

Validating okta changes with assests

Contents

Introduction

This document describes the process to identify and troubleshoot performance issues on Enterprise Routing Platforms caused by NAT bottleneck issues.

Background Information

High utilization and performance issues on the Cisco Quantum Flow Processor (QFP) can be observed on a Cisco router when there is a mix of NAT and Non-NAT traffic flows present on the same interface. This may also lead to other performance issues such as interface errors or slownes.

Note: The QFP is located on the Embedded Services Processor (ESP) and it is in charge of the data plane and packet processing for all the inbound and outbound traffic flows.

Symptoms

It is important to validate and confirm these symptoms from the router In order to identify this behavior:

1. High QFP Load alerts. These alerts appear when the Load exceeds the threshold of 80%

```
Feb 8 08:02:25.147 mst: %IOSXE_QFP-2-LOAD_EXCEED: Slot: 0, QFP:0, Load 81% exceeds the setting thresho
Feb 8 08:04:15.149 mst: %IOSXE_QFP-2-LOAD_RECOVER: Slot: 0, QFP:0, Load 59% recovered.
```

Note: You can also run the **show platform hardware qfp active datapath utilization summary** command in order to reveal the load on the QFP and the traffic rates.

```
Router# show platform hardware qfp active datapath utilization summary
  CPP 0:
  5 secs      1 min      5 min      60 min
Input:  Total (pps)      1858109      1953024      1992356      598272
        (bps)      8750397752    9770639528    10099909776    3085977056
Output:  Total (pps)      1860398      1952969      1992356      598269
        (bps)      8713684416    9717124768    10039398888    3067716480
Processing: Load (pct)      80          78          79          25
```

2. Interface errors. Packets might be dropped due to backpressure If there is high utilization of QFP. In such cases, Overruns and Output Drops are commonly observed on the interfaces. To display this information, you can run the **show interfaces** command

```
TenGigabitEthernet0/0/0 is up, line protocol is up
MTU 1500 bytes, BW 10000000 Kbit/sec, DLY 10 usec,
  reliability 255/255, txload 69/255, rxload 66/255
Encapsulation ARPA, loopback not set
Keepalive not supported
Full Duplex, 10000Mbps, media type is SFP-LR
30 second input rate 2592521000 bits/sec, 551376 packets/sec
30 second output rate 2740401000 bits/sec, 546169 packets/sec
  2561555982225 packets input, 1400761436817887 bytes, 0 no buffer
  Received 8 broadcasts (0 IP multicasts)
  0 runts, 0 giants, 0 throttles
  208773857 input errors, 0 CRC, 0 frame, 208773857 overrun, 0 ignored
```

3. In some scenarios, users can complain of slowness on the network.

4. From Packet Trace capture with Feature Invocation Array (FIA) trace option, we can observe that NAT feature consumes more resources than expected. In the example below, we can see that the *lapsed time* for the *IPV4_NAT_INPUT_FIA* feature is significantly larger than the lapsed time from other features. This behavior usually indicates that the QFP takes more time to process this feature and, as result, more resources from the QFP are used for NAT.

```
Feature: IPV4_NAT_INPUT_FIA
  Entry      : Input - 0x70013f38
  Input      : TenGigabitEthernet0/0/0
  Output     : <unknown>
  Lapsed time : 889248 ns
Feature: IPV4_INPUT_TCP_ADJUST_MSS
  Entry      : Input - 0x70013f74
  Input      : TenGigabitEthernet0/0/0
  Output     : <unknown>
  Lapsed time : 160 ns
```

5. High volume of non-NATed traffic on a NATed interface. The non-NATed traffic consume a high amount of resources and cause the QFP utilization spikes. This behavior can be validated by checking the number of *misses* as shown in the commands below.

```
Router#show platform hardware qfp active feature nat datapath gatein activity
Gatekeeper on
ext mode Size 65536, Hits 3110824242, Miss 158048278, Aged 22857149 Added 40481260 Active 9210

Router#show platform hardware qfp active feature nat datapath gateout activity
Gatekeeper on
ext mode Size 65536, Hits 8859954776, Miss 187570099, Aged 23354766 Added 195466140 Active 11688
```

Workaround/Fix for high QFP due to non-NATed traffic

Solution 1

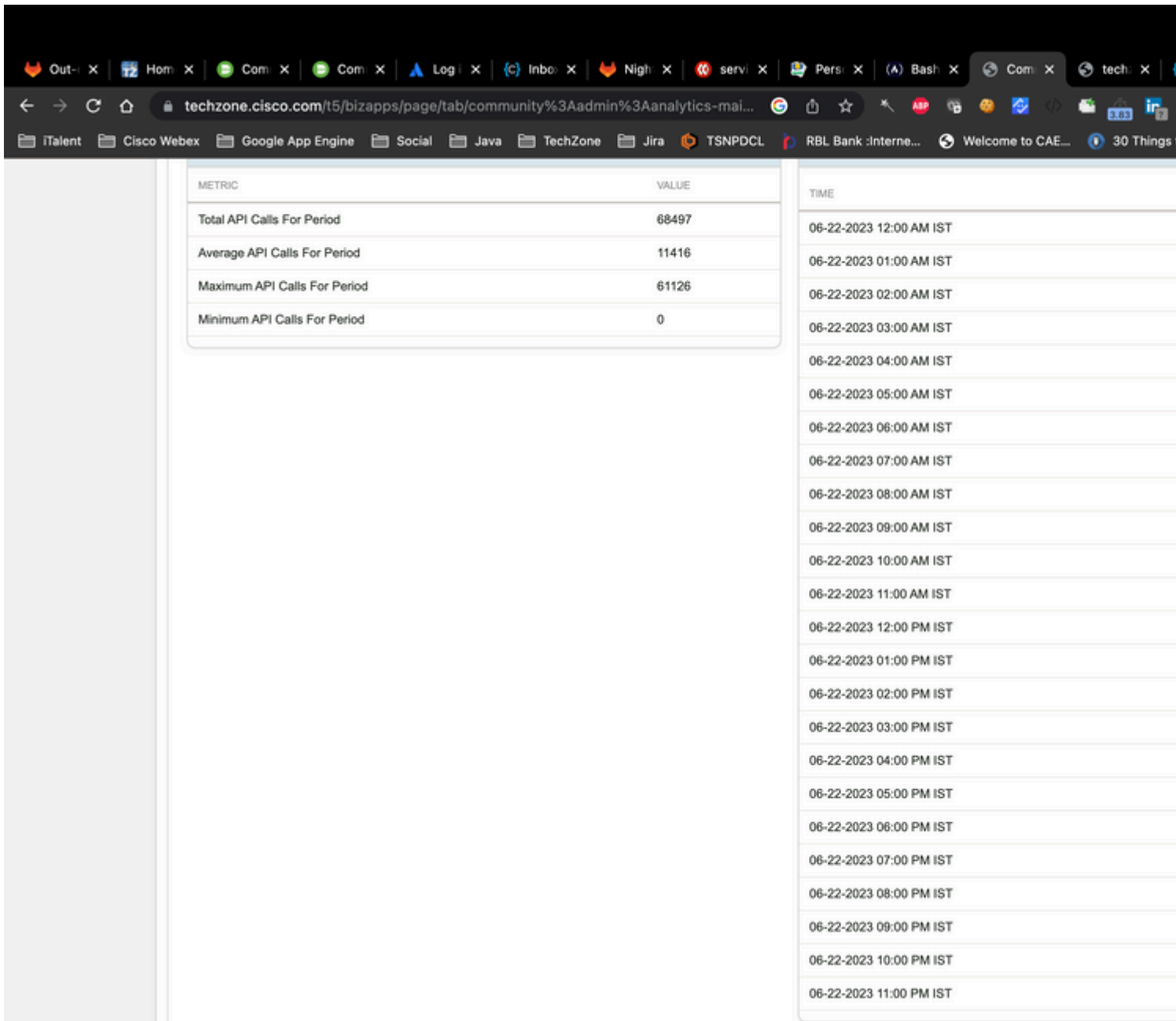
Usually, the recommendation by Cisco for this type of issues is try to redirect the non-NATed traffic from the NATed interface to a different interface from same chassis or from another router. If there are no available interfaces, then, you can try to at least reduce this type of traffic on the affected interface.

Solution 2

Another workaround is to make adjustments to increase the cache on the *NAT Gatekeeper* feature in order to try to reduce the number of *misses* from the gatekeeper. This feature was first introduced in software version 12.2(33)XND. The purpose of this feature is try to reduce the amount of resoruces consumed by non-NATed flows in order to prevent excessive utilization on the CPU and on the Quantum Flow Processor (QFP).

The example below shows how to adjust the Gatekeeper on a Cisco router. The recommendation is to start from 64K. It is important to highlight this value should be represented in powers of 2. Otherwise, the value will be automatically set to the next lower size.

```
Router(config)#ip nat service gatekeeper
Router(config)#ip nat settings gatekeeper-size 65536
```



The screenshot shows a web browser window with multiple tabs. The active tab is titled "techzone.cisco.com/t5/bizapps/page/tab/community%3Aadmin%3Aanalytics-mai...". The browser's address bar shows the URL. Below the browser window, there are two tables. The first table, titled "METRIC" and "VALUE", lists API call statistics. The second table, titled "TIME", lists a series of timestamps from 06-22-2023 12:00 AM IST to 06-22-2023 11:00 PM IST.

METRIC	VALUE
Total API Calls For Period	68497
Average API Calls For Period	11416
Maximum API Calls For Period	61126
Minimum API Calls For Period	0

TIME
06-22-2023 12:00 AM IST
06-22-2023 01:00 AM IST
06-22-2023 02:00 AM IST
06-22-2023 03:00 AM IST
06-22-2023 04:00 AM IST
06-22-2023 05:00 AM IST
06-22-2023 06:00 AM IST
06-22-2023 07:00 AM IST
06-22-2023 08:00 AM IST
06-22-2023 09:00 AM IST
06-22-2023 10:00 AM IST
06-22-2023 11:00 AM IST
06-22-2023 12:00 PM IST
06-22-2023 01:00 PM IST
06-22-2023 02:00 PM IST
06-22-2023 03:00 PM IST
06-22-2023 04:00 PM IST
06-22-2023 05:00 PM IST
06-22-2023 06:00 PM IST
06-22-2023 07:00 PM IST
06-22-2023 08:00 PM IST
06-22-2023 09:00 PM IST
06-22-2023 10:00 PM IST
06-22-2023 11:00 PM IST

Average API Calls For Period	53857
Maximum API Calls For Period	132409
Minimum API Calls For Period	0

04-10-2023 12:00 AM IST
04-10-2023 01:00 AM IST
04-10-2023 02:00 AM IST
04-10-2023 03:00 AM IST
04-10-2023 04:00 AM IST
04-10-2023 05:00 AM IST
04-10-2023 06:00 AM IST
04-10-2023 07:00 AM IST
04-10-2023 08:00 AM IST
04-10-2023 09:00 AM IST
04-10-2023 10:00 AM IST
04-10-2023 11:00 AM IST
04-10-2023 12:00 PM IST
04-10-2023 01:00 PM IST
04-10-2023 02:00 PM IST
04-10-2023 03:00 PM IST
04-10-2023 04:00 PM IST
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04-10-2023 07:00 PM IST
04-10-2023 08:00 PM IST
04-10-2023 09:00 PM IST
04-10-2023 10:00 PM IST
04-10-2023 11:00 PM IST

Username ?

User Selection ?

*** Frequency** ?

*** Date Range** to

- Metrics** ?
- Knowledge Base Articles Deleted from Pipeline
 - Knowledge Base Article Publication Count
 - REST API --
 - API Calls**
 - Community Method Calls
 - Category Method Calls
 - Board Method Calls
 - Message Method Calls
 - Note Method Calls
 - User Method Calls
 - Total Errors
 - Khoros Core Errors
 - Authentication Errors
 - API Errors
 - REST API Binding Errors

API Calls Report Graph

API Calls Report Summary Information

[Export CSV](#)

METRIC	VALUE
Total API Calls For Period	76
Average API Calls For Period	19
Maximum API Calls For Period	34
Minimum API Calls For Period	4

API Calls Data for Period

TIME	VALUE
04-19-2023	1
04-20-2023	2
04-21-2023	3
04-22-2023	4

Cisco Data Security Alert



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