



## CHAPTER 3

# Configuring Netflow for Traffic Visibility

---

This chapter contains the following sections:

- [Configuring NetFlow Data Source on the NAM VSB, page 3-1](#)
- [Configuring NetFlow on Devices](#)

NetFlow records provide an aggregate view of the network traffic. When enabled on the branch router or switch, the NetFlow data source becomes available on the Cisco NAM VSB. Netflow provides statistics for applications, hosts, and conversions. You can set up custom data sources for some specific interfaces. Netflow can be used to identify business critical applications hosted in the Data Center that are used in the branch.

## Configuring NetFlow Data Source on the NAM VSB

A data source entry must exist on the NAM in order for it to accept NetFlow records from an external device. Data source entries may be created manually using the NAM web GUI or the CLI. When manually creating a data source, you may specify any name you want for the data source.

For convenience however, manual creation of NetFlow data sources is not necessary. There is an **auto-create** feature which is enabled by default. With the auto-create feature, a new data source will automatically be created for each device which sends NDE traffic to the NAM when the first packet is received.

Auto-created NetFlow data sources will be assigned a name in the format "NDE-<IP Address>-ID-<Integer>," where <IP Address> is the IP address of the exporting device, and <Integer> is the Engine-ID that the device populates in the packets (part of the NetFlow Data Export standard). An example might be "NDE-192.168.0.1-ID-12" for device 192.168.0.1 sending NDE packets with the Engine ID field set to 12. You can edit these auto-created data sources and change the name if you want to, as well as optionally specify SNMP credentials for the device, as described later in this guide.

## Configuring Auto-Creation of NetFlow Data Sources

To configure the NAM to automatically create data sources when it receives NDE packets from an external device, use the following steps. Remember however, that the auto-create feature is turned on by default, so these steps are typically not necessary.

### Enabling Auto-Creation of NetFlow Data Sources Using the Web GUI:

---

**Step 1** Choose **Setup > Traffic > NAM Data Sources**.

- Step 2** Click the **Auto Create** button on the bottom left of the window.
  - Step 3** Check the NetFlow check box to toggle auto-creation of NDE data sources ON or OFF.
  - Step 4** Click the **Submit** button.
- 

### Enabling Auto-Creation of NetFlow Data Sources Using the CLI

Configuration of the auto-create feature is also possible using the NAM CLI. Remember that the auto-create feature is turned ON by default, so in most cases these steps are not necessary.

To configure NAM to automatically create data sources when it receives NDE packets from an external device, use the following steps:

Use the "autocreate-data-source" command as follows:

```
root@172-20-104-107.cisco.com# autocreate-data-source netflow
NDE data source autocreate successfully ENABLED
```

The NAM will now automatically create a NetFlow data source for each device that sends NetFlow packets to it. The data source will have the specific Engine ID that is populated by the device in the NDE packets sent to the NAM. If the same device happens to send NDE packets to the NAM with different Engine ID values, a separate data source will be created for each unique Engine ID sent from the device.

### Disabling Auto-Creation of NetFlow Data Sources Using the CLI

To disable auto-creation of NetFlow data sources, use the "no autocreate-data-source" command as follows:

```
root@172-20-104-107.cisco.com# no autocreate-data-source netflow
NDE data source autocreate successfully DISABLED
root@172-20-104-107.cisco.com#
```

### Creating NetFlow Data Sources Using the Web GUI

To manually configure a NetFlow data source on the NAM using the GUI, for example if the auto-creation feature is turned OFF, use the following steps:

---

- Step 1** Choose **Setup > Traffic > NAM Data Sources**.
- Step 2** Click the **Create** button at the bottom of the window.
- Step 3** In the Type drop-down list, choose NETFLOW.
- Step 4** Enter the IP address of the device that will export NDE to the NAM (required).
- Step 5** Give the Data Source a name. This name will appear anywhere there's a Data Source drop-down list.
- Step 6** (Optional) If you know the specific value of the Engine ID on the device you would like to monitor, check the Engine check box, and type in the value of the Engine ID. If the Engine check box is left blank, then all NDE records exported by the device will be grouped into the same data source, regardless of the Engine ID populated in the NDE packets (in most cases the Engine check box can be left blank and you do not have to worry about the Engine ID value).

Some devices have multiple Engines which independently export NDE records. For example, on some Cisco routers, NDE records can be exported by the Supervisor module as well as the individual line cards. The packets exported may have the same source IP address, but the Engine ID exported by the Supervisor will be a different value than the Engine ID(s) exported by the line card(s). If you want to include only one Engine in the data source, you must check the **Engine** check box and provide the value of that Engine ID.

- Step 7** (Optional) SNMP v1/v2c RW Community String: If SNMP v1 or v2c is used to communicate with the device, enter the community string that is configured on the device that is going to export NetFlow packets to the NAM.
- Step 8** (Optional) "Enable SNMP v3": If SNMP v3 is used to communicate with the device, fill in the fields within the v3-specific dialog.
- Step 9** (Optional) If desired, fill in the SNMP credentials for the device. If valid SNMP credentials are provided, the NAM can upload readable text strings from the device to describe the interfaces on that device rather than just displaying the interfaces as numbers. You may specify either SNMPv2c or SNMPv3 credentials. See [Table 3-1](#).

**Table 3-1** *SNMP Credentials*

Field	Description
Mode: No Auth, No Priv	SNMP will be used in a mode with no authentication and no privacy.
Mode: Auth, No Priv	SNMP will be used in a mode with authentication, but no privacy.
Mode: Auth and Priv	SNMP will be used in a mode with both authentication and privacy.
User Name	Enter a user name, which will match the user name configured on the device.
Auth Password	Enter the authentication password associated with the User Name, which was configured on the device. Verify the password.
Auth Algorithm	Choose the authentication standard which is configured on the device (MD5 or SHA-1).
Privacy Password	Enter the privacy password, which is configured on the device. Verify the password.
Privacy Algorithm	Enter the privacy algorithm, which is configured on the device (AES or DES).

- Step 10** Click the **Submit** button.

### Deleting NetFlow Data Sources Using the Web GUI

To delete an existing NetFlow data source, use the following steps. Note that if the auto-creation feature is turned ON, and the device continues to send NDE packets to the NAM, the data source will be recreated again automatically as soon as the next NDE packet arrives. Therefore, if you wish to delete an existing NetFlow data source, it is usually advisable to first turn the NetFlow auto-create feature OFF, as described earlier.

- 
- Step 1** Choose **Setup > Traffic > NAM Data Sources**.
  - Step 2** Select the data source you would like to delete.
  - Step 3** Click the **Delete** button at the bottom of the window.
- 

### Creating Netflow Data Sources Using the CLI

To manually configure a NetFlow data source on the NAM using the CLI, for example if the auto-creation feature is turned OFF, use the following steps. Note that when using the CLI, there are two separate phases involved. First you must create a "device" entry on the NAM and remember the device ID. Then you must create a data source entry using this device ID. For convenience, these two phases are combined together when using the GUI to create NetFlow data sources.

- 
- Step 1** Enter the command **device netflow**. You will now be in netflow device subcommand mode as shown here:

```
root@172-20-104-107.cisco.com# device netflow
Entering into subcommand mode for this command.
Type 'exit' to apply changes and come out of this mode.
Type 'cancel' to discard changes and come out of this mode.
root@172-20-104-107.cisco.com(sub-device-netflow)#
```

- Step 2** Enter **?** to see all the command options available, as in the example below:

```
root@172-20-104-107.cisco.com(sub-device-netflow)# ?
?                - display help
address          - device IP address (*)
cancel           - discard changes and exit from subcommand mode
community       - SNMPv2c community string
exit             - create device and exit from sub-command mode
help            - display help
show            - show current config that will be applied on exit
snmp-version    - SNMP version to use to communicate with device
v3-auth-passphrase - SNMPv3 authentication passphrase
v3-auth-protocol - SNMPv3 authentication protocol
v3-priv-passphrase - SNMPv3 privacy passphrase
v3-priv-protocol - SNMPv3 privacy protocol
v3-sec-level    - SNMPv3 security level
v3-username     - SNMPv3 username
(*) - denotes a mandatory field for this configuration.
root@172-20-104-107.cisco.com(sub-device-netflow)#
```

- Step 3** Enter the IP address of the device as shown in this example (required):

```
root@172-20-104-107.cisco.com(sub-device-netflow)# address 192.168.0.1
```

- Step 4** If desired, enter the SNMP credentials for the device, as in the example below. If you specify `snmp-version v2c`, then you should enter the community string for the device. If you specify `snmp-version v3`, then you should enter the security level, username, authentication protocol, authentication passphrase, privacy protocol, and privacy passphrase.

```
root@172-20-104-107.cisco.com(sub-device-netflow)# snmp-version v2c
root@172-20-104-107.cisco.com(sub-device-netflow)# community public
```

**Step 5** Enter **show** to look at the device configuration that will be applied and verify that it is correct:

```
root@172-20-104-107.cisco.com(sub-device-netflow)# show
DEVICE TYPE           : NDE (Netflow Data Export)
DEVICE ADDRESS        : 192.168.0.1
SNMP VERSION          : SNMPv2c
V2C COMMUNITY         : public
V3 USERNAME           :
V3 SECURITY LEVEL     : No authentication, no privacy
V3 AUTHENTICATION     : MD5
V3 AUTH PASSPHRASE    :
V3 PRIVACY            : DES
V3 PRIV PASSPHRASE    :
root@172-20-104-107.cisco.com(sub-device-netflow)#
```

**Step 6** Enter **exit** to come out of the subcommand mode and create the device. Remember the ID value that was assigned to the new device, you will need it to create the data source!

```
root@172-20-104-107.cisco.com(sub-device-netflow)# exit
Device created successfully, ID = 1
root@172-20-104-107.cisco.com#
```

**Step 7** Enter the command **data-source netflow**. You will now be in netflow data source subcommand mode as shown here:

```
root@172-20-104-107.cisco.com# data-source netflow
Entering into subcommand mode for this command.
Type 'exit' to apply changes and come out of this mode.
Type 'cancel' to discard changes and come out of this mode.
root@172-20-104-107.cisco.com(sub-data-source-netflow)#
```

**Step 8** Enter **?** to see all the command options available, as in the example below:

```
root@172-20-104-107.cisco.com(sub-data-source-netflow)# ?
?
cancel                - discard changes and exit from subcommand mode
device-id             - netflow device ID (*)
engine-id             - netflow Engine ID
exit                  - create data-source and exit from sub-command mode
help                  - display help
name                  - data-source name (*)
show                  - show current config that will be applied on exit
(*) - denotes a mandatory field for this configuration.
root@172-20-104-107.cisco.com(sub-data-source-netflow)#
```

**Step 9** Enter the device ID from Step 4 (required):

```
root@172-20-104-107.cisco.com(sub-data-source-netflow)# device-id 1
```

**Step 10** Enter the name you would like for the data source (required):

```
root@172-20-104-107.cisco.com(sub-data-source-netflow)# name MyFirstNdeDataSource
```

**Step 11** If desired, supply the specific Engine ID for this NDE data source (optional):

```
root@172-20-104-107.cisco.com(sub-data-source-netflow)# engine-id 123
```

**Step 12** Enter **show** to look at the data source configuration that will be applied and verify that it is correct:

```
root@172-20-104-107.cisco.com(sub-data-source-netflow)# show
DATA SOURCE NAME : MyFirstNdeDataSource
DATA SOURCE TYPE : NDE (Netflow Data Export)
DEVICE ID       : 1
```

```

DEVICE ADDRESS   : 192.168.0.1
ENGINE ID        : 123
root@172-20-104-107.cisco.com(sub-data-source-netflow)#

```

**Step 13** Enter **exit** to come out of the subcommand mode and create the data source:

```

root@172-20-104-107.cisco.com(sub-data-source-netflow)# exit
Data source created successfully, ID = 3

```

The data source is now created, and NDE records from the device will be received and accepted by the NAM as they arrive.

### Deleting Netflow Data Sources Using the CLI

To delete a NetFlow data source using the CLI, use the following steps. Note that when using the CLI, there are generally two separate phases involved. First you should delete the data source, then delete the device if you have no other data sources using the same device (for example with a different Engine ID value). As a shortcut, if you simply delete the device, then all data sources using that device will also be deleted.

**Step 1** Show all data sources so you can find the ID of the one you want to delete:

```

root@172-20-104-107.cisco.com# show data-source
DATA SOURCE ID   : 1
DATA SOURCE NAME : DATA PORT 1
TYPE             : Data Port
PORT NUMBER      : 1
-----
DATA SOURCE ID   : 2
DATA SOURCE NAME : DATA PORT 2
TYPE             : Data Port
PORT NUMBER      : 2
-----
DATA SOURCE ID   : 3
DATA SOURCE NAME : MyFirstNdeDataSource
TYPE             : NDE (Netflow Data Export)
DEVICE ID        : 2
DEVICE ADDRESS   : 192.168.0.1
ENGINE ID        : 123
-----
root@172-20-104-107.cisco.com#

```

**Step 2** Use the "no data-source" command to delete the data source:

```

root@172-20-104-107.cisco.com# no data-source 3
Successfully deleted data source 3
root@172-20-104-107.cisco.com#

```

**Step 3** Show all devices so you can find the ID of the one you want to delete:

```

root@172-20-104-107.cisco.com# show device
DEVICE ID        : 1
DEVICE TYPE      : NDE (Netflow Data Export)
IP ADDRESS       : 192.168.0.1
SNMP VERSION     : SNMPv2c
V2C COMMUNITY    : public
V3 USERNAME      :
V3 SECURITY LEVEL : No authentication, no privacy
V3 AUTHENTICATION : MD5
V3 AUTH PASSPHRASE :

```

```
V3 PRIVACY           : DES
V3 PRIV PASSPHRASE  :
INFORMATION         : No packets received
STATUS              : Inactive
-----
root@172-20-104-107.cisco.com#
```

**Step 4** Use the "no device" command to delete the device:

```
root@172-20-104-107.cisco.com# no device 1
Sucessfully deleted device 1
root@172-20-104-107.cisco.com#
```

Note that if the auto-creation mode is on, and the device continues to send NDE packets to the NAM, the data source (and device entry) will be recreated again automatically as soon as the next NDE packet arrives. Therefore, if you wish to delete an existing NetFlow data source, it is usually advisable to first turn the NetFlow auto-create feature off, as described earlier.

## Configuring NetFlow on Devices

The configuration commands for NetFlow devices to export NDE packets to the NAM are platform and device specific. The example configuration commands provided here are the ones most commonly found for devices running Cisco IOS. For more detailed information, see your device documentation.

### For Devices Running Cisco IOS

**Step 1** Choose the interface on which you wish to turn on routed flow cache.

```
Prompt# configure terminal
Prompt(config)# interface <type slot/port>

Prompt(config-if)# ip route-cache flow
```

**Step 2** Export routed flow cache entries to UDP port 3000 of the NAM.

```
Prompt(config)# ip flow-export destination <NAM IP address> 3000
```

### For Devices Supporting Multi-Layer Switching Cache Running Cisco IOS

**Step 1** Choose the version of NDE.

```
Prompt(config)# mls nde sender version <version-number>
```



**Note** The NAM supports NDE versions 1, 5, 6, 7, 8, and 9 aggregation caches.

**Step 2** Choose NDE flow mask.

```
Prompt(config)# mls flow ip full
```

**Step 3** Enable NetFlow export.

```
Prompt(config)# mls nde sender
```

**Step 4** Export NetFlow to UDP port 3000 of the NAM.

```
Prompt(config)# ip flow-export destination <NAM IP address> 3000
```

---

### For Devices Supporting NDE v8 Aggregations Running Cisco IOS

---

**Step 1** Choose a v8 aggregation.

```
Prompt(config)# ip flow-aggregation cache <aggregation-type>
```

Where *aggregation-type* can be:

- destination-prefix
- source-prefix
- protocol-port
- prefix

**Step 2** Enable the aggregation cache.

```
Prompt(config-flow-cache)# enable
```

**Step 3** Export the flow entries in the aggregation cache to NAM UDP port 3000.

```
Prompt(config-flow-cache)#export destination <NAM address> 3000
```

---

### For Devices That Support NDE Export From Bridged-Flows Statistics

---

**Step 1** Enable bridged-flows statistics on the VLANs.

```
Prompt>(enable) set mls bridged-flow-statistics enable <vlan-list>
```

**Step 2** Export the NDE packets to UDP port 3000 of the NAM

```
Prompt>(enable) set mls nde <NAM address> 3000
```

---

### For NAMs Located in a Device Slot

If the NAM is located in one of the device slots, the device can be set up to export NDE packets to the NAM.

---

**Step 1** Choose the version of NDE.

```
Prompt>(enable) set mls nde version <nde-version-number>
```

**Step 2** Choose NDE flow mask to be full.

```
Prompt>(enable) sel mls nde full
```

**Step 3** Enable NDE export.

```
Prompt>(enable) set mls nde enable
```

**Step 4** Export the NDE packets to the NAM.

```
Prompt>(enable) set snmp extendedrmon netflow enable <NAM-slot>
```

---

