Configuring IPv4 Multicast Statistics Support for Flexible NetFlow

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This document contains information about and instructions for configuring the Cisco IOS Flexible NetFlow--IPv4 Multicast Statistics Support feature. Prior to the introduction of the Flexible NetFlow--IPv4 Multicast Statistics Support feature, Flexible NetFlow could analyze IPv4 multicast traffic, but could not report the number of replicated bytes or the number of replicated packets in multicast flows. The Flexible NetFlow--IPv4 Multicast Statistics Support feature adds the capability of reporting the number of replicated bytes and the number of replicated packets in multicast flows to Flexible NetFlow.

NetFlow is a Cisco IOS technology that provides statistics on packets flowing through a networking device. NetFlow is the standard for acquiring IP operational data from IP networks. NetFlow provides provides data to support 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 facilitates the creation of more complex configurations for traffic analysis and data export through the use of reusable configuration components.

- Finding Feature Information, page 1
- Prerequisites for Configuring IPv4 Multicast Statistics Support, page 2
- Restrictions for Configuring IPv4 Multicast Statistics Support, page 2
- Information About IPv4 Multicast Statistics Support, page 2
- How to Configure IPv4 Multicast Statistics Support, page 3
- Configuration Examples for IPv4 Multicast Statistics Support, page 6
- Where to Go Next, page 7
- Additional References, page 7
- Feature Information for IPv4 Multicast Statistics Support, page 9

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 Table at the end of this document.

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Prerequisites for Configuring IPv4 Multicast Statistics Support

- You are familiar with the information in the " Cisco IOS Flexible NetFlow Overview " module.
- You are familiar with the information in the " Customizing Cisco IOS Flexible NetFlow Flow Records and Flow Monitors " module.
- The networking device is running a Cisco IOS release that supports the Flexible NetFlow--IPv4 Multicast Statistics Support feature.
- The networking device is configured for IPv4 unicast routing and IPv4 multicast routing.
- One of the following is enabled on your networking device and on any interfaces on which you want to enable Flexible NetFlow: Cisco Express Forwarding, distributed Cisco Express Forwarding.

Restrictions for Configuring IPv4 Multicast Statistics Support

IPv4 Traffic

- When the replication-factor field is used in a flow record, it will only have a nonzero value in the cache for ingress multicast traffic that is forwarded by the router. If the flow record is used with a flow monitor in output (egress) mode and to monitor unicast traffic, the cache data for the replication factor field is set to 0.

IPv6 Traffic

- Traffic monitoring for multicast statistics is not supported.

Cisco IOS Release 12.2(50)SY

- Multicast replication factor is not supported.

Information About IPv4 Multicast Statistics Support

- Replicated Bytes and Packets Reporting, page 2

Replicated Bytes and Packets Reporting

The Flexible NetFlow--IPv4 Multicast Statistics Support feature adds the capability of reporting the number of replicated bytes and the number of replicated packets in multicast flows to Flexible NetFlow. You can capture the packet-replication factor for a specific flow and for each outgoing stream.

You can use the The Flexible NetFlow--IPv4 Multicast Statistics Support feature to identify and count multicast packets on the ingress side or the egress side (or both sides) of a networking device. Multicast

ingress accounting provides information about the source and how many times the traffic was replicated. Multicast egress accounting monitors the destination of the traffic flow.

How to Configure IPv4 Multicast Statistics Support

- Configuring IPv4 Multicast Statistics Support, page 3

Configuring IPv4 Multicast Statistics Support

This task explains the steps that are used to configure multicast statistics support for IPv4 traffic.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **flow record** *flow-record-name*
4. **description** *description*
5. **match routing is-multicast**
6. Add key fields for the record as required using other **match** commands.
7. **collect counter** {**bytes replicated** [**long**] | **packets replicated** [**long**]}
8. **collect routing multicast replication-factor**
9. Add nonkey fields for the record as required using other **collect** commands.
10. **exit**
11. **flow monitor** *monitor-name*
12. **description** *description*
13. **record** *record-name*
14. **exit**
15. **interface** *type number*
16. **ip flow monitor** *monitor-name* [**multicast** | **unicast**] {**input** | **output**}
17. Repeat Steps 15 and 16 to activate a flow monitor on any other interfaces in the networking device over which you want to monitor traffic.
18. **end**
19. **show flow monitor** [[**name**] *monitor-name* [**cache** [**format** {**csv** | **record** | **table**}]][**statistics**]]

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.

	Command or Action	Purpose
Step 2	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode.
Step 3	**flow record** *flow-record-name* **Example:** `Router(config)# flow record FLOW-RECORD-2`	Creates a flow record and enters Flexible NetFlow flow record configuration mode. • This command also allows you to modify an existing flow record.
Step 4	**description** *description* **Example:** `Router(config-flow-record)# description Used for IPv4 multicast traffic analysis`	(Optional) Creates a description for the flow record.
Step 5	**match routing is-multicast** **Example:** `Router(config-flow-record)# match routing is-multicast`	Configures IPv4 multicast destination addresses (indicating that the IPv4 traffic is multicast traffic) as a key field for the flow record.
Step 6	Add key fields for the record as required using other **match** commands.	For information about the other **match** commands that are available to configure key fields, refer to the Cisco IOS Flexible NetFlow Command Reference.
Step 7	**collect counter** {**bytes replicated** [**long**] | **packets replicated** [**long**]} **Example:** `Router(config-flow-record)# collect counter packets replicated`	Configures the number of bytes or packets multiplied by the multicast replication factor (number of interfaces the multicast traffic is forwarded over) as a nonkey field. • Default: Uses a 32-bit counter. The **long** keyword configures a 64-bit counter.
Step 8	**collect routing multicast replication-factor** **Example:** `Router(config-flow-record)# collect routing multicast replication-factor`	Configures the multicast replication factor (number of interfaces over which multicast traffic is forwarded) as a nonkey field.
Step 9	Add nonkey fields for the record as required using other **collect** commands.	For information about the other **collect** commands that are available to configure nonkey fields, refer to the Cisco IOS Flexible NetFlow Command Reference.

	Command or Action	Purpose
Step 10	**exit** **Example:** `Router(config-flow-record)# exit`	Exits Flexible NetFlow flow record configuration mode and returns to global configuration mode.
Step 11	**flow monitor** *monitor-name* **Example:** `Router(config)# flow monitor FLOW-MONITOR-2`	Creates a flow monitor and enters Flexible NetFlow flow monitor configuration mode. • This command also allows you to modify an existing flow monitor.
Step 12	**description** *description* **Example:** `Router(config-flow-monitor)# description Used for IPv4 multicast traffic analysis`	(Optional) Creates a description for the flow monitor.
Step 13	**record** *record-name* **Example:** `Router(config-flow-monitor)# record FLOW-RECORD-2`	Specifies the record for the flow monitor.
Step 14	**exit** **Example:** `Router(config-flow-record)# exit`	Exits Flexible NetFlow flow monitor configuration mode and returns to global configuration mode.
Step 15	**interface** *type number* **Example:** `Router(config)# interface ethernet 0/0`	Specifies an interface and enters interface configuration mode.
Step 16	**ip flow monitor** *monitor-name* [**multicast** | **unicast**] {**input** | **output**} **Example:** `Router(config-if)# ip flow monitor FLOW-MONITOR-2 input`	Activates the flow monitor that was created previously by assigning it to the interface to analyze traffic. • To monitor only multicast traffic, use the **multicast** keyword. • Default: Unicast traffic and multicast traffic are monitored.

	Command or Action	Purpose
Step 17	Repeat Steps 15 and 16 to activate a flow monitor on any other interfaces in the networking device over which you want to monitor traffic.	--
Step 18	**end** **Example:** `Router(config-if)# end`	Exits interface configuration mode and returns to privileged EXEC mode.
Step 19	**show flow monitor** [[**name**] *monitor-name* [**cache** [**format** {**csv** | **record** | **table**}]][**statistics**]] **Example:** `Router# show flow monitor FLOW-MONITOR-2 cache`	(Optional) Displays the status and statistics for a Flexible NetFlow flow monitor.

Examples

The following output from the **show flow monitor** command shows four multicast flows and three unicast flows:

```
Router# show flow monitor FLOW-MONITOR-2 cache

Cache type:                               Normal
  Cache size:                               4096
  Current entries:                             8
  High Watermark:                              8
  Flows added:                              4074
  Flows aged:                               4066
    - Active timeout   (  1800 secs)          46
    - Inactive timeout (    15 secs)        4020
    - Event aged                               0
    - Watermark aged                           0
    - Emergency aged                           0
IP IS MULTICAST  IPV4 DST ADDR      pkts rep
===============  ===============  ==========
Yes              224.192.16.1          16642
Yes              224.192.65.1          16621
No               10.1.4.2                  0
No               10.1.2.2                  0
No               10.1.3.2                  0
Yes              224.0.0.13                0
No               255.255.255.255           0
Yes              224.0.0.1                 0
```

Configuration Examples for IPv4 Multicast Statistics Support

- Example Configuring IPv4 Multicast Statistics Support, page 6

Example Configuring IPv4 Multicast Statistics Support

This example shows how to configure the following:

- IPv4 multicast destination addresses (indicating that the IPv4 traffic is multicast traffic) as a key field.
- The destination IPv4 address as a key field.
- The replicated packet count as a nonkey field.
- The replication factor as a nonkey field.
- The flow monitor in order to monitor only multicast traffic.

This sample starts in global configuration mode:

```
!
flow record FLOW-RECORD-2
 match routing is-multicast
 match ipv4 destination address
 collect counter packets replicated
 collect routing multicast replication-factor
 exit
!
flow monitor FLOW-MONITOR-2
 record FLOW-RECORD-2
 exit
!
interface Ethernet 0/0
 no shut
 ip address 10.1.1.2 255.255.255.0
 ip flow monitor FLOW-MONITOR-2 multicast input
!
end
```

Where to Go Next

If you want to configure 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

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases
Overview of Flexible NetFlow	"Cisco IOS Flexible NetFlow Overview"
Emulating original NetFlow with Flexible NetFlow	"Getting Started with Configuring Cisco IOS Flexible NetFlow"
Configuring flow exporters to export Flexible NetFlow data	"Configuring Data Export for Cisco IOS Flexible NetFlow with Flow Exporters"

Related Topic	Document Title
Configuring flow sampling to reduce the overhead of monitoring traffic with Flexible NetFlow	"Using Cisco IOS Flexible NetFlow Flow Sampling to Reduce the CPU Overhead of Analyzing Traffic"
Configuring Flexible NetFlow using predefined records	"Configuring Cisco IOS Flexible NetFlow with Predefined Records"
Using Flexible NetFlow Top N Talkers to analyze network traffic	"Using Cisco IOS Flexible NetFlow Top N Talkers to Analyze Network Traffic"
Configuration commands for Flexible NetFlow	*Cisco IOS Flexible NetFlow Command Reference*

Standards

Standard	Title
None	--

MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 3954	*Cisco Systems NetFlow Services Export Version 9*

Technical Assistance

Description	Link
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.	http://www.cisco.com/cisco/web/support/index.html

Feature Information for IPv4 Multicast Statistics 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.

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Table 1 Feature Information for Flexible NetFlow --IPv4 Multicast Statistics Support

Feature Name	Releases	Feature Information
Flexible NetFlow	12.2(33)SRC 12.2(50)SY 12.4(9)T 15.0(1)SY	Flexible NetFlow is introduced. Support for this feature was added for Cisco 7200 series routers in Cisco IOS Release 12.2(33)SRC. The following commands were introduced or modified: **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 platform**, **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**,

Feature Name	Releases	Feature Information
		template data timeout, **transport** (Flexible NetFlow).
Flexible NetFlow--IPv4 Multicast Statistics Support	12.2(33)SRE 12.2(50)SY 12.4(22)T 15.0(1)SY	The Flexible NetFlow--IPv4 Multicast Statistics Support feature adds the capability of reporting the number of replicated bytes and the number of replicated packets in multicast flows to Flexible NetFlow. Support for this feature was added for Cisco 7200 and 7300 Network Processing Engine (NPE) series routers in Cisco IOS Release 12.2(33)SRE. The following commands were introduced or modified: **collect counter**, **collect routing is-multicast**, **collect routing multicast replication-factor**, **match routing is-multicast**, **match routing multicast replication-factor**, **ip flow monitor**, **ipv6 flow monitor**.