

Link Bundling Commands

This module provides command line interface (CLI) commands for configuring Link Bundle interfaces on the Cisco 8000 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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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 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
bundle	read, write

Examples

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

```
RP/0/RP0/CPU0:router(config)# int bundle-ether 1
RP/0/RP0/CPU0:router(config-if)#bundle lacp-delay ?
<1000-15000>  Lacp-delay timeout in milliseconds
RP/0/RP0/CPU0:router(config-if)#bundle lacp-delay 6000
RP/0/RP0/CPU0:router(config-if)#commit
```

Related Commands

Command	Description
bundle maximum-active links, on page 11	
show bundle, on page 36	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 XR EXEC mode.

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

Syntax Description

Bundle-Ether *bundle-id*	Specifies an Ethernet bundle for which you want to calculate load balancing. Range is 1- 65535.
HundredGigabitEthernet	Specifies the Hundred 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. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
location	Location of source interface.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	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.

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

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

Task ID

Task ID	Operations
bundle	read

Examples

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

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

Specify load-balance configuration (L3/3-tuple or L4/7-tuple) (L3,L4): l3
Single SA/DA pair (IPv4,IPv6) or range (IPv4 only): S/R [S]: s

Enter bundle type IP V4 (1) or IP V6 (2): 1
Enter source IP V4 address: 10.12.28.2
Enter destination IP V4 address: 10.12.28.1
```

```
Compute destination address set for all members? [y/n]: y
Enter subnet prefix for destination address set: 8
Enter bundle IP V4 address [10.12.28.2]: 10.12.28.2

Link hashed to is HundredGigabitEthernet0/6/5/7

Destination address set for subnet 10.0.0.0:
  10.0.0.6 hashes to link HundredGigabitEthernet0/1/5/6
  10.0.0.8 hashes to link HundredGigabitEthernet0/6/5/5
  10.0.0.12 hashes to link HundredGigabitEthernet0/6/5/6
  10.0.0.2 hashes to link HundredGigabitEthernet0/6/5/7
  10.0.0.1 hashes to link HundredGigabitEthernet0/1/5/7
```

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/RP0/CPU0:router# bundle-hash bundle-ether 28

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


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

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

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

Calculating simple pairs...

Total number of hits 20
Member HundredGigabitEthernet0/1/5/6 has 6 hits
Member HundredGigabitEthernet0/6/5/5 has 2 hits
Member HundredGigabitEthernet0/6/5/6 has 2 hits
Member HundredGigabitEthernet0/6/5/7 has 9 hits
Member HundredGigabitEthernet0/1/5/7 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/RP0/CPU0:router# bundle-hash bundle-ether 202

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

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

  Ingress interface --
```

```
  - physical interface format: [ HundredGigabitEthernet | TenGigE ]R/S/I/P
  - bundle interface format:   [ Bundle-Ether]bundle-id
  Enter ingress interface: HundredGigabitEthernet0/2/0/3

  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
HundredGigabitEthernet0/3/3/6

Another? [y]: y

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

  Ingress interface --
  - physical interface format: [HundredGigabitEthernet | TenGigE ]R/S/I/P
  - bundle interface format:   [ Bundle-Ether ]bundle-id
  Enter ingress interface [HundredGigabitEthernet0/2/0/3]: HundredGigabitEthernet0/2/0/3

  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
HundredGigabitEthernet0/3/3/6

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 HundredGigabitEthernet0/3/3/6

  S/D pair 172.20.180.167:1000/172.30.15.6:2000 hashes to link HundredGigabitEthernet0/2/0/1

  S/D pair 172.20.180.167:1000/172.30.15.3:2000 hashes to link HundredGigabitEthernet0/2/0/2

  S/D pair 172.20.180.167:1000/172.30.15.5:2000 hashes to link HundredGigabitEthernet0/0/3/0


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/RP0/CPU0:router# bundle-hash bundle-ether 5001 location 0/0/CPU0
Calculate Bundle-Hash for L2 or L3 or sub-int based: 2/3/4 [3]: 3
Enter traffic type (1:IPv4-inbound, 2:MPLS-inbound, 3:IPv6-inbound, 4:IPv4-MGSCP,
5:IPv6-MGSCP): [1]: 2
Entropy label: y/n [n]: y
Enter Entropy Label (in decimal): 1997
Enter the source interface name (Enter to skip interface details): TenGigE0/0/0/1/0

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

Related Commands

Command	Description
show bundle, on page 36	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 7.0.12	This command was introduced.

Usage Guidelines

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

Task ID

Task ID	Operations
bundle	read, write

Examples

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

```
RP/0/RP0/CPU0:router(config)# interface HundredGigabitEthernet 0/1/5/0
RP/0/RP0/CPU0:router(config-if)# bundle id 1
```

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

```
RP/0/RP0/CPU0:router(config)# interface HundredGigabitEthernet 0/6/5/7
RP/0/RP0/CPU0:router(config-if)# bundle id 5 mode active
```

Related Commands

Command	Description
show bundle, on page 36	Displays information about configured bundles.
show lacp bundle, on page 57	Displays detailed information about LACP ports and their peers.

bundle maximum-active links

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

bundle maximum-active links *links* [**hot-standby**]

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 7.0.12	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/RP0/CPU0:router(config)# interface bundle-ether 5
RP/0/RP0/CPU0:router(config-if)# bundle maximum-active links 1 hot-standby
```

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

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/RP0/CPU0:router(config)# interface Bundle-Ether 5
RP/0/RP0/CPU0:router(config-if)# bundle maximum-active links 1
```

Related Commands

Command	Description
bundle minimum-active links, on page 14	Sets the number of active links required to bring up a specific bundle.
show bundle, on page 36	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 7.0.12	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/RP0/CPU0:router(config)# interface Bundle-Ether 1
RP/0/RP0/CPU0:router(config-if)# bundle minimum-active bandwidth 620000
```

Related Commands

Command	Description
show bundle, on page 36	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 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
bundle	read, write

Examples

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

```
RP/0/RP0/CPU0:router(config)# interface Bundle-Ether 5
RP/0/RP0/CPU0:router(config-if)# bundle minimum-active links 2
```

Related Commands

Command	Description
bundle maximum-active links, on page 11	
show bundle, on page 36	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
Release 7.0.12	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 ID	Operations
bundle	read, write

Examples

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

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

Related Commands

Command	Description
bundle id, on page 9	Adds a port to an aggregated interface or bundle.

Command	Description
show lacp bundle, on page 57	Displays detailed information about LACP ports and their peers.
show lacp system-id, on page 64	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 7.0.12	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/(config)# interface Bundle-Ether 100
RP/0/(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 XR EXEC mode.

clear lacp counters [**bundle Bundle-Ether** *bundle-id* | **port** {**HundredGigabitEthernet** *interface-path-id* | **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 *node-id* 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.
HundredGigabitEthernet	(Optional) Hundred Gigabit Ethernet interface. Use the *interface-path-id* argument to specify the Hundred Gigabit Ethernet interface whose LACP counters you want to clear.
TenGigE	(Optional) Ten Gigabit Ethernet interface. Use the *interface-path-id* argument to specify the Ten Gigabit Ethernet interface whose LACP counters you want to clear.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	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/RP0/CPU0:router# clear lacp counters
```

Related Commands

Command	Description
show lacp counters, on page 59	Displays LACP statistics.

forwarding-unviable

To set a physical interface unviable for data transmission, use the **forwarding-unviable** command in the interface configuration mode. To disable forwarding-unviability of an interface, use the **no** form of the command.

forwarding-unviable

This command has no keywords or arguments.

Command Default

Forwarding-unviable configuration is disabled.

Command Modes

Interface configuration mode (config-if)

Command History

Release	Modification
Release 7.10.1	This command was introduced.

Usage Guidelines

There is no effect of forwarding-unviable configuration on individual Ethernet interfaces that are not part of a link bundle. That is, irrespective of the configuration, such non-member interfaces continue to attempt data transmission and reception.

Task ID

Task ID	Operation
interface	read, write

The following example shows how to disable traffic forwarding on an interface.

```
RP/0/(config)# interface HundredGigE 0/0/0/34
RP/0/(config-if)# forwarding-unviable
```

interface (bundle)

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

interface Bundle-Ether *bundle-id*

Syntax Description

Bundle-Ether	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 History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
bundle	read, write

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

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

Related Commands

Command	Description
show bundle, on page 36	Displays information about configured bundles.

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 7.0.12	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/RP0/CPU0:router(config)# interface Bundle-Ether 100
RP/0/RP0/CPU0:router(config-if)# lacp cisco enable link-order signaled
```

Related Commands

Command	Description
interface (bundle), on page 21	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 7.0.12	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/# configure terminal
RP/0/(config)# interface Bundle-Ether 100
RP/0/(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/# configure terminal
RP/0/(config)# interface Bundle-Ether 100
RP/0/(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 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operation
bundle	read, write

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

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

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 XR EXEC mode.

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

Syntax Description

bundle-ether	Ethernet bundle interface specified by *bundle-id*.
TenGigE	Ten Gigabit Ethernet interface specified by *interface-path-id*.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.
bundle-id	Number specifying the bundle interface. The range is 1 to 65535.
number-of-packets	Number of packets to capture.
clear	Clears all currently captured packets.
stop	Stops capturing packets.

Command Default

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

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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

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

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

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

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

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

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

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

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

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

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

Task ID

Task ID	Operations
bundle	read

Examples

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

```
RP/0/RP0/CPU0:router# lacp packet-capture hundredgigabitethernet 0/2/0/0 100
```

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

```
RP/0/RP0/CPU0:router# lacp packet-capture hundredgigabitethernet 0/2/0/0 stop
```

Related Commands

Command	Description
show lacp packet-capture, on page 61	Displays the contents of LACP packets that are sent and received on an interface.
lacp period short, on page 28	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 7.0.12	This command was introduced.

Usage Guidelines

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



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



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

Task ID

Task ID	Operations
bundle	read, write

Examples

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

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface hundredgigabitethernet 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# lacp period short
RP/0/RP0/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/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface hundredgigabitethernet 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# lacp period short
RP/0/RP0/CPU0:router(config-if)# commit
```

Router B

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface hundredgigabitethernet 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# lacp period short
RP/0/RP0/CPU0:router(config-if)# commit
```

Router A

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface hundredgigabitethernet 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# lacp period short transmit 500
RP/0/RP0/CPU0:router(config-if)# commit
```

Router B

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface hundredgigabitethernet 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# lacp period short transmit 500
RP/0/RP0/CPU0:router(config-if)# commit
```

Router A

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface hundredgigabitethernet 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# lacp period short receive 500
RP/0/RP0/CPU0:router(config-if)# commit
```

Router B

```
RP/0/RP0/CPU0:router# config
RP/0/RP0/CPU0:router(config)# interface hundredgigabitethernet 0/1/0/0
RP/0/RP0/CPU0:router(config-if)# lacp period short receive 500
RP/0/RP0/CPU0:router(config-if)# commit
```

Related Commands

Command	Description
show lacp packet-capture, on page 61	Displays the contents of LACP packets that are sent and received on an interface.
lacp packet-capture, on page 26	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 XR Config mode mode. To return to the default LACP system priority value, use the **no** form of this command.

lacp system priority *priority*

Syntax Description

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

Command Default

The default setting is *priority* = 32768.

Command History

Release	Modification
Release 7.0.12	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.

Task ID

Task ID	Operations
bundle	read, write

Examples

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

```
RP/0/RP0/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/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface Bundle-Ether 1
RP/0/RP0/CPU0:router(config-if)# lacp system priority 10
RP/0/RP0/CPU0:router(config-if)# lacp system mac 00c1.4c00.bd15
RP/0/RP0/CPU0:router(config-if)# commit
```

Related Commands

Command	Description
show lacp system-id, on page 64	Displays the local system ID used by the LACP.
show lacp bundle, on page 57	Displays detailed information about LACP ports and their peers.

mlacp switchback

To force a switchback to the local mlacp device for a specified bundle, use the **mlacp switchback** command in the XR EXEC mode .

mlacp switchback interface *interface-path-id* [**at** | **in** | **no prompt**]

Syntax Description

interface *interface-path-id*	Specifies a physical interface instance or a virtual interface instance.
at	Schedules the operation for a future time and date.
in	Schedules the operation for a specified delay.
no prompt	Attempts to carry out the command without prompting.

Command Default

No default behavior or values.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.12	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

Example

The following example shows how to schedule the operation at a specified time and date on a bundle-ether interface:

```
RP/0/RP0/CPU0:router#mlacp switchback bundle-ether 20 at march 21 08:30:10
```

mlacp reset priority

To reset operational priorities of mlacp members to their configured mLACP prorities, use the **mlacp reset priority** command in XR EXEC mode .

mlacp reset priority bundle-ether *interface-path-id*

Syntax Description

bundle-ether *interface-path-id*	Specifies a physical interface instance or a virtual interface instance.

Command Default

No default behavior or values.

Command Modes

XR EXEC

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

This command is for aggregated ethernet interfaces only. The command cannot be used if brute-force switchover is employed.

Task ID

Task ID	Operation
bundle	execute

Example

The following example shows how to use the **mlacp reset priority** command:

```
RP/0/RP0/CPU0:router #mlacp reset priority bundle-ether 10
```

mlacp switchover maximize

To set the maximum number of links or bandwidth in the bundle, use the **mlacp switchover maximize** command in the bundle interface configuration mode.

mlacp switchover maximize { **links** | **bandwidth** } [**threshold** *value*]

Syntax Description

links	Compares the operational links, with respect to the total number of links.
bandwidth	Compares the available bandwidth, with respect to the total bandwidth.
threshold	Sets the threshold value to switch to the peer, if its has more links/ bandwidth available.
value	• When used with the links keyword, sets the minimum number of links, below which the device switches to the peer if more links are available. Range is 1-64. • When used with the bandwidth keyword, sets the minimum bandwidth (in kbps), below which the device switches to the peer if more bandwidth is available. Range is 1-4294967295.

Command Default

No default behavior or value.

Command Modes

Bundle interface configuration.

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

This command allows switchovers to take place such that the active device is the one with most bandwidth or maximum links in the bundle.

Task ID

Task ID	Operation
bundle	read,write
interface	read,write

Example

The following example shows how to maximize the links:

```
RP/0/RP0/CPU0:router(config-if)#interface bundle-ether 10 mlacp switchover maximize links
threshold 20
```

mlacp switchover type

To specify a non-default switchover method , use the **mlacp switchover type**command in the bundle interface configuration mode.

mlacp switchover type [**brute-force** | **revertive**]

Syntax Description

brute-force	Force switchover by disabling all local member links.
revertive	Revert based on configured priority values.

Command Default

The default switchover type is non-revertive.

Command Modes

Bundle interface configuration.

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

The **brute-force** and **revertive** options are mutually exclusive, and the value must match on the bundle on both POAs. They determine whether the dynamic priority management or brute force mechanism is used, and whether the behavior is revertive or non-revertive.

Task ID

Task ID	Operation
interface	read, write

Example

The following example shows how to force a switchover by disabling all local member links on an bundle-ether interface:

```
RP/0/RP0/CPU0:router(config-if)#mlacp switchover type brute-force
```

show bundle

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

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

Syntax Description

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

Command Default

Information is displayed for all configured bundles.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

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

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

Task ID

Task ID	Operation
bundle	read

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

```
RP/0/RP0/CPU0:router# show bundle
Bundle-Ether 2
  Status:                                  Up
  Local links <active/standby/configured>:   1 / 0 / 1
  Local bandwidth <effective/available>:     100000 (100000) kbps
  MAC address (source):                      1234.4321.1111 (Gi0/0/0/1)
  Minimum active links / bandwidth:          1 / 500 kbps
  Maximum active links:                      32
  Wait-while timer:                          2000 ms
  Load-balancing:                            Default
  LACP:                                      Operational
    Flap suppression timer:                  2500 ms
    Cisco extensions:                        Disabled
    Non-revertive:                           Disabled
  mLACP:                                     Operational
    Interchassis group:                      3
    Foreign links <active/configured>:       1 / 1
    Switchover type:                         Revertive
    Recovery delay:                          300 s
    Maximize threshold:                      2 links
  IPv4 BFD:                                  Not operational
```

```
    State:                                Off
    Fast detect:                          Enabled
    Start timer:                          Off
    Neighbor-unconfigured timer:          Off
    Preferred min interval:               150 ms
    Preferred multiple:                   3
    Destination address:                  Not Configured

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


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

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


Bundle-Ether 4
  Status:                               Down
  Local links <active/standby/configured>:   0 / 0 / 1
  Local bandwidth <effective/available>:     0 (0) kbps
  MAC address (source):                 78c6.9991.3504 (Chassis pool)
  Inter-chassis link:                   No
  Minimum active links / bandwidth:     1 / 1 kbps
  Maximum active links:                 64
  Wait while timer:                     2000 ms
  Load balancing:
    Link order signaling:               Not configured
    Hash type:                          Default
    Locality threshold:                 None
  LACP:                                 Operational
    Flap suppression timer:             Off
    Cisco extensions:                   Disabled
    Non-revertive:                      Disabled
  mLACP:                                Not configured
  IPv4 BFD:                             Not configured
  IPv6 BFD:                             Not configured

  Port                  Device           State        Port ID         B/W, kbps
  --------------------  ---------------  -----------  --------------  ----------
  Hu0/0/0/34            Local            Standby      0x8000, 0x0001   100000000
      Link is not forwarding viable and in standby state
```

Table 2: show bundle Field Descriptions

Field	Description
Bundle-*typenumber*	Full name of the bundle interface, where *type* is Ether (Ethernet) , followed by the configured *number* 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. • Partner down—The partner system indicates that the bundle is unable to forward traffic at its end. • PE isolated—The bundle is isolated from the core. • Up—The bundle has Active members on this device.
Local links <active/standby/configured>:	The number of links on the device (from 0 to the maximum number of supported links for the bundle) in the format *x* / *y* / *z*, with the following values: • *x*—Number of links in Active state on the bundle. • *y*—Number of links in Standby state on the bundle. • *z*—Total number of links configured on the bundle.

Field	Description
Local bandwidth <effective/available>:	Bandwidth characteristics on the bundle in kilobits per second (kbps) in the format *x / y*, with the following values: • *x*—Current bandwidth of the bundle (this effective bandwidth might be limited by configuration). • *y*—Available bandwidth of the bundle that is the sum of the bandwidths of all of the locally active links.
MAC address (source):	Layer 2 MAC address on the bundle interface in the format xxxx.xxxx.xxxx. The (*source*) of the address is shown in parentheses with the following possible values: • Interface name—The MAC address is from the displayed member interface type and path. • Configured—The MAC address is explicity configured. • Chassis pool—The MAC address is from the available pool of addresses for the chassis. • [unknown MAC source 0]—No MAC address could be assigned to the bundle. (You might see this display if you have not completed your bundle configuration.)
Minimum active links / bandwidth:	Displays the following information in the format *x / y* kbps, with the following values: • *x*—Minimum number of active links (from 1 to the maximum number of links supported on the bundle) that are required for the bundle to be operative. • *y*—Minimum total bandwidth on active links (in kbps) that is required for the bundle to be operative. • (partner)—Shows that the peer system's value is in use.
Maximum active links:	Maximum number of links (from 1 to the maximum supported on a bundle) that can be active on the bundle.

Field	Description
Wait-while timer:	Amount of time (in milliseconds) that the system allows for the Link Aggregation Control Protocol (LACP) to negotiate on a “working”link, before moving a “protect”or backup link to Standby state.
Load balancing:	Type of load balancing in use on the bundle, with the following possible values: • Default—The default load balancing method for the system is used on the bundle, and the load balancing sub-fields are not displayed. • No value—Another load balancing method is in use on the bundle, with information shown in the related sub-fields of the display.
LACP:	Displays whether or not Link Aggregation Control Protocol (LACP) is active on the bundle, with the following possible values: • Operational—All required configuration has been committed and LACP is in use on active members. • Not operational—LACP is not working because some mandatory configuration is missing on the bundle or on the active members of the bundle. • Not configured—None of the mandatory configuration for LACP has been committed on the bundle, and the LACP sub-fields are not displayed.
Flap suppression timer:	Displays the status of the flap suppression timer, with the following possible values: • Off—The flap suppression timer is not configured using the **lacp switchover suppress-flaps** command. • *x* ms—Amount of time allowed (in milliseconds) for standby links to activate after a working link fails, before putting the link in Down state.
Cisco extensions:	Displays whether or not the Cisco-specific TLVs for LACP are enabled. The possible values are "Enabled" and "Disabled".
Non-revertive:	Displays whether non-revertive behavior for the bundle interface is enabled or not. The possible values are "Enabled" and "Disabled".

Field	Description
mLACP:	Displays whether or not the bundle is operating using Multichassis Link Aggregation (MC-LAG), with the following possible values: • Operational—All required configuration has been committed for MC-LAG and mLACP is in use on the bundle. • Not operational—mLACP is not working because some mandatory configuration for MC-LAG is missing on the bundle or on the active members of the bundle. • Not configured—None of the mandatory configuration for MC-LAG has been committed on the bundle, and the mLACP sub-fields are not displayed.
ICCP group:	Number of the Interchassis Communication Protocol group (if configured) in which the bundle participates. Otherwise, “Not configured” is displayed.
Role	ICCP redundancy role of the local device for this mLACP bundle, with the following possible values: • Active—Bundle is currently active locally. • Standby—Bundle is a backup locally.
Foreign links <active/configured>:	The number of links on the remote device in the format *x / y* , with the following values: • *x*—Number of links in Active state on the remote bundle. • *y*—Total number of links configured on the remote bundle.

Field	Description
Switchover type:	Method of performing an mLACP switchover on the bundle with the following possible values: • Brute force— Trigger the failover by marking member(s) as Not Aggregatable instead of using dynamic priority management. This is the only possible method of control when the dual-homed device (DHD) is the higher-priority system. Only applies to mLACP bundles. • Non-revertive—This is the default. Dynamic priority management is used, where the bundle does not fail back to the originally active point of attachment (PoA) except when a subsequent failure occurs. • Revertive—Dynamic priority management is used, but the higher-priority device (based on the configured port priorities for the bundle) is always Active unless it has encountered a failure. This means that if a failure is encountered triggering a switchover, once the failure condition is cleared the initially-active links become active again. • The switchover type can be changed from the default behavior using the **mlacp switchover type** command,
Recovery delay:	Number of seconds (s) to delay becoming the active mLACP device after recovering from a failure, using the **mlacp switchover recovery delay** command. “None” is displayed when the **mlacp switchover recovery delay** command is not configured.

Field	Description
Maximize threshold:	Threshold value below which mLACP switchovers are triggered to allow the bundle to reach the configured maximum number of active links or bandwidth (using the **mlacp switchover maximize**command), with the following possible values: • *x* links—Number of active links used as the maximum threshold target to be maintained as a trigger for an mLACP switchover on a bundle. • *y* kbps—Bandwidth in kilobits per second used as the target threshold to be maintained as a trigger for an mLACP switchover on a bundle. • Not configured—The **mlacp switchover maximize**command is not configured. mLACP switchovers are based on the minimum active links or bandwidth for the bundle.
IPv4 BFD:	Displays whether or not IPv4-based bidirectional forwarding (BFD) is operating on the bundle interface, with the following possible values: • Operational—All required configuration has been committed for IPv4 BFD, and it is in use on the bundle. • Not operational—IPv4 BFD is not working because some mandatory configuration is missing on the bundle or on the active members of the bundle. • Not configured—None of the mandatory configuration for IPv4 BFD has been committed on the bundle, and the BFD sub-fields are not displayed.
State:	When BFD is enabled, displays the state of BFD sessions on the bundle from the sessions running on bundle members that is communicated to interested protocols, with the following possible values: • Down—The configured minimim threshold for active links or bandwidth for BFD bundle members is not available so BFD sessions are down. • Off—BFD is not configured on bundle members. • Up—BFD sessions on bundle members are up because the minimum threshold for the number of active links or bandwidth is met.

Field	Description
Fast detect:	Displays whether or not BFD fast detection is configured on the bundle, with the following possible values: • Enabled—The**bfd fast-detect** command is configured on the bundle. • Disabled—The **bfd fast-detect** command is not configured on the bundle.
Start timer:	Displays status of the BFD start timer that is configured using the **bfd address-family ipv4 timers start** command, with the following possible values: • *x* s—Number of seconds (from 60 to 3600) after startup of a BFD member link session to wait for the expected notification from the BFD peer to be received, so that the session can be declared up. If the SCN is not received after that period of time, the BFD session is declared down. • Off—The start timer is not configured, and a BFD session is only declared Down upon notification from the BFD server.
Neighbor-unconfigured timer:	Displays status of the BFD start timer that is configured using the **bfd address-family ipv4 timers nbr-unconfig** command, with the following possible values: • *x* s—Number of seconds (from 60 to 3600) to wait after receipt of notification that the BFD configuration has been removed by a BFD neighbor, so that any configuration inconsistency between the BFD peers can be fixed. If the BFD configuration issue is not resolved before the specified timer is reached, the BFD session is declared down. • Off—The neighbor-unconfigured timer is not configured, and a BFD session is only declared Down upon notification from the BFD server.
Preferred min interval:	Number of milliseconds (in the format *x* ms) as the minimum control packet interval for BFD sessions. The range is 15 to 30000.
Preferred multiple:	Value of the multiplier (from 2 to 50) that is used for echo failure detection, which specifies the maximum number of echo packets that can be missed before a BFD session is declared Down.

Field	Description
Destination address:	Destination IP address for BFD sessions on bundle member links that is configured using the **bfd address-family ipv4 destination** command. "Not configured" is displayed when no destination IP address is configured.
Port	Name of the local interface port that is configured to be a bundle member, or a foreign interface received by an mLACP peer device. The possible values are the shortened interface name or a text string.
Device	Label Distribution Protocol (LDP) address of the device where the interface port is located, with the following possible values: • *address*—IP address of the device. • Local—Interface port is on the local device.
State	Status of the port, with one of the following possible values • Active—Link can send and receive traffic. • BFD Running—Link is inactive because BFD is down or has not been fully negotiated. • Configured—Link is not operational or remains down due to a configuration mismatch. The link is not available for switchover from failure of an active link. • Hot Standby—Link is ready to take over if an active link fails and can immediately transition to Active state without further exchange of LACP protocol data units (PDUs). • Negotiating—Link is in the process of LACP negotiation and is being held in a lower LACP state by the peer (for example, because the link is Standby on the peer.) • Standby—Link is not sending or receiving traffic, but is available for swithchover from failure of an active link.
Port ID	ID of the interface port in the format *x/y*, with the following values: • *x*—Port priority as a 2-byte hexadecimal value. • *y*—Link ID as a 2-byte hexadecimal value.

Field	Description
B/W, kbps	Bandwidth of the interface port in kilobits per second.
State reason	Text string that is displayed beneath the bundle member listing explaining why a link has not reached Active state.

Table 3: State Reasons

Reason	Description
BFD session is unconfigured on the remote end	The link is in BFD Running state because LACP is negotiated but the BFD session from the remote device has been unconfigured.
BFD state of this link is Down	The link is in BFD Running state because LACP is negotiated but the BFD session between the local system and the remote device is Down.
Bundle has been shut down	The link is in Configured state because the bundle it is configured as a member of is administratively down.
Bundle interface is not present in configuration	The link is in Configured state because the bundle it is configured as a member of has not itself been configured.
Bundle is in the process of being created	The link is in Configured state because the bundle it is configured as a member of is still being created.
Bundle is in the process of being deleted	The link is in Configured state because the bundle it is configured as a member of is being deleted.
Bundle is in the process of being replicated to this location	The link is in Configured state because the bundle it is configured as a member of is still being replicated to the linecard where the link is located.
Forced switchover to the mLACP peer	The link is in Configured state because it has been brought down as part of a forced switchover to the mLACP peer PoA. This happens only when brute force switchovers are configured.
ICCP group is isolated from the core network	The link is in Configured state because there is no connectivity through the network core for the ICCP group that the link and its bundle are part of. Therefore, the link has been brought down to prevent any traffic being sent by the LACP partner device.
Incompatible with other links in the bundle (bandwidth out of range)	The link is in Configured state because its bandwidth is incompatible with other links configured to be in the same bundle. The bandwidth may be too high or too low.

Reason	Description
LACP shutdown is configured for the bundle	The link is in Standby state because the bundle is configured with LACP shutdown.
Incompatible with other links in the bundle (LACP vs non-LACP)	The link is in Configured state because its use of LACP is incompatible with other links configured in the same bundle. Some links might be running LACP while others are not.
Link is Attached and has not gone Collecting (reason unknown)	The link is in Negotiating state because the mLACP peer PoA has not indicated that the link has gone Collecting in the Mux machine. This could be because of an issue between the mLACP peer and its LACP partner or because this state has not been communicated to the local system.
Link is Collecting and has not gone Distributing (reason unknown)	The link is in Negotiating state because the mLACP peer PoA has not indicated that the link has gone Distributing in the Mux machine. This could be because of an issue between the mLACP peer and its LACP partner or because this state has not been communicated to the local system.
Link is being removed from the bundle	The link is being removed from the bundle and remains in Configured state while this happens.
Link is Defaulted; LACPDUs are not being received from the partner	The link is in Configured state because no LACPDUs are being received from the LACP partner device. Either the partner is not transmitting or the packets are getting lost.
Link is down	The link is in Configured state because it is operationally or administratively down.
Link is Expired; LACPDUs are not being received from the partner	The link is in Negotiating state because no LACPDUs have been received from the LACP Partner device in the Current-While period and the link is now marked as Expired in the Receive machine.
Link is in the process of being created	The link is in Configured state because the member configuration is still being processed.
Link is marked as Standby by mLACP peer	The link is in Standby state because this has been indicated by the mLACP peer PoA.
Link is Not Aggregatable (reason unknown)	The link is in Configured state because it is marked as an Individual link by the mLACP peer PoA.
Link is not forwarding viable and in standby state	The link is not available for data transmission and is configured forwarding-unviable.

Reason	Description
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.
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.

Reason	Description
Partner is not Synchronized (Waiting, Standby, or LAG ID mismatch)	The link is in Negotiating state because the LACP partner device has not indicated that it is Synchronized in the LACPDUs it is sending. On the partner device the link could still be waiting for the Wait-While timer to expire, it could be held in Standby state, or there could be a misconfiguration leading to a LAG ID mismatch between links configured to be within the same bundle.
Partner System ID/Key do not match that of the Selected links	The link is in Configured state because the System ID or Operational Key specified by the LACP partner device does not match that seen on other Selected links within the same bundle. This probably indicates a misconfiguration.
Wait-while timer is running	The link is in Configured state because the Wait-While timer is still running and the new state has not yet been determined.

Related Commands

Command	Description
interface (bundle), on page 21	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

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	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/RP0/CPU0:router# show bundle brief
Thu Mar  3 14:40:35.167 PST

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

The following table 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 format: • BE*x*—Ethernet bundle with ID number *x*.
IG	Interchassis group ID (if configured) of which the bundle is a member.

Field	Description
State	State of the bundle on the local device, with the following possible values: • Admin down—The bundle has been configured to be shut down. • Bundle shut—The bundle is holding all links in Standby state and will not support any traffic. • Down—The bundle is operationally down. It has no Active members on the local device. • mLACP cold standby—The bundle is acting as a multichassis LACP Standby device, but the higher layers are not synchronized. • mLACP hot standby—The bundle is Up on the mLACP peer device, and the local device is ready to take over if that bundle goes down on the peer. • Nak—The local and peer devices cannot resolve a configuration error. • Partner down—The partner system indicates that the bundle is unable to forward traffic at its end. • PE isolated—The bundle is isolated from the core. • Up—The bundle has Active members on this device.
LACP	Status of the Link Aggregation Control Protocol (LACP) on the bundle, with the following possible values: • On—LACP is in use on the bundle. • Off—LACP is not active.

Field	Description
BFD	When BFD is enabled, displays the state of BFD sessions on the bundle from the sessions running on bundle members that is communicated to interested protocols, with the following possible values: • Down—The configured minimim threshold for active links or bandwidth for BFD bundle members is not available so BFD sessions are down. • Off—BFD is not configured on bundle members. • Up—BFD sessions on bundle members are up because the minimum threshold for the number of active links or bandwidth is met.
Links act/stby/cfgd	Number of links on the bundle with a particular status in the format *x/y/z*, with the following values: • *x*—Number of links in Active state on the bundle for the local device (from 1 to the maximum number of links supported on the bundle). • *y*—Number of links in Standby state on the bundle for the local device (from 1 to the maximum number of links supported on the bundle). • *z*—Total number of links configured on the bundle for the local device (from 1 to the maximum number of links supported on the bundle).
Local b/w, kbps	Current bandwidth of the bundle on the local device (this effective bandwidth might be limited by configuration).

Related Commands

Command	Description
show bundle, on page 36	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-id*] [**brief**] [**detail**] [**location**]

Syntax Description

Bundle-Ether *bundle-id*	(Optional) Specifies the number of the Ethernet bundle whose information you want to display. Range is 1 through 65535.
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 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
bundle	read

Examples

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

```
RP/0/RP0/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/RP0/CPU0:router# show bundle load-balancing location 0/0/CPU0

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

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

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

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

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

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

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

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

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

================================================================================
```

```
RP/0/RP0/CPU0:router# show bundle load-balancing Bundle-Ether 12345 detail location 0/0/CPU0

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

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

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

```
RP/0/RP0/CPU0:router# show bundle load-balancing Bundle-Ether12345.2 location 0/0/CPU0

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

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

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

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

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

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

Related Commands

Command	Description
bundle-hash, on page 3	Displays the source and destination IP addresses for the member links.
show bundle, on page 36	Displays information about configured bundles.

show lacp bundle

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

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

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
bundle	read

Examples

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

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

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

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

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

Table 5: show lacp bundle Field Descriptions

Field	Description
Flags	Describes the possible flags that may apply to a device or port, under the “Flags” field.

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

Related Commands

Command	Description
bundle id, on page 9	Adds a port to an aggregated interface or bundle.
show bundle, on page 36	Displays information about configured bundles.

show lacp counters

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

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

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	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/RP0/CPU0:router# show lacp counters bundle-ether 1

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

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

Table 6: show lacp counters Field Descriptions

Field	Description
LACPDUs	Provides the following statistics for Link Aggregation Control Protocol data units (LACPDUs): • Port • Sent • Received • Last Cleared • Excess • Pkt Errors
Marker	Provides the following statistics for marker packets: • Received • Resp. Sent • Last Cleared • Excess • Pkt Errors **Note** The Marker Protocol is used by IEEE 802.3ad bundles to ensure that data no longer is transmitted on a link when a flow is redistributed away from that link.
Timeouts	Provides the following statistics for LACP timeouts: • Last LACP Timeout—The timestamp indicates the time of the last state change of a LACP timeout. The state change is both a timeout event and when the timeout event is no longer active. • LACP Timeout Transition—The number of times the LACP state has transitioned with a timeout since the time the device restarted or the interface was brought up, whichever is most recent. The state change is both a timeout event and when the timeout event is no longer active.

Related Commands

Command	Description
clear lacp counters, on page 18	Clears LACP counters for all members of all bundles, all members of a specific bundle, or for a specific port.

show lacp packet-capture

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

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

Syntax Description

decoded	(Optional) Displays packet information in decoded form for the specified interface.
in	(Optional) Displays packet information for ingress packets only.
out	(Optional) Displays packet information for egress packets only.
HundredGigabitEthernet	Displays packet information for the Hundred 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 **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (**?**) online help function.

Command Default

The default displays both in and out information.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	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 Hundred Gigabit Ethernet interface:



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

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

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

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

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



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

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

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

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

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

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

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

Related Commands

Command	Description
lacp period short, on page 28	Enables a short period time interval for the transmission and reception of LACP packets.
lacp packet-capture, on page 26	Captures LACP packets so that their information can be displayed.

show lacp system-id

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

show lacp system-id

Syntax Description

This command has no keywords or arguments.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	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/RP0/CPU0:router# show lacp system-id

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

Table 7: 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.