Global Interface Commands

Note All commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router that is introduced from Cisco IOS XR Release 6.3.2. References to earlier releases in Command History tables apply to only the Cisco NCS 5500 Series Router.

Note

- Starting with Cisco IOS XR Release 6.6.25, all commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 560 Series Routers.
- Starting with Cisco IOS XR Release 6.3.2, all commands applicable for the Cisco NCS 5500 Series Router are also supported on the Cisco NCS 540 Series Router.
- References to releases before Cisco IOS XR Release 6.3.2 apply to only the Cisco NCS 5500 Series Router.
- Cisco IOS XR Software Release 7.0.1 specific updates are not applicable for the following variants of Cisco NCS 540 Series Routers:
  - N540-28Z4C-SYS-A
  - N540-28Z4C-SYS-D
  - N540X-16Z4G8Q2C-A
  - N540X-16Z4G8Q2C-D
  - N540X-16Z8Q2C-D
  - N540-12Z20G-SYS-A
  - N540-12Z20G-SYS-D
  - N540X-12Z16G-SYS-A
  - N540X-12Z16G-SYS-D

This module describes the global command line interface (CLI) commands for configuring interfaces on the Cisco NCS 5500 Series RouterCisco NCS 540 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 5500 Series RoutersInterface and Hardware Component Configuration Guide for Cisco NCS 540 Series RoutersInterface and Hardware Component Configuration Guide for Cisco NCS 560 Series Routers*

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bandwidth (global)

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

bandwidth *rate*

Syntax Description

rate	Amount of bandwidth to be allocated on the interface, in Kilobits per second (kbps). Range is from 0 through 4294967295.

Command Default

The default bandwidth depends on the interface type.

Command Modes

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	Operations
interface	execute
basic-services	read, write

Examples

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

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

cfm delay measurement

To execute an on-demand Ethernet SLA operation probe for CFM delay measurement, use the **ethernet sla on-demand operation type cfm-delay-measurement probe** command in XR EXEC mode.

ethernet sla on-demand operation type cfm-delay-measurement-v0 probe [**priority** *number*] [**send** {**packet** {**once** | **every** *number* {**milliseconds** | **seconds** | **minutes** | **hours**}} | **burst** {**once** | **every** *number* {**seconds** | **minutes** | **hours**}}} **packet count** *number* **interval** *number* {**milliseconds** | **seconds**}] [**packet size** *bytes* [**test pattern hex 0x** *HHHHHHHH*]] **domain** *domain_name* **source interface** *type interface-path-id* **target** {**mac-address H.H.H.H** | **mep-id** *id_number*} [**statistics measure** {**one-way-delay-ds** | **one-way-delay-ds** | **one-way-jitter-ds** | **one-way-jitter-sd** | **round-trip-delay** | **round-trip-jitter**} [**aggregate** {**none** | **bins** *number* **width** *count*}] [**buckets** {**archive** *number* | **size** *number* {**per-probe** | **probes**}}]] [**schedule** {**now** | **at** *hh*:*mm* [.*ss*] [*day* [*month* [*year*]]] | **in** *number* {**seconds** | **minutes** | **hours**}} [**for** *duration* {**seconds** | **minutes** | **hours**}] [**repeat every** *number* {**seconds** | **minutes** | **hours**} **count** *probes*]] [**asynchronous**]

Syntax Description

priority *number*	(Optional) Configures the priority of outgoing SLA probe packets. The range is 0 to 7. The default is to use the COS bits for the egress interface.
send packet once	(Optional) Sends one packet one time.
send packet every *number* {**milliseconds** | **seconds** | **minutes** | **hours**}	(Optional) Sends one packet every specified number of milliseconds, seconds, minutes, or hours, where *number* is in the following range: • 1 to 3600 **seconds** • 1 to 1440 **minutes** • 1 to 168 **hours** • 100 to 10000 **milliseconds** (specified in increments of 100)
send burst once	(Optional) Specifies that a burst of packets is sent one time. This is the default.

send burst every *number* {**seconds** | **minutes** | **hours**}}	(Optional) Sends a burst of packets every specified number of seconds, minutes, or hours, where *number* is in the following range: • 1–3600 **seconds** • 1–1440 **minutes** • 1–168 **hours** The default is to send a burst every 10 seconds.
packet count *number*	Specifies the number of packets to be sent in a burst, in the range 2 to 600. The default is 10.
interval *number* {**milliseconds** | **seconds**}	Specifies the time between sending packets in a burst, where *number* is in the following range: • 100 to 30000 **milliseconds** • 1 to 30 **seconds** **Note** The total length of a burst (the packet count multiplied by the interval) must not exceed 1 minute.
packet size*bytes*	Minimum size of the packet including padding when necessary. The range is 1 to 9000 bytes. This value is the total frame size including the Layer 2 or Layer 3 packet header.
test pattern hex 0x *HHHHHHHH*	(Optional) Specifies a 4-byte string (8 hexadecimal characters) to repeat as many times as required to fill the outgoing probe packet to the specified minimum packet size. The default is all 0s.
domain *domain-name*	Specifies the name of the domain for the locally defined CFM MEP.
source interface *type*	Specifies the source interface type of the locally defined CFM MEP. 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.
target mac-address *H.H.H*	Specifies the MAC address (in dotted hexadecimal format) of the target MEP that is known to the local MEP for the probe.
target mep-id *id-number*	Specifies the ID (from 1 to 8191) of the target MEP that is known to the local MEP for the probe.
statistics measure	(Optional) Specifies the type of statistics to collect: • **one-way-delay-ds**—One-way delay statistics from destination to source. • **one-way-delay-sd**—One-way delay statistics from source to destination. • **one-way-jitter-ds**—One-way delay jitter from destination to source. • **one-way-jitter-sd**—One-way delay jitter from source to destination. • **round-trip-delay**—Round-trip delay statistics. • **round-trip-jitter**—Round-trip jitter statistics. All statistics are collected by default.

aggregate none	(Optional) Specifies that statistics are not aggregated into bins, and each statistic is stored individually. **Caution** This option can be memory-intensive and should be used with care.
aggregate bins *number*	(Optional) Specifies the number of bins (from 2 to 100) within each bucket to store sample packets from the probe. The default is to aggregate into one bin.
width *milliseconds*	Specifies the range of the samples to be collected within each bin in milliseconds, from 1 to 10000. Based on the specified width, bins are established in the following way: • Delay measurements (round-trip or one-way)—The lower bound of the bins is zero and the first bin's upper limit is 0 plus the specified width, and the last bin is unbounded. • Jitter measurements (round-trip or one-way)—The bins are evenly distributed around zero, with both the lowest and highest numbered bins being unbounded. See the Usage Guidelines for more information.
buckets archive *number*	(Optional) Specifies the number of buckets to store in memory from 1 to 100. The default is 100.
buckets size *number*	(Optional) Specifies the number of buckets to be used for probes from 1 to 100. The default is 1.
per-probe	Specifies that probes span multiple buckets.
probes	Specifies that buckets span multiple probes.

schedule now	(Optional) Specifies that the probe begins as soon as you enter the command. This is the default.
schedule at *hh*:*mm*	(Optional) Specifies a specific time at which to start the probe in 24-hour notation.
ss	(Optional) Number of seconds into the next minute at which to start the probe.
day	(Optional) Number in the range 1 to 31 of the day of the month on which to start the probe.
month	(Optional) Name of the month (full word in English) in which to start the probe.
year	(Optional) Year (fully specified as 4 digits) in which to start the probe.
schedule in *number* {**seconds** | **minutes** | **hours**}	(Optional) Specifies a relative time, as a number of seconds, minutes or hours from the current time, at which to start the probe, where *number* is in the following ranges: • 1 to 3600 **seconds** • 1 to 1440 **minutes** • 1 to 24 **hours**
for *duration* {**seconds** | **minutes** | **hours**}	(Optional) Specifies the length of the probe as a number of seconds, minutes, or hours, where *number* is in the following ranges: • 1 to 3600 **seconds** • 1 to 1440 **minutes** • 1 to 24 **hours** **Note** The duration should not exceed the interval specified by the **repeat every** option.

repeat every *number* {**seconds** | **minutes** | **hours**}	(Optional) Specifies the interval at which to restart the probe as a number of seconds, minutes, or hours, where *number* is in the following ranges: • 1 to 90 **seconds** • 1 to 90 **minutes** • 1 to 24 **hours** The default is that probes are not repeated, and there is no default interval.
count *probes*	Specifies the number of probes to run in the range 1–100. There is no default.
asynchronous	(Optional) Specifies that the command displays the on-demand operation ID and exits immediately, with the operation continuing in the background. The default is synchronous and the operation displays the on-demand operation ID and all results on the console when it completes.

Command Default

No on-demand operations are configured or executed.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
ethernet-services	execute

Examples

This example shows how to enter the most basic SLA on-demand operation to measure CFM delay statistics. This example implements these defaults:

- Send a burst once for a packet count of 10 and interval of 1 second (10-second probe).
- Use default class of service (CoS) for the egress interface.

- Measure all statistics, including both one-way and round-trip delay and jitter statistics.
- Aggregate statistics into one bin.
- Schedule now.
- Display results on the console.

```
RP/0/RP0/CPU0:router# ethernet sla on-demand operation type cfm-delay-measurement
probe domain D1 source interface TenGigE 0/6/1/0 target mep-id 100
```

cfm synthetic loss measurement

To execute an on-demand Ethernet SLA operation probe for CFM synthetic loss measurement, use the **ethernet sla on-demand operation type cfm-synthetic-loss-measurement probe** command in EXEC mode.

ethernet sla on-demand operation type cfm-synthetic-loss-measurement probe [**priority** *number*] [**send** {**packet** {**once** | **every** *number* {**milliseconds** | **seconds** | **minutes** | **hours**}} | **burst** {**once** | **every** *number* {**seconds** | **minutes** | **hours**}}} **packet count** *number* **interval** *number* {**milliseconds** | **seconds**}]**synthetic loss calculation packets** *number* [**packet size** *bytes* [**test pattern hex 0x** *HHHHHHHH*]] **domain** *domain_name* **source interface** *type interface-path-id* **target** {**mac-address H.H.H.H** | **mep-id** *id_number*} [**statistics measure** {**one-way-loss-sd** | **one-way-loss-ds**} [**aggregate** {**none** | **bins** *number* **width** *count*}] [**buckets** {**archive** *number* | **size** *number* {**per-probe** | **probes**}}]] [**schedule** {**now** | **at** *hh*:*mm* [.*ss*] [*day* [*month* [*year*]]] | **in** *number* {**seconds** | **minutes** | **hours**}} [**for** *duration* {**seconds** | **minutes** | **hours**}] [**repeat every** *number* {**seconds** | **minutes** | **hours**} **count** *probes*]] [**asynchronous**]

Syntax Description

priority *number*	(Optional) Configures the priority of outgoing SLA probe packets. The range is 0 to 7. The default is to use the COS bits for the egress interface.
send packet once	(Optional) Sends one packet one time.
send packet every *number* {**milliseconds** | **seconds** | **minutes** | **hours**}	(Optional) Sends one packet every specified number of milliseconds, seconds, minutes, or hours, where *number* is in the following range: • 1 to 3600 **seconds** • 1 to 1440 **minutes** • 1 to 168 **hours** • 100 to 10000 **milliseconds** (specified in increments of 100)
send burst once	(Optional) Specifies that a burst of packets is sent one time. This is the default.
send burst every *number* { | **seconds** | **minutes** | **hours**}	(Optional) Sends a burst of packets every specified number of seconds, minutes, or hours, where *number* is in the following range: • 1–3600 **seconds** • 1–1440 **minutes** • 1–168 **hours** The default is to send a burst every 10 seconds.
packet count *number*	Specifies the number of packets to be sent in a burst, in the range 2 to 600. The default is 10.

interval *number* {**milliseconds** | **seconds**}	Specifies the time between sending packets in a burst, where *number* is in the following range: • 100 to 30000 **milliseconds** • 1 to 30 **seconds** **Note** The total length of a burst (the packet count multiplied by the interval) must not exceed 1 minute.
packet size*bytes*	Minimum size of the packet including padding when necessary. The range is 1 to 9000 bytes. This value is the total frame size including the Layer 2 or Layer 3 packet header.
test pattern hex 0x *HHHHHHHH*	(Optional) Specifies a 4-byte string (8 hexadecimal characters) to repeat as many times as required to fill the outgoing probe packet to the specified minimum packet size. The default is all 0s.
synthetic loss calculation packets*number*	Defines the number of packets that must be used to make each FLR calculation for synthetic loss measurements. It ranges from 10 to 12096000.
domain *domain-name*	Specifies the name of the domain for the locally defined CFM MEP.
source interface *type*	Specifies the source interface type of the locally defined CFM MEP. 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.
target mac-address *H.H.H*	Specifies the MAC address (in dotted hexadecimal format) of the target MEP that is known to the local MEP for the probe.
target mep-id *id-number*	Specifies the ID (from 1 to 8191) of the target MEP that is known to the local MEP for the probe.

statistics measure	(Optional) Specifies the type of statistics to collect: • **one-way-loss-ds**—One-way loss statistics from destination to source. • **one-way-loss-sd**—One-way loss statistics from source to destination.
aggregate none	(Optional) Specifies that statistics are not aggregated into bins, and each statistic is stored individually. **Caution** This option can be memory-intensive and should be used with care.
aggregate bins *number*	(Optional) Specifies the number of bins (from 2 to 100) within each bucket to store sample packets from the probe. The default is to aggregate into one bin.
width *count*	Specifies the range of the samples to be collected within each bin in percentage points, from 1 to 100.
buckets archive *number*	(Optional) Specifies the number of buckets to store in memory from 1 to 100. The default is 100.
buckets size *number*	(Optional) Specifies the number of buckets to be used for probes from 1 to 100. The default is 1.
per-probe	Specifies that probes span multiple buckets.
probes	Specifies that buckets span multiple probes.
schedule now	(Optional) Specifies that the probe begins as soon as you enter the command. This is the default.
schedule at *hh*:*mm*	(Optional) Specifies a specific time at which to start the probe in 24-hour notation.
ss	(Optional) Number of seconds into the next minute at which to start the probe.
day	(Optional) Number in the range 1 to 31 of the day of the month on which to start the probe.
month	(Optional) Name of the month (full word in English) in which to start the probe.
year	(Optional) Year (fully specified as 4 digits) in which to start the probe.

schedule in *number* {**seconds** | **minutes** | **hours**}	(Optional) Specifies a relative time, as a number of seconds, minutes or hours from the current time, at which to start the probe, where *number* is in these ranges: • 1 to 3600 **seconds** • 1 to 1440 **minutes** • 1 to 24 **hours**
for *duration* {**seconds** | **minutes** | **hours**}	(Optional) Specifies the length of the probe as a number of seconds, minutes, or hours, where *number* is in these ranges: • 1 to 3600 **seconds** • 1 to 1440 **minutes** • 1 to 24 **hours** **Note** The duration should not exceed the interval specified by the **repeat every** option.
repeat every *number* {**seconds** | **minutes** | **hours**}	(Optional) Specifies the interval at which to restart the probe as a number of seconds, minutes, or hours, where *number* is in these ranges: • 1 to 90 **seconds** • 1 to 90 **minutes** • 1 to 24 **hours** The default is that probes are not repeated, and there is no default interval.
count *probes*	Specifies the number of probes to run in the range 1–100. There is no default.
asynchronous	(Optional) Specifies that the command displays the on-demand operation ID and exits immediately, with the operation continuing in the background. The default is synchronous and the operation displays the on-demand operation ID and all results on the console when it completes.

Command Default

No on-demand operations are configured or executed.

Command Modes

EXEC (#)

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
ethernet-services	execute

Example

This example shows a minimum configuration, that specifies the local domain and source interface and target MEP, using these defaults:

- Send a burst once for a packet count of 100 and interval of 100 milliseconds.
- The number of packets to be used for FLR calculation is 100.
- Measure the one way loss statistics in both the directions.
- Aggregate statistics into one bin.
- Schedule now.
- Display results on the console.

```
RP/0/RP0/CPU0:routerethernet sla on-demand operation type cfm-synthetic-loss-measurement
probe
domain D1 source interface TenGigE 0/6/1/0 target mac-address 2.3.4
```

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
```

clear ethernet udld statistics

To remove the statistics of state machine transitions and packets exchanged on an interface running UDLD protocol, use the **clear ethernet udld statistics** command in the ethernet interface configuration mode.

clear ethernet udld statistics[**interface** *type* |**unaccounted-drops** |**all**]

Syntax Description

interface*type*	(Optional) Clears information about the specified interface type. If an interface is specified, only the interface-specific counters are shown and not the node counters.
unaccounted-drops	(Optional) Clears information for only the node counters.
all	(Optional) Clears all the udld statistics.

Command Default

None

Command Modes

Ethernet Interface Configuration

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
ethernet-services	read

Example

This example shows how to run the **clear ethernet udld statistics** command for an interface:

```
RP/0/RP0/CPU0:routerclear ethernet udld statistics interface GigabitEthernet
 0/1/0/1
```

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

half-life	(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.
reuse	(Optional) Penalty value below which a stable interface is unsuppressed. Range is from 1 through 20000. Default value is 750.
suppress	(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.
max-suppress-time	(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 HundredGigE 0/4/0/0
RP/0/RP0/CPU0:router(config-if))# dampening
```

ethernet udld reset interface

To reset the UDLD protocol state for a specified interface or for all interfaces, use the **ethernet udld reset interface** command in the Ethernet Interface Configuration mode.

ethernet udld reset interface [**interface** *type* |**all**]

Syntax Description

interface *type*	(Optional) Specifies the interface type for which the UDLD protocol state needs to be reset.
all	(Optional) Resets the UDLD state for all interfaces.

Command Default

No default behavior or values

Command Modes

Ethernet Interface Configuration

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
ethernet-services	read

Example

This example shows how to run the **ethernet udld reset interface** command:

```
RP/0/RP0/CPU0:router# ethernet udld reset interface GigabitEthernet 0/10/0/11
```

ethernet uni id

To specify a name for the Ethernet User-Network Interface (UNI) link, use the **ethernet uni id** command in interface configuration mode.

ethernet uni id *name*

Syntax Description

name	Maximum of 64 characters to identify the Ethernet UNI link.

Command Default

No name is specified for the Ethernet UNI link.

Command Modes

Interface (config-if)

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

The UNI name should be unique among all UNIs that are part of a given Ethernet Virtual Connection (EVC).

When the Ethernet Local Management Interface (E-LMI) protocol is running on the UNI, the name specified in the **ethernet uni id** command is advertised by E-LMI to the Customer Edge (CE) device. It is also carried in Ethernet Connectivity Fault Management (CFM) Continuity Check Messages (CCMs) if there is an Up MEP on the UNI, and passed to E-LMI on the peer MEP so that it can be advertised to the remote CE device.

Task ID

Task ID	Operation
interface	read, write

The following example shows how to configure the UNI name called "PE1-CustA-Slot0-Port0" on Gigabit Ethernet interface 0/0/0/0:

```
RP/0/RP0/CPU0:router(config)# interface gigabitethernet 0/0/0/0
RP/0/RP0/CPU0:router(config-if)# ethernet uni id PE1-CustA-Slot0-Port0
```

hw-module irb

To enable the two-pass model for IRB/BVI, use the **hw-module irb** command in the global configuration mode with suitable keywords to denote the specific forwarding flow. To disable two-pass model and default to single-pass model, use the **no**form of the command.

hw-module irb { **L2-L3** | **L3-L2** } **2-pass**

Syntax Description

irb	Configures IRB forwarding model.
L2-L3	Specifies IRB Layer 2 to Layer 3 forwarding options.
L3-L2	Specifies IRB Layer 3 to Layer 2 forwarding options.
2-pass	Configures IRB processing to two-pass model on ingress.

Command Default

The command is not enabled by default and the single-pass model is used for IRB processing.

Command Modes

Global Interface Configuration

Command History

Release	Modification
Release 7.9.1	This command was introduced.

Usage Guidelines

The VRRP over BVI traffic is not supported with IRB processing to two-pass model on ingress.

To activate the new IRB model, you must manually reload the chassis or all line cards after running the command.

Task ID

Task ID	Operation
config-services	read, write
root-lr	read, write

In the following example, two-pass model is configured for L3-L2 forwarding flow.

```
RP/0/(config)hw-module irb L3-L2 2-pass
```

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         Intf         LineP              Encap  MTU       BW
                Name         State        State               Type (byte)    (Kbps)
--------------------------------------------------------------------------------
                 Nu0           up           up               Null  1500   Unknown
           HundredGigE0/6/0/0      up           up               HDLC  4474   2488320
           HundredGigE0/6/0/1      up           up               HDLC  4474   2488320
           HundredGigE0/6/0/2   admin-down   admin-down          HDLC  4474   2488320
           HundredGigE0/6/0/3   admin-down   admin-down          HDLC  4474   2488320


RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface HundredGigE 0/6/0/0
RP/0/RP0/CPU0:router(config-if)# mtu 1000
```

profile (SLA)

To create an SLA operation profile and enter the SLA profile configuration mode, use the **profile** command in SLA configuration mode. To remove the profile, use the **no** form of this command.

profile *profile-name* **type** { {**cfm-delay-measurement** | **cfm-delay-measurement-v0**} | **cfm-loopback** | **cfm-synthetic-loss-measurement**}
no profile *profile-name*

Syntax Description

profile-name	Profile name, case-sensitive string up to 31 characters in length. The name "all" cannot be used.
type	Specifies the type of packets sent by operations in this profile. Valid types are: • **cfm-delay-measurement**: CFM delay measurement packets • **cfm-delay-measurement-v0**: CFM delay measurement version 0 packets • **cfm-loopback**: CFM loopback packets • **cfm-synthetic-loss-measurement**: CFM synthetic loss measurement packets

Command Default

No default behavior or values

Command Modes

Ethernet SLA configuration (config-sla)

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

Note Each profile is uniquely identified by its name. Changing the packet **type** for the profile removes all stored data from the profile and is equivalent to deleting the profile and creating a new profile.

Note You can configure the Ethernet SLA profile to use Y.1731 DMM frames. The restriction of 150 configured Ethernet SLA operations for each CFM MEP is removed not only for profiles using DMM frames, but also for profiles using the other supported Y.1731 frame types, such as loopback measurement and synthetic loss measurement. For interoperability purposes, it is still possible to configure profiles to use DMM v0 frames. This is done by specifying a type of **cfm-delay-measurement-v0** on the **profile(SLA)** command. The limit of 150 configured operations for each CFM MEP still applies in this case.

Task ID

Task ID	Operations
ethernet-services	read, write

Examples

This example shows how to configure an SLA operation profile and enter the SLA profile configuration mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# ethernet sla
RP/0/RP0/CPU0:router(config-sla)# profile  Prof1  type  cfm-loopback
RP/0/RP0/CPU0:router(config-sla-prof)#
```

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

interface	Specifies the details of interface configuration replacement follows.
interface_name_before	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.
interface_name_after	Specifies the new interface name that replaces the current interface name specified in the *interface_name_before* variable. For more information about the syntax for the router, use the question mark (**?**) online help function.
pattern	Specifies that the details of string replacement follow.
string_before	Specify the configuration string in the router that you need to replace. The *string_before* can be any regular expression that specifies a match pattern in text. **Note** You must specify the *string_before* in a single quote.
string_after	Specify the new string that replaces the configuration matching the *string_before* variable. **Note** You must specify the *string_after* in a single quote.
dry-run	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

Global ConfigurationXR 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 ethernet cfm interfaces bandwidth-notifications

To display detailed information about Ethernet CFM interfaces and bandwidth notifications, use the `show ethernet cfm interfaces bandwidth-notifications detail` command in XR EXEC mode.

show ethernet cfm interfaces bandwidth-notifications detail

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.1.1	This command was introduced.

Task ID

Task ID	Operation
interface	read

This example shows the output from the `show ethernet cfm interfaces bandwidth-notifications detail` command.

```
RP/0/RP0/CPU0:router#show ethernet cfm interfaces bandwidth-notifications detail
BNM Enabled Links at Level 3 (Down MEP) for GigabitEthernet/1
    MAC Address 000a.000a.000a
      State (OK):
        Nominal Bandwidth:                                       3000 Mbps
        Reported Bandwidth:                                      1000 Mbps
        Elapsed time in this state:                           00:00:13.000
        Transitions into degraded state:                              5000
        Hold-off:                                           111s remaining
      Last BNM received 00:00:10 ago
        Nominal Bandwidth:                                       1000 Mbps
        Current Bandwidth:                                       2000 Mbps
        Interval:                                                      10s
        Packet-type:                                           Cisco BW-VSM
      Packets received:                                              20000

    Port ID 7 (MAC Address 000c.000c.000c)
      State (DEGRADED):
        Nominal Bandwidth:                                       6000 Mbps
        Reported Bandwidth:                                      2000 Mbps
        Elapsed time in this state:                           00:00:39.000
        Transitions into degraded state:                             10000
        Wait-to-restore:                                    111s remaining
      Last BNM received 00:00:33 ago
        Nominal Bandwidth:                                       2000 Mbps
        Current Bandwidth:                                       4000 Mbps
        Interval:                                                     1min
        Packet-type:                                           Cisco BW-VSM
      Packets received:                                              40000
```

show ethernet cfm interfaces

To display Link Loss Forwarding (LLF) information, use the **show ethernet cfm interfaces** command in XR EXEC mode.

show ethernet cfm interfaces [*interface*] **llf** [**location** *node*]

Syntax Description

interface	Specifies the interface on which you want to enable llf.
llf	Allows you to enable llf on a location.
location	Specifies the location.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.5.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
ethernet-services	read, write

Examples

This sample output displays an LLF summary:

```
RP/0/RP0/CPU0:router# show ethernet cfm interfaces

   Defects (from at least one peer MEP):
 A - AIS received                I - Wrong interval
 R - Remote Defect received      V - Wrong Level
 L - Loop (our MAC received)     T - Timed out (archived)
 C - Config (our ID received)    M - Missing (cross-check)
 X - Cross-connect (wrong MAID)  U - Unexpected (cross-check)
 P - Peer port down              F - CSF received


GigabitEthernet0/1/0/0
  MEP Defects                          Restore Timer
----- ---------------------------------- --------------
  100 R                          Not running
  101 None       10s remaining
  102 RPF                              Not running

GigabitEthernet0/1/0/1
```

```
  MEP Defects                           Restore Timer
----- --------------------------------- --------------
  110 None        3s remaining

GigabitEthernet0/1/0/2
  MEP Defects                           Restore Timer
----- --------------------------------- --------------
  120 P                 Not running
```

show ethernet udld interfaces

To display the ethernet interfaces configured with unidirectional link detection protocol, use the **show ethernet udld interfaces** in the ethernet interface configuration mode.

show ethernet udld interfaces {**brief**}

Syntax Description

brief	Displays a brief summary of the ethernet udld interfaces.

Command Default

No parameters displays the current state for all udld interfaces.

Command Modes

Ethernet Interface Configuration

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
ethernet-services	read

Example

This example shows a sample output of the **show ethernet udld interfaces** command:

```
RP/0/RP0/CPU0:router# show ethernet udld interfaces

Device ID:               00:0c:cc:cc:01:02
Device name:             harpenden2.cisco.com

GigabitEthernet0/1/0/2
  Port state:            Up
  Main FSM state:        Advertisement
  Detection FSM state:   Bidirectional
  Message interval:      60 seconds
  Timeout interval:      5 seconds

  Neighbor 1
    Device ID:           00:0a:0b:0c:cc:cc
    Device name:         cambridge53.cisco.com
    Port ID:             Gi0/12
    Message interval:    7 seconds
    Timeout interval:    4 seconds
    Echo 1:              00:0c:cc:cc:01:02, Gi0/1/0/2
    Echo 2:              00:0a:0b:0c:dd:dd, GE100
  Neighbor 2
    Device ID:           00:0a:0b:0c:dd:dd
    Device name:         cambridge54.cisco.com
    Port ID:             GE100
    Message interval:    7 seconds
    Timeout interval:    4 seconds
    Echo 1:              00:0c:cc:cc:01:02, Gi0/1/0/2
    Echo 2:              00:0a:0b:0c:cc:cc, Gi0/12
```

This example shows a sample output of the **show ethernet udld interfaces** command with the brief keyword:

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

Port           State          Neighbor Device                 N'bor port
  -------------  -------------- ------------------------------- -------------
  Gi0/1/0/1      Bidirectional  london-xr22.cisco.com           Gi3/12/0/24
  Gi0/1/0/2      Bidirectional  [2 neighbors]                   -
  Gi0/1/0/3      Unknown        -                               -
  Gi0/1/0/4      Unidirectional sj-ios25.cisco.com              Gi3/5
  Te0/12/0/10    Admin Down     -                               -
  Te0/12/0/11    N'bor Mismatch long-device.cisco.com           LongPortNam>>
```

Table 1: show ethernet udld interfaces Field Descriptions

Admin Down	Indicates that the port is administratively down (shutdown configuration is in effect).
Error Disabled	Specifies that the port is in Error Disabled state for a non-UDLD reason, or the port has been disabled by UDLD but the daemon has restarted and does not have a record of the cause.
Down	Indicates that the port is operationally down but not Error Disabled.
Initializing	Indicates that the port is not yet operating the UDLD protocol.
Detecting	Indicates that the port is in the detection phase and is synchronizing the data with its peers.
Loopback	Specifies that the port has been detected to be in loopback.
Unidirectional	Indicates that the port was unidirectional and was disabled by UDLD.
N'bor Mismatch	Indicates that the port has been disabled by UDLD due to mismatched neighbors.
No Neighbors	Specified that the port does not have an active UDLD session with any of the neighbors.
Bidirectional	Indicates that the port is up and has been detected to be bidirectional.
Device ID	Specifies the ID advertised by the device to its peers. This is a MAC address.
Device name	Specifies the string identifier for the device sent to peers. This is a concatenation of the hostname with the configured IP domain (if present), separated by a dot.

show ethernet udld statistics

To display the statistics of state machine transitions and packets exchanged on an interface running UDLD protocol, use the **show ethernet udld statistics** command in the ethernet interface configuration mode.

show ethernet udld statistics[**interface** *type* |**unaccounted-drops**]

Syntax Description

interface *type*	(Optional) Displays information about the specified interface type. If an interface is specified, only the interface-specific counters are shown and not the node counters.
unaccounted-drops	(Optional) Displays information for only the node counters.

Command Default

No default behavior or values

Command Modes

Ethernet Interface Configuration

Command History

Release	Modification
Release 6.3.1	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
ethernet-services	read

Example

This example shows a sample output of the **show ethernet udld statistics** command:

```
RP/0/RP0/CPU0:router# show ethernet udld statistics interface GigabitEthernet
 0/10/0/11

Interface GigabitEthernet0/10/0/11
  Counters last cleared:              01:12:11 ago
  Main FSM transitions (to each state)
    Link up:                                     1
    Detection:                                  12
    Advertize:                                  12
    Port shutdown:                               0
    UDLD inactive:                               0
  Detection FSM transitions (to each state)
    Unknown:                                    12
    Bidirectional:                              12
    Unidirectional:                              0
    Neighbor mismatch:                           0
    Loopback:                                    0
  Rx packet counts
    Probe:                                       1
    Echo:                                     1819
    Flush:                                       5
    Invalid packets (dropped):                 154
  Tx packet counts
    Probe:                                    1
    Echo:                                  1824
    Flush:                                    0
    Unable to send (dropped):                 0

Node 0/10/CPU0
  Counters last cleared:               01:12:11 ago
  Received on ports without UDLD configured
    Total packet count:                      12
    Last port:                         Gi0/10/0/5
  Rx port could not be determined:            0
```

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*]

Syntax Description

interface *type*	(Optional) Interface type. For more information, use the question mark (**?**) online help function.
ifhandle *handle*	(Optional) Identifies the caps node whose Interface Manager (IM) dampening information you want to display.

Command Default

If you do not specify an interface, then the system displays brief details about all dampened interfaces.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines

If you do not specify an interface, then the system displays brief details about all dampened interfaces.

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.

Capsulations that may be dampened in this way include:

- L3 capsulations (for example ipv4, ipv6). These may be brought down if another link has a conflicting IP address configured.

Task ID

Task ID	Operations
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

---------                -----              ----               ----------------
```

```
HundredGigE0/4/0/0              0                  0                  0        NO

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

HundredGigE0/4/0/0 (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 HundredGigE 0/4/0/0

HundredGigE0/4/0/0 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 capsulations 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 capsulation 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

type	(Optional) Specifies the type of interface for which you want to display statistics. For more information, use the question mark (**?**) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces brief** 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.
all	(Optional) Displays interface information for all interfaces. This is the default.
local	(Optional) Displays interface information for all interfaces in the local card.
location *node-id*	(Optional) Displays information about all interfaces on the specified node. The *node-id* argument is entered in the *rack/slot/module* notation.
accounting	(Optional) Displays the number of packets of each protocol type that have been sent through the interface.
brief	(Optional) Displays brief information of each interface (one line per interface).

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

Command History

Release	Modification
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)
--------------------------------------------------------------------------------
```

```
               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	Displays the number of times the interface has changed the state. **Note** • Interface state transitions command counts only if the interface stays up. If the line protocol flaps, then it is not counted. • 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. • Use the **clear state-transitions** command to clear the counter for the current or all interfaces.
line protocol state	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. **Note** The line protocol state is not the same as the protocol state displayed in the **show ip interfaces** command, because it is the state of Layer 2 (media) rather than Layer 3 (IP protocol).
Hardware	Displays the current hardware type.
address is *n.n.n.n/n*	Displays the Layer 2 address (MAC address for Ethernet interfaces). **Note** Enter the **mac-address** command to configure the hardware address.
bia	Displays the burned-in address (BIA) for the interface. The BIA is the default L2 (MAC) address for the interface. **Note** The BIA is not configurable.

Field	Description
description	Displays the user-defined string that is associated with the interface. **Note** Enter the **description** command to configure the description associated with the interface.
Internet address	Displays the Layer 3 (IP) address for the interface. **Note** Enter the **ipv4 address** command to configure the internet address for the interface.
MTU	Displays the maximum transmission unit (MTU) for the interface. The MTU is the maximum packet size that can be transmitted over the interface. **Note** The MTU field indicates the interface MTU. Enter the **mtu** command to configure a lower MTU value at the Layer 3 level.
BW	Displays the bandwidth of the interface in kbps.
reliability	Displays the proportion of packets that are not dropped and do not have errors. **Note** The reliability is shown as a fraction of 255.
txload	Indicates the traffic flowing out of the interface as a proportion of the bandwidth. **Note** The txload is shown as a fraction of 255.
rxload	Indicates the traffic flowing into the interface as a proportion of the bandwidth. **Note** The rxload is shown as a fraction of 255.
Encapsulation	Layer 2 encapsulation installed on the interface.
CRC	Indicates the length of the cyclic redundancy check (CRC), in bytes. **Note** The CRC is not present for all interface types. **Note** Enter the **pos crc** command to configure the CRC.

Field	Description
loopback or controller loopback	Indicates whether the hardware has been configured to be looped back. **Note** Enter the **loopback** command to configure the loopback or controller loopback.
keepalive	Displays the configured keepalive value, in seconds. **Note** Enter the **keepalive** command to configure the value of the keepalive field. **Note** The *keepalive* field may not be present if it is not applicable to the interface type.
Duplexity	Displays the duplexity of the link. **Note** This field is present only for shared media. **Note** For some interface types, you can configure the duplexity by entering the **full-duplex** and **half-duplex** commands.
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.
ARP timeout	ARP timeout in *hours*:*mins*:*secs*. This value is configurable using the **arp timeout** command.
Last clearing of counters	Time since the following counters were last cleared using the **clear counters** exec command in *hours*:*mins*:*secs*.

Field	Description
Input rate	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). **Note** 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. **Note** 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.
packets input	Number of packets received on the interface that were successfully delivered to higher layers.
bytes input	Total number of bytes successfully received on the interface. **Note** This does not include FCS bytes.
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.
Received multicast packets	Total number of Layer 2 multicast packets received on the interface. This is a subset of the total input packet count.
runts	Number of received packets that were too small to be handled. This is a subset of the input errors count.

Field	Description
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. **Note** This does not include FCS bytes.
total output drops	Number of packets that were dropped before being transmitted
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.

Field	Description
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-specifc.
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, capsulations, 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, HundredGigE interface 0/4/0/2 is turned off:

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