Enable Application Telemetry and Export Data via Port-Channel

Contents

Introduction

Prerequisites

- Requirements

Application Experience Overview

Workflow

- Steps to Enable Application Telemetry
- Sample Configuration that Catalyst Center Deploys
- Processing ofNetflowData
- Verify Telemetry Status

Problem Statement

Solution

Validations

Key Points

Introduction

This document describes how NetFlow data from router interfaces can be exported to Catalyst Center through a port-channel interface.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- The device must be compatible with Catalyst Center.
- The device must have an active DNA Advantage license.
- The device must be managed in the Catalyst Center inventory.

Application Experience Overview

Application Experience is a functionality in Cisco platforms that provides performance visibility for applications running over the network. It leverages Cisco Performance Monitor (PerfMon) to measure key metrics such as delay, packet loss, and throughput. On IOS® XE releases earlier than 17.3, this was done by deploying an Easy Performance Monitor (ezPM) policy with the Application Performance profile on Cisco IOS XE router platforms. From IOS XE 17.3 onwards, Optimized Application Performance Monitoring (Optimized APM) is used, which improves efficiency, reduces CPU and memory usage, increases scalability for monitoring more flows and applications, and provides more accurate performance measurements.

Workflow

There are two criteria of enabling application telemetry:

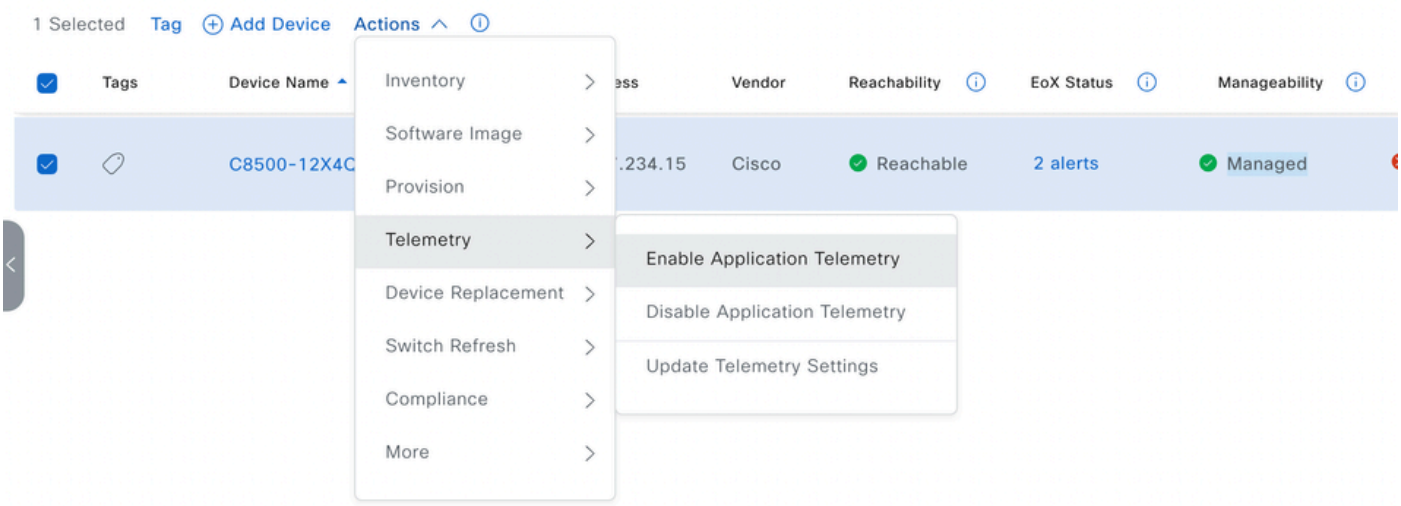
1. Conventional tagging-based algorithm: Add the lan keyword to the interfaces whose data you want to export. Then, enable application telemetry from Catalyst Center. Ensure that the interface on which you enable application telemetry is not the management interface and has an IP address assigned.

2. Automatic Selection Algorithm: There is no need to add the interfaces with any keyword. Simply ensure that the interface on which you enable application telemetry has an IP address and is not a WAN interface, loopback interface, or management interface (such as GIGABITETHERNET0, GIGABITETHERNET0/0, MGMT0, FASTETHERNET0, or FASTETHERNET1).

The conventional tagging-based algorithm takes precedence over the newer automatic selection algorithm.

Steps to Enable Application Telemetry

Navigate to **Inventory** > Change the focus to **Inventory** > **Select the device** > Click **Actions** > **Telemetry** > **Enable Application Telemetry**.



Sample Configuration that Catalyst Center Deploys

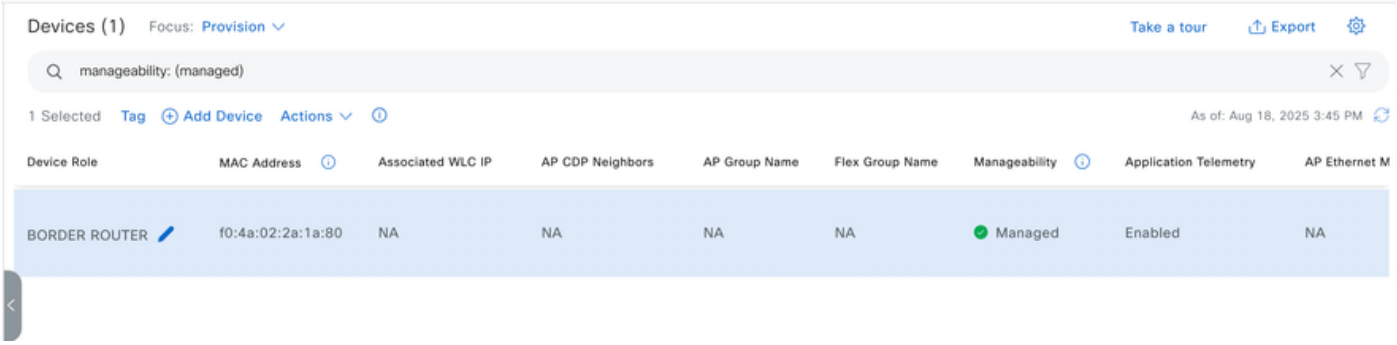
```
performance monitor context tesseract profile application-assurance
exporter destination <DNAC_IP> source <EXPORT_INTERFACE_IP> transport udp port 6007
traffic-monitor assurance-dns-monitor
traffic-monitor assurance-monitor
traffic-monitor assurance-rtp-monitor
exit
interface <INTERFACE_NAME>
performance monitor context tesseract
exit
```

Processing of Netflow Data

1. The network device sends NetFlow data to UDP port 6007.
2. Collector-netflow listens on this UDP port.
3. Collector-netflow writes the data to the netflow-generic Kafka topic.
4. The netflow-generic pipeline writes the data to the netflow-essential Kafka topic.
5. Graphwriter consumes the Kafka topic and writes the data to the graph database.
6. Elasticsearch stores the data.

Verify Telemetry Status

Navigate to **Inventory** > Change the focus to **Provision** > **Check the Application Telemetry column** > **It should show Enabled**.



Problem Statement

The device has been discovered in Catalyst Center through the management interface, and the requirement is to export NetFlow data through a port-channel configured on the router instead of a physical interface.

Solution

1. Configure the **Netflow-Source** description for the interface through which you want to export the data.

```
C8500-12X4QC#sh ip int br
Interface              IP-Address      OK? Method Status                Protocol
Te0/0/0                unassigned      YES manual up                    up
Te0/0/1                unassigned      YES unset  down                  down
Te0/0/2                unassigned      YES unset  up                    up
Te0/0/3                unassigned      YES manual up                    up
Te0/0/4                unassigned      YES unset  down                  down
Te0/0/5                unassigned      YES unset  up                    up
Te0/0/6                unassigned      YES unset  down                  down
Te0/0/7                unassigned      YES unset  down                  down
Te0/1/0                unassigned      YES unset  down                  down
Te0/1/1                unassigned      YES unset  down                  down
Te0/1/2                unassigned      YES unset  down                  down
Te0/1/3                unassigned      YES unset  down                  down
Fo0/2/0                unassigned      YES unset  down                  down
Fo0/2/4                unassigned      YES unset  down                  down
Fo0/2/8                unassigned      YES unset  down                  down
GigabitEthernet0       [redacted]      YES manual up                    up
Port-channel1          [redacted]      YES manual up                    up
Port-channel15         [redacted]      YES manual up                    up
Port-channel15.10      unassigned      YES manual deleted               down
C8500-12X4QC#sh interfaces descrip
Interface                      Status         Protocol Description
Te0/0/0                        up             up       lan
Te0/0/1                        down           down     lan
Te0/0/2                        up             up
Te0/0/3                        up             up
Te0/0/4                        down           down
Te0/0/5                        up             up
Te0/0/6                        down           down
Te0/0/7                        down           down
Te0/1/0                        down           down
Te0/1/1                        down           down
Te0/1/2                        down           down
Te0/1/3                        down           down
Fo0/2/0                        down           down
Fo0/2/4                        down           down
Fo0/2/8                        down           down
Gi0                            up             up
Po1                            up             up       lan
Po15                           up             up       Netflow-Source
Po15.10                        deleted        down
C8500-12X4QC#
```

2. Resync the device from the Catalyst Center.
3. Disable and then enable the application telemetry.

Validations

- Verify that port 6007 is allowed from the router to the Catalyst Center.
- Confirm that the Catalyst Center is reachable from the router's interface where the **Netflow-Source** description is added.
- **ping <dnac_ip> source <Netflow-Source Configured _interface _ip>**

```
C8500-12X4QC#ping [redacted] source [redacted]
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to [redacted], timeout is 2 seconds:
Packet sent with a source address of [redacted]
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/2 ms
C8500-12X4QC#
```

- Ensure that the device clock is synchronized with Catalyst Center.
- Check whether the device is sending netflow data to Catalyst Center.

show flow exporter <exporter_name> statistics

```
C8500-12X4QC#sh flow exporter tesseract-1 statistics
Flow Exporter tesseract-1:
  Packet send statistics (last cleared 00:39:59 ago):
    Successfully sent:         3136                   (4199784 bytes)

  Client send statistics:
    Client: Option options interface-table
      Records added:           136
        - sent:                136
      Bytes added:             14416
        - sent:                14416

    Client: Option options vrf-id-name-table
      Records added:           16
        - sent:                16
      Bytes added:             784
        - sent:                784

    Client: Option options sampler-table
      Records added:           0
      Bytes added:             0

    Client: Option options application-name
      Records added:           12008
        - sent:                12008
      Bytes added:             996664
        - sent:                996664

    Client: Option options application-attributes
      Records added:           11768
        - sent:                11768
      Bytes added:             3036144
        - sent:                3036144

    Client: Flow Monitor tesseract-app_assurance_dns_ipv4
      Records added:           3
        - sent:                3
      Bytes added:             240
        - sent:                240

    Client: Flow Monitor tesseract-app_assurance_dns_ipv6
      Records added:           0
      Bytes added:             0


C8500-12X4QC#sh flow exporter tesseract-1 statistics
Flow Exporter tesseract-1:
  Packet send statistics (last cleared 00:40:01 ago):
    Successfully sent:         3526                   (4723324 bytes)

  Client send statistics:
    Client: Option options interface-table
      Records added:           153
        - sent:                153
      Bytes added:             16218
        - sent:                16218

    Client: Option options vrf-id-name-table
      Records added:           18
        - sent:                18
      Bytes added:             882
        - sent:                882
```

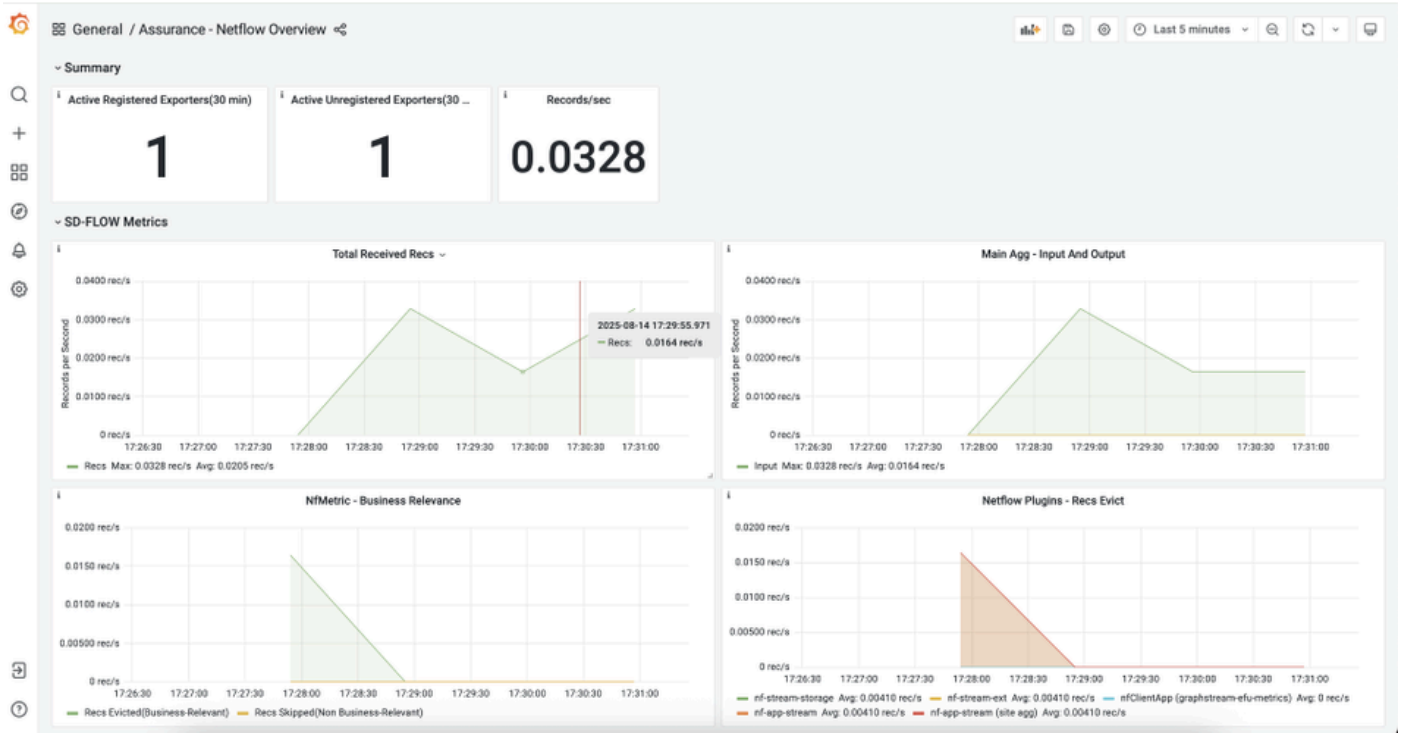
$ sudo tcpdump -i any -n "host <Netflow-Source_configure_interface IP> and udp port 6007"

- Confirm that the collector-netflow service is accepting the traffic.

  $ magctl service attach collector-netflow

  # tcpdump –n udp port 6007 and src <Netflow-Source_configured_interface IP>

- Ensure the collector is processing the data.



- Confirm that the pipelines are Healthy.

Navigate to **GUI > Menu > System > Data Platform > Pipelines**.

- Validate that data is being written to Elasticsearch.

Check last 10 records for a specific exporter by IP (Replace the exporter IP in the command).

curl 'elasticsearch.ndp:9200/*flowmetrics*/_search?q=\~label:nfMetricAggregation_5_min+AND+exporterIpAddres

Key Points

- NETCONF is not mandatory for the application telemetry.
- The exporter interface does not need to be a physical interface.
- Traffic associated with the exporter interface is not part of Application Experience.
- Catalyst Center must be reachable from the source interface.