



ADTRAN Operating System Configuring VQM Reporter for AOS and n-Command MSP

Configuration Guide

6AOSCG0047-29B

February 2021



To the Holder of this Document

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Document Revision History

Rev A	March 2013	Initial release.
Rev B	February 2021	Updated document template and added virtual routing and forwarding (VRF) instance information for the VQM reporter.

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1. Overview

This configuration guide describes the voice quality monitoring (VQM) reporter feature and its use with ADTRAN Operating System (AOS) products and the n-Command® managed service provider (MSP) server. This guide provides all necessary information for step-by-step configuration of the AOS product through the command line interface (CLI).

2. VQM Reporter Overview

Voice quality monitoring (VQM) allows real time passive Voice over IP (VoIP) quality measurements to be taken on all Realtime Transport Protocol (RTP) voice streams transmitted through an AOS device. The VQM reporter is a feature that allows the gathered VQM statistics to be aggregated by third-party collectors, such as the n-Command MSP server. Allowing aggregation by the n-Command MSP server provides more flexibility in monitoring voice networks. Configuring the VQM reporter is done through the AOS CLI and consists of creating the reporter, configuring the parameters of the reporter, and viewing the reporter statistics. VQM should be enabled and configured on the AOS device before configuring the VQM reporter. For more information about configuring VQM, refer to the [Voice Quality Monitoring Configuration Guide](https://supportcommunity.adtran.com) available online at <https://supportcommunity.adtran.com>. You must also have the AOS device connected to the n-Command MSP server for the VQM reporter feature to be functional. Refer to configuration guide [Configuring Auto-Link for AOS and n-Command MSP](https://supportcommunity.adtran.com), available online at <https://supportcommunity.adtran.com>, for assistance in connecting your unit to the server.

3. Hardware and Software Requirements and Limitations

The VQM reporter feature is supported by AOS data devices running firmware 17.06.01 or later, and for AOS voice products running firmware A2.01.00 or later.

As of AOS release R10.7.0, VQM reporter can be configured to send VQM reports to the same n-Command MSP server that auto-link is currently using. In addition, if auto-link should fail over to another MSP server, VQM reporting will also fail over to the new MSP server and send reports to that server. AOS devices running AOS firmware R10.7.0 or later support this feature, as do n-Command MSP servers running software version 6.1 or later. For more information about the auto-link feature and its configuration, refer to the configuration guide [Configuring Auto-Link for AOS and n-Command MSP](https://supportcommunity.adtran.com), available online at <https://supportcommunity.adtran.com>.

As of AOS release R13.10.0, the VQM reporter can be configured to send VQM reports on a nondefault virtual routing and forwarding (VRF) instance. If no VRF is specified in the VQM reporter configuration, then reports are sent on the unnamed default VRF instance. For more information about configuring and using multiple VRF instances, refer to the configuration guide [Configuring Multi-VRF in AOS](https://supportcommunity.adtran.com), available online at <https://supportcommunity.adtran.com>.

4. VQM Reporter Configuration

The VQM reporter is configured on the AOS device using the CLI. Configuration steps include:

1. [Accessing the CLI on page 5](#)
2. [Creating the VQM Reporter on page 6](#)
3. [Configuring the VQM Reporter on page 6](#)

Accessing the CLI

To begin configuring the VQM reporter, you must access the CLI on your AOS unit. To access the CLI, follow these steps:

1. Boot up the unit.

2. Telnet to the unit (**telnet** <ip address>), for example:

```
telnet 10.10.10.1.
```



NOTE

If during the unit's setup process you have changed the default IP address (10.10.10.1), use the configured IP address.

3. Enter your user name and password at the prompt.



NOTE

*The AOS default user name is **admin** and the default password is **password**. If your product no longer has the default user name and password, contact your system administrator for the appropriate user name and password.*

4. Enter the unit's Enable mode by entering the **enable** command at the > prompt as follows:

```
>enable
```

5. Enter your Enable mode password at the prompt.

6. Enter the unit's Global Configuration mode by entering **config terminal** as follows:

```
#config terminal
(config)#
```

Creating the VQM Reporter

To create the VQM reporter, enter the **ip rtp quality-monitoring reporter** <name> [**vrf** <name>] command from the unit's Global Configuration mode. This command creates and names the particular VQM reporter, and enters the reporter's configuration mode. The optional **vrf** <name> parameter specifies a nondefault VRF instance on which to enable the VQM reporter. If no VRF is specified, the VQM reporter is enabled on the default unnamed VRF instance. To create a VQM reporter on the default VRF, enter the command as follows:

```
(config)#ip rtp quality-monitoring reporter Reporter1
          Configuring New Reporter "Reporter1"
(config-rtp-reporter-Reporter1)#
```

You are now in the VQM reporter's configuration mode and can configure the parameters of this particular reporter.

Configuring the VQM Reporter

Once you have created the VQM reporter and entered its configuration mode, you can configure its parameters. Configurable parameters include the following:

- the primary and secondary server used to collect reports
- the protocols and ports used by the reporter
- the reporter description
- the number of reports allowed to be held in the reporter queue
- the number of times the reporter attempts to connect to the server
- whether the reporter is enabled or disabled
- the users that send or receive VQM reports

To configure the VQM reporter, complete the tasks in the following sections.

Step 1: Specifying the VQM Report Collector

You can specify that VQM reports are collected by a primary and/or secondary server or an n-Command MSP server. To use a primary or secondary server to collect VQM reports, you must specify the IP address or host name of the server(s) using the **collector [primary | secondary] <hostname | ip address> [tcp <port> | udp <port>]** command. To use an n-Command MSP server to collect VQM reports, you must specify the MSP server using the **collector auto-link [tcp | udp [<port>]]** command. Each command and its parameters are detailed in the following sections.

Using a Primary or Secondary Server as the VQM Report Collector

With the **collector [primary | secondary] <hostname | ip address> [tcp <port> | udp <port>]** command, you can set both a primary and secondary server to receive the VQM reports. Whether setting the primary or secondary collector, you must specify either a host name or an IP address for the server. IP addresses should be expressed in the decimal dotted notation (for example, **10.10.10.1**).



NOTE

*If a host name is used, a domain naming system (DNS) server should be learned by the AOS device via Dynamic Host Configuration Protocol (DHCP) or should be specified using the **name-server** command from the Global Configuration mode prompt.*

You can also optionally specify the protocol and port used to communicate with the server. You can use either Transmission Control Protocol (TCP) or User Datagram Protocol (UDP) on ports in a range from **0** to **65535**. By default, VQM reporter uses **tcp** on port **5060** in all AOS products except the IP Business Gateways and Session Border Controller (SBC) feature pack routers, which use **udp** on port **5060** by default.



NOTE

*If TCP is going to be used on IP Business Gateways or SBC feature pack routers for the VQM reporter, **ip sip tcp** must be enabled.*

To specify the primary server, enter the command from the VQM Reporter Configuration mode as follows:

```
(config-rtp-reporter-Reporter1)#collector primary 172.5.67.99
(config-rtp-reporter-Reporter1)#
```

To specify a secondary server, and include the protocol and port number, enter the command as follows:

```
(config-rtp-reporter-Reporter1)#collector secondary 172.5.67.95 udp 5061
(config-rtp-reporter-Reporter1)#
```

Using the **no** form of this command removes the server from the reporter's configuration.

Using an Auto-Link Server as the VQM Report Collector

Auto-link redundancy is a feature introduced in AOS firmware release R10.7.0. This feature allows the configuration of multiple n-Command MSP servers that are available to ADTRAN products connected to MSP through auto-link. When multiple MSP servers are configured, ADTRAN units can roll over to the next MSP server for management if the current MSP server fails. VQM reporting can be configured to use the selected auto-link MSP server as the report collector. When a failover event occurs, VQM reporters that are configured to use auto-link automatically roll over to the new server for reporting.

To configure the VQM reporter to send its reports to the IP address of the n-Command MSP server that auto-link is currently using, enter the **collector auto-link [tcp | udp [<port>]]** command from the VQM Reporter Configuration mode. The optional **tcp** and **udp** parameters specify that either TCP or UDP is used to communicate with the server. The optional **<port>** parameter specifies the port to use. Valid port range is

0 to **65535**. If no protocol is specified, and if the port is set to **0** or not specified, UDP port **5060** is used. Use the **no** form of this command to disassociate VQM reporting from the auto-link server.

To create a VQM reporter and configure it to use the auto-link MSP server as a the collector, enter the command as follows:

```
(config)#ip rtp quality-monitoring reporter Reporter1
        Configuring New Reporter "Reporter1"
(config-rtp-reporter-Reporter1)#collector auto-link
```



NOTE

*If a reporter has already been configured using specified primary or secondary collectors, and the **collector auto-link** command is entered in the reporter's configuration, the primary and secondary collectors are replaced by the auto-link server. In addition, if a reporter is configured with auto-link, and the **collector primary** command is entered, the newly entered command overwrites the reporter's auto-link configuration.*

Step 2: Entering a Reporter Description (Optional)

You can optionally enter a description of the reporter using the **description <text>** command. Adding a description to the reporter helps in managing multiple reporters. Enter the command as follows:

```
(config-rtp-reporter-Reporter1)#description NV7100VQM
(config-rtp-reporter-Reporter1)#
```

Using the **no** form of this command removes the description from the reporter's configuration.

Step 3: Specifying the VQM Reporter Queue Depth (Optional)

Using the **max-queue-depth <value>** command, you can also optionally specify the number of reports held in the queue that are waiting to send requests or receive responses. The number of reports that can be held ranges from **2** to **2000**. By default, the reporter is configured to hold **512** reports in the queue. To change this value, enter the command as follows:

```
(config-rtp-reporter-Reporter1)#max-queue-depth 700
(config-rtp-reporter-Reporter1)#
```

Using the **no** form of this command returns the queue volume to the default value.



NOTE

*The **max-queue-depth** parameter should not be changed unless it is recommended by ADTRAN technical support.*

Step 4: Specifying the VQM Reporter Connection Attempts (Optional)

You can optionally specify the number of times the VQM reporter will attempt to contact the specified server using the **max-retries <value>** command. By default, the reporter is configured to attempt **3** times before stopping, but you can specify that the reporter retry from **1** to **5** times.

To change the default value, enter the command as follows:

```
(config-rtp-reporter-Reporter1)#max-retries 4
(config-rtp-reporter-Reporter1)#
```

Using the **no** form of this command returns the number of retries to the default value.

Step 5: Enabling/Disabling the VQM Reporter

Specify whether the reporter is enabled or disabled by using the **shutdown** command. By default, the reporter is configured to be active. Using the **shutdown** command deactivates the reporter. Using the **no** form of this command returns the reporter to the active state. To specify the reporter is active, enter the command as follows:

```
(config-rtp-reporter-Reporter1)#no shutdown
(config-rtp-reporter-Reporter1)#
```

Step 6: Specifying VQM Reporter Users (Optional)

You can also specify the user that is sending the report and the user to whom the report is sent. By default, the user that sends the report is the serial number of the AOS device, and the user to whom the report is sent is **collector**. These users are Session Initiation Protocol (SIP) users, and specifying different users is done using the **grammar [from user <user name> | to user <user name>]** command. Using the **no** form of this command returns the user values to the default.

To change the VQM reporter users, enter the command(s) as follows:

```
(config-rtp-reporter-Reporter1)#grammar from user user300
(config-rtp-reporter-Reporter1)#grammar to user user500
(config-rtp-reporter-Reporter1)#
```



WARNING!

*Changing the **from user** or **to user** from the default values will cause communication with n-Command MSP to fail. These fields should only be changed if you are communicating with another type of VQM report collector. ADTRAN recommends leaving these values at the default setting.*

Step 7: Enabling SIP on the AOS Device

SIP must be enabled on the AOS device for the VQM reporter to function, even if SIP is not in use on your network. Enable SIP by entering the **ip sip** command from the Global Configuration mode prompt as follows:

```
(config)#ip sip
(config)#
```

Step 8: Specifying the VQM Reporter Media Gateway

Specify that the media gateway on the interface that routes the VQM reporter traffic uses the primary IP address by entering the **media-gateway ip primary** command from the interface's configuration mode. For example, if you are routing VQM reporter traffic through the Point-to-Point Protocol (PPP) interface, enter the command as follows:

```
(config)#interface ppp 1
(config-ppp 1)#media-gateway ip primary
```

Step 9: Saving the Configuration

The VQM reporter is now configured and you should save the configuration. Save the configuration by entering the **write** command from the Enable mode prompt as follows:

```
(config)#end
#write
```

5. Troubleshooting VQM Reporter

You can view VQM reporter statistics, clear these statistics, and view debug information regarding the VQM reporter all from the CLI. These statistics and debug information can assist in troubleshooting VQM reporters. The following sections discuss how to view VQM reporter statistics and the **show**, **clear**, and **debug** commands associated with VQM reporting.

Viewing VQM Reporter Statistics

To view VQM reporter statistics, enter the **show ip rtp quality-monitoring reporter [<name>] [realtime]** command from the Enable mode prompt. If you do not enter the name of a specific VQM reporter, statistics from all reporters are displayed. Entering the **realtime** keyword displays the statistics in real time. The following is sample output from the command:

```
#show ip rtp quality-monitoring reporter
```

Name	Depth	Success	Failed	Request	Chalnge	Rollovr	Discard
Test 1	4	0	0	36	0	36	6
Test 2	4	0	0	36	0	36	6
Test 3	0	0	10	10	0	0	0
Test 4	0	0	10	10	0	0	0
Test 5	0	0	0	0	0	0	0

These statistics display the reporter name (**Name**), the queue depth or how many reports are waiting to send requests or receive responses (**Depth**), how many successful responses have been received (**Success**), how many failure responses have been received (**Failed**), how many requests have been transmitted (**Request**), how many challenge responses have been received (**Chalnge**), how many requests did not receive responses at all (**Rollovr**), and how many reports were discarded because the retry limit was exceeded (**Discard**).



NOTE

*If you are using VQM reporting with auto-link, output from the same command displays **N/A** in the **Rollovr** column, since the rollover behavior is handled by auto-link and not the VQM reporter.*

Clearing VQM Reporter Statistics

To clear VQM reporter statistics, enter the **clear ip rtp quality-monitoring reporter [<name>]** command from the Enable mode prompt. If you do not enter the name of a specific VQM reporter, statistics from all VQM reporters are cleared. To clear VQM reporter statistics for a single reporter, enter the command as follows:

```
#clear ip rtp quality-monitoring reporter Reporter1
#
```

Using VQM Reporter Debug Messages

To enable and view debug messages related to VQM reporters, enter the **debug ip rtp quality-monitoring reporter [<name>]** command from the Enable mode prompt. If you do not enter the name of a specific VQM reporter, debug messaging is enabled for all VQM reporters.



NOTE

Turning on a large amount of debug information can adversely affect the performance of your unit.

Sample output from the **debug ip rtp quality-monitoring reporter** command appears below:

```
#debug ip rtp quality-monitoring reporter Reporter1
08:46:13 VQM.REPORTER Reporter1 1 Enqueuing VQM Report - 2575556352@10.1.3.9
  to 6353@10.1.3.9, RTP=10.10.20.2:2234->10.17.138.1:3000
08:46:13 VQM.REPORTER Reporter1 1 Generating VQM Report
08:46:13 VQM.REPORTER Reporter1 1 Sending VQM Report
08:46:13 VQM.REPORTER Reporter1 1 Transaction 0x022ad5f0: state changed ->
  Client General Request Sent
```