



Configuring NetFlow

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Information About NetFlow

NetFlow allows you to evaluate IP and Ethernet traffic and understand how and where it flows. NetFlow gives you visibility into traffic that transits the virtual switch by characterizing traffic based on its source, destination, timing, and application information. You can use this information to assess network availability and performance, assist in meeting regulatory requirements (compliance), and help with troubleshooting. NetFlow gathers data that you can use for accounting, network monitoring, and network planning.

What is a Flow

A flow is a one-directional stream of packets that arrives on a source interface (or subinterface), matching a set of criteria. All packets with the same source/destination IP address, source/destination ports, protocol, interface, and class of service are grouped into a flow and then packets and bytes are tallied. This condenses a large amount of network information into a database called the NetFlow cache.

You create a flow using a flow record to define the criteria for your flow. All criteria must match for the packet to count in the given flow. Flows are stored in the NetFlow cache. Flow information tells you the following:

- Source address tells you who is originating the traffic.
- Destination address tells who is receiving the traffic

- Ports characterize the application that uses the traffic
- Class of service examines the priority of the traffic
- The device interface tells how traffic is being used by the network device
- Talled packets and bytes show the amount of traffic

Flow Record Definition

A flow record defines the information that NetFlow gathers, such as the packets in the flow and the types of counters gathered per flow. You can define new flow records or use the predefined Cisco Nexus 1000V flow record.

Predefined flow records use 32-bit counters and are not recommended for data rates above 1 Gbps. For data rates that are higher than 1 Gbps, Cisco recommends that you manually configure the records to use 64-bit counters.

The following table describes the criteria defined in a flow record.

Table 1: Flow Record Criteria

Flow Record Criteria	Description
Match	<p>Defines the information that is matched for collection in the flow record.</p> <ul style="list-style-type: none"> • ip—Data collected in the flow record matches one of the following IP options: <ul style="list-style-type: none"> • Protocol • tos (type of service) • IPv4—Data collected in the flow record matches one of the following IPv4 address options: <ul style="list-style-type: none"> • Source address • Destination address • Transport—Data collected in the flow record matches one of the following transport options: <ul style="list-style-type: none"> • Destination port • Source port

Flow Record Criteria	Description
Collect	<p>Defines how the flow record collects information.</p> <ul style="list-style-type: none"> • Counter—Collects flow record information in one of the following formats: <ul style="list-style-type: none"> • Bytes—32-bit counter (default). • Bytes long—64-bit counter (recommended for data rates that are higher than 1 Gbps). • Packets—32-bit counter (default). or 64-bit counters. • Packets long—64-bit counters (recommended for data rates that are higher than 1 Gbps). • timestamp sys-uptime—Collects the system uptime for the first or last packet in the flow. • transport tcp flags—Collects the TCP transport layer flags for the packets in the flow. <p>Note 64-bit counters are recommended.</p>

Predefined Flow Records

Cisco Nexus 1000V Predefined Flow Record—Netflow-Original

```

switch# show flow record netflow-original
Flow record netflow-original:
  Description: Traditional IPv4 input NetFlow with origin ASs
  No. of users: 0
  Template ID: 0
  Fields:
    match ipv4 source address
    match ipv4 destination address
    match ip protocol
    match ip tos
    match transport source-port
    match transport destination-port
    match interface input
    match interface output
    match flow direction
    collect routing source as
    collect routing destination as
    collect routing next-hop address ipv4
    collect transport tcp flags
    collect counter bytes
    collect counter packets
    collect timestamp sys-uptime first
    collect timestamp sys-uptime last
switch#

```



Note Although the following lines appear in the output of the **show flow record** command, the commands they are based on are not currently supported in the Cisco Nexus 1000V. The use of these commands does not affect on the configuration.

```
collect routing source as
collect routing destination as
collect routing next-hop address ipv4
```

Cisco Nexus 1000V Predefined Flow Record—Netflow IPv4 Original-Input

```
switch# show flow record netflow ipv4 original-input
Flow record netflow ipv4 original-input:
  Description: Traditional IPv4 input NetFlow
  No. of users: 0
  Template ID: 0
  Fields:
    match ipv4 source address
    match ipv4 destination address
    match ip protocol
    match ip tos
    match transport source-port
    match transport destination-port
    match interface input
    match interface output
    match flow direction
    collect routing source as
    collect routing destination as
    collect routing next-hop address ipv4
    collect transport tcp flags
    collect counter bytes
    collect counter packets
    collect timestamp sys-uptime first
    collect timestamp sys-uptime last
switch#
```

Cisco Nexus 1000V Predefined Flow Record—Netflow IPv4 Original-Output

```
switch# show flow record netflow ipv4 original-output
Flow record netflow ipv4 original-output:
  Description: Traditional IPv4 output NetFlow
  No. of users: 0
  Template ID: 0
  Fields:
    match ipv4 source address
    match ipv4 destination address
    match ip protocol
    match ip tos
    match transport source-port
    match transport destination-port
    match interface input
    match interface output
    match flow direction
    collect routing source as
    collect routing destination as
    collect routing next-hop address ipv4
    collect transport tcp flags
    collect counter bytes
    collect counter packets
    collect timestamp sys-uptime first
```

```
        collect timestamp sys-uptime last
switch#
```

Cisco Nexus 1000V Predefined Flow Record—Netflow Protocol-Port

```
switch# show flow record netflow protocol-port
Flow record netflow protocol-port:
  Description: Protocol and Ports aggregation scheme
  No. of users: 0
  Template ID: 0
  Fields:
    match ip protocol
    match transport source-port
    match transport destination-port
    match interface input
    match interface output
    match flow direction
    collect counter bytes
    collect counter packets
    collect timestamp sys-uptime first
    collect timestamp sys-uptime last
switch#
```

Accessing NetFlow Data

You can use two methods to access NetFlow data:

- Command-line interface (CLI)
- NetFlow collector (a separate product from the Cisco Nexus 1000V for KVM)

Command-line Interface for NetFlow

You can use the CLI to access NetFlow data and to view what is happening in your network now.

The CLI uses a flow monitor and a flow exporter to capture and export flow records to the Netflow collector. Cisco Nexus 1000V supports the NetFlow Version 9 export format.



Note The Cisco Nexus 1000V supports UDP as the transport protocol for exporting data to up to two exporters per monitor.

Flow Monitor

A flow monitor creates an association between the following NetFlow components:

- Flow record—Consists of matching and collection criteria
- Flow exporter—Consists of the export criteria

This flow monitor enables a set, which consists of a record and an exporter. You can define this set once and reuse it multiple times. You can create multiple flow monitors for different needs. A flow monitor is applied to a specific interface or port profile in a specific direction.

Flow Exporter

Use the flow exporter to define where the flow records are sent from the cache to the reporting server, which is called the NetFlow collector. An exporter definition includes the following.

- Destination IP address
- Source IP address to spoof
- UDP port number (where the collector is listening)
- Export format

**Note**

NetFlow export packets use the source IP address assigned to the exporter. If the exporter does not have a source IP address assigned to it, the exporter will be inactive.

NetFlow Collector

Flows are expired when they are older than the inactive or active timeout.

The NetFlow data reporting process is as follows:

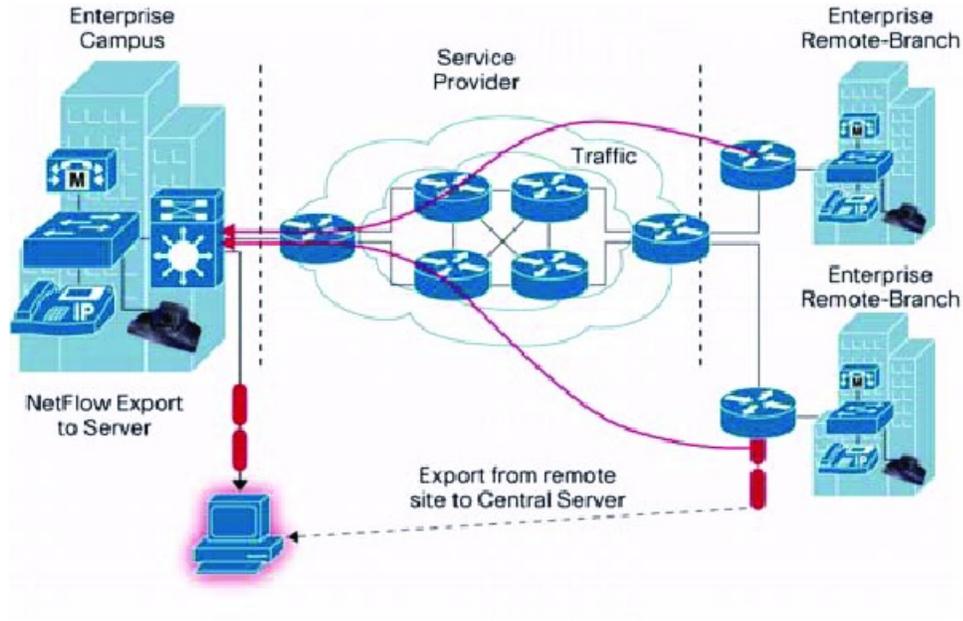
1. You configure NetFlow records to define the information that NetFlow gathers.
2. You configure Netflow monitor to capture flow records to the NetFlow cache.
3. You configure NetFlow export to send flows to the collector.
4. The Cisco Nexus 1000V searches the NetFlow cache for flows that have expired and exports them to the NetFlow collector server.
5. Flows are bundled together based on space availability in the UDP export packet and based on an export timer.
6. The NetFlow collector software creates real-time or historical reports from the data.

Exporting Flows to the NetFlow Collector Server

Timers determine when a flow is exported to the NetFlow collector server. See the following figure where a flow is ready for export when one of the following occurs:

- The flow is inactive for a certain amount of time, during which no new packets are received for the flow.
- The flow has lived longer than the active timer, such as a long FTP download.
- The flow cache is full and some flows must be aged out to make room for new flows.

Figure 1: Exporting Flows to the NetFlow Collector Server



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What NetFlow Data Looks Like

The following figure shows an example of NetFlow data.

Figure 2: NetFlow Cache Example

1. Flow cache—The first unique packet creates a flow

SrcIf	SrcPaddr	DstIf	DstPaddr	Protocol	TOS	Flags	Pkts	Src Port	Src Msk	Src AS	Dst Port	Dst Msk	Dst AS	NextHop	Bytes/Pkt	Active	Idle
Fa1/0	173.100.21.2	Fa0/0	10.0.227.12	T1	80	10	11000	162	/24	5	183	/24	15	10.0.23.2	1528	1745	4
Fa1/0	173.100.3.2	Fa0/0	10.0.227.12	E	40	0	2491	15	/26	196	18	/24	15	10.0.23.2	740	41.5	1
Fa1/0	173.100.20.2	Fa0/0	10.0.227.12	T1	80	10	10000	161	/24	180	10	/24	15	10.0.23.2	1428	1145.5	3
Fa1/0	173.100.6.2	Fa0/0	10.0.227.12	E	40	0	2210	18	/30	180	19	/24	15	10.0.23.2	1040	24.5	14

2. Flow Aging Timers

- Inactive Flow
- Long Flow
- Flow ends by RST or FIN TCP Flag

SrcIf	SrcPaddr	DstIf	DstPaddr	Protocol	TOS	Flags	Pkts	Src Port	Src Msk	Src AS	Dst Port	Dst Msk	Dst AS	NextHop	Bytes/Pkt	Active	Idle
Fa1/0	173.100.21.2	Fa0/0	10.0.227.12	T1	80	10	11000	00A2	/24	5	00A2	/24	15	10.0.23.2	1528	1800	4

3. Transport Flows to Reporting Server



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Network Analysis Module

You can also use the Cisco Network Analysis Module (NAM) to monitor NetFlow data sources. NAM enables traffic analysis views and reports such as hosts, applications, conversations, VLAN, and QoS.

High Availability for NetFlow

The Cisco Nexus 1000V supports stateful restarts for NetFlow. After a reboot or supervisor switchover, the Cisco Nexus 1000V applies the running configuration.

Configuration Guidelines and Limitations for NetFlow

- In Cisco Nexus 1000V, the mgmt0 interface IP address of the VSM is configured by default as the source IP address for an exporter.
- Predefined flow records use 32-bit counters and are not recommended for data rates above 1 Gbps. For data rates that are higher than 1 Gbps, Cisco recommends that you manually configure the records to use 64-bit counters.
- Cisco Nexus 1000V includes the following predefined flow records:
 - netflow-original—Cisco Nexus 1000V predefined traditional IPv4 input NetFlow with origin ASs



Note The routing-related fields in this predefined flow record are ignored.

- netflow ipv4 original-input—Cisco Nexus 1000V predefined traditional IPv4 input NetFlow
 - netflow ipv4 original-output—Cisco Nexus 1000V predefined traditional IPv4 output NetFlow
Cisco Nexus 1000V predefined traditional IPv4 output NetFlow
 - netflow protocol-port—Cisco Nexus 1000V predefined protocol and ports aggregation scheme
- Up to 12000 NetFlow instances are allowed per DVS.
 - Up to 1024 NetFlow instances are allowed per host.
 - A maximum of one flow monitor per interface per direction is allowed.
 - Up to 2 flow exporters are permitted per monitor.
 - Up to 64 NetFlow monitors, exporters, or records are allowed per DVS.
 - Up to 64 NetFlow monitors, exporters, or records are allowed per host.
 - NetFlow is not supported on port channels or interfaces in a port-channel.

Default Settings for NetFlow

Parameters	Default
NetFlow version	9
source interface	line card export with spoofed mgmt0 IP address of the VSM
match	direction and interface (incoming/outgoing)
flow monitor active timeout	1800
flow monitor inactive timeout	15
DSCP	default/best-effort (0)
VRF	management (1)

Enabling the NetFlow Feature

Before you begin

Log in to the CLI in EXEC mode.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# feature netflow	Enables the NetFlow feature.
Step 3	switch(config)# show feature	(Optional) Displays the available features and whether or not they are enabled.
Step 4	(Optional) switch(config)# copy running-config startup-config	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to enable the NetFlow feature:

```
switch# configure terminal
switch(config)# feature netflow
switch(config)#
```

Configuring Netflow

Defining a Flow Record

Before you begin

- Know which of the options you want this flow record to match.
- Know which options you want this flow record to collect.



Note

Although the following lines appear in the output of the **show flow record** command, the commands they are based on are not currently supported in the Cisco Nexus 1000V. The use of these commands has no effect on the configuration.

```
collect routing source as
collect routing destination as
collect routing next-hop address ipv4
```

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# flow record <i>name</i>	Creates a flow record by name, and enters the flow record configuration mode for that specific record.
Step 3	switch(config-flow-record)# description <i>string</i>	(Optional) Adds a description of up to 63 characters to the flow record and saves it to the running configuration.
Step 4	switch(config-flow-record)# match { ip { protocol tos } ipv4 { destination address source address } transport { destination-port source-port } datalink {{ mac { source-address destination-address }} ethertype vlan vxlan }}	Defines the flow record to match one of the following and saves it in the running configuration. <ul style="list-style-type: none"> • ip—Matches one of the following IP options: <ul style="list-style-type: none"> • Protocol • tos (type of service) • IPv4— Matches one of the following ipv4 address options: <ul style="list-style-type: none"> • Source address • Destination address

	Command or Action	Purpose
		<ul style="list-style-type: none"> • Transport—Matches one of the following transport options: <ul style="list-style-type: none"> • Destination port • Source port • Datalink—Data collected in the flow record matches one of the following datalink options: <ul style="list-style-type: none"> • mac source-address • mac destination-address • ethertype • vlan • vxlan <p>Note Netflow does not support mixing datalink fields with other field types in the same record.</p>
<p>Step 5</p>	<pre>switch(config-flow-record)# collect {counter {bytes [long] packets [long]} timestamp sys-uptime {first last} transport tcp flags}</pre>	<p>Specifies a collection option to define the information to collect in the Flow Record and saves it in the running configuration.</p> <ul style="list-style-type: none"> • Counter—Collects flow record information in one of the following formats: <ul style="list-style-type: none"> • Bytes—collected in 32-bit counters unless the long 64-bit counter is specified. • Packet—collected in 32-bit counters unless the long 64-bit counter is specified. <p>Note Cisco recommends that the 64-bit counters be used for systems with data rates in excess of 1 Gbps.</p> <ul style="list-style-type: none"> • timestamp sys-uptime—Collects the system up time for the first or last packet in the flow. • transport tcp flags—Collects the TCP transport layer flags for the packets in the flow.

	Command or Action	Purpose
Step 6	switch(config-flow-record)# show flow record <i>name</i>	(Optional) Displays information about Flow Records.
Step 7	switch(config-flow-record)# exit	Exits the current configuration mode.
Step 8	(Optional) switch(config)# copy running-config startup-config	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to create a flow record:

```
switch# configure terminal
switch(config)# flow record RecordTest
switch(config-flow-record)# description Ipv4flow
switch(config-flow-record)# match ipv4 destination address
switch(config-flow-record)# collect counter packets
switch(config-flow-record)# show flow record RecordTest
Flow record RecordTest:
  Description: Ipv4flow
  No. of users: 0
  Template ID: 0
  Fields:
    match ipv4 destination address
    match interface input
    match interface output
    match flow direction
    collect counter packets
switch(config-flow-record)# exit
switch(config)# copy running-config startup-config
```

Defining a Flow Exporter

A flow exporter defines where and how flow records are exported to the NetFlow collector server.

A flow exporter supports the following:

- Export format version 9.
- A maximum of two flow exporters per monitor.

Before you begin

- Know the destination IP address of the NetFlow collector server.
- Know the transport UDP port that the Netflow collector is listening on.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.

	Command or Action	Purpose
Step 2	switch(config)# flow exporter <i>name</i>	Creates a flow exporter, saves it in the running configuration, and then enters the CLI flow exporter configuration mode.
Step 3	switch(config-flow-exporter)# description <i>string</i>	Adds a description of up to 63 characters and saves it in the running configuration.
Step 4	switch(config-flow-exporter)# destination <i>{ipv4-address ipv6-address}</i>	Specifies the IP address of the destination interface and saves it in the running configuration.
Step 5	switch(config-flow-exporter)# dscp <i>value</i>	Specifies the differentiated services codepoint value between 0 and 63, and saves it in the running configuration.
Step 6	switch(config-flow-exporter)# source lc-exp <i>ipv4-address/subnet-mask</i>	Specifies the IP address to spoof, from which the flow records are sent to the NetFlow collector server, and saves it in the running configuration.
Step 7	switch(config-flow-exporter)# transport udp <i>port-number</i>	Specifies the destination UDP port, between 1 and 65535, used to reach the NetFlow collection, and saves it in the running configuration.
Step 8	switch(config-flow-exporter)# version {9}	Specifies NetFlow export version 9, saves it in the running configuration, and enters the export version 9 configuration mode.
Step 9	switch(config-flow-exporter-version-9)# option { exporter-stats interface-table } timeout <i>value</i>	Specifies one of the following version 9 exporter resend timers and its value, between 1 and 86400 seconds, and saves it in the running configuration. <ul style="list-style-type: none"> • exporter-stats • interface-table
Step 10	switch(config-flow-exporter-version-9)# template data timeout <i>seconds</i>	Sets the template data resend timer and its value, between 1 and 86400 seconds, and saves it in the running configuration.
Step 11	switch(config-flow-exporter-version-9)# show flow exporter [<i>name</i>]	(Optional) Displays information about the flow exporter.
Step 12	switch(config-flow-exporter-version-9)# copy running-config startup-config	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to create a flow exporter:

```
switch# configure terminal
switch(config)# flow exporter ExportTest
switch(config-flow-exporter)# description ExportHamilton
switch(config-flow-exporter)# destination 192.0.2.1
switch(config-flow-exporter)# dscp 2
switch(config-flow-exporter)# source lc-exp 192.0.2.2/24
switch(config-flow-exporter)# transport udp 200
switch(config-flow-exporter)# version 9
switch(config-flow-exporter-version-9)# option exporter-stats timeout 1200
switch(config-flow-exporter-version-9)# template data timeout 1200
switch(config-flow-exporter-version-9)# show flow exporter ExportTest
Flow exporter ExportTest:
  Description: ExportHamilton
  Destination: 192.0.2.1
  VRF: management (1)
  Destination UDP Port 200
  Source IP Address 192.0.2.2
  Export from Line Card
  DSCP 2
  Export Version 9
    Exporter-stats timeout 1200 seconds
    Data template timeout 1200 seconds
  Exporter Statistics
    Number of Flow Records Exported 0
    Number of Templates Exported 0
    Number of Export Packets Sent 0
    Number of Export Bytes Sent 0
    Number of Destination Unreachable Events 0
    Number of No Buffer Events 0
    Number of Packets Dropped (No Route to Host) 0
    Number of Packets Dropped (other) 0
    Number of Packets Dropped (LC to RP Error) 0
    Number of Packets Dropped (Output Drops) 1
    Time statistics were last cleared: Never
switch(config-flow-exporter-version-9)# copy running-config startup-config
[#####] 100%
Copy complete, now saving to disk (please wait)...
switch(config-flow-exporter-version-9)#
```

Defining a Flow Monitor

A flow monitor is associated with a flow record and a flow exporter.

A maximum of one flow monitor per interface per direction is permitted.

Before you begin

- Know that the name of an existing flow exporter to associate with this flow monitor.
- Know that the name of an existing flow record to associate with this flow monitor. You can use either a flow record you previously created or one of the following Cisco Nexus 1000V predefined flow records:
 - netflow-original
 - netflow ipv4 original-input

- netflow ipv4 original-output
- netflow protocol-port



Note Cisco recommends that you use the predefined flow records for systems with a lower data rate. For systems operating at a higher data rate of more than 1 Gbps, Cisco recommends that you manually configure the flow record and use the 64-bit long counters.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# flow monitor <i>name</i>	Creates a flow monitor by name, saves it in the running configuration, and enters flow monitor configuration mode.
Step 3	switch(config-flow-monitor)# description <i>string</i>	(Optional) Adds a descriptive string of up to 63 alphanumeric characters, and saves it in the running configuration.
Step 4	switch(config-flow-monitor)# exporter <i>name</i>	Adds an existing flow exporter and saves it in the running configuration.
Step 5	switch(config-flow-monitor)# record { <i>name</i> netflow { ipv4 }} netflow-original original-input original-output protocol-port }	Adds an existing flow record and saves it in the running configuration. <ul style="list-style-type: none"> • <i>name</i>—The name of a flow record you have previously created, or the name of a Cisco provided pre-defined flow record. • netflow—Traditional NetFlow collection schemes <ul style="list-style-type: none"> IPv4—Traditional IPv4 NetFlow collection schemes
Step 6	(Optional) switch(config-flow-monitor)# show flow monitor [<i>name</i>]	Displays information about existing flow monitors.
Step 7	switch(config-flow-monitor)# copy running-config startup-config	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to create a flow monitor:

```
switch# configure terminal
switch(config)# flow monitor MonitorTest
```

```

switch(config-flow-monitor)# description Ipv4Monitor
switch(config-flow-monitor)# exporter ExportTest
switch(config-flow-monitor)# record RecordTest
switch(config-flow-monitor)# show flow monitor MonitorTest
Flow Monitor MonitorTest:
  Use count: 0
  Flow Record: RecordTest
  Flow Exporter: ExportTest
switch(config-flow-monitor)#

```

Assigning a Flow Monitor to an Interface

Before you begin

- Know that the name of the flow monitor you want to use for the interface.
- Know that the interface type and its number.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface <i>interface-type</i> <i>interface-number</i>	Enters interface configuration mode for the specified interface.
Step 3	switch(config-if)# ip flow monitor <i>name</i> { input output }	Assigns a flow monitor for input or output packets and saves it in the running configuration.
Step 4	(Optional) switch(config-if)# show flow interface <i>interface-type interface-number</i>	Displays the NetFlow configuration.
Step 5	(Optional) switch(config-if)# exit	Exits the current configuration mode.
Step 6	(Optional) switch(config)# copy running-config startup-config	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to assign a flow monitor to an interface:

```

switch# configure terminal
switch(config)# interface veth 2
switch(config-if)# ip flow monitor MonitorTest output
switch(config-if)# show flow interface veth 2
Interface Vethernet2:
  Monitor: MonitorTest
  Direction: Output
switch(config-if)# exit
switch(config)# copy running-config startup-config

```

Adding a Flow Monitor to a Port Profile

Before you begin

- Log in to the CLI in EXEC mode.
- Create a flow monitor.
- If you are using an existing port profile, create the port profile and you know its name.
- If you are creating a new port profile, know the type of interface (Ethernet or vEthernet), and the name you want to give it.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# port-profile [type { ethernet vethernet }] <i>name</i>	Enters port profile configuration mode for the named port profile.
Step 3	switch(config-port-prof)# ip flow monitor <i>name</i> { input output }	Applies a named flow monitor to the port profile for either incoming (input) or outgoing (output) traffic.
Step 4	switch(config-port-prof)# show port-profile [expand-interface] [<i>name profile-name</i>]	(Optional) Displays the configuration for verification.
Step 5	(Optional) switch(config-port-prof)# copy running-config startup-config	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

Example

This example shows how to add a flow monitor to a port profile:

```
switch# configure terminal
switch(config)# port-profile AccessProf
switch(config-port-prof)# ip flow monitor access4 output
switch(config-port-prof)# show port-profile name AccessProf
port-profile AccessProf
type: vethernet
status: disabled
capability l3control: no
pinning control-vlan: -
pinning packet-vlan: -
system vlans: none
port-group:
max ports: 32
inherit:
config attributes:
ip flow monitor access4 output
evaluated config attributes:
ip flow monitor access4 output
assigned interfaces:
```

```

port-group:
system vlans: none
capability l3control: no
capability iscsi-multipath: no
capability vxlan: no
capability l3-vservice: no
port-profile role: none
port-binding: static
switch(config-port-prof)#

```

Verifying the NetFlow Configuration

Use one of the following commands to verify the configuration:

Command	Purpose
show flow exporter [<i>name</i>]	Displays information about the NetFlow flow exporter.
show flow interface [<i>interface-type number</i>]	Displays information about NetFlow interfaces.
show flow monitor [<i>name</i> [<i>cache modulenumbers</i> <i>statistics modulenumbers</i>]]	Displays information about NetFlow flow monitors. Note The show flow monitor cache module command differs from the show flow monitor statistics module command in that the cache command also displays cache entries.
show flow record [<i>name</i>]	Displays information about NetFlow flow records.

This example shows how to display information about the NetFlow flow exporter maps:

```

switch(config-flow-exporter-version-9)# show flow exporter ExportTest
Flow exporter ExportTest:
  Description: ExportHamilton
  Destination: 192.0.2.1
  VRF: management (1)
  Destination UDP Port 200
  Source IP address 192.0.2.2
  Export from Line Card
  DSCP 2
  Export Version 9
    Exporter-stats timeout 1200 seconds
    Data template timeout 1200 seconds
  Exporter Statistics
    Number of Flow Records Exported 0
    Number of Templates Exported 0
    Number of Export Packets Sent 0
    Number of Export Bytes Sent 0
    Number of Destination Unreachable Events 0
    Number of No Buffer Events 0
    Number of Packets Dropped (No Route to Host) 0
    Number of Packets Dropped (other) 0
    Number of Packets Dropped (LC to RP Error) 0
    Number of Packets Dropped (Output Drops) 1
    Time statistics were last cleared: Never
switch(config-flow-exporter-version-9)#

```

This example shows how to view information about the flow interfaces:

```
switch(config-if)# show flow interface veth2
Interface Vethernet2:
  Monitor: MonitorTest
  Direction: Output
switch(config-if)#
```

This example shows how to display information about the flow monitors:

```
switch(config-flow-monitor)# show flow monitor
Flow Monitor MonitorTest:
  Use count: 1
  Flow Record: test
  Flow Exporter: ExportTest
Flow Monitor MonitorIpv4:
  Use count: 70
  Flow Record: RecordTest
  Flow Exporter: ExportTest
switch(config-flow-monitor)#
```

This example shows how to display information about the flow monitor cache module:

Example: show flow monitor cache module

```
november(config)# show flow monitor m1 cache module 3
Cache type: Normal
Cache size: 0
Active Flows: 1
Flows added: 148
Packets added: 349
Flows aged: 147
- Watermark aged 0
- Active timeout 0
- Inactive timeout 147
- Event aged 0
- Emergency aged 0
- Permanent 0
- Immediate aged 0
- Session aged 0
- Fast aged 0
- Counters Overflow 0

  IPV4 SRC ADDR   IPV4 DST ADDR  IP PROT  IP TOS  TRNS SRC PORT  TRNS DST PORT
  INTF INPUT      INTF OUTPUT   FLOW DIRN  ipv4  next hop addr  tcp flags  bytes
pkts      time first  time last
=====
=====
=====
0.0.0.0  255.255.255.255  17      0x00  68      0.0.0.0      0x00  1026      3
Veth1    Eth3/1          Input
11609414 11622391
```

This example shows how to display information about the flow monitor statistics module:

```
switch(config)# show flow monitor m1 statistics module 3
Cache type: Normal
Cache size: 0
Active Flows: 1
Flows added: 149
Packets added: 350
Flows aged: 148
- Watermark aged 0
- Active timeout 0
- Inactive timeout 148
```

```

- Event aged                0
- Emergency aged            0
- Permanent                 0
- Immediate aged           0
- Session aged              0
- Fast aged                 0
- Counters Overflow         0
switch(config)#

```

This example shows how to display information about the flow records:

```

switch(config-flow-record)# show flow record RecordTest
Flow record RecordTest:
  Description: Ipv4flow
  No. of users: 0
  Template ID: 0
  Fields:
    match ipv4 destination address
    match interface input
    match interface output
    match flow direction
    collect counter packets
switch(config-flow-record)#

```

Example for Netflow Configuration

This example shows how to configure a flow monitor using a new flow record and apply it to an interface:

```

switch# configure terminal
switch(config)# flow record RecordTest
switch(config-flow-record)# description Ipv4flow
switch(config-flow-record)# match ipv4 destination address
switch(config-flow-record)# collect counter packets
switch(config-flow-record)# exit
switch(config)# flow exporter ExportTest
switch(config-flow-exporter)# description ExportHamilton
switch(config-flow-exporter)# destination 192.0.2.1
switch(config-flow-exporter)# dscp 2
switch(config-flow-exporter)# source lc-exp 192.0.2.2/24
switch(config-flow-exporter)# transport udp 200
switch(config-flow-exporter)# version 9
switch(config-flow-exporter-version-9)# option exporter-stats timeout 1200
switch(config-flow-exporter-version-9)# template data timeout 1200
switch(config-flow-exporter-version-9)# exit
switch(config-flow-exporter)# exit
switch(config)# flow monitor MonitorTest
switch(config-flow-monitor)# description Ipv4Monitor
switch(config-flow-monitor)# exporter ExportTest
switch(config-flow-monitor)# record RecordTest
switch(config-flow-monitor)# exit
switch(config)# interface veth 2
switch(config-if)# ip flow monitor MonitorTest output
switch(config-if)# show flow interface veth 2
Interface Vethernet2:
  Monitor: MonitorTest
  Direction: Output
switch(config-if)#

```

This example shows how to configure a flow monitor using a predefined record and apply it to an interface:

```

switch# configure terminal
switch(config)# flow exporter ExportTest
switch(config-flow-exporter)# description ExportHamilton
switch(config-flow-exporter)# destination 192.0.2.1
switch(config-flow-exporter)# dscp 2
switch(config-flow-exporter)# source lc-exp 192.0.2.2/24
switch(config-flow-exporter)# transport udp 200
switch(config-flow-exporter)# version 9
switch(config-flow-exporter-version-9)# option exporter-stats timeout 1200
switch(config-flow-exporter-version-9)# template data timeout 1200
switch(config-flow-exporter-version-9)# exit
switch(config-flow-exporter)# exit
switch(config)# flow monitor MonitorTest
switch(config-flow-monitor)# description Ipv4Monitor
switch(config-flow-monitor)# exporter ExportTest
switch(config-flow-monitor)# record netflow-original
switch(config-flow-monitor)# exit
switch(config)# interface veth 2
switch(config-if)# ip flow monitor MonitorTest output
switch(config-if)# show flow interface veth 2
Interface Vethernet2:
  Monitor: MonitorTest
  Direction: Output
switch(config-if)#

```

Related Documents for NetFlow

Related Topic	Document Title
Cisco NetFlow Overview	http://cisco.com/en/US/products/ps6601/products_ios_protocol_group_home.html

Feature History for NetFlow

Feature Name	Releases	Feature Information
Distributed NetFlow	5.2(1)SV3(1.1)	Support for this feature was added.
NAM support for NetFlow data sources	4.0(4)SV1(3)	NAM support for NetFlow data sources was added.
NetFlow	4.0(4)SV1(1)	This feature was introduced.

