Link Bundling Commands

This module provides command line interface (CLI) commands for configuring Link Bundle interfaces on the Cisco CRS RouterCisco ASR 9000 Series RouterCisco NCS 6000 Series Router.

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.

backbone interface

To configure interchassis group ICCP backbone interface, use the **backbone interface** command in the redundancy group ICCP configuration mode. To return to the default behavior, use the **no** form of this command.

backbone 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   None

Command Modes   Redundancy group ICCP configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	This command was introduced.

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

Task ID

Task ID	Operations
config-services	read, write

Examples

This example shows how to configure interchassis group ICCP backbone interface:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)# backbone interface GigabitEthernet
 0/2/1/0
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)#
```

Related Commands

Command	Description
redundancy iccp group, on page 52	Configures Inter Chassis Communication Protocol (ICCP) parameters.

bundle lacp delay

To apply delay of a specified duration in adding a member to a specific bundle, use the **bundle lacp-delay** command in the interface configuration mode.

bundle   lacp-delay

Syntax Description	*lacp-delay* Duration of delay before a member is added to the bundle.
	The range is from 1 sec to 15 sec.

Command Default
No default behavior or values. If not configured, there is no delay that is imposed on bundle members.

Command Modes
Interface configuration

Command History

Release	Modification
Release 6.1.1	This command was introduced.

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

Task ID

Task ID	Operations
bundle	read, write

Examples
The following example shows how to set the delay for a newly added member on a bundle interface. In this example, the delay defined is for 6 secs:

```
RP/0/RP0RSP0/CPU0:router(config)# int bundle-ether 1
RP/0/RP0RSP0/CPU0:router(config-if)##bundle lacp-delay ?
<1000-15000>  Lacp-delay timeout in milliseconds
RP/0/RP0RSP0/CPU0:router(config-if)##bundle lacp-delay 6000
RP/0/RP0RSP0/CPU0:router(config-if)##commit
```

Related Commands

Command	Description
bundle maximum-active links, on page 18	
show bundle, on page 54	Displays information about configured bundles.

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 EXEC modeXR EXEC mode.

bundle-hash {**Bundle-Ether** *bundle-id* | **Bundle-POS** **bundle-id** | **members** {**GigabitEthernet** | **TenGigabitEthernet** | **HundredGigabitEthernet** | **POS**} *interface-path-id*}

Syntax Description	
Bundle-Ether *bundle-id*	Specifies an Ethernet bundle for which you want to calculate load balancing. Range is 1- 65535.
Bundle-POS *bundle-id*	Specifies a POS bundle for which you want to calculate load balancing. Range is 1- 65535.
members	Identifies specific bundle member links for which you want to calculate load balancing.
GigabitEthernet	Specifies the Gigabit Ethernet interface for which you want to calculate load balancing.
TenGigE	Specifies the 10 Gigabit Ethernet interface for which you want to calculate load balancing.
HundredGigE	Specified the 100 Gigabit Ethernet interface for which you want to calculate load balancing.
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.
location	Location of source interface.

Command Default No default behavior or values

Command Modes EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.6.0	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	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 destination IP address for a specified source IP address on a specified member.

- The load balancing distribution–how many times the members of a bundle are used for a specified range of IP addresses.

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 is not applicable to multicast traffic and only applicable to unicast traffic.

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.

Table 1: bundle-hash Command Options, on page 6 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 Table 1: bundle-hash Command Options, on page 6.

Table 1: bundle-hash Command Options

Option	Information You Need to Provide
L3/3-tuple	L3 information: • Source IP address • Destination IP address • Destination subnet prefix • Bundle IP address
L4/7-tuple	L3 information: • Source IP address • Destination IP address • Protocol L4 information: • Source port • Destination port Platform-related information: • 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 the **members** keyword prompts and options:

```
RP/0/RP0RSP0/CPU0:router# bundle-hash members pos  0/2/0/1

Thu Aug 20 20:19:21.241 DST
Single SA/DA pair or range: S/R [S]: s
Enter source IP V4 address: 10.10.10.10
Enter source IP V4 address: 10.10.10.10
Enter destination IP V4 address: 20.20.20.20
Compute destination address set for all members? [y/n]: y
Enter subnet prefix for destination address set: 8
Enter bundle IP V4 address [10.10.10.10]: 10.10.10.11

Link hashed [hash:0] to is POS0/2/0/1 member id 0 ifh 0x3000f00

Destination address set for subnet 20.0.0.0:
  20.0.0.1 [hash:4] hashes to link POS0/2/0/1

Another? [y]:
```

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/RP0RSP0/CPU0:router# bundle-hash bundle-ether 28

Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): l3
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 GigabitEthernet0/6/5/7

Destination address set for subnet 10.0.0.0:
  10.0.0.6 hashes to link GigabitEthernet0/1/5/6
  10.0.0.8 hashes to link GigabitEthernet0/6/5/5
  10.0.0.12 hashes to link GigabitEthernet0/6/5/6
  10.0.0.2 hashes to link GigabitEthernet0/6/5/7
  10.0.0.1 hashes to link GigabitEthernet0/1/5/7
```

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/RP0RSP0/CPU0:router# bundle-hash bundle-ether 28

Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): l3
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 GigabitEthernet0/1/5/6 has 6 hits
Member GigabitEthernet0/6/5/5 has 2 hits
Member GigabitEthernet0/6/5/6 has 2 hits
Member GigabitEthernet0/6/5/7 has 9 hits
Member GigabitEthernet0/1/5/7 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/RP0RSP0/CPU0:router# bundle-hash bundle-ether 202

Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): l4
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: [ POS | GigabitEthernet | TenGigE ]R/S/I/P
  - bundle interface format:   [ Bundle-Ether | Bundle-POS ]bundle-id
  Enter ingress interface: GigabitEthernet0/2/0/3

  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 GigabitEthernet0/3/3/6

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: [ POS | GigabitEthernet | TenGigE ]R/S/I/P
   - bundle interface format:   [ Bundle-Ether | Bundle-POS ]bundle-id
  Enter ingress interface [GigabitEthernet0/2/0/3]: GigabitEthernet0/2/0/3

  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 GigabitEthernet0/3/3/6

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 GigabitEthernet0/3/3/6
  S/D pair 172.20.180.167:1000/172.30.15.6:2000 hashes to link GigabitEthernet0/2/0/1
  S/D pair 172.20.180.167:1000/172.30.15.3:2000 hashes to link GigabitEthernet0/2/0/2
  S/D pair 172.20.180.167:1000/172.30.15.5:2000 hashes to link GigabitEthernet0/0/3/0

Another? [y]: n
```

The following example shows how to calculate load balancing across the members of a link bundle (bundle-ether 28) using the 7-tuple hash algorithm, a range of source and destinations, and IPv4 addresses:

```
RP/0/RP0/CPU0:HUCRS1#bundle-hash bundle-ether 33509
Thu May 18 00:07:56.222 EDT
Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): L4
Single SA:SP/DA:SP pair (IPv4,IPv6) or range (IPv4 only) or Entropy Label (MPLS only): S/R/E
 [S]: S
Enter bundle type IP V4 (1) or IP V6 (2): 1
Enter source IP V4 address: 45.227.0.25
Enter destination IP V4 address: 35.227.0.25
  Ingress interface handler --
  Note: interface handler can be gotten by 'sh im data interface'
  Enter ingress interface handler (hex format): 0x000841b0
    Ingress interface Bundle-Ether218
  Enter L4 protocol (TCP,UDP,SCTP,L2TPV3,NONE): NONE
  Enter L4 protocol field [0]: 253
Compute destination address set for all members? [y/n]: n
S/D pair 45.227.0.25/35.227.0.25 -- Link hashed to is TenGigE0/5/0/1
```

> ✎
>
> **Note**   To ensure that the hashing is done correctly, do not set the L4 protocol field value to 0.

The following example shows how to calculate load balancing across the members of a link bundle (bundle-ether 5001) using entropy label, and ingress interface:

```
RP/0/RP0RSP0/CPU0:router# bundle-hash bundle-ether 5001 location 0/0/CPU0
Calculate Bundle-Hash for L2 or L3 or sub-int based: 2/3/4 [3]: 3
Enter traffic type (1:IPv4-inbound, 2:MPLS-inbound, 3:IPv6-inbound, 4:IPv4-MGSCP,
5:IPv6-MGSCP): [1]: 2
Entropy label: y/n [n]: y
Enter Entropy Label (in decimal): 1997
Enter the source interface name (Enter to skip interface details): TenGigE0/0/0/1/0
```

```
Entropy Label 1997 -- Link hashed to is TenGigE0/1/0/29, (raw hash 0xb5703292, LAG hash 2,
 ICL (), LON 2, IFH 0x06001740)
```

Related Commands	Command	Description
	show bundle, on page 54	Displays information about configured bundles.

bundle id

To add a port to an aggregated interface (or bundle), enter the **bundle id** command in interface configuration mode. To remove a port from the bundle, use the **no** form of the command.

bundle id *bundle-id* [**mode** {**active** | **on** | **passive**}]

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 3.2	This command was introduced.
Release 3.3.0	The **bundle id** command syntax was changed from **bundle-id**.
Release 3.7.2	This command was introduced.
Release 5.0.0	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/RP0RSP0/CPU0:router(config)# interface GigabitEthernet 0/1/5/0
RP/0/RP0RSP0/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/RP0RSP0/CPU0:router(config)# interface GigabitEthernet 0/6/5/7
RP/0/RP0RSP0/CPU0:router(config-if)# bundle id 5 mode active
```

Related Commands

Command	Description
show bundle, on page 54	Displays information about configured bundles.
show interfaces	Displays statistics, state and other information such as mac address etc. for all interfaces configured on the router or for a specific node.
show lacp bundle, on page 80	Displays detailed information about LACP ports and their peers.
show lacp port, on page 90	

bundle load-balancing hash

To specify the hash function to be used for traffic being forwarded over a bundle interface, use the **bundle load-balancing hash** command in interface configuration mode. To return to the default, use the **no** form of the command.

bundle load-balancing hash {**dst-ip** | **src-ip**}

Syntax Description	**dst-ip** Specifies a load-balancing hash based on destination IP address.
	src-ip Specifies a load-balancing hash based on source IP address.

Command Default The default platform hashes for the bundle are used. For IPv4 traffic, the default hash is based on router ID, source IP, destination IP, and if available, source and destination Layer 4 port.

Command Modes Interface configuration

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines Bundle load balancing hashes based on source IP address or destination IP address are used for MGSCP deployment models where traffic forwarded from the subscriber side of the network is based on source IP address, and traffic forwarded from the core side of the network is based on destination IP address.

Task ID

Task ID	Operation
bundle	read, write

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

```
RP/0/RP0RSP0/CPU0:router(config)#interface Bundle-Ether 100
RP/0/RP0RSP0/CPU0:router(config-if)# bundle load-balancing hash src-ip
```

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

```
RP/0/RP0RSP0/CPU0:router(config)#interface Bundle-Ether 100
RP/0/RP0RSP0/CPU0:router(config-if)# bundle load-balancing hash src-ip
```

Related Commands

Command	Description
interface (bundle), on page 29	Specifies or creates a new bundle and enters interface configuration mode for that bundle.
lacp cisco enable, on page 31	Enables use of Cisco-specific TLVs in addition to standard TLVs for negotiating and exchanging LACP information on link bundles.

Command	Description
show bundle, on page 54	Displays information about configured bundles.
show bundle load-balancing, on page 73	Displays load balancing information, such as the ports, usage, weight, and distribution of traffic on individual members of a link bundle interface.

bundle load-balancing hash (EFP)

To configure all egressing traffic on a particular subinterface of a bundle to flow through the same physical member link, use the **bundle load-balancing hash (EFP)** command in subinterface configuration mode. To disassociate the traffic from the physical member link, use the **no** form of the command.

bundle load-balancing hash *hash-value* [**auto**]

Syntax Description

hash-value	Numeric value that specifies the physical member link through which all egressing traffic in this bundle will flow. The values are 1 through 64.
auto	The physical member link through which all egressing traffic on this bundle will flow is automatically chosen.

Command Default   Ethernet flow point (EFP) load balancing is enabled.

Command Modes   Subinterface configuration

Command History

Release	Modification
Release 3.9.0	This command was introduced.
Release 4.0.0	The *hash-value* range was changed from an upper limit of 8 to 64.

Usage Guidelines   This command is only available on an Ethernet Bundle subinterface with Layer 2 transport (**l2transport**) enabled.

This command allows the user to configure all egressing traffic on the fixed members of a bundle to flow through the same physical member link. If the active members of the bundle change, the traffic for the bundle may get mapped to a different physical link that has a hash value that matches the configured value.

Task ID

Task ID	Operations
vlan	read, write

Examples   The following example shows how to configure all egressing traffic on the fixed members of a bundle to flow through the same physical member link automatically.

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface bundle-ether 1.1 l2transport
RP/0/RP0RSP0/CPU0:router(config-subif)# bundle load-balancing hash auto
```

The following example shows how to configure all egressing traffic on the fixed members of a bundle to flow through a specified physical member link.

```
RP/0/RP0RSP0/CPU0:router# config
```

```
RP/0/RP0RSP0/CPU0:router(config)# interface bundle-ether 1.1 l2transport
RP/0/RP0RSP0/CPU0:router(config-subif)# bundle load-balancing hash 1
```

Related Commands	Command	Description
	bundle-hash, on page 5	Displays the source and destination IP addresses for the member links.
	interface (bundle), on page 29	Specifies or creates a new bundle and enters interface configuration mode for that bundle.
	show bundle, on page 54	Displays information about configured bundles.
	show bundle load-balancing, on page 73	Displays load balancing information, such as the ports, usage, weight, and distribution of traffic on individual members of a link bundle interface.

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**]

<table>
<tr><td rowspan="2">**Syntax Description**</td><td>*links*</td><td>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.</td></tr>
<tr><td>**hot-standby**</td><td>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.</td></tr>
</table>

Command Default   No default behavior or values

Command Modes   Interface configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.7.2	This command was introduced.
Release 3.8.0	The **hot-standby** keyword was added.
Release 5.0.0	This command was introduced.

Usage Guidelines   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.

By default, multiple links can actively carry traffic for a bundle. However, if one of the links fails, there is no dedicated standby link to take its place. The **bundle maximum-active links** command enables you to implement the optional 1:1 link protection, which means for the specified bundle, you designate one active link and one or more standby links that can take over immediately if the active link fails.

By setting the **bundle maximum-active links** command to 1, the highest-priority link within the bundle becomes active (distributing state) and the remaining links are in standby mode. If a standby link meets one of the following criteria, it is in the collecting state:

If a standby link does not meet either of these criteria, it is in the waiting state.

If the **bundle maximum-active links** command is issued, then only the The second highest-priority link within the bundle is active becomes the standby link that takes over immediately if the active link fails. 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 must configure a higher the highest priority on (lowest value) for the link that you want to be active and the second-highest priority for the link that you want to act as a backup to the active link.

Note   We recommend designating only one backup link to the active link. Although you can designate an additional backup link, maintaining two backup links consumes more bandwidth and offsets any benefits that may be gained.

Note   If a link is not running LACP, the configuration of the **bundle maximum-active links** and **bundle port-priority** commands or equivalent commands must be the same on both ends of the link. If a link is running LACP, the configuration of the **bundle maximum-active links** command only must be the same on both ends of the link.

The **hot-standby** option of using an IEEE standard-based switchover (the default) or a faster proprietary optimized switchover is available only for active and standby links running LACP. For links not running LACP, the proprietary optimized switchover option is used.

When using one of the **hot-standby** options on a Cisco IOS XR device, the peer device must have a standby link configured and be one of the following:

- 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.)

When you configure the **hot-standby** keyword, if the partner device is not XR, you may have to further modify the timeouts. Use the commands that are used for refining the timeouts on the partner device as well. For best performance, do not configure with **bundle-maximum-active links** command on the partner device.

The **bundle maximum-active links hot-standby** command can be configured at both ends. However, this will impact the switchover times.

Task ID

Task ID	Operations
bundle	read, write

Examples

The following example shows how to display information about Ethernet bundle 5:

```
RP/0/RP0RSP0/CPU0:router# show bundle bundle-ether 5

State: 0 - Port is Detached. 1 - Port is Waiting.
       2 - Port is Attached. 3 - Port is Collecting.
       4 - Port is Distributing.

Bundle-Ether 5
                                Minimum active     Maximum active
  B/W (Kbps)    MAC address     Links B/W (Kbps)   Links
  ----------    -------------   ----- ----------   -----
10000000001d.e5eb.2898111

  Port          State  Port ID         B/W (Kbps)  MAC address
  -----------   -----  -------------   ----------  --------------
  Te0/1/0/1     4      0x8000, 0x0001   10000000   0000.abab.0001
```

```
   Te0/1/0/0      3      0x8000, 0x0002     10000000  0000.abab.0000
```

In the **show bundle bundle-ether 5** command output, the state of the active link is 4, which indicates that the port is distributing. The state of the standby link is 3, which indicates that the port is collecting.

In the following example, the user implements 1:1 link protection for Ethernet bundle 5 and does not specify the **hot-standby** keyword, because the user wants to use the default IEEE standard-based switchover on the LACP-enabled active and standby links:

```
RP/0/RP0RSP0/CPU0:router(config)# interface bundle-ether 5
RP/0/RP0RSP0/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/RP0RSP0/CPU0:router(config)# interface bundle-ether 5
RP/0/RP0RSP0/CPU0:router(config-if)# bundle maximum-active links 1 hot-standby
```

The following example shows how to display information about Ethernet bundle 5:

```
RP/0/RP0RSP0/CPU0:router# show bundle bundle-ether 5

State: 0 - Port is Detached. 1 - Port is Waiting.
       2 - Port is Attached. 3 - Port is Collecting.
       4 - Port is Distributing.

Bundle-Ether 5
                                Minimum active    Maximum active
  B/W (Kbps)    MAC address     Links  B/W (Kbps)  Links
  ----------    -------------   -----  ----------  -----
10000000001d.e5eb.2898111

  Port          State  Port ID        B/W (Kbps)  MAC address
  -----------   -----  -------------  ----------  --------------
  Te0/1/0/1     4      0x8000, 0x0001   10000000  0000.abab.0001
  Te0/1/0/0     10x8000, 0x0002    10000000  0000.abab.0000
```

In the **show bundle bundle-ether 5** command output, the state of the active link is 4, which indicates that the port is distributing. The state of the standby link is 1, which indicates that the port is waiting.

In the following example, the user implements 1:1 link protection for Ethernet bundle 5 and does not specify the **hot-standby** keyword, because the LACP-disabled link automatically uses the proprietary optimized switchover:

```
RP/0/RP0RSP0/CPU0:router(config)# interface bundle-ether 5
RP/0/RP0RSP0/CPU0:router(config-if)#bundle maximum-active links 1
```

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:

```
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 5
RP/0/RP0RSP0/CPU0:router(config-if)# bundle maximum-active links 1
```

The following example shows how to display information about Ethernet bundle 5:

```
RP/0/RP0RSP0/CPU0:router# show bundle bundle-ether 5

State: 0 - Port is Detached. 1 - Port is Waiting.
       2 - Port is Attached. 3 - Port is Collecting.
       4 - Port is Distributing.

Bundle-Ether 5
                                Minimum active    Maximum active
  B/W (Kbps)    MAC address     Links  B/W (Kbps) Links
  ----------    -------------   -----  ---------- -----
10000000001d.e5eb.2898111

  Port         State  Port ID          B/W (Kbps)  MAC address
  -----------  -----  --------------   ----------  --------------
  Te0/1/0/1    4      0x8000, 0x0001    10000000   0000.abab.0001
  Te0/1/0/0    3      0x8000, 0x0002    10000000   0000.abab.0000
```

In the **show bundle bundle-ether 5** command output, the state of the active link is 4, which indicates that the port is distributing. The state of the standby link is 3, which indicates that the port is collecting.

Related Commands

Command	Description
bundle minimum-active links, on page 23	Sets the number of active links required to bring up a specific bundle.
show bundle, on page 54	Displays information about configured bundles.
show lacp bundle, on page 80	Displays detailed information about LACP ports and their peers.

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

kbps	Minimum bandwidth required before you can bring up a bundle. Range is from 1 through a number that is equivalent to varies depending on the platform and the combined bandwidths of 8 TenGigabitEthernet interfaces bundle type.

Command Default

The default setting is *kbps* = 1.

kbps: 1

Command Modes

Interface configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	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 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/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 1
RP/0/RP0RSP0/CPU0:router(config-if)# bundle minimum-active bandwidth 620000
```

Related Commands

Command	Description
show bundle, on page 54	Displays information about configured bundles.

bundle minimum-active links

To set the number of active links required to bring up a specific bundle, use the **bundle minimum-active links** command in interface configuration mode.

bundle minimum-active links *links*

Syntax Description	*links* Minimum number of active links allowed in the specified bundle. The range is from 1 through 64.

Command Default	No default behavior or values

Command Modes	Interface configuration

Command History

Release	Modification
Release 3.3.0	This command was introduced.
Release 3.7.2	This command was introduced.
Release 3.9.0	The command range maximum was changed from 32 to 64.
Release 4.0.0	The command range maximum was changed from 8 to 64.
Release 5.0.0	This command was introduced.

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

Task ID

Task ID	Operations
bundle	read, write

Examples

The following example shows how to set the number of active links required to bring up a specific bundle. In this example, the user configures Ethernet bundle 5 so that 2 two links must be active before the bundle can be brought up:

```
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 5
RP/0/RP0RSP0/CPU0:router(config-if)# bundle minimum-active links 2
```

Related Commands

Command	Description
bundle maximum-active links, on page 18	
show bundle, on page 54	Displays information about configured bundles.

bundle port-priority

To configure Link Aggregation Control Protocol (LACP) a port priority for a port bundle member link, 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*

Syntax Description	*priority*	Priority for this port, where a lower value equals a higher priority. Replace the *priority* argument with a number. Range is from 1 through 65535.

Command Default *priority*: 32768

Command Modes Interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	The command name was changed from **lacp port-priority** to **bundle port-priority**.
Release 3.7.2	This command was introduced.
Release 5.0.0	This command was introduced.

Usage Guidelines The **bundle port-priority** command enables you to determine whether or not similar ports, for example, Gigabit Ethernet ports with Link Aggregation Control Protocol (LACP) enabled or with LACP disabled, are aggregated based on the priority of the port.

The In cases where LACP is enabled on aggregated ports, the port priority value forms part of the port ID, which is transmitted within the LACP a packet when a device exchanges packets that are exchanged with the its peer. The peer uses peers use the port ID within the LACP packets to determine whether a given port should carry traffic for the bundle.

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

In cases where LACP is disabled, the port priority is used locally, and a device does not communicate its priority to a peer. Therefore, the peers should have the same priority configured to avoid a mismatch in which links are used for carrying traffic. For example, you could set up the port priorities so that a device would use links 1, 3, and 4 for carrying traffic, and its peer would use links 1, 2, and 3, where links use the same numbering sequence at both ends.

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

Task ID

Task ID	Operations
bundle	read, write

Examples

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

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/1
RP/0/RP0RSP0/CPU0:router(config-if)# bundle port-priority 1
```

Related Commands

Command	Description
bundle id, on page 12	Adds a port to an aggregated interface or bundle.
show lacp bundle, on page 80	Displays detailed information about LACP ports and their peers.
show lacp port, on page 90	
show lacp system-id, on page 93	Displays the local system ID used by the LACP.

bundle wait-while

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

bundle   wait-while   *wait-while-time*

Syntax Description

wait-while-time	Wait-while time, in milliseconds. The range is between 0 to 2000.

Command Default   The default wait-while time is 2000 milliseconds.

Command Modes   Bundle interface configuration (config-if)

Command History

Release	Modification
Release 5.1.3	This command was introduced.

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

Task ID

Task ID	Operation
bundle	read, write
interface	read, write

The following example shows how to configure the wait-while time.

```
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RP0RSP0/CPU0:router(config-if)#  bundle wait-while 20
```

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 EXEC modeXR EXEC mode.

clear lacp counters [{**bundle Bundle-Ether** *bundle-id* | **port** {**GigabitEthernet** *interface-path-id* | **TenGigE** *interface-path-id*}}]
clear lacp counters [{**bundle** {**Bundle-Ether** *bundle-id* | **Bundle-POS** *bundle-id*} | **port** {**GigabitEthernet** *interface-path-id* | **TenGigE** *interface-path-id* | **POS** *interface-path-id*}}]

Syntax Description		
bundle		(Optional) Clears LACP counters for all members of a bundle.
Bundle-Ether *node-id*		(Optional) Ethernet bundle. Use the *node-id* argument to specify the node ID number of the LACP counters you want to clear. Range is 1 through 65535.
Bundle-POS *bundle-id*		(Optional) POS bundle. Use the *bundle-id* argument to specify the bundle ID number of the LACP counters you want to clear. Range is from 1 through 65535.
port		(Optional) Clears all LACP counters on the specified bundle or interface.
GigabitEthernet		(Optional) Gigabit Ethernet interface. Use the *interface-path-id* argument to specify the Gigabit Ethernet interface whose LACP counters you want to clear.
TenGigE		(Optional) Ten Gigabit Ethernet interface. Use the *interface-path-id* argument to specify the Ten Gigabit Ethernet interface whose LACP counters you want to clear.
POS		(Optional) Packet-over-SONET/SDH (POS) interface. Use the *interface-path-id* argument to specify the POS 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 EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	This command was introduced.

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

For the *interface-path-id* argument, use the following guidelines:

- If specifying a physical interface, the naming notation is *rack*/*slot*/*module*/*port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

  - *rack*: Chassis number of the rack.

  - *slot*: Physical slot number of the line card.

  - *module*: Module number. A physical layer interface module (PLIM) is always 0.

  - *port*: Physical port number of the interface.

- If specifying a virtual interface, the number range varies, depending on interface type.

Task ID

Task ID	Operations
bundle	execute
basic-services	read, write

Examples   The following example shows how to clear LACP counters:

```
RP/0/RP0RSP0/CPU0:router# clear lacp counters
```

Related Commands

Command	Description
show lacp counters, on page 82	Displays LACP statistics.

interface (bundle)

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

interface Bundle-Ether {**Bundle-Ether** | **Bundle-POS** }*bundle-id*

Syntax Description		
	Bundle-Ether	Specifies or creates an Ethernet bundle interface.
	Bundle-POS	Specifies or creates a POS bundle interface.
	bundle-id	Number from 1 to 65535 that identifies a particular bundle.

Command Default No bundle interface is configured.

Command Modes Global Configuration modeXR Config mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	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/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 3
RP/0/RP0RSP0/CPU0:router(config-if)#
```

This example shows how to create a new POS bundle and enter interface configuration mode:

```
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-POS 10
RP/0/RP0RSP0/CPU0:router(config-if)#
```

Related Commands

Command	Description
show bundle, on page 54	Displays information about configured bundles.

isolation recovery-delay

To specify a delay before clearing the isolation condition after recovery from failure, use the **isolation recovery-delay** command in the redundancy group ICCP configuration mode. To return to the default value, use the **no** form of this command.

isolation recovery-delay *seconds*

Syntax Description	*seconds* Recovery delay in seconds.

Command Default   By default, the delay is set to 180 seconds.

Command Modes   Redundancy group ICCP configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	This command was introduced.

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

Examples   This example shows how to configure ICCP parameters:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)# isolation recovery-delay 35
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)#
```

Task ID

Task ID	Operations
config-services	read, write

Related Commands

Command	Description
redundancy iccp group, on page 52	Configures Inter Chassis Communication Protocol (ICCP) parameters.

lacp cisco enable

To enable use of Cisco-specific TLVs in addition to standard TLVs for negotiating and exchanging LACP information on link bundles, use the **lacp cisco enable** command in interface configuration mode. To return to the default, use the **no** form of the command.

lacp cisco enable [**link-order signaled**]

Syntax Description	**link-order signaled**	(Optional) Includes link order numbering as part of the LACP processing.
	Note	This keyword is required for MGSCP.

Command Default Cisco type-length values (TLVs) are not used.

Command Modes Interface configuration (config-if)

Command History

Release	Modification
Release 4.1.0	This command was introduced.

Usage Guidelines The **lacp cisco enable link-order signaled** command is required on bundle interfaces supporting deployment of Multi-Gigabit Service Control Point (MGSCP), and must be configured symmetrically on both the access and core bundle. When link order signaling is enabled, then only one set of Link Ordering Numbers (LONs) are used for the bundle, and LACP processing of LONs is enabled for load balancing tables.

The LONs from the highest priority LACP system take precedence. Where both systems have the same LACP system ID (for example, with MGSCP where both ends of the bundle terminate on the same device), the LONs from the bundle interface with the numerically lowest bundle ID take precedence.

When **lacp cisco enable** command is configured without link order signaling, then links are assigned ordering numbers as they become active and keep them until the link goes inactive. The numbers are exchanged using LACP, but they are not used.

Task ID

Task ID	Operation
bundle	read, write

Example

The following example enables the use of Cisco TLVs to include link order numbering as part of the LACP processing on this bundle:

```
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RP0RSP0/CPU0:router(config-if)# lacp cisco enable link-order signaled
```

Related Commands	Command	Description
	interface (bundle), on page 29	Specifies or creates a new bundle and enters interface configuration mode for that bundle.

lacp churn logging

To configure the parameters for LACP churn detection, enter the **lacp churn loggin** command in interface configuration mode. To return to the default, use the **no** form of the command.

lacp churn logging{**actor** | **both** | **partner**}

Syntax Description		
actor	Logs the churn events of the actor, which is the router under consideration, only.
both	Logs the churn events of both the actor and the partner.
partner	Logs the churn events of the partner router only

Command Default   The parameters for churn detection are not configured.

Command Modes   Interface configuration (config-if)

Command History

Release	Modification
Release 5.1.3	This command was introduced.

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

Task ID

Task ID	Operation
bundle	read, write

The following example shows how to configure the LACP churn detection on a partner router:

```
RP/0/RP0RSP0/CPU0:router# configure terminal
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RP0RSP0/CPU0:router(config-if)# lacp churn logging partner
```

The following example shows how to configure the LACP churn detection on both actor and partner routers:

```
RP/0/RP0RSP0/CPU0:router# configure terminal
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RP0RSP0/CPU0:router(config-if)# lacp churn logging both
```

lacp collector-max-delay

To configure the maximum period of wait time between sending of two subsequent Ethernet frames on a link, enter the **lacp collector-max-delay** command in interface configuration mode. To return to the default, use the **no** form of this command.

lacp collector-max-delay *delay-in-tens-of-microseconds*

Syntax Description

delay-in-tens-of-microseconds	Length of wait time, in tens of microseconds. The range is from 0 to 65535. The default is 0xFFFF.

Command Default The collector-max-delay time is not configured.

Command Modes Interface configuration (config-if)

Command History

Release	Modification
Release 5.1.3	This command was introduced.

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

Task ID

Task ID	Operation
bundle	read, write

The following example shows how to configure the maximum period of wait time between sending of two subsequent Ethernet frames on a link:

```
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RP0RSP0/CPU0:router(config-if)#  lacp collector-max-delay 500
```

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

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

Release	Modification
Release 3.8.0	This command was introduced.
Release 3.9.0	This command was introduced.
Release 5.0.0	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 18 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/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 28
RP/0/RP0RSP0/CPU0:router(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/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 28
RP/0/RP0RSP0/CPU0:router(config-if)# no lacp fast-switchover
```

Related Commands

Command	Description
bundle maximum-active links, on page 18	

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

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 5.3.2	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/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# interface bundle-ether 1
RP/0/RP0RSP0/CPU0:router(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 EXEC modeXR EXEC mode.

{**lacp packet-capture gigabitethernet** *interface-path-id* | **pos 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 EXEC mode.

{**lacp packet-capture** [**bundle-ether** *bundle-id*] [**bundle-pos bundle-id**] [**gigabitethernet** *interface-path-id*] [**pos interface-path-id**] [**tengige** *interface-path-id*] **clear** | **stop**}

Syntax Description		
bundle-ether	Ethernet bundle interface specified by *bundle-id*.	
bundle-pos	Packet-over-SONET (POS) bundle interface specified by *bundle-id*.	
GigabitEthernet	Gigabit Ethernet interface specified by *interface-path-id*.	
POS	Packet-over-SONET (POS) interface specified by *interface-path-id*.	
TenGigE	Ten Gigabit Ethernet interface specified by *interface-path-id*.	
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.	
bundle-id	Number specifying the bundle interface. The range is 1 to 65535.	
number-of-packets	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

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.9.0	This command was introduced.
Release 3.9.0	This command was introduced.
Release 5.0.0	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

The following example shows how to capture LACP packets on a POS interface:

```
RP/0/RP0RSP0/CPU0:router# lacp packet-capture pos 0/1/0/0 100
```

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

```
RP/0/RP0RSP0/CPU0:router# lacp packet-capture pos 0/1/0/0 stop
```

The following example shows how to clear all captured LACP packets on a POS interface:

```
RP/0/RP0RSP0/CPU0:router# lacp packet-capture pos 0/1/0/0 clear
```

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

```
RP/0/RP0RSP0/CPU0:router# lacp packet-capture gigabitethernet 0/2/0/0 100
```

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

```
RP/0/RP0RSP0/CPU0:router# lacp packet-capture gigabitethernet 0/2/0/0 stop
```

Related Commands	Command	Description
	show lacp io, on page 84	Displays the LACP transmission information that used by the transmitting device for sending packets on an interface.
	show lacp packet-capture, on page 87	Displays the contents of LACP packets that are sent and received on an interface.
	lacp period short, on page 40	Enables a short period time interval for the transmission and reception of LACP packets.

lacp period short

To enable a short period time interval for the transmission and reception of Link Aggregation Control Protocol (LACP) packets, use the **lacp period short** command in interface configuration mode. To return to the default short period, use the **no** form of this command.

lacp period short [**receive** *interval*] [**transmit** *interval*]

<table>
<tr>
<td>**Syntax Description**</td>
<td>**receive** *interval*</td>
<td>Time interval (in milliseconds) for receiving LACP packets when LACP short period is enabled. The range is 100 to 1000 and must be multiples of 100, such as 100, 200, 300, and so on.</td>
</tr>
<tr>
<td></td>
<td>**transmit** *interval*</td>
<td>Time interval (in milliseconds) for transmitting LACP packets when LACP short period is enabled. The range is 100 to 1000 and must be multiples of 100, such as 100, 200, 300, and so on.</td>
</tr>
</table>

Command Default   The default is 1000.

Command Modes   Interface configuration

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.9.0	This command was introduced.
Release 3.9.0	The keywords **transmit** and **receive** were added.
Release 5.0.0	This command was introduced.

Usage Guidelines   When you configure a custom LACP short period *transmit* interval at one end of a link, you must configure the same time period for the *receive* interval at the other end of the link.

Note   You must always configure the *transmit* interval at both ends of the connection before you configure the *receive* interval at either end of the connection. Failure to configure the *transmit* interval at both ends first results in route flapping (a route going up and down continuously). When you remove a custom LACP short period, you must do it in reverse order. You must remove the *receive* intervals first and then the *transmit* intervals.

Note   Starting with Cisco IOS XR Software Release 7.1.1, the `lacp period short receive` and `lacp period short transmit` commands are deprecated. Use the `lacp period <time in milliseconds>` command to configure LACP receive and transmit time. Before using this command, you must first execute `lacp cisco enable` command in the bundle interface mode. Without `lacp cisco enable` command, the members may still transmit at the standard interval of 1 second.

Task ID

Task ID	Operations
bundle	read, write

Examples

The following example shows how to enable a default Link Aggregation Control Protocol (LACP) short period on a Gigabit Ethernet interface:

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RP0RSP0/CPU0:router(config-if)# lacp period short
RP/0/RP0RSP0/CPU0:router(config-if)# commit
```

The following example shows how to configure custom Link Aggregation Control Protocol (LACP) short period transmit and receive intervals at both ends of a connection:

Router A

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RP0RSP0/CPU0:router(config-if)# lacp period short
RP/0/RP0RSP0/CPU0:router(config-if)# commit
```

Router B

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RP0RSP0/CPU0:router(config-if)# lacp period short
RP/0/RP0RSP0/CPU0:router(config-if)# commit
```

Router A

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RP0RSP0/CPU0:router(config-if)# lacp period short transmit 500
RP/0/RP0RSP0/CPU0:router(config-if)# commit
```

Router B

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RP0RSP0/CPU0:router(config-if)# lacp period short transmit 500
RP/0/RP0RSP0/CPU0:router(config-if)# commit
```

Router A

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RP0RSP0/CPU0:router(config-if)# lacp period short receive 500
RP/0/RP0RSP0/CPU0:router(config-if)# commit
```

Router B

```
RP/0/RP0RSP0/CPU0:router# config
RP/0/RP0RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RP0RSP0/CPU0:router(config-if)# lacp period short receive 500
RP/0/RP0RSP0/CPU0:router(config-if)# commit
```

Related Commands	Command	Description
	show lacp io, on page 84	Displays the LACP transmission information that used by the transmitting device for sending packets on an interface.
	show lacp packet-capture, on page 87	Displays the contents of LACP packets that are sent and received on an interface.
	lacp packet-capture, on page 37	Captures LACP packets so that their information can be displayed.

lacp system priority

To configure the priority for the current system, enter the **lacp system priority** command in Global Configuration modeXR Config mode mode. To return to the default LACP system priority value, use the **no** form of this command.

lacp system priority *priority*

Syntax Description

s	Priority for this system. Replace *priority* with a number. Range is from 1 through 65535. A lower value is higher priority.

Command Default

The default setting is *priority* = 32768.

priority: 32768

Command Modes

Global Configuration modeXR Config mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	This command was introduced.

Usage Guidelines

The system priority value forms part of the LACP system ID, which is transmitted within each LACP packet. The system ID, port ID and key combine to uniquely define a port within a LACP system.

When the LACP system receives priority value as zero (0) from a remote device, bundle does not come up.

Task ID

Task ID	Operations
bundle	read, write

Examples

The following example shows how to configure an LACP priority of 100 on a router:

```
RP/0/RP0RSP0/CPU0:router(config)# lacp system priority 100
```

The following example shows how to configure an LACP priority of 10 and MAC address on the Bundle-Ether interface:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 1
RP/0/RP0RSP0/CPU0:router(config-if)# lacp system priority 10
RP/0/RP0RSP0/CPU0:router(config-if)# lacp system mac 00c1.4c00.bd15
```

```
RP/0/RP0RSP0/CPU0:router(config-if)# commit
```

Related Commands

Command	Description
show lacp system-id, on page 93	Displays the local system ID used by the LACP.
show lacp bundle, on page 80	Displays detailed information about LACP ports and their peers.
show lacp port, on page 90	

member neighbor

To configure interchassis group ICCP members, use the **member neighbor** command in redundancy ICCP group configuration mode. To return to the default behavior, use the **no** form of this command.

member neighbor *neighbor-ip-address*
no member neighbor *neighbor-ip-address*

Syntax Description	*neighbor-ip-address* Specifies the ICCP member neighbor IP address.

Command Default   None

Command Modes   Redundancy ICCP group configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.

Usage Guidelines   To use this command, 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 a command, contact your AAA administrator for assistance.

Task ID

Task ID	Operations
config-services	read, write

Examples   The following example shows how to configure interchassis group ICCP members:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)# member neighbor 10.1.1.1
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)#
```

Related Commands

Command	Description
redundancy iccp group, on page 52	Configures Inter Chassis Communication Protocol (ICCP) parameters.

mlacp connect

To specify configuration options for connecting to mLACP peers, use the **mlacp connect** command in the redundancy ICCP group configuration mode. To disable this feature, use the **no** form of this command.

mlacp connect timeout *seconds*

Syntax Description

timeout	Specifies the time to wait before assuming mLACP peer is down.
seconds	Number of seconds to wait before assuming the mLACP peer is down.

Command Default

No default behavior or values

Command Modes

Redundancy ICCP group configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	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 specify configuration options for connecting to mLACP peers:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)# mlacp connect timeout 100
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)#
```

Related Commands

redundancy iccp group	Configures ICCP parameters.

mlacp iccp-group

To configure ICCP redundancy group for a bundle, use the **mlacp iccp-group** command in bundle interface configuration mode. To return to the default value, use the **no** form of this command.

mlacp iccp-group *group-id*

Syntax Description	*group-id* Specifies the ICCP redundancy group in which the bundle should operate. The group-id value ranges between 1-4294967295.

Command Default   The bundle behaves as a single chassis LAG.

Command Modes   Bundle interface configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	This command was introduced.

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

Task ID

Task ID	Operations
Bundle	read, write

Examples   The following example shows how to configure an ICCP redundancy group for a bundle:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 30
RP/0/RP0RSP0/CPU0:router(config-if)# mlacp iccp-group 200
RP/0/RP0RSP0/CPU0:router(config-if)#
```

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*

Syntax Description	*node-id* Specifies the unique node ID in the ICCP group for this system. The node-id value ranges between 0 to 7.

Command Default No default behavior or values

Command Modes Redundancy ICCP group configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	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 mLACP node ID to be used in the ICCP group:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)# mlacp node 3
```

Related Commands

redundancy iccp group	Configures ICCP parameters.

mlacp port-priority

To set the priority for all member links, use the **mlacp port-priority** command in bundle interface configuration mode. To return to the default value, use the **no** form of this command.

mlacp port-priority *priority*

Syntax Description	*priority* Specifies the priority for member ports. The priority value ranges between 1-65535. A lower value indicates higher priority.

Command Default   No default behavior or values

Command Modes   Bundle interface configuration

Command History

Release	Modification
Release 4.0.0	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 set the priority for all member links:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# interface Bundle-Ether 30
RP/0/RP0RSP0/CPU0:router(config-if)# mlacp port-priority 20
```

mlacp system mac

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

mlacp system mac *mac-id*

Syntax Description

mac-id	Specifies the unique ID for the system.
Note	A non-zero value is permitted.

Command Default

No default behavior or values

Command Modes

Redundancy ICCP group configuration

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
bundle	read, write

Examples

The following example shows how to configure the LACP system ID to be used in an ICCP group:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)# mlacp system mac 1.1.1
```

Related Commands

redundancy iccp group	Configures ICCP parameters.

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*

Syntax Description	*priority* 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

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	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/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)# mlacp system priority 10
```

Related Commands

redundancy iccp group	Configures ICCP parameters.

redundancy iccp group

To configure Inter Chassis Communication Protocol (ICCP) parameters, use the **redundancy iccp group** command in the Global Configuration mode. To return to the default, use the **no** form of this command.

redundancy iccp group *group-id*

Syntax Description

group-id	Specifies ICCP group ID.

Command Default   ICCP redundancy is disabled.

Command Modes   Global Configuration mode

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	This command was introduced.

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

Task ID

Task ID	Operations
config-services	read, write

Examples   The following example shows how to configure ICCP parameters:

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RP0RSP0/CPU0:router(config-redundancy-iccp-group)#
```

redundancy one-way

To enforce one-way pseudowire redundancy behavior when the redundancy group is configured, use the **redundancy one-way** command in the L2VPN pseudowire class configuration mode. To return to the default, use the **no** form of this command.

redundancy   one-way

This command has no keywords or arguments.

| **Command Default** | One-way redundancy is disabled. |

| **Command Modes** | L2VPN pseudowire class configuration |

Command History

Release	Modification
Release 4.0.0	This command was introduced.

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

Task ID

Task ID	Operations
l2vpn	read, write

Examples   The following example shows how to :

```
RP/0/RP0RSP0/CPU0:router# configure
RP/0/RP0RSP0/CPU0:router(config)# l2vpn
RP/0/RP0RSP0/CPU0:router(config-l2vpn)# pw-class class_mpls
RP/0/RP0RSP0/CPU0:router(config-l2vpn-pwc)# encapsulation mpls
RP/0/RP0RSP0/CPU0:router(config-l2vpn-pwc-mpls)# redundancy one-way
RP/0/RP0RSP0/CPU0:router(config-l2vpn-pwc-mpls)#
```

show bundle

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

show bundle [{**Bundle-Ether** | **Bundle-POS** }*bundle-id*]
show bundle [**Bundle-EtherBundle-POS** *bundle-id*]

Syntax Description

Bundle-Ether	Displays information for the specified Ethernet bundle.
Bundle-POS	Displays information for the specified POS bundle.
bundle-id	Number from 1 to 65535 that identifies a particular bundle.

Command Default   Information is displayed for all configured bundles.

Command Modes   EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.3.0	• The output for this command was modified. • The **reasons** keyword was added.
Release 3.7.2	This command was introduced.
Release 3.8.0	The **reasons** keyword was removed.
Release 4.0.0	The output for this command was replaced with a new format.
Release 4.1.0	The following output fields were added: • Load-balancing • Link order signaling • Hash type • Cisco extensions
Release 4.2.0	Support for Bundle-POS was added.
Release 5.0.0	This command was introduced.
Release 5.3.2	The "Non-revertive" output field was added.

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*or **show bundle Bundle-POS***bundle-id* form of the command with the number of the configured bundle.

Task ID

Task ID	Operation
bundle	read

The following example shows output for all bundle interfaces that are configured on the router:

```
RP/0/RP0RSP0/CPU0:router# show bundle
Bundle-Ether 2
  Status:                             Up
  Local links <active/standby/configured>:   1 / 0 / 1
  Local bandwidth <effective/available>:     100000 (100000) kbps
  MAC address (source):               1234.4321.1111 (Gi0/0/0/1)
  Minimum active links / bandwidth:   1 / 500 kbps
  Maximum active links:               32
  Wait-while timer:                   2000 ms
  Load-balancing:                     Default
  LACP:                               Operational
    Flap suppression timer:           2500 ms
    Cisco extensions:                 Disabled
    Non-revertive:                    Disabled
  mLACP:                              Operational
    Interchassis group:               3
    Foreign links <active/configured>:   1 / 1
    Switchover type:                  Revertive
    Recovery delay:                   300 s
    Maximize threshold:               2 links
  IPv4 BFD:                           Not operational
    State:                            Off
    Fast detect:                      Enabled
    Start timer:                      Off
    Neighbor-unconfigured timer:      Off
    Preferred min interval:           150 ms
    Preferred multiple:               3
    Destination address:              Not Configured

  Port                 Device          State       Port ID         B/W, kbps
  -------------------- --------------- ----------- --------------- -----------
  Gi0/0/0/1            Local           Active      0x8000, 0x0001    100000
  MyFirstInterface     10.10.10.123    Negotiating 0x8000, 0x0032    100000


Bundle-Ether 3
  Status:                             Up
  Local links <active/standby/configured>:   1 / 0 / 1
  Local bandwidth <effective/available>:     100000 / 100000 kbps
  MAC address (source):               1234.4321.2222 (chassis pool)
  Minimum active links / bandwidth:   1 / 500 kbps
  Maximum active links:               32 (from partner)
  Wait-while timer:                   100 ms
  Load-balancing:
    Link order signaling:             Operational
    Hash type:                        Src-IP
  LACP:                               Operational
    Flap suppression timer:           120 s
    Cisco extensions:                 Enabled
    Non-revertive:                    Disabled
  mLACP:                              Not configured
  IPv4 BFD:                           Not operational

  Port                 Device          State       Port ID         B/W, kbps
  -------------------- --------------- ----------- --------------- -----------
  Gi0/0/0/2            Local           Active      0x8000, 0x0002    100000
```

```
RP/0/RP0RSP0/CPU0:router# show bundle
Sun Mar  6 12:16:25.601 PST

Bundle-Ether10
  Status:                               Up
  Local links <active/standby/configured>:  1 / 1 / 2
  Local bandwidth <effective/available>:    1000000 (1000000) kbps
  MAC address (source):                 f866.f213.25a8 (Gi0/1/0/16)
  Minimum active links / bandwidth:     1 / 1 kbps
  Maximum active links:                 1
  Wait while timer:                     2000 ms
  Load balancing:                       Default
  LACP:                                 Operational
    Flap suppression timer:             Off
    Cisco extensions:                   Disabled
   Non-revertive:                       Disabled
  mLACP:                                Not configured
  IPv4 BFD:                             Not operational
    State:                              Off
    Fast detect:                        Enabled
    Start timer:                        Off
    Neighbor-unconfigured timer:        Off
    Preferred min interval:             150 ms
    Preferred multiple:                 3
    Destination address:                Not Configured

  Port                 Device          State       Port ID        B/W, kbps
  -------------------  --------------  ----------  --------------  ----------
  Gi0/1/0/9            Local           Active      0x0001, 0x0001   1000000
      Link is Active
  Gi0/1/0/10           Local           Standby     0x0002, 0x0002   1000000
      Link is Standby due to maximum-active links configuration
```

Table 2: show bundle Field Descriptions

Field	Description
Bundle-*typenumber*	Full name of the bundle interface, where *type* is Ether (Ethernet) or POS, followed by the configured *number* of the bundle.

Field	Description
Status:	State of the bundle on the local device, with one of the following possible values: • 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>:	The number of links on the device (from 0 to the maximum number of supported links for the bundle) in the format $x / y / z$, with the following values: • x—Number of links in Active state on the bundle. • y—Number of links in Standby state on the bundle. • z—Total number of links configured on the bundle.

Field	Description
Local bandwidth <effective/available>:	Bandwidth characteristics on the bundle in kilobits per second (kbps) in the format x/y, with the following values: • 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):	Layer 2 MAC address on the bundle interface in the format xxxx.xxxx.xxxx. The (*source*) of the address is shown in parentheses with the following possible values: • Interface name—The MAC address is from the displayed member interface type and path. • Configured—The MAC address is explicity 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:	Displays the following information in the format x/y kbps, with the following values: • 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:	Maximum number of links (from 1 to the maximum supported on a bundle) that can be active on the bundle.

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:	Type of load balancing in use on the bundle, with the following possible values: • 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. The default load balancing method for the system is used on the bundle.
Link order signaling:	Displays whether or not link order signaling is operating on the bundle, with the following possible values: • 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. **Note** Link order signaling is required for the deployment of Multi-Gigabit Service Control Point (MGSCP).
Hash type:	The information to be used for the load balancing hash on the bundle, with the following possible values: • 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:	Displays whether or not Link Aggregation Control Protocol (LACP) is active on the bundle, with the following possible values: • 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:	Displays the status of the flap suppression timer, with the following possible values: • Off—The flap suppression timer is not configured using the **lacp switchover suppress-flaps** command. • x 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:	Displays whether or not the Cisco-specific TLVs for LACP are enabled. The possible values are "Enabled" and "Disabled".
Non-revertive:	Displays whether non-revertive behavior for the bundle interface is enabled or not. The possible values are "Enabled" and "Disabled".

Field	Description
mLACP:	Displays whether or not the bundle is operating using Multichassis Link Aggregation (MC-LAG), with the following possible values: • 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. mLACP is not supported on the platform.
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: • 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: • x—Number of links in Active state on the remote bundle. • y—Total number of links configured on the remote bundle.

Field	Description
Switchover type:	Method of performing an mLACP switchover on the bundle with the following possible values: • 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. The switchover type can be changed from the default behavior using the **mlacp switchover type** command,
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.

Field	Description
Maximize threshold:	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: • *x* links—Number of active links used as the maximum threshold target to be maintained as a trigger for an mLACP switchover on a bundle. • *y* 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:	Displays whether or not IPv4-based bidirectional forwarding (BFD) is operating on the bundle interface, with the following possible values: • 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.
State:	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: • Down—The configured minimim 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.

Field	Description
Fast detect:	Displays whether or not BFD fast detection is configured on the bundle, with the following possible values: • 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:	Displays status of the BFD start timer that is configured using the **bfd address-family ipv4 timers start** command, with the following possible values: • *x* s—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.
Neighbor-unconfigured timer:	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: • *x* s—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:	Number of milliseconds (in the format *x* ms) as the minimum control packet interval for BFD sessions. The range is 15 to 30000.
Preferred multiple:	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.

Field	Description
Destination address:	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.
Port	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.
Device	Label Distribution Protocol (LDP) address of the device where the interface port is located, with the following possible values: • *address*—IP address of the device. • Local—Interface port is on the local device.
State	Status of the port, with one of the following possible values • 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 swithchover from failure of an active link.
Port ID	ID of the interface port in the format *x/y*, with the following values: • *x*—Port priority as a 2-byte hexadecimal value. • *y*—Link ID as a 2-byte hexadecimal value.

Field	Description
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 3: 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.
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.

Reason	Description
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.
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; LACPDUs 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.

Reason	Description
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.
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.

Reason	Description
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.

Related Commands

Command	Description
interface (bundle), on page 29	Specifies or creates a new bundle and enters interface configuration mode for that bundle.

show bundle brief

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

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 5.0.0	This command was introduced.

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

Task ID

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/RP0RSP0/CPU0:router# show bundle brief
Thu Mar  3 14:40:35.167 PST

Name   | IG         | State          | LACP | BFD |     Links     | Local b/w, |
       |            |                |      |     | act/stby/cfgd |    kbps    |
-------|----------|---------------|------|-----|---------------|------------|
BE16          - Up              On     Off        1 / 1 / 2       1000000
BE100         - Down            Off    Off        0 / 0 / 0             0
```

describes the fields shown in the display.

Table 4: show bundle brief Field Descriptions

Field	Description
Name	Abbreviated name of the bundle interface, with the following possible formats: • BEx—Ethernet bundle with ID number x. • BPy—POS bundle with ID number y.
IG	Interchassis group ID (if configured) of which the bundle is a member.

Field	Description
State	State of the bundle on the local device, with the following possible values: • 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	Status of the Link Aggregation Control Protocol (LACP) on the bundle, with the following possible values: • On—LACP is in use on the bundle. • Off—LACP is not active.

Field	Description
BFD	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: • Down—The configured minimim 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	Number of links on the bundle with a particular status in the format $x/y/z$, with the following values: • 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	Current bandwidth of the bundle on the local device (this effective bandwidth might be limited by configuration).

Related Commands

Command	Description
show bundle, on page 54	Displays information about configured bundles.

show bundle load-balancing

To display load balancing information, such as the ports, usage, weight, and distribution of traffic on individual members of a link bundle interface, use the **show bundle load-balancing** command in EXEC mode.

show bundle load-balancing [**Bundle-Ether** |**Bundle-POS** *bundle-id*] [**brief**] [**detail**] [**location**]

Syntax Description		
Bundle-Ether *bundle-id*	(Optional) Specifies the number of the Ethernet bundle whose information you want to display. Range is 1 through 65535.	
Bundle-POS *bundle-id*	(Optional) Specifies the number of the POS bundle whose information you want to display. Range is 1 through 65535.	
brief	(Optional) Displays summary information for all nodes or for a specified location.	
detail	(Optional) Displays detailed information for all nodes or for a specified location.	
location	(Optional) Specifies the location of the node.	
	For more information about the syntax for the router, use the question mark (**?**) online help function.	

Command Default

When the **brief** or **detail** keywords are used and no **location** is specified, information is displayed for all nodes on the router.

Command Modes

EXEC mode

Command History

Release	Modification
Release 3.9.0	This command was introduced.
Release 4.2.0	The **Bundle-POS** keyword 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/RP0RSP0/CPU0:router# show bundle load-balancing brief

Node: 0/0/CPU0
                   Sub-Intf  Member
                                     Total
  Interface        Count     Count   Wgt.
  ----------------- --------  -----------
```

```
     Bundle-Ether12345    10       63     134

Node: 0/1/CPU0
                    Sub-Intf  Member
                                     Total
  Interface          Count    Count  Wgt.
  ----------------  --------  ------------
  Bundle-Ether12345    10       63     134


show bundle load-balancing brief location 0/0/CPU0

Node: 0/0/CPU0
                    Sub-Intf  Member
                                     Total
  Interface          Count    Count  Wgt.
  ----------------  --------  ------------
  Bundle-Ether12345    10       63     134




RP/0/RP0RSP0/CPU0:router# show bundle load-balancing location 0/0/CPU0


===============================================================================

Bundle-Ether12345
  Type:           Ether (L2)
  Members:        63
  Total Weighting: 134
  Sub-interfaces:  10

  Member Information:
    Port          ID  BW
    ------------  --  --
    Gi0/0/0/1      0  10
    Gi0/0/0/3      1   1
[...]

Platform Information:
=====================

    Bundle Summary Information:
    ---------------------------
    Interface        : Bundle-Ether100      Ifhandle    : 0xa0000a0
    Lag ID           : 1                    Virtual Port : 20
    Number of Members : 4                   Local to LC  : 1

    Member Information:
    ul_id  Interface      ifhandle      SFP    port   slot
    -----  ---------      ---------     ---    ----   ----
    0      Gi0/4/0/3      0x8000100     16     3      4
    1      Gi0/4/0/10     0x80002c0     17     10     4
    2      Gi0/4/0/17     0x8000480     17     17     4
    3      Gi0/4/0/24     0x8000640     18     4      4

    Bundle Table Information:
    ------------------------
    [NP 0]:
    -----------------------------------------------------------------
    Unicast (Global) LAG table     |  Multicast (Local) LAG table
    -----------------------------------------------------------------
    idx   local   ul_id  SFP  port |  idx    local   ul_id  SFP  port
    -----------------------------------------------------------------
     1      1       0    16    3   |   1      1        0    16     3
```

```
      2      1      1   17      10        2      1      1   17      10
      3      1      2   17      17        3      1      2   17      17
      4      0      3   18       4        4      0      3   18       4
      5      1      0   16       3        5      1      0   16       3
      6      1      1   17      10        6      1      1   17      10
      7      1      2   17      17        7      1      2   17      17
      8      0      3   18       4        8      0      3   18       4

   [NP 1]:
   -------------------------------------------------------------------------
   Unicast (Global) LAG table      |  Multicast (Local) LAG table
   -------------------------------------------------------------------------
   idx  local  ul_id  SFP   port   |  idx   local   ul_id  SFP   port
   -------------------------------------------------------------------------
      1      0      0   16       3        1      0      0   16       3
      2      0      1   17      10        2      0      1   17      10
      3      0      2   17      17        3      0      2   17      17
      4      1      3   18       4        4      1      3   18       4
      5      0      0   16       3        5      0      0   16       3
      6      0      1   17      10        6      0      1   17      10
      7      0      2   17      17        7      0      2   17      17
      8      1      3   18       4        8      1      3   18       4

===============================================================================

Bundle-POS3
  Type:           POS (L3)
  Members:        2
  Total Weighting: 2
  Sub-interfaces:  0

  Member Information:
    Port:         ID  BW
    ------------  --  --
    POS0/2/0/1     3   1
    POS0/4/0/0     4   1

===============================================================================


RP/0/RP0RSP0/CPU0:router# show bundle load-balancing Bundle-Ether 12345 detail location
0/0/CPU0

Bundle-Ether12345
  Type:           Ether (L2)
  Members:        63
  Total Weighting: 134
  Sub-interfaces:  10

  Member Information:
    Port          ID  BW
    ------------  --  --
    Gi0/0/0/1      0  10
    Gi0/0/0/3      1   1
[...]

  Sub-interface Information:
    Sub-interface                Type  Load Balance
    ---------------------------  ----  ------------
    Bundle-Ether12345.4294967295  L2    Default
    Bundle-Ether12345.2           L2    Hash: XID
    Bundle-Ether12345.3           L2    Fixed: 2
```

```
[...]


RP/0/RP0RSP0/CPU0:router# show bundle load-balancing Bundle-Ether12345.2 location 0/0/CPU0

Bundle-Ether12345
  Type:           Ether (L2)
  Members:        63
  Total Weighting: 134
  Sub-interfaces: 10

  Sub-interface Information:
    Sub-interface                   Type  Load Balance
    --------------------------      ----  ------------
    Bundle-Ether12345.2             L2    Hash: XID

Platform Information:
=====================

    Bundle Summary Information:
    --------------------------
    Interface        : Bundle-Ether100      Ifhandle    : 0xa0000a0
    Lag ID           : 1                    Virtual Port : 20
    Number of Members : 4                   Local to LC  : 1

    Member Information:
    ul_id   Interface       ifhandle      SFP     port    slot
    -----   ---------       ---------     ---     ----    ----
    0       Gi0/4/0/3       0x8000100     16      3       4
    1       Gi0/4/0/10      0x80002c0     17      10      4
    2       Gi0/4/0/17      0x8000480     17      17      4
    3       Gi0/4/0/24      0x8000640     18      4       4

    Bundle Table Information:
    ------------------------
    [NP 0]:
    -----------------------------------------------------------------------
    Unicast (Global) LAG table      |  Multicast (Local) LAG table
    -----------------------------------------------------------------------
    idx   local   ul_id SFP   port  |  idx   local   ul_id SFP   port
    -----------------------------------------------------------------------
      1       1       0   16      3       1       1       0   16      3
      2       1       1   17     10       2       1       1   17     10
      3       1       2   17     17       3       1       2   17     17
      4       0       3   18      4       4       0       3   18      4
      5       1       0   16      3       5       1       0   16      3
      6       1       1   17     10       6       1       1   17     10
      7       1       2   17     17       7       1       2   17     17
      8       0       3   18      4       8       0       3   18      4
```

Related Commands	**Command**	**Description**
	bundle-hash, on page 5	Displays the source and destination IP addresses for the member links.
	bundle load-balancing hash (EFP), on page 16	Configures all egress traffic on a particular subinterface of a bundle to flow through the same physical member link.
	show bundle, on page 54	Displays information about configured bundles.

show bundle replication bundle-ether

To display the replication status of a link bundle interface, use the **show bundle replication bundle-ether** command in EXEC modeXR EXEC mode.

show bundle replication bundle-ether *bundle_id* [**all**] [**in-progress**] [**pending**]

Syntax Description

all	Shows replication status for all nodes.
in-progress	Shows only nodes with replication in progress.
pending	Shows only nodes pending replication.

Command Default No default behavior or values

Command Modes EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.9.0	This command was introduced.
Release 5.0.0	This command was introduced.

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

Task ID

Task ID	Operations
bundle	read

Examples

```
RP/0/RP0RSP0/CPU0:router# show bundle replication bundle-ether 1 all
```

show iccp group

To display information for the ICCP parameters, use the **show iccp** command in EXEC mode.

show iccp group {*group-id* | **location** *node-id*}

Syntax Description

group-id	ICCP group ID.
location	Specifies the location.
node-id	Node ID. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default　None

Command Modes　EXEC mode

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	This command was introduced.

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

Task ID

Task ID	Operations
mpls-ldp	read

Examples　The following example shows the output of the **show iccp group** command:

```
RP/0/RP0RSP0/CPU0:router#show iccp group

Redundancy Group 1
  member ip:2.2.2.2 (router2), up (connected)
    monitor: route-watch (up)
  backbone interface Gi0/2/0/3: up
  enabled applications: mLACP
  isolation recovery delay timer: 180 s, not running
Redundancy Group 2
  member ip:2.2.2.2 (router2), up (disconnected)
    monitor: route-watch (up)
  backbone interface Gi0/2/0/3: up
  enabled applications: mLACP
  isolation recovery delay timer: 180 s, not running


RP/0/RP0RSP0/CPU0:router#show iccp group 1
```

```
Redundancy Group 1
  member ip:2.2.2.2 (router2), up (connected)
    monitor: route-watch (up)
  backbone interface Gi0/2/0/3: up
  enabled applications: mLACP
  isolation recovery delay timer: 180 s, not running
```

show lacp bundle

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

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

Syntax Description	**Bundle-Ether** *bundle-id* (Optional) Specifies the number of the Ethernet bundle whose information you want to display. Range is 1 through 65535.
	Bundle-POS *bundle-id* (Optional) Specifies the number of the POS bundle whose information you want to display. Range is 1 through 65535.

Command Default   No default behavior or values

Command Modes   EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	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 example shows how to display LACP information for a specific Ethernet Bundle:

```
RP/0/RP0RSP0/CPU0:router# show lacp bundle Bundle-Ether 1

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
                            Minimum active    Maximum active
  B/W (Kbps)   MAC address    Links  B/W (Kbps)  Links
  ----------   -------------  -----  ----------  -----
          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 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 *rack/slot/module/port* notation.
State	Provides information about the state of the specified port. Possible flags are: • 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: • 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 *Nxnnnn*. *N* is the port priority, and *nnnn* 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.

Related Commands

Command	Description
bundle id, on page 12	Adds a port to an aggregated interface or bundle.
show bundle, on page 54	Displays information about configured bundles.

show lacp counters

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

show lacp counters {**Bundle-Ether** | **bundle-POS**} *bundle-id*

Syntax Description

Bundle-Ether *bundle-id*	Specifies the Ethernet bundle whose counters you want to display. Replace *bundle-id* with a bundle identifier. Range is from 1 through 65535.
Bundle-POS *bundle-id*	Specifies the POS bundle whose counters you want to display. Replace *bundle-id* with a bundle identifier. Range is from 1 through 65535.

Command Default   No default behavior or values

Command Modes   EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	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 example shows how to display LACP counters on an Ethernet bundle:

```
RP/0/RP0RSP0/CPU0:router# show lacp counters bundle-ether 1

Bundle-Ether1
                    LACPDUs                    Marker
Port           Sent         Received      Received    Resp. Sent  Last Cleared
-------------  ---------------------   ----------------------  ------------
Gi0/0/2/0            12            0             0           0  never

Port         Excess                 Excess               Pkt Errors
-------------  ----------           ----------             ----------
Gi0/0/2/0            0                     0                       0
Port           Last LACP Timeout             LACP Timeout Transition
-------------      --------------------        ----------------------------
Gi0/0/2/0          1644331309763699015                            4
```

Table 6: show lacp counters Field Descriptions

Field	Description
LACPDUs	Provides the following statistics for Link Aggregation Control Protocol data units (LACPDUs): • Port • Sent • Received • Last Cleared • Excess • Pkt Errors
Marker	Provides the following statistics for marker packets: • Received • Resp. Sent • Last Cleared • Excess • Pkt Errors **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.
Timeouts	Provides the following statistics for LACP timeouts: • Last LACP Timeout—The timestamp indicates the time of the last state change due to an LACP timeout. The value is the timestamp in nanoseconds relative to the Unix Epoch (Jan 1, 1970 00:00:00 UTC). • LACP Timeout Transition—The number of times the LACP state has transitioned with a timeout since the time the device restarted or the interface was brought up, whichever is most recent.

Related Commands

Command	Description
clear lacp counters, on page 27	Clears LACP counters for all members of all bundles, all members of a specific bundle, or for a specific port.

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 EXEC modeXR EXEC mode.

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

Syntax Description		
Bundle-Ether *bundle-id*		(Optional) Displays information for the Ethernet bundle interface with the specified *bundle-id*. The range is 1 through 65535.
Bundle-POS *bundle-id*		(Optional) Displays information for the POS bundle interface with the specified *bundle-id*. The range is 1 through 65535.
GigabitEthernet		(Optional) Displays information for the Gigabit Ethernet interface with the specified *interface-path-id*.
TenGigE		(Optional) Displays information for the Ten Gigabit Ethernet interface with the specified *interface-path-id*.
POS		(Optional) Displays information for the POS interface with the specified *interface-path-id*.
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 The default takes no parameters and displays information for all actively transmitting interfaces.

Command Modes EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.9.0	This command was introduced.
Release 3.9.0	This command was introduced.
Release 5.0.0	This command was introduced.

Usage Guidelines This command displays information only for interfaces that are actively transmitting packets.

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/RP0RSP0/CPU0:router# show lacp io bundle-ether 28

Thu Jun 18 16:28:54.068 PST

Bundle-Ether28

Interface GigabitEthernet0/1/5/6
================================
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 GigabitEthernet0/1/5/7
================================
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/RP0RSP0/CPU0:router# show lacp io

Thu Jun 18 16:33:57.330 PST

Bundle-Ether28

Interface GigabitEthernet0/1/5/6
================================
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 GigabitEthernet0/1/5/7
================================
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)


Bundle-POS24

Interface POS0/1/4/0
====================
Interface handle:      0x011804c0
Interface media type:   POS
Fast periodic interval: 1000ms
Actor system:   0x8000, 00-15-63-c0-b0-04
Actor key:       0x0018
Actor port:      0x8000, 0x0003
Actor state:     Act  (T/o)  Agg   Sync   Coll   Dist  (Def) (Exp)
Partner system: 0x8000, 00-15-63-58-b9-04
Partner key:     0x0018
Partner port:    0x8000, 0x0001
Partner state:   Act  (T/o)  Agg   Sync   Coll   Dist  (Def) (Exp)

Interface POS0/1/4/1
====================
Interface handle:      0x011804e0
Interface media type:   POS
Fast periodic interval: 1000ms
Actor system:   0x8000, 00-15-63-c0-b0-04
Actor key:       0x0018
Actor port:      0x8000, 0x0004
Actor state:     Act  (T/o)  Agg   Sync   Coll   Dist  (Def) (Exp)
Partner system: 0x8000, 00-15-63-58-b9-04
Partner key:     0x0018
Partner port:    0x8000, 0x0002
Partner state:   Act  (T/o)  Agg   Sync   Coll   Dist  (Def) (Exp)
```

Related Commands	Command	Description
	show lacp packet-capture, on page 87	Displays the contents of LACP packets that are sent and received on an interface.
	lacp period short, on page 40	Enables a short period time interval for the transmission and reception of LACP packets.
	lacp packet-capture, on page 37	Captures LACP packets so that their information can be displayed.

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 EXEC modeXR EXEC mode.

show lacp packet-capture [**decoded**] [{**in** | **out**}] {**GigabitEthernet** | **POS** | **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.
GigabitEthernet	Displays packet information for the Gigabit Ethernet interface specified by *interface-path-id*.
POS	Displays packet information for the POS interface specified by *interface-path-id*.
TenGigE	Displays packet information for the Ten Gigabit Ethernet interface specified by *interface-path-id*.
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

The default displays both in and out information.

Command Modes

EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.9.0	This command was introduced.
Release 5.0.0	This command was introduced.

Usage Guidelines

Note 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

The following example shows how to display the contents of an LACP packet, in hexadecimal, for 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/RP0RSP0/CPU0:router# lacp packet-capture gigabitethernet 0/1/0/0 100
RP/0/RP0RSP0/CPU0:router# show lacp packet-capture gigabitethernet 0/1/0/0

Wed Apr 29 16:27:40.996 GMT
OUT  Apr 29 17:05:50.123
=======================
01 01 01 14 80 00 02 a7 4c 81 95 04 00 01 80 00 00 01 45 00
00 00 02 14 ff ff 00 00 00 00 00 00 00 ff ff 00 00 40 00
00 00 03 10 ff ff 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00 00 00

OUT  Apr 29 17:35:50.124
=======================
...
```

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/RP0RSP0/CPU0:router# lacp packet-capture gigabitethernet 0/1/0/0 100
RP/0/RP0RSP0/CPU0:router# show lacp packet-capture decoded gigabitethernet 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
```

Related Commands	Command	Description
	show lacp io, on page 84	Displays the LACP transmission information that used by the transmitting device for sending packets on an interface.
	lacp period short, on page 40	Enables a short period time interval for the transmission and reception of LACP packets.
	lacp packet-capture, on page 37	Captures LACP packets so that their information can be displayed.

show lacp port

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

show lacp port [[{**GigabitEthernet** | **POS** | **TenGigE**}] *interface_instance*]

Syntax Description	

Syntax Description

GigabitEthernet	(Optional) Gigabit Ethernet interface. Use the *interface-path-id* argument to specify the Gigabit Ethernet interface whose LACP counters you want to display.
TenGigE	(Optional) Ten Gigabit Ethernet interface. Use the *interface-path-id* argument to specify the Ten Gigabit Ethernet interface whose LACP counters you want to display.
POS	(Optional) Packet-over-SONET/SDH (POS) interface. Use the *interface-path-id* argument to specify the POS interface whose LACP counters you want to display.
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 EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	This command was introduced.

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

For the *interface-path-id* argument, if specifying a physical interface, the naming notation is *rack*/*slot*/*module*/*port*. The slash between values is required as part of the notation. An explanation of each component of the naming notation is as follows:

- *rack*: Chassis number of the rack.
- *slot*: Physical slot number of the line card.
- *module*: Module number. A physical layer interface module (PLIM) is always 0.
- *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/RP0RSP0/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

                          Minimum active     Maximum active
  B/W (Kbps)  MAC address     Links  B/W (Kbps)  Links
  ----------  --------------  -----  ----------  -----
           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 *rack/slot/module/port* notation.
State	Provides information about the state of the specified device or port. Possible flags are: • 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: • 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: *Nxnnnn*. *N* is the port priority, and *nnnn* is the port number assigned by the sending router.

Field	Description
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.

Related Commands

Command	Description
bundle id, on page 12	Adds a port to an aggregated interface or bundle.
show bundle, on page 54	Displays information about configured bundles.
show lacp bundle, on page 80	Displays detailed information about LACP ports and their peers.

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 EXEC modeXR EXEC mode.

show lacp system-id

Syntax Description   This command has no keywords or arguments.

Command Default   No default behavior or values

Command Modes   EXEC modeXR EXEC mode

Command History

Release	Modification
Release 3.2	This command was introduced.
Release 3.7.2	This command was introduced.
Release 5.0.0	This command was introduced.

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

Task ID

Task ID	Operations
bundle	read

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

```
RP/0/RP0RSP0/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.

Related Commands

Command	Description
bundle id, on page 12	Adds a port to an aggregated interface or bundle.

Command	Description
show bundle, on page 54	Displays information about configured bundles.
show lacp bundle, on page 80	Displays detailed information about LACP ports and their peers.
show lacp port, on page 90	

show mlacp

To display the MC-LAG information configured locally and for any connected mLACP peer devices, use the **show mlacp** command in the EXEC mode.

show mlacp [{**Bundle-Ether** *interface-path-id* | **iccp-group** *group-id*}] [{**brief** | **verbose**}]

Syntax Description	**Bundle-Ether** *interface-path-id*	Displays the information for the ICCP group of the bundle and only the specified bundle.
	iccp-group *group-id*	Displays information related to the ICCP group.
	brief	Displays only the ICCP group information without any bundle information.
	verbose	Displays the ICCP group, the bundle and member information.

Command Default

No default behavior or values

Command Modes

Exec

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
bundle	Read

Examples

These examples display the MC-LAG information:

```
RP/0/RP0RSP0/CPU0:router# show mlacp brief

ICCP Group 1
  Connect timer:  Off

  Node  LDP ID          State        System ID                Sync  Vers
  ----  --------------  -----------  -----------------------  -----  ----
     1  5.4.3.1         Up           0x0001,00-0d-00-0e-00-0f  Done  1
     2  Local           Up           0x0001,00-0d-00-0e-00-0f  Done  -

RP/0/RP0/CPU0:poa2#show mlacp

ICCP Group 1
```

```
      Connect timer:  Off

      Node  LDP ID           State          System ID                 Sync   Vers
      ----  ---------------  ------------   ------------------------  -----  ----
         1  5.4.3.1          Up             0x0001,00-0d-00-0e-00-0f  Done   1
         2  Local            Up             0x0001,00-0d-00-0e-00-0f  Done   -


     Bundle-Ether1 (ROID: 0000.0001.0000.0000)
       Node  Aggregator Name       State      Agg ID  MAC Address
       ----  -------------------   ----------  ------  ---------------
          1  BE1                   Up          0x0001  0000.deaf.0000
          2  Bundle-Ether1         Up          0x0001  0000.deaf.0000

RP/0/RP0/CPU0:router#show mlacp verbose

ICCP Group 1
  Connect timer:  Off

      Node  LDP ID           State          System ID                 Sync   Vers
      ----  ---------------  ------------   ------------------------  -----  ----
         1  5.4.3.1          Up             0x0001,00-0d-00-0e-00-0f  Done   1
         2  Local            Up             0x0001,00-0d-00-0e-00-0f  Done   -


     Bundle-Ether1 (ROID: 0000.0001.0000.0000)
       Node  Aggregator Name       State      Agg ID  MAC Address
       ----  -------------------   ----------  ------  ---------------
          1  BE1                   Up          0x0001  0000.deaf.0000
          2  Bundle-Ether1         Up          0x0001  0000.deaf.0000

                                                     Priority
       Node  Port Name             State      Port    Oper   (Cfgd)
       ----  -------------------   ----------  ------  ---------------
          1  Gi0/1/0/3             Up          0x9001  0x03e8 (0x03e8)
          2  Gi0/0/0/1             Up          0xa001  0x07d0 (0x07d0)
```

show mlacp counters

To display counters relating to mLACP information transferred to and from the local device, use the **show mlacp counters** command in the EXEC mode.

show mlacp counters [{**bdl-info**|**ig-info**|**mbr-info** [{**bundle interface**|**member interface**|**iccp-group** *group-id* | **mlacp-device** *device-id* | **mlacp-interface** *foreign-member-interface*}]}]

Syntax Description		
	Bundle-Ether	Displays the requested information associated with the bundle interface.
	member interface	Displays the requested information associated with the member interface.
	counters	Displays information on the mLACP counters.
	bdl-info	Displays the bundles counters.
	ig-info	Displays the ICCP group counters.
	mbr-info	Displays the member counters.
	mlacp-device	Displays the requested information associated with the mLACP device.
		Note The **mlacp-device** and **mlacp-interface** keywords are available only when mLACP devices and mLACP interfaces are configured.
	mlacp-interface	Displays the requested information associated with the mLACP interface.

Command Default No default behavior or values

Command Modes EXEC mode

Command History

Release	Modification
Release 4.0.0	This command was introduced.
Release 4.3.2	This command was introduced.

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

Task ID

Task ID	Operations
bundle	Read

Examples These examples display MC-LAG counter information:

✎

Note The GigabitEthernet 0/0/0/1 is configured to Bundle-Ether 1 which is within ICCP Group1. Hence, the **show mlacp counters bdl-info GigabitEthernet 0/0/0/1** command displays the counters of the bundle that GigabitEthernet 0/0/0/1 is associated with (i.e. Bundle-Ether1). The **show mlacp counters mbr-info Bundle-Ether 1** displays the counters of the members that Bundle-Ether1 is associated with (locally: GigabitEthernet 0/0/0/1, and on the foreign device: GigabitEthernet 0/1/0/3).

```
RP/0/RP0RSP0/CPU0:router# show mlacp counters bdl-info GigabitEthernet 0/0/0/1

ICCP Group 1
                                  TLVs Sent                TLVs Received
Bundle             Config    State      Priority    NAKs       Priority
-------------------- --------------------------------  ---------------------
Local Device
Bundle-Ether1 ????????????3      4          0          0          0
mLACP Peer 5.4.3.1
Bundle-Ether1 ????????????3      4          0          0          0


                                  Sync Requests
Bundle             TLVs      (config)   (state)    Last Cleared
-------------------- --------------------------------  ------------
Local Device
Bundle-Ether1 ???????????0      0          0        18m12s
mLACP Peer 5.4.3.1
Bundle-Ether1 ???????????0      0          0        17m57s


RP/0/0/CPU0:router#show mlacp counters mbr-info Bundle-Ether 1

Bundle-Ether1 (ICCP Group 1)
                                  TLVs Sent                TLVs Received
Port               Config    State      Priority    NAKs       Priority
-------------------- --------------------------------  ---------------------
Local Device
Gi0/0/0/1 ???????????????7      0          0          0          0
mLACP Peer 5.4.3.1
Gi0/1/0/3 ???????????????7      5          3          0          0


                                  Sync Requests
Port               TLVs      (config)   (state)    Last Cleared
-------------------- --------------------------------  ------------
Local Device
All ports ?????????????????0      0          0        19m3s
Gi0/0/0/1 ?????????????????0      0          0        19m3s
mLACP Peer 5.4.3.1
All ports ?????????????????1      1          1        18m49s
Gi0/1/0/3 ?????????????????0      0          0        18m49s
```