



## Flexible NetFlow - MPLS Support

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The Flexible NetFlow - MPLS Support feature supports the monitoring of the following MPLS-related fields:

- MPLS Labels 1-6 (3 bytes -- 20 bits of label, 3 bits of EXP, 1 bit of EOS).
- Top Label EXP i.e. the EXP field for label 1.
- Top Label TTL i.e. the TTL field for label 1.
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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and 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 table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfnng.cisco.com/>. An account on Cisco.com is not required.

## Information About Flexible NetFlow MPLS Support

### Flexible NetFlow—MPLS Support Overview

This feature enables collecting MPLS label IDs by applying a flow monitor having a flow record that collects the MPLS label IDs as key or nonkey fields.

# How to Configure Flexible NetFlow MPLS Support

## Configuring a Flow Exporter for the Flow Monitor

Perform this optional task to configure a flow exporter for the flow monitor in order to export the data that is collected by Flexible NetFlow to a remote system for further analysis and storage.

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.



**Note** 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.

You can export to a destination using either an IPv4 or IPv6 address.



**Note** When you configure an exporter, configure the exporter in such a way that the source interface is defined as a WAN interface. This configuration helps you prevent any unpredictable behavior because the NAT is not applied on the packets.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **flow exporter** *exporter-name*
4. **description** *description*
5. **destination** {*hostname* | *ip-address*} [**vrf** *vrf-name*]
6. **export-protocol** {**netflow-v5** | **netflow-v9** | **ipfix**}
7. **transport** **udp** *udp-port*
8. **exit**
9. **flow monitor** *flow-monitor-name*
10. **exporter** *exporter-name*
11. **end**
12. **show flow exporter** *exporter-name*
13. **show running-config flow exporter** *exporter-name*

### DETAILED STEPS

|        | Command or Action                                          | Purpose                                                                                                                   |
|--------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Step 1 | <b>enable</b><br><br><b>Example:</b><br><br>Device> enable | Enables privileged EXEC mode.<br><br><ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul> |

|                | Command or Action                                                                                                                           | Purpose                                                                                                                                                                       |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 2</b>  | <b>configure terminal</b><br><b>Example:</b><br><br>Device# configure terminal                                                              | Enters global configuration mode.                                                                                                                                             |
| <b>Step 3</b>  | <b>flow exporter exporter-name</b><br><b>Example:</b><br><br>Device(config)# flow exporter EXPORTER-1                                       | Creates a flow exporter and enters Flexible NetFlow flow exporter configuration mode.<br><br>• This command also allows you to modify an existing flow exporter.              |
| <b>Step 4</b>  | <b>description description</b><br><b>Example:</b><br><br>Device(config-flow-exporter)# description Exports to datacenter                    | (Optional) Creates a description for the flow exporter.                                                                                                                       |
| <b>Step 5</b>  | <b>destination {hostname   ip-address} [vrf vrf-name]</b><br><b>Example:</b><br><br>Device(config-flow-exporter)# destination 172.16.10.2   | Specifies the hostname or IP address of the system to which the exporter sends data.<br><br><b>Note</b> You can export to a destination using either an IPv4 or IPv6 address. |
| <b>Step 6</b>  | <b>export-protocol {netflow-v5   netflow-v9   ipfix}</b><br><b>Example:</b><br><br>Device(config-flow-exporter)# export-protocol netflow-v9 | Specifies the version of the NetFlow export protocol used by the exporter.<br><br>• Default: <b>netflow-v9</b> .                                                              |
| <b>Step 7</b>  | <b>transport udp udp-port</b><br><b>Example:</b><br><br>Device(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.                       |
| <b>Step 8</b>  | <b>exit</b><br><b>Example:</b><br><br>Device(config-flow-exporter)# exit                                                                    | Exits Flexible NetFlow flow exporter configuration mode and returns to global configuration mode.                                                                             |
| <b>Step 9</b>  | <b>flow monitor flow-monitor-name</b><br><b>Example:</b><br><br>Device(config)# flow monitor FLOW-MONITOR-1                                 | Enters Flexible NetFlow flow monitor configuration mode for the flow monitor that you created previously.                                                                     |
| <b>Step 10</b> | <b>exporter exporter-name</b><br><b>Example:</b>                                                                                            | Specifies the name of an exporter that you created previously.                                                                                                                |

|                | Command or Action                                                                                                                                              | Purpose                                                                                     |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
|                | <code>Device(config-flow-monitor)# exporter EXPORTER-1</code>                                                                                                  |                                                                                             |
| <b>Step 11</b> | <b>end</b><br><b>Example:</b><br><code>Device(config-flow-monitor)# end</code>                                                                                 | Exits Flexible NetFlow flow monitor configuration mode and returns to privileged EXEC mode. |
| <b>Step 12</b> | <b>show flow exporter</b> <i>exporter-name</i><br><b>Example:</b><br><code>Device# show flow exporter FLOW_EXPORTER-1</code>                                   | (Optional) Displays the current status of the specified flow exporter.                      |
| <b>Step 13</b> | <b>show running-config flow exporter</b> <i>exporter-name</i><br><b>Example:</b><br><code>Device&lt;# show running-config flow exporter FLOW_EXPORTER-1</code> | (Optional) Displays the configuration of the specified flow exporter.                       |

## Creating a Customized Flow Monitor

Perform this required task to create a customized flow monitor.

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. These record formats can be one of the predefined formats or a user-defined format. An advanced user can create a customized format using the **flow record** command.

### Before you begin

If you want to use a customized record instead of using one of the Flexible NetFlow predefined records, you must create the customized record before you can perform this task. If you want to add a flow exporter to the flow monitor for data export, you must create the exporter before you can complete this task.



**Note** You must use the **no ip flow monitor** command to remove a flow monitor from all of the interfaces to which you have applied it before you can modify the parameters for the **record** command on the flow monitor.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **flow monitor** *monitor-name*
4. **description** *description*
5. **record** {*record-name*}
6. **cache** {*timeout* {**active**} *seconds* | { **normal** }

7. Repeat Step 6 as required to finish modifying the cache parameters for this flow monitor.
8. **exporter** *exporter-name*
9. **end**
10. **show flow monitor** *[[name] monitor-name [cache [format {csv | record | table} ] ] ]*
11. **show running-config flow monitor** *monitor-name*

## DETAILED STEPS

|               | Command or Action                                                                                                                                    | Purpose                                                                                                                                                                                                     |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b> | <b>enable</b><br><b>Example:</b><br><pre>Device&gt; enable</pre>                                                                                     | Enables privileged EXEC mode.<br><ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>                                                                                       |
| <b>Step 2</b> | <b>configure terminal</b><br><b>Example:</b><br><pre>Device# configure terminal</pre>                                                                | Enters global configuration mode.                                                                                                                                                                           |
| <b>Step 3</b> | <b>flow monitor</b> <i>monitor-name</i><br><b>Example:</b><br><pre>Device(config)# flow monitor FLOW-MONITOR-1</pre>                                 | Creates a flow monitor and enters Flexible NetFlow flow monitor configuration mode.<br><ul style="list-style-type: none"> <li>• This command also allows you to modify an existing flow monitor.</li> </ul> |
| <b>Step 4</b> | <b>description</b> <i>description</i><br><b>Example:</b><br><pre>Device(config-flow-monitor)# description Used for basic ipv4 traffic analysis</pre> | (Optional) Creates a description for the flow monitor.                                                                                                                                                      |
| <b>Step 5</b> | <b>record</b> { <i>record-name</i> }<br><b>Example:</b><br><pre>Device(config-flow-monitor)# record FLOW-RECORD-1</pre>                              | Specifies the record for the flow monitor.                                                                                                                                                                  |
| <b>Step 6</b> | <b>cache</b> { <b>timeout</b> { <b>active</b> } <i>seconds</i>   { <b>normal</b> }<br><b>Example:</b>                                                |                                                                                                                                                                                                             |
| <b>Step 7</b> | Repeat Step 6 as required to finish modifying the cache parameters for this flow monitor.                                                            | —                                                                                                                                                                                                           |
| <b>Step 8</b> | <b>exporter</b> <i>exporter-name</i><br><b>Example:</b><br><pre>Device(config-flow-monitor)# exporter EXPORTER-1</pre>                               | (Optional) Specifies the name of an exporter that was created previously.                                                                                                                                   |

|                | Command or Action                                                                                                                                                              | Purpose                                                                                     |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Step 9</b>  | <b>end</b><br><b>Example:</b><br><pre>Device(config-flow-monitor)# end</pre>                                                                                                   | Exits Flexible NetFlow flow monitor configuration mode and returns to privileged EXEC mode. |
| <b>Step 10</b> | <b>show flow monitor</b> <i>[[name] monitor-name [cache [format {csv   record   table} ] ]</i><br><b>Example:</b><br><pre>Device# show flow monitor FLOW-MONITOR-2 cache</pre> | (Optional) Displays the status for a Flexible NetFlow flow monitor.                         |
| <b>Step 11</b> | <b>show running-config flow monitor</b> <i>monitor-name</i><br><b>Example:</b><br><pre>Device# show running-config flow monitor FLOW_MONITOR-1</pre>                           | (Optional) Displays the configuration of the specified flow monitor.                        |

## Applying a Flow Monitor to an Interface

Before it can be activated, a flow monitor must be applied to at least one interface. Perform this required task to activate a flow monitor.

While running the **ip flow monitor** command for the first interface to enable FNF monitor, you may see the following warning message displaying a GLOBAL memory allocation failure. This log is triggered by enabling FNF monitoring with a large cache size.

```
Jul  4 01:45:00.255: %CPPEXMEM-3-NOMEM: F0/0: cpp_cp_svr: QFP: 0, GLOBAL memory allocation
of 90120448 bytes by FNF failed
Jul  4 01:45:00.258: %CPPEXMEM-3-TOPUSER: F0/0: cpp_cp_svr: QFP: 0, Top User: CPR STILE
EXMEM GRAPH, Allocations: 877, Type: GLOBAL
Jul  4 01:45:00.258: %CPPEXMEM-3-TOPUSER: F0/0: cpp_cp_svr: QFP: 0, Top User: SBC, Bytes
Allocated: 53850112, Type: GLOBAL
```

The warning message does not necessarily indicate a flow monitor application failure. The warning message can indicate internal steps that FNF uses for applying memory from the EXMEM infrastructure.

To ensure that the FNF monitor is enabled successfully, use the **show flow monitor** *monitor-name* command to check **Status (allocated or not allocated)** of a flow monitor. For more information, see [Displaying the Current Status of a Flow Monitor](#).

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface** *type number*
4. **{ip | ipv6} flow monitor** *monitor-name* **{input | output}**
5. Repeat Steps 3 and 4 to activate a flow monitor on any other interfaces in the device over which you want to monitor traffic.

6. **end**
7. **show flow interface** *type number*
8. **show flow monitor name** *monitor-name* **cache format record**

## DETAILED STEPS

|               | Command or Action                                                                                                                                                               | Purpose                                                                                                               |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <b>Step 1</b> | <b>enable</b><br><b>Example:</b><br><pre>Device&gt; enable</pre>                                                                                                                | Enables privileged EXEC mode.<br><ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul> |
| <b>Step 2</b> | <b>configure terminal</b><br><b>Example:</b><br><pre>Device# configure terminal</pre>                                                                                           | Enters global configuration mode.                                                                                     |
| <b>Step 3</b> | <b>interface</b> <i>type number</i><br><b>Example:</b><br><pre>Device(config)# interface GigabitEthernet 0/0/0</pre>                                                            | Specifies an interface and enters interface configuration mode.                                                       |
| <b>Step 4</b> | <b>{ip   ipv6} flow monitor</b> <i>monitor-name</i> <b>{input   output}</b><br><b>Example:</b><br><pre>Device(config-if)# ip flow monitor FLOW-MONITOR-1 input</pre>            | Activates a flow monitor that was created previously by assigning it to the interface to analyze traffic.             |
| <b>Step 5</b> | Repeat Steps 3 and 4 to activate a flow monitor on any other interfaces in the device over which you want to monitor traffic.                                                   | —                                                                                                                     |
| <b>Step 6</b> | <b>end</b><br><b>Example:</b><br><pre>Device(config-if)# end</pre>                                                                                                              | Exits interface configuration mode and returns to privileged EXEC mode.                                               |
| <b>Step 7</b> | <b>show flow interface</b> <i>type number</i><br><b>Example:</b><br><pre>Device# show flow interface GigabitEthernet 0/0/0</pre>                                                | Displays the status of Flexible NetFlow (enabled or disabled) on the specified interface.                             |
| <b>Step 8</b> | <b>show flow monitor name</b> <i>monitor-name</i> <b>cache format record</b><br><b>Example:</b><br><pre>Device# show flow monitor name FLOW_MONITOR-1 cache format record</pre> | Displays the status, statistics, and flow data in the cache for the specified flow monitor.                           |

# Configuration Examples for Flexible NetFlow MPLS Support

## Example: Configuring Flexible NetFlow for MPLS Support

The following example shows how to configure a flow monitor using the Flexible NetFlow "BGP ToS next-hop" predefined record to monitor IPv4 traffic.

This sample starts in global configuration mode:

```
Router(config)#flow record mpls_1
Router(config-flow-record)#match mpls label 1 details
Router(config-flow-record)#match mpls label 1 exp
Router(config-flow-record)#match mpls label 1 ttl
Router(config-flow-record)#match mpls label 2 details
Router(config-flow-record)#match mpls label 3 details
Router(config-flow-record)#collect mpls label 4 details
Router(config-flow-record)#collect mpls label 5 details
!
flow monitor mpls_1
record mpls_1
!
interface Ethernet 0/0
 mpls flow monitor mpls_1 input
 mpls flow monitor mpls_1 output
!
```

## Additional References

### Related Documents

| Related Topic                                                   | Document Title                                              |
|-----------------------------------------------------------------|-------------------------------------------------------------|
| Cisco IOS commands                                              | <a href="#">Cisco IOS Master Command List, All Releases</a> |
| Flexible NetFlow conceptual information and configuration tasks | <i>Flexible NetFlow Configuration Guide</i>                 |
| Flexible NetFlow commands                                       | <i>Cisco IOS Flexible NetFlow Command Reference</i>         |

### Standards/RFCs

| Standard                                                         | Title |
|------------------------------------------------------------------|-------|
| No new or modified standards/RFCs are supported by this feature. |       |



**MIBs**

| <b>MIB</b> | <b>MIBs Link</b>                                                                                                                                                                                                            |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| None       | To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL:<br><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a> |

**Technical Assistance**

| <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                    | <b>Link</b>                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password. | <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: MPLS Support

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

**Table 1: Feature Information for Flexible NetFlow: MPLS Support**

| <b>Feature Name</b>            | <b>Releases</b>           | <b>Feature Information</b>                                                                                                                                                                                                                                              |
|--------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flexible NetFlow: MPLS Support | Cisco IOS XE Release 3.9S | Enables collecting MPLS label IDs by applying a flow monitor having a flow record that collects the MPLS label IDs as key or nonkey fields.<br><br>The following commands were introduced or modified:<br><b>collect mplslabel, match mplslabel, mpls flow monitor.</b> |

