



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*

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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*}

Syntax Description

Bundle-Ether *bundle-id* Specifies an Ethernet bundle for which you want to calculate load balancing. Range is 1- 65535.

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

Command Default

No default behavior or values

Command Modes

Command History

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 1: bundle-hash Command Options

Option	Information You Need to Provide
L3/3-tuple	L3 information: <ul style="list-style-type: none"> • Source IP address • Destination IP address • Destination subnet prefix • Bundle IP address
L4/7-tuple	L3 information: <ul style="list-style-type: none"> • Source IP address • Destination IP address • Protocol L4 information: <ul style="list-style-type: none"> • Source port • Destination port Platform-related information: <ul style="list-style-type: none"> • Router ID • Ingress interface
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*]

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

Command Default	The LACP Fallback feature is not enabled.
------------------------	---

Command Modes	Interface configuration
----------------------	-------------------------

Command History	Release	Modification
	Release 6.1.2	This command was introduced.

Task ID	Task ID	Operation
	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*

Syntax Description	<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>hot-standby 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>				
Command Default	No default behavior or values				
Command Modes	Interface configuration				
Command History	<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	<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 bundle maximum-active links command is issued, then only the highest-priority link within the bundle is active. The priority is based on the value from the bundle port-priority 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"> • Another Cisco IOS XR device using the same option. • 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.) 				
Task ID	<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	<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>				

```
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*

Syntax Description	<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.
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Command Default	The default setting is <i>kbps</i> = 1.
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Command Modes	Interface configuration
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Command History	Release	Modification
	Release 6.0	This command was introduced.

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

Syntax Description	<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.
---------------------------	--

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

Command Modes	Interface configuration
----------------------	-------------------------

Command History	Release	Modification
	Release 6.0	This command was introduced.

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



Note	A lower LACP value is a higher LACP priority for the port.
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Task ID	Task ID	Operations
	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

bundle	(Optional) Clears LACP counters for all members of a bundle.
Bundle-Ether <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.
port	(Optional) Clears all LACP counters on the specified bundle or interface.
HundredGigE	(Optional) Hundred Gigabit Ethernet interface. Use the <i>interface-path-id</i> argument to specify the interface whose LACP counters you want to clear.
TenGigE	(Optional) Ten Gigabit Ethernet interface. Use the <i>interface-path-id</i> argument to specify the interface whose LACP counters you want to clear.

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

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*

Syntax Description	Bundle-Ether	Specifies or creates an Ethernet bundle interface.
	<i>bundle-id</i>	Number from 1 to 65535 that identifies a particular bundle.
Command Default	No bundle interface is configured.	
Command Modes	XR Config 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
	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

Syntax Description	This command has no keywords or arguments.				
Command Default	The wait-while timer in the LACP state machine is enabled.				
Command Modes	Interface configuration (config-if)				
Command History	<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 9](#) 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

bundle-ether	Ethernet bundle interface specified by <i>bundle-id</i> .
HundredGigE	Hundred Gigabit Ethernet interface specified by <i>interface-path-id</i> .
TenGigE	Ten Gigabit Ethernet interface specified by <i>interface-path-id</i> .
<i>interface-path-id</i>	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.
<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.
clear	Clears all currently captured packets.
stop	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*

Syntax Description	<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.
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Command Default	No default behavior or values
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Command Modes	Redundancy ICCP group configuration
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Command History	Release	Modification
	Release 6.0	This command was introduced.

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

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

Note	Lower value indicates higher priority.
-------------	--

Command Default	No default behavior or values
------------------------	-------------------------------

Command Modes	Redundancy ICCP group configuration
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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, write

Examples	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

Syntax Description	This command has no keywords or arguments.				
Command Default	Information for all configured bundles is displayed.				
Command Modes	XR EXEC mode				
Command History	<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	No specific guidelines impact the use of this command.				
Task ID	<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 2: 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"> • BEx—Ethernet bundle with ID number x.
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"> • Admin down—The bundle has been configured to be shut down. • Bundle shut—The bundle is holding all links in Standby state and will not support any traffic. • Down—The bundle is operationally down. It has no Active members on the local device. • mLACP cold standby—The bundle is acting as a multichassis LACP Standby device, but the higher layers are not synchronized. • 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. • Nak—The local and peer devices cannot resolve a configuration error. • Partner down—The partner system indicates that the bundle is unable to forward traffic at its end. • PE isolated—The bundle is isolated from the core. • Up—The bundle has Active members on this device.
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"> • On—LACP is in use on the bundle. • Off—LACP is not active.

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"> • Down—The configured minimum threshold for active links or bandwidth for BFD bundle members is not available so BFD sessions are down. • Off—BFD is not configured on bundle members. • Up—BFD sessions on bundle members are up because the minimum threshold for the number of active links or bandwidth is met.
Links act/stby/cfgd	<p>Number of links on the bundle with a particular status in the format $x/y/z$, with the following values:</p> <ul style="list-style-type: none"> • x—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). • y—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). • z—Total number of links configured on the bundle for the local device (from 1 to the maximum number of links supported on the bundle).
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 3: show bundle Field Descriptions

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

Field	Description
Local bandwidth <effective/available>:	<p>Bandwidth characteristics on the bundle in kilobits per second (kbps) in the format x / y, with the following values:</p> <ul style="list-style-type: none"> • x—Current bandwidth of the bundle (this effective bandwidth might be limited by configuration). • y—Available bandwidth of the bundle that is the sum of the bandwidths of all of the locally active links.
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"> • Interface name—The MAC address is from the displayed member interface type and path. • Configured—The MAC address is explicitly configured. • Chassis pool—The MAC address is from the available pool of addresses for the chassis. • [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.)
Minimum active links / bandwidth:	<p>Displays the following information in the format x / y kbps, with the following values:</p> <ul style="list-style-type: none"> • x—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. • y—Minimum total bandwidth on active links (in kbps) that is required for the bundle to be operative. • (partner)—Shows that the peer system's value is in use.
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"> • Default—The default load balancing method for the system is used on the bundle, and the load balancing sub-fields are not displayed. • No value—Another load balancing method is in use on the bundle, with information shown in the related sub-fields of the display.
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"> • 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. • 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.
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"> • Dst-IP—The load balancing on the bundle is based on the packet's destination IP address. • Src-IP—The load balancing on the bundle is based on the packet's source IP address.

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"> • Operational—All required configuration has been committed and LACP is in use on active members. • Not operational—LACP is not working because some mandatory configuration is missing on the bundle or on the active members of the bundle. • Not configured—None of the mandatory configuration for LACP has been committed on the bundle, and the LACP sub-fields are not displayed.
Flap suppression timer:	<p>Displays the status of the flap suppression timer, with the following possible values:</p> <ul style="list-style-type: none"> • Off—The flap suppression timer is not configured using the lacp switchover suppress-flaps command. • <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.
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"> • Operational—All required configuration has been committed for MC-LAG and mLACP is in use on the bundle. • 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. • Not configured—None of the mandatory configuration for MC-LAG has been committed on the bundle, and the mLACP sub-fields are not displayed.

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"> • Active—Bundle is currently active locally. • Standby—Bundle is a backup locally.
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"> • x—Number of links in Active state on the remote bundle. • y—Total number of links configured on the remote bundle.
Switchover type:	Method of performing an mLACP switchover on the bundle with the following possible values: <ul style="list-style-type: none"> • 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. • 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. • 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. <p>The switchover type can be changed from the default behavior using the mlacp switchover type command,</p>

Field	Description
Recovery delay:	Number of seconds (s) to delay becoming the active mLACP device after recovering from a failure, using the mlacp switchover recovery delay command. “None” is displayed when the mlacp switchover recovery delay command is not configured.
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 mlacp switchover maximize command), with the following possible values:</p> <ul style="list-style-type: none"> • <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. • <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. • Not configured—The mlacp switchover maximize command is not configured. mLACP switchovers are based on the minimum active links or bandwidth for the bundle.
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"> • Operational—All required configuration has been committed for IPv4 BFD, and it is in use on the bundle. • Not operational—IPv4 BFD is not working because some mandatory configuration is missing on the bundle or on the active members of the bundle. • Not configured—None of the mandatory configuration for IPv4 BFD has been committed on the bundle, and the BFD sub-fields are not displayed.

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"> • Down—The configured minimum threshold for active links or bandwidth for BFD bundle members is not available so BFD sessions are down. • Off—BFD is not configured on bundle members. • Up—BFD sessions on bundle members are up because the minimum threshold for the number of active links or bandwidth is met.
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"> • Enabled—The bfd fast-detect command is configured on the bundle. • Disabled—The bfd fast-detect command is not configured on the bundle.
Start timer:	<p>Displays status of the BFD start timer that is configured using the bfd address-family ipv4 timers start command, with the following possible values:</p> <ul style="list-style-type: none"> • <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. • Off—The start timer is not configured, and a BFD session is only declared Down upon notification from the BFD server.

Field	Description
Neighbor-unconfigured timer:	<p>Displays status of the BFD start timer that is configured using the bfd address-family ipv4 timers nbr-unconfig command, with the following possible values:</p> <ul style="list-style-type: none"> • <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. • Off—The neighbor-unconfigured timer is not configured, and a BFD session is only declared Down upon notification from the BFD server.
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 bfd address-family ipv4 destination 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"> • <i>address</i>—IP address of the device. • Local—Interface port is on the local device.

Field	Description
State	<p>Status of the port, with one of the following possible values</p> <ul style="list-style-type: none"> • Active—Link can send and receive traffic. • BFD Running—Link is inactive because BFD is down or has not been fully negotiated. • 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. • 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). • 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.) • Standby—Link is not sending or receiving traffic, but is available for switchover from failure of an active link.
Port ID	<p>ID of the interface port in the format x/y, with the following values:</p> <ul style="list-style-type: none"> • x—Port priority as a 2-byte hexadecimal value. • y—Link ID as a 2-byte hexadecimal value.
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 4: 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	
database	Displays the information from the bundle manager database.
ma	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 5: 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"> • 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.
Flags	Provides information about the state of the specified device or port. Possible flags are: <ul style="list-style-type: none"> • A—Device is in Active mode. • P—Device is in Passive mode. • S—Device requests peer to send PDUs at a slow rate. • F—Device requests peer to send PDUs at a fast rate. • D—Port is using default values for partner information. • E—Information about partner has expired.
Port ID	Port identifier, expressed in the format <i>Nxnmmn</i> . <i>N</i> is the port priority, and <i>mmmm</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 6: 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"> • Port • Sent • Received • Last Cleared • Excess • Pkt Errors
Marker	<p>Provides the following statistics for marker packets:</p> <ul style="list-style-type: none"> • Received • Resp. Sent • Last Cleared • Excess • Pkt Errors <p>Note 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	
Bundle-Ether <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.
HundredGigE	(Optional) Displays information for the HundredGigabit Ethernet interface with the specified <i>interface-path-id</i> .
TenGigE	(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>Note Use the show interfaces 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	
decoded	(Optional) Displays packet information in decoded form for the specified interface.
in	(Optional) Displays packet information for ingress packets only.
out	(Optional) Displays packet information for egress packets only.
HundredGigE	Displays packet information for the Hundred Gigabit Ethernet interface specified by <i>interface-path-id</i> .
TenGigE	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.
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 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 <i>interface-path-id</i> argument, if specifying a physical interface, the naming notation is <i>rack/slot/module/port</i> . 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 7: 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"> • 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.
Flags	Provides information about the state of the specified port. Possible flags are: <ul style="list-style-type: none"> • A—Device is in Active mode. • P—Device is in Passive mode. • S—Device requests peer to send PDUs at a slow rate. • F—Device requests peer to send PDUs at a fast rate. • D—Port is using default values for partner information. • E—Information about partner has expired.
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 8: 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.