interface-path-id*

Syntax Description	
<b>decoded</b>	(Optional) Displays packet information in decoded form for the specified interface.
<b>in</b>	(Optional) Displays packet information for ingress packets only.
<b>out</b>	(Optional) Displays packet information for egress packets only.
<b>HundredGigE</b>	Displays packet information for the Hundred Gigabit Ethernet interface specified by <i>interface-path-id</i> .
<b>TenGigE</b>	Displays packet information for the Ten Gigabit Ethernet interface specified by <i>interface-path-id</i> .
<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.

**Command Default** The default displays both in and out information.

**Command Modes** XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

**Usage Guidelines** The **lacp packet-capture** command captures transmit and receive packets on a single interface. The contents of these packets can then be displayed by the **show lacp packet-capture** command. If the **lacp packet-capture** command is not issued, the **show lacp packet-capture** command does not display any information.

Task ID	Task ID	Operations
	bundle	read

**Examples** This example shows how to display the contents of an LACP packet, in hexadecimal, for a Gigabit Ethernet interface:

The following example shows how to display the LACP parameters, decoded from individual packets, transmitted and received on a Gigabit Ethernet interface:



**Note** In the following example, after you issue the **lacp packet-capture** command, you must wait for a reasonable amount of time for the system to capture packets that are sent and received on the interface before you issue the **show lacp packet-capture** command. Otherwise, there is no information to display.

```
RP/0/RP0/CPU0:router# lacp packet-capture HundredGigE 0/1/0/0 100
RP/0/RP0/CPU0:router# show lacp packet-capture decoded HundredGigE 0/1/0/0

Wed Apr 29 16:27:54.748 GMT
OUT Apr 29 17:06:03.008
=====
Subtype: 0x01 - LACP      Version: 1

TLV: 0x01 - Actor Information      Length: 20
System: Priority: 32768, ID: 02-a7-4c-81-95-04
Key: 0x0001, Port priority: 32768, Port ID: 1
State: Act (T/o) Agg (Sync) (Coll) (Dist) Def (Exp)

TLV: 0x02 - Partner Information    Length: 20
System: Priority: 65535, ID: 00-00-00-00-00-00
Key: 0x0000, Port priority: 65535, Port ID: 0
State: (Act) (T/o) (Agg) (Sync) (Coll) (Dist) Def (Exp)

TLV: 0x03 - Collector Information  Length: 16
Max delay: 65535

TLV: 0x00 - Terminator            Length: 0
```

# show lacp port

To display detailed information about Link Aggregation Control Protocol (LACP) ports, enter the **show lacp port** command in XR EXEC mode.

```
show lacp port [{HundredgigE | TenGigE}interface_instance]
```

This command has no keywords or arguments.

---

**Command Default** No default behavior or values.

---

**Command Modes** XR EXEC mode

---

Command History	Release	Modification
	Release 6.0	This command was introduced.

---



---

**Usage Guidelines** For the *interface-path-id* argument, 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.
- *port* : Physical port number of the interface.

---

Task ID	Task ID	Operations
	bundle read	

---

## Examples

The following example shows how to display LACP port information for all link bundles on a router:

```
RP/0/RP0/CPU0:router# show lacp port
```

```
Flags: A - Device is in Active mode. P - Device is in Passive mode.
       S - Device sends PDUs at slow rate. F - Device sends PDUs at fast rate.
       D - Port is using default values for partner information
       E - Information about partner has expired
State: 0 - Port is Not Aggregatable. 1 - Port is Out Of Sync with peer.
       2 - Port is In Sync with peer. 3 - Port is Collecting.
       4 - Port is Collecting and Distributing.
```

```
Bundle-Ether1
      B/W (Kbps)  MAC address  Minimum active  Maximum active
      -----  -
           0  0800.453a.651d  1  620000  32
```



```

Port          State  Flags  Port ID          Key          System-ID
-----
Gi0/0/2/0    1      ASDE   0x8000, 0x0001  0x0001      0x8000, 08-00-45-3a-65-01
PEER         0      PSD    0xffff, 0x0000  0x0000      0xffff, 00-00-00-00-00-00

```

Table 10: show lacp port Field Descriptions

Field	Description
Port	Identifies the LACP port whose information is displayed. The port number is expressed in the <i>rack/slot/module/port</i> notation.
State	Provides information about the state of the specified device or port. Possible flags are: <ul style="list-style-type: none"> <li>• 0—Port is not aggregatable.</li> <li>• 1—Port is out of sync with peer.</li> <li>• 2—Port is in sync with peer.</li> <li>• 3—Port is collecting.</li> <li>• 4—Port is collecting and distributing.</li> </ul>
Flags	Provides information about the state of the specified port. Possible flags are: <ul style="list-style-type: none"> <li>• A—Device is in Active mode.</li> <li>• P—Device is in Passive mode.</li> <li>• S—Device requests peer to send PDUs at a slow rate.</li> <li>• F—Device requests peer to send PDUs at a fast rate.</li> <li>• D—Port is using default values for partner information.</li> <li>• E—Information about partner has expired.</li> </ul>
Port ID	Port identifier, expressed in the following format: <i>Nxnnnn</i> . <i>N</i> is the port priority, and <i>nnnn</i> is the port number assigned by the sending router.
Key	Two-byte number associated with the specified link and aggregator. Each port is assigned an operational key. The ability of one port to aggregate with another is summarized by this key. Ports which have the same key select the same bundled interface. The system ID, port ID and key combine to uniquely define a port within a LACP system.
System-ID	System identifier. The System ID is an LACP property of the system which is transmitted within each LACP packet together with the details of the link.

# show lacp system-id

To display the local system ID used by the Link Aggregation Control Protocol (LACP), enter the **show lacp system-id** command in XR EXEC mode.

**show lacp system-id**

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

**Command Default** No default behavior or values

**Command Modes** XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

**Usage Guidelines** The System ID and details about the specific link are transmitted within each LACP packet.

Task ID	Task	Operations
	bundle	read

## Examples

The following example shows how to display the system ID used by the LACP:

```
RP/0/RP0/CPU0:router# show lacp system-id

Priority  MAC Address
-----  -
0x8000   08-00-45-3a-65-01
```

**Table 11: show lacp system-id Field Descriptions**

Field	Description
Priority	Priority for this system. A lower value is higher priority.
MAC Address	MAC address associated with the LACP system ID.



## Management Ethernet Interface Commands

---

This module provides command line interface (CLI) commands for configuring Management Ethernet interfaces on the Cisco NCS 5000 Series Router.

For detailed information about Management Ethernet interfaces concepts, configuration tasks, and examples, refer to the *Interface and Hardware Component Configuration Guide for Cisco NCS 5000 Series Routers*

- [duplex \(Management Ethernet\), on page 108](#)
- [interface MgmtEth, on page 109](#)
- [ipv6 address autoconfig, on page 110](#)
- [mac-address \(Management Ethernet\), on page 112](#)
- [speed \(Management Ethernet\), on page 113](#)

# duplex (Management Ethernet)

To configure duplex mode operation on a Management Ethernet interface, use the **duplex** command in interface configuration mode. To return the interface to autonegotiated duplex mode, use the **no** form of the **duplex** command.

```
duplex {full | half}
no duplex
```

## Syntax Description

**full** Configures the Management Ethernet interface to operate in full duplex mode.

**half** Configures the Management Ethernet interface to operate in half duplex mode.

## Command Default

Autonegotiates duplex operation

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 6.0	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 configure the Management Ethernet interface to operate in full duplex mode:

```
RP/0/RP0/CPU0:router(config)# interface mgmtEth 0/
RP0/CPU0/0
RP/0/RP0/CPU0:router(config-if)# duplex full
```

This example shows how to configure the Management Ethernet interface to operate in half duplex mode:

```
RP/0/RP0/CPU0:router(config)# interface mgmtEth 0/RP0/CPU0/0
RP/0/RP0/CPU0:router(config-if)# duplex half
```

This example shows how to return a Management Ethernet interface to autonegotiated duplex mode:

```
RP/0/RP0/CPU0:router(config)# interface mgmtEth 0/RP0/CPU0/0
RP/0/RP0/CPU0:router(config-if)# no duplex
```

# interface MgmtEth

To enter interface configuration mode for the Management Ethernet interface, use the **interface MgmtEth** command in XR Config mode. To delete a Management Ethernet interface configuration, use the **no** form of this command.

```
interface MgmtEth interface-path-id
no interface MgmtEth interface-path-id
```

## Syntax Description

*interface-path-id* Physical interface or virtual 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

No default behavior or values

## Command History

Release	Modification
Release 6.0	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 enter interface configuration mode for a Management Ethernet interface:

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

## ipv6 address autoconfig

The **ipv6 address autoconfig** command is used to configure IPv6 addresses or prefix on the interface. This command enables IPv6 processing on the interface. To remove all manually configured IPv6 addresses from an interface, use the **no ipv6 address** command without arguments.

The IPv6 Stateless Address Auto Configuration (SLAAC) is used when a site is not particularly concerned with the exact addresses the hosts use, as long as they are unique and can be routed. IPv6 auto configuration is disabled by default. To enable IPv6 SLAAC on Management interface, use the **ipv6 address autoconfig** command on the Management interface configuration mode. To disable auto configuration on the Management interface, use the no form of the command.

```
ipv6 address { [ ipv6addr ] | [ ipv6-prefix/prefix length ] | [ autoconfig ] }
no ipv6 address { [ ipv6addr ] | [ ipv6-prefix/prefix length ] | [ autoconfig ] }
```

### Syntax Description

<i>ipv6addr</i>	(Optional) Specify the IPv6 address.
<i>ipv6-prefix/prefix length</i>	(Optional) Specify the IPv6 prefix and the prefix length preceded by a slash [/].
<b>autoconfig</b>	(Optional) Enable IPv6 stateless address auto configuration (SLAAC) on Management interface.
<b>Note</b>	The <b>autoconfig</b> option is only available for Management Interfaces.

### Command Default

No default behavior or values

### Command Modes

Management Interface Configuration

### Command History

Release	Modification
Release 6.3.1	This command was introduced.

### Usage Guidelines

In the **ipv6 address** interface configuration command, you can enter the *ipv6addr* or *ipv6-prefix/prefix length* variables with the address specified in hexadecimal using 16-bit values between colons. The *prefix length* variable (preceded by a slash [/]) is a decimal value that shows how many of the high-order contiguous bits of the address comprise the prefix (the network portion of the address).

The router will automatically configure an IPv6 link-local address on the interface, and enable the interface for IPv6 processing, and trigger IPv6 Neighbor Discovery (ND) auto configuration functionality in ND. Once the Management interface is in no shut state and **ipv6 address autoconfig** configuration is enabled, you will receive Router Advertisement (RA) on Management interface and get prefix and other information.

### Task ID

Task ID	Operations
interface	read, write

---

**Examples**

The following example shows how to configure the IPv6 address based on the IPv6 prefix 2001:0DB8:c18:1::/64:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface gigabitEthernet 0/2/0/0
RP/0/RP0/CPU0:router(config-if)# ipv6 address 2001:0DB8:c18:1::/64
```

The following example shows how to enable IPv6 auto configuration on router:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface mgmtEth 0/RSP0/CPU0/0
RP/0/RP0/CPU0:router(config-if)# ipv6 address autoconfig
```

---

**Related Commands**

Command	Description
<a href="#">interface MgmtEth, on page 109</a>	Enters interface configuration mode for the Management Ethernet interface.

---

## mac-address (Management Ethernet)

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

```
mac-address value1.value2.value3
no mac-address
```

### Syntax Description

*value1* High 2 bytes of the MAC address in hexadecimal. 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 6.0	This command was introduced.

### Usage Guidelines

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

### Task ID

Task ID	Operations
	interface read, write

### Examples

This example shows how to set the MAC address of the Management Ethernet interface located at 0/ RP0/CPU0/0:

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/RP0/CPU0/0
RP/0/RP0/CPU0:router(config-if)# mac-address 0001.2468.ABCD
```



# speed (Management Ethernet)

To configure the speed for a Management Ethernet interface, enter the **speed** command in interface configuration mode. To return the system to autonegotiate speed, use the **no** form of the **speed** command.

```
speed {10 | 100 | 1000}
no speed
```

<b>Syntax Description</b>	<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).
<b>Command Default</b>	Interface speed is autonegotiated.	
<b>Command Modes</b>	Interface configuration	
<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 6.0	This command was introduced.

## Usage Guidelines



**Note** Keep in mind that both ends of a link must have the same interface speed. A manually configured interface speed overrides any autonegotiated 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.

[Table 12: Relationship Between duplex and speed Commands, on page 113](#) describes the performance of the system for different combinations of the duplex and speed modes. The specified **duplex** command configured with the specified **speed** command produces the resulting system action.

**Table 12: Relationship Between duplex and speed Commands**

duplex Command	speed Command	Resulting System Action
no duplex	no speed	Autonegotiates both speed and duplex modes.
no duplex	speed 1000	Forces 1000 Mbps (1 Gbps) and full duplex.
no duplex	speed 100	Autonegotiates for duplex mode and forces 100 Mbps.
no duplex	speed 10	Autonegotiates for duplex mode and forces 10 Mbps.
duplex full	no speed	Forces full duplex and autonegotiates for speed.

duplex Command	speed Command	Resulting System Action
duplex full	speed 1000	Forces 1000 Mbps (1 Gbps) and full duplex.
duplex full	speed 100	Forces 100 Mbps and full duplex.
duplex full	speed 10	Forces 10 Mbps and full duplex.
duplex half	no speed	Forces half duplex and autonegotiates for speed (10 or 100 Mbps.)
duplex half	speed 100	Forces 100 Mbps and half duplex.
duplex half	speed 10	Forces 10 Mbps and half duplex.

**Task ID****Task ID Operations**

```
interface read,
write
```

**Examples**

This example shows how to configure the Management Ethernet interface to transmit at one gigabit:

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/RP0/CPU0/0
RP/0/RP0/CPU0:router(config-if)# speed 1000
```



## VLAN Subinterface Commands

---

This module provides command line interface (CLI) commands for configuring 802.1Q VLANs on the Cisco NCS 5000 Series Router.

For detailed information about VLAN Subinterfaces concepts, configuration tasks, and examples, refer to the *Interface and Hardware Component Configuration Guide for Cisco NCS 5000 Series Routers*

- [interface \(VLAN\)](#), on page 116

## interface (VLAN)

To create a VLAN subinterface, use the **interface** command in XR Config mode. To delete a subinterface, use the **no** form of this command.

```
interface type interface-path-id.subinterface [I2transport]
no interface type interface-path-id.subinterface [I2transport]
```

### Syntax Description

<i>type</i>	Type of Ethernet interface on which you want to create a VLAN. Enter <b>GigabitEthernet</b> , <b>TenGigE</b> , or <b>Bundle-Ether</b> .
<i>interface-path-id.subinterface</i>	Physical interface or virtual interface followed by the subinterface path ID. Naming notation is <i>interface-path-id.subinterface</i> . The period in front of the subinterface value is required as part of the notation.  For more information about the syntax for the router, use the question mark (?) online help function.
<b>I2transport</b>	Enables Layer 2 transport port mode on the specified VLAN interface and enters Layer 2 transport configuration mode. The I2transport keyword creates the Vlan interface in L2 mode so that it can be used for L2VPNs and local switching.

### Command Default

No default behavior or values

### Command Modes

r-interface-vlan-common

### Command History

Release	Modification
Release 6.0	This command was introduced.

### 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 an Ethernet bundle interface, the range is from 1 through 65535.

For the *subinterface* argument, the range is from 0 through 4095.

To configure a large number of subinterfaces, we recommend entering all configuration data before you commit the **interface** command.

To change an interface from Layer 2 to Layer 3 mode and back, you must delete the interface first and then re-configure it in the appropriate mode.



**Note** A subinterface does not pass traffic without an assigned VLAN ID.

Task ID	Task ID	Operations
	vlan	read, write

### Examples

This example shows how to configure a VLAN subinterface on a 10-Gigabit Ethernet interface:

```
RP/0/RP0/CPU0:router(config)# interface TenGigE 0/0/0/10.1
RP/0/RP0/CPU0:router(config-subif)# ipv4 address 30.0.1.2 255.255.255.0
RP/0/RP0/CPU0:router(config-subif)# encapsulation dot1q 3201
```

This example shows how to create a VLAN subinterface with Layer 2 transport port mode enabled, and enter Layer 2 transport configuration mode under that VLAN:

```
RP/0/RP0/CPU0:router(config)# interface TenGigE0/0/0/10.101 l2transport
RP/0/RP0/CPU0:router(config-if-l2)#encapsulation dot1q 101
```





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