



# Customizing the Display of Recorded Cisco Express Forwarding Events

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This module contains information about and instructions for customizing the display of recorded Cisco Express Forwarding events for Cisco IOS releases prior to 12.2(25)S, 12.2(33)SB, 12.2(33)SRA, 12.2.(33)SXH, and 12.4(20)T.

For information about and instructions for customizing the display of recorded Cisco Express Forwarding events for Cisco IOS Releases 12.2(25)S, 12.2(33)SB, 12.2(33)SRA, 12.2.(33)SXH, 12.4(20)T, and later releases, see [Customizing the Display of Cisco IOS Event Trace Messages](#).

You can customize the Cisco Express Forwarding event log display by specifying the size of the Cisco Express Forwarding event log or by choosing to display events by prefix and mask or by Cisco Express Forwarding Virtual Private Network (VPN) routing/forwarding instance (VRF).

Cisco Express Forwarding is an advanced Layer 3 IP switching technology. It optimizes network performance and scalability for all kinds of networks: those that carry small amounts of traffic and those that carry large amounts of traffic in complex patterns, such as the Internet and networks characterized by intensive web-based applications or interactive sessions.

## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the [“Feature Information for Configuring the Display of Recorded Cisco Express Forwarding Events” section on page 9](#).

Use Cisco Feature Navigator to find information about platform support and Cisco IOS and Catalyst OS software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



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## Prerequisites for Configuring the Display of Recorded Cisco Express Forwarding Events

Cisco Express Forwarding must be running on the networking device before you can customize the display of recorded Cisco Express Forwarding events.

## Restrictions for Configuring the Display of Recorded Cisco Express Forwarding Events

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

## Information About Configuring the Display of Recorded Cisco Express Forwarding Events

Before customizing Cisco Express Forwarding event logging, you should understand the following concepts:

- [Cisco Platform Support for Central Cisco Express Forwarding and Distributed Cisco Express Forwarding, page 3](#)
- [Cisco Express Forwarding Event Log Overview, page 3](#)

For links to information about other Cisco Express Forwarding and distributed Cisco Express Forwarding features that you can configure, go to the [“Additional References” section on page 7](#).

## Cisco Platform Support for Central Cisco Express Forwarding and Distributed Cisco Express Forwarding

Cisco Express Forwarding is enabled by default on most Cisco platforms running Cisco IOS software Release 12.0 or later. When Cisco Express Forwarding is enabled on a router, the Route Processor (RP) performs the express forwarding.

To find out if Cisco Express Forwarding is enabled on your platform, enter the **show ip cef** command. If Cisco Express Forwarding is enabled, you receive output that looks like this:

```
Router# show ip cef

Prefix          Next Hop          Interface
[...]
10.2.61.8/24    192.168.100.1    FastEthernet1/0/0
                192.168.101.1    FastEthernet6/1
[...]
```

If Cisco Express Forwarding is not enabled on your platform, the output for the **show ip cef** command looks like this:

```
Router# show ip cef

%CEF not running
```

Distributed Cisco Express Forwarding is enabled by default on the Catalyst 6500 series switch, the Cisco 7500 series router, and the Cisco 12000 Series Internet Router. When distributed Cisco Express Forwarding is enabled on your platform, the line cards perform the express forwarding.

If Cisco Express Forwarding is not enabled on your platform, use the **ip cef** command to enable (central) Cisco Express Forwarding or the **ip cef distributed** command to enable distributed Cisco Express Forwarding.

## Cisco Express Forwarding Event Log Overview

The Cisco Express Forwarding event log collects Cisco Express Forwarding events as they occur, even when debugging is not enabled. This allows the tracing of an event immediately after it occurs. Cisco technical personnel can use the event log to help resolve problems with the Cisco Express Forwarding feature.

When the Cisco Express Forwarding event log has reached its capacity, the oldest event is written over by the newest event. You can use the following commands to change the capacity of the Cisco Express Forwarding event log:

- The **ip cef table event-log** command allows you to increase or decrease the number of entries that the event log can hold.
- The **clear ip cef event-log** command allows you to clear all event log entries.

You can use the following commands to display Cisco Express Forwarding events:

- The **show ip cef events** command displays all recorded Cisco Express Forwarding forwarding information base (FIB) and adjacency events.
- The **debug ip cef** command and the **events** keyword record general Cisco Express Forwarding events as they occur.
- The **debug ip cef table** command enables the real-time collection of events that affect entries in the Cisco Express Forwarding tables.

# How to Customize the Display of Recorded Cisco Express Forwarding Events

Perform the following tasks to customize Cisco Express Forwarding event logging and display logging events:

- [Customizing Cisco Express Forwarding Event Logging, page 4](#) (optional)
- [Displaying Cisco Express Forwarding Event-Log Information, page 5](#) (optional)

## Customizing Cisco Express Forwarding Event Logging

This section contains information about and instructions for customizing Cisco Express Forwarding event logging.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip cef table event-log [size *event-number*] [match *ip-prefix mask*] [vrf *vrf-name*]**
4. **exit**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 3	<p><b>ip cef table event-log</b> [<b>size</b> <i>event-number</i>] [<b>match</b> <i>ip-prefix mask</i>] [<b>vrf</b> <i>vrf-name</i>]</p> <p><b>Example:</b> Router(config)# ip cef table event-log size 25000</p>	<p>Controls Cisco Express Forwarding table event-log characteristics.</p> <ul style="list-style-type: none"> <li>The <b>size</b> <i>event-number</i> keyword-argument pair specifies the number of event entries. The range is from 1 to 4294967295.</li> <li>The <b>match</b> keyword logs events that match the specified prefix and mask.</li> <li>The <i>ip-prefix</i> argument is the specified IP prefix to match in dotted decimal format (A.B.C.D).</li> <li>The <i>mask</i> argument is the network mask written as A.B.C.D.</li> <li>The <b>vrf</b> <i>vrf-name</i> keyword-argument pair displays the named Virtual Private Network (VPN) routing/forwarding instance (VRF) Cisco Express Forwarding table.</li> </ul>
Step 4	<p><b>exit</b></p> <p><b>Example:</b> Router(config)# exit</p>	<p>Exits to privileged EXEC mode.</p>

## Displaying Cisco Express Forwarding Event-Log Information

Perform the following task to display Cisco Express Forwarding event-log information.

### SUMMARY STEPS

1. **enable**
2. **clear ip cef event-log**
3. **debug ip cef table**
4. **show ip cef events summary**
5. **show ip cef events within** *seconds*
6. **exit**

### DETAILED STEPS

#### Step 1 **enable**

Use this command to enable privileged EXEC mode. For example:

```
Router> enable
```

Enter your password if prompted.

#### Step 2 **clear ip cef event-log**

Use this command to clear the Cisco Express Forwarding event-log buffer. For example:

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

**Step 3 debug ip cef table**

Use this command to enable the collection of events that affect entries in the Cisco Express Forwarding tables. For example:

```
Router# debug ip cef table

01:25:46:CEF-Table:Event up, 10.1.1.1/32 (rdfs:1, flags:1000000)
01:25:46:CEF-IP:Checking dependencies of 0.0.0.0/0
01:25:47:CEF-Table:attempting to resolve 10.1.1.1/32
01:25:47:CEF-IP:resolved 10.1.1.1/32 via 10.9.104.1 to 10.9.104.1 Ethernet2/0/0
01:26:02:CEF-Table:Event up, default, 0.0.0.0/0 (rdfs:1, flags:400001)
01:26:02:CEF-IP:Prefix exists - no-op change
```

**Step 4 show ip cef events summary**

Use this command to display a summary of recorded Cisco Express Forwarding FIB and adjacency events. For example:

```
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.
```

**Step 5 show ip cef events within seconds**

Use this command to display Cisco Express Forwarding events that occurred within (during) a specified number of seconds. For example, 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] 10.1.80.194/32     FIB insert in mtrie   [OK]
+00:00:00.000:[Default-table] 10.1.80.0/32         FIB insert in mtrie   [OK]
+00:00:00.000:[Default-table] 10.1.80.255/32       FIB insert in mtrie   [OK]
+00:00:00.004:[Default-table] 10.1.80.0/24         FIB insert in mtrie   [OK]
+00:00:00.004:[Default-table] 10.1.80.0/24         NBD up                 [OK]
+00:00:00.004:[Default-table] 239.224.0.0/4        FIB insert in mtrie   [OK]
+00:00:00.012:[Default-table] 10.1.80.0/24         NBD up                 [Ignr]
+00:00:00.012:[Default-table] 239.224.0.0/4        FIB remove            [OK]
+00:00:00.016:[Default-table] 239.224.0.0/4        FIB insert in mtrie   [OK]
+00:00:05.012:[Default-table] 239.224.0.0/4        FIB remove            [OK]
+00:00:05.012:[Default-table] 239.224.0.0/4        FIB insert in mtrie   [OK]
+00:00:28.440:[Default-table] 239.224.0.0/4        FIB remove            [OK]
+00:00:28.440:[Default-table] 239.224.0.0/4        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)
```

**Step 6 exit**

Use this command to exit to user EXEC mode. For example:

```
Router# exit
Router>
```

# Configuration Examples for Configuring the Display of Recorded Cisco Express Forwarding Events

This section contains one configuration example for customizing the display of recorded Cisco Express Forwarding events:

- [Customizing Cisco Express Forwarding Event Logging: Example, page 7](#)

## Customizing Cisco Express Forwarding Event Logging: Example

The following example shows how to enable event logging for Cisco Express Forwarding:

```
clear ip cef event-log
!
debug ip cef table
!
configure terminal
!
ip cef table event-log size 25000
exit
!
```

In this example, the Cisco Express Forwarding event log is configured to hold 25000 entries.

## Additional References

The following sections provide references related to the customizing of the display of recorded Cisco Express Forwarding events.

## Related Documents

Related Topic	Document Title
Cisco Express Forwarding commands	<a href="#">Cisco IOS IP Switching Command Reference</a>
List of the features documented in the Cisco Express Forwarding modules	<a href="#">Cisco Express Forwarding Features Roadmap</a>
Overview of the Cisco Express Forwarding feature	<a href="#">Cisco Express Forwarding Overview</a>
Tasks for verifying basic Cisco Express Forwarding and distributed Cisco Express Forwarding operation	<a href="#">Configuring Basic Cisco Express Forwarding for Improved Performance, Scalability, and Resiliency in Dynamic Networks</a>
Tasks for enabling or disabling Cisco Express Forwarding or distributed Cisco Express Forwarding	<a href="#">Enabling or Disabling Cisco Express Forwarding or Distributed Cisco Express Forwarding to Customize Switching and Forwarding for Dynamic Networks</a>
Tasks for configuring load-balancing schemes for Cisco Express Forwarding	<a href="#">Configuring a Load-Balancing Scheme for Cisco Express Forwarding Traffic</a>
Tasks for configuring Cisco Express Forwarding consistency checkers	<a href="#">Configuring Cisco Express Forwarding Consistency Checkers for Route Processors and Line Cards</a>
Tasks for configuring epochs for Cisco Express Forwarding tables	<a href="#">Configuring Epochs to Clear and Rebuild Cisco Express Forwarding and Adjacency Tables</a>

Related Topic	Document Title
Tasks for configuring and verifying Cisco Express Forwarding network accounting	<a href="#">Configuring Cisco Express Forwarding Network Accounting</a>
Tasks for customizing the display of recorded Cisco Express Forwarding events trace messages for Cisco IOS Releases 12.2(25)S, 12.2(33)SB, 12.2(33)SRA, 12.2.(33)SXH, 12.4(20)T and later releases	<a href="#">Customizing the Display of Cisco IOS Event Trace Messages</a>
Causes of common Cisco Express Forwarding-related error messages on platforms running distributed Cisco Express Forwarding switching (Cisco 7500 series routers and Cisco 12000 series Internet routers) and how to troubleshoot them	<a href="#">Troubleshooting Cisco Express Forwarding-Related Error Messages</a>

## Standards

Standards	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

## MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

## RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	—

## Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p><a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a></p>

## Feature Information for Configuring the Display of Recorded Cisco Express Forwarding Events

**Table 1** lists the features in this module and provides links to specific configuration information. Only features that were introduced or modified in Cisco IOS Release 12.2(1) or a later release appear in the table.

For information on a feature in this technology that is not documented here, see the *Cisco Express Forwarding Features Roadmap*.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.



### Note

**Table 1** lists only the Cisco IOS software release that introduced support for a given feature in a given Cisco IOS software release train. Unless noted otherwise, subsequent releases of that Cisco IOS software release train also support that feature.

**Table 1** Feature Information for Configuring the Display of Recorded Cisco Express Forwarding Events

Feature Name	Releases	Feature Configuration Information
This table is intentionally left blank because no features were introduced or modified in Cisco IOS Release 12.2(1) or later. This table will be updated when feature information is added to this module.	—	—

# Glossary

**adjacency**—A relationship formed between selected neighboring routers and end nodes for the purpose of exchanging routing information. Adjacency is based upon the use of a common media segment by the routers and nodes involved.

**Cisco Express Forwarding**—A Layer 3 switching technology. Cisco Express Forwarding can also refer to central Cisco Express Forwarding mode, one of two modes of Cisco Express Forwarding operation. Cisco Express Forwarding enables a Route Processor to perform express forwarding. Distributed Cisco Express Forwarding is the other mode of Cisco Express Forwarding operation.

**distributed Cisco Express Forwarding**—A mode of Cisco Express Forwarding operation in which line cards (such as Versatile Interface Processor (VIP) line cards) maintain identical copies of the forwarding information base (FIB) and adjacency tables. The line cards perform the express forwarding between port adapters; this relieves the Route Switch Processor of involvement in the switching operation.

**FIB**—forwarding information base. A component of Cisco Express Forwarding that is conceptually similar to a routing table or information base. The router uses the FIB lookup table to make destination-based switching decisions during Cisco Express Forwarding operation. The router maintains a mirror image of the forwarding information in an IP routing table.

**line card**—A general term for an interface processor that can be used in various Cisco products. For example, a Versatile Interface Processor (VIP) is a line card for the Cisco 7500 series router.

**prefix**—The network address portion of an IP address. A prefix is specified by a network and mask and is generally represented in the format network/mask. The mask indicates which bits are the network bits. For example, 1.0.0.0/16 means that the first 16 bits of the IP address are masked, making them the network bits. The remaining bits are the host bits. In this example, the network number is 10.0.

**VPN**—Virtual Private Network. The result of a router configuration that enables IP traffic to use tunneling to travel securely over a public TCP/IP network.

**VRF**—A Virtual Private Network (VPN) routing/forwarding instance. A VRF consists of an IP routing table, a derived forwarding table, a set of interfaces that use the forwarding table, and a set of rules and routing protocols that determine what goes into the forwarding table. In general, a VRF includes the routing information that defines a customer VPN site that is attached to a PE router.

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