



## Link Bundling Commands

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This module contains commands for configuring and monitoring Link Bundling on the Cisco 9000 Series Aggregation Services Routers.

# bundle id

To add a port to an aggregated interface (or bundle), enter the **bundle id** command in interface configuration mode.

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

**no bundle id** *bundle-id* *vlan\_id*

## Syntax Description

<i>bundle-id</i>	Bundle on which you want to add a port. Range is 1 through 65535.
<i>bundle-id.vlan_id</i>	VLAN bundle on which you want to add a port. The VLAN bundle ID is entered in the <i>bundle-id.vlan_id</i> format, and a period between the <i>bundle-id</i> and <i>vlan_id</i> arguments is required. <ul style="list-style-type: none"> <li>Replace the <i>bundle-id</i> argument with the bundle ID. Range is from 1 through 65535.</li> <li>Replace the <i>vlan_id</i> argument with the VLAN trunk interface ID. Range is from 1 to 4094 inclusive (0 and 4095 are reserved).</li> </ul> <p><b>Note</b> The <i>vlan_id</i> argument is available only for Ethernet bundles.</p>
<b>mode</b>	(Optional) Specifies the mode of operation, as follows: <ul style="list-style-type: none"> <li><b>active</b>—Use the <b>mode active</b> keywords to run Link Aggregation Control Protocol (LACP) in active mode over the port. When you specify <b>active</b>, the port joins the bundle and is activated if LACP determines that it is compatible.</li> <li><b>on</b>—Use the <b>mode on</b> keywords to configure an Etherchannel link over the port (no LACP running over the port).</li> <li><b>passive</b>—Use the <b>mode passive</b> keywords to run LACP in passive mode over the port. When you specify <b>passive</b>, 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.</li> </ul>

## Defaults

The default setting is **mode = on**

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

**Usage Guidelines**

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

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**

The following example shows how to add a port onto a bundle:

```
RP/0/RSP0/CPU0:router(config-if)# bundle id 1
```

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

```
RP/0/RSP0/CPU0:router(config-if)# bundle id 5 mode active
```

**Related Commands**

Command	Description
<a href="#">show bundle Bundle-Ether</a>	Displays information about a specific Ethernet bundle.
<a href="#">show interfaces</a>	Displays statistics for all interfaces configured on the router or on a specific node.
<a href="#">show lacp bundle</a>	Displays detailed information about LACP ports and their peers.
<a href="#">show lacp port</a>	Displays detailed information about LACP ports.

# bundle-hash

To calculate load balancing across the members of a multilink interface bundle, use the **bundle-hash** command in the EXEC mode.

```
bundle-hash {Bundle-Ether bundleID | members {GigabitEthernet interface-pathID... | TenGigE
interface-pathID...}}
```

Syntax Description	<i>bundleID</i>	ID number of the Ethernet interface bundle. Range is from 1 through 1024.
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Defaults	No default behavior or values
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Command Modes	EXEC
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Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

Usage Guidelines	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.
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Bundle interface traffic is distributed over the various member links of a bundle according to a hash function. The **bundle-hash** command displays the load-balancing information.

This information includes such things as the member link on which the traffic for a specific source address and destination address is transmitted, or how the load balancing is distributed on member links for a specific subnet.

Task ID	Task ID	Operations
	bundle	read

Examples	The following example shows how to calculate load balancing across the members of a Layer 3 multilink interface bundle:
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```
RP/0/RSP0/CPU0:router# bundle-hash Bundle-Ether 90
Calculate Bundle-Hash for L2 or L3: 2/3 [3]:3
Single SA/DA pair or range: S/R [S]:S
Enter source IP V4 address: 10.10.10.1
Enter destination IP V4 address: 10.10.10.2
Compute destination address set for all members? [y/n]: y
Enter subnet prefix for destination address set: 255.255.255.0
Invalid subnet prefix 255, not computing destination address set
```

```
Link hashed [hash:1] to is GigabitEthernet0/1/0/28 member id 1 ifh 0x2000740
```

```
Another? [y]:n
```

The following example shows how to calculate load balancing across the members of a Layer 2 multilink interface bundle:

```
RP/0/RSP0/CPU0:RTP-VIKING-L2-3#bundle-hash bundle-ether 90  
Calculate Bundle-Hash for L2 or L3: 2/3 [3]: 2  
Enter source MAC address [xxxx:yyyy:zzzz]:000a:1010:2121  
Enter Destination MAC address [xxxx:yyyy:zzzz]:000c:2312:2123  
Link hashed [hash_val:7] to is GigabitEthernet0/1/0/28 member id 1 ifh 0x2000740
```

```
Another? [y]:n
```

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**Related Commands**

Command	Description
<a href="#">bundle id</a>	Adds a port to an aggregated interface (or bundle).

# 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 (1:1 protection) use the **bundle maximum-active links** command in the interface configuration mode.

**bundle maximum-active links** *links*

## Syntax Description

<i>links</i>	Number of active links you want to bring up in the specified bundle. Replace the <i>links</i> value with <b>1</b> .
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## Defaults

No default behavior or values

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.



### Note

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.

## 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 sets the required number of active links required to bring up Ethernet bundle 5 to 2:

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

## Related Commands

Command	Description
<a href="#">bundle minimum-active links</a>	Sets the minimum amount of bandwidth required before a user can bring up a specific bundle.
<a href="#">show bundle Bundle-Ether</a>	Displays information about a specific Ethernet bundle.

# 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.

## Defaults

The default setting is *kbps* = 1.

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

## Task ID

Task ID	Operations
bundle	read, write

## Examples

The following example shows how to set the minimum amount of bandwidth required before a user can bring up a specific bundle. In this example, the user sets the minimum amount of bandwidth required to bring up Ethernet bundle 1 to 620000:

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

## Related Commands

Command	Description
<a href="#">show bundle Bundle-Ether</a>	Displays information about a specific Ethernet bundle.



# 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*

<b>Syntax Description</b>	<i>links</i>	Number of active links you want to bring up in the specified bundle. Range is from 1 through 8.
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<b>Defaults</b>	No default behavior or values
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<b>Command Modes</b>	Interface configuration
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<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.	

<b>Usage Guidelines</b>	To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.
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<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	bundle	read, write

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

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<a href="#">bundle maximum-active links</a>	Sets the active links required to bring up a specific bundle.
	<a href="#">show bundle Bundle-Ether</a>	Displays information about a specific Ethernet bundle.

# bundle port-priority

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

**bundle port-priority** *priority*

**no bundle port-priority** *priority*

## Syntax Description

<i>priority</i>	Priority for this port, where a lower value equals a higher priority. Replace the <i>priority</i> argument with a number. Range is from 0 through 65535.
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## Defaults

The default setting is *priority* = 32768

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

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.



### 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/RSP0/CPU0:router(config-if)# bundle port-priority 1
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<a href="#">bundle id</a>	Adds a port to an aggregated interface (or bundle).
<a href="#">show lacp bundle</a>	Displays detailed information about LACP ports and their peers.
<a href="#">show lacp port</a>	Displays detailed information about LACP ports.
<a href="#">show lacp system-id</a>	Displays the local system ID used by LACP.

# clear lacp counters

To clear Link Aggregation Control Protocol (LACP) counters for all members of all bundles, all members of a specific bundle, or for a specific port, enter the **clear lacp counters** command in EXEC mode.

```
clear lacp counters [bundle {Bundle-Ether bundle-id} | port {GigabitEthernet
interface_instance | TenGigE interface_instance}]
```

Syntax Description		
<b>bundle</b>		Clears LACP counters for all members of a bundle.
<b>Bundle-Ether</b> <i>bundle-id</i>	(Optional)	Specifies the Ethernet bundle whose LACP counters you want to clear. Replace <i>bundle-id</i> with a number. Range is from 1 through 65535.
<b>port</b>	(Optional)	Clears all LACP counters on the specified bundle or interface.
<b>GigabitEthernet</b> <i>interface_instance</i>	(Optional)	Specifies the Gigabit Ethernet interface whose LACP counters you want to clear. Replace <i>bundle-id</i> with the number of the bundle you want to clear.
<b>TenGigE</b> <i>interface_instance</i>	(Optional)	TenGigE interface whose LACP counters you want to clear. The <i>interface_instance</i> is expressed in the <i>rack/slot/module/port</i> notation.

**Defaults** No default behavior or values

**Command Modes** EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

Task ID	Task ID	Operations
	bundle	execute
	basic-services	read, write

**Examples** The following example shows how to clear LACP counters:

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

**Related Commands**

Command	Description
<a href="#">show lacp counters</a>	Displays LACP statistics.

# hw-module load-balance bundle l2-service l3-params

To enable Layer 2 service specific load-balance algorithm for bundle EFPs, use the **hw-module load-balance** command in the global configuration mode. When this service specific load balance is configured, all traffic egressing the bundle EFPs in the system are load balanced based on the IPv4 source and destination addresses in the packet. If the packet does not have an IPv4 payload, the packet uses default load balancing. To return to the default settings, use the **no** form of this command.

**hw-module load-balance bundle l2-service l3-params**

**no hw-module load-balance bundle l2-service l3-params**

**Syntax Description** This command has no arguments or keywords.

**Defaults** Bundle load balancing is performed based on the MAC SA or DA fields in the packet data header.

**Command Modes** EXEC

Command History	Release	Modification
	Release 3.9.1	This command was introduced.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

Task ID	Task ID	Operations
	root-lr	read, write

**Examples** The following example shows how to clear LACP counters:

```
RP/0/RSP0/CPU0:router(config)# hw-module load-balance bundle l2-service l3-params
```

# interface Bundle-Ether

To create a new Ethernet bundle and enter interface configuration mode for that bundle, use the **interface Bundle-Ether** command in global configuration mode. To delete an Ethernet bundle, use the **no** form of this command.

**interface Bundle-Ether** *bundle-id*

**no interface Bundle-Ether** *bundle-id*

## Syntax Description

<i>bundle-id</i>	Ethernet bundle you want to create or configure. Replace <i>bundle-id</i> with a bundle identifier. Range is from 1 through 65535.
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## Defaults

No default behavior or values

## Command Modes

Global configuration

## Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

## Task ID

Task ID	Operations
bundle	read, write

## Examples

The following example shows how to create a new Ethernet bundle and enter interface configuration mode for that bundle:

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

## Related Commands

Command	Description
<a href="#">show bundle Bundle-Ether</a>	Displays information about a specific Ethernet bundle.

# lacp period short

To configure a one second interval between LACP packets that are received from the peer, enter the **lacp period** command in interface configuration mode. To return to the default LACP period, use the **no** form of this command.

**lacp period short**

**no lacp period**

## Syntax Description

This command has no arguments or keywords.

## Defaults

If you do not enter the **lacp period short** command, then the peer transmits LACP packets every 30 seconds.

## Command Modes

Interface configuration

## Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

## Task ID

Task ID	Operations
bundle	read, write

## Examples

The following example shows how to configure a one-second interval between LACP packets that are received from the peer:

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

## Related Commands

Command	Description
<a href="#">bundle id</a>	Adds a port to an aggregated interface (or bundle).
<a href="#">show lacp port</a>	Displays detailed information about LACP ports.
<a href="#">show lacp bundle</a>	Displays detailed information about LACP ports and their peers.



# lACP system-priority

To configure the priority for the current system, enter the **lACP system-priority** command in global configuration mode. To return to the default LACP system-priority value, use the **no** form of this command.

**lACP system-priority** *priority*

**no lACP system-priority** *priority*

## Syntax Description

<i>priority</i>	Priority for this system. Replace <i>priority</i> with a number. Range is from 0 through 65535. A lower value is higher priority.
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## Defaults

The default setting is *priority* = 32768.

## Command Modes

Global configuration

## Command History

Release	Modification
Release 3.7.2	This command was introduced.
Release 3.9.0	No modification.

## Usage Guidelines

To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

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:

```
RSP/0/RSP0/CPU0router(config)# lACP system-priority 100
```

## Related Commands

Command	Description
<a href="#">show lACP system-id</a>	Displays the local system ID used by LACP.
<a href="#">show lACP bundle</a>	Displays detailed information about LACP ports and their peers.
<a href="#">show lACP port</a>	Displays detailed information about LACP ports.

# show bundle Bundle-Ether

To display information about a specific Ethernet bundle, enter the **show bundle Bundle-Ether** command in EXEC mode.

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

Syntax Description		
<i>bundle-id</i>	Number of the Ethernet bundle whose information you want to display. Replace <i>bundle-id</i> with a bundle identifier. Range is from 1 through 65535.	
<b>reasons</b>	(Optional) Displays the mux reason, which is the reason why each link is in its state.  For a listing of each state, along with an explanation about the state, reasons the link is in that state, and possible corrective actions you can take to resolve an error state, see <a href="#">Table 2</a> .	

**Defaults** No default behavior or values

**Command Modes** EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

Task ID	Task ID	Operations
	bundle	read

**Examples** The following example shows the output from the **show bundle Bundle-Ether** command:

```
RP/0/RSP0/CPU0:router# show bundle Bundle-Ether 1

State: 0 - Port is Detached. 1 - Port is Waiting.
       2 - Port is Attached. 3 - Port is Collecting.
       4 - Port is 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  Port ID          B/W (Kbps)  MAC address
-----
Gi0/0/2/0    0      0x8000, 0x0001  1000000    0800.453a.651d*

```

The following is sample output from the **show bundle Bundle-Ether** command with the **reasons** keyword included in the command string:

```

RP/0/RSP0/CPU0:router# show bundle Bundle-Ether 1 reasons

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

Bundle-Ether1
      B/W (Kbps)  MAC address      Minimum active  Maximum active
      -----
                   0 0800.453a.651d      1      620000      8

      Port          State  Port ID          B/W (Kbps)  MAC address
      -----
      Gi0/0/2/0    0      0x8000, 0x0001  1000000    0800.453a.651d*
      Link is marked individual by partner

```

Table 1 describes the significant fields shown in the display.

**Table 1** *show bundle Bundle-Ether Field Descriptions*

Field	Description
B/W (Kbps)	Bundled interface bandwidth, in kilobits per second.
MAC address	MAC address of the bundle.
Minimum links	Minimum number of active links required before the specified bundle can be activated.
active B/W (Kbps)	Minimum amount of bandwidth required before a user can bring up the specified bundle.
Maximum active links	Maximum number of links that can be actively carrying traffic in the specified bundle.
Port ID	Port identifier, in the <i>rack/slot/module/port</i> format.
State	Current state of the specified port. Possible port states are as follows: <ul style="list-style-type: none"> <li>• 0—Port is Detached</li> <li>• 1—Port is Waiting</li> <li>• 2—Port is Attached</li> <li>• 3—Port is Collecting</li> <li>• 4—Port is Distributing</li> </ul>
Port ID	Port identifier in hexadecimal format
B/W (Kbps)	Port bandwidth, in kilobits per second.
MAC address	MAC address associated with the specified port.

Table 2 describes the reason why each link is in its state, along with an explanation about the state, reasons the link is in that state, and possible corrective actions you can take to resolve an error state.

**Table 2** *Ethernet Link State Explanation, Cause, and Action*

<b>Reasons</b>
<b>State</b>
Selection logic has not yet been run for the bundle this link is a member of
<b>Explanation</b>
Status is not yet determined; process initialization is not complete.
<b>Cause</b>
In most cases, indicates that the bundlemgr_distrib process has not completed initialization after a restart or failover. If the command is run soon after a restart or failover, this behavior is expected. In other cases, indicates a problem during process initialization.
<b>Action</b>
Restart the bundlemgr_distrib process. If restarting this process does not work, restart the ifmgr process.
<b>State</b>
Link is down
<b>Explanation</b>
Interface or line protocol state is not operationally up. Possible explanations are that the port is shut down, the port is not connected to a peer or is shut down on the peer, or the L1 or L2 is affected by signalling problems.
<b>Cause</b>
A normal condition in which the link is shut down or not connected. Other causes include a fault with the line or a misconfiguration of the line protocol.
<b>Action</b>
Check the port configuration and status on both devices.
<b>State</b>
Link is being removed from the bundle
<b>Explanation</b>
Bundle membership configuration was removed from the link, and the effects of this action are still being processed.
<b>Cause</b>
If receiving this reason is transient, the condition is normal. If the reason is persistent, a problem is present.
<b>Action</b>
If reason is persistent, restart the bundlemgr_distrib process.

**Table 2** *Ethernet Link State Explanation, Cause, and Action (continued)*

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**Reasons**

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**State**

Link has wrong duplexity

**Explanation**

Link is configured to run LACP but is in half-duplex mode. Or the link duplexity does not match that of the primary link.

**Cause**

Link is improperly configured. Links running LACP must be full-duplex, and all links in a bundle must have the same duplexity.

**Action**

If LACP is running, check to make sure link is in full-duplex mode. Otherwise, check the duplexity of the other bundle members and correct the duplexity setting of this link accordingly.

---

**State**

Link has wrong bandwidth

**Explanation**

The acceptable bandwidth for links in a bundle is determined by the existing configured links in a bundle. All links must have a bandwidth within a certain range of the first links added. This link has a bandwidth outside that range.

**Cause**

Link is improperly configured. All links must have a bandwidth within a certain range of each other. The range is determined by the platform. The Cisco ASR 9000 Series Router requires that the bandwidth is the same on all links.

**Action**

Reconfigure the links with the incorrect bandwidth.

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**State**

Link is a loopback interface

**Explanation**

LACP detected that the peer device has the same LACP system ID as the local device.

**Cause**

A port is connected to another port on the same device, or the system ID settings of two devices are identical. This latter case usually indicates a failure to acquire a unique system MAC address from the backplane of the device.

**Action**

Check the cabling to ensure that two ports on the same device are not connected. If the connection is between two devices, then check that the backplane is correctly programmed with a base MAC address.

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**Table 2**      **Ethernet Link State Explanation, Cause, and Action (continued)**

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**Reasons**

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**State**

Link has wrong activity type

**Explanation**

The use of LACP on this link is inconsistent with the use of LACP on other links in the bundle. Some links are configured to run LACP, but others are not.

**Cause**

Link is improperly configured. All links must either be running LACP or not running LACP.

**Action**

Check the LACP configuration on the link, and reconfigure the setting as appropriate.

---

**State**

Link's bundle already has maximum number of members allowed

**Explanation**

A bundle can only have a certain number of members attached to it. This state indicates that more links are configured than can be attached. The Cisco ASR 9000 Series Router has a limit of 8.

**Cause**

Although the number of members is over-configured, this condition is normal.

**Action**

No action is required. If desired, you can remove the extra links from the bundle and assign them to a different bundle.

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**State**

Link is attached to a shared medium

**Note**    The detection of this condition is not currently supported.

**Explanation**

Link bundles can operate using point-to-point links only. The link is running over a shared media, which makes the link unusable.

**Cause**

The link is connected to a shared media device or network.

**Action**

Check the connectivity of the link to make sure that all links are point-to-point connections.

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**Table 2** *Ethernet Link State Explanation, Cause, and Action (continued)*

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**Reasons**

---

**State**

Link has wrong LAG ID

**Explanation**

The LAG ID of this link differs from that of the primary link, which indicates that the port on the peer device is not configured to be in the same bundle as the port to which the primary link is connected. It could also indicate that the connections are to different peer devices.

**Cause**

Link is improperly configured, or a cabling problem exists.

**Action**

Check the link configuration and connectivity, and modify as appropriate.

---

**State**

Link's bundle does not exist

**Explanation**

Link was configured to be a member of a bundle that does not exist.

**Cause**

Link is improperly configured.

**Action**

Configure the non-existent bundle interface, or reconfigure the link to be in the desired bundle.

---

**State**

Link's bundle has no primary link

**Explanation**

No link is configured to be a member of the bundle that is currently a candidate for aggregation.

**Cause**

To be considered a candidate for aggregation, a link must be up, and it must be compatible with previously configured links regarding bandwidth and LACP usage. For links running LACP, the links must also be full-duplex, and the partner must indicate an ability to form an aggregation. If there is no primary link, it is because there are no links that meet these criteria.

**Action**

Check all the links in a bundle against the criteria, and take the appropriate action.

---

**Table 2** *Ethernet Link State Explanation, Cause, and Action (continued)*

---

**Reasons**

---

**State**

Link's bundle is shut down

**Explanation**

The link is configured as a member of a bundle that is shut down.

**Cause**

If the bundle is indeed shut down, this condition is normal.

**Action**

Clear the shutdown configuration on the bundle.

---

**State**

Link is marked individual by partner

**Explanation**

Peer device has not set the aggregatable bit in the LACPDU's it is sending. The Cisco IOS XR software does not support forming bundles with links that are not marked as aggregatable.

**Cause**

Indicates that the peer LACP status is defaulted, which means that LACP packets are not being received.

**Action**

Check to make sure that the peer is sending LACP packets and that the packets are delivered to the bundlemgr\_local process on the line card where the port is located.

---

**State**

Link is in InSync state

**Explanation**

Indicates that LACP data exchanged between two peer devices is correct, and the link is compatible with other links already in the bundle. Typically, this state is transitory and occurs before the link moves to Collecting and then Distributing states.

**Cause**

If link remains in this state, the link may not be synchronized on the peer device. Possible causes are a misconfiguration or cabling error such that the ports on each device are not set up as members of the same bundle on both ends.

**Action**

Check the configuration and connectivity, and take the appropriate action.

---



**Table 2** Ethernet Link State Explanation, Cause, and Action (continued)

<b>Reasons</b>
<b>State</b>
Link is in Collecting state
<b>Explanation</b>
Indicates that LACP data exchanged between two peer devices is correct and that both devices are now synchronized. Typically, this state is transitory and occurs before the link moves to the Distributing state.
<b>Cause</b>
If the link remains in this state, the peer has not reached Collecting state. Possible causes are a fault with the peer, a loss of packets on the line, or a local software problem that is preventing the transmission to Distributing state.
<b>Action</b>
Check the peer status, and look for packet loss on the link.
<b>State</b>
Link exceeds maximum active limit
<b>Explanation</b>
You set the <b>bundle maximum-active links</b> to $x$ on the bundle, and there are already $x$ links active in the bundle. As a result, this link is held in standby state.
<b>Cause</b>
Assuming that there are actually $x$ active links in the bundle, this condition is normal.
<b>Action</b>
No action is required.
<b>State</b>
Link is in Distributing state
<b>Explanation</b>
The link is fully active, transmitting and receiving traffic. This reason is not usually displayed because it is the normal stable state.
<b>Cause</b>
This conditional is normal.
<b>Action</b>
No action is required.

**Related Commands**

Command	Description
<a href="#">bundle id</a>	Adds a port to an aggregated interface (or bundle).

Command	Description
<a href="#">show lacp bundle</a>	Displays detailed information about LACP ports and their peers.
<a href="#">show interfaces</a>	Displays statistics for all interfaces configured on the router or on a specific node.

# show lacp bundle

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

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

<b>Syntax Description</b>	<b>Bundle-Ether</b> <i>bundle-id</i> (Optional) Specifies the number of the Ethernet bundle you want to display. Range is through 65535.
---------------------------	--

**Defaults** No default behavior or values

**Command Modes** EXEC

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

<b>Task ID</b>	<b>Task ID</b>	<b>Operations</b>
	bundle	read

**Examples** The following example shows how to display LACP information for a specific ethernet bundle:

```
RP/0/RSP0/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
      B/W (Kbps)  MAC address      Minimum active  Maximum active
      -----  -
              0  0800.453a.651d      1             620000      32
Port          State  Flags  Port ID          Key          System-ID
```

```

-----
Gi0/0/2/0      1      ASDE  0x8000, 0x0001 0x0001 0x8000, 08-00-45-3a-65-01
PEER          0      PSD   0xffff, 0x0000 0x0000 0xffff, 00-00-00-00-00-00

```

Table 3 describes the significant fields shown in the display.

**Table 3** *show lacp bundle Field Descriptions*

Field	Description
Flags	Describes the possible flags that may apply to a device or port, under the “Flags” field.
State	Describes the possible flags that may apply the port state, under the “State” field.
Port	Port identifier, in the <i>rack/slot/module/port</i> notation.
State	Provides information about the state of the specified port. Possible flags are: <ul style="list-style-type: none"> <li>• 0—Port is not aggregatable.</li> <li>• 1—Port is out of sync with peer.</li> <li>• 2—Port is in sync with peer.</li> <li>• 3—Port is collecting.</li> <li>• 4—Port is collecting and distributing.</li> </ul>
Flags	Provides information about the state of the specified device or port. Possible flags are: <ul style="list-style-type: none"> <li>• A—Device is in Active mode.</li> <li>• P—Device is in Passive mode.</li> <li>• S—Device sends PDUs at slow rate.</li> <li>• F—Device sends PDUs at fast rate.</li> <li>• D—Port is using default values for partner information.</li> <li>• E—Information about partner has expired.</li> </ul>
Port ID	Port identifier, expressed in the format <i>Nxnnnn</i> . <i>N</i> is the port priority, and <i>nnnn</i> is the port number assigned by the sending router.
Key	Two-byte number associated with the specified link and aggregator. Each port is assigned an operational key. The ability of one port to aggregate with another is summarized by this key. Ports which have the same key select the same bundled interface. The system ID, port ID and key combine to uniquely define a port within a LACP system.
System-ID	System identifier. The system ID is a LACP property of the system which is transmitted within each LACP packet together with the details of the link.

#### Related Commands

Command	Description
<a href="#">bundle id</a>	Adds a port to an aggregated interface (or bundle).
<a href="#">show bundle Bundle-Ether</a>	Displays information for a specific Ethernet bundle.

# show lacp counters

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

```
show lacp counters [bundle-ether bundle-id]
```

Syntax Description	bundle-ether <i>bundle-id</i>	Specifies the ethernet bundle whose counters you want to display. Replace <i>bundle-id</i> with a bundle identifier. Range is from 1 through 65535.
--------------------	-------------------------------	---

**Defaults** No default behavior or values

**Command Modes** EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

Task ID	Task ID	Operations
	bundle	read

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

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

Bundle-Ether1
Port          LACPDU          Marker
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
```

[Table 4](#) describes the significant fields shown in the display.

**Table 4**      *show lacp counters Field Descriptions*

Field	Description
LACPDU	<p>Provides the following statistics for Link Aggregation Control Protocol data units (LACPDU):</p> <ul style="list-style-type: none"> <li>• Port</li> <li>• Sent</li> <li>• Received</li> <li>• Last Cleared</li> <li>• Excess</li> <li>• Pkt Errors</li> </ul>
Marker	<p>Provides the following statistics for marker packets:</p> <ul style="list-style-type: none"> <li>• Received</li> <li>• Resp. Sent</li> <li>• Last Cleared</li> <li>• Excess</li> <li>• Pkt Errors</li> </ul> <p><b>Note</b>    The Marker Protocol is used by IEEE 802.3ad bundles to ensure that data no longer is transmitted on a link when a flow is redistributed away from that link.</p>

**Related Commands**

Command	Description
<a href="#">clear lacp counters</a>	Clears LACP counters for all members of all bundles, all members of a specific bundle, or for a specific port.

# show lacp port

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

```
show lacp port [GigabitEthernet interface_instance | TenGigE interface_instance]
```

Syntax Description		
<b>GigabitEthernet</b> <i>interface_instance</i>	Specifies the Gigabit Ethernet interface bundle whose LACP port information you want to display. The <i>interface_instance</i> is expressed in the <i>rack/slot/module/port</i> notation.	
<b>TenGigE</b> <i>interface_instance</i>	Specifies the TenGigE interface whose LACP port information you want to display. The <i>interface_instance</i> is expressed in the <i>rack/slot/module/port</i> notation.	

**Defaults** No default behavior or values.

**Command Modes** EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.

Task ID	Task ID	Operations
	bundle	read

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

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

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

```
Bundle-Ether1
```

```
Minimum active Maximum active
```

## ■ show lacp port

```

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 describes the significant fields shown in the display.

**Table 5** *show lacp port Field Descriptions*

Field	Description
Port	Identifies the LACP port whose information is displayed. The port number is expressed in the <i>rack/slot/module/port</i> notation.
State	Provides information about the state of the specified device or port. Possible flags are: <ul style="list-style-type: none"> <li>• A—Device is in Active mode.</li> <li>• P—Device is in Passive mode.</li> <li>• S—Device sends PDUs at slow rate.</li> <li>• F—Device sends PDUs at fast rate.</li> <li>• D—Port is using default values for partner information.</li> <li>• E—Information about partner has expired.</li> </ul>
Flags	Provides information about the state of the specified port. Possible flags are: <ul style="list-style-type: none"> <li>• 0—Port is not aggregatable.</li> <li>• 1—Port is out of sync with peer.</li> <li>• 2—Port is in sync with peer.</li> <li>• 3—Port is collecting.</li> <li>• 4—Port is collecting and distributing.</li> </ul>
Port ID	Port identifier, expressed in the following format: <i>Nxnnnn</i> . <i>N</i> is the port priority, and <i>nnnn</i> is the port number assigned by the sending router.
Key	Two-byte number associated with the specified link and aggregator. Each port is assigned an operational key. The ability of one port to aggregate with another is summarized by this key. Ports which have the same key select the same bundled interface. The system ID, port ID and key combine to uniquely define a port within a LACP system.
System-ID	System identifier. The System ID is an LACP property of the system which is transmitted within each LACP packet together with the details of the link.

#### Related Commands

Command	Description
<b>bundle id</b>	Adds a port to an aggregated interface (or bundle).
<b>show bundle Bundle-Ether</b>	Displays information about a specific Ethernet bundle.



# show lacp system-id

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

```
show lacp system-id
```

**Syntax Description** This command has no arguments or keywords.

**Defaults** No default behavior or values

**Command Modes** EXEC

Command History	Release	Modification
	Release 3.7.2	This command was introduced.
	Release 3.9.0	No modification.

**Usage Guidelines** To use this command, you must be in a user group associated with a task group that includes the proper task IDs. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator.



**Note**

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

Task ID	Task ID	Operations
	bundle	read

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

```
RP/0/RSP0/CPU0:router# show lacp system-id
```

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

Table 6 describes the significant fields shown in the display.

**Table 6** *show lacp system-id Field Descriptions*

Field	Description
Priority	Priority for this system. A lower value is higher priority.
MAC Address	MAC address associated with the LACP system ID.

#### Related Commands

Command	Description
<a href="#">bundle id</a>	Adds a port to an aggregated interface (or bundle).
<a href="#">show bundle Bundle-Ether</a>	Displays information about a specific Ethernet bundle.
<a href="#">show lacp bundle</a>	Displays detailed information about LACP ports and their peers.
<a href="#">show lacp port</a>	Displays detailed information about LACP ports.