Cisco Express Forwarding Commands

This chapter describes the commands used to configure and monitor Cisco Express Forwarding (CEF) on a Cisco 8000 Series Router.

For detailed information about ACL concepts, configuration tasks, and examples, refer to the *IP Addresses and Services Command Reference for Cisco 8000 Series Routers*

cef adjacency route override rib

Use this command to enable CEF prefer Adjacency Information Base (AIB) prefixes over Routing Information Base (RIB) prefixes in the Global configuration mode. To disable 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	Modification
Release 7.0.12	This command was introduced.

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.

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:

```
Router# configure
Router# cef adjacency route override rib
```

cef load-balancing

To configure load-balancing parameters, use the **cef load-balancing** command in Global configuration mode. To enable the default CEF load-balancing behavior, use the **no** form of this command.

cef load-balancing { **mode hierarchical** { **ucmp group-size** | **ecmp min-path** } <*range*> | **recursive oor mode dampening-and-dlb** [**dampening resource-threshold** <*percentage*> | **dlb resource-threshold** <*percentage*> | **max-duration** <*secs*>] }

Syntax Description

mode	Specifies the mode as hierarchical.
hierarchical	Specifies the configuration for multi-level load balancing in CEF.
ucmp	Specifies the **ucmp** parameters for CEF load-balancing configuration.
group-size	Enables **ucmp** group size for hierarchical load balancing (HLB).
ecmp	Specifies the **ecmp** parameters for CEF load-balancing configuration.
min-path	Specifies the minimum number of paths required for hierarchical **ecmp** load balancing.
range	Specifies the range of values for configuring the group size for **ucmp** and minimum paths for **ecmp** in hierarchical load balancing. The routers supports the values ranging from 1 to 128.
recursive	Enables recursive route configuration.
oor	Enables oor configuration.
dlb	Specifies the dynamic load balancing (DLB) parameter in CEF load balancing.
dampening-and-dlb	Enables dampening and dlb mode for oor handling.
dampening	Configure dampening mode parameters.
resource-threshold	Specifies the resource threshold percentage to enable dynamic load-balancing mode.
percentage	Specifies the threshold percentage for enabling FIB dampening and DLB features.
max-duration	Specifies the maximum duration time configuration for dampening and dynamic load balancing in CEF load balancing.
secs	Specifies the maximum duration time, in seconds, for configuring dampening and dynamic load balancing in CEF load balancing. You can configure the time range from 1 to 600 seconds.

Command Default

None

Command Modes

Global configuration

Command History

Release	Modification
Release 24.2.1	This command was introduced.

Usage Guidelines

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

The **cef load-balancing mode hierarchical ecmp min-paths** command is a replacement for the **cef hierarchical-load-balancing ecmp min-paths** command.

If the number of paths exceeds 128, HLB is automatically applied.

The **cef load-balancing mode hierarchical ucmp group-size** command is a replacement for the **cef hierarchical-load-balancing ucmp group-size** command.

Task ID

Task ID	Operation
cef	read, write

Example

The following example shows how to enable FIB dampening and DLB features with default values of dampening threshold percentage and max switchover duration and dlb threhold percentage as (70%, 300 sec, 90%)

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router# cef load-balancing recursive oor mode dampening-and-dlb
```

The following example shows how to enable FIB dampening and DLB features with default values of dampening threshold percetange and max switchover duration and dlb threhold percentage as (70%, 90%).

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router# cef load-balancing recursive oor mode dampening-and-dlb max-duration
 600
```

The following example shows how to configure dampening and dynamic load balancing with specified resource-threshold for dampening and dlb each and maximum duration for switchover time.

Note The dampening threshold value should be lower than the DLB threshold.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router# cef load-balancing recursive oor mode dampening-and-dlb dampening
resource-threshold 99 max-duration 600 dlb resource-threshold 99
```

The following example shows how to configure the group size for ucmp in hierarchical load balancing

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router# cef load-balancing mode  hierarchical ucmp group-size 128
```

The following example shows how to configure the minimum paths for hierarchical ecmp load balancing.

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router# cef load-balancing mode  hierarchical ecmp min-path 128
```

clear adjacency statistics

To clear adjacency packet and byte counter statistics, use the **clear adjacency statistics** command in XR EXEC mode.

clear adjacency statistics [**ipv4** [**nexthop** *ipv4-address*] | **mpls** | **ipv6**] [*interface-type interface-instance* | **location** *node-id*]

Syntax Description

ipv4	(Optional) Clears only IPv4 adjacency packet and byte counter statistics.
nexthop *ipv4-address*	(Optional) Clears adjacency statistics that are destined to the specified IPv4 nexthop.
mpls	(Optional) Clears only MPLS adjacency statistics.
ipv6	(Optional) Clears only IPv6 adjacency statistics.
interface-type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-instance	(Optional) Either a physical interface instance or a virtual interface instance: • Physical interface instance. Naming notation is *rack/slot/module/port* and a slash mark between values is required as part of the notation. • *rack*: Chassis number of the rack. • *slot*: Physical slot number of the line card. • *module*: Module number. A physical layer interface module (PLIM) is always 0. • *port*: Physical port number of the interface. **Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0) and the module is CPU0. Example: interface MgmtEth0/ RP0 • 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 *node-id*	(Optional) Clears detailed adjacency statistics 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 7.0.12	This command was introduced.

Usage Guidelines

The **clear adjacency statistics** command is useful for troubleshooting network connection and forwarding problems.

If you do not specify any of the optional keywords, all adjacency statistics are cleared for the node on which the command is issued.

Task ID

Task ID	Operations
basic-services	read, write
cef	read, write

Related Commands

Command	Description
show adjacency, on page 22	Displays the IPv4 CEF adjacency table.

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 *node-id*	Clears IPv4 packet drop counters 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 7.0.12	This command was introduced.

Usage Guidelines

If you do not specify a node with the **location** keyword and *node-id* argument, this command will clear IPv4 CEF drop counters only for the node on which the command is issued.

Task ID

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:

```
Router# show cef ipv4 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
```

```
  LISP decap err drops packets :               0

Node: 0/RP1/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
  LISP decap err drops packets :               0

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 mode.

clear cef ipv4 exceptions location *node-id*

Syntax Description

location *node-id*	Clears IPv4 CEF exception packet counters 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 7.0.12	This command was introduced.

Usage Guidelines

If you do not specify a node with the **location** keyword and *node-id* argument, this command will clear IPv4 CEF exception packet counters for all nodes.

Task ID

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:

```
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
Node: 0/RP1/CPU0
  Slow encap  packets :              3
  Unsupported packets :              0
  Redirect    packets :              0
  Receive     packets :          12787
  Broadcast   packets :          74814
```

```
  IP options  packets :               0
  TTL expired packets :               0
  Fragmented  packets :               0

Router# clear cef ipv4 exceptions location 0/RP0/CPU0

Node: 0/RP0/CPU0
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 *node-id*	Clears IPv6 packet drop counters 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 7.0.12	This command was introduced.

Usage Guidelines

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

Task ID

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:

```
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 :              1
  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

Node: 0/RP1/CPU0
  Unresolved drops     packets :               0
  Unsupported drops    packets :               0
  Null0 drops          packets :               0
  No route drops       packets :               1
  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

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 *node-id*	Clears IPv6 CEF exception packet counters 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 7.0.12	This command was introduced.

Usage Guidelines

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

Task ID

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:

```
Router# show cef ipv6 exceptions

CEF Exception Statistics
Node: 0/RP0/CPU0
  Slow encap  packets :              0
  Unsupported packets :              0
  Redirect    packets :              0
  Receive     packets :              1
  Broadcast   packets :              0
  IP options  packets :              0
  TTL expired packets :              0
  Fragmented  packets :              0

Node: 0/RP1/CPU0
  Slow encap  packets :              0
  Unsupported packets :              0
  Redirect    packets :              0
  Receive     packets :              7
```

```
  Broadcast   packets :               0
  IP options  packets :               0
  TTL expired packets :               0
  Fragmented  packets :               0

Router# clear cef ipv6 exceptions location 0/RP0/CPU0

Node: 0/RP0/CPU0
Clearing CEF Exception Statistics
```

hw-module profile cef

To configure cef profile on a Global Configuration level, use the hw-module profile cef command in the XR Config mode.

hw-module profile cef { **bgplu enable** | **dark-bw enable** | **lpts acl** | **source-rtbh enable** | **mplsoudp scale** }

Syntax Description

bgplu	Configures the bgplu feature.
dark-bw	Configures the dark bandwidth.
lpts acl	Configures the lpts acl mode
source-rtbh enable	Configures source-based Remote Triggered Black Hole filtering (RTBH).
mplsoudp scale	Enhance the MPLS over UDP tunnel scale up to 15284 tunnels.

Command Default

No default behavior or values

Command Modes

XR Config

Command History

Release	Modification
Release 24.4.1	This command was modified. The **mplsoudp scale** keyword-pair was introduced.
Release 24.2.1	This command was modified. The **source-rtbh enable** keyword-pair was introduced.
Release 7.5.2	The **lpts acl** option was introduced.
Release 7.0.12	This command was introduced.

Task ID

Task ID	Operations
basic-services	read, write
cef	read, write

Usage Guidelines

You must reload the router after executing the **hw-module profile cef** command.

For more information about configuring Dark Bandwidth (dark-bw), see chapter *Implementing MPLS Traffic Engineering* in the *MPLS Configuration Guide for Cisco 8000 Series Routers*.

Examples

The following example displays the MPLS over UDP tunnel scale enhancement:

```
Router# config
Router(config)# hw-module profile cef mplsoudp scale
Router(config)# commit
Router# reload location all
```

After you enable or disable the MPLS over UDP tunnel scale enhancement feature, you must reload the line cards with the **reload location all** command for the configuration to take effect.

hw-module profile route scale

To increase the route scale for IPv4 or IPv6 traffic types, use the **hw-module profile stats route-scale** command in XR Config mode.

hw-module profile route scale lpm tcam-banks wide-entries shortened

Syntax Description

lpm tcam-banks	Increases the IPv4 route scale from 2 million to 3 million entries and IPv6 route scale from 0.5 million to 1 million entries.
lpm wide-entries shortened	Shortens the wide routing prefixes for IPv6 addresses.

Command Default

By default, the route scale for IPv4 traffic is 2 million entries and IPv6 traffic is 0.5 million entries.

Command Mode

XR Config

Command History

Release	Modification
Release 24.1.1	The **lpm wide-entries shortened** keyword was introduced.
Release 7.9.1	This command was introduced.

Usage Guidelines

- You must reload the router after executing the **hw-module profile route scale** command.
- When you increase the route scale, it will result in restricted resources for packet classification features such as Security ACL, QoS ACL, BGP Flowspec, and LPTS.
- The **hw-module profile route scale lpm wide-entries shortened** command isn't enabled by default, and we recommend using it judiciously to accomodate higher number of wide-entry IPv6 prefixes.

Task ID	Operations
config-services	read, write
root-lr	read, write

Examples

The following example shows you how to configure the **hw-module profile route scale** command:

```
Router# config
Router(config)# hw-module profile route scale lpm tcam-banks
Router(config)# commit
Router# reload location all
```

The following example shows you how to configure the **hw-module profile route scale lpm wide-entries shortened** command:

```
Router# config
Router(config)# hw-module profile route scale lpm wide-entries shortened
Router(config)# commit
Router# reload location all
```

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 *ipv4-address*	(Optional) Displays adjacencies that are destined to the specified IPv4 nexthop.
mpls	(Optional) Displays only MPLS adjacencies.
ipv6	(Optional) Displays only IPv6 adjacencies.
interface-type	(Optional) Interface type. For more information, use the question mark (?) online help function.

interface-instance	Either a physical interface instance or a virtual interface instance:
	• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash mark between values is required as part of the notation.
	  • *rack*: Chassis number of the rack.
	  • *slot*: Physical slot number of the line card.
	  • *module*: Module number. A physical layer interface module (PLIM) is always 0.
	  • *port*: Physical port number of the interface.
	• 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 *node-id*	(Optional) Displays detailed CEF information 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 7.0.12	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:

```
Router# show adjacency location 0/RP1/CPU0

Interface                  Address                 Version  Refcount Protocol
FH0/0/0/21                 (interface)                   5         1(    0)
FH0/0/0/17                 (interface)                   9         1(    0)
Mg0/RP0/CPU0/0             (interface)                   1         1(    0)
FH0/0/0/13                 (interface)                  13         1(    0)
Hu0/0/0/34                 (interface)                  27         1(    0)
FH0/0/0/3                  (interface)                  23         1(    0)
Hu0/0/0/30                 (interface)                  31         1(    0)
FH0/0/0/7                  (interface)                  19         1(    0)
Hu0/0/0/26                 (interface)                  35         1(    0)
FH0/0/0/11                 (interface)                  15         1(    0)
FH0/0/0/20                 (interface)                   6         1(    0)
FH0/0/0/16                 (interface)                  10         1(    0)
FH0/0/0/12                 (interface)                  14         1(    0)
Hu0/0/0/33                 (interface)                  28         1(    0)
FH0/0/0/4                  (interface)                  22         1(    0)
Hu0/0/0/29                 (interface)                  32         1(    0)
FH0/0/0/8                  (interface)                  18         1(    0)
Hu0/0/0/25                 (interface)                  36         1(    0)
Hu0/0/0/24                 (interface)                  37         1(    0)
FH0/0/0/23                 (interface)                   3         1(    0)
FH0/0/0/19                 (interface)                   7         1(    0)
Hu0/0/0/32                 (interface)                  29         1(    0)
FH0/0/0/15                 (interface)                  11         1(    0)
Hu0/0/0/28                 (interface)                  33         1(    0)
FH0/0/0/1                  (interface)                  25         1(    0)
FH0/0/0/5                  (interface)                  21         1(    0)
FH0/0/0/9                  (interface)                  17         1(    0)
FH0/0/0/0                  (interface)                   2         1(    0)
FH0/0/0/22                 (interface)                   4         1(    0)
FH0/0/0/18                 (interface)                   8         1(    0)
FH0/0/0/14                 (interface)                  12         1(    0)
Hu0/0/0/35                 (interface)                  26         1(    0)
FH0/0/0/2                  (interface)                  24         1(    0)
Hu0/0/0/31                 (interface)                  30         1(    0)
FH0/0/0/6                  (interface)                  20         1(    0)
Hu0/0/0/27                 (interface)                  34         1(    0)
FH0/0/0/10                 (interface)                  16         1(    0)
```

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 bgp-attribute

To display Border Gateway Protocol (BGP) attributes for Cisco Express Forwarding (CEF), use the **show cef bgp-attribute** command in XR EXEC mode.

show cef bgp-attribute [**attribute-id index-id**] [**local-attribute-id index-id**] [**location** *node-id*]

Syntax Description

attribute-id *index-id*	(Optional) Displays FIB attribute index.
local-attribute-id *index-id*	(Optional) Displays FIB local attribute index.
location *node-id*	(Optional) Displays BGP information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

The default location is active RP.

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

This command has no keywords or arguments.

Task ID

Task ID	Operations
cef	read

Examples

The following example shows how to use the **show cef bgp-attribute** command:

```
Router# show cef bgp-attribute

Total number of entries: 75742
BGP Attribute ID: 0x2058a, Local Attribute ID: 0x1
    Origin AS:    195, Next Hop AS:        195
BGP Attribute ID: 0x20583, Local Attribute ID: 0x2
    Origin AS:    22, Next Hop AS:        22
BGP Attribute ID: 0x20582, Local Attribute ID: 0x3
    Origin AS:    21, Next Hop AS:        21
BGP Attribute ID: 0x20585, Local Attribute ID: 0x4
    Origin AS:    28, Next Hop AS:        28
BGP Attribute ID: 0x20584, Local Attribute ID: 0x5
    Origin AS:    27, Next Hop AS:        27
BGP Attribute ID: 0x2057f, Local Attribute ID: 0x6
    Origin AS:    86, Next Hop AS:        86
BGP Attribute ID: 0x2058b, Local Attribute ID: 0x7
    Origin AS:    196, Next Hop AS:        196
BGP Attribute ID: 0x20589, Local Attribute ID: 0x8
    Origin AS:    194, Next Hop AS:        194
```

This table describes the significant fields shown in the display.

Table 2: show cef bgp-attribute Command Field Descriptions

Field	Description
BGP Attribute ID	Displays the id assigned by BGP.
Local Attribute ID	Displays the id assigned by FIB.
Origin AS	Displays the origin AS of the prefix that carries this attribute id.
Next Hop AS	Displays the AS that contains the BGP nexthop for this prefix.

show cef

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

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

Syntax Description

prefix	(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 packets.
detail	(Optional) Displays full details.
location *node-id*	(Optional) Displays detailed CEF information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
all	(Optional) Displays all locations.
tables	Displays the list of tables known to Forwarding Information Base (FIB).

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 24.4.1	This command was modified to include the **detail** keyword.
Release 7.0.12	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:

```
Router# show cef 192.0.2.1/16 hardware ingress location 0/RP0/CPU0

Tue Apr 28 04:17:05.105 UTC
192.0.2.1/32, version 25, internal 0x1000001 0x0 (ptr 0x8e7cf528) [1], 0x0 (0x8e9a7a68),
0x0 (0x0)
 Updated Apr 28 04:06:38.879
 local adjacency 9.1.58.5
 Prefix Len 32, traffic index 0, precedence n/a, priority 1
  gateway array (0x8e80fe90) reference count 2, flags 0x0, source rib (7), 0 backups
                [3 type 3 flags 0x8401 (0x8e8c1cd8) ext 0x0 (0x0)]
  LW-LDI[type=3, refc=1, ptr=0x8e9a7a68, sh-ldi=0x8e8c1cd8]
  gateway array update type-time 1 Apr 28 04:06:38.879
 LDI Update time Apr 28 04:06:38.899
 LW-LDI-TS Apr 28 04:06:38.899
   via 192.0.10.1/32, Bundle-Ether4, 7 dependencies, weight 0, class 0 [flags 0x0]
    path-idx 0 NHID 0x0 [0x8fa2a260 0x0]
    next hop 9.1.58.5/32
    local adjacency
   via 192.0.20.1/32, Bundle-Ether28, 7 dependencies, weight 0, class 0 [flags 0x0]
    path-idx 1 NHID 0x0 [0x8fa2a140 0x0]
    next hop 9.9.28.2/32
    local adjacency
   via 10.28.1.2/32, Bundle-Ether2801, 7 dependencies, weight 0, class 0 [flags 0x0]
    path-idx 2 NHID 0x0 [0x8fa2a1d0 0x0]
    next hop 192.0.30.1/32
    local adjacency

    Load distribution: 0 1 2 (refcount 3)

    Hash  OK  Interface                 Address
    0     Y   Bundle-Ether4             192.0.10.1
    1     Y   Bundle-Ether28            192.0.20.1
    2     Y   Bundle-Ether2801          192.0.30.1
```

The following sample output shows the Cisco Express Forwarding (CEF) tables from the **show cef tables** command for **detail** keyword:

```
Router# show cef tables detail

Codes:   L - SVD Local Routes, R - SVD Remote Routes
         T - Total Routes
         C - Table Converged,  D - Table Deleted
         M - Table Marked,     S - Table Subscribed
         F - Fallback VRF,     FM - Fallback VRF Marked

Table           Table ID            L          R          T C D M S F FM
cofo-v4         0x2b                0          0          0 N N N N N  N

---Origin Protocol                Routes---
  DIRECTLY_CONNECTED              0
  LOCAL                           0
  STATIC                          0
  BGP                             0
  ISIS                            0
  OSPF                            0
  GRIBI                           0

vrf1            0xe0000201          0          0          5 N N N Y N  N

---Origin Protocol                Routes---
  DIRECTLY_CONNECTED              0
  LOCAL                           0
  STATIC                          0
```

```
  BGP                           0
  ISIS                          0
  OSPF                          0
  GRIBI                         0

default         0xe0000000      22          0         46 N N N Y N  N

---Origin Protocol              Routes---
  DIRECTLY_CONNECTED            0
  LOCAL                         0
  STATIC                        0
  BGP                           0
  ISIS                          0
  OSPF                          0
  GRIBI                         0

iid             0xe0000801       0          0          5 N N N Y N  N

---Origin Protocol              Routes---
  DIRECTLY_CONNECTED            0
  LOCAL                         0
  STATIC                        0
  BGP                           0
  ISIS                          0
  OSPF                          0
  GRIBI                         0

decap_te        0xe0000101       0          0          5 N N N Y N  N

---Origin Protocol              Routes---
  DIRECTLY_CONNECTED            0
  LOCAL                         0
  STATIC                        0
  BGP                           0
  ISIS                          0
  OSPF                          0
  GRIBI                         0
```

show cef exact-route (user-data)

To display the route taken from a source IP to a destination IP , use the **show cef exact-route** command in XR EXEC mode.

show cef [**exact-route** *ipv4-source-address* *ipv4-destination-address* **protocol** *protocol* **source-port** *source-port* **destination-port** *destination-port* { **ingress-interface** *ingress-interface* | **user-data** *user-data* **ingress-interface** *ingress-interface* [**brief** | **detail** | **hardware** | **internal** | **location** | **policy-class** | **protocol**] }]

Syntax Description

exact-route	(Optional) Displays the egress interface where traffic corresponding to the other specified parameters will be sent.
ipv4-source-address	Specifies IPv4 source address in x.x.x.x format.
ipv4-destination-address	Specifies IPv4 destination address in x.x.x.x format.
protocol *protocol*	Specifies protocol number or name for this route. For more information, use the question mark (?) online help function.
source-port *source-port*	Specifies the source port number. The range is from 0 to 65535.
destination-port *destination-port*	Specifies the destination port number. The range is from 0 to 65535.
ingress-interface	(Optional) Specifies the ingress interface information.
user-data *user-data*	(Optional) Specifies the additional user chosen data bytes used in multi-path computation. In *user-data*, you can enter 1-4 bytes in hexadecimal.
ingress-interface *ingress-interface*	Specifies the ingress interface information.
brief	(Optional) Displays brief information of CEF table.
detail	(Optional) Displays full information of CEF table.
hardware	(Optional) Displays information from hardware.
location	(Optional) Provides the forwarding information for the designated node. The node-id argument is entered in the *rack/slot/module* notation.
policy-class	(Optional) Class for policy-based tunnel selection.

Command Default

None

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.5.5	The keyword **user-data** was introduced.

Release	Modification
Release 24.2.11	The keyword **user-data** was introduced.
Release 7.0.12	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 is a sample output of the **show cef exact-route** command:

```
Router# show cef exact-route 100.0.0.10 60.1.0.1 protocol 253 source-port 0 destination-port
 0 user-data 0x4 ingress-interface HundredGigE0/0/0/2 location 0/0/cpu0

Mon Aug 14 07:56:18.145 UTC

Unsupported protocol value 253
48.0.0.0/4, version 1377, internal 0x1000001 0x20 (ptr 0x8b470510) [1], 0x400 (0x8e0d45e8),
 0x0 (0x0)
 Updated Aug 14 07:50:20.022
 local adjacency to HundredGigE0/0/0/26.29

 Prefix Len 4, traffic index 0, precedence n/a, priority 2
   via HundredGigE0/0/0/26.29
   via 34.0.9.2/32, HundredGigE0/0/0/26.29, 5 dependencies, weight 0, class 0 [flags 0x0]
    path-idx 1 NHID 0x0 [0x8c60c480 0x0]
    next hop 34.0.9.2/32
    local adjacency
```

show cef ext-client

To display Cisco Express Forwarding (CEF) external client dependency information, use the**show cef ext-client** command in XR EXEC mode.

show cef ext-client [**detail** | **hardware** | **internal** | **location** | **summary**]

Syntax Description

detail	(Optional) Displays all information of all external clients in details.
hardware	(Optional) Displays hardware information of external clients.
internal	(Optional) Displays internal information of external clients.
location *node-id*	(Optional) Displays external client dependency information for the specified node. The *node-id* argument is entered in the *rack/slot/module* notation.
prefix	(Optional) Displays external client information for a specific prefix.
resolved	(Optional) Displays external client information for resolved ECD prefixes.
summary	(Optional) Displays summary of external client information.
unresolved	(Optional) Displays external client information for unresolved specific prefixes.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
cef	read

The following sample output is from the show cef external command:

```
Router#show cef ext-client summary
Thu Apr  9 15:33:32.259 UTC
Client Name: mfwd6 (comp-id: 0x89a)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
```

```
ECD version: 1
# of ECD Pathlist: 0

Client Name: l2fib_mgr (comp-id: 0x7e6d)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
ECD version: 1
# of ECD Pathlist: 0

Client Name: ipv4_IPV4_MRIB (comp-id: 0x305)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
ECD version: 1
# of ECD Pathlist: 0

Client Name: XTC_AGENT (comp-id: 0x19fc)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
ECD version: 1
# of ECD Pathlist: 0

Client Name: object_tracking (comp-id: 0xc99)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
ECD version: 1
# of ECD Pathlist: 0

Client Name: mfwd (comp-id: 0x348)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
ECD version: 1
# of ECD Pathlist: 0

Client Name: PBR_EA (comp-id: 0x1277)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
ECD version: 1
# of ECD Pathlist: 0

Client Name: bfd_agent (comp-id: 0x859)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
ECD version: 1
```

```
# of ECD Pathlist: 0

Client Name: IPV4_ABF (comp-id: 0x1e01)
------------
Protocol           : ipv4
# of Registrations : 0
# of Pending notifs: 0
Client last pulsed : Never
ECD version: 1
# of ECD Pathlist: 0
```

Related Commands

Command	Description
show cef, on page 27	Displays information about packets forwarded by Cisco Express Forwarding (CEF).

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

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
interface-type	(Optional) Interface type. For more information, use the question mark (?) online help function.

interface- path-id	(Optional) Either a physical interface instance or a virtual interface instance:
	• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash mark between values is required as part of the notation.
	  • *rack*: Chassis number of the rack.
	  • *slot*: Physical slot number of the line card.
	  • *module*: Module number. A physical layer interface module (PLIM) is always 0.
	  • *port*: Physical port number of the interface.
	• 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 *node-id*	(Optional) Displays detailed CEF information for the designated node. The *node-id* argument is entered in the *rack/slot/module* 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 7.0.12	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 :

```
Router# show cef ipv4 adjacency

Display protocol is ipv4
Interface    Address                                          Type    Refcount

Hu0/6/0/16                                                    special 2
             Interface: Hu0/6/0/16 Type:  glean
             Interface Type: 0x0, Base Flags: 0x220 (0x8ceb3f98)
             Nhinfo PT: 0x8ceb3f98, Idb PT: 0x8cb35a20,
             If Handle: 0x30001e0 no dependent adj
             Ancestor If Handle: 0x0
 Update time Dec  7 11:20:35.145


Hu0/6/0/16  Prefix: 10.0.22.2/32                           local   9
            Adjacency: PT:0x8d5752b8 10.0.22.2/32
            Interface: Hu0/6/0/16
            NHID: 0x0
            MAC: e6.07.2b.8d.33.f0.e6.48.5c.10.b3.a0.08.00
            Interface Type: 0x0, Base Flags: 0x1 (0x8d001fa0)
            Nhinfo PT: 0x8d001fa0, Idb PT: 0x8cb35a20,
            If Handle: 0x30001e0 no dependent adj
            Ancestor If Handle: 0x0
Update time Dec  7 11:20:45.022


Hu0/6/0/18                                                    special 2
             Interface: Hu0/6/0/18 Type:  glean
             Interface Type: 0x0, Base Flags: 0x220 (0x8ceb44c0)
             Nhinfo PT: 0x8ceb44c0, Idb PT: 0x8cb35920,
             If Handle: 0x30001f0 no dependent adj
             Ancestor If Handle: 0x0
 Update time Dec  7 11:20:33.449


Hu0/6/0/18   Prefix: 10.0.62.2/32                          local   10
             Adjacency: PT:0x8d5794a0 10.0.62.2/32
             Interface: Hu0/6/0/18
             NHID: 0x0
             MAC: e6.07.2b.8d.34.48.e6.48.5c.10.b3.a8.08.00
             Interface Type: 0x0, Base Flags: 0x1 (0x8d002aa0)
             Nhinfo PT: 0x8d002aa0, Idb PT: 0x8cb35920
             If Handle: 0x30001f0 no dependent adj
```

```
            Ancestor If Handle: 0x0
 Update time Dec  7 11:20:45.019
```

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 adjacency hardware

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

show cef[**vrf** *vrf-name*] **ipv4 adjacency hardware** {**egress**} [**detail** | **discard** | **drop** | **glean** | **location** *node-id* | **null** | **punt** | **protected** | **remote**]

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 packets.
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 *node-id*	(Optional) Displays detailed CEF information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
null	(Optional) Displays the null adjacency information.
punt	(Optional) Displays the punt adjacency information.
protected	(Optional) Filters out and displays only the IP-Fast Reroute (FRR) protected 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 7.0.12	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 ipv4 adjacency hardware** command for the **egress** keyword:

```
Router# show cef ipv4 adjacency hardware egress detail location 0/RP0/CPU0
Tue Apr 28 04:15:15.408 UTC
Display protocol is ipv4
Interface    Address                                          Type    Refcount

BE3                                                           special 2
             Interface: BE3 Type:  glean
             Interface Type: 0x1c, Base Flags: 0x10001100 (0x8deeece0)
             Nhinfo PT: 0x8deeece0, Idb PT: 0x8db2a1c0, If Handle: 0xf00001c
no dependent adj
             Ancestor If Handle: 0x0
 Update time Apr 28 03:49:04.881


BE3           Prefix: 9.1.48.4/32                             local   5
             Adjacency: PT:0x8e68d1b8 9.1.48.4/32
             Interface: BE3
             NHID: 0x0
             MAC: 78.70.32.67.6d.03.b0.65.62.36.20.03.08.00
             Interface Type: 0x1c, Base Flags: 0x10000001 (0x8fa2a0b0)
             Nhinfo PT: 0x8fa2a0b0, Idb PT: 0x8db2a1c0, If Handle: 0xf00001c
no dependent adj
             Ancestor If Handle: 0x0
 Update time Apr 28 03:49:05.238


BE4                                                           special 2
             Interface: BE4 Type:  glean
             Interface Type: 0x1c, Base Flags: 0x10001100 (0x8deeed68)
             Nhinfo PT: 0x8deeed68, Idb PT: 0x8db2a250, If Handle: 0xf000024
no dependent adj
             Ancestor If Handle: 0x0
 Update time Apr 28 03:49:04.884


BE4           Prefix: 9.1.58.5/32                             local   7
             Adjacency: PT:0x8e68d548 9.1.58.5/32
             Interface: BE4
             NHID: 0x0
             MAC: 78.46.8e.f2.f9.03.b0.65.62.36.20.02.08.00
             Interface Type: 0x1c, Base Flags: 0x10000001 (0x8fa2a260)
             Nhinfo PT: 0x8fa2a260, Idb PT: 0x8db2a250, If Handle: 0xf000024
no dependent adj
             Ancestor If Handle: 0x0
 Update time Apr 28 04:05:26.678


BE28                                                          special 2
             Interface: BE28 Type:  glean
             Interface Type: 0x1c, Base Flags: 0x10001100 (0x8deeedf0)
             Nhinfo PT: 0x8deeedf0, Idb PT: 0x8db2a2e0, If Handle: 0xf00002c
no dependent adj
             Ancestor If Handle: 0x0
 Update time Apr 28 03:49:04.884


BE28          Prefix: 9.9.28.2/32                             local   7
             Adjacency: PT:0x8e68d2e8 9.9.28.2/32
             Interface: BE28
```

```
             NHID: 0x0
             MAC: 78.70.d8.38.0d.03.b0.65.62.36.20.01.08.00
             Interface Type: 0x1c, Base Flags: 0x10000001 (0x8fa2a140)
             Nhinfo PT: 0x8fa2a140, Idb PT: 0x8db2a2e0, If Handle: 0xf00002c
no dependent adj
             Ancestor If Handle: 0x0
 Update time Apr 28 04:04:30.218


BE2801                                                        special 2
             Interface: BE2801 Type:  glean
             Interface Type: 0x1c, Base Flags: 0x10001100 (0x8deeee78)
             Nhinfo PT: 0x8deeee78, Idb PT: 0x8db2a370, If Handle: 0xf000034
no dependent adj
             Ancestor If Handle: 0x0
 Update time Apr 28 03:49:04.884


BE2801        Prefix: 10.28.1.2/32                            local   7
             Adjacency: PT:0x8e68d418 10.28.1.2/32
             Interface: BE2801
             NHID: 0x0
             MAC: 78.70.d8.38.0d.02.b0.65.62.36.20.00.08.00
             Interface Type: 0x1c, Base Flags: 0x10000001 (0x8fa2a1d0)
             Nhinfo PT: 0x8fa2a1d0, Idb PT: 0x8db2a370, If Handle: 0xf000034
no dependent adj
             Ancestor If Handle: 0x0
 Update time Apr 28 04:04:30.218
```

show cef ipv4

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

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

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
prefix	(Optional) Longest matching CEF entry for the specified IPv4 destination prefix.
mask	(Optional) Exact CEF entry for the specified IPv4 prefix and mask.
interface-type	(Optional) Interface type. For more information, use the question mark (?) online help function.

interface-instance	Either a physical interface instance or a virtual interface instance:
	• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash mark between values is required as part of the notation.
	  • *rack*: Chassis number of the rack.
	  • *slot*: Physical slot number of the line card.
	  • *module*: Module number. A physical layer interface module (PLIM) is always 0.
	  • *port*: Physical port number of the interface.
	Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0) and the module is CPU0. Example: interface MgmtEth0/RP0 /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 *node-id*	(Optional) Displays the IPv4 CEF table for the designated node. The *node-id* argument is entered in the *rack/slot/module* 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 24.4.1	The command is enhanced to include additional details about Layer 2 IPv4 prefixes that resolve as nexthop Layer 3 prefixes.
Release 7.0.12	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:

```
Router# show cef ipv4
Prefix              Next Hop            Interface
------------------- ------------------- ------------------
0.0.0.0/0           drop                default handler
0.0.0.0/32          broadcast
1.75.55.1/32        1.76.0.1/32         <recursive>
1.76.0.0/16         attached            MgmtEth0/RP0/CPU0/0
1.76.0.0/32         broadcast           MgmtEth0/RP0/CPU0/0
1.76.0.1/32         1.76.0.1/32         MgmtEth0/RP0/CPU0/0
1.76.0.2/32         1.76.0.2/32         MgmtEth0/RP0/CPU0/0
1.76.0.3/32         1.76.0.3/32         MgmtEth0/RP0/CPU0/0
1.76.11.2/32        1.76.11.2/32        MgmtEth0/RP0/CPU0/0


Router# show cef ipv4
Prefix              Next Hop            Interface
------------------- ------------------- ------------------
0.0.0.0/0           drop                default handler
0.0.0.0/32          broadcast
1.75.55.1/32        1.76.0.1/32         <recursive>
1.76.0.0/16         attached            MgmtEth0/RP0/CPU0/0
1.76.0.0/32         broadcast           MgmtEth0/RP0/CPU0/0
1.76.0.1/32         1.76.0.1/32         MgmtEth0/RP0/CPU0/0
1.76.0.2/32         1.76.0.2/32         MgmtEth0/RP0/CPU0/0
1.76.0.3/32         1.76.0.3/32         MgmtEth0/RP0/CPU0/0
1.76.11.2/32        1.76.11.2/32        MgmtEth0/RP0/CPU0/0
```

This table describes the significant fields shown in the display.

Table 4: show cef ipv4 Command Field Descriptions

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

Field	Description
Interface	Interface associated with the prefix.

In the following example, the IPv4 Layer 2 prefixes, which resolve as nexthop for Layer 3 prefixes are collapsed.

```
Router#show cef ipv4 209.165.201.1 detail
Output received:
Mon Dec  2 08:31:43.765 UTC
209.165.201.1/27, version 47031, internal 0x5000001 0x40 (ptr 0x98246ad8) [1], 0x0 (0x0),
0x0 (0x0)
Updated Dec  2 08:27:35.523
Prefix Len 32, traffic index 0, precedence n/a, priority 4
gateway array (0x98099098) reference count 1, flags 0x2010, source rib (7), 0 backups
[1 type 3 flags 0x40441 (0x98134438) ext 0x0 (0x0)]
LW-LDI[type=0, refc=0, ptr=0x0, sh-ldi=0x0]
gateway array update type-time 1 Dec  2 08:27:35.523
LDI Update time Dec  2 08:31:14.951

Level 1 - Load distribution: 0 1
[0] via 209.165.200.225/27, recursive
[1] via 209.165.200.226/27, recursive

via 209.165.200.225/27, 3 dependencies, recursive, bgp-multipath [flags 0x6080]
path-idx 0 NHID 0x0 [0x982355c8 0x0]
next hop 209.165.200.225/27 via 209.165.200.225/27

Load distribution: 0 1 2 2 (refcount 1)

Hash  OK  Interface                 Address
0     Y   HundredGigE0/0/0/0/2      fe80::2
1     Y   Bundle-Ether1201          fe80::2
2     Y   Bundle-Ether1301          fe80::3
3     Y   Bundle-Ether1301          fe80::3

via 209.165.200.226/27, 3 dependencies, recursive, bgp-multipath [flags 0x6080]
path-idx 1 NHID 0x0 [0x98235678 0x0]
next hop 209.165.200.226/27 via 209.165.200.226/27

Load distribution: 0 1 2 2 (refcount 1)

Hash  OK  Interface                 Address
4     Y   HundredGigE0/0/0/0/2      fe80::2
5     Y   Bundle-Ether1201          fe80::2
6     Y   Bundle-Ether1301          fe80::3
7     Y   Bundle-Ether1301          fe80::3
```

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 [**vrf** *vrf-name*] **ipv4 drops** [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
location *node-id*	(Optional) Displays IPv4 CEF table packet drop counters 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 7.0.12	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 *node-id* argument, this command displays IPv4 CEF packet drop counters for all nodes.

Task ID

Task ID	Operations
cef	read

Examples

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

```
Router# show cef ipv4 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
  LISP decap err drops packets :               0

Node: 0/RP1/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
  LISP decap err drops packets :               0
```

Table 5: 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 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 [**vrf** *vrf-name*]**ipv4 exact-route** {*source-address destination-address*} [**protocol***protocol-name*] [**source-port***source-port*] [**destination-port***destination-port*] [*type interface-path-id*] [*policy-class-value*] [**detail | location** *node-id*] { **ingress-interface** *ingress-interface* | **user-data** *user-data* **ingress-interface** *ingress-interface* [**brief** | **detail** | **hardware** | **internal** | **location** | **policy-class** | **protocol**] }

Syntax Description

vrf	(Optional) Sets VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
source-address	The IPv4 source address in x.x.x.x format.
destination-address	The IPv4 destination address in x.x.x.x format.
protocol *protocol name*	(Optional) Sets the specified protocol for the route.
source-port *source-port*	(Optional) Sets the TCP and UDP source port. The range is from 0 to 65535.
destination-port *destination-port*	(Optional) Sets the TCP and UDP destination port. The range is from 0 to 65535.
type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
detail	(Optional) Provides full CEF entry information.
location *node-id*	(Optional) Provides the IPv4 CEF table for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
ingress-interface	(Optional) Specifies the ingress interface information.
user-data *user-data*	(Optional) Specifies the additional user chosen data bytes used in multi-path computation. In *user-data*, you can enter 1-4 bytes in hexadecimal.
ingress-interface *ingress-interface*	Specifies the ingress interface information.

brief	(Optional) Displays brief information of CEF table.
detail	(Optional) Displays full information of CEF table.
hardware	(Optional) Displays information from hardware.
location	(Optional) Provides the forwarding information for the designated node. The node-id argument is entered in the *rack/slot/module* notation.
policy-class	(Optional) Class for policy-based tunnel selection.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.5.5	The keyword **user-data** was introduced.
Release 24.2.11	The keyword **user-data** was introduced.
Release 7.0.12	This command was introduced.

Usage Guidelines

For TCP and UDP protocols, configure the source-port and destination-port mandatorily. For other protocols, configure the source-port and destination-port as zero. 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:

```
Router# show cef ipv4 exact-route 192.0.2.1 198.51.100.1 protocol TCP source-port 25000
destination-port 30000 ingress-interface HundredGigE 0/0/0/24
Wed Apr 15 02:15:16.102 UTC
5.5.5.5/32, version 18, labeled SR, internal 0x1000001 0x8110 (ptr 0x94730608) [1], 0x0
(0x94710b18), 0xa28 (0x9849c0a8)
 Updated Apr 14 19:08:57.655 local adjacency 30.0.0.2
 Prefix Len 32, traffic index 0, precedence n/a, priority 1, encap-id 0x1000800000001
   via Bundle-Ether3
   via 30.0.0.2/32, Bundle-Ether3, 7 dependencies, weight 0, class 0 [flags 0x0]
    path-idx 1 NHID 0x0 [0x97b2d338 0x0]
    next hop 30.0.0.2/32
     local adjacency
      local label 21555 labels imposed {21555}
```

The following is a sample output of the **show cef ipv4 exact-route** command with **user-data** keyword:

```
Router# show cef ipv4 exact-route 100.0.0.10 60.1.0.1 protocol 253 source-port 0
destination-port 0 user-data 0x4 ingress-interface HundredGigE0/0/0/2 location 0/0/cpu0
```

```
Mon Aug 14 07:56:18.145 UTC

Unsupported protocol value 253
48.0.0.0/4, version 1377, internal 0x1000001 0x20 (ptr 0x8b470510) [1], 0x400 (0x8e0d45e8),
 0x0 (0x0)
 Updated Aug 14 07:50:20.022
 local adjacency to HundredGigE0/0/0/26.29

 Prefix Len 4, traffic index 0, precedence n/a, priority 2
   via HundredGigE0/0/0/26.29
   via 34.0.9.2/32, HundredGigE0/0/0/26.29, 5 dependencies, weight 0, class 0 [flags 0x0]
    path-idx 1 NHID 0x0 [0x8c60c480 0x0]
    next hop 34.0.9.2/32
    local adjacency
```

This table describes the significant fields shown in the display.

Table 6: 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 [**vrf** *vrf-name*] **ipv4 exceptions** [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
location *node-id*	(Optional) Displays CEF exception packet counters 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

Command History

Release	Modification
Release 7.0.12	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 *node-id* argument, this command displays IPv4 CEF exception packet counters on all nodes.

Task ID

Task ID	Operations
cef	read

Examples

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

```
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
Node: 0/RP1/CPU0
  Slow encap  packets :              3
  Unsupported packets :              0
  Redirect    packets :              0
```

```
Receive     packets :           12787
Broadcast   packets :           74814
IP options  packets :               0
TTL expired packets :               0
Fragmented  packets :               0
```

This table describes the significant fields shown in the display.

Table 7: 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 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** | [**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 packets.
detail	(Optional) Displays full details.
location *node-id*	(Optional) Displays detailed CEF information 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 7.0.12	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:

```
Router# show cef ipv4 hardware egress detail location 0/RP0/CPU0

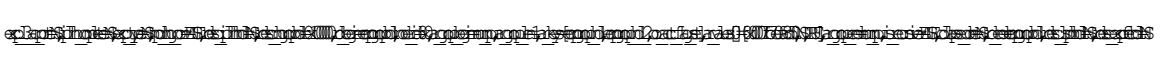
Wed Apr 22 09:06:45.028 UTC
0.0.0.0/0, version 0, proxy default, default route handler, drop adjacency, internal 0x1001011
 0x0 (ptr 0x919f10b8) [1], 0x0 (0x919bf0a8), 0x0 (0x0)
 Updated Apr 22 09:03:29.837
 Prefix Len 0, traffic index 0, precedence n/a, priority 15
  gateway array (0x918320a8) reference count 1, flags 0x200, source default (12), 0 backups

                [2 type 3 flags 0xa401 (0x918e50a8) ext 0x0 (0x0)]
  LW-LDI[type=3, refc=1, ptr=0x919bf0a8, sh-ldi=0x918e50a8]
  gateway array update type-time 1 Apr 22 09:03:29.838
 LDI Update time Apr 22 09:03:29.881
 LW-LDI-TS Apr 22 09:03:29.881
```

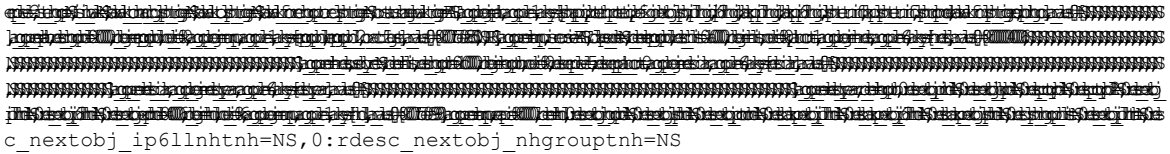
```
   via 0.0.0.0/32, 3 dependencies, weight 0, class 0 [flags 0x0]
    path-idx 0 NHID 0x0 [0x90e9d810 0x0]
    next hop 0.0.0.0/32
     drop adjacency

 Show-data Print at RPLC

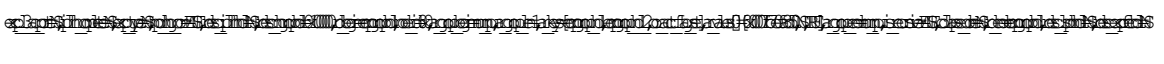

 LEAF - HAL pd context :
 sub-type : IPV4, ecd_marked:0, has_collapsed_ldi:0
 collapse_bwalk_required:0, ecdv2_marked:0,
HW Walk:
LEAF:
    trans_id: 29
    PI_ctx: 0x30919f10b8
    eng_ctx: 0x30919f1158
    revision: 29
    hal_leaf_type: IPV4
    created_in_ofa: 1
    NHGROUP_key:  {ID: 24-14-00-10-01-00-00-00}
    leaf npd data:




FIB_HAL_OBJECT_NRLWLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 28
  engctx: 0x30919bf0e8

FIB_HAL_OBJECT_SHLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 27
  engctx: 0x30918e5178
  nhgroup
    key: 24140010 01000000
    num paths: 1
    oor_state: 0
    is_protected[0]: 0
    next_obj[0] type: 6
    next_obj[0] exceptionnh key: type,4, intf,0, proto,0
  nhgroup npd data:

c_nextobj_ip6llnhtnh=NS,0:rdesc_nextobj_nhgrouptnh=NS

HW Walk:
LEAF:
    trans_id: 29
    PI_ctx: 0x30919f10b8
    eng_ctx: 0x30919f1158
    revision: 29
    hal_leaf_type: IPV4
    created_in_ofa: 1
    NHGROUP_key:  {ID: 24-14-00-10-01-00-00-00}
    leaf npd data:


```

```
    Load distribution: 0 (refcount 2)

    Hash  OK  Interface                 Address
    0     Y   recursive                 drop
0.0.0.0/32, version 0, broadcast
  Updated Apr 22 09:03:29.912
  Prefix Len 32

 Show-data Print at RPLC


 LEAF - HAL pd context :
 sub-type : IPV4, ecd_marked:0, has_collapsed_ldi:0
 collapse_bwalk_required:0, ecdv2_marked:0,
HW Walk:
LEAF:
    trans_id: 35
    PI_ctx: 0x30919f1298
    eng_ctx: 0x30919f1338
    revision: 35
    hal_leaf_type: IPV4
    created_in_ofa: 1
    ExceptionNH_key: {type: 2, proto: 0, l3addr: 0.0.0.0}
    leaf npd data:

[illegible]


FIB_HAL_OBJECT_NRLWLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 34
  engctx: 0x30919c0438

FIB_HAL_OBJECT_SHLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 33
  engctx: 0x30918e65f8

HW Walk:
LEAF:
    trans_id: 35
    PI_ctx: 0x30919f1298
    eng_ctx: 0x30919f1338
    revision: 35
    hal_leaf_type: IPV4
    created_in_ofa: 1
    ExceptionNH_key: {type: 2, proto: 0, l3addr: 0.0.0.0}
    leaf npd data:

[illegible]
224.0.0.0/4, version 0, external adjacency, internal 0x1040001 0x0 (ptr 0x919f1478) [1],
0x0 (0x919c1748), 0x0 (0x0)
 Updated Apr 22 09:03:29.916
 Prefix Len 4, traffic index 0, precedence n/a, priority 15
  gateway array (0x91832448) reference count 1, flags 0x0, source special (1), 0 backups
                [2 type 3 flags 0x8401 (0x918e79a8) ext 0x0 (0x0)]
  LW-LDI[type=3, refc=1, ptr=0x919c1748, sh-ldi=0x918e79a8]
  gateway array update type-time 1 Apr 22 09:03:29.916
 LDI Update time Apr 22 09:03:29.916
 LW-LDI-TS Apr 22 09:03:29.916
   via 0.0.0.0/32, 3 dependencies, weight 0, class 0 [flags 0x0]
```

```
    path-idx 0 NHID 0x0 [0x90e9e468 0x0]
    next hop 0.0.0.0/32
     external adjacency

 Show-data Print at RPLC


 LEAF - HAL pd context :
 sub-type : IPV4, ecd_marked:0, has_collapsed_ldi:0
 collapse_bwalk_required:0, ecdv2_marked:0,
HW Walk:
LEAF:
    trans_id: 41
    PI_ctx: 0x30919f1478
    eng_ctx: 0x30919f1518
    revision: 41
    hal_leaf_type: IPV4
    created_in_ofa: 1
    NHGROUP_key:  {ID: 24-14-00-10-02-00-00-00}
    leaf npd data:

<redacted>


FIB_HAL_OBJECT_NRLWLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 40
  engctx: 0x30919c1788

FIB_HAL_OBJECT_SHLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 39
  engctx: 0x30918e7a78
  nhgroup
    key: 24140010 02000000
    num paths: 1
    oor_state: 0
    is_protected[0]: 0
    next_obj[0] type: 6
    next_obj[0] exceptionnh key: type,1, intf,0, proto,0
  nhgroup npd data:
<redacted>
nextobj_ip6llnhtnh=NS,0:rdesc_nextobj_nhgrouptnh=NS

HW Walk:
LEAF:
    trans_id: 41
    PI_ctx: 0x30919f1478
    eng_ctx: 0x30919f1518
    revision: 41
    hal_leaf_type: IPV4
    created_in_ofa: 1
    NHGROUP_key:  {ID: 24-14-00-10-02-00-00-00}
    leaf npd data:

<redacted>
```

```
    Load distribution: 0 (refcount 2)

    Hash  OK  Interface                 Address
    0     Y   recursive                 external
224.0.0.0/24, version 0, receive
  Updated Apr 22 09:03:29.912
  Prefix Len 24
  internal 0x1004001 (ptr 0x919f1388) [1], 0x0 (0x919c0da0), 0x0 (0x0)
, receive adjacency, internal 0x1004001 0x0 (ptr 0x919f1388) [1], 0x0 (0x919c0da0), 0x0
(0x0)
 Updated Apr 22 09:03:29.912
 Prefix Len 24, traffic index 0, precedence n/a, priority 15
  gateway array (0x91832360) reference count 1, flags 0x0, source special (1), 0 backups
                [2 type 3 flags 0x8401 (0x918e6f68) ext 0x0 (0x0)]
  LW-LDI[type=3, refc=1, ptr=0x919c0da0, sh-ldi=0x918e6f68]
  gateway array update type-time 1 Apr 22 09:03:29.911
 LDI Update time Apr 22 09:03:29.911
 LW-LDI-TS Apr 22 09:03:29.911
   via 0.0.0.0/32, 11 dependencies, weight 0, class 0 [flags 0x0]
    path-idx 0 NHID 0x0 [0x90e9dd00 0x0]
    next hop 0.0.0.0/32
     receive adjacency

 Show-data Print at RPLC


 LEAF - HAL pd context :
 sub-type : IPV4, ecd_marked:0, has_collapsed_ldi:0
 collapse_bwalk_required:0, ecdv2_marked:0,
HW Walk:
LEAF:
    trans_id: 38
    PI_ctx: 0x30919f1388
    eng_ctx: 0x30919f1428
    revision: 38
    hal_leaf_type: IPV4
    created_in_ofa: 1
    ExceptionNH_key: {type: 1, proto: 0, l3addr: 0.0.0.0}
    leaf npd data:

[illegible]


FIB_HAL_OBJECT_NRLWLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 37
  engctx: 0x30919c0de0

FIB_HAL_OBJECT_SHLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 36
  engctx: 0x30918e7038

HW Walk:
LEAF:
    trans_id: 38
    PI_ctx: 0x30919f1388
    eng_ctx: 0x30919f1428
    revision: 38
    hal_leaf_type: IPV4
    created_in_ofa: 1
    ExceptionNH_key: {type: 1, proto: 0, l3addr: 0.0.0.0}
```

```
    leaf npd data:

<illegible>

    Load distribution: 0 (refcount 2)

    Hash  OK  Interface                 Address
    0     Y   recursive                 receive
255.255.255.255/32, version 0, broadcast
  Updated Apr 22 09:03:29.905
  Prefix Len 32

 Show-data Print at RPLC


 LEAF - HAL pd context :
 sub-type : IPV4, ecd_marked:0, has_collapsed_ldi:0
 collapse_bwalk_required:0, ecdv2_marked:0,
HW Walk:
LEAF:
    trans_id: 32
    PI_ctx: 0x30919f11a8
    eng_ctx: 0x30919f1248
    revision: 32
    hal_leaf_type: IPV4
    created_in_ofa: 1
    ExceptionNH_key: {type: 2, proto: 0, l3addr: 0.0.0.0}
    leaf npd data:

<illegible>


FIB_HAL_OBJECT_NRLWLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 31
  engctx: 0x30919bfa90

FIB_HAL_OBJECT_SHLDI:
  hal_proto: 12
  trans_id: 0
  prev_trans_id: 30
  engctx: 0x30918e5bb8

HW Walk:
LEAF:
    trans_id: 32
    PI_ctx: 0x30919f11a8
    eng_ctx: 0x30919f1248
    revision: 32
    hal_leaf_type: IPV4
    created_in_ofa: 1
    ExceptionNH_key: {type: 2, proto: 0, l3addr: 0.0.0.0}
    leaf npd data:

<illegible>
```

show cef ipv4 interface

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

show cef[**vrf** *vrf-name*] **ipv4 interface** *type interface-path-id* [**detail**] [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
type	Interface type. For more information, use the question mark (?) online help function.

in terface-path-id	Either a physical interface instance or a virtual interface instance as follows:
	• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.
	  • *rack*: Chassis number of the rack.
	  • *slot*: Physical slot number of the modular services card or line card.
	  • *module*: Module number. A physical layer interface module (PLIM) is always 0.
	  • *port*: 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 (RP0) and the module is CPU0. Example: interface HundredGigE 0/RP0 /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 detailed CEF information for all the interfaces on the node in which the command is issued.
location *node-id*	(Optional) Displays IPv4 CEF-related information for an interface. The *node-id* argument is entered in the *rack/slot/module* notation.

Command Default

No default behavior or values

Command History

Release	Modification
Release 7.0.12	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 interface rpf-statistics** command displays the CEF-related information for the interface on the route processor.

Task ID

Task ID	Operations
cef	read

Examples

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

```
Router# show cef ipv4 interface  HundredGigE 0/0/0/24
HundredGigE0/0/0/0 is up if_handle 0x0f000138 if_type IFT_HUNDREDGE(0x49)
     idb info 0x9093e730 flags 0x8001 ext 0x942c8da8 flags 0x50
     Vrf Local Info (0x95106328)
  Interface last modified Jan 13, 2020 06:08:29, create
  Reference count 1       Next-Hop Count 2
  Forwarding is enabled
  ICMP redirects are never sent
  ICMP unreachables are enabled
  Protocol MTU 1500, TableId 0xe0000000(0x90d43400)
  Protocol Reference count 2
  Primary IPV4 local address 100.0.0.6/32
```

This table describes the significant fields shown in the display.

Table 8: show cef ipv4 interface Command Field Descriptions

Field	Description
HundredGigE0/0/0/24 is down	Status of the interface.
if_handle	Internal interface handle.
Forwarding is enabled	Indicates that Cisco Express Forwarding (CEF) is enabled.
ICMP redirects are always sent or never sent	Indicates whether ICMP[4] redirect messages should be sent. By default, ICMP redirect messages are always sent.
IP MTU	Value of the IPv4 MTU[5] size set on the interface.
Reference count	Internal reference counter.

[4] ICMP = internet control message protocol
[5] MTU = maximum transmission unit

show cef ipv4 non-recursive

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

show cef [**vrf** *vrf-name*] **ipv4 non-recursive** [**detail**] [**hardware** {**egress** | **ingress**}] [*interface-type interface-instance*] [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
detail	(Optional) Displays detailed information about nonrecursive prefix entries in the IPv4 CEF table.
hardware	(Optional) Displays detailed information about hardware.
egress	(Optional) Displays egress NPU.
ingress	(Optional) Displays ingress NPU.
interface-type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface-instance	(Optional) Either a physical interface instance or a virtual interface instance: • Physical interface instance. Naming notation is *rack/slot/module/port* and a slash mark between values is required as part of the notation. • *rack*: Chassis number of the rack. • *slot*: Physical slot number of the line card. • *module*: Module number. A physical layer interface module (PLIM) is always 0. • *port*: Physical port number of the interface. **Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0) and the module is CPU0. Example: interface MgmtEth0/RP0 /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 *node-id*	(Optional) Displays the IPv4 nonrecursive prefix entries in the IPv4 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 7.0.12	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 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 non-recursive** command:

```
Router# show cef ipv4 non-recursive

Prefix              Next Hop            Interface
0.0.0.0/0           1012.8.0.1
0.0.0.0/32          broadcast
10.8.0.0/16         attached            MgmtEth0/0/CPU0/0
10.8.0.0/32         broadcast           MgmtEth0/0/CPU0/0
10.8.0.1/32         12.8.0.1            MgmtEth0/0/CPU0/0
10.8.0.2/32         12.8.0.2            MgmtEth0/0/CPU0/0
10.8.0.3/32         12.8.0.3            MgmtEth0/0/CPU0/0
10.8.16.10/32       12.8.16.10          MgmtEth0/0/CPU0/0
10.8.16.30/32       12.8.16.30          MgmtEth0/0/CPU0/0
10.8.16.40/32       12.8.16.40          MgmtEth0/0/CPU0/0
10.8.28.8/32        12.8.28.8           MgmtEth0/0/CPU0/0
10.8.28.101/32      12.8.28.101         MgmtEth0/0/CPU0/0
10.8.28.103/32      12.8.28.103         MgmtEth0/0/CPU0/0
10.8.28.104/32      12.8.28.104         MgmtEth0/0/CPU0/0
10.8.28.106/32      receive             MgmtEth0/0/CPU0/0
10.8.29.113/32      12.8.29.113         MgmtEth0/0/CPU0/0
10.8.29.118/32      12.8.29.118         MgmtEth0/0/CPU0/0
10.8.29.140/32      12.8.29.140         MgmtEth0/0/CPU0/0
10.8.33.101/32      12.8.33.101         MgmtEth0/0/CPU0/0
10.8.33.103/32      12.8.33.103         MgmtEth0/0/CPU0/0
10.8.33.105/32      12.8.33.105         MgmtEth0/0/CPU0/0
10.8.33.110/32      12.8.33.110         MgmtEth0/0/CPU0/0
10.8.57.1/32        12.8.57.1           MgmtEth0/0/CPU0/0
10.8.255.255/32     broadcast           MgmtEth0/0/CPU0/0
10.29.31.2/32       12.29.31.2          MgmtEth0/0/CPU0/0
10.255.0.0/16            attached        MgmtEth0/0/CPU0/0
10.255.254.254/32   10223.255.254.254     MgmtEth0/0/CPU0/0
10.0.0.0/4            0.0.0.0
10.0.0.0/24         receive
255.255.255.255/32   broadcast
```

This table describes the significant fields shown in the display.

Table 9: show cef ipv4 non-recursive Command Field Descriptions

Field	Description
Prefix	Nonrecursive prefixes detected on the node.
Next Hop	Routing next hop.
Interface	Interface associated with the nonrecursive prefix.

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.
location *node-id*	(Optional) Displays the IPv4 resource entries in the IPv4 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 7.0.12	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 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:

```
Router# show cef ipv4 resource detail

CEF resource availability summary state: GREEN
CEF will work normally
  ipv4 shared memory resource:
        CurrMode GREEN, CurrAvail 7167668222 bytes, MaxAvail 7242276863 bytes
  ipv6 shared memory resource:
        CurrMode GREEN, CurrAvail 7167668222 bytes, MaxAvail 7242276863 bytes
  mpls shared memory resource:
        CurrMode GREEN, CurrAvail 7167668222 bytes, MaxAvail 7242276863 bytes
  common shared memory resource:
        CurrMode GREEN, CurrAvail 7167668222 bytes, MaxAvail 7242276863 bytes
  DATA_TYPE_TABLE_SET hardware resource: GREEN
  DATA_TYPE_TABLE hardware resource: GREEN
  DATA_TYPE_IDB hardware resource: GREEN
  DATA_TYPE_IDB_EXT hardware resource: GREEN
  DATA_TYPE_LEAF hardware resource: GREEN
  DATA_TYPE_LOADINFO hardware resource: GREEN
  DATA_TYPE_PATH_LIST hardware resource: GREEN
  DATA_TYPE_NHINFO hardware resource: GREEN
```

```
DATA_TYPE_LABEL_INFO hardware resource: GREEN
DATA_TYPE_FRR_NHINFO hardware resource: GREEN
DATA_TYPE_ECD hardware resource: GREEN
DATA_TYPE_RECURSIVE_NH hardware resource: GREEN
DATA_TYPE_TUNNEL_ENDPOINT hardware resource: GREEN
DATA_TYPE_LOCAL_TUNNEL_INTF hardware resource: GREEN
DATA_TYPE_ECD_TRACKER hardware resource: GREEN
DATA_TYPE_ATTRIBUTE hardware resource: GREEN
DATA_TYPE_LSPA hardware resource: GREEN
DATA_TYPE_LDI_LW hardware resource: GREEN
DATA_TYPE_LDSH_ARRAY hardware resource: GREEN
DATA_TYPE_TE_TUN_INFO hardware resource: GREEN
DATA_TYPE_DUMMY hardware resource: GREEN
DATA_TYPE_IDB_VRF_LCL_CEF hardware resource: GREEN
DATA_TYPE_PROTO_GBL hardware resource: GREEN
DATA_TYPE_MOL hardware resource: GREEN
DATA_TYPE_MPI hardware resource: GREEN
DATA_TYPE_SUBS_INFO hardware resource: GREEN
DATA_TYPE_LISP_IPENCAP hardware resource: GREEN
DATA_TYPE_LSM_ID hardware resource: GREEN
DATA_TYPE_INTF_LIST hardware resource: GREEN
DATA_TYPE_TUNNEL_ENCAP_STR hardware resource: GREEN
DATA_TYPE_LABEL_RPF hardware resource: GREEN
DATA_TYPE_L2_SUBS_INFO hardware resource: GREEN
DATA_TYPE_LISP_IID_MAPPING hardware resource: GREEN
DATA_TYPE_LISP_RLOC_TBL hardware resource: GREEN
DATA_TYPE_NHID hardware resource: GREEN
DATA_TYPE_LOOKUP hardware resource: GREEN
DATA_TYPE_PREFIX_FILTER hardware resource: GREEN
DATA_TYPE_PREFIX_FILTER_TBL hardware resource: GREEN
DATA_TYPE_LLC_TBL hardware resource: GREEN
DATA_TYPE_LLC hardware resource: GREEN
DATA_TYPE_TI_PL_TBL hardware resource: GREEN
DATA_TYPE_RETRY_TBL hardware resource: GREEN
DATA_TYPE_RETRY hardware resource: GREEN
DATA_TYPE_OBJECT_QUEUE_HEAD hardware resource: GREEN
DATA_TYPE_OBJECT_MARKER hardware resource: GREEN
DATA_TYPE_PL_TRKR_ENTRY hardware resource: GREEN
DATA_TYPE_PL_TRKR_SHARE_NH hardware resource: GREEN
DATA_TYPE_NH_TRKR_SHARE_NH hardware resource: GREEN
DATA_TYPE_LEAF_TRKR_SHARE_NH hardware resource: GREEN
DATA_TYPE_FRR_NH_TRKR_SHARE_NH hardware resource: GREEN
DATA_TYPE_NH_REPL hardware resource: GREEN
DATA_TYPE_LEAF_EXT hardware resource: GREEN
DATA_TYPE_QUEUE_EXT hardware resource: GREEN
DATA_TYPE_COFO_TBL hardware resource: GREEN
DATA_TYPE_COFO_TBL_ENTRY hardware resource: GREEN
DATA_TYPE_COFO_IDB_TBL hardware resource: GREEN
DATA_TYPE_COFO_IDB_ENTRY hardware resource: GREEN
DATA_TYPE_DELETED_OBJECT_TBL hardware resource: GREEN
DATA_TYPE_DELETED_OBJECT hardware resource: GREEN
DATA_TYPE_SR6_GBL hardware resource: GREEN
DATA_TYPE_SR6A hardware resource: GREEN
DATA_TYPE_SR6I hardware resource: GREEN
DATA_TYPE_TEP hardware resource: GREEN
DATA_TYPE_LTEP hardware resource: GREEN
DATA_TYPE_TES hardware resource: GREEN
DATA_TYPE_ENCAP hardware resource: GREEN
DATA_TYPE_ENCAP_ARRAY hardware resource: GREEN
DATA_TYPE_ENCAP_IDA hardware resource: GREEN
DATA_TYPE_ENCAP_ID_TBL hardware resource: GREEN
DATA_TYPE_ENCAP_ID 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 [**vrf** *vrf-name*] **ipv4 summary** [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
location *node-id*	(Optional) Displays a summary of the IPv4 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 7.0.12	This command was introduced.

Usage Guidelines

If you do not specify a node with the **location** keyword and *node-id* argument, this command displays a summary of the IPv4 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 ipv4 summary** command:

```
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 10: 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 (*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 *x*s, peak *x*s)	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 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 [**vrf** *vrf-name*] **ipv4 unresolved** [**detail**] [**hardware** {**egress**}] [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
detail	(Optional) Displays detailed information unresolved routes listed in the IPv4 CEF table.
hardware	(Optional) Displays detailed information about hardware.
egress	(Optional) Displays egress packets.
location *node-id*	(Optional) Displays the unresolved routes in the IPv4 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 7.0.12	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:

```
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 11: 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 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 [**vrf** *vrf-name*] **ipv6 adjacency** [*interface-type interface-path-id*] [**location** *node-id*] [**detail**] [**discard**] [**glean**] [**null**] [**punt**] [**remote**]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
interface-type	(Optional) Interface type. For more information, use the question mark (?) online help function.
interface- path-id	(Optional) Either a physical interface instance or a virtual interface instance: • Physical interface instance. Naming notation is *rack/slot/module/port* and a slash mark between values is required as part of the notation. • *rack*: Chassis number of the rack. • *slot*: Physical slot number of the line card. • *module*: Module number. A physical layer interface module (PLIM) is always 0. • *port*: Physical port number of the interface. **Note** In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0) and the module is CPU0. Example: interface MgmtEth0/RP0 /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 *node-id*	(Optional) Displays detailed CEF information for the designated node. The *node-id* argument is entered in the *rack/slot/module* 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

Command History

Release	Modification
Release 7.0.12	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
cef	read

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

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 packets.
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 *node-id*	(Optional) Displays detailed CEF information for the designated node. The *node-id* argument is entered in the *rack/slot/module* 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 7.0.12	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:

```
Router#  sh cef ipv6 adjacency hardware egress location 0/6/CPU

Display protocol is ipv6
Interface    Address                                          Type    Refcount

BE31                                                          special 2
             Interface: BE31 Type:  glean
             Interface Type: 0x1c, Base Flags: 0x8001100
             Nhinfo PT: 0x9420ebb0, Idb PT: 0x93793f00, If Handle: 0xf00001c
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:44.108

 Show-data Print at RPLC



BE31          Prefix: 45:31::5/128                            local   3
             Adjacency: PT:0x91369078 45:31::5/128
             Interface: BE31
             NHID: 0x0
             MAC: 78.d3.62.4d.c5.03.78.4a.33.fd.49.03.86.dd
             Interface Type: 0x1c, Base Flags: 0x8000001
             Nhinfo PT: 0x987610b0, Idb PT: 0x93793f00, If Handle: 0xf00001c
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  5 17:37:20.035

 Show-data Print at RPLC


FIB_HAL_OBJECT_NHINFO_TX:
  hal_proto: 19
  trans_id: 0
  prev_trans_id: 693
  engctx: 0x3098761140



BE31          Prefix: fe80::7ad3:62ff:fe4d:c503/128          local   3
             Adjacency: PT:0x913692d8 fe80::7ad3:62ff:fe4d:c503/128
             Interface: BE31
             NHID: 0x0
             MAC: 78.d3.62.4d.c5.03.78.4a.33.fd.49.03.86.dd
             Interface Type: 0x1c, Base Flags: 0x8000001
             Nhinfo PT: 0x98761340, Idb PT: 0x93793f00, If Handle: 0xf00001c
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  5 17:37:20.063

 Show-data Print at RPLC


FIB_HAL_OBJECT_NHINFO_TX:
  hal_proto: 19
  trans_id: 0
  prev_trans_id: 697
  engctx: 0x30987613d0



BE31.1                                                        special 2
```

```
             Interface: BE31.1 Type:  glean
             Interface Type: 0x19, Base Flags: 0x8001100
             Nhinfo PT: 0x9420ee38, Idb PT: 0x93794290, If Handle: 0xf000024
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:44.132

 Show-data Print at RPLC



BE31.1        Prefix: 45:31:1::5/128                          local   3
             Adjacency: PT:0x91369408 45:31:1::5/128
             Interface: BE31.1
             NHID: 0x0
             MAC: 78.d3.62.4d.c5.03.78.4a.33.fd.49.03.81.00.00.01.86.dd
             Interface Type: 0x19, Base Flags: 0x8000001
             Nhinfo PT: 0x987615d0, Idb PT: 0x93794290, If Handle: 0xf000024
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  5 17:37:33.401

 Show-data Print at RPLC


FIB_HAL_OBJECT_NHINFO_TX:
  hal_proto: 19
  trans_id: 0
  prev_trans_id: 700
  engctx: 0x3098761660



BE31.1        Prefix: fe80::7ad3:62ff:fe4d:c503/128          local   3
             Adjacency: PT:0x91369668 fe80::7ad3:62ff:fe4d:c503/128
             Interface: BE31.1
             NHID: 0x0
             MAC: 78.d3.62.4d.c5.03.78.4a.33.fd.49.03.81.00.00.01.86.dd
             Interface Type: 0x19, Base Flags: 0x8000001
             Nhinfo PT: 0x98761af0, Idb PT: 0x93794290, If Handle: 0xf000024
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  5 17:37:33.414

 Show-data Print at RPLC


FIB_HAL_OBJECT_NHINFO_TX:
  hal_proto: 19
  trans_id: 0
  prev_trans_id: 705
  engctx: 0x3098761b80



FH0/0/0/6                                                     special 2
             Interface: FH0/0/0/6 Type:  glean
             Interface Type: 0xcb, Base Flags: 0x8001100
             Nhinfo PT: 0x9420e6a0, Idb PT: 0x93793320, If Handle: 0xf0001c8
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:42.113
```

```
 Show-data Print at RPLC



FH0/0/0/6     Prefix: 20::2/128                               local   3
              Adjacency: PT:0x913698c8 20::2/128
              Interface: FH0/0/0/6
              NHID: 0x0
              MAC: 78.1a.ee.b6.f0.00.78.4a.33.fd.48.30.86.dd
              Interface Type: 0xcb, Base Flags: 0x8000001
              Nhinfo PT: 0x98762010, Idb PT: 0x93793320, If Handle: 0xf0001c8
no dependent adj
              Ancestor If Handle: 0x0
 Update time May  5 17:39:48.833

 Show-data Print at RPLC


FIB_HAL_OBJECT_NHINFO_TX:
  hal_proto: 19
  trans_id: 0
  prev_trans_id: 709
  engctx: 0x30987620a0



FH0/0/0/6     Prefix: fe80::7a1a:eeff:feb6:f000/128          local   3
              Adjacency: PT:0x91369b28 fe80::7a1a:eeff:feb6:f000/128
              Interface: FH0/0/0/6
              NHID: 0x0
              MAC: 78.1a.ee.b6.f0.00.78.4a.33.fd.48.30.86.dd
              Interface Type: 0xcb, Base Flags: 0x8000001
              Nhinfo PT: 0x98762530, Idb PT: 0x93793320, If Handle: 0xf0001c8
no dependent adj
              Ancestor If Handle: 0x0
 Update time May  5 17:39:53.830

 Show-data Print at RPLC


FIB_HAL_OBJECT_NHINFO_TX:
  hal_proto: 19
  trans_id: 0
  prev_trans_id: 714
  engctx: 0x30987625c0



Hu0/0/0/32                                                   special 2
              Interface: Hu0/0/0/32 Type:  glean
              Interface Type: 0x49, Base Flags: 0x8001100
              Nhinfo PT: 0x9420dc80, Idb PT: 0x93793878, If Handle: 0xf000218
no dependent adj
              Ancestor If Handle: 0x0
 Update time May  4 22:49:42.097

 Show-data Print at RPLC



Hu0/0/0/31                                                   special 2
              Interface: Hu0/0/0/31 Type:  glean
```

```
             Interface Type: 0x49, Base Flags: 0x8001100
             Nhinfo PT: 0x9420d9f8, Idb PT: 0x93793910, If Handle: 0xf000220
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:42.097

 Show-data Print at RPLC



Hu0/0/0/30                                                   special 2
             Interface: Hu0/0/0/30 Type:  glean
             Interface Type: 0x49, Base Flags: 0x8001100
             Nhinfo PT: 0x9420d770, Idb PT: 0x937939a8, If Handle: 0xf000228
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:42.090

 Show-data Print at RPLC



Hu0/0/0/30.1                                                 special 2
             Interface: Hu0/0/0/30.1 Type:  glean
             Interface Type: 0x19, Base Flags: 0x8001100
             Nhinfo PT: 0x9420df08, Idb PT: 0x93793f98, If Handle: 0xf000258
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:42.100

 Show-data Print at RPLC



Hu0/0/0/31.1                                                 special 2
             Interface: Hu0/0/0/31.1 Type:  glean
             Interface Type: 0x19, Base Flags: 0x8001100
             Nhinfo PT: 0x9420e190, Idb PT: 0x93794030, If Handle: 0xf000260
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:42.104

 Show-data Print at RPLC



Hu0/0/0/32.1                                                 special 2
             Interface: Hu0/0/0/32.1 Type:  glean
             Interface Type: 0x19, Base Flags: 0x8001100
             Nhinfo PT: 0x9420e418, Idb PT: 0x937940c8, If Handle: 0xf000268
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:42.107

 Show-data Print at RPLC



FH0/0/0/6.1                                                  special 2
```

```
             Interface: FH0/0/0/6.1 Type:  glean
             Interface Type: 0x19, Base Flags: 0x8001100
             Nhinfo PT: 0x9420e928, Idb PT: 0x93794160, If Handle: 0xf000270
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  4 22:49:42.114

 Show-data Print at RPLC



FH0/0/0/6.1   Prefix: 20:0:1::2/128                          local   3
             Adjacency: PT:0x91369d88 20:0:1::2/128
             Interface: FH0/0/0/6.1
             NHID: 0x0
             MAC: 78.1a.ee.b6.f0.00.78.4a.33.fd.48.30.81.00.00.01.86.dd
             Interface Type: 0x19, Base Flags: 0x8000001
             Nhinfo PT: 0x98762a50, Idb PT: 0x93794160, If Handle: 0xf000270
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  5 17:39:57.518

 Show-data Print at RPLC


FIB_HAL_OBJECT_NHINFO_TX:
  hal_proto: 19
  trans_id: 0
  prev_trans_id: 718
  engctx: 0x3098762ae0



FH0/0/0/6.1   Prefix: fe80::7a1a:eeff:feb6:f000/128          local   3
             Adjacency: PT:0x91369fe8 fe80::7a1a:eeff:feb6:f000/128
             Interface: FH0/0/0/6.1
             NHID: 0x0
             MAC: 78.1a.ee.b6.f0.00.78.4a.33.fd.48.30.81.00.00.01.86.dd
             Interface Type: 0x19, Base Flags: 0x8000001
             Nhinfo PT: 0x98762f70, Idb PT: 0x93794160, If Handle: 0xf000270
no dependent adj
             Ancestor If Handle: 0x0
 Update time May  5 17:40:02.514

 Show-data Print at RPLC


FIB_HAL_OBJECT_NHINFO_TX:
  hal_proto: 19
  trans_id: 0
  prev_trans_id: 723
  engctx: 0x3098763000
```

show cef ipv6

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

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

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
interface-type interface-number	(Optional) IPv6 prefixes going through the specified next hop interface.
ipv6-prefix/prefix-length	(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 *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 24.4.1	The command is enhanced to include additional details about Layer 2 IPv6 prefixes that resolve as nexthop Layer 3 prefixes.
Release 7.0.12	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:

```
Router# show cef ipv6

::/0
drop default handler
```

```
fe80::/10
receive
ff02::/16
receive
ff02::2/128
receive
ff02::1:ff00:0/104
receive
ff05::/16
receive
ff12::/16
receive
```

This table describes the significant fields shown in the display.

Table 12: 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:

```
Router# show cef ipv6 detail


::/0, version 0, proxy default, default route handler, drop adjacency, internal 0x1001011
0x0 (ptr 0x8d7d52dc) [1], 0x0 (0x8db46098), 0x0 (0x0)
Updated Nov 22 22:57:58.580
Prefix Len 0, traffic index 0, precedence n/a, priority 15
via ::/128, 3 dependencies, weight 0, class 0 [flags 0x0]
path-idx 0 NHID 0x0 [0x8cf1c218 0x0]
next hop ::/128
drop adjacency
::ffff:90.0.0.1/128, version 14, attached, receive
Updated Nov 25 15:28:03.320
Prefix Len 128
internal 0x1004141 (ptr 0x8d7d48b4) [1], 0x0 (0x8db462c8), 0x0 (0x0)
fe80::/10, version 0, receive
Updated Nov 22 22:57:58.611
Prefix Len 10
internal 0x1004001 (ptr 0x8d7d4cc4) [1], 0x0 (0x8db461e8), 0x0 (0x0)
ff02::/16, version 0, receive
Updated Nov 22 22:57:58.611
Prefix Len 16
internal 0x1004001 (ptr 0x8d7d4f14) [1], 0x0 (0x8db46140), 0x0 (0x0)
ff02::2/128, version 0, receive
Updated Nov 22 22:57:58.611
Prefix Len 128
```

```
internal 0x1004001 (ptr 0x8d7d4fe4) [1], 0x0 (0x8db46108), 0x0 (0x0)
ff02::1:ff00:0/104, version 0, receive
Updated Nov 22 22:57:58.601
Prefix Len 104
internal 0x1004001 (ptr 0x8d7d520c) [1], 0x0 (0x8db460d0), 0x0 (0x0)
ff05::/16, version 0, receive
Updated Nov 22 22:57:58.607
Prefix Len 16
internal 0x1004001 (ptr 0x8d7d513c) [1], 0x0 (0x8db461b0), 0x0 (0x0)
ff12::/16, version 0, receive
Updated Nov 22 22:57:58.607
Prefix Len 16
internal 0x1004001 (ptr 0x8d7d4d94) [1], 0x0 (0x8db46178), 0x0 (0x0)
```

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

Table 13: 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.

In the following example, the IPv6 Layer 2 prefixes, which resolve as nexthop for Layer 3 prefixes are collapsed. This is indicated by the **collapsed** keyword in the output. The SRv6 SID lists indicate the different encapsulation layers or hierarchy.

```
Router#show cef ipv6 2001:DB8:A:B::1/64
Thu Jun  6 12:48:52.399 EDT
2001:DB8:A:B::1/64, version 8, SRv6 Headend, internal 0x1000001 0x0 (ptr 0x63851c98) [1],
0x1400 (0x63851da0), 0x0 (0x638b2128)
 Updated Jun  6 12:41:10.589
 Prefix Len 64, traffic index 0, precedence n/a, priority 0, encap-id 0x11deadbeef
  gateway array (0x61e1a798) reference count 1, flags 0x10, source rib (7), 0 backups
                [2 type 3 flags 0x40008501 (0x63853e38) ext 0x0 (0x0) (collapsed)]
  LW-LDI[type=3, refc=1, ptr=0x63851da0, sh-ldi=0x63853e38]
  gateway array update type-time 1 Jun  6 12:41:10.589
 LDI Update time Jun  6 12:41:10.629
 LW-LDI-TS Jun  6 12:41:10.629
 Accounting: Disabled
   via 2001:DB8::1/128, 1 dependency, recursive [flags 0x3000000]
    path-idx 0 NHID 0x0 [0x63a2c098 0x0]
    next hop 2001:DB8::1/128 via  2001:DB8::1
    SRv6 H.Encaps.Red SID-list {2001:DB8:1:e002::}
      SRv6 H.Insert.Red SID-list {}
      SRv6 H.Insert.Red SID-list {bbbb:bbbb:3:: bbbb:bbbb:4::}
   via 2001:DB8::1/128, 1 dependency, recursive [flags 0x3000000]
    path-idx 1 NHID 0x0 [0x63a2c270 0x0]
    next hop 2001:DB8::1/128 via 2001:DB8::1
    SRv6 H.Encaps.Red SID-list {bbbb:bbbb:2:e002::}
```

```
   SRv6 H.Insert.Red SID-list {}

Load distribution: 0 1 2 2 (refcount 2)

Hash  OK  Interface                 Address
0     Y   UNKNOWN intf 0x00000013   10::2
1     Y   UNKNOWN intf 0x00000014   20::2
2     Y   UNKNOWN intf 0x00000013   10::2
3     Y   UNKNOWN intf 0x00000013   10::2
```

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 cef [**vrf** *vrf-name*]**ipv6 drops** [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
location *node-id*	(Optional) Displays IPv6 CEF table packet drop counters 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 7.0.12	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 *node-id* 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

Task ID	Operations
cef	read

Examples

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

```
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 :              1
```

```
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 14: 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[6].
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.

[6] 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 [**vrf** *vrf-name*] **ipv6 exact-route** { *source-address destination-address* } [**flow-label** *flow-label-value*] [**protocol** { *protocol-number* | *protocol-value* }] [**source-port** *source-port-number*] [**destination-port** *destination-port-number*] [**ingress-interface interface-type** *interface-id*] [**hardware** { **ingress** | **egress** }] [**policy-class** *value*] [**detail** | **location** *node-id]*] { **ingress-interface** *ingress-interface* | **user-data** *user-data* **ingress-interface** *ingress-interface* [**brief** | **detail** | **flow-label** | **hardware** | **internal** | **location** | **policy-class** | **protocol**] }

Syntax Description

vrf	(Optional) Sets VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
source-address	The IPv6 source address in x:x::x format.
destination-address	The IPv6 destination address in x:x::x format.
protocol *protocol-number* | *protocol-name*	Sets the specified protocol for the route.
source-port *source-port-number*	(Optional) Sets the source port. The range is from 0 to 65535.
destination-port *destination-port-number*	(Optional) Sets the destination port. The range is from 0 to 65535.
ingress-interface interface-type *interface-id*	Sets the ingress interface type and ID.
hardware { **protocol-value** | **protocol-name** }	(Optional) Reads from the ingress or egress packet.
flow-label *flow-label-value*	Sets the IPv6 flow-label and flow-label-value.
policy-class *value*	(Optional) Sets the class for the policy-based tunnel selection. The range for the tunnel policy class value is from 1 to 7.
detail	(Optional) Provides full CEF entry information.

location *node-id*	(Optional) Provides the IPv6 CEF table for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
ingress-interface	(Optional) Specifies the ingress interface information.
user-data *user-data*	(Optional) Specifies the additional user chosen data bytes used in multi-path computation. In *user-data*, you can enter 1-4 bytes in hexadecimal.
ingress-interface *ingress-interface*	Specifies the ingress interface information.
brief	(Optional) Displays brief information of CEF table.
detail	(Optional) Displays full information of CEF table.
flow-label	(Optional) Specifies the IPv6 flow-label.
hardware	(Optional) Displays information from hardware.
location	(Optional) Provides the forwarding information for the designated node. The node-id argument is entered in the *rack/slot/module* notation.
policy-class	(Optional) Class for policy-based tunnel selection.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.5.5	The keyword **user-data** was introduced.
Release 24.2.11	The keyword **user-data** was introduced.
Release 7.0.12	This command was introduced.

Usage Guidelines

For TCP and UDP protocols, providing the source-port and destination-port is mandatory. For other protocols, provide the source-port and destination-port as zero. Providing flow-label is also mandatory. 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:

```
Router# show cef ipv6 exact-route 2001:DB8::1 2001:DB8:0:ABCD::1 flow-label 15000 protocol
 UDP source-port 34000 destination-port 45000 ingress-interface HundredGigE 0/0/0/24
Wed Apr 15 02:36:17.632 UTC
2001:DB8:0:ABCD::1/128, version 27, labeled SR, internal 0x1000001 0x8010 (ptr 0x96a0571c)
 [1], 0x0 (0x969e5160), 0xa28 (0x9849c120)
 Updated Apr 14 21:29:19.925
 local adjacency fe80::7ace:ecff:fecf:d103
 Prefix Len 128, traffic index 0, precedence n/a, priority 1, encap-id 0x1001500000001
   via Bundle-Ether2
   via fe80::7ace:ecff:fecf:d103/128, Bundle-Ether2, 7 dependencies, weight 0, class 0
[flags 0x0]
    path-idx 0 NHID 0x0 [0x981225d0 0x0]
    next hop fe80::7ace:ecff:fecf:d103/128
     local adjacency
     local label 21556 labels imposed {21556}
```

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

```
Router# show cef ipv6 exact-route 100::10 60::1 flow-label 0 protocol 59 source-port 0
destination-port 0 user-data 0x2 ingress-interface HundredGigE0/0/0/2 location 0/0/cpu0

Unsupported protocol value 59
60::/16, version 1293, internal 0x1000001 0x20 (ptr 0x8b78ef00) [1], 0x400 (0x8e9cfc48),
0x0 (0x0)
 Updated Aug 14 07:50:20.022
 local adjacency to Bundle-Ether3.30

 Prefix Len 16, traffic index 0, precedence n/a, priority 2
   via Bundle-Ether3.30
   via fe80::72b3:17ff:feae:d703/128, Bundle-Ether3.30, 7 dependencies, weight 0, class 0
[flags 0x0]
    path-idx 7 NHID 0x0 [0x8db8bed8 0x0]
    next hop fe80::72b3:17ff:feae:d703/128
    local adjacency
```

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 [**vrf** *vrf-name*] **ipv6 exceptions** [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
location *node-id*	(Optional) Displays IPv6 CEF exception packet counters 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 7.0.12	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:

```
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 :               1
  Broadcast   packets :               0
  IP options  packets :               0
  TTL expired packets :               0
  Fragmented  packets :               0
```

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 [**vrf** *vrf-name*] **ipv6 hardware** {**egress** | [**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 packets.
detail	(Optional) Displays full details.
location *node-id*	(Optional) Displays detailed CEF information 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 7.0.12	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:

```
Router# show cef ipv6 hardware egress detail

::/0, version 0, proxy default, default route handler, drop adjacency, internal 0x1001011
0x0 (ptr 0x8d7d52dc) [1], 0x0 (0x8db46098), 0x0 (0x0)
Updated Nov 22 22:57:58.578
Prefix Len 0, traffic index 0, precedence n/a, priority 15
gateway array (0x8d87a098) reference count 1, flags 0x200, source default (12), 0 backups
[2 type 3 flags 0xa401 (0x8d9cf098) ext 0x0 (0x0)]
LW-LDI[type=3, refc=1, ptr=0x8db46098, sh-ldi=0x8d9cf098]
gateway array update type-time 1 Nov 22 22:57:58.578
LDI Update time Nov 22 22:57:58.595
LW-LDI-TS Nov 22 22:57:58.595
via ::/128, 3 dependencies, weight 0, class 0 [flags 0x0]
path-idx 0 NHID 0x0 [0x8cf1c218 0x0]
```

```
next hop ::/128
drop adjacency


Load distribution: 0 (refcount 2)

Hash OK Interface Address
0 Y Unknown drop
::ffff:90.0.0.1/128, version 14, attached, receive
Updated Nov 25 15:28:03.318
Prefix Len 128
internal 0x1004141 (ptr 0x8d7d48b4) [1], 0x0 (0x8db462c8), 0x0 (0x0)
fe80::/10, version 0, receive
Updated Nov 22 22:57:58.608
Prefix Len 10
internal 0x1004001 (ptr 0x8d7d4cc4) [1], 0x0 (0x8db461e8), 0x0 (0x0)
ff02::/16, version 0, receive
Updated Nov 22 22:57:58.609
Prefix Len 16
internal 0x1004001 (ptr 0x8d7d4f14) [1], 0x0 (0x8db46140), 0x0 (0x0)
```

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 [**vrf** *vrf-name*] **ipv6 interface** *type interface-path-id* [**detail**] [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
type	Interface type. For more information, use the question mark (?) online help function.
interface-path-id	Physical interface or virtual interface. **Note** Use the **show interfaces** command to see a list of all interfaces currently configured on the router. For more information about the syntax for the router, use the question mark (?) online help function.
detail	(Optional) Displays detailed CEF information for all the interfaces on the node in which the command is issued.
location *node-id*	(Optional) Displays IPv4 CEF-related information for an interface. 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 7.0.12	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 HundredGigE 0/0/0/0** command:

```
Router# show cef ipv6 interface HundredGigE 0/0/0/0

HundredGigE0/0/0/0 is up if_handle 0x0f000138 if_type IFT_HUNDREDGE(0x49)
```

```
   idb info 0x9093e730 flags 0x8001 ext 0x9557d0a8 flags 0x50
   Vrf Local Info (0x95b7a0a8)
Interface last modified Jan 13, 2020 06:08:29, create
Reference count 1       Next-Hop Count 1
Forwarding is enabled
ICMP redirects are never sent
ICMP unreachables are enabled
Protocol MTU 1500, TableId 0xe0800000(0x91382758)
Protocol Reference count 2
Primary IPV6 local address 100::6/128
```

show cef ipv6 non-recursive

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

show cef [**vrf** *vrf-name*] **ipv6 non-recursive** [**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.
hardware	(Optional) Displays Cisco Express Forwarding (CEF) IPv6 hardware status and configuration information.
egress	(Optional) Displays information from the egress packets.
ingress	(Optional) Displays information from the ingress packets.
detail	(Optional) Displays full details.
location *node-id*	(Optional) Displays the nonrecursive prefix entries in 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 7.0.12	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 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 non-recursive** command:

```
Router# show cef ipv6 non-recursive

20::/64
connected FourHundredGigE0/0/0/6
20::2/128
20::2/128 FourHundredGigE0/0/0/6
20::3/128
```

```
receive FourHundredGigE0/0/0/6
20:0:1::/64
connected FourHundredGigE0/0/0/6.1
20:0:1::2/128
20:0:1::2/128 FourHundredGigE0/0/0/6.1
20:0:1::3/128
receive FourHundredGigE0/0/0/6.1
30:30::/64
connected HundredGigE0/0/0/30
30:30::3/128
receive HundredGigE0/0/0/30
30:30:1::/64
connected HundredGigE0/0/0/30.1
30:30:1::3/128
receive HundredGigE0/0/0/30.1
30:31::/64
connected HundredGigE0/0/0/31
30:31::3/128
receive HundredGigE0/0/0/31
30:31:1::/64
connected HundredGigE0/0/0/31.1
30:31:1::3/128
receive HundredGigE0/0/0/31.1
30:32::/64
connected HundredGigE0/0/0/32
30:32::3/128
receive HundredGigE0/0/0/32
30:32:1::/64
connected HundredGigE0/0/0/32.1
30:32:1::3/128
receive HundredGigE0/0/0/32.1
45:31::/64
connected Bundle-Ether31
45:31::3/128
receive Bundle-Ether31
45:31::5/128
45:31::5/128 Bundle-Ether31
45:31:1::/64
connected Bundle-Ether31.1
45:31:1::3/128
receive Bundle-Ether31.1
45:31:1::5/128
45:31:1::5/128 Bundle-Ether31.1
210:210:1::3/128
receive Loopback0
```

This table describes the significant fields shown in the display.

Table 15: show cef ipv6 non-recursive 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.

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**] [**location** *node-id*]

Syntax Description

detail	(Optional) Displays detailed information resources listed in the IPv6 CEF table.
location *node-id*	(Optional) Displays the IPv6 resource entries in 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 7.0.12	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 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:

```
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
  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 [**vrf** *vrf-name*] **ipv6 summary** [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
location *node-id*	(Optional) Displays a summary of 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 7.0.12	This command was introduced.

Usage Guidelines

If you do not specify a node with the **location** keyword and *node-id* argument, this command displays a summary of the IPv6 CEF table 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 summary** command:

```
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 16: 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 (*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 *x*s, peak *x*s)	Currently not used.
prefixes modified in place	Prefixes modified in place.
Router ID	Router identification.
Adjacency Table has *x* adjacencies	Total number of adjacencies.
x 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 [**vrf** *vrf-name*] **ipv6 unresolved** [**detail**] [**hardware** {**egress**}] [**location** *node-id*]

Syntax Description

vrf	(Optional) Displays VPN routing and forwarding (VRF) instance information.
vrf-name	(Optional) Name of a VRF.
detail	(Optional) Displays full details.
hardware	(Optional) Displays Cisco Express Forwarding (CEF) IPv6 hardware status and configuration information.
egress	Displays information from the egress packets.
location *node-id*	(Optional) Displays detailed CEF information 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 7.0.12	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:

```
Router# show cef ipv6 unresolved

9999::/64
  unresolved
```

This table describes the significant fields shown in the display.

Table 17: 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

interface-type	(Optional) Interface type. For more information, use the question mark (?) online help function.

interface- path-id	(Optional) Either a physical interface instance or a virtual interface instance:
	• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash mark between values is required as part of the notation.
	  • *rack*: Chassis number of the rack.
	  • *slot*: Physical slot number of the line card.
	  • *module*: Module number. A physical layer interface module (PLIM) is always 0.
	  • *port*: Physical port number of the interface.
	Note In references to a Management Ethernet interface located on a route processor card, the physical slot number is alphanumeric (RP0) and the module is CPU0. Example: interface MgmtEth0/RP0 /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 *node-id*	(Optional) Displays detailed CEF information 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 7.0.12	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:

```
Router# sh cef mpls adjacency inter

Display protocol is mpls
Interface    Address                                        Type   Refcount

BE1906       Prefix: 10.0.86.1/32                           local   7
             Adjacency: PT:0x8cba28d0 10.0.86.1/32
             Interface: BE1906
             NHID: 0x0
             MAC: e6.48.5c.10.b4.8e.e6.07.2b.8d.34.88.88.47
             Interface Type: 0x1c, Base Flags: 0x1 (0x8d10f620)
             Nhinfo PT: 0x8d10f620, Idb PT: 0x8ca57320, If Handle:
0x8000174
no dependent adj
             Ancestor If Handle: 0x0
 Update time Dec 21 03:56:49.977


BE1904       Prefix: 10.0.85.1/32                           local   7
             Adjacency: PT:0x8cba3c78 10.0.85.1/32
             Interface: BE1904
             NHID: 0x0
             MAC: e6.48.5c.10.b4.86.e6.07.2b.8d.34.89.88.47
             Interface Type: 0x1c, Base Flags: 0x1 (0x8d10f1a0)
             Nhinfo PT: 0x8d10f1a0, Idb PT: 0x8ca572a0, If Handle:
0x800016c
no dependent adj
             Ancestor If Handle: 0x0
 Update time Dec 21 03:57:25.360
```

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**} [**detail** | **discard** | **drop** | **glean** | **location** *node-id* | **null** | **punt** | **remote**]

Syntax Description

egress	Displays information from the egress packets.
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 *node-id*	(Optional) Displays detailed CEF information for the designated node. The *node-id* argument is entered in the *rack/slot/module* 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 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
cef	read

Examples

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

```
Router# sh cef mpls adjacency inter

Display protocol is mpls
Interface    Address                                          Type    Refcount
```

```
BE1906       Prefix: 10.0.86.1/32                            local   7
             Adjacency: PT:0x8cba28d0 10.0.86.1/32
             Interface: BE1906
             NHID: 0x0
             MAC: e6.48.5c.10.b4.8e.e6.07.2b.8d.34.88.88.47
             Interface Type: 0x1c, Base Flags: 0x1 (0x8d10f620)
             Nhinfo PT: 0x8d10f620, Idb PT: 0x8ca57320, If Handle:
0x8000174
no dependent adj
             Ancestor If Handle: 0x0
 Update time Dec 21 03:56:49.977


BE1904       Prefix: 10.0.85.1/32                            local   7
             Adjacency: PT:0x8cba3c78 10.0.85.1/32
             Interface: BE1904
             NHID: 0x0
             MAC: e6.48.5c.10.b4.86.e6.07.2b.8d.34.89.88.47
             Interface Type: 0x1c, Base Flags: 0x1 (0x8d10f1a0)
             Nhinfo PT: 0x8d10f1a0, Idb PT: 0x8ca572a0, If Handle:
0x800016c
no dependent adj
             Ancestor If Handle: 0x0
 Update time Dec 21 03:57:25.360
```

show cef mpls drops

To display Multiprotocol Label Switching (MPLS) drop counters for packets that belong to a segment routing (SR) network, use the **show cef mpls drops** command in XR EXEC mode.

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

Syntax Description

location *node-id*	(Optional) Displays detailed Cisco Express Forwarding (CEF) information for the designated node. The *node-id* argument is entered in the *rack/slot/module* notation.
all	(Optional) Displays all locations.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

Use this command to display the SR MPLS drop counters.

The incoming top MPLS label is inspected. If the label belongs to the Segment Routing Local Block (SRLB) or the Segment Routing Global Block (SRGB), an MPLS SR drop counter is incremented for unknown label value or for MPLS time to live (TTL) expiry.

Note The drop counters will increment for manually allocated adjacency SIDs and prefix SIDs only. They will not increment for dynamically allocated adjacency SIDs.

Task ID

Task ID	Operation
cef	read

Example

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

```
Router# show cef mpls drops location 0/0/CPU0
Sat Jun  9 03:49:27.100 IST
CEF Drop Statistics
Node: 0/0/CPU0
  SR MPLS unreachable packets :               100
  SR MPLS TTL expired packets :               400
```

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

type	Interface type. For more information, use the question mark (?) online help function.

in terface-path-id	Either a physical interface instance or a virtual interface instance as follows:
	• Physical interface instance. Naming notation is *rack/slot/module/port* and a slash between values is required as part of the notation.
	  • *rack*: Chassis number of the rack.
	  • *slot*: Physical slot number of the modular services card or line card.
	  • *module*: Module number. A physical layer interface module (PLIM) is always 0.
	  • *port*: 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 (RP0) and the module is CPU0. Example: interface MgmtEth0/ RP0
	• 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 *node-id*	(Optional) Displays IPv4 CEF-related information for an interface. 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 7.0.12	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 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:

```
Router#  sh cef mpls interface hundredGigE 0/0/0/24
Wed Apr 22 16:56:48.376 UTC
HundredGigE0/0/0/24 is down if_handle 0x0f0001f8 if_type IFT_HUNDREDGE(0x49)
     idb info 0x912e6ae0 flags 0x8001 ext 0x0
     Vrf Local Info (0x0)
  Interface last modified Apr 22, 2020 14:28:51, create
  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 *node-id*	(Optional) Displays detailed CEF information 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 7.0.12	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:

```
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 18: 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 recursive-nexthop

To display Cisco Express Forwarding (CEF) recursive next-hop information, use the**show cef recursive-nexthop** command in XR EXEC mode.

show cef recursive-nexthop [**hardware**] [**location node-id**]

Syntax Description

hardware	(Optional) Displays hardware information related to the recursive next hop.
location *node-id*	(Optional) Displays recursive next-hop information for the specified 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 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
cef	read

Related Commands

Command	Description
show cef, on page 27	Displays information about packets forwarded by Cisco Express Forwarding (CEF).

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

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

No specific guidelines impact the use of this command.

Task ID

Task ID	Operations
cef	read

Examples

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

```
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
```

This table describes the significant fields shown in the display.

Table 19: 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 *x*s, peak *x*s)	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 vrf

To display the contents of the VPN routing and forwarding (VRF) instance, use the **show cef vrf** command in XR EXEC mode.

show cef vrf [*vrf-name*]

Syntax Description

vrf-name	Name of the VRF instance.

Command Default

No default behavior or values

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.0.12	This command was introduced.

Usage Guidelines

To display unresolved routes, you must use the **unresolved** keyword explicitly.

Task ID

Task ID	Operations
cef	read

Examples

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

```
Router# show cef vrf test1
Tue Apr 28 04:21:48.588 UTC

Prefix              Next Hop            Interface
------------------- ------------------- ------------------
0.0.0.0/0           drop                default handler
0.0.0.0/32          broadcast
26.0.0.0/24         attached            HundredGigE0/0/0/26
26.0.0.0/32         broadcast           HundredGigE0/0/0/26
26.0.0.1/32         26.0.0.1/32         HundredGigE0/0/0/26
26.0.0.2/32         receive             HundredGigE0/0/0/26
26.0.0.255/32       broadcast           HundredGigE0/0/0/26
27.0.0.0/24         attached            HundredGigE0/0/0/27
27.0.0.0/32         broadcast           HundredGigE0/0/0/27
27.0.0.2/32         receive             HundredGigE0/0/0/27
27.0.0.3/32         27.0.0.3/32         HundredGigE0/0/0/27
27.0.0.255/32       broadcast           HundredGigE0/0/0/27
224.0.0.0/4         0.0.0.0/32
224.0.0.0/24        receive
```

This table describes the significant fields shown in the display.

Table 20: show cef vrf 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 hw-module profile cef

To display information about the configuration status of CEF hardware-modules, use the **show hw-module profile cef** command in XR EXEC mode.

show hw-module profile cef

Command Modes

XR EXEC mode

Command History

Release	Modification
Release 7.3.1	This command was introduced.

Task ID

Task ID	Operations
cef	read

Examples

This sample output is from the **show hw-module profile cef** command:

```
Router# show hw-module profile cef
Tue Oct 6 00:34:47.735 UTC
-------------------------------------------------------------------------------------------
Knob                                          Status      Applied    Action
-------------------------------------------------------------------------------------------
BGPLU                                      Configured       No       Reload
Dark Bandwidth                             Unconfigured     Yes      None
MPLS Per Path Stats                        Unconfigured     Yes      None
Tunnel TTL Decrement                       Configured       Yes      None
High-Scale No-LDP-Over-TE                  Unconfigured     Yes      None
```