



Application Performance Monitoring on SD-Routing Devices

This chapter includes information on how to monitor application performance on SD-Routing devices. It contains the following sections:

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Information about Application Performance Monitor

The Application Performance Monitor feature is a simplified framework that enables you to configure intent-based performance monitors. With this feature, you can view real-time, end-to-end application performance filtered by client segments, network segments, and server segments. This information helps you optimize application performance.

An application performance monitor is a predefined configuration that is used to collect performance metrics for specific traffic.

Key Concepts in Application Performance Monitoring

- **Monitoring Profile:** A profile is a predefined set of traffic monitors that can be enabled or disabled for a context. As part of this feature, the SD-Routing performance profile include Application Response Time (ART) aggregation monitor to monitor traffic passing through Cisco Catalyst SD-Routing interfaces. The SD-Routing performance profile has a dedicated policy to filter traffic based on your intent.
- **Context:** A context represents a performance monitor policy map that is attached to an interface for ingress and egress traffic. A context contains information about a traffic monitor that has to be enabled. When a context is attached to an interface, two policy-maps are created, one each for ingress and egress traffic. Depending on the direction specified in the traffic monitor, the policy maps are attached in that direction and the traffic is monitored.

Application Performance Monitor Workflow

You can enable performance monitor only on Direct Internet Access (DIA) interfaces. Performance is monitored for traffic going out of, and coming into the DIA interfaces. You can then view details of the application that you are monitoring using various show commands.

Prerequisites for Application Performance Monitoring

- Minimum software version for Cisco IOS XE Catalyst SD-Routing devices: Cisco IOS XE Catalyst SD-WAN Release 17.13.1a

Limitations

The limitations for Application Performance Monitor are:

- The Application Performance Monitor support only ART on the SD-Routing device.
- Only Direct Internet Access (DIA) scenario is supported in this release
- Performance monitoring is only supported on IPv4 traffic. IPv6 traffic is not supported.
- Application Performance Monitor does not support multi application-aggregation monitors on the device.
- The class-map used in APM only supports maximum two layer class-map and does not support three or more layer class-map.
- Only CLI based config group is supported on Cisco SD-WAN Manager to config APM for SD-Routing device.

Configuring Application Performance Monitor

You can enable application performance monitor on DIA interfaces and monitor the traffic metrics for ART.

Enabling Performance on DIA Interface

The following example shows how to configure a performance monitor context using the SD-Routing application-aggregation profile. This configuration enables monitoring of traffic metrics for ART and applies it to a specific interface.

```
class-map match-any APP_PERF_MONITOR_APPS_0
  match protocol attribute application-group amazon-group
  match protocol attribute application-group box-group
  match protocol attribute application-group concur-group
  match protocol attribute application-group dropbox-group
  match protocol attribute application-group google-group
  match protocol attribute application-group gotomeeting-group
  match protocol attribute application-group intuit-group
  match protocol attribute application-group ms-cloud-group
  match protocol attribute application-group oracle-group
  match protocol attribute application-group salesforce-group
  match protocol attribute application-group sugar-crm-group
  match protocol attribute application-group webex-group
  match protocol attribute application-group zendesk-group
  match protocol attribute application-group zoho-crm-group
class-map match-any APP_PERF_MONITOR_FILTERS --- class-map max 2 layer supported, 3 or
  more layer class-map not supported for APM feature
  match class-map APP_PERF_MONITOR_APPS_0
!
```

This configuration example shows how to configure the context of performance monitor.

```
performance monitor context APP_PM_POLICY profile application-aggregation
  exporter destination local-controller source Null0
  traffic-monitor art-aggregated class-and APP_PERF_MONITOR_FILTERS interval-timeout 300
  sampling-interval 100
```

This configuration example shows how to enable the performance monitor context on an interface.

```
interface GigabitEthernet1                                     --- DIA
interface(s)
  performance monitor context APP_PM_POLICY
```

Configuring Application Performance Monitoring on SD-Routing Device

To create a configuration group, perform these steps:

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- Step 1** From Cisco IOS XE Catalyst SD-WAN Manager menu, choose **Configuration > Configuration Groups > Add CLI based Configuration Group** .
 - Step 2** In the **Add CLI based Configuration Group** pop-up dialog box, enter the configuration group name.
 - Step 3** Click the **Solution Type** drop-down list and select the solution type as **sd-routing** for the SD-Routing devices.
 - Step 4** In the **Description** field, enter a description for the feature
 - Step 5** Click **Next**.
 - Step 6** Click the **Load Running Config from Reachable Device** drop-down list and select the running configuration or add the configuration CLI in text box.
 - Step 7** Click **Save**
 - Step 8** Click ... adjacent to the configuration group name and choose **Edit**
 - Step 9** Click **Associated Devices**.
 - Step 10** Choose one or more devices, and then click **Deploy**
- Note** Application Performance Monitoring does not support performance monitor context profile and flow monitor change when the performance monitor context profile and flow monitor are attached to an interface.
- Step 11** Click **Configuration > Configuration Groups > Deploy**
 - Step 12** Click ... adjacent to the configuration group name and choose **Edit** to modify performance monitor context profile and flow monitor and re-attach it to the interface.
 - Step 13** Click **Deploy**.
 - Step 14** Click **Save**.
-

Verifying Application Performance Monitor

To verify the Application Performance Monitor configuration on the SD-Routing device , use the **show performance monitor cache monitor** command.

```
Device#show performance monitor cache monitor APP_PM_POLICY-art_agg detail format record
Monitor: APP_PM_POLICY-art_agg
Data Collection Monitor:
  CAT-art-aggregated CTX:0 ID:2947958679|2000002 Epoch:0
  Max number of records:          675000
  Current record count:           7
  High Watermark:                 13
```

```

Record added:                14
Record aged:                 7
Record failed to add:        0
Synchronized timeout (secs): 300

FLOW DIRECTION:              Output
TIMESTAMP MONITOR START:    14:10:00.000
FLOW OBSPOINT ID:           4294967298
INTERFACE OVERLAY SESSION ID OUTPUT: 0
IP VPN ID:                  65535
APPLICATION NAME:           layer7 share-point
connection server resp counter: 1477
connection to server netw delay sum: 10822 < --- SND_samples
connection to server netw delay min: 100
connection to server netw delay max: 103
connection to client netw delay sum: 3559 < --- CND_samples
connection to client netw delay min: 20
connection to client netw delay max: 198
connection application delay sum: 936
connection application delay min: 0
connection application delay max: 122
connection responder retrans packets: 2 <---- lost_samples
connection to server netw jitter mean: 0
connection count new:       108 < ---- SND/CND_counts
connection server packets counter: 2018 <---- total_samples

Latency(SND ms) = SND_samples/ SND/CND_counts
Latency(CND ms) = CND_samples/ SND/CND_counts
Loss ratio = lost_samples /total_samples

```

Feature Information for Application Performance Monitor

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.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfng.cisco.com/>. An account on Cisco.com is not required.

Table 1: Feature Information for Application Performance Monitor

Feature Name	Releases	Feature Information
Cisco SD-Routing Application Performance Monitor	Cisco IOS XE Release 17.13.1a	The Application Performance Monitor feature introduces a simplified framework that enables you to configure intent-based performance monitors. With this framework, you can view real-time, end-to-end application performance filtered by client segments, network segments, and network segments.