



# Getting Started with Configuring Cisco IOS Flexible NetFlow

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This document contains information about and instructions for configuring Flexible NetFlow to emulate the data capture, data analysis, and data export features of original NetFlow. The Flexible NetFlow equivalents of some of the other features that have been added to original NetFlow, such as NetFlow Subinterface Support, and Multiple Export Destinations, are covered in this document. The purpose of this document is to help you get started using Flexible NetFlow as quickly as possible.

This document explains how to configure certain Flexible NetFlow features but does not explain them in detail. The documents listed in the [“Related Documents” section on page 23](#) contain more detailed information on Flexible NetFlow features.

NetFlow is a Cisco IOS technology that provides statistics on packets flowing through the router. NetFlow is the standard for acquiring IP operational data from IP networks. NetFlow provides network and security monitoring, network planning, traffic analysis, and IP accounting.

Flexible NetFlow improves on original NetFlow by adding the capability to customize the traffic analysis parameters for your specific requirements. Flexible NetFlow makes it easier to create more complex configurations for traffic analysis and data export through the use of reusable configuration components.

## 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 Flexible NetFlow” section on page 25](#).

Use Cisco Feature Navigator to find information about platform support and Cisco IOS, Catalyst OS, and Cisco IOS XE 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 Getting Started with Configuring Flexible NetFlow

The following prerequisites must be met before you can configure Flexible NetFlow:

- You are familiar with the information in the “[Cisco IOS Flexible NetFlow Overview](#)” module.
- The networking device must be running a Cisco IOS release that supports Cisco IOS Flexible NetFlow. See the “[Cisco IOS Flexible NetFlow Features Roadmap](#)” module for a list of Cisco IOS software releases that support Flexible NetFlow.

### IPv4 Traffic

- The networking device must be configured for IPv4 routing.
- One of the following must be enabled on your router and on any interfaces on which you want to enable Flexible NetFlow: Cisco Express Forwarding (CEF) or distributed CEF (dCEF).

### IPv6 Traffic

- The networking device must be configured for IPv6 routing.
- One of the following must be enabled on your router and on any interfaces on which you want to enable Flexible NetFlow: Cisco Express Forwarding IPv6 (CEF IPv6) or distributed CEF IPv6 (dCEF IPv6).

## Information About Getting Started with Configuring Flexible NetFlow

Before you configure Flexible NetFlow to emulate original NetFlow, you should understand the following concepts:

- [Benefit of Emulating Original NetFlow with Flexible NetFlow, page 3](#)
- [Flexible NetFlow “NetFlow Original” and “NetFlow IPv4 Original Input” Predefined Records, page 3](#)
- [Flexible NetFlow “NetFlow IPv4 Original Output” Predefined Record, page 4](#)
- [Flexible NetFlow “NetFlow IPv6 Original Input” Predefined Record, page 5](#)

- [Flexible NetFlow “NetFlow IPv6 Original Output” Predefined Record, page 6](#)
- [Flexible NetFlow—MPLS Egress NetFlow, page 7](#)

## Benefit of Emulating Original NetFlow with Flexible NetFlow

Emulating original NetFlow with Flexible NetFlow enables you to deploy Flexible NetFlow quickly because you can use a predefined record instead of designing and configuring a custom user-defined record. You need only configure a flow monitor and apply it to an interface for Flexible NetFlow to start working like original NetFlow. You can add an optional exporter if you want to analyze the data that you collect with an application such as NetFlow collector.

If you are familiar with original NetFlow, you already understand the format and content of the data that you collect and export with Flexible NetFlow when you emulate original NetFlow. You will be able to use the same techniques for analyzing the data.

## Flexible NetFlow “NetFlow Original” and “NetFlow IPv4 Original Input” Predefined Records

The Flexible NetFlow “NetFlow original” and “NetFlow IPv4 original input” predefined records can be used interchangeably because they have the same key and non-key fields. The key and non-key fields and the counters for the Flexible NetFlow “NetFlow original” and “NetFlow IPv4 original input” predefined records are shown in [Table 1](#).

**Table 1** Key and Non Key-Fields Used by the Flexible NetFlow “NetFlow Original” and “NetFlow IPv4 Original Input” Predefined Records

Field	Key or Non-Key Field	Definition
IP ToS	Key	Value in the type of service (ToS) field.
IP Protocol	Key	Value in the IP protocol field.
IP Source Address	Key	IP source address.
IP Destination Address	Key	IP source address.
Transport Source Port	Key	Value of the transport layer source port field.
Transport Destination Port	Key	Value of the transport layer destination port field.
Interface Input	Key	Interface on which the traffic is received.
Flow Sampler ID	Key	ID number of the flow sampler (if flow sampling is enabled).
IP Source AS	Non-key	Source autonomous system number.
IP Destination AS	Non-key	Destination autonomous system number.
IP Next Hop Address	Non-key	IP address of the next hop.
IP Source Mask	Non-key	Mask for the IP source address.
IP Destination Mask	Non-key	Mask for the IP destination address.
TCP Flags	Non-key	Value in the TCP flag field.
Interface Output	Non-key	Interface on which the traffic is transmitted.

**Table 1** Key and Non Key-Fields Used by the Flexible NetFlow “NetFlow Original” and “NetFlow IPv4 Original Input” Predefined Records (continued)

Field	Key or Non-Key Field	Definition
Counter Bytes	Non-key	Number of bytes seen in the flow.
Counter Packets	Non-key	Number of packets seen in the flow.
Time Stamp System Uptime First	Non-key	System uptime (time, in milliseconds, since this device was first booted) when the first packet was switched.
Time Stamp System Uptime Last	Non-key	System uptime (time, in milliseconds, since this device was first booted) when the last packet was switched.

The configuration in the [“How to Get Started with Configuring Flexible NetFlow”](#) section on page 8 uses the predefined Flexible NetFlow “NetFlow original” record.

## Flexible NetFlow “NetFlow IPv4 Original Output” Predefined Record

The Flexible NetFlow “NetFlow IPv4 original output” predefined record is used to emulate the original NetFlow Egress NetFlow Accounting feature that was released in Cisco IOS Release 12.3(11)T. The key and non-key fields and the counters for the Flexible NetFlow “NetFlow IPv4 original output” predefined record are shown in [Table 2](#).

**Table 2** Key and Non Key Fields Used by the Flexible NetFlow “NetFlow IPv4 Original Output” Predefined Record

Field	Key or Non-Key Field	Definition
IP ToS	Key	Value in the ToS field.
IP Protocol	Key	Value in the IP protocol field.
IP Source Address	Key	IP source address.
IP Destination Address	Key	IP destination address.
Transport Source Port	Key	Value of the transport layer source port field.
Transport Destination Port	Key	Value of the transport layer destination port field.
Interface Output	Key	Interface on which the traffic is transmitted.
Flow Sampler ID	Key	ID number of the flow sampler (if flow sampling is enabled).
IP Source AS	Non-key	Source autonomous system number.
IP Destination AS	Non-key	Destination autonomous system number.
IP Next Hop Address	Non-key	IP address of the next hop.
IP Source Mask	Non-key	Mask for the IP source address.
IP Destination Mask	Non-key	Mask for the IP destination address.
TCP Flags	Non-key	Value in the TCP flag field.
Interface Input	Non-key	Interface on which the traffic is received.

**Table 2** Key and Non Key Fields Used by the Flexible NetFlow “NetFlow IPv4 Original Output” Predefined Record (continued)

Field	Key or Non-Key Field	Definition
Counter Bytes	Non-key	Number of bytes seen in the flow.
Counter Packets	Non-key	Number of packets seen in the flow.
Time Stamp System Uptime First	Non-key	System uptime (time, in milliseconds, since this device was first booted) when the first packet was switched.
Time Stamp System Uptime Last	Non-key	System uptime (time, in milliseconds, since this device was first booted) when the last packet was switched.

The configuration in the [“Configuring Flexible NetFlow Egress Accounting for IPV4 and IPv6 Traffic: Example”](#) section on page 21 uses the predefined Flexible NetFlow “NetFlow original output” record.

## Flexible NetFlow “NetFlow IPv6 Original Input” Predefined Record

The key and non-key fields and the counters for the Flexible NetFlow “NetFlow IPv6 original input” predefined record are shown in [Table 3](#).

**Table 3** Key and Non Key-Fields Used by the Flexible NetFlow “NetFlow IPv6 Original Input” Predefined Record

Field	Key or Non-Key Field	Definition
Traffic Class	Key	Value in the traffic class field.
Flow Label	Key	Flow label.
Protocol	Key	Value in the protocol field.
Extension Map	Key	Value in the extension map bitmap.
IP Source Address	Key	IP source address.
IP Destination Address	Key	IP destination address.
Transport Source Port	Key	Value of the transport layer source port field.
Transport Destination Port	Key	Value of the transport layer destination port field.
Interface Input	Key	Interface on which the traffic is received.
Flow Direction	Key	The direction of the flow.
Flow Sampler	Key	ID number of the flow sampler (if flow sampling is enabled).
Routing Source AS	Non-key	Source autonomous system number.
Routing Destination AS	Non-key	Destination autonomous system number.
Routing Next-hop Address	Non-key	IP address of the next hop.
IP Source Mask	Non-key	Mask for the IP source address.
IP Destination Mask	Non-key	Mask for the IP destination address.

**Table 3** *Key and Non Key-Fields Used by the Flexible NetFlow “NetFlow IPv6 Original Input” Predefined Record (continued)*

Field	Key or Non-Key Field	Definition
Transport TCP Flags	Non-key	Value in the TCP flag field.
Interface Output	Non-key	Interface over which the traffic is transmitted.
Counter Bytes	Non-key	Number of bytes seen in the flow.
Counter Packets	Non-key	Number of packets seen in the flow.
Time Stamp System Uptime First	Non-key	System uptime (time, in milliseconds, since this device was first booted) when the first packet was switched.
Time Stamp System Uptime Last	Non-key	System uptime (time, in milliseconds, since this device was first booted) when the last packet was switched.

## Flexible NetFlow “NetFlow IPv6 Original Output” Predefined Record

The key and non-key fields and the counters for the Flexible NetFlow “NetFlow IPv6 original output” predefined record are shown in [Table 4](#).

**Table 4** *Key and Non Key-Fields Used by the Flexible NetFlow “NetFlow IPv6 Original Output” Predefined Record*

Field	Key or Non-Key Field	Definition
Traffic Class	Key	Value in the traffic class field.
Flow Label	Key	The flow label.
Protocol	Key	Value in the protocol field.
Extension Map	Key	Value in the extension map bitmap.
IP Source Address	Key	IP source address.
IP Destination Address	Key	IP destination address.
Transport Source Port	Key	Value of the transport layer source port field.
Transport Destination Port	Key	Value of the transport layer destination port field.
Interface Output	Key	Interface over which the traffic is transmitted.
Flow Direction	Key	The direction of the flow.
Flow Sampler	Key	ID number of the flow sampler (if flow sampling is enabled).
Routing Source AS	Non-key	Source autonomous system number.
Routing Destination AS	Non-key	Destination autonomous system number.
Routing Next-hop Address	Non-key	IP address of the next hop.
IP Source Mask	Non-key	Mask for the IP source address.
IP Destination Mask	Non-key	Mask for the IP destination address.

**Table 4** Key and Non Key-Fields Used by the Flexible NetFlow “NetFlow IPv6 Original Output” Predefined Record (continued)

Field	Key or Non-Key Field	Definition
Transport TCP Flags	Non-key	Value in the TCP flag field.
Interface Input	Non-key	Interface on which the traffic is received.
Counter Bytes	Non-key	Number of bytes seen in the flow.
Counter Packets	Non-key	Number of packets seen in the flow.
Time Stamp System Uptime First	Non-key	System uptime (time, in milliseconds, since this device was first booted) when the first packet was switched.
Time Stamp System Uptime Last	Non-key	System uptime (time, in milliseconds, since this device was first booted) when the last packet was switched.

## Flexible NetFlow—MPLS Egress NetFlow

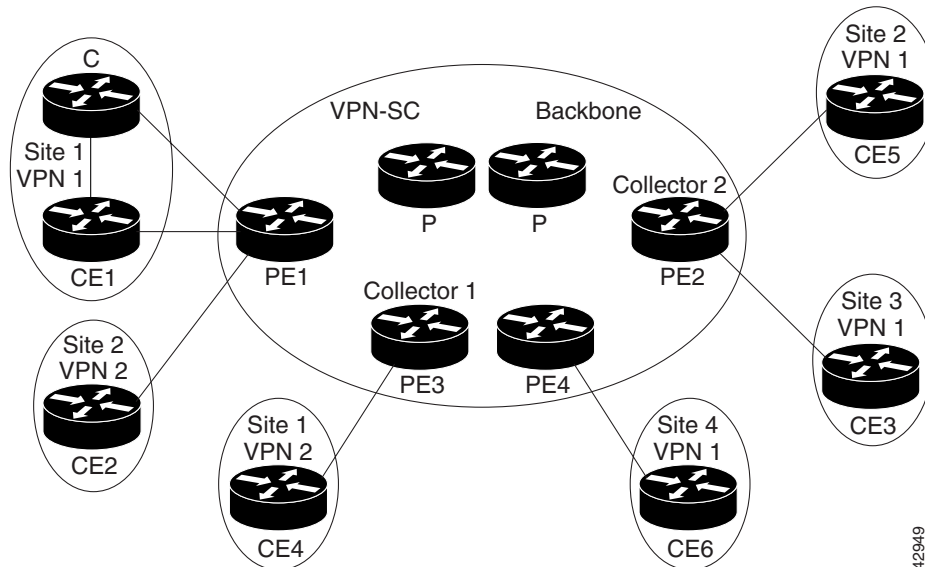
The Flexible NetFlow—MPLS Egress NetFlow feature allows you to capture IP flow information for packets that arrive on a router as MPLS packets and are transmitted as IP packets. This feature allows you to capture the MPLS Virtual Private Network (VPN) IP flows that are traveling through the service provider backbone from one site of a VPN to another site of the same VPN. The Flexible NetFlow—MPLS Egress NetFlow feature is enabled by applying a flow monitor in output (egress) mode on the provider edge (PE) to customer edge (CE) interface of the provider’s network.

Figure 1 shows a sample MPLS VPN network topology that includes four VPN 1 sites and two VPN 2 sites. If the Flexible NetFlow—MPLS Egress NetFlow is enabled on an outgoing PE interface by applying a flow monitor in output mode, IP flow information for packets that arrive at the PE as MPLS packets (from an MPLS VPN) and that are transmitted as IP packets to the PE router is captured. For example,

- To capture the flow of traffic going to site 2 of VPN 1 from any remote VPN 1 sites, you enable a flow monitor in output mode on link PE2-CE5 of provider edge router PE2.
- To capture the flow of traffic going to site 1 of VPN 2 from any remote VPN 2 site, you enable a flow monitor in output mode on link PE3-CE4 of the provider edge router PE3.

The flow data is stored in the Flexible NetFlow cache. You can use the **show flow monitor** *monitor-name* **cache** command view the flow data in the cache.

**Figure 1** Sample MPLS VPN Network Topology with Flexible NetFlow—MPLS Egress NetFlow feature



If you configure a Flexible NetFlow exporter for the flow monitors you use for the Flexible NetFlow—MPLS Egress NetFlow feature, the PE routers will export the captured flows to the configured collector devices in the provider network. Applications such as the Network Data Analyzer or the VPN Solution Center (VPN-SC) can gather information from the captured flows and compute and display site-to-site VPN traffic statistics.

## How to Get Started with Configuring Flexible NetFlow

The tasks in this section explain how to configure and verify the emulation of original (ingress) NetFlow data capture with Flexible NetFlow for traffic that is received by the router and how to configure and verify the emulation of original NetFlow data export with Flexible NetFlow.



### Note

Flexible NetFlow emulation of original NetFlow requires the configuration of a flow monitor and the application of the flow monitor to at least one interface that is receiving the traffic that you want to analyze.



### Note

Only the keywords and arguments required for the Flexible NetFlow commands used in these tasks are explained in these tasks. For information on the other keywords and arguments available for these Flexible NetFlow commands, refer to the [Cisco IOS Flexible NetFlow Command Reference](#).

To configure and enable Flexible NetFlow using a predefined record, perform the following tasks:

- [Configuring a Flow Monitor for IPv4 Traffic Using the Flexible NetFlow “NetFlow IPv4 Original Input” Predefined Record, page 9](#)
- [Configuring a Flow Monitor for IPv6 Traffic Using the Flexible NetFlow “NetFlow IPv6 Original Input” Predefined Record, page 10](#)
- [Applying an IPv4 Flow Monitor to an Interface, page 12](#)

- [Applying an IPv6 Flow Monitor to an Interface, page 13](#)
- [Verifying the Flow Monitor, page 14](#) (optional)
- [Verifying That Flexible NetFlow Is Enabled, page 15](#) (optional)
- [Viewing the Flow Monitor Cache, page 15](#)
- [Configuring a Flow Exporter for the Flow Monitor, page 18](#)
- [Verifying the Flow Exporter, page 20](#) (optional)

## Configuring a Flow Monitor for IPv4 Traffic Using the Flexible NetFlow “NetFlow IPv4 Original Input” Predefined Record

To configure a flow monitor for IPv4 traffic using the Flexible NetFlow “NetFlow IPv4 original input” predefined record for the flow monitor, perform the following required task.

### Flow Monitors

Each flow monitor has a separate cache assigned to it. Each flow monitor requires a record to define the contents and layout of its cache entries. The record format can be one of the predefined record formats, or an advanced user may create his or her own record format using the **collect** and **match** commands in flow record configuration mode.

### Restrictions

You must remove a flow monitor from all of the interfaces to which you have applied it before you can modify the **record** format of the flow monitor.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **flow monitor** *monitor-name*
4. **description** *text-string*
5. **record netflow ipv4 original-input**
6. **end**

## 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.
Step 3	<b>flow monitor</b> <i>monitor-name</i>  <b>Example:</b> Router(config)# flow monitor FLOW-MONITOR-1	Creates a flow monitor and enters Flexible NetFlow flow monitor configuration mode. <ul style="list-style-type: none"><li>• This command also allows you to modify an existing flow monitor.</li></ul>
Step 4	<b>description</b> <i>text-string</i>  <b>Example:</b> Router(config-flow-monitor)# description Used for monitoring IPv4 traffic	(Optional) Creates a description for the flow monitor.
Step 5	<b>record netflow ipv4 original-input</b>  <b>Example:</b> Router(config-flow-monitor)# record netflow ipv4 original-input	Specifies the record for the flow monitor.
Step 6	<b>end</b>  <b>Example:</b> Router(config-flow-monitor)# end	Exits flow monitor configuration mode and returns to privileged EXEC mode.

## Configuring a Flow Monitor for IPv6 Traffic Using the Flexible NetFlow “NetFlow IPv6 Original Input” Predefined Record

To configure a flow monitor for IPv6 traffic using the Flexible NetFlow “NetFlow IPv6 original input” predefined record for the flow monitor, perform the following required task.

### Flow Monitors

Each flow monitor has a separate cache assigned to it. Each flow monitor requires a record to define the contents and layout of its cache entries. The record format can be one of the predefined record formats, or an advanced user may create his or her own record format using the **collect** and **match** commands in flow record configuration mode.

## Restrictions

You must remove a flow monitor from all of the interfaces to which you have applied it before you can modify the **record** format of the flow monitor.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **flow monitor** *monitor-name*
4. **description** *string*
5. **record netflow ipv6 original-input**
6. **end**

### 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.
Step 3	<b>flow monitor</b> <i>monitor-name</i>  <b>Example:</b> Router(config)# flow monitor FLOW-MONITOR-2	Creates a flow monitor and enters Flexible NetFlow flow monitor configuration mode. <ul style="list-style-type: none"> <li>• This command also allows you to modify an existing flow monitor.</li> </ul>
Step 4	<b>description</b> <i>string</i>  <b>Example:</b> Router(config-flow-monitor)# description Used for monitoring IPv6 traffic	(Optional) Creates a description for the flow monitor.
Step 5	<b>record netflow ipv6 original-input</b>  <b>Example:</b> Router(config-flow-monitor)# record netflow ipv6 original-input	Specifies the record for the flow monitor.
Step 6	<b>end</b>  <b>Example:</b> Router(config-flow-monitor)# end	Exits flow monitor configuration mode and returns to privileged EXEC mode.

## Applying an IPv4 Flow Monitor to an Interface

Before it can be activated an IPv4 flow monitor must be applied to at least one interface. To activate an IPv4 flow monitor, perform the following required task.

### Restrictions

When you specify the “NetFlow original” or the “NetFlow IPv4 original input” predefined record for the flow monitor to emulate original NetFlow, the flow monitor can be used only for analyzing input (ingress) traffic.

When you specify the “NetFlow IPv4 original output” predefined record for the flow monitor to emulate the Egress NetFlow Accounting feature, the flow monitor can be used only for analyzing output (egress) traffic.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ip flow monitor** *monitor-name* **input**
5. **end**

### 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.
Step 3	<b>interface</b> <i>type number</i>  <b>Example:</b> Router(config)# interface ethernet 0/0	Specifies an interface and enters interface configuration mode.
Step 4	<b>ip flow monitor</b> <i>monitor-name</i> <b>input</b>  <b>Example:</b> Router(config-if)# ip flow monitor FLOW-MONITOR-1 input	Activates the flow monitor that you created previously by assigning it to the interface to analyze traffic.
Step 5	<b>end</b>  <b>Example:</b> Router(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

## Applying an IPv6 Flow Monitor to an Interface

before it can be activated an IPv6 flow monitor must be applied to at least one interface. To activate an IPv6 flow monitor, perform the following required task.

### Restrictions

When you specify the “NetFlow IPv6 original input” predefined record for the flow monitor to emulate original NetFlow, the flow monitor can be used only for analyzing input (ingress) traffic.

When you specify the “NetFlow IPv6 original output” predefined record for the flow monitor to emulate the Egress NetFlow Accounting feature, the flow monitor can be used only for analyzing output (egress) traffic.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **ipv6 flow monitor** *monitor-name* **input**
5. **end**

### 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.
Step 3	<b>interface</b> <i>type number</i>  <b>Example:</b> Router(config)# interface ethernet 0/0	Specifies an interface and enters interface configuration mode.
Step 4	<b>ipv6 flow monitor</b> <i>monitor-name</i> <b>input</b>  <b>Example:</b> Router(config-if)# ipv6 flow monitor FLOW-MONITOR-2 input	Activates the flow monitor that you created previously by assigning it to the interface to analyze traffic.
Step 5	<b>end</b>  <b>Example:</b> Router(config-if)# end	Exits interface configuration mode and returns to privileged EXEC mode.

## Verifying the Flow Monitor

To view the current status of a flow monitor and verify the configuration commands that you entered, perform the following optional task.

### Prerequisites

The interface to which you applied the input flow monitor must be receiving traffic that meets the criteria defined by the NetFlow original record before you can view the flows in the flow monitor cache.

### SUMMARY STEPS

1. **enable**
2. **show flow monitor**
3. **show running-config flow monitor**

### DETAILED STEPS

---

#### Step 1 **enable**

The **enable** command enters privileged EXEC mode (enter the password if prompted).

```
Router> enable
```

```
Router#
```

#### Step 2 **show flow monitor**

The **show flow monitor** command shows the current status of the flow monitor that you specify.

```
Router# show flow monitor
```

```
Flow Monitor FLOW-MONITOR-1:
  Description:      Used for basic IPv4 traffic analysis
  Flow Record:     netflow ipv4 original-input
  Cache:
    Type:           normal
    Status:         allocated
    Size:           4096 entries / 311316 bytes
    Inactive Timeout: 15 secs
    Active Timeout: 1800 secs
    Update Timeout: 1800 secs
```

```
Flow Monitor FLOW-MONITOR-2:
  Description:      Used for basic IPv6 traffic analysis
  Flow Record:     netflow ipv6 original-input
  Cache:
    Type:           normal
    Status:         allocated
    Size:           4096 entries / 507936 bytes
    Inactive Timeout: 15 secs
    Active Timeout: 1800 secs
    Update Timeout: 1800 secs
```

#### Step 3 **show running-config flow monitor**

The **show running-config flow monitor** command shows the configuration commands of the flow monitor that you specify.

```
Router# show running-config flow monitor

Current configuration:
!
flow monitor FLOW-MONITOR-1
  description Used for basic IPv4 traffic analysis
  record netflow ipv4 original-input
!
!
flow monitor FLOW-MONITOR-2
  description Used for basic IPv6 traffic analysis
  record netflow ipv6 original-input
!
```

---

## Verifying That Flexible NetFlow Is Enabled

To verify that Flexible NetFlow is enabled on an interface, perform the following optional task.

### SUMMARY STEPS

1. **enable**
2. **show flow interface** *type number*

### DETAILED STEPS

---

**Step 1** **enable**

The **enable** command enters privileged EXEC mode (enter the password if prompted).

```
Router> enable
```

```
Router#
```

**Step 2** **show flow interface** *type number*

The **show flow interface** command verifies that Flexible NetFlow is enabled on an interface.

```
Router# show flow interface ethernet 0/0
```

```
Interface Ethernet0/0
  FNF:  monitor:      FLOW-MONITOR-1
        direction:   Input
        traffic(ip):  on
  FNF:  monitor:      FLOW-MONITOR-2
        direction:   Input
        traffic(ipv6): on
```

---

## Viewing the Flow Monitor Cache

To display the status, statistics and the flow data in the cache for a flow monitor, perform the following optional task.

## Prerequisites

The interface to which you applied the input flow monitor must be receiving traffic that meets the criteria defined by the NetFlow original record before you can view the flow data in the flow monitor cache.

## SUMMARY STEPS

1. **enable**
2. **show flow monitor name *monitor-name* cache format record**

## DETAILED STEPS

### Step 1 **enable**

The **enable** command enters privileged EXEC mode (enter the password if prompted).

```
Router> enable
```

```
Router#
```

### Step 2 **show flow monitor name *monitor-name* cache format record**

The **show flow monitor name *monitor-name* cache format record** command string displays the status, statistics, and the flow data in the cache for a flow monitor.

```
Router# show flow monitor name FLOW-MONITOR-1 cache format record
```

```
Cache type:                               Normal
Cache size:                               4096
Current entries:                           8
High Watermark:                            8

Flows added:                               24
Flows aged:                                16
- Active timeout ( 1800 secs)              0
- Inactive timeout ( 15 secs)              16
- Event aged                                0
- Watermark aged                            0
- Emergency aged                            0
```

```
IPV4 SOURCE ADDRESS:                      10.251.10.1
IPV4 DESTINATION ADDRESS:                  172.16.10.2
TRNS SOURCE PORT:                          0
TRNS DESTINATION PORT:                     2048
INTERFACE INPUT:                           Et0/0
FLOW SAMPLER ID:                           0
IP TOS:                                     0x00
IP PROTOCOL:                               1
ip source as:                              0
ip destination as:                          0
ipv4 next hop address:                      172.16.7.2
ipv4 source mask:                           /0
ipv4 destination mask:                      /24
tcp flags:                                  0x00
interface output:                           Et1/0
counter bytes:                              733500
counter packets:                            489
timestamp first:                            720892
timestamp last:                             975032
```

```
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.
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```

```

IPV4 SOURCE ADDRESS:      172.16.6.1
IPV4 DESTINATION ADDRESS: 224.0.0.9
TRNS SOURCE PORT:        520
TRNS DESTINATION PORT:   520
INTERFACE INPUT:         Et0/0
FLOW SAMPLER ID:         0
IP TOS:                   0xC0
IP PROTOCOL:              17
ip source as:             0
ip destination as:       0
ipv4 next hop address:   0.0.0.0
ipv4 source mask:        /24
ipv4 destination mask:   /0
tcp flags:                0x00
interface output:        Null
counter bytes:            52
counter packets:         1
timestamp first:         973804
timestamp last:          973804

```

Router# **show flow monitor name FLOW-MONITOR-2 cache format record**

```

Cache type:                Normal
Cache size:                 4096
Current entries:            6
High Watermark:            8

Flows added:                1048
Flows aged:                 1042
- Active timeout ( 1800 secs)  11
- Inactive timeout ( 15 secs) 1031
- Event aged                   0
- Watermark aged               0
- Emergency aged               0

IPV6 FLOW LABEL:           0
IPV6 EXTENSION MAP:        0x00000040
IPV6 SOURCE ADDRESS:       2001:DB8:1:ABCD::1
IPV6 DESTINATION ADDRESS:  2001:DB8:4:ABCD::2
TRNS SOURCE PORT:          3000
TRNS DESTINATION PORT:     55
INTERFACE INPUT:           Et0/0
FLOW DIRECTION:            Input
FLOW SAMPLER ID:           0
IP PROTOCOL:                17
IP TOS:                     0x00
ip source as:               0
ip destination as:         0
ipv6 next hop address:     ::
ipv6 source mask:          /48
ipv6 destination mask:    /0
tcp flags:                  0x00
interface output:          Null
counter bytes:              521192
counter packets:           9307
timestamp first:           9899684
timestamp last:            11660744
.
.
.
IPV6 FLOW LABEL:           0
IPV6 EXTENSION MAP:        0x00000000
IPV6 SOURCE ADDRESS:       FE80::A8AA:BBFF:FEBB:CC03
IPV6 DESTINATION ADDRESS:  FF02::9

```

```

TRNS SOURCE PORT:          521
TRNS DESTINATION PORT:     521
INTERFACE INPUT:           Et0/0
FLOW DIRECTION:            Input
FLOW SAMPLER ID:           0
IP PROTOCOL:                17
IP TOS:                     0xE0
ip source as:               0
ip destination as:         0
ipv6 next hop address:     ::
ipv6 source mask:          /10
ipv6 destination mask:    /0
tcp flags:                  0x00
interface output:          Null
counter bytes:              92
counter packets:           1
timestamp first:            11653832
timestamp last:             11653832

```

---

## Configuring a Flow Exporter for the Flow Monitor

To export the data that is collected by Flexible NetFlow to a remote system for further analysis and storage, perform the following optional task.

### Flow Exporters

Flow exporters are used to send the data that you collect with Flexible NetFlow to a remote system such as a NetFlow Collection Engine. Exporters use UDP as the transport protocol and use the Version 9 export format.

### Restrictions

Each flow exporter supports only one destination. If you want to export the data to multiple destinations, you must configure multiple flow exporters and assign them to the flow monitor.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **flow exporter** *exporter-name*
4. **description** *string*
5. **destination** {*hostname* | *ip-address*} [**vrf** *vrf-name*]
6. **transport udp** *udp-port*
7. **exit**
8. **flow monitor** *monitor-name*
9. **exporter** *exporter-name*
10. **end**

## 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.
Step 3	<b>flow exporter</b> <i>exporter-name</i>  <b>Example:</b> Router(config)# flow exporter EXPORTER-1	Creates a flow exporter and enters Flexible NetFlow flow exporter configuration mode. <ul style="list-style-type: none"><li>This command also allows you to modify an existing flow exporter.</li></ul>
Step 4	<b>description</b> <i>string</i>  <b>Example:</b> Router(config-flow-exporter)# description Exports to Chicago datacenter	(Optional) Creates a description for the flow exporter.
Step 5	<b>destination</b> { <i>hostname</i>   <i>ip-address</i> } [ <b>vrf</b> <i>vrf-name</i> ]  <b>Example:</b> Router(config-flow-exporter)# destination 172.16.10.2	Specifies the hostname or IP address of the system to which the exporter sends data.
Step 6	<b>transport udp</b> <i>udp-port</i>  <b>Example:</b> Router(config-flow-exporter)# transport udp 65	Configures UDP as the transport protocol and specifies the UDP port on which the destination system is listening for exported Flexible NetFlow traffic.
Step 7	<b>exit</b>  <b>Example:</b> Router(config-flow-exporter)# exit	Exits Flexible NetFlow flow exporter configuration mode and returns to global configuration mode.
Step 8	<b>flow monitor</b> <i>flow-monitor-name</i>  <b>Example:</b> Router(config)# flow monitor FLOW-MONITOR-1	Enters Flexible NetFlow flow monitor configuration mode for the flow monitor that you created previously.
Step 9	<b>exporter</b> <i>exporter-name</i>  <b>Example:</b> Router(config-flow-monitor)# exporter EXPORTER-1	Specifies the name of an exporter that you created previously.
Step 10	<b>end</b>  <b>Example:</b> Router(config-flow-monitor)# end	Exits Flexible NetFlow flow monitor configuration mode and returns to privileged EXEC mode.

## Verifying the Flow Exporter

To view the current status of a flow exporter and verify the configuration commands that you entered, perform the following optional task.

### SUMMARY STEPS

1. **enable**
2. **show flow exporter**
3. **show running-config flow exporter** *exporter-name*

### DETAILED STEPS

---

#### Step 1 **enable**

The **enable** command enters privileged EXEC mode (enter the password if prompted).

```
Router> enable
```

```
Router#
```

#### Step 2 **show flow exporter** *exporter-name*

The **show flow exporter** command shows the current status of the flow exporter that you specify.

```
Router# show flow exporter EXPORTER-1
```

```
Flow Exporter EXPORTER-1:
  Description:           Exports to Chicago datacenter
  Transport Configuration:
    Destination IP address: 172.16.10.2
    Source IP address:     172.16.7.1
    Transport Protocol:    UDP
    Destination Port:      65
    Source Port:           56041
    DSCP:                  0x0
    TTL:                   255
```

#### Step 3 **show running-config flow exporter**

The **show running-config flow exporter** command shows the configuration commands of the flow exporter that you specify.

```
Router# show running-config flow exporter EXPORTER-1
```

```
Building configuration...
```

```
!
flow exporter EXPORTER-1
  description Exports to Chicago datacenter
  destination 172.16.10.2
  transport udp 65
!
```

---

# Configuration Examples for Emulating Original NetFlow Features with Flexible NetFlow

The following examples show you how to configure Flexible NetFlow to emulate three features that are available in original NetFlow:

- [Configuring Flexible NetFlow Egress Accounting for IPV4 and IPv6 Traffic: Example, page 21](#)
- [Configuring Flexible NetFlow Subinterface Support: Example, page 21](#)
- [Configuring Flexible NetFlow Multiple Export Destinations: Example, page 22](#)

## Configuring Flexible NetFlow Egress Accounting for IPV4 and IPv6 Traffic: Example

The following example shows how to configure Flexible NetFlow Egress Accounting for IPv4 and IPv6 traffic.

This sample starts in global configuration mode:

```
!  
flow monitor FLOW-MONITOR-1  
  record netflow ipv4 original-output  
  exit  
!  
!  
flow monitor FLOW-MONITOR-2  
  record netflow ipv6 original-output  
  exit  
!  
  
ip cef  
ipv6 cef  
!  
interface Ethernet0/0  
  ip address 172.16.6.2 255.255.255.0  
  ipv6 address 2001:DB8:2:ABCD::2/48  
  
  ip flow monitor FLOW-MONITOR-1 output  
  ipv6 flow monitor FLOW-MONITOR-2 output  
!
```

## Configuring Flexible NetFlow Subinterface Support: Example

The following example shows how to configure Flexible NetFlow Subinterface Support for IPv4 traffic.

This sample starts in global configuration mode:

```
!  
flow monitor FLOW-MONITOR-1  
  record netflow ipv4 original-input  
  exit  
!  
ip cef  
!  
interface Ethernet0/0.1  
  ip address 172.16.6.2 255.255.255.0  
  ip flow monitor FLOW-MONITOR-1 input
```

!

The following example shows how to configure Flexible NetFlow to Emulate NetFlow Subinterface Support for IPv6 traffic.

This sample starts in global configuration mode:

```
!
flow monitor FLOW-MONITOR-2
 record netflow ipv6 original-input
 exit
!
ip cef
ipv6 cef
!
interface Ethernet0/0.1
 ipv6 address 2001:DB8:2:ABCD::2/48
 ipv6 flow monitor FLOW-MONITOR-2 input
!
```

## Configuring Flexible NetFlow Multiple Export Destinations: Example

The following example shows how to configure Flexible NetFlow Multiple Export Destinations.

This sample starts in global configuration mode:

```
!
flow exporter EXPORTER-1
 destination 172.16.10.2
 transport udp 90
 exit
!
flow exporter EXPORTER-2
 destination 172.16.10.3
 transport udp 90
 exit
!
flow monitor FLOW-MONITOR-1
 record netflow-original
 exporter EXPORTER-2
 exporter EXPORTER-1
 exit
!
ip cef
!
interface Ethernet0/0
 ip address 172.16.6.2 255.255.255.0
 ip flow monitor FLOW-MONITOR-1 input
!
```

## Where to Go Next

For information on advanced Flexible NetFlow configurations for specific purposes such as quality of service (QoS) and bandwidth monitoring, application and user flow monitoring and profiling, and security analysis, refer to the [“Customizing Cisco IOS Flexible NetFlow Flow Records and Flow Monitors”](#) module.

If you want to configure additional options for data export for Flexible NetFlow, refer to the [“Configuring Data Export for Cisco IOS Flexible NetFlow with Flow Exporters”](#) module.

If you want to configure flow sampling to reduce the CPU overhead of analyzing traffic, refer to the [“Using Cisco IOS Flexible NetFlow Flow Sampling to Reduce the CPU Overhead of Analyzing Traffic”](#) module.

If you want to configure any of the predefined records for Flexible NetFlow refer, to the [“Configuring Cisco IOS Flexible NetFlow with Predefined Records”](#) module.

## Additional References

The following sections provide references related to Flexible NetFlow.

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<i>Cisco IOS Master Commands List, All Releases</i>
Overview of Flexible NetFlow	<a href="#">“Cisco IOS Flexible NetFlow Overview”</a>
Flexible NetFlow Feature Roadmap	<a href="#">“Cisco IOS Flexible NetFlow Features Roadmap”</a>
Configuring flow exporters to export Flexible NetFlow data.	<a href="#">“Configuring Data Export for Cisco IOS Flexible NetFlow with Flow Exporters”</a>
Customizing Flexible NetFlow	<a href="#">“Customizing Cisco IOS Flexible NetFlow Flow Records and Flow Monitors”</a>
Configuring flow sampling to reduce the overhead of monitoring traffic with Flexible NetFlow	<a href="#">“Using Cisco IOS Flexible NetFlow Flow Sampling to Reduce the CPU Overhead of Analyzing Traffic”</a>
Configuring Flexible NetFlow using predefined records	<a href="#">“Configuring Cisco IOS Flexible NetFlow with Predefined Records”</a>
Using Flexible NetFlow Top N Talkers to Analyze Network Traffic	<a href="#">“Using Cisco IOS Flexible NetFlow Top N Talkers to Analyze Network Traffic”</a>
Configuring IPv4 Multicast Statistics Support for Flexible NetFlow	<a href="#">“Configuring IPv4 Multicast Statistics Support for Cisco IOS Flexible NetFlow”</a>
Configuration commands for Flexible NetFlow	<i>Cisco IOS Flexible NetFlow Command Reference</i>

### Standards

Standard	Title
There are no standards associated with this feature.	—

## MIBs

MIB	MIBs Link
None	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

RFC	Title
RFC #3954	<i>Cisco Systems NetFlow Services Export Version 9</i>

## 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>	<a href="http://www.cisco.com/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

# Feature Information for Flexible NetFlow

[Table 5](#) 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 Cisco IOS Releases 12.2(1) or 12.0(3)S or a later release appear in the table.

For information on a feature in this technology that is not documented here, see the “[Cisco IOS Flexible NetFlow 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, Catalyst OS, and Cisco IOS XE 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**

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[Table 5](#) 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 5 Feature Information for Flexible NetFlow

Feature Name	Releases	Feature Configuration Information
Flexible NetFlow	12.4(9)T 12.2(33)SRC	<p>Flexible NetFlow is introduced.</p> <p>Support for this feature was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC.</p> <p>Information about the Flexible NetFlow feature is included in the following sections:</p> <ul style="list-style-type: none"> <li>• <a href="#">Prerequisites for Getting Started with Configuring Flexible NetFlow, page 2</a></li> <li>• <a href="#">Information About Getting Started with Configuring Flexible NetFlow, page 2</a></li> <li>• <a href="#">How to Get Started with Configuring Flexible NetFlow, page 8</a></li> <li>• <a href="#">Configuration Examples for Emulating Original NetFlow Features with Flexible NetFlow, page 21</a></li> </ul> <p>The following commands were introduced or modified: <b>cache (Flexible NetFlow), clear flow exporter, clear flow monitor, clear sampler, collect counter, collect flow, collect interface, collect ipv4, collect ipv4 destination, collect ipv4 fragmentation, collect ipv4 section, collect ipv4 source, collect ipv4 total-length, collect ipv4 ttl, collect routing, collect timestamp sys-uptime, collect transport, collect transport icmp ipv4, collect transport tcp, collect transport udp, debug flow exporter, debug flow monitor, debug flow record, debug sampler, description (Flexible NetFlow), destination, dscp (Flexible NetFlow), exporter, flow exporter, flow monitor, flow record, ip flow monitor, match flow, match interface (Flexible NetFlow), match ipv4, match ipv4 destination, match ipv4 fragmentation, match ipv4 section, match ipv4 source, match ipv4 total-length, match ipv4 ttl, match routing, match transport, match transport icmp ipv4, match transport tcp, match transport udp, mode (Flexible NetFlow), option (Flexible NetFlow), record, sampler, show flow exporter, show flow interface, show flow monitor, show flow record, show sampler, source (Flexible NetFlow), statistics packet, template data timeout, transport (Flexible NetFlow).</b></p>

Table 5 Feature Information for Flexible NetFlow

Feature Name	Releases	Feature Configuration Information
Flexible NetFlow—MPLS Egress NetFlow	12.4(22)T 12.2(33)SRE	<p>The Flexible NetFlow—MPLS Egress NetFlow feature allows you to capture IP flow information for packets undergoing MPLS label disposition; that is, packets that arrive on a router as MPLS packets and are transmitted as IP packets.</p> <p>Support for this feature was added for Cisco 7200 and 7300 NPE series routers in Cisco IOS Release 12.2(33)SRE.</p> <p>The following sections provide information about this feature:</p> <ul style="list-style-type: none"> <li>• <a href="#">Flexible NetFlow—MPLS Egress NetFlow, page 7</a></li> </ul> <p>No commands were introduced or modified by this feature.</p>
Flexible NetFlow—IPv6 Unicast Flows	12.4(20)T 12.2(33)SRE	<p>Enables Flexible NetFlow to monitor IPv6 traffic.</p> <p>Support for this feature was added for Cisco 7200 and 7300 NPE series routers in Cisco IOS Release 12.2(33)SRE.</p> <p>Information about the Flexible NetFlow—IPv6 Unicast Flows feature is included in the following sections:</p> <ul style="list-style-type: none"> <li>• <a href="#">Configuring a Flow Monitor for IPv6 Traffic Using the Flexible NetFlow “NetFlow IPv6 Original Input” Predefined Record, page 10</a></li> <li>• <a href="#">Applying an IPv6 Flow Monitor to an Interface, page 13</a></li> <li>• <a href="#">Configuring Flexible NetFlow Egress Accounting for IPv4 and IPv6 Traffic: Example, page 21</a></li> </ul> <p>The following commands were introduced or modified:  <b>collect routing, debug flow record, match routing, record, show flow monitor, show flow record, collect ipv6, collect ipv6 destination, collect ipv6 extension map, collect ipv6 fragmentation, collect ipv6 hop-limit, collect ipv6 length, collect ipv6 section, collect ipv6 source, collect transport icmp ipv6, ipv6 flow monitor, match ipv6, match ipv6 destination, match ipv6 extension map, match ipv6 fragmentation, match ipv6 hop-limit, match ipv6 length, match ipv6 section, match ipv6 source, match transport icmp ipv6.</b></p>

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