

Configuring Media Flow Analytics

This chapter contains information about media flow analytics for Cisco's IP fabric for media solution.

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RTP Flow Monitoring

Real-Time Transport Protocol (RTP) is a network protocol for delivering audio and video over IP networks. It is designed for end-to-end, real-time transfer of streaming media. The protocol provides facilities for jitter compensation and detection of packet loss, which are common during UDP transmissions on an IP network.

RTP flow monitoring caches RTP flows on the switch and detects any gaps in the RTP sequence number, which indicates a loss in RTP frames. This information helps to pinpoint where the loss is occurring and enables you to better plan hardware resources.

Guidelines and Limitations for RTP Flow Monitoring

The following guidelines and limitations apply to RTP flow monitoring:

- Only Cisco Nexus 9300-FX, 9300-FX2, and 9300-FX3 platform switches support RTP flow monitoring.

  In addition, beginning with Cisco NX-OS 9.3(6), Cisco Nexus 9300-GX platform switches support RTP flow monitoring.

- When RTP flow monitoring is configured with an initial ACL, and then changed to a different ACL, the RTP configuration must be removed with the `no flow rtp` form of the command and then configured again with the required ACL.

- Reboot the switch after configuring UDF for RTP flow monitoring.

- You can configure only one RTP flow monitoring UDF.

- The RTP flow monitoring UDF must be the first UDF.

- Traditional NetFlow Monitor and RTP flow monitoring cannot coexist on the switch.

- On Cisco Nexus 9300-GX2, H2R, H1, and 9408 Series switches, multicast RTP flow monitoring with the optimization knob is not supported in the following scenarios:
  - when port-channels with PIM enabled are configured
  - when SVIs are configured
- These guidelines apply to RTP flow history entry management:
  - Use the command **flow rtp history** *value* to configure the desired maximum number of RTP errored flow history entries to be stored. This value acts as a guideline for the history buffer size.
  - Be aware that the actual number of stored entries shown by the **show flow rtp errors history** command may exceed the configured value due to internal system mechanisms. This behavior ensures that critical and recent RTP error events are comprehensively logged and retained for effective troubleshooting.

    For example, if you configure **flow rtp history 500**, you may observe more than 500 entries when running **show flow rtp errors history**.
- Beginning with Cisco NX-OS Release 10.6(1)F, DME operational objects are available for monitoring RTP flow-loss events through telemetry. For telemetry configuration and downgrade compatibility information, see Cisco Nexus 9000 Series NX-OS Programmability Guide.
- Beginning with Cisco NX-OS Release 10.6(2)F, RTP flow error checks are sampled at a 1-in-10 rate to limit update volume when scale reaches 16,000. Every tenth packet triggers an update to the RtpFlowLossNotifv4 or RtpFlowLossNotifv6 in the DME database.

  This feature is supported on Nexus 9300-FX/FX2/FX3/GX/GX2/H2R/H1 TOR switches

Configuring RTP Flow Monitoring

You can configure RTP flow monitoring for Cisco Nexus 9300-FX, 9300-FX2, and 9300-FX3 platform switches.

In addition, beginning in Cisco NX-OS 9.3(6), you can configure RTP flow monitoring for Cisco Nexus 9300-GX platform switches.

Before you begin

Enable UDF for RTP flow monitoring using the **udf netflow_rtp netflow-rtp** command, copy the running configuration to startup, and reboot the switch. Make sure that the RTP flow monitoring UDF is the first UDF.

SUMMARY STEPS

1. **configure terminal**
2. [**no**] **feature netflow**
3. (Optional) **ip access-list** *acl*
4. [**no**] {**ip** | **ipv6**} **flow rtp** [*acl*]

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	[**no**] **feature netflow** **Example:** `switch(config)# feature netflow`	Enables RTP flow monitoring globally on the switch.

Step 3	(Optional) **ip access-list** *acl*
	Example:
	`ip access-list ipv4-test-acl`
	`10 permit ip any 224.0.1.39/32`
	`20 permit ip any 224.0.1.40/32`
		Configures an ACL policy to filter any specific traffic.

Step 4	[**no**] {**ip** | **ipv6**} **flow rtp** [*acl*]
	Example:
	`switch(config)# ip flow rtp`
		Enables RTP flow monitoring for IPv4 or IPv6 flows.
		• This command also creates a system-wide access control list (ACL) to filter the UDP port range of 16384 to 32767. This range is the RFC standard UDP port range for RTP traffic.
		Note
		The **ignore routable** command filters any multicast traffic.
		`switch(config)# show ip access-list`
		`IP access list nfm-rtp-ipv4-acl`
		`ignore routable`
		`10 permit udp any any range 16384 32767`
		Note
		When an ACL is specified in the command, only traffic that matches the specified ACL is reported as RTP flows.
		`switch(config)# ip flow rtp ipv4-test-acl`

Displaying RTP Flows and Errors

To display the RTP flows and errors, perform one of the following tasks.

show flow rtp details	Displays all IPv4 and IPv6 RTP flows.
show flow rtp details {**ipv4** | **ipv6**}	Displays either IPv4 or IPv6 RTP flows.
show flow rtp errors active	Displays details of all RTP flows that are currently experiencing losses (if the packet loss is detected in at least one update interval within the last 10 seconds). The loss statistics for the active loss window are also displayed. Because the loss window is still considered active, the loss end time shows as "N/A."
show flow rtp errors history	Displays details of the last 1000 historical loss windows (in reverse chronological order) and their respective flow details.

The following example shows sample output for the **show flow rtp details** command:

```
RTP Flow timeout is 1440 minutes
IPV4 Entries
SIP      DIP      BD ID S-Port D-Port Intf/Vlan Name  Packet Count BytesPerSec  FlowStart
50.1.1.2 20.1.1.2 4151  16385  17999  Ethernet1/49/1  269207033    594468000    00:21:16
PST Apr 07 2019
20.1.1.2 50.1.1.2 4100  16385  18999  port-channel500 2844253      199000       00:21:59
PST Apr 07 2019

IPv6 Entries
SIP          DIP    BD ID S-Port D-Port Intf/Vlan Name   Packet Count BytesPerSec FlowStart
20::2        50::2  4100  30000  31999  port-channel500  2820074      199000      00:22:04
 PST Apr 07 2019
50::2        20::2  4151  30000  31999  Ethernet1/49/1   3058232      199000      00:21:16
 PST Apr 07 2019
```

The following example shows sample output for the **show flow rtp errors active** command:

```
RTP Flow timeout is 1440 minutes
IPV4 Entries
SIP             DIP             BD ID   S-Port  D-Port  Intf/Vlan Name      Packet Count
   BytesPerSec  FlowStart                 Packet Loss Loss Start                Loss End
30.30.1.2       20.20.1.2       4197    30000   20392   Ethernet1/98        200993031
   10935633     20:23:15 UTC May 30 2019  1558        03:48:32 UTC May 31 2019  N/A
20.20.1.2       30.30.1.2       4196    30000   20392   Ethernet1/97        204288988
   11114959     20:23:15 UTC May 30 2019  222         03:48:30 UTC May 31 2019  N/A
```

Note When an RTP flow enters the "active-errored" state, the following syslog message appears:

```
%NFM-1-RTP_FLOW_ERROR_DETECTED: Flow SIP: 30.30.1.2 DIP: 20.20.1.2 Interface: Ethernet1/98
 loss detected
```

The following example shows sample output for the **show flow rtp errors history** command:

```
RTP Flow timeout is 1440 minutes
IPV4 Entries
SIP             DIP             BD ID   S-Port  D-Port  Intf/Vlan Name      Packet Count
   BytesPerSec  FlowStart                 Packet Loss Loss Start               Loss End

20.20.1.2       30.30.1.2       4196    30000   20392   Ethernet1/97        204187441
   11122753     20:23:15 UTC May 30 2019  2061        03:47:57 UTC May 31 2019  03:47:57
UTC May 31 2019
30.30.1.2       20.20.1.2       4197    30000   20392   Ethernet1/98        199495510
   10937237     20:23:15 UTC May 30 2019  1882        03:45:06 UTC May 31 2019  03:45:06
UTC May 31 2019
20.20.1.2       30.30.1.2       4196    30000   20392   Ethernet1/97        202753418
   11116269     20:23:15 UTC May 30 2019  4976        03:45:05 UTC May 31 2019  03:45:05
UTC May 31 2019
20.20.1.2       30.30.1.2       4196    30000   20392   Ethernet1/97        202630465
   11123369     20:23:15 UTC May 30 2019  2139        03:44:32 UTC May 31 2019  03:44:32
UTC May 31 2019
30.30.1.2       20.20.1.2       4197    30000   20392   Ethernet1/98        197973969
   10938370     20:23:15 UTC May 30 2019  1854        03:41:41 UTC May 31 2019  03:41:41
UTC May 31 2019
```

Note When an RTP flow is no longer in the “active-errored” state, the following syslog message appears:

```
%NFM-1-RTP_FLOW_ERROR_STOP: Flow SIP: 30.30.1.2 DIP: 20.20.1.2 Interface: Ethernet1/98 loss
 no longer detected
```

Clearing RTP Flows

To clear RTP flows, perform one of the following tasks.

clear flow rtp detail	Clears all RTP flows and loss histories.
clear flow rtp detail {**ipv4** | **ipv6**}	Clears either IPv4 or IPv6 RTP flows and loss histories.
[**no**] **flow rtp timeout** *value* **Example:** `switch(config)# flow rtp timeout 100`	Clears non-active RTP flows from the **show rtp details**, **show flow rtp errors active**, and **show flow rtp errors history** tables. The default value is 1440 minutes (24 hours), and the range is from 0 to 1440 minutes. A value of 0 prevents RTP flows from being cleared. **Note** This command does not clear active RTP flows.