



IP-Aware MPLS NetFlow

The IP-Aware MPLS NetFlow feature is an extension of the NetFlow accounting feature that uses copy-based sampling to copy sampled packets to the software where they can be further processed. This sampling provides highly granular traffic statistics for Cisco devices. NetFlow is a Cisco application that provides statistics about packets flowing through the device.

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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 at the end of this module.

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. An account on Cisco.com is not required.

Restrictions for Configuring IP-Aware MPLS NetFlow

- Copy-based sampling is allowed only in the ingress direction.
- The Lawful Intercept (LI) feature is of higher priority than the Capture2 (CAP2) feature. If LI is enabled, the copy-based sampling configuration is not removed but the feature is disabled.

- Inner Internet Protocol (IP) header meta details such as Ingress Interface, Egress Enterface, Border Gateway Protocol (BGP) next hop, and Interior Gateway Protocol (IGP) next hop are not allowed as collect fields with copy-based sampling.
- IP copy-based sampling supports both IP and Multiprotocol Label Switching (MPLS) packets coming in on the interface. However, these packets cannot be distinguished.
- All flow key and nonkey fields are enabled on the platform CLI but, during the configuration, only hardware supported fields are allowed on the noncopy-based sampling and nonsampling cases. For copy-based sampler all the fields are allowed, except the meta fields.
- The number of different profiles that can be used for copy-based sampling is limited to eight.
- In some cases the ingress and egress interface type cannot be derived in Cisco software.

Information About IP-Aware MPLS NetFlow

Benefits of the CAP2 Rate Limiter

During copy-based sampling the sampled packets are copied to the Route Processor. If this rate of sampling is high, the act of processing all of these packets in software may cause a negative impact on the CPU performance.

The CAP2 rate limiter limits the number of packets copied to the Route Processor, decreasing any chances of performance impact. The rate limiter configuration of access control list (ACL) logging (OAL) is also used for copy-based sampling rate limiting.

How to Configure IP-Aware MPLS NetFlow

Creating a Flow Record and Flow Exporter

Before You Begin

To enable copy-based sampling you must first create a flow record and flow exporter that can then be added to a flow monitor. The flow record is used for traffic analysis, and the exporter to export the data that is collected by flexible NetFlow.

**Note**

Meta fields, such as number and BGP next hop, are not allowed with copy-based sampling.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **flow record** *record-name*
4. **match ipv4 source** *address*
5. **end**
6. **flow exporter** *exporter-name*
7. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	flow record <i>record-name</i> Example: Device(config)# flow record FLOW-RECORD-1	Enters flexible NetFlow flow record configuration mode and creates a flow record.
Step 4	match ipv4 source <i>address</i> Example: Device(config-flow-record)# match ipv4 source address	Configures the IPv4 source address as a key field for the flow record.
Step 5	end Example: Device(config-flow-record)# end	Exits flexible NetFlow flow record configuration mode and returns to privileged EXEC mode.
Step 6	flow exporter <i>exporter-name</i> Example: Device(config)# flow exporter FLOW-EXPORTER-1	Enters flexible NetFlow flow exporter configuration mode and creates a flow exporter.

	Command or Action	Purpose
Step 7	end Example: Device(config-flow-exporter)# end	Exits flexible NetFlow flow exporter configuration mode and returns to privileged EXEC mode.

Creating a Monitor and Adding a Flow Record and Flow Exporter

Before You Begin

To enable flow sampling, you configure the record that you want to use for traffic analysis, and the exporter to export the data that is collected by flexible NetFlow to a remote system for further analysis and storage, and assign them to a flow monitor.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **flow monitor** *monitor-name*
4. **record** *record-name*
5. **exporter** *exporter-name*
6. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	flow monitor <i>monitor-name</i> Example: Device(config)# flow monitor FLOW-MONITOR-1	Enters flexible NetFlow flow monitor configuration mode and creates a flow monitor.

	Command or Action	Purpose
Step 4	record <i>record-name</i> Example: Device(config-flow-monitor)# record FLOW-RECORD-1	Adds the record FLOW-RECORD-1 to the monitor.
Step 5	exporter <i>exporter-name</i> Example: Device(config-flow-monitor)# exporter FLOW-EXPORTER-1	Adds the exporter FLOW-EXPORTER-1 to the monitor.
Step 6	end Example: Device(config-flow-monitor)# end	Exits flexible NetFlow flow monitor configuration mode and returns to privileged EXEC mode.

Configuring a Flow Sampler with a Copy Type

Before You Begin

Flow samplers are used to reduce the load placed by flexible NetFlow on the networking device to monitor traffic by limiting the number of packets that are analyzed. By applying the **copy type** command to the flow sampler, you enable the copying of sampled packets to the software or Route Processor. Features that are not available in hardware can then be applied on those packets.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **sampler** *sampler-name*
4. **type copy**
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: Device> enable	<ul style="list-style-type: none"> • Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	sampler <i>sampler-name</i> Example: Device(config)# sampler SAMPLER-1	Enters flexible NetFlow sampler configuration mode and creates a flow sampler with the name SAMPLER-1.
Step 4	type copy Example: Device(config-sampler)# type copy	Configures the sampler with the copy type to enable the sampled packets to be copied to Cisco software for accounting.
Step 5	end Example: Device(config-sampler)# end	Exits flexible NetFlow sampler configuration mode and returns to privileged EXEC mode.

Configuration Examples for IP-Aware MPLS NetFlow

Example: Creating a Flow Record and Flow Exporter

The following example shows how to create a flow record and flow exporter for copy-based sampling. Meta fields, such as number and BGP next hop, are not allowed with copy-based sampling.

```
Device(config)# flow record FLOW-RECORD-1
Device(config-record)# exit

Device(config)# flow exporter FLOW-EXPORTER-1
Device(config-exporter)#
```

Example: Configuring a Flow Monitor and Adding a Flow Record and Flow Exporter

The following configuration example, in flow monitor configuration mode, shows how to configure a flow monitor and add to it a flow record and flow exporter which enables flow sampling.

```
Device(config)# flow monitor FLOW-MONITOR-1
Device(config-flow-monitor)# record FLOW-RECORD-1
Device(config-flow-monitor)# exporter FLOW-EXPORTER-1
```

Example: Configuring a Sampler with a Copy Type

The following example shows how to configure a sampler for copy-based sampling. When the type **copy** is not specified the command is in noncopy-based sampling mode and the sampled packets are accounted for in hardware.

```
Device(config)# sampler SAMPLER-1
Device(config-sampler)# type copy
Device(config-sampler)# mode rand 1 out 10
Device(config)# end
```

Example: Applying the Monitor and Sampler to an Interface

The following example shows how to apply the monitor and sampler commands to an interface. Copy-based sampling is allowed only on the ingress direction. By applying a flow monitor and a sampler to the interface, you ensure the rate of analysis of the sampled packets is at the rate specified by the sampler. The sampled packets are then compared with the flow record associated with the flow monitor. If the analyzed packets meet the criteria specified by the flow record, they are added to the flow monitor cache.

```
Device(config)# interface g1/1
Device(config-if)# ip flow monitor FLOW-MONITOR-1 sampler SAMPLER-1 input
```

Additional References for IP-Aware MPLS NetFlow

Related Documents

Related Topic	Document Title
Overview of Cisco IOS NetFlow	<i>Cisco IOS NetFlow Overview</i>
Cisco IOS commands	Master Commands List, All Releases

Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Feature Information for IP-Aware MPLS NetFlow

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.

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Table 1: Feature Information for IP Aware MPLS Netflow

Feature Name	Releases	Feature Information
IP-Aware MPLS NetFlow	15.1(1)SY	<p>The IP-Aware MPLS NetFlow feature is an extension of the NetFlow accounting feature that uses copy-based sampling to copy sampled packets to the software where they can be further processed. This sampling provides highly granular traffic statistics for Cisco devices. NetFlow is a Cisco application that provides statistics on packets flowing through the device.</p> <p>The following command was introduced: type copy.</p>