Output Sampled NetFlow

The Output Sampled NetFlow feature collects NetFlow statistics for outgoing IPv4 traffic on Cisco 12000 Series IP Service Engine (ISE) line cards.

Feature History for Output Sampled NetFlow

Feature History	
Release	**Modification**
12.0(24)S	This feature was introduced.
12.0(26)S	The feature was enhanced to report the input interface field in a flow as the lowest interface on the ingress line card from which the flow arrives. Support for the Cisco 12000 Series 4-Port Gigabit Ethernet ISE line card was added.

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 Output Sampled Netflow

If you are aggregating NetFlow data, you should have aggregation schemes configured.

If you are exporting NetFlow data, you will need a NetFlow collector and analyzer capable of collecting NetFlow export packets in Version 5, 8, or 9 format.

Table 1 lists the Cisco 12000 series line cards that support output sampled NetFlow.

Table 1 Cisco 12000 Series Line Cards Support for Output Sampled NetFlow

Type	Line Card
Packet Over Sonet (POS)	4-Port OC-12 POS ISE 1-Port OC-48 POS ISE 4-Port OC-3 POS ISE 8-Port OC-3 POS ISE 16-Port OC-3 POS ISE
Channelized Interfaces	1-Port CHOC-48 ISE 4-Port CHOC-12 ISE
Ethernet	4-Port GE ISE

Restrictions for Output Sampled Netflow

- In Cisco IOS Release 12.0(24)S, output sampled NetFlow is implemented only on Cisco 12000 Series IP Service Engine (ISE) line cards.
- In Cisco IOS Release 12.0(24)S, the feature reports the input interface field as “NULL” in all flow records.

  However, starting in Cisco IOS Release 12.0(26)S, the input interface field in a flow is reported as the lowest interface on the ingress line card from which the flow arrives.

Information About Output Sampled Netflow

To configure and use the Output Sampled Netflow feature, you must understand the following concepts:

- Output Sampled NetFlow, page 2
- NetFlow Configuration, page 3

Output Sampled NetFlow

Configuring sampled NetFlow on an interface allows you to collect NetFlow statistics for a subset of incoming (ingress) IPv4 traffic on the interface, selecting only one out of “N” sequential packets, where “N” is a configurable parameter. Configuring output sampled NetFlow on an interface allows you to collect NetFlow statistics for a subset of outgoing (egress) IPv4 traffic on the interface. This outgoing IPv4 traffic can arrive at the router as either MPLS or IPv4; however, the feature will collect NetFlow statistics only on IPv4 traffic leaving the interface.

Output sampled NetFlow uses the output interface as a key flow field instead of the input interface. The feature reports the input interface flow field as:

- NULL, starting in Cisco IOS Release 12.0(24)S
- The lowest interface on the ingress line card from which a flow arrives, starting in Cisco IOS Release 12.0(26)S. For example, if the input subinterface of flow traffic is POS2/1.10, output sampled NetFlow reports the input subinterface as POS2/0.

For more information on existing NetFlow features, see the "Related Documents" section on page 6.

NetFlow Configuration

Output sampled NetFlow shares configuration of the packet sampling interval, export, and aggregation settings with input sampled NetFlow. For example, the packet sampling interval setting applies globally to both input and output sampled NetFlow.

For more information on configuring the packet sampling interval, export, and aggregation see the "Related Documents" section on page 6.

How to Configure Output Sampled NetFlow

This section provides the procedure for configuring output sampled NetFlow on an ISE line card.

Configure Output Sampled NetFlow on an Interface

SUMMARY STEPS

1. **enable**
2. **configure** {**terminal** | **memory** | **network**}
3. **interface** *type slot/port*
4. **ip route-cache flow [sampled** [{**input** | **output**}]]
5. Repeat steps 3 and 4 for each interface.

DETAILED STEPS

	Command or Action	Purpose

Step 1	`enable`
	
	Example:
	`Router> enable`
		Enables higher privilege levels, such as privileged EXEC mode.
		• Enter your password if prompted.

Step 2	`configure {terminal | memory | network}`
	
	Example:
	`Router# configure terminal`
		Enters global configuration mode.

	Command or Action	Purpose
Step 3	**interface** *type slot/port* **Example:** `Router(config)# interface pos 3/0`	Specifies an interface and enters interface configuration mode.
Step 4	**ip route-cache flow** [**sampled** [{**input** | **output**}]] **Example:** `Router(config-if)# ip route-cache flow sampled output`	Enables NetFlow data collection on the interface: • The sampled keyword enables NetFlow data collection in sampled mode on the interface. • The **input** keyword (default) enables NetFlow data collection for incoming (ingress) traffic on the interface. • The **output** keyword enables NetFlow data collection for outgoing (egress) traffic on the interface. This example enables output sampled NetFlow on the interface.
Step 5	Repeat Steps 3 and 4 for each interface where you want to enable NetFlow accounting.	—

Step 6	`exit`
	
	Example:
	`Router(config-if)# exit`
		Exits the current mode.

Step 7	`exit`
	
	Example:
	`Router(config)# exit`
		Exits the current mode.

Display NetFlow Cache Information

Perform this task to display output sampled NetFlow cache information.

SUMMARY STEPS

1. **enable**
2. **attach** *slot-number*
3. **show ip cache verbose flow**
4. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables higher privilege levels, such as privileged EXEC mode. Enter your password if prompted.
Step 2	**attach** *slot-number* **Example:** `Router# attach 3`	Accesses the Cisco IOS software image on a line card. • The *slot-number* argument is the slot number of the line card.
Step 3	**show ip cache** [**verbose**] **flow** **Example:** `LC-Slot3# show ip cache verbose flow`	Displays input and output IP flow records in the NetFlow cache. • Use the **verbose** keyword to display flow records in the NetFlow cache in detailed format.
Step 4	**exit** **Example:** `LC-Slot3# exit`	Exits to privileged EXEC mode.

Configuration Example for Output Sampled NetFlow

This section provides the following configuration examples:

- Output Sampled NetFlow Configuration Example, page 5
- Displaying NetFlow Cache Information Example, page 6

Output Sampled NetFlow Configuration Example

The following example enables output sampled NetFlow on interface POS 3/0. This example also includes a configuration of NetFlow export, NetFlow sampling rate, and aggregation scheme.

```
interface POS3/0
 ip route-cache flow sampled output
!
```

```
ip flow-export version 5 origin-as
ip flow-export destination 172.16.1.3 3000
ip flow-export source Loopback0
ip flow-sampling-mode packet-interval 101
ip flow-aggregation cache destination-prefix-tos
 enabled
```

Displaying NetFlow Cache Information Example

The following output from the **show ip cache verbose flow** command in Cisco IOS Release 12.0(24)S shows the current content of the NetFlow cache with output flows that are indicated by a NULL value in the source (input) interface field.

```
Router> enable
Router# attach 3
LC-Slot3# show ip cache verbose flow
  ...
  SrcIf        SrcIPaddress  DstIf        DstIPaddress  Pr TOS Flgs   Pkts
  Port Msk AS                Port Msk AS  NextHop       B/Pk   Active
  NULL         10.1.1.1      PO3/0        10.0.0.1      06 00  00      24K
  0100 /24 50                0200 /0  60  10.2.1.1      256    34.6
```

The next example shows sample output from the **show ip cache verbose flow** command in Cisco IOS Release 12.0(26)S and later releases for an output flow. In this example, the source (input) interface of the flow is POS2/1.10. However, the source interface field is displayed as PO2/0, the lowest interface on the ingress line card from which the flow arrives.

```
Router> enable
Router# attach 3
LC-Slot3# show ip cache verbose flow
  ...
  SrcIf        SrcIPaddress  DstIf        DstIPaddress  Pr TOS Flgs   Pkts
  Port Msk AS                Port Msk AS  NextHop       B/Pk   Active
  PO2/0        10.1.1.1      PO3/0        10.0.0.1      06 00  00      24K
  0100 /24 50                0200 /0  60  10.2.1.1      256    34.6
```

Additional References

For additional information related to output sampled NetFlow, refer to the following references:

Related Documents

Related Topic	Document Title
Enabling Sampled NetFlow and customizing the sampling mode interval.	*Sampled NetFlow,* Release 12.0(11)S
NetFlow aggregation cache configuration	NetFlow ToS-Based Router Aggregation, Release 12.0(15)S
Configuring NetFlow multiple export destinations	NetFlow Multiple Export Destinations, Release 12.0(19)S
Enabling NetFlow switching and exporting NetFlow cache entries	Configuring NetFlow Switching" chapter in the *Cisco IOS Switching Services Configuration Guide*, Release 12.0
NetFlow commands	*Cisco IOS Switching Services Command Reference*, Release 12.0

Standards

Standards[1]	Title
• No new or modified MIBs are supported by this feature.	—

1. Not all supported standards are listed.

MIBs

MIBs[1]	MIBs Link
• No new or modified MIBs are supported by this feature.	To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL: http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

1. Not all supported MIBs are listed.

To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:

http://tools.cisco.com/ITDIT/MIBS/servlet/index

If Cisco MIB Locator does not support the MIB information that you need, you can also obtain a list of supported MIBs and download MIBs from the Cisco MIBs page at the following URL:

http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

To access Cisco MIB Locator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions found at this URL:

http://www.cisco.com/register

RFCs

RFCs[1]	Title
• No new or modified MIBs are supported by this feature.	—

1. Not all supported RFCs are listed.

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, tools, and lots more. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

This section documents modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.0 command reference publications.

ip route-cache flow

To enable NetFlow data collection on an interface, use the **ip route-cache flow** command in interface configuration mode. To disable NetFlow switching, use the **no** form of this command.

ip route-cache flow [**sampled** [{**input** | **output**}]]

no ip route-cache flow

Syntax Description

sampled	(Optional) Enables NetFlow data collection in sampled mode on the interface.
input	(Optional) Enables NetFlow data collection for incoming (ingress) traffic on the interface.
output	(Optional) Enables NetFlow data collection for outgoing (egress) traffic on the interface.

Defaults

This command is not enabled by default.

If neither the **input** nor **output** keywords are specified in the command, NetFlow collects statistics for incoming traffic.

Command Modes

Interface configuration

Command History

Release	Modification
11.1	This command was introduced.
12.0(11)S	The **sampled** keyword was added.
12.0(24)S	The **input** and **output** keywords were added.

Usage Guidelines

You can enable input, output, or both input and output NetFlows on an interface at the same time.

Note NetFlow does consume additional memory and CPU resources on your router and line cards.

Examples

The following example shows output sampled NetFlow enabled on interface POS3/0.

```
interface POS3/0
 ip route-cache flow sampled output
```

Related Commands!

Command	Description
ip flow-export	Configures the exporting of information from the NetFlow cache.
ip flow-sampling-mode	Enables NetFlow in sampling mode.
ip flow-aggregation cache	Enables aggregation cache configuration mode.