NetFlow MPLS Aggregation

First Published: December 4th, 2006
Last Updated: December 4th, 2006

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

The NetFlow MPLS Aggregation feature helps you configure a lightweight version of NetFlow that captures high-level Multi Protocol Label Switching (MPLS) provider edge–provider edge (PE-to-PE) Traffic statistics for your network. The phrase “MPLS PE–to–PE traffic statistics” is often abbreviated as “MPLS-PET”.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the,

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Prerequisites for NetFlow MPLS Aggregation

The following prerequisites must be met before you configure the NetFlow MPLS Aggregation feature:

- The router must be configured for IP routing.
- One of the following must be enabled on your router and on the interfaces on which you want to configure NetFlow: Cisco Express Forwarding (CEF) or distributed CEF.

Restrictions for NetFlow MPLS Aggregation

The following restrictions apply to configuring the NetFlow MPLS Aggregation feature:

- This feature is intended for use on an MPLS PE node.
- Cisco 10K—If you have egress NetFlow configured and you configure NetFlow MPLS Aggregation, the parallel express forwarding (PXF) is changed to MPLS-PET NetFlow, and all NetFlow egress records will become MPLS-PET egress NetFlow records.
- Cisco 10K—NetFlow will not capture actual MPLS labels in the aggregation cache. The value in the MPLS labels field will be set to zero.
- Cisco 10K—The MPLS-PET records go directly to the aggregation cache, bypassing the main cache.

Information About NetFlow MPLS Aggregation

The NetFlow MPLS Aggregation feature allows you to generate a PE-to-PE traffic matrix with a minimal impact on the processing capabilities of your router. The data captured by the NetFlow MPLS Aggregation feture is similar to the data captured by Traffic Matrix Statistics (TMS). Cisco has discontinued TMS support in 12.2S. If you want to generate a PE-to-PE traffic matrix on a router running Cisco IOS Release 12.2S, you must use the NetFlow MPLS Aggregation feature.

The NetFlow MPLS Aggregation feature limits the impact on the processing capabilities of your router because it requires only the following information from the traffic that is analyzed by NetFlow:

- The interface on which the flow traffic is received on

- The exit point of the flow traffic from the MPLS cloud, such as the BGP next hop
- EXP bits from the imposed MPLS top label post switching
- The packet and byte counts for the flow

How to Configure NetFlow MPLS Aggregation

The tasks in this section explain how to configure and verify the NetFlow MPLS Aggregation feature:

- Configuring NetFlow MPLS Aggregation, page 3
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Configuring NetFlow MPLS Aggregation

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip flow-cache mpls label-positions** [*label-position-1* [*label-position-2* [*label-position-3*]]] **exp-bgp-prefix-fields**
4. **ip flow-export version 9 bgp-nexthop**
5. **ip flow-aggregation cache exp-bgp-prefix**
6. **export version 9**
7. **export destination** {*ip-address* | *hostname*} *port-number*
8. **enabled**
9. **exit**
10. **interface** *interface-number interface-type*
11. **ip flow** {**ingress** | **egress**}
12. **end**

DETAILED STEPS

	Command or Action	Purpose

Step 1	`enable`
	
	Example:
	`Router> enable`
		Enables privileged EXEC mode.
		• Enter your password if prompted.

Step 2	`configure terminal`
	
	Example:
	`Router# configure terminal`
		Enters global configuration mode.

	Command or Action	Purpose
Step 3	**ip flow-cache mpls label-positions** [*label-position-1* [*label-position-2* [*label-position-3*]]] **exp-bgp-prefix-fields** **Example:** `Router(config)# ip flow-cache mpls label-positions 1 2 exp-bgp-prefix-fields`	Configures the MPLS label positions and enables capturing the MPLS-PET traffic matrix data.
Step 4	**ip flow-export version 9 bgp-nexthop** **Example:** `Router(config)# ip flow-export version 9 bgp-nexthop`	Enables the export of information in NetFlow cache entries. • The **version 9** keyword specifies that the export packet uses the Version 9 format. • The **bgp-nexthop** keyword specifies that export statistics include BGP next hop related information.
Step 5	**ip flow-aggregation cache exp-bgp-prefix** **Example:** `Router(config)# ip flow-aggregation cache exp-bgp-prefix`	Enables the NetFlow **exp-bgp-prefix** aggregation cache and enters aggregation cache configuration mode.
Step 6	**export version 9** **Example:** `Router(config-flow-cache)# export version 9`	Specifies the version for the data export format • The **version 9** keyword specifies that the export packet uses the Version 9 format.
Step 7	**export destination** {*ip-address* | *hostname*} *port-number* **Example:** `Router(config-flow-cache)# export destination 172.16.10.2 99`	Enables the exporting of information from NetFlow aggregation caches. • The *ip-address* or *hostname* argument is the destination IP address or hostname. • The *port-number* argument is the destination port
Step 8	**enabled** **Example:** `Router(config-flow-cache)# enabled`	Enables the exp-bgp-prefix aggregation cache.
Step 9	**exit** **Example:** `Router(config-flow-cache)# end`	Exits aggregation cache configuration mode and returns to global configuration mode.
Step 10	**interface** *interface-number interface-type* **Example:** `Router(config)# interface fastethernet 2/1/1`	Specifies the interface on which you want to enable NetFlow and enters interface configuration mode.

	Command or Action	Purpose

Step 11	`ip flow {ingress | egress}`
	
	Example:
	`Router(config-if)# ip flow egress`
		Enables NetFlow on the interface.
		• **ingress**—captures traffic that is being received by the interface
		• **egress**—captures traffic that is being transmitted by the interface

Step 12	`end`
	
	Example:
	`Router(config-if)# end`
		Exits interface configuration mode and returns to privileged EXEC mode.

Verifying NetFlow MPLS Aggregation

SUMMARY STEPS

1. **enable**
2. **show ip cache verbose flow aggregation exp-bgp-prefix**

DETAILED STEPS

Step 1 **enable**

Enters privileged EXEC mode.

```
Router> enable
```

Step 2 **show ip cache verbose flow aggregation exp-bgp-prefix**

Displays the MPLS-PET traffic matrix from the exp-bgp-prefix aggregation cache.

```
Router# show ip cache verbose flow aggregation exp-bgp-prefix

IP Flow Switching Cache, 278544 bytes
  1 active, 4095 inactive, 4 added
  97 ager polls, 0 flow alloc failures
  Active flows timeout in 30 minutes
  Inactive flows timeout in 15 seconds
IP Sub Flow Cache, 17032 bytes
  1 active, 1023 inactive, 4 added, 4 added to flow
  0 alloc failures, 0 force free
  1 chunk, 1 chunk added

Src If         BGP Nexthop     Label  MPLS EXP    Flows    Pkts   B/Pk    Active
Gi4/0/0.102    10.40.40.40     0      0           1        5      100     0.0
```

Configuration Example for NetFlow MPLS Aggregation

This section provides the following example for configuring the NetFlow MPLS Aggregation feature:

- Configuring NetFlow MPLS Aggregation: Example, page 6

Configuring NetFlow MPLS Aggregation: Example

The following example shows how to configure the NetFlow MPLS Aggregation feature.

This example uses the following parameters for the exp-bgp-prefix aggregation cache:

- Cache size: 2046
- Inactive timeout: 200 seconds
- Active timeout: 45 minutes
- Export destination IP address and UDP port number: 172.16.10.2 99

```
!
ip flow-cache mpls label-positions 1 2 exp-bgp-prefix-fields
!
ip flow-export version 9 bgp-nexthop
!
ip flow-aggregation cache exp-bgp-prefix
!
 export version 9
 export destination 172.16.10.2 99
 cache entries 2046
 cache timeout inactive 200
 cache timeout active 45
 enabled
 exit
interface fastethernet 2/1/2
 ip flow ingress
 end
!
```

Additional References

The following sections provide references related to the NetFlow MPLS Aggregation feature.

Related Documents

Related Topic	Document Title
Cisco IOS NetFlow configuration	*Cisco IOS NetFlow Configuration Guide*, Release 12.4
Cisco IOS NetFlow commands	*Cisco IOS NetFlow Command Reference*, Release 12.2SB

Standards

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

MIBs

MIB	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: http://www.cisco.com/go/mibs

RFCs

RFC	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
The Cisco Technical Support & Documentation 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

Command Reference

This section documents modified commands only.

- ip flow-cache mpls label-positions

ip flow-cache mpls label-positions

To enable Multiprotocol Label Switching (MPLS)-Aware NetFlow, use the **ip flow-cache mpls label-positions** command in global configuration mode. To disable MPLS-aware NetFlow, use the **no** form of this command.

ip flow-cache mpls label-positions [*label-position-1* [*label-position-2* [*label-position-3*]]] [[**exp-bgp-prefix-fields**] [**no-ip-fields**]] [**mpls-length**]

no ip flow-cache mpls label-positions

Syntax Description

label-position-l	(Optional) Position of an MPLS label in the incoming label stack. Label positions are counted from the top of the stack, starting with 1.
no-ip-fields	(Optional) Controls the capture and reporting of MPLS flow fields. If the **no-ip-fields** keyword is not specified, the following IP-related flow fields are included: • Source IP address • Destination IP address • Transport layer protocol • Source application port number • Destination application port number • IP type of service (ToS) • TCP flag If the **no-ip-fields** keyword is specified, the IP-related fields are reported with a value of 0.
mpls-length	(Optional) Controls the reporting of packet length. If the **mpls-length** keyword is specified, the reported length represents the sum of the MPLS packet payload length and the MPLS label stack length. If the **mpls-length** keyword is not specified, only the length of the MPLS packet payload is reported.
exp-bgp-prefix-fields	(Optional) Generates a MPLS Provider Edge (PE) PE-to-PE traffic matrix. The following IP-related flow fields are included: • Input interface • BGP Nexthop • MPLS Experimental (EXP) bits The MPLS label values will be set to zero on the Cisco 10000 in the display output of the **show ip cache verbose flow aggregation exp-bgp-prefix** command.

Defaults

MPLS-Aware NetFlow is not enabled.

Command Modes

Global configuration

Command History

Release	Modification
12.0(24)S	This command was introduced.
12.0(25)S	The **no-ip-fields** and **mpls-length** keywords were added to the command.
12.3(8)T	This command was integrated into Cisco IOS Release 12.3(8)T.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2. The **exp-bgp-prefix-fields** keyword was added.

Usage Guidelines

You must have NetFlow accounting configured on your router before you can use this command.

Use this command to configure the NetFlow MPLS Aggregation feature on a label switch router (LSR) and to specify labels of interest in the incoming label stack. Label positions are counted from the top of the stack, starting with 1. The position of the top label is 1, the position of the second label is 2, and so forth.

With NetFlow MPLS Aggregation enabled on the router, NetFlow collects data for incoming IP packets and for incoming MPLS packets on all interfaces where NetFlow is enabled in full or in sampled mode.

Caution When you enter the **ip flow-cache mpls label-positions** command on a Cisco 12000 Series Internet Router, NetFlow will stop collecting data for incoming IP packets on any Engine 4P line cards installed in the router on which NetFlow is enabled in full or in sampled mode. Engine 4P line cards in a Cisco 12000 Series Internet Router do not support NetFlow data collection of incoming IP packets and MPLS packets concurrently.

Tip NetFlow MPLS Aggregation is enabled in global configuration mode. NetFlow is enabled per interface.

Examples

The following example shows how to configure NetFlow MPLS Aggregation to capture the first (top), third, and fifth label:

```
Router(config)# ip flow-cache mpls label-positions 1 3 5
```

The following example shows how to configure NetFlow MPLS Aggregation to capture only MPLS flow information (no IP-related flow fields) and the length that represents the sum of the MPLS packet payload length and the MPLS label stack length:

```
Router(config)# ip flow-cache mpls label-positions no-ip-fields mpls-length
```

The following example shows how to configure MPLS PE-to-PE Traffic Statistics for Netflow:

```
Router(config)# ip flow-cache mpls label-positions 1 2 exp-bgp-prefix-fields
```

Related Commands

Command	Description
ip flow ingress	Enables NetFlow (ingress) accounting for traffic arriving on an interface.
ip flow egress	Enables NetFlow egress accounting for traffic that the router is forwarding.

Command	Description
ip flow-egress input-interface	Removes the NetFlow egress accounting flow key that specifies an output interface and adds a flow key that specifies an input interface for NetFlow egress accounting.
ip flow-cache timeout	Specifies NetFlow accounting flow cache parameters.
ip flow-cache entries	Changes the number of entries maintained in the NetFlow accounting cache.
show ip cache flow	Displays a summary of the NetFlow accounting statistics.
show ip cache verbose flow	Displays a detailed summary of the NetFlow accounting statistics.
show ip flow interface	Displays NetFlow accounting configuration for interfaces.

Feature Information for NetFlow MPLS Aggregation

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For details on when support for a specific command was introduced, see the command reference documentation.

For information on a feature in this technology that is not documented here, see the "Cisco IOS NetFlow Features Roadmap" module.

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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 NetFlow MPLS Aggregation

Feature Name	Releases	Feature Configuration Information
NetFlow MPLS Aggregation	12.2(31)SB2	The NetFlow MPLS Aggregation feature helps you configure a lightweight version of NetFlow that captures high-level Multi Protocol Label Switching (MPLS) provider edge–provider edge (PE-to-PE) Traffic statistics for your network. The following commands were modified by this feature: **ip flow-aggregation cache**, **ip flow-cache mpls label-positions**, **show ip cache verbose flow aggregation**.

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