![Palo Alto Networks logo] paloalto NETWORKS

How to Configure and Test QoS in PANOS 3.0

This document walks through the steps needed for a simple test of the QoS feature. In particular, these steps will rate-limit applications such as youtube, hulu, and web browsing.

Preparation steps:
- Place a Palo Alto Networks firewall inline in your network. The firewall must be running PANOS 3.0.0 or higher. The firewall interfaces can be in virtual wire mode, or layer 3 mode.
- The external interface needs to have network access to the Internet.
- You will be performing the throughput tests on a PC located in your trust zone.
- Configure routing and policies on the firewall to allow traffic to flow from the trust zone to untrust zone.

Part 1: Rate-limiting Web-browsing

In this part, you will set up a simple QoS configuration, and test it by going to a speed testing site on the Internet.

1. Perform an initial throughput test. On the internal PC, use a browser to go to the URL: http://www.speakeasy.net/speedtest, and click on the city closest to you to check your throughput. (Or you can use any bandwidth test program on the Internet that you like.) Run the test a couple times, and record the average throughput:

    Download rate: _____

    Upload rate:_____

2. Login to the firewall as the administrator. Go to the **Policies** tab -> **QoS** screen. Create a rule from "any" zone to "any" zone. On that rule, select application "web-browsing", and configure the class of service to be 5. Your policy should look like this:

QoS Rules

	Name	Source Zone	Destination Zone	Source Address	Source User	Destination Address	Application	Service	Class	Schedule
1	rate limit web browsing	any	any	any	any	any	web-browsing	any	5	none

3. Go to the **Network** tab -> **Network Profiles** -> **QoS Profiles** screen. Create a new QoS profile. Define a QoS profile that will assign a maximum egress limit for class 5 traffic. Set the maximum rate to be 50% or less than download rate you determined step 1. (This example will use 5 Mbps.) Note that you must click in the empty space in the appropriate column, and then type a value.

Your QoS profile will look like this:

4. Go to **Network** tab -> **QoS** screen. Click **New** to assign the QoS profile to a specific interface. Note that rate limiting is performed on the EGRESS interface. In this first test, we want to rate limit files being downloaded via web browsing, therefore assign the profile to the INTERNAL interface. Next to **Clear Text Default Profile**, select the profile you created in the previous step.

5. Commit the changes.

6. Perform the throughput test a couple of times, and record the average results.

       Download rate: _____

       Upload rate:_____

You should find that the download rate is limited, but the upload rate is not. That is because we assigned the QoS profile on the internal interface only.

7. Go to the **Network** tab -> **Network Profiles** -> **QoS Profiles** screen. Create a new QoS profile that will assign a different maximum egress limit for class 5 traffic. Set the maximum rate to be approximately half of the UPLOAD rate you determined in step 1. (This example will use 2 Mbps.)

8. Go to **Network** tab -> **QoS** screen. Click **New** to add another interface that will be rate limited. Select the EXTERNAL interface, and select the profile you just created.

Your QoS interfaces will now look like this:

	Name	Guaranteed Egress (Mbps)	Maximum Egress (Mbps)	Profile
☐ ⚏ ethernet1/2				
	🔒 Tunneled Traffic			
	✏ Clear Text Traffic			limit class 5 traffic to 5 Mbps
☐ ⚏ ethernet1/1				
	🔒 Tunneled Traffic			
	✏ Clear Text Traffic			limit class 5 traffic to 2 Mbps

9. Commit the changes.

10. Perform the throughput test a few times, and record the average results.

   Download rate: _____

   Upload rate:_____

You should find that the upload rate is now limited, since you assigned a new QoS profile on the external interface.

Part 2: Rate-limiting Video Apps

11. Go to the following sites to make sure that you can view videos, and there is no delay in the video feed:
   - www.youtube.com
   - video.google.com
   - www.hulu.com

12. Go to the **Policies** tab -> **QoS** screen. Configure your policy to match the following:

QoS Rules

	Name	Source Zone	Destination Zone	Source Address	Source User	Destination Address	Application	Service	Class	Schedule
1	rate limit video apps	any	any	any	any	any	🔳 google-video 🔳 hulu 🔳 youtube	any	8	none

13. Go to the **Network** tab -> **Network Profiles** -> **QoS Profiles** screen. Create a new profile that matches the following:

This profile will still rate-limit class 5 traffic to 5 Mbps, but it will also rate-limit class 8 traffic to a very small amount of bandwidth: .1 Mbps.

14. Go to **Network** tab -> **QoS** screen. Since you will be downloading videos, you should edit your INTERNAL interface, and select the profile you just created.

15. Commit the changes.

16. Go to the video sites you tested previously, and attempt to watch videos. You should find that the videos will stop and start, or not even be able to be viewed, due to the decrease in bandwidth.

17. Also go to the throughput testing web site, and test downloading throughput. That should be rate-limited as well, as defined in the profile.

   At this point you can continue testing by adding additional QoS policies, and creating new QoS profiles. For further information, refer to PANOS 3.0 Administrator's Guide, found on http://support.paloaltonetworks.com