Cisco Cloud APIC Statistics

About Cisco Cloud APIC Statistics

The Cisco Cloud APIC supports stats that are collected from the cloud routers. Additionally, it supports stats that are derived by processing AWS flow logs. Because AWS flow logs is not a free service, the Cisco Cloud APIC provides a policy that allows you to control this feature. This feature is not enabled by default.

See the AWS documentation for more information about CloudWatch and flow logs.

AWS Networking Interface Statistics Collection

AWS provides the nonreal-time IP traffic information per network interface through flow logs. Cisco Cloud APIC provides a policy for enabling flow logs per `cloudCtxProfile`. Because the `cloudCtxProfile` maps to a VPC in AWS, enabling flow logs per `cloudCtxProfile` or VPC means that you enabled flow logs for each interface belonging to that VPC. Once flow logs are enabled, flow records are periodically pushed to AWS Cloudwatch. The Cisco Cloud APIC then periodically polls AWS CloudWatch for these flow records and parses these records to extract statistics. Because it can take up to 15 minutes to publish flow records to CloudWatch, the Cisco Cloud APIC delays its flow logs query to CloudWatch by 15 minutes too. This means that there is a lag between the flow logs being present in CloudWatch and the corresponding statistics showing up on the Cisco Cloud APIC. Cisco Cloud APIC does not process flow records that take longer than 15 minutes to publish to CloudWatch.

Cisco Cloud APIC Endpoints and cloudEPg Statistics Processing

The Cisco Cloud APIC extracts the following statistics for each AWS networking endpoint that has flow logs present in CloudWatch:

- Number of bytes or packets sent

- Number of bytes or packets received
- Number of bytes or packets rejected

These statistics are associated with the `cloudEpInfoHolder` observable.

Also, the Cisco Cloud APIC maps the flow log records to one or more per region `cloudEPg` objects. This is because a `cloudEPg` can be present in multiple regions. These statistics are associated with the `cloudRgInfoHolder` observable. This observable is a child of `cloudEPg` and the accumulation of statistics for the cloudRgInfoHolder children results in statistics for `cloudEPg`. The `cloudEPg` supports the following statistics:

- Number of bytes or packets sent
- Number of bytes or packets received
- Number of bytes or packets rejected

The `cloudEPg` statistics are aggregated up `fvApp` and then up `fvTenant`.

Enabling VPC Flow Logs

Steps to enable VPC Flow Logs:

1. Define a log group policy.
2. Define a flow log policy and associate the log group that you defined in the first step.
3. Associate the flow log policy to one or more `cloudCtxProfile`.

Log group properties:

- **name**—The location in CloudWatch where flow logs are sent.

  Note The actual log group name that is programmed in AWS is the concatenation of `<tenant name><cloudCtxProfile name><log group name>`.

- **retention**—The length of duration for storing the logs in CloudWatch. The default is 5-days.

Flow log properties:

- **trafficType**—The type of traffic to collect. Supported types are **all**, **accepted only,** and **rejected only**. The default is **all**.

Enabling VPC Flow Logs Using the Cisco Cloud APIC GUI

This section explains how to enable VPC flow logs using the Cisco Cloud APIC GUI.

Step 1 Click the **Navigation** menu and choose **Application Management** > **Tenants**.

The **Tenants** window appears with the tenants listed as rows in a summary table.

Step 2 Double-click on a tenant.

The tenant dialog box appears over the Work pane. The tenant dialog box displays the **Overview**, **Cloud Resources**, **Application Management**, **Statistics**, and **Event Analytics** tabs.

Step 3 Click the **Statistics** tab.

The **EPGs**, **CSRs**, and **Flow Log Collection** subtabs appear.

Step 4 Click **Flow Log Collection**.

The **Flow Log Collection Settings** information appears at the top of the dialog box with the **edit** icon in the top-right corner.

Step 5 Click the **edit** icon.

The **Flow Log Collection Settings** dialog box appears.

Step 6 Enter the appropriate values in each field as listed in the following *Flow Log Collection Settings Dialog Box Fields* table then continue.

Table 1: Flow Log Collection Settings Dialog Box Fields

Properties	Description
Type of Traffic to be Logged	Click the **Type of Traffic to be Logged** drop-down list and choose one of the following options: • **All Traffic** (default) • **Accepted Only Traffic** • **Rejected Only Traffic**
Destination	Click the **Destination** drop-down list and choose **CloudWatch** (default).

Properties	Description
Retention	Click the **Retention** drop-down list and chose from the following options: • **1 day** • **3 days** • **5 days** (default) • **1 month** • **13 months** • **18 months** • **2 months** • **3 months** • **4 months** • **5 months** • **6 months** • **1 week** • **2 weeks** • **1 year** • **10 years** • **2 years** • **5 years**

Step 7 When finished, click **Save**.

Enabling VPC Flow Logs Using the REST API

This section demonstrates how to enable VPC flow logs using the REST API.

Step 1 Create a log group:

```
<cloudAwsLogGroup name="lg1" retention="days-3" status="">
    </cloudAwsLogGroup>
```

Step 2 Create a flow log policy:

```
<cloudAwsFlowLogPol name="flowLog1" trafficType="ALL" status="">
```

```
    <cloudRsToLogGrp tDn="uni/tn-t20/loggrp-lg1" status=""/>
</cloudAwsFlowLogPol>
```

Step 3 Create a relationship from a CtxProfile to a flow log policy:

```
<cloudCtxProfile name=" vrf1" status="">
  <cloudRsCtxToFlowLog tnCloudAwsFlowLogPolName="flowLog1" status=""/>
</cloudCtxProfile>
```

Cloud Router Statistics

These statistics are available for the cloud router:

- Ingress packets
- Egress packets
- Ingress bytes
- Egress bytes

The Cisco Cloud APIC collects and stores the cloud router statistics by the following granularities:

- 15-minutes
- 1-hour
- 1-month
- 1-year

Collection Mechanism

Each cloud router instance captures and stores the previously mentioned 4-stat values for each physical and tunnel interface.

The Cisco Cloud APIC queries the cloud routers for these statistics and maps the response to cloud router statistics on the Cisco Cloud APIC. The statistics query repeats every 5 minutes for as long as the tunnel is up and operational.

Raw Statistics

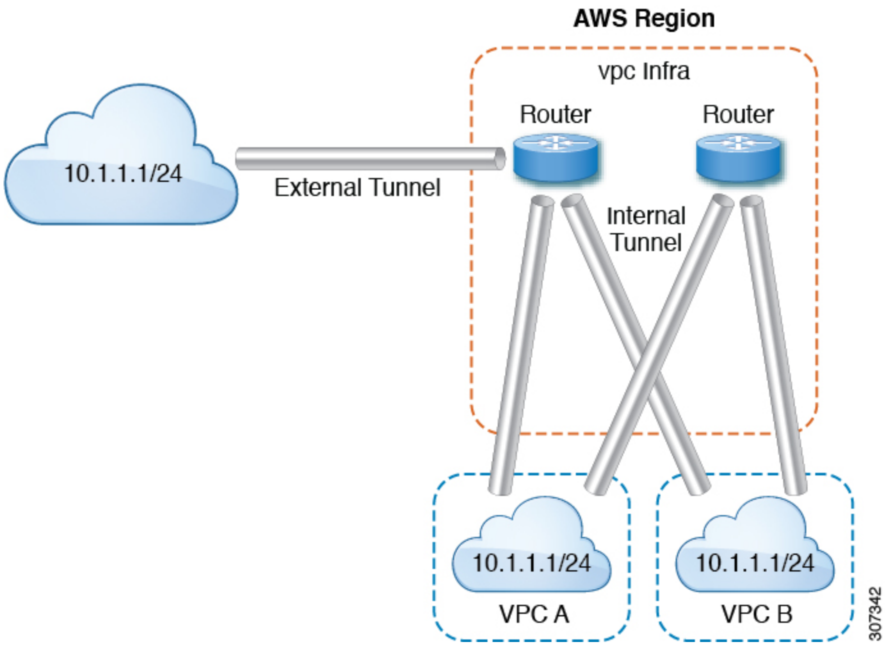
The raw statistics are stored under 2 Dns:

- `uni/tn-<infraTenant>/ctx-<infraCtx>/region-<infraRegion>/router-<csrname>/to-<ip or user-region>/tunn-<tunnel-id>`
- `uni/tn-<userTenant>/ctx-<userCtx>/region-<userRegion>/region-<infraRegion>/router-<csrname>/tunn-<tunnel-id>`

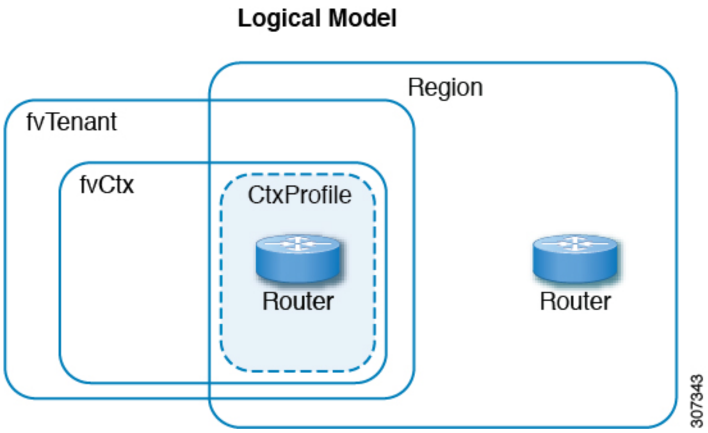
Note

- The second Dn holder is the statistics as seen from the user endpoints connected to the cloud router. These statistics are hence flipped (Ingress on the CSR becomes egress on the user region)
- Not all tunnels have a corresponding user dn. This is only applicable to internal tunnels. External tunnels statistics are only available on the 1st Dn.

In the following figure, internal tunnels are between the user VPC and infra VPC. The infra VPC contains the host router. The user VPC can contain the host or VGW router. The infra creates these tunnels. The tunnels are not explicitly configured. As a result, statistics are available for both the infra side and the user side. External tunnels are between infra VPC and an external IP address. Statistics are only available on the infra side (Dn-1).



In the logical model diagram, a tenant can be infra or a user tenant. You configure a VRF (or `fvCtx`) to be inside a tenant (per tenant). A VRF can be within one region or span across multiple regions.



Aggregated Statistics

Statistics are aggregated at each parent level of the DN. For the preceding case, statistics on tunnel, statistics are aggregated on to the destination IP, cloud router, region, vrf (`ctx`), and tenant.

For example, if you want to find the egress packets from the infra cloud router to a user region, it is available under `uni/tn-<infraTenant>/ctx-<infraCtx>/region-<infraRegion>/router-<csrname>/to-<ip or user-region>/`

If you want to get all the packets between user region1 and infra region2, it is available under `uni/tn-<userTenant>/ctx-<userCtx>/region-<userRegion>/region-<infraRegion>/`

Also, if you want to find statistics per `cloudCtxProfile`, it is available under `uni/tn-<userTenant>/ctx-<userCtx>/region-<userRegion>/` or `uni/tn-<infraTenant>/ctx-<infraCtx>/region-<infraRegion>/`.

Cloud Router GUI Statistics

On the UI, statistics are available under the tenant, VRF, infra region, and `cloudCtxProfile`.