



Cisco Express Forwarding Commands

This chapter describes the commands used to configure and monitor Cisco Express Forwarding (CEF) on NCS 5000 routers.

For detailed information about CEF concepts, configuration tasks, and examples, see *Cisco IP Addresses and Services Configuration Guide*.

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cef adjacency route override rib

To enable the CEF prefer Routing Information Base (RIB) prefixes over Adjacency Information Base (AIB) prefixes in the Global configuration mode. To enable the CEF prefer AIB prefixes over RIB prefixes, use the **no** form of this command.

cef adjacency route override rib

no cef adjacency route override rib

Syntax Description	route	Enables adjacency route configuration
	override	Sets override options for the adjacency routes.
	rib	Sets options for adjacency routes to override the RIB routes.
Command Default	By default, CEF prefers RIB prefixes over AIB prefixes.	
Command Modes	Global configuration	
Command History	Release	This command was introduced.
	6.0	
Usage Guidelines	CEF may prefer the L2 adjacency for forwarding over the RIB (routing) entry under the following conditions:	
	- When there is no local ARP entry (yet). ARP learning may result in the router creating a forwarding entry. - A forwarding entry of /32 (or /128 for IPv6) RIB routes are overridden when there is a covering connected or attached route.	
	If an interface has a larger subnet, and you want to redirect a /32 out of that subnet of a different interface via a static route.	
This can be seen in scenarios of EVPN and or HSRP, or in bridge domains with a BVI and multiple EFP's.		
To deviate from the behavior of preferring a L2 adjacency for forwarding over a route entry, use the cef adjacency route override rib command.		

Task ID	Task ID	Operation
	cef	read, write

Example

The following example shows how to override the CEF adjacency route:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router# cef adjacency route override rib
```

clear cef ipv4 drops

To clear Cisco Express Forwarding (CEF) IPv4 packet drop counters, use the **clear cef ipv4 drops** command in XR EXEC mode.

clear cef ipv4 drops location *node-id*

Syntax Description	location <i>node-id</i> Clears IPv4 packet drop counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.						
Command Default	No default behavior or values						
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.		
Release	Modification						
Release 6.0	This command was introduced.						
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, this command will clear IPv4 CEF drop counters only for the node on which the command is issued.						
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>basic-services</td><td>read, write</td></tr> <tr> <td>cef</td><td>read, write</td></tr> </table>	Task ID	Operations	basic-services	read, write	cef	read, write
Task ID	Operations						
basic-services	read, write						
cef	read, write						

Examples

The following example displays sample output for the IPv4 Cisco Express Forwarding (CEF) table packet drop counters, and clears IPv4 CEF drop counters for location 0/RP0/CPU0:

```
RP/0/RP0/CPU0:router# show cef ipv4 drops

CEF Drop Statistics
Node: 0/RP0/CPU0
  Unresolved drops    packets :           0
  Unsupported drops   packets :          61
  Null0 drops         packets :           0
  No route drops      packets :        74026
  No Adjacency drops  packets :           0
  Checksum error drops packets :           0
  RPF drops           packets :           0
  RPF suppressed drops packets :           0
  RP destined drops   packets :           0
  Discard drops       packets :           0
  GRE lookup drops    packets :           0
  GRE processing drops packets :           0
  LISP punt drops     packets :           0
  LISP encap err drops packets :           0
  LISP decap err drops packets :           0
```

clear cef ipv4 drops

```
RP/0/RP0/CPU0:router# clear cef ipv4 drops location 0/RP0/CPU0
```

```
Node: 0/RP0/CPU0
```

```
Clearing CEF Drop Statistics
```

clear cef ipv4 exceptions

To clear IPv4 Cisco Express Forwarding (CEF) exception packet counters, use the **clear cef ipv4 exceptions** command in XR EXEC mode.

clear cef ipv4 exceptions location *node-id*

Syntax Description	location <i>node-id</i> Clears IPv4 CEF exception packet counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.						
Command Default	No default behavior or values						
Command Modes	XR EXEC mode						
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.		
Release	Modification						
Release 6.0	This command was introduced.						
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, this command will clear IPv4 CEF exception packet counters for all nodes.						
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>basic-services</td><td>read, write</td></tr> <tr> <td>cef</td><td>read, write</td></tr> </table>	Task ID	Operations	basic-services	read, write	cef	read, write
Task ID	Operations						
basic-services	read, write						
cef	read, write						
Examples	The following example displays sample output for the IPv4 Cisco Express Forwarding (CEF) exception packet counters, and clear s IPv4 CEF exception packets node 0/RP0/CPU0: <pre>RP/0/RP0/CPU0:router# show cef ipv4 exceptions CEF Exception Statistics Node: 0/RP0/CPU0 Slow encap packets : 0 Unsupported packets : 0 Redirect packets : 0 Receive packets : 0 Broadcast packets : 0 IP options packets : 0 TTL expired packets : 0 Fragmented packets : 0 RP/0/RP0/CPU0:router# clear cef ipv4 exceptions location 0/RP0/CPU0 Node: 0/RP0/CPU0</pre>						

clear cef ipv4 exceptions

Clearing CEF Exception Statistics

clear cef ipv6 drops

To clear Cisco Express Forwarding (CEF) IPv6 packet drop counters, use the **clear cef ipv6 drop** command in XR EXEC mode.

clear cef ipv6 drops location *node-id*

Syntax Description	location <i>node-id</i> Clears IPv6 packet drop counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.						
Command Default	No default behavior or values						
Command Modes	XR EXEC mode						
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.		
Release	Modification						
Release 6.0	This command was introduced.						
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, this command clears IPv6 CEF drop counters for all nodes.						
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>basic-services</td><td>read, write</td></tr> <tr> <td>cef</td><td>read, write</td></tr> </table>	Task ID	Operations	basic-services	read, write	cef	read, write
Task ID	Operations						
basic-services	read, write						
cef	read, write						

Examples

The following example displays sample output for the IPv6 Cisco Express Forwarding (CEF) table packet drop counters, and clears IPv6 CEF drop counters for location 0/RP0/CPU0:

```
RP/0/RP0/CPU0:router# show cef ipv6 drops
```

```
CEF Drop Statistics
```

```
Node: 0/RP0/CPU0
```

```

Unresolved drops    packets :          0
Unsupported drops   packets :          0
Null0 drops         packets :          0
No route drops      packets :          0
No Adjacency drops  packets :          0
Checksum error drops packets :          0
RPF drops           packets :          0
RPF suppressed drops packets :          0
RP destined drops   packets :          0
Discard drops       packets :          0
GRE lookup drops    packets :          0
GRE processing drops packets :          0
LISP punt drops     packets :          0
LISP encap err drops packets :          0

```

clear cef ipv6 drops

LISP decap err drops packets : 0

RP/0/RP0/CPU0:router# **clear cef ipv6 drop**

Node: 0/RP0/CPU0

Clearing CEF Drop Statistics

clear cef ipv6 exceptions

To clear IPv6 Cisco Express Forwarding (CEF) exception packet counters, use the **clear cef ipv6 exceptions** command in XR EXEC mode .

clear cef ipv6 exceptions location *node-id*

Syntax Description	location <i>node-id</i> Clears IPv6 CEF exception packet counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.						
Command Default	No default behavior or values						
Command Modes	XR EXEC mode						
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.		
Release	Modification						
Release 6.0	This command was introduced.						
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, this command clears IPv6 CEF exception packet counters for all nodes.						
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>basic-services</td><td>read, write</td></tr> <tr> <td>cef</td><td>read, write</td></tr> </table>	Task ID	Operations	basic-services	read, write	cef	read, write
Task ID	Operations						
basic-services	read, write						
cef	read, write						
Examples	The following example displays sample output for the IPv6 Cisco Express Forwarding (CEF) exception packet counters, and clears the IPv6 CEF exception packets for location: <pre> RP/0/RP0/CPU0:router# show cef ipv6 exceptions CEF Exception Statistics Node: 0/RP0/CPU0 Slow encap packets : 0 Unsupported packets : 0 Redirect packets : 0 Receive packets : 0 Broadcast packets : 0 IP options packets : 0 TTL expired packets : 0 Fragmented packets : 0 RP/0/RP0/CPU0:router# clear cef ipv6 exceptions location 0/RP0/CPU0 Node: 0/RP0/CPU0 </pre>						

clear cef ipv6 exceptions

Clearing CEF Exception Statistics

show adjacency

To display Cisco Express Forwarding (CEF) adjacency table information, use the **show adjacency** command in XR EXEC mode.

```
show adjacency [{ipv4 [nexthop ipv4-address]|mpls|ipv6}] [interface type interface-instance]
[remote] [detail] [location node-id]
```

Syntax Description	
ipv4	(Optional) Displays only IPv4 adjacencies.
nexthop <i>ipv4-address</i>	(Optional) Displays adjacencies that are destined to the specified IPv4 nexthop.
mpls	(Optional) Displays only MPLS adjacencies.
ipv6	(Optional) Displays only IPv6 adjacencies.
<i>interface-type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-instance</i>	Either a physical interface instance or a virtual interface instance: - Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash mark between values is required as part of the notation. <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. - Virtual interface instance. Number range varies depending on interface type. For more information about the syntax for the router, use the question mark (?) online help function.
remote	(Optional) Displays only remote adjacencies. A remote adjacency is an internal adjacency used to forward packets between line cards.
detail	(Optional) Displays detailed adjacency information, including Layer 2 information.
location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines

This command is used to verify that an adjacency exists for a connected device, that the adjacency is valid, and that the MAC header rewrite string is correct.

If you do not specify a node with the **location** keyword and *node-id* argument, this command displays the CEF adjacency table for the node on which the command is issued.

Task ID

Task ID	Operations
cef	read

Examples

The following is sample output from **show adjacency** command with the **location** keyword specified:

This table describes the significant fields shown in the display.

Table 1: show adjacency Command Field Descriptions

Field	Description
Interface	Outgoing interface associated with the adjacency.
Address	Address can represent one of these addresses: • Next hop IPv4 or IPv6 address • Point-to-Point address Information in parentheses indicates different types of adjacency.
Version	Version number of the adjacency. Updated whenever the adjacency is updated.
Refcount	Number of references to this adjacency.
Protocol	Protocol for which the adjacency is associated.
0f000800 and 000c86f33d330800453a21c10800	Layer 2 encapsulation string.
mtu	Value of the maximum transmission unit (MTU).
flags	Internal field.
packets	Number of packets going through the adjacency.
bytes	Number of bytes going through the adjacency.

show cef

To display information about packets forwarded by Cisco Express Forwarding (CEF), use the **show cef** command in XR EXEC mode.

show cef [*prefix* [*mask*]] [{**hardware** {**egress**|**ingress**}|**detail**}] [**location** {*node-id*|**all**}]

Syntax Description	
<i>prefix</i>	(Optional) Longest matching CEF entry for the specified IPv4 destination prefix.
mask	(Optional) Exact CEF entry for the specified IPv4 prefix and mask.
hardware	(Optional) Displays detailed information about hardware.
egress	Displays information from the egress packet switch exchange (PSE) file.
ingress	Displays information from the ingress packet switch exchange (PSE) file.
detail	(Optional) Displays full details.
location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
all	(Optional) Displays all locations.

Command Default When the prefix is not explicitly specified, this command displays all the IPv4 prefixes that are present in CEF. When not specified, the location defaults to the active Route Processor (RP) node.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

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

Task ID	Task ID	Operations
	cef	read

Examples The following sample output shows the load information flag from the **show cef** command for both **hardware** and **ingress** keywords:

```
RP/0/RP0/CPU0:router# show cef 101.1.3.0/24 hardware ingress location 0/RP0/CPU0
101.1.3.0/24, version 0, internal 0x40000001 (0x598491e8) [1], 0x0 (0x0),
(0x0)
  local adjacency 10.0.101.2
  Prefix Len 24, traffic index 0, precedence routine (0)
```

```

BGP Attribute: id: 8, Local id: 6, Origin AS: 1003, Next Hop AS: 4

  via 10.0.101.2, 2 dependencies, recursive
  next hop 10.0.101.2 via 10.0.101.2/32

```

```

Number of Mnodes: 2
Mnode 0 HW Location: 0x00080404 HW Value
[ 0x0081a600 00000000 00000000 00000000 ]

```

```

Leaf Mnode 1 HW Location: 0x040d3030
Hardware Leaf: PLU Leaf Value
[ 0x8000d800 028842c6 00000000 1fff2000 ]

```

```

FCR 2 TLU Address 0x00210b19 TI 0 AS 6

```

```

VPN Label 1 0

```

```

***** IGP LoadInfo *****
Loadinfo HW Max Index 0
Loadinfo SW Max Index 0
PBTS Loadinfo Attached: No
LI Path [ 0] HFA Info: 0x10204028 FCR: 4
*****

```

```

-----
HW Rx Adjacency 0 Detail:
-----

```

```

  Rx Adj HW Address 0x02040280 (ADJ)
  packets 0 bytes 0
  HFA Bits 0x80 gp 16 mtu 9248 (Fabric MTU) TAG length 0
  OI 0x409 (Tx uidb 0 PPindex 1033)
  OutputQ 0 Output-port 0x0 local-outputq 0x8000

```

```

[ 0x80181040 00002420 00000409 00008000 ]
[ 0x00000000 00000000 00000000 00000000 ]
[ 0x00000000 00000000 00000000 00000000 ]

```

show cef ipv4

To display the IPv4 Cisco Express Forwarding (CEF) table, use the **show cef ipv4** command in XR EXEC mode.

show cef ipv4 [{*prefix* [*mask*]|*interface-type interface-instance*}] [**detail**] [**location** *node-id*]

Syntax Description	
<i>prefix</i>	(Optional) Longest matching CEF entry for the specified IPv4 destination prefix.
<i>mask</i>	(Optional) Exact CEF entry for the specified IPv4 prefix and mask.
<i>interface-type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-instance</i>	Either a physical interface instance or a virtual interface instance: - Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash mark between values is required as part of the notation. <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RSP0) and the module is CPU0. Example: interface MgmtEth0/RSP0 /CPU0/0. - Virtual interface instance. Number range varies depending on interface type. For more information about the syntax for the router, use the question mark (?) online help function.
detail	(Optional) Displays full CEF entry information.
location <i>node-id</i>	(Optional) Displays the IPv4 CEF table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default If the location is not specified, the command defaults to the active RP node.

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines

If you do not specify a node with the **location** keyword and *node-id* argument, this command displays the CEF table on the node in which the command is issued. Otherwise, the command is effective on the node specified by the **location** *node-id* keyword and argument.

Task ID

Task ID	Operations
cef	read

Examples

The following sample output is from the **show cef ipv4** command:

This table describes the significant fields shown in the display.

Table 2: show cef ipv4 Command Field Descriptions

Field	Description
Prefix	Prefix in the IPv4 CEF table.
Next Hop	Next hop of the prefix.
Interface	Interface associated with the prefix.

show cef ipv4 adjacency

To display Cisco Express Forwarding (CEF) IPv4 adjacency status and configuration information, use the **show cef ipv4 adjacency** command in XR EXEC mode.

show cef ipv4 adjacency [*interface-type interface-path-id*] [**location** *node-id*] [**detail**] [**discard**] [**glean**] [**null**] [**punt**] [**remote**] [**protected**]

Syntax Description	<i>interface-type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
	<i>interface-path-id</i>	(Optional) Either a physical interface instance or a virtual interface instance: - Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash mark between values is required as part of the notation. <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. - Virtual interface instance. Number range varies depending on interface type. For more information about the syntax for the router, use the question mark (?) online help function.
	location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	detail	(Optional) Displays the detailed adjacency information.
	discard	(Optional) Filters out and displays only the discarded adjacency information.
	glean	(Optional) Filters out and displays only the glean adjacency information.
	null	(Optional) Filters out and displays only the adjacency information.
	punt	(Optional) Filters out and displays only the punt adjacency information.
	remote	(Optional) Filters out and displays only the remote adjacency information.
	protected	(Optional) Filters out and displays only the IP-Fast Reroute (FRR) protected adjacency information.
Command Default	No default behavior or values	
Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines

If you do not specify a node with the **location** keyword and *node-id* argument, the **show cef ipv4 adjacency** command displays the CEF adjacency table for the node on which the command is issued.

Task ID

Task ID	Operations
cef	read

Examples

The following sample output is from **show cef ipv4 adjacency** command :

```
RP/0/RP0/CPU0:router# show cef ipv4 adjacency tenGigE 0/0/0/0

Display protocol is ipv4
Interface      Address                                     Type      Refcount
Mg0/RSP0/CPU0/0Prefix: 10.25.0.3/32          local      2
Adjacency: PT:0x782a2900 12.25.0.3/32
Interface: Mg0/RSP0/CPU0/0
MAC: 00.d0.02.75.ab.fd.00.11.93.ef.e3.50.08.00
Interface Type: 0x8, Base Flags: 0x1
Dependent adj type: remote
Dependent adj intf: Mg0/RSP0/CPU0/0
Mg0/RSP0/CPU0/0Prefix: 10.24.0.32/32          remote     6
Adjacency: PT:0x782a2b58
Interface: Mg0/RSP0/CPU0/0
MAC: 28.4e.4f.4e.45.29
Interface Type: 0x8, Base Flags: 0x0
```

This table describes the significant fields shown in the display.

Table 3: show cef ipv4 adjacency Command Field Descriptions

Field	Description
Interface	Interface associated with the prefix.
Address	Prefix address information.
Type	Type of adjacency, can be either local or remote.
Refcount	Number of times the adjacency is referenced by other routers.

show cef ipv4 drops

To display IPv4 Cisco Express Forwarding (CEF) table packet drop counters, use the **show cef ipv4 drops** command in XR EXEC mode.

show cef ipv4 drops [**location** *node-id*]

Syntax Description	location <i>node-id</i> (Optional) Displays IPv4 CEF table packet drop counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.				
Command Default	No default behavior or values				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
Usage Guidelines	A packet might be dropped from the IPv4 CEF table because of unresolved CEF entries, unsupported features, absence of route information, absence of adjacency information, or an IP checksum error. If you do not specify a node with the location keyword and <i>node-id</i> argument, this command displays IPv4 CEF packet drop counters for all nodes.				
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>cef</td><td>read</td></tr> </table>	Task ID	Operations	cef	read
Task ID	Operations				
cef	read				

Examples

The following is sample output from the **show cef ipv4 drops** for location command:

```
RP/0/RP0/CPU0:router# show cef ipv4 drops
```

```
CEF Drop Statistics
Node: 0/RP0/CPU0
  Unresolved drops    packets :          0
  Unsupported drops   packets :         61
  Null0 drops         packets :          0
  No route drops      packets :       74026
  No Adjacency drops  packets :          0
  Checksum error drops packets :          0
  RPF drops           packets :          0
  RPF suppressed drops packets :          0
  RP destined drops   packets :          0
  Discard drops       packets :          0
  GRE lookup drops    packets :          0
  GRE processing drops packets :          0
  LISP punt drops     packets :          0
  LISP encap err drops packets :          0
  LISP decap err drops packets :          0
```

Table 4: show cef ipv4 drop Command Field Descriptions

Field	Description
Unresolved drops	Drops due to unresolved routes.
Unsupported drops	Drops due to an unsupported feature.
Null0 drops	Drops to the Null0 interface.
No route drops	Number of packets dropped because there were no routes to the destination.
No Adjacency drops	Number of packets dropped because there were no adjacencies established.
Checksum error drops	Drops due to IPv4 checksum error.
RPF drops	Drops due to IPv4 unicast RPF ¹ .
RPF suppressed drops	Drops suppressed due to IPv4 unicast RPF.
RP destined drops	Drops destined for the router.
Discard drops	Drops those were discarded.
GRE lookup drops	GRE packets dropped during GRE Lookup.
GRE processing drops	GRE packets dropped during GRE Processing.
LISP punt drops	LISP packets dropped during software processing of the packets.
LISP encap err drops	LISP encap packets dropped due to errors.
LISP decap err drops	LISP Decap packets dropped due to errors.

¹ RPF = Reverse Path Forwarding

show cef ipv4 hardware

To display Cisco Express Forwarding (CEF) IPv4 hardware status and configuration information, use the **show cef ipv4 hardware** command in XR EXEC mode.

show cef [**vrf** *vrf-name*] **ipv4 hardware** {**egress**|**ingress** [{**detail**|**location** *node-id*}]}

Syntax Description	vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
	vrf-name	(Optional) Name of a VRF.
	egress	Displays information from the egress packet switch exchange (PSE) file.
	ingress	Displays information from the ingress packet switch exchange (PSE) file.
	detail	(Optional) Displays full details.
	location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
Command Default	No default behavior or values	
Command Modes	XR EXEC mode	
Command History	Release	Modification
	Release 6.0	This command was introduced.
Usage Guidelines	No specific guidelines impact the use of this command.	
Task ID	Task ID	Operations
	cef	read

Examples

The following sample output is from the **show cef ipv4 hardware** command:

```
RP/0/RP0/CPU0:router# sh cef ipv4 hardware egress
```

Prefix	Next Hop	Interface
0.0.0.0/0	7.35.0.1/32	<recursive>
0.0.0.0/32	broadcast	
5.5.5.1/32	receive	Loopback0
7.35.0.0/16	attached	MgmtEth0/RP0/CPU0/0
7.35.0.0/32	broadcast	MgmtEth0/RP0/CPU0/0
7.35.0.1/32	7.35.0.1/32	MgmtEth0/RP0/CPU0/0
7.35.0.2/32	7.35.0.2/32	MgmtEth0/RP0/CPU0/0
7.35.0.3/32	7.35.0.3/32	MgmtEth0/RP0/CPU0/0

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7.35.0.5/32	7.35.0.5/32	MgmtEth0/RP0/CPU0/0
7.35.0.6/32	7.35.0.6/32	MgmtEth0/RP0/CPU0/0
7.35.0.56/32	7.35.0.56/32	MgmtEth0/RP0/CPU0/0
7.35.0.245/32	7.35.0.245/32	MgmtEth0/RP0/CPU0/0
7.35.10.38/32	7.35.10.38/32	MgmtEth0/RP0/CPU0/0
7.35.10.44/32	7.35.10.44/32	MgmtEth0/RP0/CPU0/0
7.35.10.47/32	receive	MgmtEth0/RP0/CPU0/0
7.35.10.74/32	7.35.10.74/32	MgmtEth0/RP0/CPU0/0
7.35.10.113/32	7.35.10.113/32	MgmtEth0/RP0/CPU0/0
7.35.11.22/32	7.35.11.22/32	MgmtEth0/RP0/CPU0/0
7.35.11.27/32	7.35.11.27/32	MgmtEth0/RP0/CPU0/0
7.35.11.32/32	7.35.11.32/32	MgmtEth0/RP0/CPU0/0
7.35.11.78/32	7.35.11.78/32	MgmtEth0/RP0/CPU0/0
7.35.11.111/32	7.35.11.111/32	MgmtEth0/RP0/CPU0/0
7.35.11.112/32	7.35.11.112/32	MgmtEth0/RP0/CPU0/0
7.35.12.11/32	7.35.12.11/32	MgmtEth0/RP0/CPU0/0
7.35.12.23/32	7.35.12.23/32	MgmtEth0/RP0/CPU0/0
7.35.12.24/32	7.35.12.24/32	MgmtEth0/RP0/CPU0/0
7.35.12.29/32	7.35.12.29/32	MgmtEth0/RP0/CPU0/0
7.35.12.30/32	7.35.12.30/32	MgmtEth0/RP0/CPU0/0
7.35.12.44/32	7.35.12.44/32	MgmtEth0/RP0/CPU0/0
7.35.15.83/32	7.35.15.83/32	MgmtEth0/RP0/CPU0/0
7.35.15.84/32	7.35.15.84/32	MgmtEth0/RP0/CPU0/0
7.35.15.86/32	7.35.15.86/32	MgmtEth0/RP0/CPU0/0
7.35.15.92/32	7.35.15.92/32	MgmtEth0/RP0/CPU0/0
7.35.15.93/32	7.35.15.93/32	MgmtEth0/RP0/CPU0/0
7.35.15.95/32	7.35.15.95/32	MgmtEth0/RP0/CPU0/0
7.35.15.96/32	7.35.15.96/32	MgmtEth0/RP0/CPU0/0
7.35.15.97/32	7.35.15.97/32	MgmtEth0/RP0/CPU0/0
7.35.15.98/32	7.35.15.98/32	MgmtEth0/RP0/CPU0/0
7.35.15.103/32	7.35.15.103/32	MgmtEth0/RP0/CPU0/0
7.35.15.119/32	7.35.15.119/32	MgmtEth0/RP0/CPU0/0
7.35.15.123/32	7.35.15.123/32	MgmtEth0/RP0/CPU0/0
7.35.15.133/32	7.35.15.133/32	MgmtEth0/RP0/CPU0/0
7.35.15.173/32	7.35.15.173/32	MgmtEth0/RP0/CPU0/0
7.35.15.175/32	7.35.15.175/32	MgmtEth0/RP0/CPU0/0
7.35.15.178/32	7.35.15.178/32	MgmtEth0/RP0/CPU0/0
7.35.15.179/32	7.35.15.179/32	MgmtEth0/RP0/CPU0/0
7.35.15.188/32	7.35.15.188/32	MgmtEth0/RP0/CPU0/0
7.35.19.124/32	7.35.19.124/32	MgmtEth0/RP0/CPU0/0
7.35.19.127/32	7.35.19.127/32	MgmtEth0/RP0/CPU0/0
7.35.19.180/32	7.35.19.180/32	MgmtEth0/RP0/CPU0/0
7.35.19.181/32	7.35.19.181/32	MgmtEth0/RP0/CPU0/0
7.35.19.182/32	7.35.19.182/32	MgmtEth0/RP0/CPU0/0
7.35.19.183/32	7.35.19.183/32	MgmtEth0/RP0/CPU0/0
7.35.19.201/32	7.35.19.201/32	MgmtEth0/RP0/CPU0/0
7.35.19.205/32	7.35.19.205/32	MgmtEth0/RP0/CPU0/0
7.35.20.157/32	7.35.20.157/32	MgmtEth0/RP0/CPU0/0
7.35.21.156/32	7.35.21.156/32	MgmtEth0/RP0/CPU0/0
7.35.21.212/32	7.35.21.212/32	MgmtEth0/RP0/CPU0/0
7.35.23.59/32	7.35.23.59/32	MgmtEth0/RP0/CPU0/0
7.35.25.48/32	7.35.25.48/32	MgmtEth0/RP0/CPU0/0
7.35.25.77/32	7.35.25.77/32	MgmtEth0/RP0/CPU0/0
7.35.25.100/32	7.35.25.100/32	MgmtEth0/RP0/CPU0/0
7.35.25.101/32	7.35.25.101/32	MgmtEth0/RP0/CPU0/0
7.35.25.102/32	7.35.25.102/32	MgmtEth0/RP0/CPU0/0
7.35.25.107/32	7.35.25.107/32	MgmtEth0/RP0/CPU0/0
7.35.25.148/32	7.35.25.148/32	MgmtEth0/RP0/CPU0/0
7.35.25.198/32	7.35.25.198/32	MgmtEth0/RP0/CPU0/0
7.35.25.210/32	7.35.25.210/32	MgmtEth0/RP0/CPU0/0
7.35.25.223/32	7.35.25.223/32	MgmtEth0/RP0/CPU0/0
7.35.25.232/32	7.35.25.232/32	MgmtEth0/RP0/CPU0/0
7.35.25.233/32	7.35.25.233/32	MgmtEth0/RP0/CPU0/0
7.35.26.107/32	7.35.26.107/32	MgmtEth0/RP0/CPU0/0

7.35.26.188/32	7.35.26.188/32	MgmtEth0/RP0/CPU0/0
7.35.49.94/32	7.35.49.94/32	MgmtEth0/RP0/CPU0/0
7.35.104.155/32	7.35.104.155/32	MgmtEth0/RP0/CPU0/0
7.35.255.255/32	broadcast	MgmtEth0/RP0/CPU0/0
202.153.144.25/32	7.35.0.1/32	MgmtEth0/RP0/CPU0/0
224.0.0.0/4	0.0.0.0/32	
224.0.0.0/24	receive	
255.255.255.255/32	broadcast	

show cef ipv4 exact-route

To display an IPv4 Cisco Express Forwarding (CEF) exact route, use the **show cef ipv4 exact-route** command in XR EXEC mode.

show cef ipv4 exact-route {*source-address destination-address*} [**protocol** *protocol-name*] [**source-port** *source-port*] [**destination-port** *destination-port*] [**ingress-interface** *type interface-path-id*] [*policy-class-value*] [**detail** | **location** *node-id*]

Syntax Description					
<i>source-address</i>	The IPv4 source address in x.x.x.x format.				
<i>destination-address</i>	The IPv4 destination address in x.x.x.x format.				
protocol <i>protocol name</i>	(Optional) Displays the specified protocol for the route.				
source-port <i>source-port</i>	(Optional) Sets the UDP source port. The range is from 0 to 65535.				
destination-port <i>destination-port</i>	(Optional) Sets the UDP destination port. The range is from 0 to 65535.				
ingress-interface	(Optional) Sets the ingress interface.				
<i>type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.				
<i>interface-path-id</i>	Physical interface or virtual interface. Note Use the show interfaces command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.				
policy-class <i>value</i>	(Optional) Displays the class for the policy-based tunnel selection. The range for the tunnel policy class value is from 1 to 7.				
detail	(Optional) Displays full CEF entry information.				
location <i>node-id</i>	(Optional) Displays the IPv4 CEF table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.				
Command Default	No default behavior or values				
Command Modes	XR EXEC mode				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
Usage Guidelines	If the Layer 4 information is enabled, the source-port, destination-port, ingress-interface, and protocol fields are required. Otherwise, the output of the show cef ipv4 exact-route command is not correct.				

Task ID	Task ID	Operations
	cef	read

Examples

The following sample output is from the **show cef ipv4 exact-route** command:

```
RP/0/RP0/CPU0:router# show cef ipv4 exact-route 10.1.1.1 10.1.1.2 detail
0.0.0.0/0, version 432, proxy default, internal 0x2000201[1]
  Prefix Len 0, traffic index 0, precedence routine (0)
    via tenGigE0/RSP0RP1/CPU0/0
```

This table describes the significant fields shown in the display.

Table 5: show cef ipv4 exact-route Command Field Descriptions

Field	Description
Prefix	Prefix in the IPv4 CEF table .
Next Hop	Next hop of the prefix
Interface	Interface associated with the prefix

show cef ipv4 exceptions

To display IPv4 Cisco Express Forwarding (CEF) exception packet counters, use the **show cef ipv4 exceptions** command in .

show cef ipv4 exceptions [**location** *node-id*]

Syntax Description	location <i>node-id</i> (Optional) Displays CEF exception packet counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.				
Command Default	No default behavior or values				
Command Modes					
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
Usage Guidelines	CEF exception packets are those packets that have been sent from the hardware to the software because they require additional handling. The types of IPv4 CEF exception packets are displayed in the command's output and are defined. If you do not specify a node with the location keyword and <i>node-id</i> argument, this command displays IPv4 CEF exception packet counters on all nodes.				
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>cef</td><td>read</td></tr> </table>	Task ID	Operations	cef	read
Task ID	Operations				
cef	read				

Examples

The following is sample output from the **show cef ipv4 exceptions** command:

```
RP/0/# show cef ipv4 exceptions

CEF Exception Statistics
Node: 0/RP0/CPU0
  Slow encap packets :           0
  Unsupported packets :           0
  Redirect packets   :           0
  Receive packets    :           0
  Broadcast packets   :           0
  IP options packets :           0
  TTL expired packets :           0
  Fragmented packets :           0
```

This table describes the significant fields shown in the display.

Table 6: show cef ipv4 exceptions Command Field Descriptions

Field	Description
Slow encap	Number of packets requiring special processing during encapsulation.
Redirect	Number of ICMP ² redirect messages sent.
Receive	Number of packets destined to the router.
Broadcast	Number of broadcasts received.
IP options	Number of IP option packets.
TTL expired	Number of packets with expired TTLs ³ .
Fragmented	Number of packets that have been fragmented.

² ICMP = internet control message protocol

³ TTL = time to live

show cef ipv4 resource

To display the IPv4 nonrecursive prefix entries in the IPv4 Cisco Express Forwarding (CEF) table, use the **show cef ipv4 resource** command in XR EXEC mode.

show cef ipv4 resource [**detail**] [**hardware** {**egress**|**ingress**}] [**location** *node-id*]

Syntax Description	detail	(Optional) Displays detailed information resources listed in the IPv4 CEF table.
	hardware	(Optional) Displays detailed information about hardware.
	egress	(Optional) Displays egress packet switch exchange (PSE).
	ingress	(Optional) Displays ingress packet switch exchange (PSE).
	location <i>node-id</i>	(Optional) Displays the IPv4 resource entries in the IPv4 CEF table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
Command Default	No default behavior or values	
Command Modes	XR EXEC mode	
Command History	Release	Modification
	Release 6.0	This command was introduced.
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, the output displays the IPv4 CEF nonrecursive routes for the node on which the command is issued.	
Task ID	Task ID	Operations
	cef	read

Examples

The following is sample output from the **show cef ipv4 resource** command:

```
RP/0/RP0/CPU0:router# show cef ipv4 resource detail

CEF resource availability summary state: GREEN
  ipv4 shared memory resource:
    CurrMode GREEN, CurrUtil 0%
    CurrAvail 1874526208 bytes, MaxAvail 1875693568 bytes
  ipv6 shared memory resource:
    CurrMode GREEN, CurrUtil 0%
    CurrAvail 1874591744 bytes, MaxAvail 1875365888 bytes
  mpls shared memory resource:
    CurrMode GREEN, CurrUtil 0%
    CurrAvail 1874407424 bytes, MaxAvail 1875038208 bytes
  common shared memory resource:
```

```
      CurrMode GREEN, CurrUtil 0%
      CurrAvail 1873215488 bytes, MaxAvail 1874972672 bytes
TABLE hardware resource: GREEN
LEAF hardware resource: GREEN
LOADINFO hardware resource: GREEN
NHINFO hardware resource: GREEN
LABEL_INFO hardware resource: GREEN
IDB hardware resource: GREEN
FRR_NHINFO hardware resource: GREEN
LDSh_ARRAY hardware resource: GREEN
Rsrc_MON hardware resource: GREEN
```

show cef ipv4 summary

To display a summary of the IPv4 Cisco Express Forwarding (CEF) table, use the **show cef ipv4 summary** command in XR EXEC mode.

show cef ipv4 summary [**location** *node-id*]

Syntax Description	location <i>node-id</i> (Optional) Displays a summary of the IPv4 CEF table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.				
Command Default	No default behavior or values				
Command Modes	XR EXEC mode				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, this command displays a summary of the IPv4 CEF table for the node on which the command is issued.				
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>cef</td><td>read</td></tr> </table>	Task ID	Operations	cef	read
Task ID	Operations				
cef	read				
Examples	The following sample output is from the show cef ipv4 summary command:				

```
RP/0/RP0/CPU0:router# show cef ipv4 summary
Router ID is
10
0
.0.0.0

IP CEF with switching (Table Version 0)

Load balancing: L3
Tableid 0xe0000000, Vrfid 0x60000000, Vrid 0x20000000, Flags 0x301
Vrfname default, Refcount 367
193 routes, 0 reresolve, 0 unresolved (0 old, 0 new), 13896 bytes
204 load sharing elements, 51904 bytes, 154 references
17 shared load sharing elements, 5536 bytes
187 exclusive load sharing elements, 46368 bytes
0 CEF route update drops, 175 revisions of existing leaves
Resolution Timer: 15s
0 prefixes modified in place
0 deleted stale prefixes
16 prefixes with label imposition, 51 prefixes with label information
Adjacency Table has 44 adjacencies
1 incomplete adjacency
```

This table describes the significant fields shown in the display.

Table 7: show cef ipv4 summary Command Field Descriptions

Field	Description
Load balancing	Current load-balancing mode. The default value is L3.
Table Version	Version of the CEF table.
tableid	Table identification number.
vrfid	VPN routing and forwarding (VRF) identification (vrfid) number.
vrfname	VRF name.
vrid	Virtual router identification (vrid) number.
flags	Option value for the table
routes	Total number of routes.
reresolve	Total number of routes being reresolved.
unresolved (<i>x</i> old, <i>x</i> new)	Number of routes not yet resolved.
load sharing elements	Total number of internal load-sharing data structures.
bytes	Total memory used by internal load sharing data structures.
references	Total reference count of all internal load sharing data structures.
CEF resets	Number of CEF table resets.
revisions of existing leaves	Number of updates to existing prefixes.
Exponential (currently <i>xs</i> , peak <i>xs</i>)	Currently not used.
prefixes modified in place	Prefixes modified in place.
Adjacency Table has <i>x</i> adjacencies	Total number of adjacencies.
<i>x</i> incomplete adjacency	Total number of incomplete adjacencies.

show cef ipv4 unresolved

To display unresolved routes in the IPv4 Cisco Express Forwarding (CEF) table, use the **show cef ipv4 unresolved** command in XR EXEC mode.

show cef ipv4 unresolved [**detail**] [**hardware** {**egress**|**ingress**}] [**location** *node-id*]

Syntax Description	detail	(Optional) Displays detailed information unresolved routes listed in the IPv4 CEF table.
	hardware	(Optional) Displays detailed information about hardware.
	egress	(Optional) Displays egress packet switch exchange (PSE).
	ingress	(Optional) Displays ingress packet switch exchange (PSE).
	location <i>node-id</i>	(Optional) Displays the unresolved routes in the IPv4 CEF table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines If you do not specify a node with the **location** keyword and *node-id* argument, the output displays the unresolved routes for the node on which the command is issued.

Task ID	Task ID	Operations
	cef	read

Examples The following is sample output from the **show cef ipv4 unresolved** command when an unresolved route is detected:

```
RP/0/RP0/CPU0:router# show cef ipv4 unresolved

Prefix          Next Hop          Interface
10.3.3.3         102.2.2.2         ?
```

This table describes the significant fields shown in the display.

Table 8: show cef ipv4 unresolved Command Field Descriptions

Field	Description
Prefix	Prefix of the unresolved CEF.
Next Hop	Next hop of the unresolved CEF.
Interface	Next hop interface. A question mark (?) indicates that the interface has not been resolved.

show cef ipv6

To display the IPv6 Cisco Express Forwarding (CEF) table, use the **show cef ipv6** command in XR EXEC mode.

show cef] ipv6 [*interface-type interface-number* | *ipv6-prefix/prefix-length*] [**detail**] [**location***node-id*]

Syntax Description	<i>interface-type interface-number</i>	(Optional) IPv6 prefixes going through the specified next hop interface.
	<i>ipv6-prefix/prefix-length</i>	(Optional) Longest prefix entry in the CEF table matching the specified IPv6 prefix and prefix length.
	detail	(Optional) Displays detailed IPv6 CEF table information.
	location <i>node-id</i>	(Optional) Displays the IPv6 CEF table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines If you do not specify a node with the **location** keyword and *node-id* argument, this command displays the IPv6 CEF table for the node on which the command is issued.

Task ID	Task ID	Operations
	cef	read

Examples

The following sample output is from the **show cef ipv6** command:

```
RP/0/RP0/CPU0:router# show cef ipv6

::/0

::/128
  drop
::1/128
  loopback
66::4/128
  receive      Loopback0
2222::/64
  connected   tenGigE0/0/0/4
2222::1/128
  receive     tenGigE0/0/0/4
```

```

3333::/64
  connected tenGigE0/0/0/3
3333::2/128
  receive tenGigE0/0/0/3
5656::2/128
  recursive fe80::3031:48ff:fe53:5533, tenGigE0/0/0/3
7777::/64
  connected tenGigE0/0/0/0
7777::2/128
  receive tenGigE0/0/0/0
9999::1/128
  recursive fe80::205:5fff:fe1d:7600, tenGigE0/0/0/4
ff00::/8
  drop
ff02::1/128
  receive
ff02::2/128
  receive
ff02::5/128
  receive
ff02::6/128
  receive
ff02::1:ff00:0/104
  receive

```

This table describes the significant fields shown in the display.

Table 9: show cef ipv6 Command Field Descriptions

Field	Description
drop	Indicates that packets sent to the destination prefix are dropped.
loopback	Indicates that the prefix points to a loopback address. Packets sent to loopback addresses are dropped.
receive	Indicates that the prefix is configured on one of the router interfaces. Packets sent to those prefixes are received by the router.
connected	Indicates that the prefix points to a directly connected next-hop interface.
recursive	Indicates that the prefix is not directly connected but is reachable through the next-hop prefix displayed.

The following sample output is from the **show cef ipv6** with the **detail** keyword:

```
RP/0/RP0/CPU0:router# show cef ipv6 detail
```

```

::/0
  flags: source_rib
  Loadinfo owner: <this route>
  fast adj: glean
  path 1:
    flags      :
    next hop   : ::
    interface  :
  tenGigE/0/0/0
::/128

```

```

flags: drop, source_fib
Loadinfo owner: <this route>
fast adj: drop
path 1:
  flags      :
  next hop   : ::
  interface  : <not specified>

::1/128
flags: loopback, source_fib
Loadinfo owner: <this route>
fast adj: loopback
path 1:
  flags      :
  next hop   : ::
  interface  : <not specified>

66::4/128
flags: receive, source_rib
Loadinfo owner: <this route>
fast adj: receive
path 1:
  flags      : point-to-point
  next hop   : ::
  interface  : Loopback0

```

This table describes the significant output fields shown in the display.

Table 10: show cef ipv6 detail Command Field Descriptions

Field	Description
flags:	Properties of the indicated prefix.
Loadinfo owner:	Owner of the Loadinfo used by the prefix for forwarding. The Loadinfo owner is the prefix that owns the array of pointers to adjacencies.
fast adj:	Cached adjacency used for forwarding.
path 1:	The following three items are displayed below path 1: • flags—Properties of the path. • next hop—Next-hop prefix if the packet is being forwarded. • interface—Next-hop interface if the packet is being forwarded.

show cef ipv6 adjacency

To display Cisco Express Forwarding (CEF) IPv6 adjacency status and configuration information, use the **show cef ipv6 adjacency** command in XR EXEC mode.

show cef ipv6 adjacency [*interface-type interface-path-id*] [**location** *node-id*] [**detail**] [**discard**] [**glean**] [**null**] [**punt**] [**remote**]

Syntax Description	<i>interface-type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
	<i>interface- path-id</i>	(Optional) Either a physical interface instance or a virtual interface instance: - Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash mark between values is required as part of the notation. <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RSP0) and the module is CPU0. Example: interface MgmtEth0/RSP0 /CPU0/0. - Virtual interface instance. Number range varies depending on interface type. For more information about the syntax for the router, use the question mark (?) online help function.
	location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	detail	(Optional) Displays the detailed adjacency information.
	discard	(Optional) Filters out and displays only the discarded adjacency information.
	glean	(Optional) Filters out and displays only the glean adjacency information.
	null	(Optional) Filters out and displays only the null adjacency information.
	punt	(Optional) Filters out and displays only the punt adjacency information.
	remote	(Optional) Filters out and displays only the remote adjacency information.

Command Default No default behavior or values

Command Modes XR EXEC mode

show cef ipv6 adjacency

Command History

Release Modification

Release	Modification
6.0	This command was introduced.

Usage Guidelines

If you do not specify a node with the **location** keyword and *node-id* argument, this command displays the CEF adjacency table for the node on which the command is issued.

Task ID

Task ID Operations

Task ID	Operations
cef	read

Examples

The following sample output is from the **show cef ipv6 adjacency** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 adjacency
```

```
Display protocol is ipv6
```

Interface	Address	Type	RefCount
-----------	---------	------	----------

Te0/0/0/9		special	2
-----------	--	---------	---

```
Interface: Te0/0/0/9 Type: glean
Interface Type: 0x1e, Base Flags: 0x220 (0x8a796038)
Nhinfo PT: 0x8a796038, IdB PT: 0x8a3e09a0, If Handle: 0x8000088
Dependent adj type: remote (0x8c34c238)
Dependent adj intf: Te0/0/0/9
Ancestor If Handle: 0x0
Update time Dec 19 06:43:23.354
```

Te0/0/0/9	Prefix: 9::2/128	local	3
-----------	------------------	-------	---

```
Adjacency: PT:0x88155c18 9::2/128
Interface: Te0/0/0/9
NHID: 0x0
MAC: 10.f3.11.25.39.5b.28.c7.ce.01.ec.20.86.dd
Interface Type: 0x1e, Base Flags: 0x1 (0x8c39e238)
Nhinfo PT: 0x8c39e238, IdB PT: 0x8a3e09a0, If Handle: 0x8000088
Dependent adj type: remote (0x8c34c238)
Dependent adj intf: Te0/0/0/9
Ancestor If Handle: 0x0
Update time Dec 19 06:44:49.548
```

Te0/0/0/9	Prefix: fe80::12f3:11ff:fe25:395b/128	local	3
-----------	---------------------------------------	-------	---

```
Adjacency: PT:0x881559c8 fe80::12f3:11ff:fe25:395b/128
Interface: Te0/0/0/9
NHID: 0x0
MAC: 10.f3.11.25.39.5b.28.c7.ce.01.ec.20.86.dd
Interface Type: 0x1e, Base Flags: 0x1 (0x8c39e568)
Nhinfo PT: 0x8c39e568, IdB PT: 0x8a3e09a0, If Handle: 0x8000088
Dependent adj type: remote (0x8c34c238)
Dependent adj intf: Te0/0/0/9
Ancestor If Handle: 0x0
Update time Dec 19 06:44:59.553
```

Te0/0/0/8		special	2
-----------	--	---------	---

```
Interface: Te0/0/0/8 Type: glean
```

```

Interface Type: 0x1e, Base Flags: 0x220 (0x8a795ea8)
Nhinfo PT: 0x8a795ea8, IdB PT: 0x8a3e0920, If Handle: 0x8000080
Dependent adj type: remote (0x8c34c0a0)
Dependent adj intf: Te0/0/0/8
Ancestor If Handle: 0x0
Update time Dec 19 06:43:23.351

```

```

Te0/0/0/8    Prefix: 8::2/128                                local    3
Adjacency: PT:0x88155e68 8::2/128
Interface: Te0/0/0/8
NHID: 0x0
MAC: 10.f3.11.25.39.5a.28.c7.ce.01.ec.1f.86.dd
Interface Type: 0x1e, Base Flags: 0x1 (0x8c39e0a0)
Nhinfo PT: 0x8c39e0a0, IdB PT: 0x8a3e0920, If Handle: 0x8000080
Dependent adj type: remote (0x8c34c0a0)
Dependent adj intf: Te0/0/0/8
Ancestor If Handle: 0x0
Update time Dec 19 06:44:46.155

```

```

Te0/0/0/8    Prefix: fe80::12f3:11ff:fe25:395a/128          local    3
Adjacency: PT:0x88155d40 fe80::12f3:11ff:fe25:395a/128
Interface: Te0/0/0/8
NHID: 0x0
MAC: 10.f3.11.25.39.5a.28.c7.ce.01.ec.1f.86.dd
Interface Type: 0x1e, Base Flags: 0x1 (0x8c39e3d0)
Nhinfo PT: 0x8c39e3d0, IdB PT: 0x8a3e0920, If Handle: 0x8000080
Dependent adj type: remote (0x8c34c0a0)
Dependent adj intf: Te0/0/0/8
Ancestor If Handle: 0x0
Update time Dec 19 06:44:56.154

```

This is a sample output from the **show cef ipv6 adjacency remote detail** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 adjacency remote detail location 0/RP0/CPU0
```

```

Display protocol is ipv6
Interface      Address                                     Type      Refcount

Te0/2/0/3      Ifhandle: 0x8000240                                remote    2
Adjacency: PT:0xa1bed9e4
Interface: Te0/2/0/3
Interface Type: 0x0, Base Flags: 0x0 (0xa55f3114)
Nhinfo PT: 0xa55f3114, IdB PT: 0xa2d850d8, If Handle: 0x8000240
Ancestor If Handle: 0x0

tt103          Ifhandle: 0x120                                remote    1
no next-hop adj
Interface: NULLIFHNDL
tunnel adjacency
Interface Type: 0x24, Base Flags: 0x200 (0xa61ddc30)
Nhinfo PT: 0xa61ddc30, IdB PT: 0xa2d851d8, If Handle: 0x120
Ancestor If Handle: 0x0

tt2993         Ifhandle: 0xf9a0                                remote    1
no next-hop adj
Interface: NULLIFHNDL
tunnel adjacency
Interface Type: 0x24, Base Flags: 0x200 (0xa65634f0)
Nhinfo PT: 0xa65634f0, IdB PT: 0xa2d94a58, If Handle: 0xf9a0

```

show cef ipv6 adjacency

```

Ancestor If Handle: 0x0

tt2994      Ifhandle: 0xf9e0                      remote  1
            no next-hop adj
            Interface: NULLIFHNDL
            tunnel adjacency
            Interface Type: 0x24, Base Flags: 0x200 (0xa65641e0)
            Nhinfo PT: 0xa65641e0, Idb PT: 0xa2d94a98, If Handle: 0xf9e0
            Ancestor If Handle: 0x0

tt2995      Ifhandle: 0xfa20                      remote  1
            no next-hop adj
            Interface: NULLIFHNDL
            tunnel adjacency
            Interface Type: 0x24, Base Flags: 0x200 (0xa6564350)
            Nhinfo PT: 0xa6564350, Idb PT: 0xa2d94ad8, If Handle: 0xfa20
            Ancestor If Handle: 0x0
```

show cef ipv6 adjacency hardware

To display Cisco Express Forwarding (CEF) IPv6 adjacency hardware status and configuration information, use the **show cef ipv6 adjacency hardware** command in XR EXEC mode.

show cef ipv6 adjacency hardware {egress|ingress} [{detail|discard|drop|glean|location *node-id*|null|punt|remote}]

Syntax Description		
egress		Displays information from the egress packet switch exchange (PSE) file.
ingress		Displays information from the ingress packet switch exchange (PSE) file.
detail		(Optional) Displays full details.
discard		(Optional) Displays the discard adjacency information.
drop		(Optional) Displays the drop adjacency information.
glean		(Optional) Displays the glean adjacency information.
location	<i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
null		(Optional) Displays the null adjacency information.
punt		(Optional) Displays the punt adjacency information.
remote		(Optional) Displays the remote adjacency information.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

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

Task ID	Task ID	Operations
	cef	read

Examples The following sample output is from the **show cef ipv6 adjacency hardware** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 adjacency hardware egress
```

show cef ipv6 adjacency hardware

```

Display protocol is ipv6
Interface      Address                                     Type      Refcount

Te0/0/0/9                                           special 2
    Interface: Te0/0/0/9 Type: glean
    Interface Type: 0x1e, Base Flags: 0x220 (0x8a796038)
    Nhinfo PT: 0x8a796038, Idb PT: 0x8a3e09a0, If Handle: 0x8000088
    Dependent adj type: remote (0x8c34c238)
    Dependent adj intf: Te0/0/0/9
    Ancestor If Handle: 0x0
    Update time Dec 19 06:43:23.354

Show-data Print at RPLC

RX H/W Result on NP:10 [Adj ptr:0x40 (BE)]:
Rx-Adj is NOT required on this platform

TX H/W Result for NP:10 (index: 0x186ac (BE)):
```

```

Next Hop Data
Next Hop Valid:      YES
Next Hop Index:      100012
Egress Next Hop IF:  100012
Hw Next Hop Intf:    0
HW Port:             0
Next Hop Flags:      DISCARD PUNT
Next Hop MAC:        0000.0000.0000

Te0/0/0/9      Prefix: 9::2/128                                     local  3
    Adjacency: PT:0x88155c18 9::2/128
    Interface: Te0/0/0/9
    NHID: 0x0
    MAC: 10.f3.11.25.39.5b.28.c7.ce.01.ec.20.86.dd
    Interface Type: 0x1e, Base Flags: 0x1 (0x8c39e238)
    Nhinfo PT: 0x8c39e238, Idb PT: 0x8a3e09a0, If Handle: 0x8000088
    Dependent adj type: remote (0x8c34c238)
    Dependent adj intf: Te0/0/0/9
    Ancestor If Handle: 0x0
    Update time Dec 19 06:44:49.548

Show-data Print at RPLC

TX H/W Result for NP:0 (index: 0x186bd (BE)):
```

```

Next Hop Data
Next Hop Valid:      YES
Next Hop Index:      100029
Egress Next Hop IF:  100028
Hw Next Hop Intf:    15
HW Port:             10
Next Hop Flags:      COMPLETE
Next Hop MAC:        10f3.1125.395b

NHINDEX H/W Result for NP:0 (index: 0 (BE)):
```

```

NhIndex is NOT required on this platform

NHINDEX STATS: pkts 0, bytes 0 (all NPs combined, no stats)

RX H/W Result on NP:0 [Adj ptr:0x40 (BE)]:
Rx-Adj is NOT required on this platform

```

```
Te0/0/0/9    Prefix: fe80::12f3:11ff:fe25:395b/128          local    3
Adjacency: PT:0x881559c8 fe80::12f3:11ff:fe25:395b/128
Interface: Te0/0/0/9
NHID: 0x0
MAC: 10.f3.11.25.39.5b.28.c7.ce.01.ec.20.86.dd
Interface Type: 0x1e, Base Flags: 0x1 (0x8c39e568)
Nhinfo PT: 0x8c39e568, Idb PT: 0x8a3e09a0, If Handle: 0x8000088
Dependent adj type: remote (0x8c34c238)
Dependent adj intf: Te0/0/0/9
Ancestor If Handle: 0x0
Update time Dec 19 06:44:59.554
```

Show-data Print at RPLC

TX H/W Result for NP:0 (index: 0x186bf (BE)):

```
Next Hop Data
Next Hop Valid:      YES
Next Hop Index:      100031
Egress Next Hop IF:  100030
Hw Next Hop Intf:    15
HW Port:             10
Next Hop Flags:      COMPLETE
Next Hop MAC:        10f3.1125.395b
```

NHINDEX H/W Result for NP:0 (index: 0 (BE)):
NhIndex is NOT required on this platform

NHINDEX STATS: pkts 0, bytes 0 (all NPs combined, no stats)

RX H/W Result on NP:0 [Adj ptr:0x40 (BE)]:
Rx-Adj is NOT required on this platform

show cef ipv6 drops

To display IPv6 Cisco Express Forwarding (CEF) table packet drop counters, use the **show cef ipv6 drops** command in XR EXEC mode.

show cefipv6 drops [**location** *node-id*]

Syntax Description	location <i>node-id</i> (Optional) Displays IPv6 CEF table packet drop counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.				
Command Default	No default behavior or values				
Command Modes	XR EXEC mode				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
Usage Guidelines	A packet might be dropped by the IPv6 CEF table because of unresolved CEF entries, unsupported features, absence of route information, absence of adjacency information, or an IP checksum error. If you do not specify a node with the location keyword and <i>node-id</i> argument, this command displays the packet drops for all nodes.				
					
Note	Because no hardware forwarding occurs on the route processor (RP), no packet drop information is displayed for that node.				
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>cef</td><td>read</td></tr> </table>	Task ID	Operations	cef	read
Task ID	Operations				
cef	read				
Examples	The following is sample output from the show cef ipv6 drops command: <pre>RP/0/RP0/CPU0:router# show cef ipv6 drops location 0/RP0/CPU0 CEF Drop Statistics Node: 0/RP0/CPU0 Unresolved drops packets : 0 Unsupported drops packets : 0 Null0 drops packets : 0 No route drops packets : 0 No Adjacency drops packets : 0 Checksum error drops packets : 0 RPF drops packets : 0 RPF suppressed drops packets : 0</pre>				

```

RP destined drops    packets :          0
Discard drops        packets :          0
GRE lookup drops     packets :          0
GRE processing drops packets :          0
LISP punt drops      packets :          0
LISP encap err drops packets :          0
LISP decap err drops packets :          0

```

Table 11: show cef ipv6 drops Command Field Descriptions

Field	Description
Unresolved drops	Drops due to unresolved routes.
Unsupported drops	Drops due to an unsupported feature.
Null0 drops	Drops to the Null0 interface.
No route drops	Number of packets dropped because there were no routes to the destination.
No Adjacency drops	Number of packets dropped because there were no adjacencies established.
Checksum error drops	Drops due to IPv6 checksum error.
RPF drops	Drops due to IPv6 unicast RPF ⁴ .
RPF suppressed drops	Drops suppressed due to IPv6 unicast RPF.
RP destined drops	Drops destined for the router.
Discard drops	Drops those were discarded
GRE lookup drops	GRE packets dropped during GRE Lookup.
GRE processing drops	GRE packets dropped during GRE Processing.
LISP punt drops	LISP packets dropped during software processing of the packets.
LISP encap err drops	LISP encap packets dropped due to errors.
LISP decap err drops	LISP Decap packets dropped due to errors.

⁴ RPF = Reverse Path Forwarding

show cef ipv6 exact-route

To display the path an IPv6 flow comprising a source and destination address would take, use the **show cef ipv6 exact-route** command in XR EXEC mode.

show cef ipv6 exact-route {*source-address destination-address* } [**protocol** *protocol name*] [**source-port** *source-port*] [**destination-port** *destination-port*] [**ingress-interface** *type interface-path-id*] [**policy-class** *value*] [**detail** | **location** *node-id*]

Syntax Description		
<i>source-address</i>		The IPv6 source address in x:x::x format.
<i>destination-address</i>		The IPv6 destination address in x:x::x format.
protocol <i>protocol name</i>		(Optional) Displays the specified protocol for the route.
source-port <i>source-port</i>		(Optional) Sets the UDP source port. The range is from 0 to 65535.
destination-port <i>destination-port</i>		(Optional) Sets the UDP destination port. The range is from 0 to 65535.
ingress-interface		(Optional) Sets the ingress interface.
<i>type</i>		(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>		Physical interface or virtual interface.
	Note	Use the show interfaces command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (?) online help function.
policy-class <i>value</i>		(Optional) Displays the class for the policy-based tunnel selection. The range for the tunnel policy class value is from 1 to 7.
detail		(Optional) Displays full CEF entry information.

location *node-id*

(Optional) Displays the IPv6 CEF table for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines

If the Layer 4 information is enabled, the source-port, destination-port, protocol, and ingress-interface fields are required. Otherwise, the output of the **show cef ipv6 exact-route** command is not correct.

Task ID

Task ID	Operations
cef	read

Examples

The following sample output is from the **show cef ipv6 exact-route** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 exact-route 222::2 9999::6751 location
0/RP0/CPU0 source address: 222::2 destination address: 9999::6751
interface : tenGigE 0/0/0/3 non local interface
```

show cef ipv6 exceptions

To display IPv6 Cisco Express Forwarding (CEF) exception packet counters, use the **show cef ipv6 exceptions** command in XR EXEC mode.

show cef ipv6 exceptions [*location node-id*]

Syntax Description	location node-id (Optional) Displays IPv6 CEF exception packet counters for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
---------------------------	---

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

Command Modes	XR EXEC mode
----------------------	--------------

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines	CEF exception packets are those packets that have been sent from the hardware to the software because they require additional handling. The types of IPv6 CEF exception packets are displayed in the output of show cef ipv6 exceptions .
-------------------------	--

If you do not specify a node with **location** keyword and *node-id* argument, this command displays IPv6 CEF exception packet counters for all nodes.

Task ID	Task ID	Operations
	cef	read

Examples

The following is sample output from the **show cef ipv6 exceptions** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 exceptions location 0/RP0/CPU0
```

```
CEF Exception Statistics
Node: 0/RP0/CPU0
  Slow encap packets :          0
  Unsupported packets :          0
  Redirect packets   :          0
  Receive packets    :          0
  Broadcast packets   :          0
  IP options packets :          0
  TTL expired packets :          0
  Fragmented packets :          0
```

This table describes the significant fields shown in the display.

Table 12: show cef ipv6 exceptions Command Field Descriptions

Field	Description
Slow encap	Number of packets requiring special processing during encapsulation.
Redirect	Number of ICMP ⁵ redirect messages sent.
Receive	Number of packets destined to the router.
Broadcast	Number of broadcasts received.
IP options	Number of IP option packets.
TTL expired	Number of packets with expired TTLs ⁶ .
Fragmented	Number of packets that have been fragmented.

⁵ ICMP = internet control message protocol

⁶ TTL = time to live

show cef ipv6 hardware

To display Cisco Express Forwarding (CEF) IPv6 hardware status and configuration information, use the **show cef ipv6 hardware** command in XR EXEC mode.

show cef ipv6 hardware {egress|ingress [{detail|location *node-id*}]}

Syntax Description	egress	Displays information from the egress packet switch exchange (PSE) file.
	ingress	Displays information from the ingress packet switch exchange (PSE) file.
	detail	(Optional) Displays full details.
	location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

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

Task ID	Task ID	Operations
	cef	read

Examples

The following sample output displays the full details from the **show cef ipv6 hardware** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 hardware egress detail

::/0, version 0, proxy default, default route handler, drop adjacency, internal
Prefix Len 0, traffic index 0, precedence routine (0)
gateway array (0x0) reference count 1, flags 0x4000, source 4,
[0 type 3 flags 0x109000 (0x7895114c) ext 0x0 (0x0)]
LW-LDI[type=3, refc=1, ptr=0x78a7d0dc, sh-ldi=0x7895114c]
via point2point, 0 dependencies, weight 0, class 0
next hop point2point
drop adjacency

Load distribution: 0 (refcount 0)

Hash OK Interface Address
0 Y Unknown drop
ff02::/16, version 0, receive
```

```
Prefix Len 16  
ff02::2/128, version 0, receive  
Prefix Len 128  
ff02::1:ff00:0/104, version 0, receive  
Prefix Len 104
```

show cef ipv6 interface

To display IPv6 Cisco Express Forwarding (CEF)-related information for an interface, use the **show cef ipv6 interface** command in XR EXEC mode.

show cef ipv6 interface *type interface-path-id* [**detail**] [**location** *node-id*] [**rpf-drop**]

Syntax Description	<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
	<i>interface-path-id</i>	Physical interface or virtual interface.
	Note	Use the show interfaces command to see a list of all interfaces currently configured on the router.
		For more information about the syntax for the router, use the question mark (?) online help function.
	detail	(Optional) Displays detailed CEF information for all the interfaces on the node in which the command is issued.
	location <i>node-id</i>	(Optional) Displays IPv4 CEF-related information for an interface. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
	rpf-drop	(Optional) Displays information about the drops due to IPv6 unicast RPF.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines If you do not specify a node with the **location** keyword and *node-id* argument, the **show cef ipv6 interface** command displays the CEF-related information for the interface on the route processor.

Task ID	Task ID	Operations
	cef	read

Examples The following sample output is from the **show cef ipv6 interface** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 interface

fib_show_interface
created item name: 1000/protocol/1/vrf/default/interface-info/1/
Bundle-Ether5.2 is down if_handle 0x0800002c if_type IFT_VLAN_SUBIF(0x19)
    idb info 0x898ecfa0 flags 0x48001 ext 0x8c38b488 flags 0x10
```

```
Vrf Local Info (0x0)
Interface last modified Dec 15, 2015 16:15:28, modify
Reference count 1   Next-Hop Count 0
Forwarding is disabled
ICMP redirects are never sent
ICMP unreachableables are enabled
Protocol MTU 9202, TableId 0xe0800000(0x8a1ce6c8)
Protocol Reference count 1
Primary IPV6 local address NOT PRESENT
Bundle-Ether5.1 is down if_handle 0x08000024 if_type IFT_VLAN_SUBIF(0x19)
  idb info 0x898ecf20 flags 0x48001 ext 0x8c38b338 flags 0x10
  Vrf Local Info (0x0)
  Interface last modified Dec 15, 2015 16:15:28, modify
  Reference count 1   Next-Hop Count 0
  Forwarding is disabled
  ICMP redirects are never sent
  ICMP unreachableables are enabled
  Protocol MTU 9202, TableId 0xe0800000(0x8a1ce6c8)
  Protocol Reference count 1
  Primary IPV6 local address NOT PRESENT
Loopback0 is up if_handle 0x0800001c if_type IFT_LOOPBACK(0x10)
  idb info 0x898ecda0 flags 0x8061 ext 0x0
  Vrf Local Info (0x0)
  Interface last modified Dec 14, 2015 17:24:58, modify
  Interface is marked as point to point interface
  Interface is marked as loopback interface
  Reference count 1   Next-Hop Count 0
  Protocol Reference count 0
  Protocol ipv6 not configured or enabled on this card
  Primary IPV6 local address NOT PRESENT
Bundle-Ether5 is down if_handle 0x08000014 if_type IFT_ETHERBUNDLE(0x1c)
  idb info 0x898ecd20 flags 0x48001 ext 0x8c38b1e8 flags 0x10
  Vrf Local Info (0x0)
  Interface last modified Dec 15, 2015 16:15:28, modify
  Reference count 1   Next-Hop Count 0
  Forwarding is disabled
  ICMP redirects are never sent
  ICMP unreachableables are enabled
  Protocol MTU 9202, TableId 0xe0800000(0x8a1ce6c8)
  Protocol Reference count 1
  Primary IPV6 local address NOT PRESENT
TenGigE0/0/0/79 is down if_handle 0x080002b8 if_type IFT_TENGETHERNET(0x1e)
  idb info 0x898ecca0 flags 0x8001 ext 0x0
  Vrf Local Info (0x0)
  Interface last modified Dec 14, 2015 17:24:58, modify
  Reference count 1   Next-Hop Count 0
  Protocol Reference count 0
  Protocol ipv6 not configured or enabled on this card
  Primary IPV6 local address NOT PRESENT
TenGigE0/0/0/78 is down if_handle 0x080002b0 if_type IFT_TENGETHERNET(0x1e)
  idb info 0x898ecc20 flags 0x8001 ext 0x0
  Vrf Local Info (0x0)
  Interface last modified Dec 14, 2015 17:24:58, modify
  Reference count 1   Next-Hop Count 0
  Protocol Reference count 0
  Protocol ipv6 not configured or enabled on this card
  Primary IPV6 local address NOT PRESENT
TenGigE0/0/0/77 is down if_handle 0x080002a8 if_type IFT_TENGETHERNET(0x1e)
  idb info 0x898ecba0 flags 0x8001 ext 0x0
  Vrf Local Info (0x0)
  Interface last modified Dec 14, 2015 17:24:58, modify
  Reference count 1   Next-Hop Count 0
  Protocol Reference count 0
  Protocol ipv6 not configured or enabled on this card
```

```
show cef ipv6 interface
```

```
Primary IPV6 local address NOT PRESENT
```

show cef ipv6 resource

To display the IPv6 nonrecursive prefix entries in the IPv6 Cisco Express Forwarding (CEF) table, use the **show cef ipv6 resource** command in XR EXEC mode.

show cef ipv6 resource [**detail**] [**hardware** {**egress**|**ingress**}] [**location** *node-id*]

Syntax Description	detail	(Optional) Displays detailed information resources listed in the IPv6 CEF table.
	hardware	(Optional) Displays Cisco Express Forwarding (CEF) IPv6 hardware status and configuration information.
	egress	(Optional) Displays information from the egress packet switch exchange (PSE) file.
	ingress	(Optional) Displays information from the ingress packet switch exchange (PSE) file.
	location <i>node-id</i>	(Optional) Displays the IPv6 resource entries in the IPv6 CEF table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
Command Default	No default behavior or values	
Command Modes	XR EXEC mode	
Command History	Release	Modification
	Release 6.0	This command was introduced.
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, the output displays the IPv6 CEF nonrecursive routes for the node on which the command is issued.	
Task ID	Task ID	Operations
	cef	read

Examples

The following is sample output from the **show cef ipv6 resource** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 resource

CEF resource availability summary state: GREEN
  ipv4 shared memory resource: GREEN
  ipv6 shared memory resource: GREEN
  mpls shared memory resource: GREEN
  common shared memory resource: GREEN
  TABLE hardware resource: GREEN
  LEAF hardware resource: GREEN
  LOADINFO hardware resource: GREEN
  NHINFO hardware resource: GREEN
  LABEL_INFO hardware resource: GREEN
  IDB hardware resource: GREEN
```

show cef ipv6 resource

```
FRR_NHINFO hardware resource: GREEN
LDSH_ARRAY hardware resource: GREEN
RSRC_MON hardware resource: GREEN
```

show cef ipv6 summary

To display a summary of the IPv6 Cisco Express Forwarding (CEF) table, use the **show cef ipv6 summary** command in XR EXEC mode.

show cef ipv6 summary [**location** *node-id*]

Syntax Description	location <i>node-id</i> (Optional) Displays a summary of the IPv6 CEF table for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.				
Command Default	No default behavior or values				
Command Modes	XR EXEC mode				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, this command displays a summary of the IPv6 CEF table for the node on which the command is issued.				
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>cef</td><td>read</td></tr> </table>	Task ID	Operations	cef	read
Task ID	Operations				
cef	read				

Examples

The following is sample output from the **show cef ipv6 summary** command:

```
RP/0/RP0/CPU0:router# show cef ipv6 summary
```

```
IP CEF with switching (Table Version 0)
```

```

Load balancing: L3
Tableid 0xe0800000, Vrfid 0x60000000, Vrid 0x20000000, Flags 0x301
Vrfname default, Refcount 12
4 routes, 0 reresolve, 0 unresolved (0 old, 0 new), 288 bytes
0 load sharing elements, 0 bytes, 0 references
0 shared load sharing elements, 0 bytes
0 exclusive load sharing elements, 0 bytes
0 CEF route update drops, 0 revisions of existing leaves
Resolution Timer: 15s
0 prefixes modified in place
0 deleted stale prefixes
0 prefixes with label imposition, 0 prefixes with label information
Adjacency Table has 44 adjacencies
1 incomplete adjacency
```

This table describes the significant fields shown in the display.

Table 13: show cef ipv6 summary Command Field Descriptions

Field	Description
Load balancing	Current load-balancing mode. The default value is L3.
Table Version	Version of the CEF table.
routes	Total number of routes.
unresolved (<i>x</i> old, <i>x</i> new)	Number of routes not yet resolved.
load sharing elements	Total number of internal load-sharing data structures.
bytes	Total memory used by internal load sharing data structures.
references	Total reference count of all internal load sharing data structures.
CEF resets	Number of CEF table resets.
revisions of existing leaves	Number of updates to existing prefixes.
Exponential (currently <i>xs</i> , peak <i>xs</i>)	Currently not used.
prefixes modified in place	Prefixes modified in place.
Router ID	Router identification.
Adjacency Table has <i>x</i> adjacencies	Total number of adjacencies.
<i>x</i> incomplete adjacency	Total number of incomplete adjacencies.

show cef ipv6 unresolved

To display the unresolved routes in the IPv6 Cisco Express Forwarding (CEF) table, use the **show cef ipv6 unresolved** command in XR EXEC mode.

show cef ipv6 unresolved [**detail**] [**hardware** {**egress**|**ingress**}] [**location** *node-id*]

Syntax Description	detail	(Optional) Displays full details.
	hardware	(Optional) Displays Cisco Express Forwarding (CEF) IPv6 hardware status and configuration information.
	egress	Displays information from the egress packet switch exchange (PSE) file.
	ingress	Displays information from the ingress packet switch exchange (PSE) file.
	location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

Usage Guidelines If you do not specify a node with the **location** keyword and *node-id* argument, this command displays the unresolved routes for the node on which the command is issued.

Task ID	Task ID	Operations
	cef	read

Examples

This following is sample output from **show cef ipv6 unresolved** command when an unresolved route is detected:

```
RP/0/RP0/CPU0:router# show cef ipv6 unresolved

9999::/64
    unresolved
```

This table describes the significant fields shown in the display.

Table 14: show cef ipv6 unresolved Command Field Descriptions

Field	Description
xxxx::/xx	Detected unresolved route.

show cef mpls adjacency

To display the Multiprotocol Label Switching (MPLS) adjacency table, use the **show cef mpls adjacency** command in XR EXEC mode.

```
show cef mpls adjacency [interface-type interface-path-id]
[detail|discard|drop|glean|null|punt|remote] [location node-id]
```

Syntax	Description
<i>interface-type</i>	(Optional) Interface type. For more information, use the question mark (?) online help function.
<i>interface-path-id</i>	(Optional) Either a physical interface instance or a virtual interface instance: - Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash mark between values is required as part of the notation. <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RSP0) and the module is CPU0. Example: interface MgmtEth0/RSP0 /CPU0/0. - Virtual interface instance. Number range varies depending on interface type. For more information about the syntax for the router, use the question mark (?) online help function.
detail	(Optional) Displays full details.
discard	(Optional) Displays the discard adjacency information.
drop	(Optional) Displays the drop adjacency information.
glean	(Optional) Displays the glean adjacency information.
null	(Optional) Displays the null adjacency information.
punt	(Optional) Displays the punt adjacency information.
remote	(Optional) Displays the remote adjacency information.
location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
Command Default	No default behavior or values

Command Modes XR EXEC mode

Command History

Release	Modification
Release 6.0	This command was introduced.

Usage Guidelines If you do not specify a node with the **location** keyword and *node-id* argument, the **show cef mpls adjacency** command displays the MPLS adjacency table for the node in which the command is issued.

Task ID

Task ID	Operations
cef	read

Examples

This following is sample output from **show cef mpls adjacency** command:

```
RP/0/RP0/CPU0:router# show cef mpls adjacency hardware egress
```

```
Display protocol is mpls
Interface      Address                                     Type      Refcount

Te0/0/0/11    Prefix: 79.0.0.2/32                        local     5
               Adjacency: PT:0x894d40c0 79.0.0.2/32
               Interface: Te0/0/0/11
               NHID: 0x0
               MAC: 6c.9c.ed.28.8b.71.28.c7.ce.01.f0.4f.88.47
               Interface Type: 0x1e, Base Flags: 0x1 (0x8bec8230)
               Nhinfo PT: 0x8bec8230, IdB PT: 0x899f6a20, If Handle: 0x8000090
               Dependent adj type: remote (0x8be85230)
               Dependent adj intf: Te0/0/0/11
               Ancestor If Handle: 0x0
Update time Dec 17 09:44:45.779
```

```
Show-data Print at RPLC
```

```
TX H/W Result for NP:0 (index: 0x186bc (BE)):
```

```
Next Hop Data
Next Hop Valid:      YES
Next Hop Index:      100028
Egress Next Hop IF:  100028
Hw Next Hop Intf:    17
HW Port:             12
Next Hop Flags:      COMPLETE
Next Hop MAC:        6c9c.ed28.8b71
```

```
NHINDEX H/W Result for NP:0 (index: 0 (BE)):
NhIndex is NOT required on this platform
```

```
NHINDEX STATS: pkts 0, bytes 0 (no stats)
```

```
RX H/W Result on NP:0 [Adj ptr:0x40 (BE)]:
Rx-Adj is NOT required on this platform
```

show cef mpls adjacency hardware

To display the Multiprotocol Label Switching (MPLS) adjacency hardware status and configuration information, use the **show cef mpls adjacency hardware** command in XR EXEC mode.

show cef mpls adjacency hardware {egress|ingress} [{detail|discard|drop|glean|location
node-id|null|punt|remote}]

Syntax Description		
egress		Displays information from the egress packet switch exchange (PSE) file.
ingress		Displays information from the ingress packet switch exchange (PSE) file.
detail		(Optional) Displays full details.
discard		(Optional) Displays the discard adjacency information.
drop		(Optional) Displays the drop adjacency information.
glean		(Optional) Displays the glean adjacency information.
location	<i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
null		(Optional) Displays the null adjacency information.
punt		(Optional) Displays the punt adjacency information.
remote		(Optional) Displays the remote adjacency information.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

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

Task ID	Task ID	Operations
	cef	read

Examples

The following is sample output from **show cef mpls adjacency hardware** command:

```
RP/0/RP0/CPU0:router# show cef mpls adjacency hardware egress
Display protocol is mpls
```

show cef mpls adjacency hardware

Interface	Address	Type	RefCount
Te0/0/0/11	Prefix: 79.0.0.2/32 Adjacency: PT:0x894d40c0 79.0.0.2/32 Interface: Te0/0/0/11 NHID: 0x0 MAC: 6c.9c.ed.28.8b.71.28.c7.ce.01.f0.4f.88.47 Interface Type: 0x1e, Base Flags: 0x1 (0x8bec8230) Nhinfo PT: 0x8bec8230, IdB PT: 0x899f6a20, If Handle: 0x8000090 Dependent adj type: remote (0x8be85230) Dependent adj intf: Te0/0/0/11 Ancestor If Handle: 0x0	local	5

Update time Dec 17 09:44:45.779

Show-data Print at RPLC

TX H/W Result for NP:0 (index: 0x186bc (BE)):

```

Next Hop Data
Next Hop Valid:      YES
Next Hop Index:      100028
Egress Next Hop IF:  100028
Hw Next Hop Intf:    17
HW Port:             12
Next Hop Flags:      COMPLETE
Next Hop MAC:        6c9c.ed28.8b71

```

NHINDEX H/W Result for NP:0 (index: 0 (BE)):
NhIndex is NOT required on this platform

NHINDEX STATS: pkts 0, bytes 0 (no stats)

RX H/W Result on NP:0 [Adj ptr:0x40 (BE)]:
Rx-Adj is NOT required on this platform

show cef mpls interface

To display the Multiprotocol Label Switching (MPLS) Cisco Express Forwarding (CEF)-related information for an interface, use the **show cef mpls interface** command in XR EXEC mode.

show cef mpls interface *type interface-path-id* [**detail**] [**location** *node-id*]

Syntax Description	<i>type</i>	Interface type. For more information, use the question mark (?) online help function.
	<i>in interface-path-id</i>	Either a physical interface instance or a virtual interface instance as follows: - Physical interface instance. Naming notation is <i>rack/slot/module/port</i> and a slash between values is required as part of the notation. <i>rack</i>: Chassis number of the rack. <i>slot</i>: Physical slot number of the modular services card or line card. <i>module</i>: Module number. A physical layer interface module (PLIM) is always 0. <i>port</i>: Physical port number of the interface. Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RSP0) and the module is CPU0. Example: interface MgmtEth0/ RSP0 - Virtual interface instance. Number range varies depending on interface type. For more information about the syntax for the router, use the question mark (?) online help function.
	detail	(Optional) Displays detailed CEF information for all the interfaces on the node in which the command is issued.
	location <i>node-id</i>	(Optional) Displays IPv4 CEF-related information for an interface. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.
Command Default	No default behavior or values	
Command Modes	XR EXEC mode	
Command History	Release	Modification
	Release 6.0	This command was introduced.
Usage Guidelines	If you do not specify a node with the location keyword and <i>node-id</i> argument, the show cef mpls interface command displays the CEF-related information for the interface on the route processor.	

Task ID	Task ID	Operations
	cef	read

Examples

The following sample output is from the **show cef mpls interface** command:

```
RP/0/RP0/CPU0:router# show cef mpls interface

fib_show_interface
Loopback0 is up if_handle 0x08000014 if_type IFT_LOOPBACK(0x10)
  idb info 0x899f78a0 flags 0x8061 ext 0x0
  Vrf Local Info (0x0)
  Interface last modified Dec 17, 2015 09:42:15, create
  Interface is marked as point to point interface
  Interface is marked as loopback interface
  Reference count 1      Next-Hop Count 0
  Protocol Reference count 0
  Protocol mpls not configured or enabled on this card
mpls_v6_item_name: 1000/protocol/1/vrf/default/interface-info/2/8000090
TenGigE0/0/0/11 is up if_handle 0x08000090 if_type IFT_TENGETHERNET(0x1e)
  idb info 0x899f6a20 flags 0x8001 ext 0x8bf0b098 flags 0x50
  Vrf Local Info (0x0)
  Interface last modified Dec 17, 2015 09:42:12, create
  Reference count 1      Next-Hop Count 2
  Forwarding is enabled
  Protocol MTU 1500, TableId 0(0x8a287098)
  Protocol Reference count 2
TenGigE0/0/0/1 is up if_handle 0x08000040 if_type IFT_TENGETHERNET(0x1e)
  idb info 0x899f6520 flags 0x8001 ext 0x0
  Vrf Local Info (0x0)
  Interface last modified Dec 17, 2015 09:42:12, create
  Reference count 1      Next-Hop Count 0
  Protocol Reference count 0
  Protocol mpls not configured or enabled on this card
Null0 is up if_handle 0x0800000c if_type IFT_NULL(0x11)
  idb info 0x899f61a0 flags 0x8061 ext 0x0
  Vrf Local Info (0x0)
  Interface last modified Dec 17, 2015 09:41:51, create
  Interface is marked as point to point interface
  Interface is marked as nullidb
  Reference count 1      Next-Hop Count 0
  Protocol Reference count 0
  Protocol mpls not configured or enabled on this card
FINT0/RP0/CPU0 is up if_handle 0x08000010 if_type IFT_FINT_INTF(0x1b)
  idb info 0x899f6120 flags 0x8021 ext 0x0
  Vrf Local Info (0x0)
  Interface last modified Dec 17, 2015 09:41:51, create
  Interface is marked as point to point interface
  Reference count 1      Next-Hop Count 0
  Protocol Reference count 0
  Protocol mpls not configured or enabled on this card
```

show cef mpls unresolved

To display the Multiprotocol Label Switching (MPLS) unresolved routes, use the **show cef mpls unresolved** command in XR EXEC mode.

show cef mpls unresolved [**detail**] [**location** *node-id*]

Syntax Description	detail	(Optional) Displays detailed adjacency information, including Layer 2 information.
	location <i>node-id</i>	(Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation.

Command Default No default behavior or values

Command Modes XR EXEC mode

Command History	Release	Modification
	Release 6.0	This command was introduced.

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

Task ID	Task ID	Operations
	cef	read

Examples

The following sample output is from the **show cef mpls unresolved** command:

```
RP/0/RP0/CPU0:router# show cef mpls unresolved

Label/EOS          Next Hop          Interface
20001/0
20001/1
```

This table describes the significant fields shown in the display.

Table 15: show cef mpls unresolved Command Field Descriptions

Field	Description
Label/EOS	MPLS forwarding label/End of Stack (EOS) bit.
Next Hop	Next hop of the prefix.
Interface	Interface associated with the prefix.

show cef summary

To display summary information for the Cisco Express Forwarding (CEF) table, use the **show cef summary** command in XR EXEC mode.

show cef summary [**location** {*node-id*|**all**}]

Syntax Description	location <i>node-id</i> (Optional) Displays detailed CEF information for the designated node. The <i>node-id</i> argument is entered in the <i>rack/slot/module</i> notation. all (Optional) Displays all locations.				
Command Default	The show cef summary command assumes the IPv4 CEF table and the active RP node as the location.				
Command Modes	XR EXEC mode				
Command History	<table> <tr> <th>Release</th><th>Modification</th></tr> <tr> <td>Release 6.0</td><td>This command was introduced.</td></tr> </table>	Release	Modification	Release 6.0	This command was introduced.
Release	Modification				
Release 6.0	This command was introduced.				
Usage Guidelines	No specific guidelines impact the use of this command.				
Task ID	<table> <tr> <th>Task ID</th><th>Operations</th></tr> <tr> <td>cef</td><td>read</td></tr> </table>	Task ID	Operations	cef	read
Task ID	Operations				
cef	read				
Examples	The following sample output is from the show cef summary command. <pre>RP/0/RP0/CPU0:router# show cef summary location 0/RP0/CPU0 Router ID is 10.1.1.1 IP CEF with switching (Table Version 0) for node0_1_CPU0 Load balancing: L3 Tableid 0xe0000000, Vrfid 0x60000000, Vrid 0x20000000, Flags 0x301 Vrfname default, Refcount 318 170 routes, 0 reresolve, 0 unresolved (0 old, 0 new), 12240 bytes 183 load sharing elements, 57292 bytes, 184 references 19 shared load sharing elements, 7036 bytes 164 exclusive load sharing elements, 50256 bytes 0 CEF route update drops, 10 revisions of existing leaves Resolution Timer: 15s 0 prefixes modified in place 0 deleted stale prefixes 21 prefixes with label imposition, 60 prefixes with label information Adjacency Table has 49 adjacencies 25 incomplete adjacencies</pre>				

This table describes the significant fields shown in the display.

Table 16: show cef summary Command Field Descriptions

Field	Description
Load balancing	Current load-balancing mode. The default value is L3.
Table Version	Version of the CEF table.
tableid	Table identification number.
vrfname	VRF name.
flags	Option value for the table
routes	Total number of routes.
reresolve	Total number of routes being reresolved.
unresolved (x old, x new)	Number of routes not yet resolved.
load sharing elements	Total number of internal load-sharing data structures.
bytes	Total memory used by internal load sharing data structures.
references	Total reference count of all internal load sharing data structures.
CEF resets	Number of CEF table resets.
revisions of existing leaves	Number of updates to existing prefixes.
Exponential (currently xs, peak xs)	Currently not used.
prefixes modified in place	Prefixes modified in place.
Adjacency Table has x adjacencies	Total number of adjacencies.
x incomplete adjacency	Total number of incomplete adjacencies.

 show cef summary