



Cisco IOS IP Switching Command Reference

Release 12.4T

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Cisco IOS IP Switching Command Reference

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Introduction ISW-1

Cisco IOS IP Switching Commands ISW-3



Introduction

This document describes the commands used to configure IP switching features such as Cisco Express Forwarding (CEF), Distributed CEF (dCEF), and Fast Switching in Cisco IOS software.



Note

Prior to Cisco IOS Release 12.3(14)T, the commands for configuring IP switching features were presented in the *Cisco IOS Switching Services Command Reference*.

Refer to the configuration guide indicated here for configuration guidelines:

For Guidelines About Configuring This Cisco IOS Feature...	Refer to the Following Cisco IOS Configuration Guide...
IP switching features	<ul style="list-style-type: none">• <i>Cisco IOS IP Switching Configuration Guide</i>, Release 12.4



Cisco IOS IP Switching Commands

clear adjacency

To clear the Cisco Express Forwarding (CEF) adjacency table, use the **clear adjacency** command in privileged EXEC mode.

clear adjacency

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History

Release	Modification
11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
11.1 CC	Multiple platform support was added.

Usage Guidelines

When you issue this command, entries in the adjacency table that reside on the Route Processor (RP) are removed and then adjacency sources (such as ARP and Frame Relay) are requested to repopulate the adjacency tables once again. Layer 2 next hop information is reevaluated.

With distributed CEF (dCEF) mode, the adjacency tables that reside on line cards are always synchronized to the adjacency table that resides on the RP. Therefore, clearing the adjacency table on the RP using the **clear adjacency** command also clears the adjacency tables on the line cards; all changes are propagated to the line cards.

Clearing adjacencies causes the adjacency table to repopulate from the Layer 2 to Layer 3 mapping tables, such as Address Resolution Protocol (ARP). To cause the mappings to be re-evaluated, the source information must be cleared by using a Cisco IOS command, such as the **clear arp-cache** command.

Examples

The following example shows how to clear the adjacency table:

```
Router# clear adjacency
```

Related Commands

Command	Description
clear arp-cache	Deletes all dynamic entries from the ARP cache.
show adjacency	Displays CEF adjacency table information.

clear adjacency epoch

To begin a new epoch and increment the epoch number of the adjacency table, use the **clear adjacency epoch** command in privileged EXEC mode.

clear adjacency epoch

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(8)T	This command was introduced.

Usage Guidelines The **clear adjacency epoch** command increments the epoch and flushes entries with the old epoch. This command clears inconsistencies.

Use the **clear adjacency epoch** command when you want to rebuild the adjacency table. A new adjacency table might be required because the user wants to remove inconsistencies from the table.

Examples The following example shows how to begin a new epoch and increments the epoch number of the adjacency table:

```
Router# clear adjacency epoch
```

Related Commands	Command	Description
	clear ip cef epoch	Begins a new epoch and increments the epoch number for a CEF table.

clear cef interface

To clear the Cisco Express Forwarding (CEF) per-interface traffic policy statistics for an interface, use the **clear cef interface policy-statistics** command in privileged EXEC mode.

clear cef interface [*interface-type interface-number*] **policy-statistics**

Syntax Description	<i>interface-type</i>	Type of interface to clear the policy statistics for
	<i>interface-number</i>	Port, connector, or interface card number

Defaults If you do not specify an interface type and interface number the policy statistics for all interfaces are cleared.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0(9)S	This command was introduced to support the Cisco 12000 series Internet routers.
	12.0(17)ST	This command was introduced to support the Cisco 12000 series Internet routers.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

Usage Guidelines This command clears the CEF BGP traffic policy statistics counters for an interface.

Examples The following example clears the CEF BGP traffic policy statistics counters:

```
R1# clear cef interface ethernet 0/0 policy-statistics
R1#
```

Related Commands	Command	Description
	bgp-policy	Enables Border Gateway Protocol (BGP) policy accounting or policy propagation on an interface.
	show cef interface policy-statistics	Displays detailed Cisco Express Forwarding (CEF) policy statistical information for all interfaces.

clear cef linecard

To clear Cisco Express Forwarding (CEF) information from line cards, use the **clear cef linecard** command in privileged EXEC mode.

clear cef linecard [*slot-number*] [**adjacency** | **interface** | **prefix** | **events**]

Syntax Description		
	<i>slot-number</i>	(Optional) Line card slot number to clear. When you omit this argument, all line card slots are cleared.
	adjacency	(Optional) Clears line card adjacency tables and rebuilds adjacency for the specified line card.
	interface	(Optional) Clears line card interface information and recreates the interface information for the specified line card.
	prefix	(Optional) Clears line card prefix tables and starts rebuilding the forwarding information base (FIB) table.
	events	(Optional) Clears the CEF linecard event log.

Command Modes Privileged EXEC

Command History	Release	Modification
	11.2GS	This command was introduced to support the Cisco 12012 Internet router.
	11.1CC	Multiple platform support was added.

Usage Guidelines This command is available only on distributed switching platforms running distributed CEF (dCEF). CEF information on the line cards is cleared; however, CEF information on the Route Processor (RP) is not affected.

Once you clear CEF information from line cards, the corresponding information from the RP is propagated to the line cards. Interprocess communications (IPC) ensures that CEF information on the RP matches the CEF information on the line cards.

Examples The following example shows how to clear the CEF information from the line cards:

```
Router# clear cef linecard
```

The following example shows how to clear the CEF linecard event log:

```
Router# clear cef linecard events
```

```
All recorded events will be lost. Continue? [yes/no]: y
Router#
```

clear cef linecard**Related Commands**

Command	Description
show cef linecard	Displays CEF-related interface information by line card.

clear ip cache

To delete entries in the routing table cache used to fast switch IP traffic, use the **clear ip cache** command in the privileged EXEC mode.

```
clear ip cache [prefix mask]
```

Syntax Description	<i>prefix mask</i>	(Optional) Deletes only the entries in the cache that match the prefix and mask combination.
---------------------------	--------------------	--

Command Modes	Privileged EXEC
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Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines	Use this command to clear routes from the routing table cache. You can remove all entries in the routing cache or you can remove only those entries associated with a specified prefix and mask.
-------------------------	--

Examples The following command shows how to delete entire in the routing table cache:

```
Router# clear ip cache
```

The following command show how to delete entries in the router table associated with the prefix and mask 192.168.32.0 255.255.255.0:

```
Router# clear ip cache 192.168.32.0 255.255.255.0
```

Related Commands	Command	Description
	ip route-cache	Controls the use of high-speed switching caches for IP routing.
	show ip cache	Displays the routing table cache used to fast switch IP traffic.

clear ip cef epoch

To begin a new epoch and increment the epoch number for one or all Cisco Express Forwarding (CEF) tables, use the **clear ip cef epoch** command in privileged EXEC mode.

```
clear ip cef epoch [all-vrfs | full | vrf [table]]
```

Syntax Description	all-vrfs	(Optional) Begins a new epoch for all Forwarding Information Base (FIB) tables.
	full	(Optional) Begins a new epoch for all tables, including adjacency tables.
	vrf	(Optional) Begins a new epoch for the specified FIB table.
	<i>table</i>	(Optional) Virtual Private Network (VPN) routing/forwarding instance (VRF) name.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(8)T	This command was introduced.

Usage Guidelines Use the **clear ip cef epoch** command when you want to rebuild a table. This command increments the epoch and flushes entries with the old epoch. This command clears any inconsistencies that might exist, so if everything in the system is working correctly, this command does not affect the CEF forwarding tables other than changing the current epoch values.

Examples The following example shows the output before and after you clear the epoch table and increment the epoch number:

```
Router# show ip cef epoch

CEF epoch information:

Table: Default-table
    Table epoch: 2 (43 entries at this epoch)

Adjacency table
    Table epoch: 2 (5 entries at this epoch)

Router# clear ip cef epoch full

Router# show ip cef epoch

CEF epoch information:

Table: Default-table
    Table epoch: 3 (43 entries at this epoch)

Adjacency table
    Table epoch: 3 (5 entries at this epoch)
```

Related Commands

Command	Description
show cef state	Displays the state of CEF.
show ip cef epoch	Shows the table epochs of the adjacency table and of all FIB tables.

clear ip cef event-log

To clear the Cisco Express Forwarding (CEF) event-log buffer, use the **clear ip cef event-log** command in user EXEC or privileged EXEC mode.

clear ip cef event-log

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	12.0(15)S	This command was introduced.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.

Usage Guidelines This command clears the entire CEF table event log that holds forwarding information base (FIB) and adjacency events.

Examples The following example shows how to clear the CEF event-log buffer:

```
Router# clear ip cef event-log
```

Related Commands	Command	Description
	ip cef table consistency-check	Enables CEF table consistency checker types and parameters.
	ip cef table event-log	Controls CEF table event-log characteristics.
	show ip cef events	Displays all recorded CEF FIB and adjacency events.

clear ip cef inconsistency

To clear the Cisco Express Forwarding (CEF) inconsistency statistics and records found by the CEF consistency checkers, use the **clear ip cef inconsistency** command in user EXEC or privileged EXEC mode.

clear ip cef inconsistency

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	12.0(15)S	This command was introduced.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.

Usage Guidelines This command clears the CEF inconsistency checker statistics and records that accumulate when the **ip cef table consistency-check** command is enabled.

Examples The following example shows how to clear all CEF inconsistency checker statistics and records:

```
Router# clear ip cef inconsistency
```

Related Commands	Command	Description
	ip cef table consistency-check	Enables CEF table consistency checker types and parameters.
	show ip cef inconsistency	Displays CEF IP prefix inconsistencies.

clear ip cef prefix-statistics

To clear Cisco Express Forwarding (CEF) counters by resetting the packet and byte count to zero (0), use the **clear ip cef prefix-statistics** command in user EXEC or privileged EXEC mode.

```
clear ip cef {network [mask] | *} prefix-statistics
```

Syntax Description	network	Forwarding information base (FIB) entry specified by network.
	mask	(Optional) FIB entry specified by network and mask.
	*	Indicates all FIB entries.

Command Modes	User EXEC Privileged EXEC
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Command History	Release	Modification
	11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
	11.1 CC	Multiple platform support was added.

Usage Guidelines When the clear statistics flag is set, statistics are cleared as the FIB table is scanned. The time period is up to 60 seconds for all statistics to clear. However, clearing a specific prefix is completed immediately.

Examples The following example shows how to reset the packet and byte counts to zero for all CEF entries:

```
Router# clear ip cef * prefix-statistics
```

Related Commands	Command	Description
	ip cef accounting	Enables CEF network accounting.
	show adjacency	Displays CEF adjacency table information.
	show ip cef	Displays entries or a summary of the FIB table.

clear ip mds

To clear multicast distributed switching (MDS) information from the router, use the **clear ip mds** command in privileged EXEC mode.

```
clear ip mds {all | [vrf vrf-name] forwarding}
```

Syntax Description	all	(Optional) Clear all IP MDS information.
	vrf	(Optional) A Virtual Private Network (VPN) routing and forwarding (VRF) instance.
	<i>vrf-name</i>	(Optional) Name assigned to the VRF.
	forwarding	(Optional) Clears all linecard routes from a Multicast Forwarding Information Base (MFIB) table and resynchronizes it with the Route Processor (RP).

Command Modes Privileged EXEC

Command History	Release	Modification
	11.2(11)GS	This command was introduced.

Usage Guidelines **Cisco 12000 Series Internet Router**
 On a Cisco 12000 Series Internet Router the **clear ip mds** command must be run in privileged EXEC mode on a linecard.

Examples The following example clears all line card routes in an MFIB table on a Cisco 12000 Series Internet Router:

```
Router# attach 1
LC-Slot1> enable
LC-Slot1# clear ip mds forwarding
```

The following example clears all line card routes in an MFIB table on a Cisco 7500 Series Router:

```
Router# clear ip mds forwarding
```

Related Commands	Command	Description
	show ip mds interface	Displays the MFIB table and forwarding information for MDS on a line card.
	show ip mds stats	Display switching statistics or line card statistics for MDS.
	show ip mds summary	Displays a summary of the MFIB table for MDS.
	show ip mds forwarding	Displays MDS information for all the interfaces on the line card.

clear ip mds forwarding

The **forwarding** keyword for the **clear ip mds** command is no longer documented as a separate command.

The information for using the **forwarding** keyword for the **clear ip mds** command has been incorporated into the **clear ip mds** command documentation. See the **clear ip mds** command documentation for more information.

clear ip mds linecard

To reset multicast distributed switching (MDS) line card information on the router, use the **clear ip mds linecard** command in privileged EXEC mode.

```
clear ip mds linecard {linecard-slot-number | *}
```

Syntax Description

<i>linecard-slot-number</i>	Slot number containing the line card to be reset.
*	Indicates that the reset should be executed on all line cards.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(19.3)S	This command was introduced.

Usage Guidelines

When the * keyword is specified instead of the *linecard-slot-number* argument, all MDS information on all line cards is cleared and reset.

Examples

The following example clears and resets all MDS line card information on the router:

```
Router# clear ip mds linecard *
```

Related Commands

Command	Description
show ip mds	Clears MDS information from the router.
show ip mds interface	Displays the MFIB table and forwarding information for MDS on a line card.
show ip mds stats	Display switching statistics or line card statistics for MDS.
show ip mds summary	Displays a summary of the MFIB table for MDS.
show ip mds forwarding	Displays MDS information for all the interfaces on the line card.

ip cache-invalidate-delay

To control the invalidation rate of the IP route cache, use the **ip cache-invalidate-delay** command in global configuration mode. To allow the IP route cache to be immediately invalidated, use the **no** form of this command.

ip cache-invalidate-delay [*minimum maximum quiet threshold*]

no ip cache-invalidate-delay

Syntax Description

<i>minimum</i>	(Optional) Minimum time (in seconds) between invalidation request and actual invalidation. The default is 2 seconds.
<i>maximum</i>	(Optional) Maximum time (in seconds) between invalidation request and actual invalidation. The default is 5 seconds.
<i>quiet</i>	(Optional) Length of quiet period (in seconds) before invalidation.
<i>threshold</i>	(Optional) Maximum number of invalidation requests considered to be quiet.

Defaults

minimum: 2 seconds
maximum: 5 seconds, and 3 seconds with no more than zero invalidation requests

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

After you enter the **ip cache-invalidate-delay** command all cache invalidation requests are honored immediately.



Caution

This command should only be used under the guidance of technical support personnel. Incorrect settings can seriously degrade network performance. The command-line-interface (CLI) will not allow you to enter the **ip cache-invalidate-delay** command until you configure the **service internal** command in global configuration mode.

The IP fast-switching and autonomous-switching features maintain a cache of IP routes for rapid access. When a packet is to be forwarded and the corresponding route is not present in the cache, the packet is process switched and a new cache entry is built. However, when routing table changes occur (such as when a link or an interface goes down), the route cache must be flushed so that it can be rebuilt with up-to-date routing information.

This command controls how the route cache is flushed. The intent is to delay invalidation of the cache until after routing has settled down. Because route table changes tend to be clustered in a short period of time, and the cache may be flushed repeatedly, a high CPU load might be placed on the router.

When this feature is enabled, and the system requests that the route cache be flushed, the request is held for at least *minimum* seconds. Then the system determines whether the cache has been “quiet” (that is, less than *threshold* invalidation requests in the last *quiet* seconds). If the cache has been quiet, the cache is then flushed. If the cache does not become quiet within *maximum* seconds after the first request, it is flushed unconditionally.

Manipulation of these parameters trades off CPU utilization versus route convergence time. Timing of the routing protocols is not affected, but removal of stale cache entries is affected.

Examples

The following example shows how to set a minimum delay of 5 seconds, a maximum delay of 30 seconds, and a quiet threshold of no more than 5 invalidation requests in the previous 10 seconds:

```
Router(config)# service internal  
Router(config)# ip cache-invalidate-delay 5 30 10 5
```

Related Commands

Command	Description
ip route-cache	Configures the high-speed switching caches for IP routing.

ip cef

To enable Cisco Express Forwarding (CEF) on the route processor card, use the **ip cef** command in global configuration mode. To disable CEF, use the **no** form of this command.

ip cef [distributed]

no ip cef [distributed]

Syntax Description

distributed	(Optional) Enables distributed CEF (dCEF) operation. Distributes CEF information to line cards. Line cards perform express forwarding.
--------------------	--

Defaults

CEF is disabled by default, excluding these platforms:

CEF is enabled on the Cisco 7100 series router.

CEF is enabled on the Cisco 7200 series router.

CEF is enabled on the Cisco 7500 series Internet router.

Distributed CEF is enabled on the Cisco 6500 series router

Distributed CEF is enabled on the Cisco 12000 series Internet router.

Command Modes

Global configuration

Command History

Release	Modification
11.1 CC	This command was introduced.
12.2	The default for Cisco 7200 series routers was changed from disabled to enabled.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T and implemented on the following platforms: Cisco IAD2420 series, Cisco 2600 series, Cisco 3620 routers, Cisco 3640 routers, Cisco 3660 routers, Cisco 3700 series routers, and Cisco MC3810 multiservice access concentrators.

Usage Guidelines

The **ip cef** command is not available on the Cisco 12000 series because that router series operates only in dCEF mode.

CEF is advanced Layer 3 IP switching technology. CEF optimizes network performance and scalability for networks with dynamic, topologically dispersed traffic patterns, such as those associated with web-based applications and interactive sessions.

If you enable CEF and then create an access list that uses the **log** keyword, the packets that match the access list are not CEF switched. They are fast switched. Logging disables CEF.

Examples

The following example shows how to enable standard CEF operation:

```
Router(config)# ip cef
```

The following example shows how to enable dCEF operation:

```
Router(config)# ip cef distributed
```

Related Commands	Command	Description
	ip cache-route	Controls the use of high-speed switching caches for IP routing.
	ip cef accounting	Enables CEF network accounting.
	ip cef load-sharing algorithm	Selects a CEF load balancing algorithm.
	ip cef table adjacency-prefix	Enables CEF adjacency prefixes to override static host glean routes.
	ip cef table consistency-check	Enables CEF table consistency checker types and parameters.
	ip cef table event-log	Controls CEF table event-log characteristics.
	ip cef table resolution-timer	Changes CEF background resolution timer.

ip cef accounting

To enable Cisco Express Forwarding (CEF) network accounting, use the **ip cef accounting** command in global configuration mode or interface configuration mode. To disable network accounting of CEF, use the **no** form of this command.

```
ip cef accounting {[non-recursive] [per-prefix] [prefix-length]}
```

```
no ip cef accounting {[non-recursive] [per-prefix] [prefix-length]}
```

Specific CEF Accounting Information Through Interface Configuration Mode

```
ip cef accounting non-recursive {external | internal}
```

```
no ip cef accounting non-recursive {external | internal}
```

Syntax Description	non-recursive	per-prefix	prefix-length	external	internal
	Enables accounting through nonrecursive prefixes. This keyword is optional when used in global configuration mode.	(Optional) Enables the collection of the number of packets and bytes express forwarded to a destination (or prefix).	(Optional) Enables accounting through prefix length.	Counts input traffic in the nonrecursive external bin.	Counts input traffic in the nonrecursive internal bin.

Defaults Accounting is disabled by default.

Command Modes Global configuration
Interface configuration

Command History	Release	Modification
	11.2 GS	This command was introduced.
	11.1 CC	Multiple platform support was added.
	11.1 CC	The prefix-length keyword was added.
	12.2(2)T	The ip cef accounting non-recursive command in interface configuration mode was added.

Usage Guidelines You might want to collect statistics to better understand CEF patterns in your network.

When you enable network accounting for CEF from global configuration mode, accounting information is collected at the Route Processor (RP) when CEF mode is enabled and at the line cards when distributed CEF (dCEF) mode is enabled. You can then display the collected accounting information using the **show ip cef** privileged EXEC command.

For prefixes with directly connected next hops, the **non-recursive** keyword enables the collection of packets and bytes to be express forwarded through a prefix. This keyword is optional when this command is used in global configuration mode.

This command in interface configuration mode must be used in conjunction with the global configuration command. The interface configuration command allows a user to specify two different bins (internal or external) for the accumulation of statistics. The internal bin is used by default. The statistics are displayed through the **show ip cef detail** command.

Examples

The following example shows how to enable the collection of CEF accounting information:

```
Router(config)# ip cef accounting
```

Related Commands

Command	Description
show ip cef	Displays entries or a summary of the FIB table.

ip cef linecard ipc memory

To configure the line card memory pool for the Cisco Express Forwarding (CEF) queuing messages, use the **ip cef linecard ipc memory** command in global configuration mode. To return to the default Inter-process Communications (IPC) memory allocation, use the **no** form of this command.

ip cef linecard ipc memory *kbps*

no ip cef linecard ipc memory *kbps*

Syntax Description	<i>kbps</i>	Kilobytes of line card memory allocated. Range is 0 to 12800.
---------------------------	-------------	---

Defaults	Default IPC memory allocation is 25 messages. However, this value is dependant on the switching platform.
-----------------	---

Command Modes	Global configuration
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Command History	Release	Modification
	12.2(2)T	This command was introduced.

Usage Guidelines	<p>This command is available only on distributed switching platforms.</p> <p>If you are expecting large routing updates to the Route Processor (RP), use this command to allocate a larger memory pool on the line cards for queuing CEF routing update messages. The memory pool reduces the transient memory requirements on the RP.</p> <p>To display and monitor the current size of the CEF message queues, use the show cef linecard command. Also, the peak size is recorded and displayed when you use the detail keyword.</p>
-------------------------	--

Examples	<p>The following example shows how to configure the CEF line card memory queue to 128000 kilobytes per second:</p> <pre>Router(config)# ip cef linecard ipc memory 128000</pre>
-----------------	---

Related Commands	Command	Description
	show cef linecard	Displays detailed CEF information for the specified line card.

ip cef load-sharing algorithm

To select a Cisco Express Forwarding (CEF) load balancing algorithm, use the **ip cef load-sharing algorithm** command in global configuration mode. To return to the default universal load balancing algorithm, use the **no** form of this command.

```
ip cef load-sharing algorithm { original | tunnel [id] | universal [id]}
```

```
no ip cef load-sharing algorithm { original | tunnel [id] | universal [id]}
```

Syntax Description

original	Sets the load balancing algorithm to the original based on a source and destination hash.
tunnel	Sets the load balancing algorithm for use in tunnel environments or in environments where there are only a few IP source and destination address pairs.
universal	Sets the load balancing algorithm to the universal algorithm that uses a source and destination, and ID hash.
<i>id</i>	(Optional) Fixed identifier.

Defaults

The universal load sharing algorithm is selected.

Command Modes

Global configuration

Command History

Release	Modification
12.0(12)S	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines

The original CEF load sharing algorithm produced distortions in load sharing across multiple routers due to the use of the same algorithm on every router. When the load sharing algorithm is set to universal mode, each router on the network can make a different load sharing decision for each source-destination address pair which resolves load sharing distortions.

The tunnel algorithm is designed to more fairly share load when only a few source-destination pairs are involved.

Examples

The following example shows how to enable the CEF load sharing algorithm for universal environments:

```
Router(config)# ip cef load-sharing algorithm universal 1
```

Related Commands

Command	Description
debug ip cef hash	Records CEF load sharing hash algorithm events
ip load-sharing	Enables load balancing.

ip cef table adjacency-prefix

To modify how Cisco Express Forwarding (CEF) adjacency prefixes are managed, use the **ip cef table adjacency-prefix** command in global configuration mode. To disable CEF adjacency prefix management, use the **no** form of this command.

ip cef table adjacency-prefix [**override** | **validate**]

no ip cef table adjacency-prefix [**override** | **validate**]

Syntax Description

override	Enables Cisco Express Forwarding (CEF) adjacency prefixes to override static host glean routes.
validate	Enables the periodic validation of Cisco Express Forwarding (CEF) adjacency prefixes.

Defaults

All CEF adjacency prefix management is disabled by default.

Command Modes

Global configuration

Command History

Release	Modification
12.0(16)S	This command was introduced.
12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.
12.1(13)E07	The validate keyword was added.
12.1(19.02)E	The default behavior for ip cef table adjacency-prefix override was changed to disabled
12.3(04)XG	
12.3(04)XK	
12.3(06.01)PI03	

Usage Guidelines

When CEF is configured, the forwarding information base (FIB) table may conflict with static host routes that are specified in terms of an output interface or created by a Layer 2 address resolution protocols such as Address Resolution Protocol (ARP), map lists, and so on.

The Layer 2 address resolution protocol adds adjacencies to CEF, which in turn creates a corresponding host route entry in the FIB table. This entry is called an adjacency prefix.

override

If the CEF adjacency prefix entries are also configured by a static host route, a conflict occurs.

This command ensures that adjacency prefixes can override static host glean routes, and correctly restore routes when the adjacency prefix is deleted.

validate

When you add a /31 netmask route, the new netmask does not overwrite an existing /32 CEF entry. This problem is resolved by configuring the **validate** keyword to periodically validate prefixes derived from adjacencies in the FIB against prefixes originating from the RIB.

Examples**override**

The following example shows how to enable CEF table adjacency prefix override:

```
Router(config)# ip cef table adjacency-prefix override
```

validate

The following example shows how to enable CEF table adjacency prefix validation:

```
Router(config)# ip cef table adjacency-prefix validate
```

ip cef table adjacency-prefix override

The **override** keyword for the **ip cef table adjacency-prefix** command is no longer documented as a separate command.

The information for using the **override** keyword for the **ip cef table adjacency-prefix** command has been incorporated into the **ip cef table adjacency-prefix** command documentation. See the **ip cef table adjacency-prefix** command documentation for more information.

ip cef table consistency-check

To enable Cisco Express Forwarding (CEF) table consistency checker types and parameters, use the **ip cef table consistency-check** command in global configuration mode. To disable consistency checkers, use the **no** form of this command.

```
ip cef table consistency-check [type {lc-detect | scan-lc | scan-rib | scan-rp}] [count
count-number] [period seconds]
```

```
no ip cef table consistency-check [type {lc-detect | scan-lc | scan-rib | scan-rp}] [count
count-number] [period seconds]
```

Specific to Suppress Errors During Route Updates

```
ip cef table consistency-check [settle-time seconds]
```

```
no ip cef table consistency-check [settle-time seconds]
```

Syntax	Description
type	(Optional) Type of consistency check to configure.
lc-detect	(Optional) Line card detects missing prefix. Confirmed by Route Processor (RP).
scan-lc	(Optional) Passive scan check of tables on line card.
scan-rib	(Optional) Passive scan check of tables on RP against Routing Information Base (RIB).
scan-rp	(Optional) Passive scan check of tables on RP.
count <i>count-number</i>	(Optional) Maximum number of prefixes to check per scan. Range is from 1 to 225.
period <i>seconds</i>	(Optional) Period between scans. Range is from 30 to 3600 seconds.
settle-time <i>seconds</i>	(Optional) Time elapsed during which updates for a candidate prefix are ignored as inconsistencies. Range is from 1 to 3600 seconds.

Defaults All consistency checkers are disabled by default.

Command Modes Global configuration

Command History	Release	Modification
	12.0(15)S	This command was introduced.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.

Usage Guidelines

This command configures CEF consistency checkers and parameters for the following detection mechanism types:

Detection Mechanism	Operates On	Description
Lc-detect	Line Card	Operates on the line card by retrieving IP prefixes found missing from its forwarding information base (FIB) table. If IP prefixes are missing, the line card can not forward packets for these addresses. Lc-detect will then send IP prefixes to the RP for confirmation. If the RP detects that it has the relevant entry, an inconsistency is detected and an error message will be displayed. Also, the RP will send a signal back to the line card confirming that the IP prefix is an inconsistency.
Scan-lc	Line Card	Operates on the line card by looking through the FIB table for a configurable time period and sending the next <i>n</i> prefixes to the RP. The RP does an exact lookup. If it finds the prefix missing, the RP reports an inconsistency. Finally, the RP sends a signal back to the line card for confirmation.
Scan-rp	Route Processor	Operates on the RP (opposite of the scan-lc) by looking through the FIB table for a configurable time period and sending the next <i>n</i> prefixes to the line card. The line card does an exact lookup. If it finds the prefix missing, the line card reports an inconsistency and finally signals the RP for confirmation.
Scan-rib	Route Processor	Operates on all RPs (even nondistributed), and scans the RIB to ensure that prefix entries are present in the RP FIB table.

Examples

The following example shows how to enable the CEF consistency checkers:

```
Router(config)# ip cef table consistency-check
```

Related Commands,

Command	Description
clear ip cef inconsistency	Clears CEF inconsistency statistics and records found by the CEF consistency checkers.
debug ip cef	Displays various CEF table query and check events.
show ip cef inconsistency	Displays CEF IP prefix inconsistencies.

ip cef table event-log

To control Cisco Express Forwarding (CEF) table event-log characteristics, use the **ip cef table event-log** command in global configuration mode.

ip cef table event-log [*size event-number*] [**match** *ip-prefix mask*]

no ip cef table event-log [*size event-number*] [**match** *ip-prefix mask*]

Specific to Virtual Private Network (VPN) Event Log

ip cef table event-log [*size event-number*] [**vrf** *vrf-name*] [**match** *ip-prefix mask*]

no ip cef table event-log [*size event-number*] [**vrf** *vrf-name*] [**match** *ip-prefix mask*]

Syntax Description

size <i>event-number</i>	(Optional) Number of event entries. The range is from 1 to 4294967295.
match	(Optional) Log events matching specified prefix and mask.
<i>ip-prefix</i>	(Optional) IP prefixes matched, in dotted decimal format (A.B.C.D).
<i>mask</i>	(Optional) Network mask written as A.B.C.D.
vrf <i>vrf-name</i>	(Optional) Virtual Private Network (VPN) routing/forwarding instance (VRF) CEF table and VRF name.

Defaults

Default size for event log is 10000 entries.

Command Modes

Global configuration

Command History

Release	Modification
12.0(15)S	This command was introduced.
12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.

Usage Guidelines

This command is used to troubleshoot inconsistencies that occur in the CEF event log between the routes in the Routing Information Base (RIB), Route Processor (RP) CEF tables, and line card CEF tables.

The CEF event log collects CEF events as they occur without debugging enabled. This process allows the tracing of an event immediately after it occurs. Cisco technical personnel may ask for information from this event log to aid in resolving problems with the CEF feature.

When the CEF table event log has reached its capacity, the oldest event is written over by the newest event until the event log size is reset using this command or cleared using the **clear ip cef event-log** command.

Examples

The following example shows how to set the CEF table event log size to 5000 entries:

```
Router(config)# ip cef table event-log size 5000
```

Related Commands

Command	Description
clear ip cef event-log	Clears the CEF event-log buffer.
ip cef table consistency-check	Enables CEF table consistency checker types and parameters.
show ip cef events	Displays all recorded CEF FIB and adjacency events.

ip cef table resolution-timer

To change the Cisco Express Forwarding (CEF) background resolution timer, use the **ip cef table resolution-timer** command in global configuration mode.

ip cef table resolution-timer *seconds*

no ip cef table resolution-timer *seconds*

Syntax Description	<i>seconds</i>	Timer value in seconds. Range is from 0 to 30 seconds; 0 is for the automatic exponential backoff scheme.
---------------------------	----------------	---

Defaults	The default configuration value is 0 seconds for automatic exponential backoff.
-----------------	---

Command Modes	Global configuration
----------------------	----------------------

Command History	Release	Modification
	12.2(2)T	This command was introduced.

Usage Guidelines	The CEF background resolution timer can use either a fixed time interval or an exponential backoff timer that reacts to the amount of resolution work required. The exponential backoff timer starts at 1 second, increasing to 16 seconds when a network flap is in progress. When the network recovers, the timer returns to 1 second.
-------------------------	--

The default is used for the exponential backoff timer. During normal operation, the default configuration value set to 0 results in re-resolution occurring much sooner than when the timer is set at a higher fixed interval.

Examples	The following example show how to set the CEF background resolution timer to 3 seconds:
-----------------	---

```
Router(config)# ip cef table resolution-timer 3
```

ip load-sharing

To enable load balancing for Cisco Express Forwarding (CEF), use the **ip load-sharing** command in interface configuration mode.

ip load-sharing [per-packet] [per-destination]

Syntax Description	
per-packet	(Optional) Enables per-packet load balancing on the interface.
per-destination	(Optional) Enables per-destination load balancing on the interface.

Defaults Per-destination load balancing is enabled by default when you enable CEF.

Command Modes Interface configuration

Command History	Release	Modification
	11.2 GS	This command was introduced.
	11.1 CC	Multiple platform support was added.

Usage Guidelines Per-packet load balancing allows the router to send data packets over successive equal-cost paths without regard to individual destination hosts or user sessions. Path utilization is good, but packets destined for a given destination host might take different paths and might arrive out of order.



Note

Per-packet load balancing via CEF is not supported on Engine 2 Gigabit Switch Router (GSR) line cards (LCs).

Per-destination load balancing allows the router to use multiple, equal-cost paths to achieve load sharing. Packets for a given source-destination host pair are guaranteed to take the same path, even if multiple, equal-cost paths are available. Traffic for different source-destination host pairs tend to take different paths.



Note

If you want to enable per-packet load sharing to a particular destination, then all interfaces that can forward traffic to the destination must be enabled for per-packet load sharing.

Examples The following example shows how to enable per-packet load balancing:

```
Router(config)# interface E0
Router(config-if)# ip load-sharing per-packet
```

The following example shows how to enable per-destination load balancing:

```
Router(config)# interface E0
Router(config-if)# ip load-sharing per-destination
```

Related Commands

Command	Description
ip cef	Enables CEF on the RP card.

ip route-cache

To control the use of switching methods for forwarding IP packets use the **ip route-cache** command in interface configuration mode. To disable any of these switching methods, use the **no** form of this command.

ip route-cache [**same-interface** | **flow** | **distributed** | **cef** | **policy**]

no ip route-cache [**same-interface** | **flow** | **distributed** | **cef** | **policy**]

Syntax Description

same-interface	Enables fast-switching packets to forward IP packets back out through the interface on which they arrived.
flow	Enables NetFlow accounting for packets that are received by the interface.
distributed	Enables distributed switching on the interface.
cef	Enables Cisco Express Forwarding (CEF) operation on an interface.
policy	Enables fast-switching for packets that are forwarded using Policy Based Routing (PBR).

Defaults

Fast Switching

The default behavior for Fast Switching varies by interface and media.

Distributed Switching

Distributed switching is disabled.

CEF and dCEF

When CEF or dCEF operation is enabled globally, all interfaces that support CEF or dCEF are enabled by default.

NetFlow Accounting

NetFlow accounting is disabled

Fast Switching for PBR (FSPBR)

FSPBR is disabled

Command Modes

Interface configuration

Command History

Release	Modification
10.0	This command was introduced.
11.1	The flow keyword was added.
11.2GS	The cef and distributed keywords were added.
11.1CC	Support for multiple platforms was added for cef keyword.
12.0	The policy keyword was added.

Usage Guidelines

- [ip route-cache](#)
- [ip route-cache same-interface](#)
- [ip route-cache flow](#)
- [ip route-cache distributed](#)
- [ip route-cache cef](#)
- [ip route-cache policy](#)

ip route-cache

Using the route cache is often called *fast switching*. The route cache allows outgoing packets to be load-balanced on a *per-destination* basis rather than on a per-packet basis. The **ip route-cache** command with no additional keywords enables fast switching.

Entering the **ip route-cache** command has no effect on a subinterface. Subinterfaces accept the **no** form of the command; however, this disables CEF or dCEF on the physical interface as well as all subinterfaces associated with the physical interface

ip route-cache same-interface

You can enable IP fast switching when the input and output interfaces are the same interface, using the **ip route-cache same-interface** command. This configuration normally is not recommended, although it is useful when you have partially meshed media, such as Frame Relay or you are running Web Cache Communication Protocol (WCCP) redirection. You could use this feature on other interfaces, although it is not recommended because it would interfere with redirection of packets to the optimal path.

ip route-cache flow

Enables (ingress) NetFlow accounting for traffic arriving on an interface.

ip route-cache distributed

The distributed option is supported on Cisco routers with line cards and Versatile Interface Processors (VIPs) that support both CEF and flow switching.

On Cisco routers with Route Switch Processor (RSP) and VIP controllers, the VIP hardware can be configured to switch packets received by the VIP with no per-packet intervention on the part of the RSP. When VIP distributed switching is enabled, the input VIP interface tries to switch IP packets instead of forwarding them to the RSP for switching. Distributed switching helps decrease the demand on the RSP

ip route-cache cef

In some instances, you might want to disable CEF or dCEF on a particular interface because that interface is configured with a feature that CEF or dCEF does not support. Because all interfaces that support CEF or dCEF are enabled by default when you enable CEF operation globally, you must use the **no** form of the **ip route-cache cef** command in the interface configuration mode to turn CEF operation off a particular interface. To reenabling CEF or dCEF operation, use the **ip route-cache cef** command.

Disabling CEF or dCEF on an interface disables CEF switching for packets forwarded to the interface, but has no effect on packets forwarded out of the interface.

Additionally when you disable CEF or dCEF, Cisco IOS software switches packets using the next-fastest switching path. In the case of dCEF, the next-fastest switching path is CEF on the RSP.

**Note**

On the Cisco 12000 Series Internet Router, you must not disable dCEF on an interface

ip route-cache policy

1. If Cisco Express Forwarding (CEF) is already enabled, this command is not needed because PBR packets are CEF switched by default.
2. Before you can enable fast-switched PBR, PBR itself must be configured.
3. FSPBR supports all of PBR's **match** commands and most of PBR's **set** commands, with the following restrictions:
 - The **set ip default next-hop** and **set default interface** commands are not supported.
 - The **set interface** command is supported only over point-to-point links, unless a route cache entry exists using the same interface specified in the **set interface** command in the route map. Also, at the process level, the routing table is consulted to determine if the interface is on a reasonable path to the destination. During fast switching, the software does not make this check. Instead, if the packet matches, the software blindly forwards the packet to the specified interface.

Examples

- [Configuring Fast Switching and Disabling CEF Switching](#)
- [Configuring Fast Switching for Traffic That is Received and Transmitted Over the Same Interface](#)
- [Enabling NetFlow Accounting](#)
- [Configuring Distributed Switching](#)
- [Configuring Fast Switching for PBR](#)

Configuring Fast Switching and Disabling CEF Switching

The following example shows how to enable fast switching and disable CEF switching:

```
Router(config)# interface ethernet 0/0/0
Router(config-if)# ip route-cache
```

The following example shows that fast switching is enabled:

```
Router# show ip interface fastEthernet 0/0/0
FastEthernet0/0/0 is up, line protocol is up
  Internet address is 10.1.1.254/24
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.10
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP Distributed switching is disabled
  IP Feature Fast switching turbo vector
  IP Null turbo vector
  IP multicast fast switching is enabled
```

The following example shows that CEF switching is disabled:

```
Router# show cef interface fastEthernet 0/0/0
FastEthernet0/0/0 is up (if_number 3)
  Corresponding hwidb fast_if_number 3
  Corresponding hwidb firstsw->if_number 3
  Internet address is 10.1.1.254/24
  ICMP redirects are always sent
  Per packet load-sharing is disabled
  IP unicast RPF check is disabled
  Inbound access list is not set
  Outbound access list is not set
  IP policy routing is disabled
  Hardware idb is FastEthernet0/0/0
  Fast switching type 1, interface type 18
  IP CEF switching disabled
  IP Feature Fast switching turbo vector
  IP Null turbo vector
  Input fast flags 0x0, Output fast flags 0x0
  ifindex 1(1)
  Slot 0 Slot unit 0 VC -1
  Transmit limit accumulator 0x48001A02 (0x48001A02)
  IP MTU 1500
```

The following example shows the configuration information for interface fastethernet 0/0/0

```
Router# show running-config
.
.
!
interface FastEthernet0/0/0
 ip address 10.1.1.254 255.255.255.0
 no ip route-cache cef
 no ip route-cache distributed
!
```

Configuring Fast Switching for Traffic That is Received and Transmitted Over the Same Interface

The following example shows how to enable fast switching and disable CEF switching:

```
Router(config)# interface ethernet 0/0/0
Router(config-if)# ip route-cache same-interface
```

The following example shows that fast switching on the same interface is enabled for interface fastethernet 0/0/0:

```
Router# show ip interface fastEthernet 0/0/0
FastEthernet0/0/0 is up, line protocol is up
  Internet address is 10.1.1.254/24
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.10
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
```

```

IP fast switching on the same interface is enabled
IP Flow switching is disabled
IP Distributed switching is disabled
IP Feature Fast switching turbo vector
IP Null turbo vector
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled
IP multicast multilayer switching is disabled

```

The following example shows the configuration information for interface fastethernet 0/0/0

```

Router# show running-config
.
.
!
interface FastEthernet0/0/0
 ip address 10.1.1.254 255.255.255.0
 ip route-cache same-interface
 no ip route-cache cef
 no ip route-cache distributed
!

```

Enabling NetFlow Accounting

The following example shows how to enable NetFlow switching:

```

Router(config)# interface ethernet 0/0/0
Router(config-if)# ip route-cache flow

```

The following example shows that NetFlow accounting is enabled for interface fastethernet 0/0/0:

```

Router# show ip interface fastEthernet 0/0/0
FastEthernet0/0/0 is up, line protocol is up
 Internet address is 10.1.1.254/24
 Broadcast address is 255.255.255.255
 Address determined by non-volatile memory
 MTU is 1500 bytes
 Helper address is not set
 Directed broadcast forwarding is disabled
 Multicast reserved groups joined: 224.0.0.10
 Outgoing access list is not set
 Inbound access list is not set
 Proxy ARP is enabled
 Security level is default
 Split horizon is enabled
 ICMP redirects are always sent
 ICMP unreachable are always sent
 ICMP mask replies are never sent
 IP fast switching is enabled
 IP fast switching on the same interface is disabled
 IP Flow switching is enabled

```

```

IP Distributed switching is disabled
IP Flow switching turbo vector
IP Null turbo vector
IP multicast fast switching is enabled
IP multicast distributed fast switching is disabled
IP route-cache flags are Fast, Flow
Router Discovery is disabled
IP output packet accounting is disabled
IP access violation accounting is disabled
TCP/IP header compression is disabled
RTP/IP header compression is disabled
Probe proxy name replies are disabled
Policy routing is disabled
Network address translation is disabled
WCCP Redirect outbound is disabled
WCCP Redirect inbound is disabled
WCCP Redirect exclude is disabled
BGP Policy Mapping is disabled
IP multicast multilayer switching is disabled

```

Configuring Distributed Switching

The following example shows how to enable distributed switching:

```

Router(config)# ip cef distributed
Router(config)# interface ethernet 0/0/0
Router(config-if)# ip route-cache distributed

```

The following example shows that distributed CEF switching is for interface fastethernet 0/0/0:

```

Router# show cef interface fastEthernet 0/0/0
FastEthernet0/0/0 is up (if_number 3)
  Corresponding hwidb fast_if_number 3
  Corresponding hwidb firstsw->if_number 3
  Internet address is 10.1.1.254/24
  ICMP redirects are always sent
  Per packet load-sharing is disabled
  IP unicast RPF check is disabled
  Inbound access list is not set
  Outbound access list is not set
  IP policy routing is disabled
  Hardware idb is FastEthernet0/0/0
  Fast switching type 1, interface type 18
  IP Distributed CEF switching enabled
  IP Feature Fast switching turbo vector
  IP Feature CEF switching turbo vector
  Input fast flags 0x0, Output fast flags 0x0
  ifindex 1(1)
  Slot 0 Slot unit 0 VC -1
  Transmit limit accumulator 0x48001A02 (0x48001A02)
  IP MTU 1500

```

Configuring Fast Switching for PBR

The following example shows how to configure a simple policy based routing scheme and to enable FSPBR:

```

Router(config)# access-list 1 permit 10.1.1.0 0.0.0.255
Router(config)# route-map my_pbr_tag permit 10
Router(config-route-map)# match ip address 1
Router(config-route-map)# set ip next-hop 10.1.1.195
Router(config-route-map)# exit
Router(config)# interface fastethernet 0/0/0

```

```
Router(config-if)# ip route-cache policy
Router(config-if)# ip policy route-map my_pbr_tag
```

The following example shows that FSPBR is enabled for interface fastEthernet 0/0/0:

```
Router# show ip interface fastEthernet 0/0/0
FastEthernet0/0/0 is up, line protocol is up
  Internet address is 10.1.1.254/24
  Broadcast address is 255.255.255.255
  Address determined by non-volatile memory
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Multicast reserved groups joined: 224.0.0.10
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is enabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP CEF switching is enabled
  IP Distributed switching is enabled
  IP Feature Fast switching turbo vector
  IP Feature CEF switching turbo vector
  IP multicast fast switching is enabled
  IP multicast distributed fast switching is disabled
  IP route-cache flags are Fast, Distributed, Policy, CEF
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is enabled, using route map my_pbr_tag
  Network address translation is disabled
  WCCP Redirect outbound is disabled
  WCCP Redirect inbound is disabled
  WCCP Redirect exclude is disabled
  BGP Policy Mapping is disabled
  IP multicast multilayer switching is disabled
```

Related Commands^R

Command	Description
ip cef	Enables CEF on the RP card.
ip cef distributed	Enables distributed CEF (dCEF) operation.
show ip interface	Displays the usability status of interfaces configured for IP.
show cef interface	Displays detailed Cisco Express Forwarding (CEF) information for interfaces.

ip route-cache policy

The **policy** keyword for the **ip route-cache** command is no longer documented as a separate command.

The information for using the **policy** keyword for the **ip route-cache** command has been incorporated into the **ip route-cache** command documentation. See the **ip route-cache** command documentation for more information.

show adjacency

To display information about the Cisco Express Forwarding (CEF) adjacency table or the hardware Layer 3-switching adjacency table, use the **show adjacency** command in user EXEC or privileged EXEC mode.

```
show adjacency [summary [interface interface-number]] | [prefix] [interface-type
interface-number] [connectionid id] [link {ipv4 | ipv6 | mpls}] [detail]
```

Syntax Description	
summary	(Optional) Displays a summary of CEF adjacency information.
<i>interface</i>	(Optional) Interface type.
<i>interface-number</i>	(Optional) Specifies the module and port number. Valid values depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 2 to 13, and valid values for the port number are from 1 to 48. For line cards, you must specify the linecard if_number (interface number). Use the show cef interface command to obtain linecard if_numbers. null interface-number specifies the null interface; the valid value is 0 . port-channel number specifies an Ethernet channel of interfaces; valid values are a maximum of 64 values from 1 to 256.
<i>prefix</i>	(Optional) Specifies an IP address or IPv6 address.
connectionid id	(Optional) Specifies the client connection identification number.
link {ipv4 ipv6 mpls}	(Optional) Specifies the link type (IP, IPv6, or MPLS traffic) of the adjacency.
detail	(Optional) Displays the protocol detail and timer information.

Defaults This command has no default settings.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	11.2GS	This command was introduced.
	11.1CC	Multiple platform support was added.
	12.0(7)XE	Support was added for the Cisco 7600 series routers.
	12.1(1)E	Support for the Cisco 7600 series routers was integrated into Cisco IOS Release 12.1(1)E.
	12.1(3a)E3	The number of valid values for port-channel number changed.
	12.1(5c)EX	This command was modified to include Layer 3 information.

Release	Modification
12.1(11b)E	The pos , atm , and ge-wan keywords were added.
12.2(8)T	The detail keyword output was modified to show the epoch value for each entry of the adjacency table. The summary keyword output was modified to show the table epoch for the adjacency table.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(25)S	This command was integrated into Cisco IOS Release 12.2(25)S and updated with new keywords.

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.

You can use any combination of the *prefix*, *interface*, *connectionid id*, and *link {ipv4 | ipv6 | mpls}* keywords and arguments (in any order) as a filter to enable the display of a specified subset of adjacencies.

The information displayed by the **show adjacency** commands includes the following:

- Protocol
- Interface
- Type of routed protocol traffic using this adjacency
- Next hop address
- Adjacency source (for example, ARP or ATM Map)
- Encapsulation prepended to packet switched through this adjacency
- Chain of output chain elements applied to packets after an adjacency
- Packet and byte counts
- HA epoch and summary event epoch

Examples

The following example shows how to display adjacency information:

```
Router# show adjacency

Protocol Interface                Address
IP       FastEthernet2/3              172.20.52.1(3045)
IP       FastEthernet2/3              172.20.52.22(11)
Router#
```

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

```
Router# show adjacency summary

Adjacency table has 7 adjacencies:
  each adjacency consumes 368 bytes (4 bytes platform extension)
  6 complete adjacencies
  1 incomplete adjacency
  4 adjacencies of linktype IP
    4 complete adjacencies of linktype IP
    0 incomplete adjacencies of linktype IP
    0 adjacencies with fixups of linktype IP
    2 adjacencies with IP redirect of linktype IP
```

```

3 adjacencies of linktype IPV6
  2 complete adjacencies of linktype IPV6
  1 incomplete adjacency of linktype IPV6

```

```

Adjacency database high availability:
  Database epoch: 8 (7 entries at this epoch)

```

```

Adjacency manager summary event processing:
  Summary events epoch is 52
  Summary events queue contains 0 events (high water mark 113 events)
  Summary events queue can contain 49151 events
  Adj last sourced field refreshed every 16384 summary events
  RP adjacency component enabled

```

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

```
Router# show adjacency detail
```

```

Protocol Interface          Address
IP          Serial5/0/0/1:1    point2point(7)
                                0 packets, 0 bytes
                                0F000800
                                CEF   expires: 00:02:09
                                refresh: 00:00:09
                                Epoch: 14
IP          Serial5/0/1/1:1    point2point(7)
                                0 packets, 0 bytes
                                0F000800
                                CEF   expires: 00:02:09
                                refresh: 00:00:09
                                Epoch: 14

```

```
Router#
```

The following example shows how to display adjacency information for a specific interface:

```
Router# show adjacency ethernet 3/0
```

```

Protocol Interface          Address
IPV6         Ethernet3/0    FE80::20C:CFFF:FEDF:6854(2)
Router#

```

The following example shows how to display protocol detail and timer adjacency information for IPv6 links for a specific interface:

```
Router# show adjacency ethernet 3/0 link ipv6 detail
```

```

Protocol Interface          Address
IPV6         Ethernet3/0    FE80::20C:CFFF:FEDF:6854(2)
                                0 packets, 0 bytes
                                epoch 0
                                sourced in sev-epoch 16
                                Encap length 14
                                000CCFDF6854000CCFF9485486DD
                                IPv6 ND

```

```
Router#
```

Table 1 describes the significant fields shown in the displays.

Table 1 *show adjacency Field Descriptions*

Field	Description
Protocol	Routed protocol to which the adjacency is related.
Interface	Outgoing interface associated with the adjacency.
Address	The address can represent one of these addresses: <ul style="list-style-type: none"> • Next-hop address • Point-to-point address The number (in parentheses) that follows this field indicates the number of internal references to the adjacency.
Table epoch	Table epoch value at the time when the adjacency was last modified.

Related Commands

Command	Description
clear adjacency	Clears the CEF adjacency table.
clear arp-cache	Deletes all dynamic entries from the ARP cache.
debug adjacency	Enables the display of information about the adjacency database.
show mls cef adjacency	Displays information about the hardware Layer 3 switching adjacency node.

show cef drop

To display a list of which packets each line card dropped, use the **show cef drop** command in user EXEC or privileged EXEC mode.

show cef drop

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
11.1 CC	Multiple platform support was added.
12.0(22)S	The display output for this command was modified to include support for Cisco Express Forwarding for IPv6 (CEFv6) and distributed CEF for IPv6 (dCEFv6) packets.
12.0(23)S	This command was integrated into Cisco IOS Release 12.0(23)S.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T. Previously there was a show cef command, and drop was a keyword of that command.
12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines

A line card might drop packets because of encapsulation failure, absence of route information, or absence of adjacency information.

A packet is sent to a different switching path (punted) because CEF does not support the encapsulation or feature, the packet is destined for the router, or the packet has IP options, such as time stamp and record route. IP options are process switched.



Note

If CEFv6 or dCEFv6 is enabled globally on the router, the **show cef drop** command displays IPv6 CEF counter information and IPv4 CEF counter information. If CEFv6 or dCEFv6 is not enabled globally on the router, the command displays only IPv4 CEF counter information.

Examples

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

```
Router# show cef drop

CEF Drop Statistics
Slot  Encap_fail  Unresolved  Unsupported  No_route  No_adj  ChksumErr
RP    4             89          0            4         0       0
1     0             0           0            0         0       0
2     0             0           5            0         0       5

IPv6 CEF Drop Statistics
Slot  Encap_fail  Unresolved  Unsupported  No_route  No_adj
```

```

RP          2          33          0          2          0
1           0          0          3          0          0
2           0          0          0          0          0

```

Table 2 describes the significant fields shown in the display.

Table 2 show cef drop Field Descriptions

Field	Description
Slot	The slot number on which the packets were received.
Encap_fail	Indicates the number of packets dropped after exceeding the limit for packets punted to the processor due to missing adjacency information (CEF throttles packets passed up to the process level at a rate of one packet per second).
Unresolved	Indicates the number of packets dropped due to an unresolved prefix in the Forwarding Information Base (FIB) table.
Unsupported	Indicates the number of packets fast-dropped by CEF (drop adjacency).
No_route	Indicates the number of packets dropped due to a missing prefix in the FIB table.
No_adj	Indicates the number of packets dropped due to incomplete adjacency.
ChksumErr	Indicates the number of IPv4 packets received with a checksum error. Note This field is not supported for IPv6 packets.

Related Commands

Command	Description
show cef interface	Displays CEF-related interface information.
show ipv6 cef	Displays entries in the IPv6 FIB.

show cef events

To display a list of events internal to the CEF process, use the **show cef events** command in user EXEC or privileged EXEC mode.

show cef events

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	12.0(23)S	This command was introduced.
	12.0(24)S	This command was integrated into Cisco IOS Release 12.0(24)S.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

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

```
Router# show cef events

CEF events (14/0 recorded/ignored)

Time          Event      Details
+00:00:00.000 SubSys    ipfib init
+00:00:00.000 SubSys    ipfib_ios init
+00:00:00.000 SubSys    ipfib_util init
+00:00:00.000 SubSys    adj_ios init
+00:00:00.000 SubSys    ipfib_les init
+00:00:01.272 Flag      FIB enabled set to yes
+00:00:01.272 Flag      FIB switching enabled set to yes
+00:00:01.272 GState    CEF enabled
+00:00:02.872 Process   Background created
+00:00:02.872 Flag      FIB running set to yes
+00:00:02.872 Process   Background event loop enter
+00:00:02.912 Flag      FIB switching running set to yes
+00:00:02.920 Process   Scanner created
+00:00:02.920 Process   Scanner event loop enter
```

[Table 3](#) describes the significant fields shown in the display.

Table 3 *show cef events Field Descriptions*

Field	Description
Time	Time that the event occurred.
Event	Type of event that occurred.
Details	Detailed description of the event.

Related Commands

Command	Description
show cef drop	Displays a list of which packets each line card dropped.
show cef interface	Displays CEF-related interface information.
show cef linecard	Displays CEF-related interface information by line card.

show cef interface

To display detailed Cisco Express Forwarding (CEF) information for a specified interface or for all interfaces, use the **show cef interface** command in user EXEC or privileged EXEC mode.

```
show cef interface [type number] [statistics | detail | internal | brief | policy-statistics [input | output]]
```

Syntax Description		
	<i>type number</i>	(Optional) Interface type and number. No space is required between the interface type and number.
	statistics	(Optional) Displays switching statistics for an interface or interfaces.
	detail	(Optional) Displays detailed CEF information for the specified interface type and number.
	internal	(Optional) Displays internal CEF interface status and configuration.
	brief	(Optional) Summarizes the CEF interface state.
	policy-statistics	(Optional) Displays Border Gateway Protocol (BGP) policy statistical information for a specific interface or for all interfaces.
	input	(Optional) Displays BGP accounting policy statistics for traffic that is traveling through an input interface.
	output	(Optional) Displays BGP accounting policy statistics for traffic that is traveling through an output interface.

Command Modes	
	User EXEC Privileged EXEC

Command History	Release	Modification
	11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
	11.1 CC	Support for multiple platforms was added.
	12.0(14)ST	This command was integrated into Cisco IOS Release 12.0(14)ST, and the statistics keyword was added.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T, and the detail keyword was added.
	12.2(13)T	The policy-statistics keyword was added.
	12.0(22)S	The input and output keywords were added. The display output was modified to include support for CEF for IPv6 (CEFv6) and distributed (dCEFv6) interface information. Output fields that support Border Gateway Protocol (BGP) policy accounting were added for the Cisco 7200 series and Cisco 7500 series platforms.
	12.3(4)T	Changes to this command were integrated into Cisco IOS Release 12.3(4)T.
	12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
	12.2(25)S	The internal keyword was added.

Usage Guidelines

You can use this command to display the detailed CEF status for all interfaces.

Values entered for the *type* and *number* arguments display CEF status information for the specified interface type and number.

The **policy-statistics**, **input**, and **output** keywords are available only on distributed switching platforms.

Examples

The following example shows how to display a summary of CEF information for an interface named Ethernet 3/0:

```
Router# show cef interface ethernet 3/0 brief

Interface                IP-Address      Status  Switching
Ethernet3/0              10.0.212.6     up      CEF
Router#
```

The following is sample output from the **show cef interface** command for Fast Ethernet interface 1/0/0 with BGP policy accounting configured for input traffic:

```
Router# show cef interface fastethernet 1/0/0

FastEthernet1/0/0 is up (if_number 6)
  Corresponding hwidb fast_if_number 6
  Corresponding hwidb firstsw->if_number 6
  Internet address is 10.1.1.1/24
  ICMP redirects are always sent
  Per packet load-sharing is disabled
  IP unicast RPF check is disabled
  Inbound access list is not set
  Outbound access list is not set
  IP policy routing is disabled
  BGP based policy accounting on input is enabled
  BGP based policy accounting on output is disabled
Hardware idb is FastEthernet1/0/0 (6)
Software idb is FastEthernet1/0/0 (6)
Fast switching type 1, interface type 18
IP Distributed CEF switching enabled
IP Feature Fast switching turbo vector
IP Feature CEF switching turbo vector
Input fast flags 0x100, Output fast flags 0x0, Flags 0x0
ifindex 7(7)
Slot 1 Slot unit 0 VC -1
Transmit limit accumulator 0xE8001A82 (0xE8001A82)
IP MTU 1500
```

The following is sample output from the **show cef interface detail** command for Ethernet interface 1/0/0:

```
Router# show cef interface ethernet 1/0/0 detail

FastEthernet1/0/0 is up (if_number 6)
  Corresponding hwidb fast_if_number 6
  Corresponding hwidb firstsw->if_number 6
  Internet address is 10.1.1.1/24
  ICMP redirects are always sent
  Per packet load-sharing is disabled
  IP unicast RPF check is disabled
  Inbound access list is not set
  Outbound access list is not set
  IP policy routing is disabled
  BGP based policy accounting on input is enabled
  BGP based policy accounting on output is disabled
```

```

Hardware idb is FastEthernet1/0/0 (6)
Software idb is FastEthernet1/0/0 (6)
Fast switching type 1, interface type 18
IP Distributed CEF switching enabled
IP Feature Fast switching turbo vector
IP Feature CEF switching turbo vector
Input fast flags 0x100, Output fast flags 0x0, Flags 0x0
ifindex 7(7)
Slot 1 Slot unit 0 VC -1
Transmit limit accumulator 0xE8001A82 (0xE8001A82)
IP MTU 1500

```

The following is sample output from the **show cef interface Null 0 detail** command:

```
Router# show cef interface null 0 detail
```

```

Null0 is up (if_number 1)
Corresponding hwidb fast_if_number 1
Corresponding hwidb firstsw->if_number 1
Internet Protocol processing disabled
Interface is marked as nullidb
Packets switched to this interface on linecard are dropped to next slow path
Hardware idb is Null0
Fast switching type 13, interface type 0
IP CEF switching enabled
IP Feature CEF switching turbo vector
Input fast flags 0x0, Output fast flags 0x0
ifindex 0(0)
Slot -1 Slot unit -1 VC -1
Transmit limit accumulator 0x0 (0x0)
IP MTU 1500

```

The following is sample output for internal CEF interface status and configuration for the Ethernet 3/1 interface:

```
Router# show cef interface ethernet 3/1 internal
```

```

Ethernet3/1 is up (if_number 13)
Corresponding hwidb fast_if_number 13
Corresponding hwidb firstsw->if_number 13
Internet address is 10.0.212.6/24
ICMP redirects are always sent
Per packet load-sharing is disabled
IP unicast RPF check is disabled
Inbound access list is not set
Outbound access list is not set
IP policy routing is disabled
BGP based policy accounting on input is disabled
BGP based policy accounting on output is disabled
Hardware idb is Ethernet3/1
Fast switching type 1, interface type 63
IP CEF switching enabled
IP CEF switching turbo vector
IP CEF turbo switching turbo vector
IP prefix lookup IPv4 mtrie 8-8-8-8 optimized
Input fast flags 0x0, Output fast flags 0x0
ifindex 11(11)
Slot 3 Slot unit 0 VC -1
Transmit limit accumulator 0x0 (0x0)
IP MTU 1500
Subblocks:
IPv6: enabled 1 unreachable FALSE redirect TRUE mtu 1500 flags 0x0
      link-local address is FE80::20C:CFFF:FEF9:4854
      Global unicast address(es):

```

```

10:6:6:6:20C:CFFF:FEF9:4854, subnet is 10:6:6:6::/64 [EUI]
IPv4: Internet address is 10.0.212.6/24
Broadcast address 255.255.255.255
Per packet load-sharing is disabled
IP MTU 1500

```

Table 4 describes the significant fields shown in the displays.

Table 4 *show cef interface Field Descriptions*

Field	Description
FastEthernet1/0/0 is up	Indicates type, number, and status of the interface.
Internet address is	Internet address of the interface.
ICMP redirects are always sent	Indicates how packet forwarding is configured.
Per packet load-sharing is disabled	Indicates status of load sharing on the interface.
IP unicast RPF check is disabled	Indicates status of IP unicast Reverse Path Forwarding (RPF) check on the interface.
Inbound access list is not set	Indicates the number or name of the inbound access list if one is applied to this interface. Also indicates whether list is set or not.
Outbound access list is not set	Indicates the number or name of the outbound access list if one is applied to this interface. Also indicates whether list is set or not.
IP policy routing is disabled	Indicates the status of IP policy routing on the interface.
BGP based policy accounting on input is enabled	Indicates the status of BGP policy accounting on the input interface.
BGP based policy accounting on output is disabled	Indicates the status of BGP policy accounting on the output interface.
Hardware idb is Ethernet1/0/0	Interface type and number configured.
Fast switching type	Used for troubleshooting; indicates switching mode in use.
Interface type	Indicates interface type.
IP Distributed CEF switching enabled	Indicates whether distributed CEF is enabled on this interface. (Cisco 7500 and 12000 series Internet routers only.)
IP Feature Fast switching turbo vector	Indicates IP fast switching type configured.
IP Feature CEF switching turbo vector	Indicates IP feature CEF switching type configured.

Table 4 *show cef interface Field Descriptions (continued)*

Field	Description
Input fast flags	<p data-bbox="941 315 1453 367">Indicates the input status of various switching features:</p> <ul data-bbox="941 388 1453 1491" style="list-style-type: none"> <li data-bbox="941 388 1453 451">• 0x0001 (input Access Control List [ACL] enabled) <li data-bbox="941 462 1453 493">• 0x0002 (policy routing enabled) <li data-bbox="941 504 1453 535">• 0x0004 (input rate limiting) <li data-bbox="941 546 1453 577">• 0x0008 (MAC/Prec accounting) <li data-bbox="941 588 1453 619">• 0x0010 (DSCP/PREC/QOS GROUP) <li data-bbox="941 630 1453 661">• 0x0020 (input named access lists) <li data-bbox="941 672 1453 703">• 0x0040 (NAT enabled on input) <li data-bbox="941 714 1453 745">• 0x0080 (crypto map on input) <li data-bbox="941 756 1453 787">• 0x0100 (QPPB classification) <li data-bbox="941 798 1453 829">• 0x0200 (inspect on input) <li data-bbox="941 840 1453 871">• 0x0400 (input classification) <li data-bbox="941 882 1453 913">• 0x0800 (casa input enable) <li data-bbox="941 924 1453 987">• 0x1000 (Virtual Private Network [VPN] enabled on a swidb) <li data-bbox="941 997 1453 1029">• 0x2000 (input idle timer enabled) <li data-bbox="941 1039 1453 1102">• 0x4000 (unicast Reverse Path Forwarding [RPF] check) <li data-bbox="941 1113 1453 1144">• 0x8000 (per-address ACL enabled) <li data-bbox="941 1155 1453 1186">• 0x10000 (deaggregating a packet) <li data-bbox="941 1197 1453 1228">• 0x20000 (GPRS enabled on input) <li data-bbox="941 1239 1453 1270">• 0x40000 (URL RenDezvous) <li data-bbox="941 1281 1453 1312">• 0x80000 (QoS classification) <li data-bbox="941 1323 1453 1354">• 0x100000 (FR switching on interface) <li data-bbox="941 1365 1453 1396">• 0x200000 (WCCP redirect on input) <li data-bbox="941 1407 1453 1438">• 0x400000 (input classification)

Table 4 show cef interface Field Descriptions (continued)

Field	Description
Output fast flags	Indicates the output status of various switching features, as follows: <ul style="list-style-type: none"> • 0x0001 (output ACL enabled) • 0x0002 (IP accounting enabled) • 0x0004 (WCC redirect enabled interface) • 0x0008 (rate limiting) • 0x0010 (MAC/Prec accounting) • 0x0020 (DSCP/PREC/QOS GROUP) • 0x0040 (D-QOS classification) • 0x0080 (output named access lists) • 0x0100 (NAT enabled on output) • 0x0200 (TCP intercept enabled) • 0x0400 (crypto map set on output) • 0x0800 (output firewall) • 0x1000 (RSVP classification) • 0x2000 (inspect on output) • 0x4000 (QoS classification) • 0x8000 (QoS preclassification) • 0x10000 (output stile)
ifindex 7/(7)	Indicates the SNMP ifindex for this interface.
Slot 1 Slot unit 0 VC -1	The slot number and slot unit.
Transmit limit accumulator	Indicates the maximum number of packets allowed in the transmit queue.
IP MTU	The MTU size set on the interface.

The following is sample output from the **show cef interface command** using the **policy-statistics** keyword:

```
Router# show cef interface policy-statistics
```

```
POS7/0 is up (if_number 8)
Index  Packets          Bytes
-----
1         0                0
2         0                0
3         50              5000
4        100             10000
5        100             10000
6         10              1000
7         0                0
8         0                0
```

The following is sample output from the **show cef interface** command using the **policy-statistics** keyword, and it shows policy statistics for Ethernet interface 1/0:

```
Router# show cef interface ethernet 1/0 policy-statistics
```

```
Ethernet1/0 is up (if_number 3)
  Corresponding hwidb fast_if_number 3
  Corresponding hwidb firstsw->if_number 3
  Index          Packets          Bytes
    1              0              0
    2              0              0
    3              0              0
    4              0              0
    5              0              0
    6              0              0
    7              0              0
    8              0              0
```

The following is sample output from the **show cef interface** command using the **policy-statistics** keyword, and it shows policy statistics for Fast Ethernet interface 1/0/0 with the policy accounting based on input traffic:

```
Router# show cef interface fastethernet 1/0/0 policy-statistics input
```

```
FastEthernet1/0/0 is up (if_number 6)
  Corresponding hwidb fast_if_number 6
  Corresponding hwidb firstsw->if_number 6
  BGP based Policy accounting on input is enabled
  Index          Packets          Bytes
    1             9999          999900
    2              0              0
    3              0              0
    4              0              0
    5              0              0
    6              0              0
    7              0              0
    8              0              0
    9              0              0
   10             0              0
   11             0              0
   12             0              0
   13             0              0
   14             0              0
   15             0              0
   16             0              0
   17             0              0
   18             0              0
   19             0              0
   20             0              0
   21             0              0
   22             0              0
   23             0              0
   24             0              0
   25             0              0
   26             0              0
   27             0              0
   28             0              0
   29             0              0
   30             0              0
   31             0              0
   32             0              0
   33             0              0
   34             1234          123400
   35             0              0
```

show cef interface

```

36          0          0
37          0          0
38          0          0
39          0          0
40          0          0
41          0          0
42          0          0
43          0          0
44          0          0
45         1000       100000
46          0          0
47          0          0
48          0          0
49          0          0
50          0          0
51          0          0
52          0          0
53          0          0
54         5123       1198782

```

The following is sample output from the **show cef interface** command using the **policy-statistics** keyword, and it shows policy statistics for serial interface 1/1/2 with the policy accounting based on output traffic:

```
Router# show cef interface serial 1/1/2 policy-statistics output
```

```

Serial1/1/2 is up (if_number 9)
  Corresponding hwidb fast_if_number 9
  Corresponding hwidb firstsw->if_number 9
  BGP based Policy accounting on output is enabled

```

Index	Packets	Bytes
1	9999	999900
2	0	0
3	0	0
4	0	0
5	0	0
6	0	0
7	0	0
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	0	0
23	0	0
24	0	0
25	0	0
26	0	0
27	0	0
28	0	0
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0

```

34          1234          123400
35          0            0
36          0            0
37          0            0
38          0            0
39          0            0
40          0            0
41          0            0
42          0            0
43          0            0
44          0            0
45          1000         100000
46          0            0
47          0            0
48          0            0
49          0            0
50          0            0
51          0            0
52          0            0
53          0            0
54          5123         1198782
55          0            0
56          0            0
57          0            0
58          0            0
59          0            0
60          0            0
61          0            0
62          0            0
63          0            0
64          0            0

```

Table 5 describes the significant fields shown in the display.

Table 5 *show cef interface policy-statistics Field Descriptions*

Field	Description
Index	Traffic index set with the route-map command.
Packets	Number of packets switched that match the index definition.
Bytes	Number of bytes switched matching the index definition.

Related Commands

Command	Description
clear cef linecard	Clears CEF information from line cards.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol to another, or enables policy routing.
show cef	Displays information about packets forwarded by CEF.
show cef drop	Displays which packets the line cards dropped, or displays which packets were not express forwarded.
show cef linecard	Displays CEF-related interface information by line card.

show cef interface policy-statistics

To display Cisco Express Forwarding (CEF) policy statistical information for a specific interface or for all interfaces, use the **show cef interface policy-statistics** command in user EXEC or privileged EXEC mode.

```
show cef interface [type number] policy-statistics [input | output]
```

Syntax Description	
<i>type number</i>	(Optional) Interface type and number. No space is required between the interface type and number.
input	(Optional) Displays Border Gateway Protocol (BGP) accounting policy statistics for traffic that is traveling through an input interface.
output	(Optional) Displays BGP accounting policy statistics for traffic that is traveling through an output interface.

Command Modes	
	User EXEC Privileged EXEC

Command History	Release	Modification
	12.0(9)S	This command was introduced on the Cisco 12000 series Internet routers.
	12.0(14)ST	This command was integrated into Cisco IOS Release 12.0(14)ST, and the statistics keyword was added.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
	12.0(22)S	The input and output keywords were added. The display output was modified to include support for CEF for IPv6 (CEFv6) and distributed (dCEFv6) interface information. Output fields that support Border Gateway Protocol (BGP) policy accounting were added for the Cisco 7200 series and Cisco 7500 series platforms.
	12.3(4)T	Changes to this command was integrated into Cisco IOS Release 12.3(4)T.
	12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.
	12.2(25)S	The internal keyword was added.

Usage Guidelines	
	This command is available only on distributed switching platforms.

Examples The following is sample output from the **show cef interface policy-statistics** command:

```
Router# show cef interface policy-statistics

POS7/0 is up (if_number 8)
Index   Packets          Bytes
-----
1       0                  0
2       0                  0
```

3	50	5000
4	100	10000
5	100	10000
6	10	1000
7	0	0
8	0	0

The following is sample output from the **show cef interface policy-statistics** command showing policy statistics for Ethernet interface 1/0:

```
Router# show cef interface ethernet 1/0 policy-statistics
```

```
Ethernet1/0 is up (if_number 3)
  Corresponding hwidb fast_if_number 3
  Corresponding hwidb firstsw->if_number 3
Index      Packets      Bytes
  1         0           0
  2         0           0
  3         0           0
  4         0           0
  5         0           0
  6         0           0
  7         0           0
  8         0           0
```

The following is sample output from the **show cef interface policy-statistics** command showing policy statistics for Fast Ethernet interface 1/0/0 with the policy accounting based on input traffic:

```
Router# show cef interface fastethernet 1/0/0 policy-statistics input
```

```
FastEthernet1/0/0 is up (if_number 6)
  Corresponding hwidb fast_if_number 6
  Corresponding hwidb firstsw->if_number 6
  BGP based Policy accounting on input is enabled
Index      Packets      Bytes
  1         9999        999900
  2         0           0
  3         0           0
  4         0           0
  5         0           0
  6         0           0
  7         0           0
  8         0           0
  9         0           0
 10        0           0
 11        0           0
 12        0           0
 13        0           0
 14        0           0
 15        0           0
 16        0           0
 17        0           0
 18        0           0
 19        0           0
 20        0           0
 21        0           0
 22        0           0
 23        0           0
 24        0           0
 25        0           0
 26        0           0
 27        0           0
 28        0           0
 29        0           0
```

show cef interface policy-statistics

```

30          0          0
31          0          0
32          0          0
33          0          0
34         1234        123400
35          0          0
36          0          0
37          0          0
38          0          0
39          0          0
40          0          0
41          0          0
42          0          0
43          0          0
44          0          0
45         1000        100000
46          0          0
47          0          0
48          0          0
49          0          0
50          0          0
51          0          0
52          0          0
53          0          0
54         5123        1198782
55          0          0
56          0          0
57          0          0
58          0          0
59          0          0
60          0          0
61          0          0
62          0          0
63          0          0
64          0          0

```

The following is sample output from the **show cef interface policy-statistics** command showing policy statistics for serial interface 1/1/2 with the policy accounting based on output traffic:

```
Router# show cef interface serial 1/1/2 policy-statistics output
```

```

Serial1/1/2 is up (if_number 9)
  Corresponding hwidb fast_if_number 9
  Corresponding hwidb firstsw->if_number 9
  BGP based Policy accounting on output is enabled
Index      Packets      Bytes
  1         9999      999900
  2          0          0
  3          0          0
  4          0          0
  5          0          0
  6          0          0
  7          0          0
  8          0          0
  9          0          0
 10         0          0
 11         0          0
 12         0          0
 13         0          0
 14         0          0
 15         0          0
 16         0          0
 17         0          0
 18         0          0

```

```

19          0          0
20          0          0
21          0          0
22          0          0
23          0          0
24          0          0
25          0          0
26          0          0
27          0          0
28          0          0
29          0          0
30          0          0
31          0          0
32          0          0
33          0          0
34      1234      123400
35          0          0
36          0          0
37          0          0
38          0          0
39          0          0
40          0          0
41          0          0
42          0          0
43          0          0
44          0          0
45      1000      100000
46          0          0
47          0          0
48          0          0
49          0          0
50          0          0
51          0          0
52          0          0
53          0          0
54      5123      1198782
55          0          0
56          0          0
57          0          0
58          0          0
59          0          0
60          0          0
61          0          0
62          0          0
63          0          0
64          0          0

```

Table 5 describes the significant fields shown in the display.

Table 6 *show cef interface policy-statistics Field Descriptions*

Field	Description
Index	Traffic index set with the route-map command.
Packets	Number of packets switched that match the index definition.
Bytes	Number of bytes switched matching the index definition.

Related Commands	Command	Description
	route-map (IP)	Defines the conditions for redistributing routes from one routing protocol to another, or enables policy routing.
	show cef drop	Displays which packets the line cards dropped, or displays which packets were not express forwarded.
	show cef linecard	Displays CEF-related interface information by line card.

show cef linecard

To display Cisco Express Forwarding (CEF)-related information by line card, use the **show cef linecard** command in user EXEC or privileged EXEC mode.

show cef linecard [*slot-number*] [**detail**] [**internal**]

Syntax Description		
<i>slot-number</i>	(Optional) Slot number containing the line card about which to display CEF-related information. When you omit this argument, information about all line cards is displayed.	
detail	(Optional) Displays detailed CEF information for the specified line card.	
internal	(Optional) Displays internal CEF information for the specified line card.	

Command Modes	
	User EXEC Privileged EXEC

Command History	Release	Modification
	11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
	11.1 CC	Multiple platform support was added.
	12.0(10)S	Output display was changed.
	12.1(2)T	This command was integrated into Cisco IOS Release 12.1(2)T.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S, and the display output was modified to include support for CEF for IPv6 (CEFv6) and distributed CEFv6 (dCEFv6) line card information.
	12.2(13)T	The display output modifications made in Cisco IOS Release 12.0(22)S were integrated into Cisco IOS Release 12.2(13)T.
	12.2(14)S	This command was integrated into Cisco IOS release 12.2(14)S.

Usage Guidelines	
	This command is available only on distributed switching platforms.
	When you omit the <i>slot-number</i> argument, information about all line cards is displayed. When you omit the <i>slot-number</i> argument and include the detail keyword, detailed information is displayed for all line cards. When you omit the <i>slot-number</i> argument and include the internal keyword, detailed internal information is displayed for all line cards. When you omit all keywords and arguments, the show cef linecard command displays important information about all line cards in table format.

Examples	
	The following is sample output from the show cef linecard command. The command displays information for all line cards in table format.

```
Router# show cef linecard
```

show cef linecard

```

Slot    MsgSent    XDRSent    Window    LowQ    MedQ    HighQ    Flags
0       6            95         24        0       0       0       0 up
1       6            95         24        0       0       0       0 up
VRF Default-table, version 8, 6 routes
Slot Version    CEF-XDR    I/Fs State    Flags
0       7            4          8 Active    up, sync
1       7            4          10 Active   up, sync

```

The following is sample output from the **show cef linecard detail** command for all line cards:

```

Router# show cef linecard detail

CEF linecard slot number 0, status up
Sequence number 4, Maximum sequence number expected 28, Seq Epoch 2
Send failed 0, Out Of Sequence 0, drops 0
Linecard CEF reset 0, reloaded 1
95 elements packed in 6 messages(3588 bytes) sent
69 elements cleared
linecard in sync after reloading
0/0/0 xdr elements in LowQ/MediumQ/HighQ
11/9/69 peak elements on LowQ/MediumQ/HighQ
Input  packets 0, bytes 0
Output packets 0, bytes 0, drops 0
CEF Table statistics:
Table name           Version Prefix-xdr Status
Default-table        7           4 Active, up, sync
CEF linecard slot number 1, status up
Sequence number 4, Maximum sequence number expected 28, Seq Epoch 2
Send failed 0, Out Of Sequence 0, drops 0
Linecard CEF reset 0, reloaded 1
95 elements packed in 6 messages(3588 bytes) sent
69 elements cleared
linecard in sync after reloading
0/0/0 xdr elements in LowQ/MediumQ/HighQ
11/9/69 peak elements on LowQ/MediumQ/HighQ
Input  packets 0, bytes 0
Output packets 0, bytes 0, drops 0
CEF Table statistics:
Table name           Version Prefix-xdr Status
Default-table        7           4 Active, up, sync

```

The following is sample output from the **show cef linecard internal** command for all line cards:

```

Router# show cef linecard internal

CEF linecard slot number 0, status up
Sequence number 11, Maximum sequence number expected 35
Send failed 0, Out Of Sequence 0
Linecard CEF reset 2, reloaded 2
Total elements queued:
prefix                4
adjacency              4
interface              91
address                2
policy routing         2
hw interface           57
state                  6
resequence             2
control                13
table                  2
time                   4484
flow features deactivate 2
flow cache config      2
flow export config     2

```

```

dss 2
isl 2
mpls atm vc remove 2
mpls atm vc set label 2
2
2
3
1
4574 elements packed in 4495 messages (90286 bytes) sent
115 elements cleared
Total elements cleared:
prefix 2
adjacency 1
interface 63
address 1
policy routing 1
hw interface 29
state 2
control 5
table 1
flow features deactivate 1
flow cache config 1
flow export config 1
dss 1
isl 1
mpls atm vc remove 1
mpls atm vc set label 1
1
1
1
linecard disabled - failed a reload
0/0/0 xdr elements in LowQ/MediumQ/HighQ
Input packets 0, bytes 0
Output packets 0, bytes 0, drops 0

CEF Table statistics:
Table name Version Prefix-xdr Status
Default-table 8 4 Active, sync

```

[Table 7](#) describes the significant fields shown in the displays.

Table 7 *show cef linecard Field Descriptions*

Field	Description
Table name	Name of the CEF table.
Version	Number of the Forwarding Information Base (FIB) table version.
Prefix-xdr	Number of prefix IPC information elements XDRs processed.
Status	State of the CEF table.
Slot	Slot number of the line card.
MsgSent	Number of IPC messages sent.
XDRSent	XDRs packed into IPC messages sent from the Route Processor (RP) to the line card.
Window	Size of the IPC window between the line card and the RP.
LowQ/MedQ/HighQ	Number of XDR elements in the Low, Medium, and High priority queues.

Table 7 *show cef linecard Field Descriptions (continued)*

Field	Description
Flags	Indicates the status of the line card. States are... <ul style="list-style-type: none"> • up—Line card is up. • sync—Line card is in synchronization with the main FIB. • FIB is repopulated on the line card. • reset—Line card FIB is reset. • reloading—Line card FIB is being reloaded. • disabled—Line card is disabled.
CEF-XDR	Number of CEF XDR messages processed.
I/Fs	Interface numbers.

Related Commands

Command	Description
show cef	Displays which packets the line cards dropped or displays which packets were not express-forwarded.
show cef interface	Displays CEF-related interface information.
show ipv6 cef	Displays entries in the IPv6 FIB.

show cef not-cef-switched

To display which packets were sent to a different switching path, use the **show cef not-cef-switched** command in user EXEC or privileged EXEC mode.

show cef not-cef-switched

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
	11.1 CC	Multiple platform support was added.
	12.0(22)S	The display output for this command was modified to include support for Cisco Express Forwarding for IPv6 (CEFv6) and distributed CEF for IPv6 (dCEFv6) packets.
	12.0(23)S	This command was integrated into Cisco IOS Release 12.0(23)S.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T. Previously there was a show cef command, and drop was a keyword of that command.
	12.2(14)S	This command was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines If packets are not being cef switched and you want to determine why, enter the **show cef not-cef switched** command.



Note

If CEFv6 or dCEFv6 is enabled globally on the router, the **show cef not-cef-switched** command displays IPv6 CEF counter information and IPv4 CEF counter information. If CEFv6 or dCEFv6 is not enabled globally on the router, the command displays only IPv4 CEF counter information.

Examples The following is sample output from the **show cef not-cef switched** command:

```
Router# show cef not-cef-switched

CEF Packets passed on to next switching layer
Slot No_adj No_encap Unsupp'ted Redirect Receive Options Access Frag
RP 0 0 0 0 91584 0 0 0
1 0 0 0 0 0 0 0 0
2 0 0 0 0 0 0 0 0
IPv6 CEF Packets passed on to next switching layer
Slot No_adj No_encap Unsupp'ted Redirect Receive Options Access MTU
RP 0 0 0 0 92784 0 0 0
1 0 0 0 0 0 0 0 0
2 0 0 0 0 0 0 0 0
```

Table 8 describes the significant fields shown in the display.

Table 8 *show cef not-cef-switched* Field Descriptions

Field	Meaning
Slot	The slot number on which the packets were received.
No_adj	Indicates the number of packets sent to the processor due to incomplete adjacency.
No_encap	Indicates the number of packets sent to the processor for Address Resolution Protocol (ARP) resolution.
Unsup'ed	Indicates the number of packets punted to the next switching level due to unsupported features.
Redirect	Records packets that are ultimately destined to the router, and packets destined to a tunnel endpoint on the router. If the decapsulated tunnel is IP, it is CEF switched; otherwise, packets are process switched.
Receive	Indicates the number of packets ultimately destined to the router, or packets destined to a tunnel endpoint on the router. If the decapsulated tunnel packet is IP, the packet is CEF switched. Otherwise, packets are process switched.
Options	Indicates the number of packets with options. Packets with IP options are handled only at the process level.
Access	Indicates the number of packets punted due to an access list failure.
Frag	Indicates the number of packets punted due to fragmentation failure. Note This field is not supported for IPv6 packets.
MTU	Indicates the number of packets punted due to maximum transmission unit (MTU) failure. Note This field is not supported for IPv4 packets.

Related Commands

Command	Description
show cef drop	Displays a list of which packets each line card dropped.
show cef interface	Displays CEF-related interface information.
show ipv6 cef	Displays entries in the IPv6 FIB.

show cef timers

To display the current state of the timers internal to the CEF process, use the **show cef timers** command in user EXEC or privileged EXEC mode.

show cef timers

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	12.3(2)T	This command was introduced.

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

```
Router# show cef timers

CEF background process
  Expiration  Type
    0.208 (parent)
    0.208 adjacency update hwidb
    0.540 slow resolution
    1.208 ARP throttle

CEF FIB scanner process
  Expiration  Type
    44.852 (parent)
    44.852 checker scan-rib
```

[Table 9](#) describes the significant fields shown in the display.

Table 9 *show cef timers Field Descriptions*

Field	Description
Expiration	Seconds in which the timers will expire.
Type	Identification of the timer.

Related Commands	Command	Description
	show cef interface	Displays CEF-related interface information.
	show ipv6 cef	Displays entries in the IPv6 FIB.

show interface stats

To display numbers of packets that were process switched, fast switched, and distributed switched, use the **show interface stats** command in user EXEC or privileged EXEC mode.

show interface *type number* **stats**

Syntax Description

type number Interface type and number about which to display statistics.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.3(14)YM2	This command was modified to show the counter for Multi-Processor Forwarding (MPF) switched packets.
12.4(4)T	This command was integrated into Cisco IOS Release 12.4(4)T.

Usage Guidelines

Use this command on the Route Processor (RP).



Note

When fast switching is configured on the outbound interface, and RSP optimum, RSP flow, and VIP DFS switching modes are all specified on the incoming interface, the interface on which RSP optimum, RSP flow, and VIP DFS switching modes is not enabled can still show packets switched out via those switching paths when packets are received from other interfaces with RSP optimum, RSP flow, and VIP DES switching modes enabled.

Examples

The following sample output is from Cisco IOS Release 12.3(14)YM2 and shows counters for both Multi-Processor Forwarding (MPF) switched packets on native GigabitEthernet interfaces and for non-MPF FastEthernet interfaces:

```
Router# show interface stats
GigabitEthernet0/0
  Switching path  Pkts In  Chars In  Pkts Out  Chars Out
  Processor       0        0        225      77625
  Route cache     0        0         0         0
  Multi-Processor Fwding  950     221250   500      57000
  Total           950     221250   725     134625
GigabitEthernet0/1
  Switching path  Pkts In  Chars In  Pkts Out  Chars Out
  Processor       1         60       226      77685
  Route cache     0         0         0         0
  Multi-Processor Fwding  500     57000   500      57000
  Total           501     57060   726     134685
GigabitEthernet0/2
  Switching path  Pkts In  Chars In  Pkts Out  Chars Out
  Processor       1         60       226      77685
```

```

Route cache          0          0          0          0
Multi-Processor Fwding  0          0          0          0
Total                1          60         226         77685
FastEthernet1/0
Switching path      Pkts In   Chars In   Pkts Out   Chars Out
Processor           34015    5331012    1579       158190
Route cache         0         0          0          0
Total               34015    5331012    1579       158190

```

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

```
Router# show interface fddi 3/0/0 stats
```

```

Fddi3/0/0
Switching path      Pkts In   Chars In   Pkts Out   Chars Out
Processor           3459994  1770812197  4141096    1982257456
Route cache         10372326 3693920448  439872     103743545
Distributed cache   19257912 1286172104  86887377  1184358085
Total               33090232 2455937453  91468345  3270359086

```

[Table 10](#) describes the significant fields in the display.

Table 10 *show interface stats Field Descriptions*

Field	Description
Fddi3/0/0	Interface for which information is shown
Switching path	Column heading for the various switching paths below it
Pkts In	Number of packets received in each switching mechanism
Chars In	Number of characters received in each switching mechanism
Pkts Out	Number of packets sent out each switching mechanism
Chars Out	Number of characters sent out each switching mechanism

show interfaces switching

To display the number of packets sent and received on an interface classified by the switching path, use the **show interfaces switching** command in user EXEC and privileged EXEC mode.

show interfaces [*type number*] **switching**

Syntax Description	<i>type number</i>	Interface type and number about which to display packet switching path information.
--------------------	--------------------	---

Command Modes	User EXEC Privileged EXEC
---------------	------------------------------

Command History	Release	Modification
	12.3	This command was introduced.

Usage Guidelines Use the **show interfaces switching** command to show which path the router uses and how the traffic is switched. This command is also useful for troubleshooting CPU utilization.

Statistics for packets in, bytes in, packets out, and bytes out are displayed for the available protocols. The statistics are arranged by process, cache misses, fast-path and autonomous path. All values displayed by the **show interfaces switching** command are absolute. The **clear interface counters** command has no effect on these values.

You must enter at least seven characters of the **switching** keyword (**switchi**) when you use the **show interfaces switching** command.

Examples The following shows sample output from the **show interfaces switching** command:

```
Router# show interface switching

FastEthernet0/0
  Throttle count      0
  Drops              RP      0      SP      0
  SPD Flushes        Fast      0      SSE     0
  SPD Aggress        Fast      0
  SPD Priority        Inputs    0      Drops   0

  Protocol IP
  Switching path     Pkts In  Chars In  Pkts Out  Chars Out
  Process            24      8208      0          0
  Cache misses
  Fast               0        0          0          0
  Auton/SSE          0        0          0          0

  Protocol DECnet
  Switching path     Pkts In  Chars In  Pkts Out  Chars Out
  Process            0        0          0          0
  Cache misses
  Fast               0        0          0          0
```

```

Auton/SSE          0          0          0          0
.....
.....

Protocol IPv6
Switching path    Pkts In   Chars In   Pkts Out   Chars Out
  Process          0          0          0          0
Cache misses      0          -          -          -
  Fast             0          0          0          0
Auton/SSE         0          0          0          0

Protocol Other
Switching path    Pkts In   Chars In   Pkts Out   Chars Out
  Process          2          120        3          180
Cache misses      0          -          -          -
  Fast             0          0          0          0
Auton/SSE         0          0          0          0

```

NOTE: all counts are cumulative and reset only after a reload.

Interface POS4/0 is disabled

The following shows sample output from the **show interfaces switching** command for the interface FastEthernet 0/0:

Router> **show interfaces FastEthernet 0/0 switching**

```

FastEthernet0/0
  Throttle count      0
    Drops              RP          SP          0
  SPD Flushes         Fast          218        SSE          0
  SPD Aggress         Fast          0
  SPD Priority         Inputs        0          Drops          0

Protocol IP
Switching path    Pkts In   Chars In   Pkts Out   Chars Out
  Process          239      23422     237        23226
Cache misses      0          -          -          -
  Fast             0          0          0          0
Auton/SSE         0          0          0          0

Protocol ARP
Switching path    Pkts In   Chars In   Pkts Out   Chars Out
  Process          4          240        3          180
Cache misses      0          -          -          -
  Fast             0          0          0          0
Auton/SSE         0          0          0          0

Protocol CDP
Switching path    Pkts In   Chars In   Pkts Out   Chars Out
  Process          8          2632     15          5477
Cache misses      0          -          -          -
  Fast             0          0          0          0
Auton/SSE         0          0          0          0

```

NOTE: all counts are cumulative and reset only after a reload.

Table 11 describes the significant fields shown in the display.

Table 11 *show interfaces switching Field Descriptions*

Field	Description
Throttle count	Number of times input packet processing was throttled on this interface.
Drops	RP—Number of packets dropped for input congestion. SP—Number of packets flushed by external throttling.
SPD Flushes	Fast—Number of packets flushed by selective packet discard on RP. SSE—Number of packets flushed by external selective packet discard.
SPD Aggress	Fast—Input packets dropped by aggressive selective packet discard.
SPD Priority	Inputs—Number of priority packets received. Drops—Number of priority packets dropped.
Protocol	Name of the protocol for which packet switching information is displayed.
Switching Path	Indicates the traffic switching path.
Pkts In	Number of incoming packets.
Char In	Number of incoming bytes.
Pkts Out	Number of outgoing packets.
Char Out	Number of outgoing bytes.
Process	Process switching. With this type of switching, an incoming packet is associated with a destination network or subnet entry in the routing table located in main memory. Process switching is a scheduled process that is performed by the system processor.
Cache misses	Packets that were forwarded through the process level (for which there was no entry in fast switching cache).
Fast	Fast switching. With this type of switching, an incoming packet matches an entry in the fast-switching cache located in main memory. Fast switching is done via asynchronous interrupts, which are handled in real time. Fast switching allows higher throughput by switching a packet using a cache created by previous packets.
Auton	Autonomous switching. With this type of switching, an incoming packet matches an entry in the autonomous-switching cache located on the interface processor. Autonomous switching provides faster packet switching by allowing the ciscoBus controller to switch packets independently without having to interrupt the system processor. It is available only on Cisco 7000 series routers and in AGS+ systems with high-speed network controller cards.
SSE	Silicon switching engine switching. With this type of switching, an incoming packet matches an entry in the silicon-switching cache located in the silicon switching engine (SSE) of the Silicon Switch Processor (SSP) module. This module is available only on Cisco 7000 series routers. Silicon switching provides very fast, dedicated packet switching by allowing the SSE to switch packets independently without having to interrupt the system processor.

Related Commands

Command	Description
show interface stats	Displays numbers of packets that were process switched, fast switched, and distributed switched.

show ip cache

To display the routing table cache used to fast switch IP traffic, use the **show ip cache** command in user EXEC or privileged EXEC mode.

```
show ip cache [prefix mask] [type number]
```

Syntax Description	prefix	(Optional) Displays only the entries in the cache that match the prefix and mask combination.
	mask	(Optional) Displays only the entries in the cache that match the prefix and mask combination.
	type	(Optional) Displays only the entries in the cache that match the interface type and number combination.
	number	(Optional) Displays only the entries in the cache that match the interface type and number combination.

Command Modes	User EXEC Privileged EXEC
---------------	------------------------------

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines The **show ip cache** display shows MAC headers up to 92 bytes.

Examples The following is sample output from the **show ip cache** command:

```
Router# show ip cache

IP routing cache version 4490, 141 entries, 20772 bytes, 0 hash overflows
Minimum invalidation interval 2 seconds, maximum interval 5 seconds,
  quiet interval 3 seconds, threshold 0 requests
Invalidation rate 0 in last 7 seconds, 0 in last 3 seconds
Last full cache invalidation occurred 0:06:31 ago

Prefix/Length      Age      Interface      MAC Header
131.108.1.1/32     0:01:09  Ethernet0/0    AA000400013400000C0357430800
131.108.1.7/32     0:04:32  Ethernet0/0    00000C01281200000C0357430800
131.108.1.12/32    0:02:53  Ethernet0/0    00000C029FD000000C0357430800
131.108.2.13/32    0:06:22  Fddi2/0        00000C05A3E000000C035753AAAA0300
00000800
131.108.2.160/32   0:06:12  Fddi2/0        00000C05A3E000000C035753AAAA0300
00000800
131.108.3.0/24     0:00:21  Ethernet1/2    00000C026BC600000C03574D0800
131.108.4.0/24     0:02:00  Ethernet1/2    00000C026BC600000C03574D0800
131.108.5.0/24     0:00:00  Ethernet1/2    00000C04520800000C03574D0800
131.108.10.15/32   0:05:17  Ethernet0/2    00000C025FF500000C0357450800
131.108.11.7/32    0:04:08  Ethernet1/2    00000C010E3A00000C03574D0800
131.108.11.12/32   0:05:10  Ethernet0/0    00000C01281200000C0357430800
```

```
131.108.11.57/32    0:06:29    Ethernet0/0    00000C01281200000C0357430800
```

Table 12 describes the significant fields shown in the display.

Table 12 show ip cache Field Descriptions

Field	Description
IP routing cache version	Version number of this table. This number is incremented any time the table is flushed.
entries	Number of valid entries.
bytes	Number of bytes of processor memory for valid entries.
hash overflows	Number of times autonomous switching cache overflowed.
Minimum invalidation interval	Minimum time delay between cache invalidation request and actual invalidation.
maximum interval	Maximum time delay between cache invalidation request and actual invalidation.
quiet interval	Length of time between cache flush requests before the cache will be flushed.
threshold <n> requests	Maximum number of requests that can occur while the cache is considered quiet.
Invalidation rate <n> in last <m> seconds	Number of cache invalidations during the last <m> seconds.
0 in last 3 seconds	Number of cache invalidation requests during the last quiet interval.
Last full cache invalidation occurred <hh:mm:ss> ago	Time since last full cache invalidation was performed.
Prefix/Length	Network reachability information for cache entry.
Age	Age of cache entry.
Interface	Output interface type and number.
MAC Header	Layer 2 encapsulation information for cache entry.

The following is sample output from the **show ip cache** command with a prefix and mask specified:

```
Router# show ip cache 131.108.5.0 255.255.255.0

IP routing cache version 4490, 119 entries, 17464 bytes, 0 hash overflows
Minimum invalidation interval 2 seconds, maximum interval 5 seconds,
  quiet interval 3 seconds, threshold 0 requests
Invalidation rate 0 in last second, 0 in last 3 seconds
Last full cache invalidation occurred 0:11:56 ago

Prefix/Length      Age      Interface      MAC Header
131.108.5.0/24    0:00:34    Ethernet1/2    00000C04520800000C03574D0800
```

The following is sample output from the **show ip cache** command with an interface specified:

```
Router# show ip cache e0/2

IP routing cache version 4490, 141 entries, 20772 bytes, 0 hash overflows
Minimum invalidation interval 2 seconds, maximum interval 5 seconds,
  quiet interval 3 seconds, threshold 0 requests
Invalidation rate 0 in last second, 0 in last 3 seconds
```

Last full cache invalidation occurred 0:06:31 ago

Prefix/Length	Age	Interface	MAC Header
131.108.10.15/32	0:05:17	Ethernet0/2	00000C025FF500000C0357450800

Related Commands

Command	Description
clear ip cache	Deletes entries in the routing table cache used to fast switch IP traffic.

show ip cef

To display entries in the Forwarding Information Base (FIB) or to display a summary of the FIB, use the **show ip cef** command in user EXEC or privileged EXEC mode.

```
show ip cef [vrf vrf-name] [unresolved [detail] | [detail | summary]]
```

Specific FIB Entries Based on IP Address Information

```
show ip cef [vrf vrf-name] [network [mask]] [longer-prefixes] [detail]
```

Specific FIB Entries Based on Interface Information

```
show ip cef [vrf vrf-name] [type number] [detail]
```

Specific FIB Entries Based on Nonrecursive Routes

```
show ip cef [vrf vrf-name] non-recursive [detail]
```

Syntax	Description
vrf	(Optional) A Virtual Private Network (VPN) routing/forwarding (VRF) instance.
<i>vrf-name</i>	(Optional) Name assigned to the VRF.
unresolved	(Optional) Displays unresolved FIB entries.
detail	(Optional) Displays detailed FIB entry information.
summary	(Optional) Displays a summary of the FIB.
<i>network</i>	(Optional) Network number for which to display a FIB entry.
<i>mask</i>	(Optional) Network mask to be used with the specified <i>network</i> .
longer-prefixes	(Optional) Displays FIB entries for more specific destinations.
<i>type number</i>	(Optional) Interface type and number for which to display FIB entries.
non-recursive	Displays only nonrecursive routes.

Command Modes
User EXEC Privileged EXEC

Command History	Release	Modification
	11.2 GS	This command was introduced to support the Cisco 12012 Internet router.
	11.1 CC	Multiple platform support was added.
	12.0(5)T	The vrf keyword was added.
	12.0(17)ST	The display of a message indicating support for Border Gateway Protocol (BGP) policy accounting was added.
	12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
	12.0(26)S	Additional output display was added for the summary keyword.

Usage Guidelines

The **show ip cef** command without any keywords or arguments shows a brief display of all FIB entries. The **show ip cef detail** command shows detailed FIB entry information for all FIB entries.

Examples

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

```
Router# show ip cef unresolved

IP Distributed CEF with switching (Table Version 136632)
45776 routes, 13 unresolved routes (0 old, 13 new)
45776 leaves, 2868 nodes, 8441480 bytes, 136632 inserts, 90856 invalidations
1 load sharing elements, 208 bytes, 1 references
1 CEF resets, 1 revisions of existing leaves
refcounts: 527292 leaf, 465617 node

10.214.0.0/16, version 136622
0 packets, 0 bytes
  via 172.17.233.56, 0 dependencies, recursive
  unresolved
10.215.0.0/16, version 136623
0 packets, 0 bytes
  via 172.17.233.56, 0 dependencies, recursive
  unresolved
10.218.0.0/16, version 136624
0 packets, 0 bytes
```

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

```
Router# show ip cef summary

IP Distributed CEF with switching (Table Version 135165)
45788 routes, 0 reresolve, 4 unresolved routes (0 old, 4 new)
45788 leaves, 2868 nodes, 8442864 bytes, 135165 inserts, 89377 invalidations
0 load sharing elements, 0 bytes, 0 references
1 CEF resets, 0 revisions of existing leaves
refcounts: 527870 leaf, 466167 node
```

The following is sample output from the **show ip cef summary** command on Cisco IOS Release 12.0(26)S and higher:

```
Router# show ip cef summary

IP Distributed CEF with switching (Table Version 2283113), flags=0x0
164413 routes, 0 reresolve, 0 unresolved (0 old, 0 new), peak 3451
2234324 instant recursive resolutions, 0 used background process
304 load sharing elements, 336 references
14758 in-place/0 aborted modifications
36745512 bytes allocated to the FIB table data structures
universal per-destination load sharing algorithm, id B03E8BB3
2(0) CEF resets
Resolution Timer: Exponential (currently 1s, peak 1s)
Tree summary:
  8-8-8-8 stride pattern
  short mask protection disabled
  164413 leaves, 11622 nodes using 16691988 bytes
Transient memory used: 168, max: 865064
```

Table epoch: 0 (164413 entries at this epoch)

```
Hardware resource allocation status summary
Green (Normal), Yellow (Caution) Red (Alarm)
Slot HW Resource Name      Util      Alert
```

```

1    E3 Rx PLU                22    G
1    E3_Rx_TLU               6     G
2    E3 Rx PLU                22    G
2    E3_Rx_TLU               6     G
3    E3 Rx PLU                22    G
3    E3_Rx_TLU               6     G
9    E3 Rx PLU                22    G
9    E3_Rx_TLU               6     G

```

Adjacency Table has 11 adjacencies

The following is sample output from the **show ip cef detail** command for Ethernet interface 0. It shows all the prefixes resolving through adjacency pointing to next hop Ethernet interface 0/0 and next hop interface IP address 172.19.233.33.

```
Router# show ip cef e0/0 172.19.233.33 detail
```

```

IP Distributed CEF with switching (Table Version 136808)
45800 routes, 8 unresolved routes (0 old, 8 new) 45800 leaves, 2868 nodes, 8444360 bytes,
136808 inserts, 91008 invalidations 1 load sharing elements, 208 bytes, 1 references 1 CEF
resets, 1 revisions of existing leaves refcounts: 527343 leaf, 465638 node

172.19.233.33/32, version 7417, cached adjacency 172.19.233.33 0 packets, 0 bytes,
Adjacency-prefix
via 172.19.233.33, Ethernet0/0, 0 dependencies
next hop 172.19.233.33, Ethernet0/0
valid cached adjacency

```

The following is sample output from the **show ip cef detail** command for the prefix 192.168.5.0, showing that the BGP policy accounting bucket number 4 (traffic_index 4) is assigned to this prefix:

```
Router# show ip cef 192.168.5.0 detail
```

```

192.168.5.0/24, version 21, cached adjacency to POS7/2
0 packets, 0 bytes, traffic_index 4
via 10.14.1.1, 0 dependencies, recursive
next hop 10.14.1.1, POS7/2 via 10.14.1.0/30
valid cached adjacency

```

The following example shows the forwarding table associated with the VRF named vrf1:

```
Router# show ip cef vrf vrf1
```

```

Prefix          Next Hop          Interface
0.0.0.0/32      receive
10.11.0.0/16    10.50.0.1        Ethernet1/3
10.12.0.0/16    10.52.0.2        POS6/0
10.50.0.0/16    attached         Ethernet1/3
10.50.0.0/32    receive
10.50.0.1/32    10.50.0.1        Ethernet1/3
10.50.0.2/32    receive
10.255.255.255/32 receive
10.51.0.0/16    10.52.0.2        POS6/0
224.0.0.0/24    receive
255.255.255.255/32 receive

```

Table 13 describes the significant fields shown in the display.

Table 13 *show ip cef vrf Field Descriptions*

Field	Description
Prefix	Specifies the network prefix.
Next Hop	Specifies the BGP next hop address.
Interface	Specifies the VRF interface.

Related Commands

Command	Description
show cef	Displays which packets the line cards dropped, or displays which packets were not express forwarded.
show cef interface	Displays CEF-related interface information.

show ip cef adjacency

To display Cisco Express Forwarding (CEF) recursive and direct prefixes resolved through an adjacency, use the **show ip cef adjacency** command in user EXEC or privileged EXEC mode.

```
show ip cef [vrf vrf-name] adjacency type number ip-prefix [detail]
```

To display CEF recursive and direct prefixes resolved through special adjacency types representing nonstandard switching paths, use this form of the **show ip cef adjacency** command in privileged EXEC mode.

```
show ip cef [vrf vrf-name] adjacency {discard | drop | glean | null | punt} [detail]
```

Syntax Description		
vrf	(Optional) A Virtual Private Network (VPN) routing and forwarding (VRF) instance.	
<i>vrf-name</i>	(Optional) Name assigned to the VRF.	
<i>type number</i>	Interface type and number for which to display forwarding information base (FIB) entries.	
<i>ip-prefix</i>	Next hop IP prefix, in dotted decimal format (A.B.C.D).	
detail	(Optional) Displays detailed information for each CEF adjacency type entry.	
discard	Discard adjacency. Sets up for loopback interfaces. Loopback IP addresses are receive entries in the FIB table.	
drop	Drop adjacency. Packets forwarded to this adjacency are dropped.	
glean	Glean adjacency. Represents destinations on a connected interface for which no ARP cache entry exists.	
null	Null adjacency. Formed for the Null0 interface. Packets forwarded to this adjacency are dropped.	
punt	Punt adjacency. Represents destinations that cannot be switched in the normal path and that are punted to the next fastest switching vector.	

Command Modes	
	User EXEC Privileged EXEC

Command History	Release	Modification
	11.1 CC	This command was introduced.
	12.0(5)T	The vrf keyword was added.

Usage Guidelines

An adjacency is a node that can be reached by one Layer 2 hop.

This command shows all prefixes resolved through a regular next hop adjacency or through a special adjacency type such as discard, drop, glean, null and punt.

The following sample output is from the **show ip cef adjacency** command when the **glean** type is specified:

```
Router# show ip cef adjacency glean
```

```
Prefix           Next Hop           Interface
9.2.61.0/24      attached          Ethernet1/0/0
172.17.250.252/32 9.2.61.1          Ethernet1/0/0
```

The following sample output is from the **show ip cef adjacency drop** command with **detail** specified:

```
Router# show ip cef adjacency drop detail
```

```
IP CEF with switching (Table Version 4), flags=0x0
 4 routes, 0 reresolve, 0 unresolved (0 old, 0 new), peak 0
 4 leaves, 8 nodes, 8832 bytes, 13 inserts, 9 invalidations
 0 load sharing elements, 0 bytes, 0 references
 universal per-destination load sharing algorithm, id 00B999CA
 3 CEF resets, 0 revisions of existing leaves
 Resolution Timer: Exponential (currently 1s, peak 1s)
 0 in-place modifications
 refcounts: 533 leaf, 536 node

224.0.0.0/4, version 3
 0 packets, 0 bytes, Precedence routine (0)
 via 0.0.0.0, 0 dependencies
  next hop 0.0.0.0
  valid drop adjacency
```

The following sample output shows the direct IP prefix when the next hop Gigabit Ethernet interface 3/0 is specified:

```
Router# show ip cef adjacency GigabitEthernet 3/0 172.20.26.29
```

```
Prefix           Next Hop           Interface
34.1.1.0/24      172.20.26.29      GigabitEthernet3/0
```

[Table 14](#) describes the significant fields shown in the display.

Table 14 *show ip cef adjacency Field Descriptions*

Field	Description
Prefix	Destination IP prefix.
Next Hop	Next hop IP address.
Interface	Next hop interface.

Related Commands

Command	Description
show adjacency	Displays CEF adjacency table information.

show ip cef events

To display all recorded Cisco Express Forwarding (CEF) forwarding information base (FIB) and adjacency events, use the **show ip cef events** command in user EXEC or privileged EXEC mode.

```
show ip cef [vrf vrf-name] events [ip-prefix] [new | within seconds] [detail] [summary]
```

Syntax Description		
vrf	(Optional) A Virtual Private Network (VPN) routing and forwarding (VRF) instance.	
<i>vrf-name</i>	(Optional) Name assigned to the VRF.	
<i>ip-prefix</i>	(Optional) Next hop IP prefix, in dotted decimal format (A.B.C.D).	
new	(Optional) Displays new CEF events not previously shown.	
within seconds	(Optional) Displays CEF events that occurred within a specified number of seconds.	
detail	(Optional) Displays detailed information for each CEF event entry.	
summary	(Optional) Displays a summary of the CEF event log.	

Command Modes	
	User EXEC Privileged EXEC

Command History	Release	Modification
	12.0(15)S	This command was introduced.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.

Usage Guidelines This command shows the state of the table event log and must be enabled for events to record. The **ip cef table event-log** command controls parameters such as event log size.

Examples The following sample output is from the **show ip cef events** command with **summary** specified:

```
Router# show ip cef events summary

CEF table events summary:
  Storage for 10000 events (320000 bytes), 822/0 events recorded/ignored
  Matching all events, traceback depth 16
  Last event occurred 00:00:06.516 ago.
```

The following sample output is from the **show ip cef events** command displaying events that occurred within 1 second:

```
Router# show ip cef events within 1

CEF table events (storage for 10000 events, 14 events recorded)
+00:00:00.000:[Default-table] *.*.*.*/*          New FIB table          [OK]
+00:00:00.000:[Default-table] 9.1.80.194/32      FIB insert in mtrie   [OK]
+00:00:00.000:[Default-table] 9.1.80.0/32         FIB insert in mtrie   [OK]
+00:00:00.000:[Default-table] 9.1.80.255/32       FIB insert in mtrie   [OK]
```

```

+00:00:00.004:[Default-table] 9.1.80.0/24      FIB insert in mtrie [OK]
+00:00:00.004:[Default-table] 9.1.80.0/24      NBD up [OK]
+00:00:00.004:[Default-table] 224.0.0.0/4      FIB insert in mtrie [OK]
+00:00:00.012:[Default-table] 9.1.80.0/24      NBD up [Ignr]
+00:00:00.012:[Default-table] 224.0.0.0/4      FIB remove [OK]
+00:00:00.016:[Default-table] 224.0.0.0/4      FIB insert in mtrie [OK]
+00:00:05.012:[Default-table] 224.0.0.0/4      FIB remove [OK]
+00:00:05.012:[Default-table] 224.0.0.0/4      FIB insert in mtrie [OK]
+00:00:28.440:[Default-table] 224.0.0.0/4      FIB remove [OK]
+00:00:28.440:[Default-table] 224.0.0.0/4      FIB insert in mtrie [OK]
First event occurred at 00:00:36.568 (00:04:40.756 ago)
Last event occurred at 00:01:05.008 (00:04:12.316 ago)

```

Table 15 describes the significant fields shown in the display.

Table 15 *show ip cef events Field Descriptions*

Field	Description
+00:00:00.000	Time stamp of the IP CEF event.
[Default-table]	Type of VPN routing and forwarding (VRF) table for this event entry.
..*.*/*	All IP prefixes.
9.1.80.194/32	IP prefix associated with the event.
FIB insert in mtrie	IP prefix insert in the FIB table event.
NBD up	IP prefix up event.
FIB remove	FIB entry remove event.
[Ignr]	CEF ignored event.
[OK]	CEF processed event.

Related Commands

Command	Description
ip cef table consistency-check	Enables CEF table consistency checker types and parameters.
ip cef table event-log	Controls CEF table event-log characteristics.

show ip cef exact-route

To display the exact route for a source-destination IP address pair, use the **show ip cef exact-route** command in user EXEC or privileged EXEC mode.

```
show ip cef [vrf vrf-name] exact-route source-address destination-address
```

Syntax Description	Parameter	Description
	vrf	(Optional) A Virtual Private Network (VPN) routing and forwarding (VRF) instance.
	<i>vrf-name</i>	(Optional) Name assigned to the VRF.
	<i>source-address</i>	Specifies the network source address.
	<i>destination-address</i>	Specifies the network destination address.

Command Modes	Mode
	User EXEC
	Privileged EXEC

Command History	Release	Modification
	12.1(4)T	This command was introduced.

Usage Guidelines When you are load balancing per destination, this command shows the exact next hop that is used for a given IP source-destination pair.

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

```
Router# show ip cef exact-route 1.1.1.1 172.17.249.252
1.1.1.1          -> 172.17.249.252 :Ethernet2/0/0 (next hop 9.1.104.1)
```

[Table 16](#) describes the significant fields shown in the display.

Table 16 *show ip cef exact-route* Field Descriptions

Field	Description
1.1.1.1 -> 172.17.249.252	From source 1.1.1.1 to destination 172.17.249.252.
Ethernet2/0/0 (next hop 9.1.104.1)	Next hop is 9.1.104.1 on Ethernet 2/0/0.

show ip cef inconsistency

To display Cisco Express Forwarding (CEF) IP prefix inconsistencies, use the **show ip cef inconsistency** command in user EXEC or privileged EXEC mode.

```
show ip cef [vrf vrf-name] inconsistency [records] [detail]
```

Syntax Description	Parameter	Description
	vrf	(Optional) A Virtual Private Network (VPN) routing and forwarding (VRF) instance.
	<i>vrf-name</i>	(Optional) Name assigned to the VRF.
	records	(Optional) Displays all recorded inconsistencies.
	detail	(Optional) Displays detailed information for each CEF table entry.

Command Modes	Mode
	User EXEC Privileged EXEC

Command History	Release	Modification
	12.0(15)S	This command was introduced.
	12.2(2)T	This command was integrated into Cisco IOS Release 12.2(2)T.

Usage Guidelines	Guidelines
	This command is available only on routers with line cards.
	This command displays recorded CEF inconsistency records found by the lc-detect, scan-rp, scan-rib, and scan-lc detection mechanisms.
	You can configure the CEF consistency detection mechanisms using the ip cef table consistency-check command.

Examples The following sample output is from the **show ip cef inconsistency** command:

```
Router# show ip cef inconsistency

Table consistency checkers (settle time 65s)
lc-detect:running
  0/0/0 queries sent/ignored/received
scan-lc:running [100 prefixes checked every 60s]
  0/0/0 queries sent/ignored/received
scan-rp:running [100 prefixes checked every 60s]
  0/0/0 queries sent/ignored/received
scan-rib:running [1000 prefixes checked every 60s]
  0/0/0 queries sent/ignored/received
Inconsistencies:0 confirmed, 0/16 recorded
```

Table 17 describes the significant fields shown in the display.

Table 17 *show ip cef inconsistency Field Descriptions*

Field	Description
settle time	Time after a recorded inconsistency is confirmed.
lc-detect running	Consistency checker lc-detect is running.
0/0/0 queries	Number of queries sent, ignored, and received.
Inconsistencies:0 confirmed, 0/16 recorded	Number of inconsistencies confirmed, and recorded. Sixteen is the maximum number of inconsistency records to be recorded.

Related Commands

Command	Description
ip cef table consistency-check	Enables CEF table consistency checker types and parameters.

show ip cef traffic prefix-length

To display Cisco Express Forwarding (CEF) traffic statistics, use the **show ip cef traffic prefix-length** command in user EXEC or privileged EXEC mode.

```
show ip cef [vrf vrf-name] traffic prefix-length
```

Syntax Description	Parameter	Description
	vrf	(Optional) A Virtual Private Network (VPN) routing and forwarding (VRF) instance.
	<i>vrf-name</i>	(Optional) Name assigned to the VRF.
	prefix-length	Displays traffic statistics by prefix size.

Command Modes	Mode
	User EXEC
	Privileged EXEC

Command History	Release	Modification
	11.1 CC	This command was introduced.
	12.0(5)T	The vrf keyword was added.

Usage Guidelines This command is used to display CEF switched traffic statistics by destination prefix length. The **ip cef accounting prefix-length** command must be enabled for the counters to increment.

Examples The following sample output is from the **show ip cef traffic prefix-length** command:

```
Router# show ip cef traffic prefix-length
```

```
IP prefix length switching statistics:
```

```
-----
Prefix      Number of      Number of
Length      Packets        Bytes
-----
      0              0              0
      1              0              0
      2              0              0
      3              0              0
      4              0              0
      5              0              0
      .
      .
      .
     28              0              0
     29              0              0
     30              0              0
     31              0              0
     32              0              0
```

Table 18 describes the significant fields shown in the display.

Table 18 *show ip cef traffic prefix-length Field Descriptions*

Field	Description
Prefix Length	Destination IP prefix length for CEF switched traffic.
Number of packets	Number of packets forwarded for the specified IP prefix length.
Number of bytes	Number of bytes transmitted for the specified IP prefix length.

Related Commands

Command	Description
ip cef accounting	Enables network accounting of CEF.

show ip cef vrf

To display the Cisco Express Forwarding (CEF) forwarding table associated with a Virtual Private Network (VPN) routing/forwarding instance (VRF), use the **show ip cef vrf** command in privileged EXEC mode.

```
show ip cef vrf vrf-name [ip-prefix [mask [longer-prefixes]] [detail] [output-modifiers]] [interface
interface-number] [adjacency [interface interface-number] [detail] [discard] [drop] [glean]
[null] [punt] [output-modifiers]] [detail [output-modifiers]] [non-recursive [detail]
[output-modifiers]] [summary [output-modifiers]] [traffic [prefix-length] [output-modifiers]]
[unresolved [detail] [output-modifiers]]
```

Syntax Description		
vrf-name	Name assigned to the VRF.	
<i>ip-prefix</i>	(Optional) IP prefix of entries to show, in dotted decimal format (A.B.C.D).	
<i>mask</i>	(Optional) Mask of the IP prefix, in dotted decimal format.	
longer-prefixes	(Optional) Displays table entries for all of the more specific routes.	
detail	(Optional) Displays detailed information for each CEF table entry.	
<i>output-modifiers</i>	(Optional) For a list of associated keywords and arguments, use context-sensitive help.	
<i>interface</i>	(Optional) Type of network interface to use: ATM, Ethernet, Loopback, POS (packet over SONET) or Null.	
<i>interface-number</i>	Number identifying the network interface to use.	
adjacency	(Optional) Displays all prefixes resolving through adjacency.	
discard	(Optional) Discards adjacency.	
drop	(Optional) Drops adjacency.	
glean	(Optional) Gleans adjacency.	
null	(Optional) Nulls adjacency.	
punt	(Optional) Punts adjacency.	
non-recursive	(Optional) Displays only nonrecursive routes.	
summary	(Optional) Displays a CEF table summary.	
traffic	(Optional) Displays traffic statistics.	
prefix-length	(Optional) Displays traffic statistics by prefix size.	
unresolved	(Optional) Displays only unresolved routes.	

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0(5)T	This command was introduced.
	12.0(21)ST	This command was integrated into Cisco IOS 12.0(21)ST.
	12.0(23)S	This command was integrated into Cisco IOS 12.0(23)S.
	12.2(13)T	This command was integrated into Cisco IOS 12.2(13)T.

Usage Guidelines

Used with only the *vrf-name* argument, the **show ip cef vrf** command shows a shortened display of the CEF table.

Used with the **detail** keyword, the **show ip cef vrf** command shows detailed information for all CEF table entries.

Examples

This example shows the forwarding table associated with the VRF called vrf1:

```
Router# show ip cef vrf vrf1
```

```
Prefix          Next Hop          Interface
0.0.0.0/32      receive
11.0.0.0/8      50.0.0.1          Ethernet1/3
12.0.0.0/8      52.0.0.2          POS6/0
50.0.0.0/8      attached          Ethernet1/3
50.0.0.0/32     receive
50.0.0.1/32     50.0.0.1          Ethernet1/3
50.0.0.2/32     receive
50.255.255.255/32 receive
51.0.0.0/8      52.0.0.2          POS6/0
224.0.0.0/24    receive
255.255.255.255/32 receive
```

[Table 19](#) describes the fields shown in the example.

Table 19 *show ip cef vrf Field Descriptions*

Field	Description
Prefix	Specifies the network prefix.
Next Hop	Specifies the BGP next hop address.
Interface	Specifies the VRF interface.

Related Commands

Command	Description
show ip route vrf	Displays the IP routing table associated with a VRF.
show ip vrf	Displays VRF interfaces.

show ip mds forwarding

To display the Multicast Forwarding Information Base (MFIB) table and forwarding information for multicast distributed switching (MDS) on a line card, use the **show ip mds forwarding** command in user EXEC or privileged EXEC mode.

```
show ip mds forwarding [group-address] [source-address]
```

Syntax Description	
<i>group-address</i>	(Optional) Address of the IP multicast group for which to display the MFIB table.
<i>source-address</i>	(Optional) Address of the source of IP multicast packets for which to display the MFIB table.

Command Modes	
	User EXEC Privileged EXEC

Command History	Release	Modification
	11.2(11)GS	This command was introduced.

Usage Guidelines Use this command on the line card. This command displays the MFIB table, forwarding information, and related flags and counts.



Note

To reach the console for a line card, enter **attach slot#** (slot number where the line card resides).

On a GSR only, line card commands can be executed from the RP using the following syntax: **execute [slot slot-number | all] command**.

The *command* argument is any of the line card **show** commands, such as **show ip mds summary** and **show ip mds forward**.

Examples

The following is sample output from the **show ip mds forwarding** command:

```
Router# show ip mds forwarding

IP multicast MDFS forwarding information and statistics:
Flags: N - Not MDFS switchable, F - Not all MDFS switchable, O - OIF Null
      R - In-ratelimit, A - In-access, M - MTU mismatch, P - Register set

Interface state: Interface, Next-Hop, Mac header

(*, 224.2.170.73),
  Incoming interface: Null
  Pkts: 0, last used: never, Kbps: 0, fast-flags: N
  Outgoing interface list: Null

(128.97.62.86, 224.2.170.73) [31]
  Incoming interface: Fddi3/0/0
```

```
Pkts: 3034, last used: 00:00:00, Kbps: 0, fast-flags: M
Outgoing interface list:
```

Table 20 describes the significant fields shown in the display.

Table 20 *show ip mds forwarding Field Descriptions*

Field	Description
(128.97.62.86, 224.2.170.73) [31])	Source and group addresses. The number in brackets is the hash bucket for the route.
Incoming interface:	Expected interface for a multicast packet from the source. If the packet is not received on this interface, it is discarded.
Pkts	Total number of packets switched by that entry.
last used:	Time when this MFIB entry was used to switch a packet.
Kbps:	Kilobits per second of the switched traffic.
Outgoing interface list:	Interfaces through which packets will be forwarded.

show ip mds interface

To display Multicast Distributed Switching (MDS) information for all the interfaces on the line card, use the **show ip mds interface** command in user EXEC or privileged EXEC mode.

```
show ip mds interface [vrf vrf-name]
```

Syntax Description

vrf	(Optional) Supports the Multicast Virtual Private Network (VPN) routing/forwarding instance (VRF).
<i>vrf-name</i>	(Optional) Name assigned to the VRF.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.0	This command was introduced.
11.2(11)GS	This command was integrated into Cisco IOS Release 11.2(11)GS.
12.0(23)S	The vrf keyword and <i>vrf-name</i> argument were added.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

Examples

The following is sample output from the **show ip mds interface** command.

```
Router# show ip mds interface
```

```
Interface          SW-Index  HW-Index  HW IDB      FS Vector  VRF
Ethernet1/0/0      2          1          0x60C2DB40  0x602FB7A4 default
Ethernet1/0/1      3          2          0x60C32280  0x603D52B8 default
Ethernet1/0/2      4          3          0x60C35E40  0x602FB7A4 default
Ethernet1/0/3      5          4          0x60C39E60  0x603D52B8 default
Ethernet1/0/4      6          5          0x60C3D780  0x602FB7A4 default
Ethernet1/0/5      7          6          0x60C41140  0x602FB7A4 default
Ethernet1/0/6      8          7          0x60C453A0  0x602FB7A4 default
Ethernet1/0/7      9          8          0x60C48DC0  0x602FB7A4 default
POS2/0/0           10         9          0x0          default
POS3/0/0           11         10         0x0          default
Virtual-Access1    13         11         0x0          default
Loopback0          14         12         0x0          default
Tunnel0            15         23         0x61C2E480  0x603D52B8 vrf1
Tunnel1            16         24         0x61C267E0  0x603D52B8 vrf2
Ethernet1/0/3.1    17         4          0x60C39E60  0x603D52B8 vrf1
Ethernet1/0/3.2    18         4          0x60C39E60  0x603D52B8 vrf2
```

Table 21 describes the significant fields shown in the display.

Table 21 *show ip mds interface Field Descriptions*

Field	Description
Interface	The specified interface.
SW-Index	Software index.
HW-Index	Hardware index.
HW IDB	Hardware interface description block.
VRF	VPN routing/forwarding instance.

show ip mds stats

To display switching statistics or line card statistics for multicast distributed switching (MDS), use the **show ip mds stats** command in user EXEC or privileged EXEC mode.

show ip mds stats [**switching** | **linecard**]

Syntax Description	switching	(Optional) Displays switching statistics.
	linecard	(Optional) Displays line card statistics.

Command Modes	User EXEC Privileged EXEC
---------------	------------------------------

Command History	Release	Modification
	11.2(11)GS	This command was introduced.

Usage Guidelines	Use this command on the Route Processor (RP).
------------------	---

Examples The following is sample output from the **show ip mds stats** command used with the **switching** keyword:

```
Router# show ip mds stats switching
```

Slot	Total	Switched	Drops	RPF	Punts	Failures (switch/clone)
1	0	0	0	0	4	0/0
3	20260925	18014717	253	93	2247454	1/0

[Table 22](#) describes the significant fields in the display.

Table 22 *show ip mds stats switching Field Descriptions*

Field	Description
Slot	Slot number for the line card.
Total	Total number of packets received.
Switched	Total number of packets switched.
Drops	Total number of packets dropped.
RPF	Total number of packets that failed RPF lookup.
Punts	Total number of packets sent to the RP because the line card could not switch them.
Failures (switch/clone)	Times that the RP tried to switch but failed because of lack of resources or clone for the RSP only; failed to get a packet clone.

The following is sample output from the **show ip mds stats** command with the **linecard** keyword:

```
Router# show ip mds stats linecard
```

Slot	Status	IPC(seq/max)	Q(high/route)	Reloads
1	active	10560/10596	0/0	9
3	active	11055/11091	0/0	9

show ip mds summary

To display a summary of the MFIB table for multicast distributed switching (MDS), use the **show ip mds summary** command in user EXEC or privileged EXEC mode.

show ip mds summary

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	11.2(11)GS	This command was introduced.

Usage Guidelines Use this command on a line card. On a GSR only, line card commands can be executed from the RP using the following syntax:

execute [slot *slot-number* | **all**] *command*

The *command* argument is any of the line card **show** commands, such as **show ip mds summary** and **show ip mds forward**.

Examples The following is sample output from the **show ip mds summary** command:

```
Router# show ip mds summary

IP multicast MDFS forwarding information and statistics:
Flags: N - Not MDFS switchable, F - Not all MDFS switchable, O - OIF Null
       R - In-ratelimit, A - In-access, M - MTU mismatch, P - Register set

Interface state: Interface, Next-Hop, Mac header

(*, 224.2.170.73),
  Incoming interface: Null
  Pkts: 0, last used: never, Kbps: 0, fast-flags: N
(128.97.62.86, 224.2.170.73) [31]
  Incoming interface: Fddi3/0/0
  Pkts: 3045, last used: 00:00:03, Kbps: 0, fast-flags: M
(128.223.3.7, 224.2.170.73) [334]
  Incoming interface: Fddi3/0/0
  Pkts: 0, last used: never, Kbps: 0, fast-flags: M
```

Table 23 describes the significant fields in the display.

Table 23 *show ip mds summary Field Descriptions*

Field	Description
(128.97.62.86, 224.2.170.73) [31]	Source and group addresses. The number in brackets is the hash bucket for the route.
Incoming interface	Expected interface for a multicast packet from the source. If the packet is not received on this interface, it is discarded.
Pkts	Total number of packets switched by that entry.
last used	Time when this MFIB entry was used to switch a packet.
Kbps	Kilobits per second of the switched traffic.

show pxf accounting

To show Parallel eXpress Forwarding (PXF) switching statistics for individual interfaces, use the **show pxf accounting** command in user EXEC or privileged EXEC mode.

```
show pxf accounting interface [slot/port]
```

Syntax Description	interface	Specifies the type of interface to display.
	slot	(Optional) Backplane slot number. On the Cisco 7200 VXR series routers, the value can be from 0 to 6.
	port	(Optional) Port number of the interface. On the Cisco 7200 VXR series routers, the value can be from 0 to 5.

Command Modes	User EXEC Privileged EXEC
---------------	------------------------------

Command History	Release	Modification
	12.1(1)E	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Usage Guidelines You can display information about the following interface types using the **show pxf accounting** command, as shown in [Table 24](#):

Table 24 show pxf accounting Interface Types

Keyword	Interface Type
atm	ATM interface.
ethernet	Ethernet interface.
fastethernet	FastEthernet interface.
hssi	High Speed Serial interface.
null	Null interface.
pos	Packet-over-SONET interface.
serial	Synchronous serial interface.
summary	PXF summary statistics.

Examples The following is sample output from the **show pxf accounting ?** command:

```
Router# show pxf accounting ?
      ATM          ATM interface
      Ethernet     IEEE 802.3
      FastEthernet FastEthernet IEEE 802.3
```

```

Hssi          High Speed Serial Interface
Null          Null interface
POS           Packet over Sonet
Serial        Serial
summary      PXF summary statistics

```

The following is sample output from the **show pxf accounting ethernet** command using an Ethernet interface in slot 4 on a Cisco 7200 VXR series router:

```
Router# show pxf accounting ethernet 4/0
```

Interface	Pkts In	Chars In	Pkts Out	Chars Out	Punted	Dropped
Ethernet4/0	0	0	122	11490	4	0

The following is sample output from the **show pxf accounting null** command using a null interface in slot 0 on a Cisco 7200 VXR series router:

```
Router# show pxf accounting null 0/0
```

Interface	Pkts In	Chars In	Pkts Out	Chars Out	Punted	Dropped
nu0/0	0	0	0	0	4932	0

The following is sample output from the **show pxf accounting pos** command using a Packet-over-SONET interface in slot 4 on a Cisco 7200 VXR series router:

```
Router# show pxf accounting pos
```

Interface	Pkts In	Chars In	Pkts Out	Chars Out	Punted	Dropped
POS4/0	19	1064	0	0	44	0

The following is sample output from the **show pxf accounting serial** command using a serial interface in slot 5 on a Cisco 7200 VXR series router:

```
Router# show pxf accounting serial 5/0
```

Interface	Pkts In	Chars In	Pkts Out	Chars Out	Punted	Dropped
Serial5/0	0	0	0	0	0	0

The following is sample output from the **show pxf accounting summary** command:

```
Router# show pxf accounting summary
```

Pkts	Dropped	RP Processed	Ignored
Total	0	48360	0

PXF Statistic:

Packets RP -> PXF:

```

switch ip:          0
switch raw:        30048360
qos fastsend:      0
qos enqueue:       1938

```

```
Total:              30050298
```

Packets PXF -> RP:

```

qos pkts:           1938
fast pkts:          30000000
drops:total         0
punts:total         48360
" not IP           :    40572
" CEF no adjacency :    7788

```

```
Total:              30050298
```

Packets ignored:		ring space:	
shadow ring full:	0	shadow ring:	16384
in ring full:	0	inring:	968

```

PXF inactive:                0
tx credits:                   16230330 | delayed credits:           0
holdq enqueues:               0       | requeue drops:             0
interrupts:                   40538   | interrupt misses:          1947
interrupt packets:            53326
pending read bytes:           0

```

Interface	Pkts In	Chars In	Pkts Out	Chars Out	Punted	Dropped
Fa0/0	0	0	30000000	1740000000	970	0
Et1/0	0	0	0	0	21309	0
Et1/1	0	0	0	0	0	0
Et1/2	0	0	0	0	0	0
Et1/3	0	0	0	0	0	0
Se2/0	0	0	0	0	963	0
Se2/1	0	0	0	0	0	0
Se2/2	0	0	0	0	0	0
Se2/3	0	0	0	0	0	0
Fa3/0	0	0	0	0	963	0
PO4/0	30000000	1440000000	0	0	963	0
AT5/0	0	0	0	0	23192	0
Vi1	0	0	0	0	0	0
Vt1	0	0	0	0	0	0
Vi2	0	0	0	0	0	0

Related Commands

Command	Description
show pxf crash	Displays PXF crash information.
show pxf feature	Displays the PXF routing feature tables for enabled PXF features.
show pxf interface	Displays a summary of the interfaces in the router and the PXF features or capabilities enabled on these interfaces.

show pxf crash

To show Parallel eXpress Forwarding (PXF) crash information, use the **show pxf crash** command in user EXEC or privileged EXEC mode.

show pxf crash

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	12.1(1)E	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Examples The following is sample output from the **show pxf crash** command:

Router# **show pxf crash**

```

EX_Type = 0x80000000
EX_ID(b0~3,16~17) = 0x00400
CPU_EX_ID(b0~15) = 0x0004
IHB_EX_Type(b0~5) = 0x00
XRAM0(b0~13) = 0x00000
XRAM1(b0~13) = 0x00000
XRAM2(b0~13) = 0x00000
XRAM3(b0~13) = 0x00000
Pipeline:7FDEFD pdone[3210]:1F 17 17 1D

ICM0(b4~13) = 0x00000 ICM1(b4~13) = 0x00000
ICM2(b4~13) = 0x00010 ICM3(b4~13) = 0x00000
LOCK0(b0~4) = 0x00000 LOCK1(b0~4) = 0x00000
LOCK2(b0~4) = 0x00000 LOCK3(b0~4) = 0x00000
CPU0/2: SW EX Type=0x00000000 LBUS EX Type=0x00000081 HW EX
Type=0x00000400

CPU:row=0x0 column=0x2 cpu=0x2
PC:0000098E LR:0000087F CR:002C4C00
r0:00000000 r1:8001CEA0 r2:80784390 r3:00000000
r4:00005400 r5:80D3BA04 r6:80A7CA00 r7:00000004
r8:00000000 r9:00000008 r10:80092324 r11:800A6200
r12:00000033 r13:00000008 r14:00000000 r15:00000000
misr1a:00000000 misr1bhi:00000000 misr1blo:00000000 misr2hi:00000000
misr2lo:00000000 reserve:00000000 reserve:00000000 reserve:00000000
sisr1a:01000040 sisr1b:00000000 irhi:4402200F irlo:00000000
cAll:C20DE822 DCD1:00020400 DCD2:00000002 CNTL:00000000
TBuf intr 0:1111111F
TBuf intr 1:020FFFF0
TBuf intr 2:00003C80
TBuf intr 3:80000000
TBuf intr 4:00000400

```

```
Xram return:00000000
Icram return hi:80024E00
Icram return lo:800A4E00
TBuf addr 0:005E6800 TBuf sblock1 0:8078A374 TBuf sblock0 0:804FD600
TBuf addr 1:005E6800 TBuf sblock1 1:8078A374 TBuf sblock0 1:804FD600
TBuf addr 2:005E6800 TBuf sblock1 2:8078A374 TBuf sblock0 2:804FD600
TBuf addr 3:005E6800 TBuf sblock1 3:8078A374 TBuf sblock0 3:804FD600
TBuf addr 4:005E6800 TBuf sblock1 4:8078A374 TBuf sblock0 4:804FD600
TBuf addr 5:005E6800 TBuf sblock1 5:8078A374 TBuf sblock0 5:804FD600
TBuf addr 6:005E6800 TBuf sblock1 6:8078A374 TBuf sblock0 6:804FD600
TBuf addr 7:005E6800 TBuf sblock1 7:8078A374 TBuf sblock0 7:804FD600
```

show pxf feature cef vrf

To display the routing feature tables for Virtual Private Network (VPN) routing/forwarding instances (VRFs) on the Parallel eXpress Forwarding (PXF) path, use the **show pxf feature cef vrf** command in privileged EXEC mode.

```
show pxf feature cef vrf vpn-name
```

Syntax Description

<i>vpn-name</i>	Name of the VPN to display.
-----------------	-----------------------------

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(15)B	This command was introduced.
12.3(4)T	This command was integrated into Cisco IOS Release 12.3(4)T.

Usage Guidelines

Use this command to display VRF PXF routing feature tables for a specified VPN for Cisco Express Forwarding (CEF). This command also displays information about prefix and MTRIE resource usage.

Examples

The following is sample output for the **show pxf feature cef vrf** command when it is used to display information about VRF vpn1:

```
Router# show pxf feature cef vrf vpn1
```

```
Shadow 8-8-4-4-8 PXF Mtrie:
 51 leaves, 2448 leaf bytes, 92 nodes, 56352 node bytes
 10 invalidations
 61 prefix updates
refcounts: 3666 leaf, 3733 node
```

Prefix/Length	Refcount	Parent	Address	Shadow
0.0.0.0/32	3		0xC0047218	0x62CAF2E8
5.0.0.0/16	558		0xC0047278	0x62CAF108
5.0.0.0/32	3	5.0.0.0/16	0xC0047268	0x62CAEE08
5.0.0.1/32	3	5.0.0.0/16	0xC0047260	0x62CAEA18
5.0.0.2/32	3	5.0.0.0/16	0xC0047388	0x62CAEA48
5.0.255.255/32	3	5.0.0.0/16	0xC0047270	0x62CAF0D8
30.1.0.0/16	288		0xC0047360	0x62CAEB38
30.1.1.1/32	3	30.1.0.0/16	0xC0047350	0x62CAEB98
70.0.0.0/32	3		0xC00472C0	0x62CAEEF8
70.1.1.1/32	3		0xC0047358	0x62CAEB68
70.1.1.2/32	3		0xC0047368	0x62CAEB08
70.1.1.3/32	3		0xC0047370	0x62CAEAD8
70.1.1.4/32	3		0xC0047378	0x62CAEAA8
70.1.1.5/32	3		0xC0047380	0x62CAEA78
224.0.0.0/24	3		0xC0047228	0x62CAF288
255.255.255.255/32	3		0xC0047220	0x62CAF2B8

```
=====
5 routes with less specific overlapping parent route
```

Table 25 describes the significant fields shown in the display.

Table 25 *show pxf feature cef vrf Field Descriptions*

Field	Description
Shadow 8-8-4-4-8 PXF Mtrie:	MTRIE lookup table index structures.
51 leaves	All created leaves for all MTRIEs.
2448 leaf bytes	Leaf byte counter. When a new leaf is created, the leaf byte counter is incremented by the size of the leaf structure.
92 nodes	All created nodes for all MTRIEs.
56352 node bytes	Node byte counter. When a new node is created, the node byte counter is incremented.
10 invalidations	Invalidation counter. When a route (represented by a leaf) is deleted from an MTRIE, the invalidations counter is incremented. This counter includes all MTRIEs.
61 prefix updates	IP prefix counter. When an IP prefix (represented by a leaf) is added to the MTRIE, the IP prefix counter is incremented. This counter includes all MTRIEs.
refcounts:	Counters associated with references between leaves.
3666 leaf	MTRIEs have a leaf lock and a leaf free function. The leaf lock function increments the leaf refcount. The leaf free function decrements the leaf refcount. The leaf lock and leaf free functions prevent a leaf from being freed (deleted) while the leaf is still being referenced. This counter includes all MTRIEs.
3733 node	Node counter. When a child node is added to another node, the node to which the child node is added becomes a parent node. The node counter is decremented when a child node is deleted. This counter includes all MTRIEs.
Prefix/Length	The IP address and subnet mask of a leaf.
Refcount	The number of leaves that reference a specified leaf. The refcount counter is incremented when the leaf lock function is called and decremented when the leaf free function is called.
Parent	When you add a less specific route to a more specific route, the more specific route has a back pointer that points to the less specific route.
Address	The address of the memory for the specified leaf.
Shadow	The shadow address in Route Processor memory for the specified leaf.

Related Commands

Command	Description
show pxf feature cef	Displays PXF routing feature tables for CEF.
show pxf feature nat	Displays PXF routing feature tables for NAT.

show pxf feature cef

To display Parallel eXpress Forwarding (PXF) routing feature tables for Cisco Express Forwarding (CEF), use the **show pxf feature cef** command in user EXEC or privileged EXEC mode.

show pxf feature cef *entry*

Syntax Description

<i>entry</i>	Display the PXF entry.
--------------	------------------------

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.1(1)E	This command was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Examples

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

```
Router# show pxf feature cef entry
```

```
Shadow 16-4-4-8 PXF Mtrie:
 41 leaves, 1968 leaf bytes, 15 nodes, 267000 node bytes
 5 invalidations
 46 prefix updates
refcounts: 66746 leaf, 66720 node
```

Prefix/Length	Refcount	Parent
0.0.0.0/0	62282	
0.0.0.0/32	3	0.0.0.0/0
171.69.12.128/27	34	0.0.0.0/0
171.69.12.128/32	3	171.69.12.128/27
171.69.12.129/32	3	171.69.12.128/27
171.69.12.130/32	3	171.69.12.128/27
171.69.12.131/32	3	171.69.12.128/27
171.69.12.147/32	3	171.69.12.128/27

Related Commands

Command	Description
show pxf feature nat	Displays PXF routing feature tables for NAT.

show pxf feature nat

To display Parallel eXpress Forwarding (PXF) routing tables for Network Address Translation (NAT), use the **show pxf feature nat** command in user EXEC or privileged EXEC mode.

show pxf feature nat [**entry** | **stat** | **tcp**]

Syntax Description	entry	Displays NAT information.
	stat	Displays NAT processing information.
	tcp	Displays NAT TCP logging information.

Command Modes	User EXEC Privileged EXEC
---------------	------------------------------

Command History	Release	Modification
	12.1(1)E	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

Examples The following is sample output from the **show pxf feature nat** command:

```
Router# show pxf feature nat
--- 171.69.12.175      192.168.0.129      ---
--- 171.69.12.163      192.168.0.7        ---
--- 171.69.12.161      192.168.0.13       ---
--- 171.69.12.162      192.168.0.3        ---
--- 171.69.12.165      192.168.0.8        ---
--- 171.69.12.168      192.168.0.14       ---
--- 171.69.12.170      192.168.0.12       ---
--- 171.69.12.166      192.168.0.15       ---
--- 171.69.12.164      192.168.0.16       ---
```

Related Commands	Command	Description
	show pxf feature cef	Displays PXF routing feature tables for CEF.

show pxf interface

To show a summary of the interfaces on the router and the Parallel eXpress Forwarding (PXF) features or capabilities enabled on these interfaces, use the **show pxf interface** command in user EXEC or privileged EXEC mode.

show pxf interface

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	12.1(3a)E	This command was introduced.
	12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.

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

```
Router# show pxf interface

  Intf  I/f #  Attributes
Fa0/0   3      Raw, Encap, QoS(Cr 0, Thrsh 2, Max 101)
Et1/0   4      Raw, Encap
Et1/1   5      Raw, Encap, QoS(Cr 0, Thrsh 2, Max 13)
Et1/2   6      Raw, Encap
Et1/3   7      Raw, Encap
Se2/0   8      Raw, Encap, QoS(Cr 0, Thrsh 2, Max 5)
Se2/1   9      Raw, Encap, QoS(Cr 0, Thrsh 2, Max 5)
Se2/2  10     Raw, Encap, QoS(Cr 0, Thrsh 2, Max 5)
Se2/3  11     Raw, Encap, QoS(Cr 0, Thrsh 2, Max 5)
Fa3/0  12     Raw, Encap
PO4/0  13     Raw, Encap
AT5/0  14     Raw, Encap
```

Related Commands	Command	Description
	show pxf feature	Displays the PXF routing feature tables for enabled PXF features.

show route-map ipc

To display counts of the one-way route map interprocess communication (IPC) messages sent from the rendezvous point (RP) to the Versatile Interface Processor (VIP) when NetFlow policy routing is configured, use the **show route-map ipc** command in user EXEC or privileged EXEC mode.

show route-map ipc

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.0(3)T	This command was introduced.

Usage Guidelines This command displays the counts of one-way route map IPC messages from the RP to the VIP when NetFlow policy routing is configured. If you execute this command on the RP, the messages are shown as “Sent.” If you execute this command on the VIP console, the IPC messages are shown as “Received.”

Examples The following is sample output of the **show route-map ipc** command when it is executed on the RP:

```
Router# show route-map ipc

Route-map RP IPC Config Updates Sent
Name: 4
Match access-list: 2
Match length: 0
Set precedence: 1
Set tos: 0
Set nexthop: 4
Set interface: 0
Set default nexthop: 0
Set default interface: 1
Clean all: 2
```

The following is sample output of the **show route-map ipc** command when it is executed on the VIP:

```
Router# show route-map ipc

Route-map LC IPC Config Updates Received
Name: 4
Match access-list: 2
Match length: 0
Set precedence: 1
Set tos: 0
Set nexthop: 4
Set interface: 0
Set default nexthop: 0
Set default interface: 1
Clean all: 2
```

Table 26 describes the significant fields shown in the display.

Table 26 *show route-map ipc Field Descriptions*

Field	Description
Route-map RP IPC Config Updates Sent	Indicates that IPC messages are being sent from the RP to the VIP.
Name:	Number of IPC messages sent about the name of the route map.
Match access-list:	Number of IPC messages sent about the access list.
Match length	Number of IPC messages sent about the length to match.
Set precedence:	Number of IPC messages sent about the precedence.
Set tos:	Number of IPC messages sent about the type of service (ToS).
Set nexthop:	Number of IPC messages sent about the next hop.
Set interface:	Number of IPC messages sent about the interface.
Set default nexthop:	Number of IPC messages sent about the default next hop.
Set default interface:	Number of IPC messages sent about the default interface.
Clean all:	Number of IPC messages sent about clearing the policy routing configuration from the VIP. When dCEF is disabled and reenabled, the configuration related to policy routing must be removed (cleaned) from the VIP before the new information is downloaded from the RP to the VIP.

Related Commands

Command	Description
set ip next-hop verify-availability	Configures policy routing to verify if the next hops of a route map are CDP neighbors before policy routing to that next hop.