

# **Link Bundling Commands**

This module provides command line interface (CLI) commands for configuring Link Bundle interfaces on the Cisco ASR 9000 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.

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### 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.

#### **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/RSP0/CPU0:router# configure

RP/0/RSP0/CPU0:router(config)# redundancy iccp group 10

RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)# backbone interface GigabitEthernet

0/2/1/0

 ${\tt RP/0/RSP0/CPU0:} router ({\tt config-redundancy-iccp-group}) \ \#$ 

Command	Description
redundancy iccp group, on page 47	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

Operations
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/RSP0/CPU0:router(config)# int bundle-ether 1
RP/0/RSP0/CPU0:router(config-if)##bundle lacp-delay ?
<1000-15000> Lacp-delay timeout in milliseconds
RP/0/RSP0/CPU0:router(config-if)##bundle lacp-delay 6000
RP/0/RSP0/CPU0:router(config-if)##commit

Command	Description
bundle maximum-active links, on page 17	
show bundle, on page 49	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 mode.

 $bundle-hash \ \ \{Bundle-Ether \ \ \, bundle-id \ \ | \ members \ \ \, \{GigabitEthernet \ \ | \ \, TenGigabitEthernet\}$ 

interface-path-id}

**location** source-interface

#### **Syntax Description**

Bundle-Ether bundle-id	Specifies an Ethernet 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.	
interface-path-id	Physical interface or virtual interface.	
	<b>Note</b> Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.	
	For more information about the syntax for the router, use the question mark (?) online help function.	
location	Location of source interface.	

#### Command Default

No default behavior or values

#### **Command Modes**

EXEC mode

#### **Command History**

Release	Modification
Release 3.7.2	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	

Option	Information You Need to Provide	
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 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/RSP0/CPU0:router# bundle-hash bundle-ether 28
Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): 13
Single SA/DA pair (IPv4, IPv6) or range (IPv4 only): S/R [S]: s
Enter bundle type IP V4 (1) or IP V6 (2): 1
Enter source IP V4 address: 10.12.28.2
Enter destination IP V4 address: 10.12.28.1
Compute destination address set for all members? [y/n]: y
Enter subnet prefix for destination address set: 8
Enter bundle IP V4 address [10.12.28.2]: 10.12.28.2
Link hashed to is 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/RSP0/CPU0:router# bundle-hash bundle-ether 28
Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): 13
Single SA/DA pair (IPv4, IPv6) or range (IPv4 only): S/R [S]: r
Maximum number of flows (num src addr * num dst addr): 65536
Enter first source IP address: 10.12.28.2
Enter subnet prefix for source address set: 8
Enter number of source addresses (1-245): 20
Enter source address modifier (1-12) [def:1]: 5
  Enter destination IP address: 10.12.28.1
 Enter subnet prefix for destination address set: 8
 Enter number of destination addresses (1-245): 20
Enter destination address modifier (1-12) [1]: 5
Many to many (M) or simple pairs (S)? [M]: s
Calculating simple pairs...
Total number of hits 20
Member 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/RSP0/CPU0:router# bundle-hash bundle-ether 202
```

```
Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): 14
Single SA:SP/DA:SP pair (IPv4, IPv6) or range (IPv4 only): S/R [S]: s
Enter bundle type IP V4 (1) or IP V6 (2): 1
Enter source IP V4 address: 172.20.180.167
Enter destination IP V4 address: 172.30.15.42
  Ingress interface --
  - physical interface format: [ GigabitEthernet | TenGigE ]R/S/I/P
  - bundle interface format:
                               [ Bundle-Ether]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): {\bf 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: [GigabitEthernet | TenGigE ]R/S/I/P
  - bundle interface format: [ Bundle-Ether ]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 5001) using entropy label, and ingress interface:

```
RP/0/RSP0/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)

Command	Description
show bundle, on page 49	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 3.7.2	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/RSP0/CPU0:router(config)# interface GigabitEthernet 0/1/5/0
RP/0/RSP0/CPU0:router(config-if)# bundle id 1

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

 $\label{eq:reconstruction} $$ RP/0/RSP0/CPU0: router(config) $$ $$ interface $GigabitEthernet 0/6/5/7 $$ RP/0/RSP0/CPU0: router(config-if) $$ $$ $$ bundle id 5 $$ mode active $$$ 

# 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.

Release 6.1.4 This command was modified. Support for Layer 3 multicast flow was added.

#### **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.

From Release 6.1.4, for IPv4 and IPv6 multicast traffic, the default hash is based on source IP and destination IP address.

In Release earlier than Release 6.1.4, the bundle load-balancing hash command has no effect on Layer 3 Multicast IP traffic.



Note

If the **bundle load-balancing hash** command has been configured under bundle sub-interface, then this configuration takes precedence over the bundle parent configuration.

#### Task ID

Task ID	Operation
bundle	read,
	write

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

RP/0/RSP0/CPU0:router(config) #interface Bundle-Ether 100
RP/0/RSP0/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/RSP0/CPU0:router(config) #interface Bundle-Ether 100
RP/0/RSP0/CPU0:router(config-if) # bundle load-balancing hash src-ip

Command	Description
interface (bundle), on page 25	Specifies or creates a new bundle and enters interface configuration mode for that bundle.
lacp cisco enable, on page 27	Enables use of Cisco-specific TLVs in addition to standard TLVs for negotiating and exchanging LACP information on link bundles.
show bundle, on page 49	Displays information about configured bundles.
show bundle load-balancing, on page 67	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 (**12transport**) 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/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface bundle-ether 1.1 l2transport
RP/0/RSP0/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/RSP0/CPU0:router# config

RP/0/RSP0/CPU0:router(config)# interface bundle-ether 1.1 l2transport
RP/0/RSP0/CPU0:router(config-subif)# bundle load-balancing hash 1

Command	Description
bundle-hash, on page 5	Displays the source and destination IP addresses for the member links.
interface (bundle), on page 25	Specifies or creates a new bundle and enters interface configuration mode for that bundle.
show bundle, on page 49	Displays information about configured bundles.
show bundle load-balancing, on page 67	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 [hot-standby]

#### **Syntax Description**

*links* 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.

**hot-standby** Modifies some default timeouts, such as wait-while timer and suppress-flaps, to avoid bundle-level flaps when the highest priority link fails or recovers.

#### **Command Default**

No default behavior or values

#### **Command Modes**

Interface configuration

#### **Command History**

Release	Modification
Release 3.7.2	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.

If the **bundle maximum-active links** command is issued, then only the highest-priority link within the bundle is active. The priority is based on the value from the **bundle port-priority** command, where a lower value is a higher priority. Therefore, we recommend that you configure a higher priority on the link that you want to be the active link.

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

```
RP/0/RSP0/CPU0:router(config) # interface bundle-ether 5
RP/0/RSP0/CPU0:router(config-if) # bundle maximum-active links 1 hot-standby
```

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/RSP0/CPU0:router(config)# interface Bundle-Ether 5
RP/0/RSP0/CPU0:router(config-if)# bundle maximum-active links 1
```

Command	Description
bundle minimum-active links, on page 20	Sets the number of active links required to bring up a specific bundle.
show bundle, on page 49	Displays information about configured bundles.

### 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 the combined bandwidths of 8 TenGigabitEthernet interfaces.

#### **Command Default**

The default setting is kbps = 1.

#### **Command Modes**

Interface configuration

#### **Command History**

Release	Modification
Release 3.7.2	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 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/RSP0/CPU0:router(config)# interface Bundle-Ether 1
RP/0/RSP0/CPU0:router(config-if)# bundle minimum-active bandwidth 620000

Command	Description
show bundle, on page 49	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 3.7.2	This command was introduced.
Release 4.0.0	The command range maximum was changed from 8 to 64.

#### **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 links must be active before the bundle can be brought up:

RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 5
RP/0/RSP0/CPU0:router(config-if)# bundle minimum-active links 2

Command	Description
bundle maximum-active links, on page 17	
show bundle, on page 49	Displays information about configured bundles.

# bundle port-priority

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

#### bundle port-priority priority

#### **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
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Release 3.7.2 This command was introduced.

#### **Usage Guidelines**

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

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



Note

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

#### Task ID

# Task Operations ID bundle read, write

#### **Examples**

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

RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/1
RP/0/RSP0/CPU0:router(config-if)# bundle port-priority 1

Command	Description
bundle id, on page 11	Adds a port to an aggregated interface or bundle.

Command	Description
show lacp bundle, on page 74	Displays detailed information about LACP ports and their peers.
show lacp port, on page 84	
show lacp system-id, on page 86	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/RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RSP0/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 mode.

clear lacp counters [ $\{bundle Bundle - Ether bundle - id \mid port \{Gigabit Ethernet interface - path - id \mid TenGigE interface - path - id\}\}$ ]

#### **Syntax Description**

bundle	(Optional) Clears LACP counters for all members of a bundle.
Bundle-Ether node-id	(Optional) Ethernet bundle. Use the <i>node-id</i> argument to specify the node ID number of the LACP counters you want to clear. Range is 1 through 65535.
port	(Optional) Clears all LACP counters on the specified bundle or interface.
GigabitEthernet	(Optional) Gigabit Ethernet interface. Use the <i>interface-path-id</i> argument to specify the Gigabit Ethernet interface whose LACP counters you want to clear.
TenGigE	(Optional) Ten Gigabit Ethernet interface. Use the <i>interface-path-id</i> argument to specify the Ten Gigabit Ethernet interface whose LACP counters you want to clear.

#### **Command Default**

No default behavior or values

#### **Command Modes**

EXEC mode

#### **Command History**

Release	Modification
Release 3.7.2	This command was introduced.

#### **Usage Guidelines**

No specific guidelines impact the use of this command.

#### Task ID

Task ID	Operations
bundle	execute
basic-services	read, write

#### **Examples**

The following example shows how to clear LACP counters:

RP/0/RSP0/CPU0:router# clear lacp counters

Command	Description
show lacp counters, on page 76	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 mode. To delete a bundle, use the **no** form of this command.

interface Bundle-Ether bundle-id

Syntax Description	<b>Bundle-Ether</b>	Specifies or creates an Ethernet 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 mode

#### **Command History**

Release	Modification
Release 3.7.2	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/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 3
RP/0/RSP0/CPU0:router(config-if)#

Command	Description
show bundle, on page 49	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.

#### **Usage Guidelines**

No specific guidelines impact the use of this command.

#### **Examples**

This example shows how to configure ICCP parameters:

RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)# isolation recovery-delay 35
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)#

#### Task ID

Task ID	Operations
config-services	read, write

Command	Description
redundancy iccp group, on page 47	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/RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RSP0/CPU0:router(config-if)# lacp cisco enable link-order signaled

Command	Description
interface (bundle), on page 25	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/RSP0/CPU0:router# configure terminal
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RSP0/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/RSP0/CPU0:router# configure terminal
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RSP0/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	,
	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/RSP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RSP0/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
Palanca 2 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 17 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/RSP0/CPU0:router(config)# interface Bundle-Ether 28
RP/0/RSP0/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/RSP0/CPU0:router(config)# interface Bundle-Ether 28
RP/0/RSP0/CPU0:router(config-if)# no lacp fast-switchover

#### **Related Commands**

Command	Description

bundle maximum-active links, on page 17

# 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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface bundle-ether 1
RP/0/RSP0/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 mode.

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

#### **Syntax Description**

bundle-ether	Ethernet bundle interface specified by bundle-id.	
GigabitEthernet	Gigabit Ethernet 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 <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.
	For more in help function	information about the syntax for the router, use the question mark (?) online on.
bundle-id	Number specifying the bundle interface. The range is 1 to 65535.	
number-of-packets	s 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 mode

#### **Command History**

Release	Modification
Release 3.9.0	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**

RP/0/RSP0/CPU0:router# lacp packet-capture pos 0/1/0/0 100

RP/0/RSP0/CPU0:router# lacp packet-capture pos 0/1/0/0 stop

RP/0/RSP0/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/RSP0/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/RSP0/CPU0:router# lacp packet-capture gigabitethernet 0/2/0/0 stop

Command	Description
show lacp io, on page 78	Displays the LACP transmission information that used by the transmitting device for sending packets on an interface.
show lacp packet-capture, on page 81	Displays the contents of LACP packets that are sent and received on an interface.
lacp period short, on page 35	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]

#### **Syntax Description**

receive interval	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.
transmit interval	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.

#### **Command Default**

The default is 1000.

#### **Command Modes**

Interface configuration

#### **Command History**

Release	Modification
Release 3.9.0	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

Operations
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/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# lacp period short
RP/0/RSP0/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/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# lacp period short
RP/0/RSP0/CPU0:router(config-if)# commit
```

#### **Router B**

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# lacp period short
RP/0/RSP0/CPU0:router(config-if)# commit
```

#### Router A

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# lacp period short transmit 500
RP/0/RSP0/CPU0:router(config-if)# commit
```

#### **Router B**

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# lacp period short transmit 500
RP/0/RSP0/CPU0:router(config-if)# commit
```

#### Router A

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
RP/0/RSP0/CPU0:router(config-if)# lacp period short receive 500
RP/0/RSP0/CPU0:router(config-if)# commit
```

#### Router B

```
RP/0/RSP0/CPU0:router# config
RP/0/RSP0/CPU0:router(config)# interface gigabitethernet 0/1/0/0
```

Command	Description
show lacp io, on page 78	Displays the LACP transmission information that used by the transmitting device for sending packets on an interface.
show lacp packet-capture, on page 81	Displays the contents of LACP packets that are sent and received on an interface.
lacp packet-capture, on page 33	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 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.

#### **Command Modes**

Global Configuration mode

### **Command History**

#### Release Modification

Release 3.7.2 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 Operations ID

bundle read, write

### **Examples**

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

```
RP/0/RSP0/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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 1
RP/0/RSP0/CPU0:router(config-if)# lacp system priority 10
RP/0/RSP0/CPU0:router(config-if)# lacp system mac 00c1.4c00.bd15
```

RP/0/RSP0/CPU0:router(config-if)# commit

Command	Description
show lacp system-id, on page 86	Displays the local system ID used by the LACP.
show lacp bundle, on page 74	Displays detailed information about LACP ports and their peers.
show lacp port, on page 84	

# 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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)# member neighbor 10.1.1.1
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)#
```

Command	Description
redundancy iccp group, on page 47	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.

### **Usage Guidelines**

No specific guidelines impact the use of this command.

### Task ID

# Task Operations ID bundle read, write

### **Examples**

This example shows how to specify configuration options for connecting to mLACP peers:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)# mlacp connect timeout 100
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)#
```

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.

### **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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 30
RP/0/RSP0/CPU0:router(config-if)# mlacp iccp-group 200
RP/0/RSP0/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.

### **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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)# mlacp node 3
```

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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# interface Bundle-Ether 30
RP/0/RSP0/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 i	mac	mac-id
----------------	-----	--------

•		-	-	
V-1	/ntax	Heer	rın	tınn
v	/IILUA	DUSU	, , , ,	uvii

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.

### **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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# redundancy iccp group 10
```

RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)# mlacp system mac 1.1.1

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.

### **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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RSP0/CPU0:router(config-redundancy-iccp-group)# mlacp system priority 10

$redundancy\:iccp\:group$	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-ic	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.

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

Task ID	Task ID	Operations
	config-services	read, write

## **Examples** The follow

The following example shows how to configure ICCP parameters:

```
RP/0/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# redundancy iccp group 10
RP/0/RSP0/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/RSP0/CPU0:router# configure
RP/0/RSP0/CPU0:router(config)# 12vpn
RP/0/RSP0/CPU0:router(config-12vpn)# pw-class class_mpls
RP/0/RSP0/CPU0:router(config-12vpn-pwc)# encapsulation mpls
RP/0/RSP0/CPU0:router(config-12vpn-pwc-mpls)# redundancy one-way
RP/0/RSP0/CPU0:router(config-12vpn-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-EtherBundle-POS bundle-id]

### **Syntax Description**

<b>Bundle-Ether</b>	Displays information for the specified Ethernet bundle.
<b>Bundle-POS</b>	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 mode

### **Command History**

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.8.0	The <b>reasons</b> 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 5.3.2	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 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/RSP0/CPU0:router# show bundle
Bundle-Ether 2
 Status:
 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
 TACP:
                                     Operational
   Flap suppression timer:
                                     2500 ms
   Cisco extensions:
                                     Disabled
   Non-revertive:
                                     Disabled
 mLACP:
                                     Operational
   Interchassis group:
                                     1 / 1
   Foreign links <active/configured>:
   Switchover type:
                                     Revertive
   Recovery delay:
                                     300 s
   Maximize threshold:
                                     2 links
 IPv4 BFD:
                                     Not operational
                                     Off
   State:
   Fast detect:
                                     Enabled
   Start timer:
                                     Off
                                     Off
   Neighbor-unconfigured timer:
   Preferred min interval:
                                     150 ms
   Preferred multiple:
                                     3
   Destination address:
                                     Not Configured
                                State
                                          Port ID
                                                       B/W, kbps
 Port
                   Device
 Gi0/0/0/1 Local Active 0x8000, 0x0001 100000
 MyFirstInterface
                  10.10.10.123 Negotiating 0x8000, 0x0032
                                                           100000
Bundle-Ether 3
                                     Up
 Local links <active/standby/configured>: 1 \ / \ 0 \ / \ 1
 Local bandwidth <effective/available>: 100000 / 100000 kbps
                                     1234.4321.2222 (chassis pool)
 MAC address (source):
 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
 TACP:
                                     Operational
   Flap suppression timer:
                                     120 s
  Cisco extensions:
                                     Enabled
   Non-revertive:
                                     Disabled
 mLACP:
                                     Not configured
 IPv4 BFD:
                                     Not operational
                            State Port ID
                   Device
                                                      B/W, kbps
 Gi0/0/0/2
                   Local Active 0x8000, 0x0002 100000
```

### Table 2: show bundle Field Descriptions

Field	Description
Bundle-typenumber	Full name of the bundle interface, where <i>type</i> is Ether (Ethernet), followed by the configured <i>number</i> of the bundle.
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.
	<ul> <li>Partner down—The partner system indicates that the bundle is unable to forward traffic at its end.</li> <li>PE isolated—The bundle is isolated from the core.</li> </ul>
	Up—The bundle has Active members on this device.
Local links <active configured="" standby="">:</active>	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:
	• <i>x</i> —Number of links in Active state on the bundle.
	• y—Number of links in Standby state on the bundle.
	• <i>z</i> —Total number of links configured on the bundle.

Field	Description
Local bandwidth <effective available="">:</effective>	Bandwidth characteristics on the bundle in kilobits per second (kbps) in the format $x/y$ , with the following values:
	• <i>x</i> —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:
	• <i>x</i> —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.
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".
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.
	<ul> <li>Not operational—mLACP is not working because some mandatory configuration for MC-LAG is missing on the bundle or on the active members of the bundle.</li> <li>Not configured—None of the mandatory</li> </ul>
	configuration for MC-LAG has been committed on the bundle, and the mLACP sub-fields are not displayed.

Field	Description
ICCP group:	Number of the Interchassis Communication Protocol group (if configured) in which the bundle participates. Otherwise, "Not configured" is displayed.
Role	ICCP redundancy role of the local device for this mLACP bundle, with the following possible values:
	Active—Bundle is currently active locally.
	Standby—Bundle is a backup locally.
Foreign links <active configured="">:</active>	The number of links on the remote device in the format $x/y$ , with the following values:
	• <i>x</i> —Number of links in Active state on the remote bundle.
	• y—Total number of links configured on the remote bundle.
Switchover type:	Method of performing an mLACP switchover on the bundle with the following possible values:
	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 <b>mlacp switchover type</b> command,

Field	Description
Recovery delay:	Number of seconds (s) to delay becoming the active mLACP device after recovering from a failure, using the mlacp switchover recovery delay command. "None" is displayed when the mlacp switchover recovery delay command is not configured.
Maximize threshold:	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 maximizecommand), 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 maximizecommand 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.

Field	Description
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.
Fast detect:	Displays whether or not BFD fast detection is configured on the bundle, with the following possible values:
	Enabled—The <b>bfd fast-detect</b> command is configured on the bundle.
	Disabled—The <b>bfd fast-detect</b> command is not configured on the bundle.
Start timer:	Displays status of the BFD start timer that is configured using the <b>bfd address-family ipv4 timers start</b> command, with the following possible values:
	• 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.

Field	Description
Neighbor-unconfigured timer:	Displays status of the BFD start timer that is configured using the <b>bfd address-family ipv4 timers nbr-unconfig</b> command, with the following possible values:
	• 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 <i>x</i> 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.
Destination address:	Destination IP address for BFD sessions on bundle member links that is configured using the <b>bfd address-family ipv4 destination</b> command. "Not configured" is displayed when no destination IP address is configured.
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.

Field	Description
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.
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.

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

Reason	Description
Link is Collecting and has not gone Distributing (reason unknown)	The link is in Negotiating state because the mLACP peer PoA has not indicated that the link has gone Distributing in the Mux machine. This could be because of an issue between the mLACP peer and its LACP partner or because this state has not been communicated to the local system.
Link is being removed from the bundle	The link is being removed from the bundle and remains in Configured state while this happens.
Link is Defaulted; 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.
Link is Standby; bundle has more links than are supported	The link is in Standby state because the number of links in Selected state has already reached the hard platform limit on the number of active links.
Link is Standby due to maximum-active links configuration	The link is in Standby state because the number of links in Selected state has already reached the configured maximum active links threshold.
Link is waiting for BFD session to start	The link is in BFD Running state because LACP is negotiated but the BFD session has not started from the remote device.

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

Reason	Description
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.

Command	Description
interface (bundle), on page 25	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 mode

### **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	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/RSP0/CPU0:router# show bundle brief Thu Mar 3 14:40:35.167 PST
```

Name	IG 	State 		BFD	Links act/stby/cfgd	
			- i	ii		
BE16		- Up	On	Off	1 / 1 / 2	1000000
BE100		- Down	Off	Off	0 / 0 / 0	0

Table 4: show bundle brief Field Descriptions, on page 64 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:  • BE <i>x</i> —Ethernet bundle with ID number <i>x</i> .
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.
	<ul> <li>Partner down—The partner system indicates that the bundle is unable to forward traffic at its end.</li> <li>PE isolated—The bundle is isolated from the core.</li> </ul>
	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:				
	• <i>x</i> —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).				

Command	Description
show bundle, on page 49	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**

<b>Bundle-Ether</b> 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 <b>Bundle-POS</b> 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/RSP0/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/RSP0/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

6 7 8	1 1 1 0	3 0 1 2	18 16 17 17	10 17 4 3 10 17 4		2 3 4 5 6 7 8	1 1 1	1 2 3 0 1 2 3	16 17 17		
[NP 1											
	ast (Glob									le	
	local		SFP		1	idx	local			port	
1	0	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-PC	DS3										
Type:		POS	(L3)								
	3:										
	Veighting										
Sub-int	erfaces:	0									
Member Information:											

\_\_\_\_\_\_

### RP/0/RSP0/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

[...]
```

Port: ID BW

POS0/2/0/1 3 1 POS0/4/0/0 4 1

#### RP/0/RSP0/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 Sub-interface Bundle-Ether12345.2 L2 Hash: XID

### Platform Information:

Bundle Summary Information:

Local to LC : 1

Number of Members : 4 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						Mult:	icast (Lo	ocal) LA	G tab	le
idx	local	ul_id	SFP	port	ı	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

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 15	Configures all egress traffic on a particular subinterface of a bundle to flow through the same physical member link.
show bundle, on page 49	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 mode.

chow	hundla	raplication	hundle_other	hundla	id [all]	[in-progress]	[nanding]	
Snow	bunaie	replication	bunaie-einer	bunate	<i>ia</i>   <b>an</b>	in-progress	penaing	

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 b	ehavior or values
Command Modes	EXEC mode	
Command History	Release	Modification
	Release 3.9	0 This command was introduced.
Usage Guidelines	No specific	guidelines impact the use of this command.
Task ID	Task Ope	erations
	bundle read	<u></u> d

**Examples** 

 $\label{eq:replication} \mbox{RP/O/RSPO/CPUO:} \mbox{router\# show bundle replication bundle-ether 1 all}$ 

# 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.		

### **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/RSP0/CPU0:router#show iccp group

backbone interface Gi0/2/0/3: up

```
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/RSP0/CPU0:router#show iccp group 1
Redundancy Group 1
  member ip:2.2.2.2 (router2), up (connected)
   monitor: route-watch (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 mode.

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

# **Command Default**

No default behavior or values

#### **Command Modes**

EXEC mode

#### **Command History**

Release	Modification
Release 3.7.2	This command was introduced.

## **Usage Guidelines**

No specific guidelines impact the use of this command.

## Task ID

Task ID	Operations
bundle	read

## **Examples**

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

 $\label{eq:rp_operator} \mbox{RP/O/RSPO/CPU0:} \mbox{router\# show lacp bundle Bundle-Ether 1}$ 

```
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

B/W (Kbps)	MAC address	Minimum active Links B/W (Kbps)	Maximum active Links
0	0800.453a.651d	1 620000	32
Port	State Flags	Port ID Key	y System-ID
Gi0/0/2/0 PEER	1 ASDE 0 PSD	•	0001 0x8000, 08-00-45-3a-65-01 0000 0xffff, 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.

Field	Description
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 <i>N</i> x <i>nnnn</i> . <i>N</i> is the port priority, and <i>nnnn</i> is the port number assigned by the sending router.
Key	Two-byte number associated with the specified link and aggregator. Each port is assigned an operational key. The ability of one port to aggregate with another is summarized by this key. Ports which have the same key select the same bundled interface. The system ID, port ID and key combine to uniquely define a port within a LACP system.
System-ID	System identifier. The system ID is a LACP property of the system which is transmitted within each LACP packet together with the details of the link.

Command	Description
bundle id, on page 11	Adds a port to an aggregated interface or bundle.
show bundle, on page 49	Displays information about configured bundles.

# show lacp counters

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

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

**Command Default** 

No default behavior or values

**Command Modes** 

EXEC mode

**Command History** 

Release	Modification
Release 3.7.2	This command was introduced.

**Usage Guidelines** 

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
bundle	read

## **Examples**

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

RP/0/RSP0/CPU0:router# show lacp counters bundle-ether 1

Bundle-Ether1

	LACPDU	S	Marke	r		
Port	Sent	Received	Received	Resp. Se	ent	Last Cleared
Gi0/0/2/0	12	0	0		0	never
Port	Excess		Excess			Pkt Errors
Gi0/0/2/0 Port	0 Last L	ACP Timeout	0		? Tir	0 neout Transition
Gi0/0/2/0	1644	 3313097636990	 015			4

## Table 6: show lacp counters Field Descriptions

Field	Descriptio	n				
LACPDUs	Provides the following statistics for Link Aggregation Control Protocol data units (LACPDUs)					
	• Port					
	• Sent					
	• Received					
	• Last (	Cleared				
	• Exces	SS				
	• Pkt E	rrors				
Marker	Provides the following statistics for marker packets:					
	• Recei	ved				
	• 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 at LACP timeout. The value is the timestamp in nanoseconds relative to the Unix Epoch (Ja 1, 1970 00:00:00 UTC).					
	timeo	P Timeout Transition—The number of times the LACP state has transitioned with a ut since the time the device restarted or the interface was brought up, whichever is recent.				

Command	Description
clear lacp counters, on page 24	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 mode.

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

## **Syntax Description**

Bundle-Ether bundle-id	(Optional) Displays information for the Ethernet bundle interface with the specified <i>bundle-id</i> . 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 <i>interface-path-id</i> .	
interface-path-id Physical interface or virtual interface.		terface or virtual interface.
	Note	Use the <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.
	For more in online help	information about the syntax for the router, use the question mark (?) of function.

# **Command Default**

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

## **Command Modes**

EXEC mode

# **Command History**

Release	Modification
Release 3.9.0	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/RSP0/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 key: UXUUIC
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/RSP0/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)

Command	Description
show lacp packet-capture, on page 81	Displays the contents of LACP packets that are sent and received on an interface.
lacp period short, on page 35	Enables a short period time interval for the transmission and reception of LACP packets.
lacp packet-capture, on page 33	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 mode.

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

## **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.	
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 <b>show interfaces</b> command to see a list of all interfaces currently configured on the router.
For more information about the syntax for the router, use the questi- help function.		iformation about the syntax for the router, use the question mark (?) online on.

#### **Command Default**

The default displays both in and out information.

#### **Command Modes**

EXEC mode

#### **Command History**

Release	Modification
Release 3.9.0	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.

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/RSP0/CPU0:router# lacp packet-capture gigabitethernet 0/1/0/0 100
RP/0/RSP0/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:
State: Act (T/o) Agg (Sync) (Coll) (Dist) Def
                                  Length: 20
TLV: 0x02 - Partner Information
System: Priority: 65535, ID: 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

Command	Description
show lacp io, on page 78	Displays the LACP transmission information that used by the transmitting device for sending packets on an interface.
lacp period short, on page 35	Enables a short period time interval for the transmission and reception of LACP packets.
lacp packet-capture, on page 33	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 mode.

show lacp port [[{GigabitEthernet | TenGigE}] interface\_instance]

# **Command Default**

No default behavior or values.

#### **Command Modes**

EXEC mode

#### **Command History**

Release	Modification
Release 3.7.2	This command was introduced.

## **Usage Guidelines**

No specific guidelines impact the use of this command.

#### Task ID

Task ID	Operations
bundle	read

## **Examples**

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

RP/0/RSP0/CPU0:router# show lacp port

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

#### Bundle-Ether1

B/W (Kbps)	MAC address	Minimum active Links B/W (Kbps)	Maximum active Links
0	0800.453a.651d	1 620000	32
Port	State Flags	Port ID Key	y System-ID
Gi0/0/2/0 PEER	1 ASDE 0 PSD	•	0001 0x8000, 08-00-45-3a-65-01 0000 0xffff, 00-00-00-00-00

#### Table 7: show lacp port Field Descriptions

Field	Description
Port	Identifies the LACP port whose information is displayed. The port number is expressed in the <i>rack/slot/module/port</i> notation.

Field	Description
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: <i>Nxnnnn</i> . <i>N</i> is the port priority, and <i>nnnn</i> is the port number assigned by the sending router.
Key	Two-byte number associated with the specified link and aggregator. Each port is assigned an operational key. The ability of one port to aggregate with another is summarized by this key. Ports which have the same key select the same bundled interface. The system ID, port ID and key combine to uniquely define a port within a LACP system.
System-ID	System identifier. The System ID is an LACP property of the system which is transmitted within each LACP packet together with the details of the link.

Command	Description
bundle id, on page 11	Adds a port to an aggregated interface or bundle.
show bundle, on page 49	Displays information about configured bundles.
show lacp bundle, on page 74	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 mode.

## show lacp system-id

## **Syntax Description**

This command has no keywords or arguments.

# **Command Default**

No default behavior or values

#### **Command Modes**

EXEC mode

## **Command History**

Release	Modification
Release 3.7.2	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/RSP0/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.

Command	Description	
bundle id, on page 11	Adds a port to an aggregated interface or bundle.	
show bundle, on page 49	Displays information about configured bundles.	

Command	Description
show lacp bundle, on page 74	Displays detailed information about LACP ports and their peers.
show lacp port, on page 84	

# 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.

# **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/RSP0/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

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

 ${\tt RP/0/RP0/CPU0:}$ 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	ďυ	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
				Dad and ba

				Prio	Priority	
Node	Port Name	State	Port	Oper	(Cfgd)	
1	Gi0/1/0/3	Up	0x9001	0x03e8	(0x03e8)	
2	Gi0/0/0/1	qU	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**

<b>Bundle-Ether</b>	Displays the requested information associated with the bundle interface.					
member interface	ace Displays the requested information associated with the member interface.					
counters	Displays in	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 with 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.

# **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/RSP0/CPU0:router# show mlacp counters bdl-info GigabitEthernet 0/0/0/1

TCCP	Croun	- 1
	Group	

1001 0100p 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	· -	4	0	0	0
Bundle-Ether1 ??	11111111111	4	0	0	0
		Sync Req	uests		
Bundle	TLVs	(config)	(state)	Last Clear	red
Local Device					· <b></b>
Bundle-Ether1 ??	????????0	0	0	18m12s	
mLACP Peer 5.4.3		0	0	19	
Bundle-Ether1 ??	.3333333330	0	0	17m57s	

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

#### Bundle-Ether1 (ICCP Group 1)

		TLVs S	Sent	TLVs	Received	
Port	Config	State	Priority	NAKs	Priority	
Local Device	000007	0	0	0	0	
Gi0/0/0/1 ?????????? mLACP Peer 5.4.3.1	222221	0	0	0	0	
Gi0/1/0/3 ??????????	?????7	5	3	0	0	
		Sync Requ	ıests			
Port	TLVs	(config)	(state)	Last Clear	ed 	
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		

show mlacp counters