

AMD Quick Stream 2.0 Showcase

This document describes the environment and procedure to demonstrate or verify AMD Quick Stream 2.0's functionalities.

Background

Today's media rich and interactive applications are consuming more and more bandwidth. Managing multiple applications when they are contending for limited bandwidth is a major challenge in today's internet savvy environment. Most users open multiple applications without knowing the impact to latency sensitive applications and get frustrated when everything slows down. There needs to be an easy and automated way to prioritize the applications to ensure the best user experience.

What does AMD Quick Stream do?

AMD Quick Stream was created to prioritize and manage applications dynamically in a bandwidth challenged environment. Normal OS mechanisms can handle simple scenarios where there is plenty of bandwidth for all running applications but as soon as there is more bandwidth demand than available bandwidth then the normal management mechanisms are challenged. This usually results in a poor user experience for the most important applications. Latency sensitive applications like video streaming and VOIP for example are impacted the most. **AMD Quick Stream** has the built-in intelligence to identify the highest priority applications and allow them to use the available bandwidth much more efficiently.

AMD Quick Stream defines four priority levels for the applications. Applications within each priority have a guaranteed 5% of total bandwidth to prevent any bandwidth starvation to lower priority traffic if higher priority applications are bandwidth intensive. Applications with the same priority dynamically fair-share the bandwidth available for that priority. **AMD Quick Stream** dynamically detects the total bandwidth availability so the total throughput of all priorities never goes beyond the available bandwidth..

Besides prioritization, **AMD Quick Stream** also shapes the traffic to smooth it out and deliver consistent performance. This will reduce the chances of flow congestion and enhance the overall network performance for each application.

AMD Quick Stream allows a list of *Rules* to be configured to tell which application receives what priority. An application can be identified by its name, to be exact, the executable file name (*.exe); or for web browsers, the URL they are accessing. In version 2.0, they can also be identified by the HTML Content-type they are accessing. For this version only Video and Audio types are explicitly used.

Version 2.0 also introduced the GUI components to allow the end users to create, edit and remove the *Profiles*. A *Profile* is a group of *Rules* to be applied at the same time. End users now can define their own *Profiles* and activate one of them from the main GUI. There is a factory default profile just like in version 1.0. PC vendors can define this profile and the end users cannot modify or delete it from the GUI.

When will AMD Quick Stream deliver benefit?

AMD Quick Stream's works very well when multiple applications contend for limited bandwidth. There are certain scenarios where the benefit of AMD Quick Stream will be minimal or un-noticed:

- If you have a single application using the bandwidth and there is plenty of bandwidth available the **AMD QuickStream** impact will be minimal.
- *Even when there are multiple applications if there is sufficient bandwidth then the impact will be minimized.* In other words the effect of the prioritization is maximized when applications are competing for bandwidth.

Example: If your total bandwidth is 10Mbps and you are downloading a file (low priority) that takes 3Mbps and at the same time watching a YouTube video (high priority) that runs at max 2Mbps, then you will not notice much difference in the video performance.

The traffic shaping feature of **AMD Quick Stream** is still effective for the single application or large bandwidth case but the benefit usually goes unnoticed for the users with a good network connection and plenty of bandwidth. On the other hand in congestive and/or lossy environments, such as public WiFi hotspots, performance gains will be obvious. The traffic shaping is independent of the application priority settings.

New in Version 2.0

The following lists the major improvements and new features in **AMD Quick Stream 2.0**:

- User-configurable Profiles;
- Content-type based application prioritization.

Showcase

Due to the complicated and random nature of the Internet, the quantitative performance tests of network services/equipment are usually conducted in a controlled lab environment, or executed over a long period of time with a large number of samples to filter out the noise.

To showcase the functionality of **AMD Quick Stream** the results need to be real-world results where Users can visually see the difference. Therefore we need a setup that is stable and consistent enough for this to happen. The key points for a successful demo of **AMD Quick Stream's** flow regulation feature are:

- Low-priority traffic that is capable of quickly and constantly saturating the total bandwidth.
- A stable total bandwidth that is high enough for high-priority video.

Setup

The following is an effective setup to demo AMD Quick Stream:

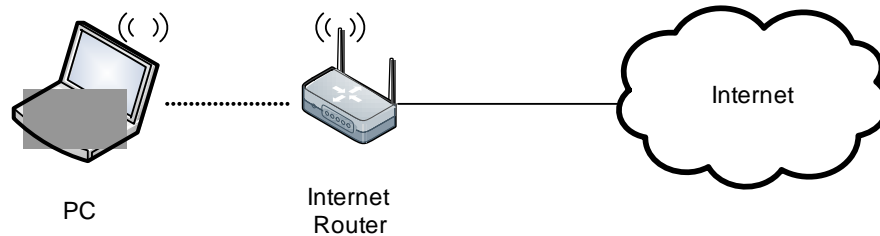


Figure 1. Setup Diagram

Router Setup

An Internet router capable of configuring a max bandwidth imitation should be used. The bandwidth limitation can be set to 6Mbps if the real Internet bandwidth is a minimum of 10Mbps. The reason to limit the bandwidth is to enable contention and congestion to occur more quickly, allowing **AMD Quick Stream** to manage the traffic. Some ISPs may tolerate a big initial burst up to dozens of MB and shrink it down afterwards to the subscribed bandwidth level. This may cause a few minutes of delay before **AMD Quick Stream** is able to work effectively. If the bandwidth limit in the router is set lower than 6Mbps then AMD Quick Stream will show benefit faster. In this example the 6Mbps total is low enough for the P2P traffic to quickly saturate the bandwidth and at the same time big enough for a YouTube HD video to run.

A good router of choice is a DD-WRT mod of Linksys or any of the other well known routers. With DD-WRT, the bandwidth can be configured in the following way:

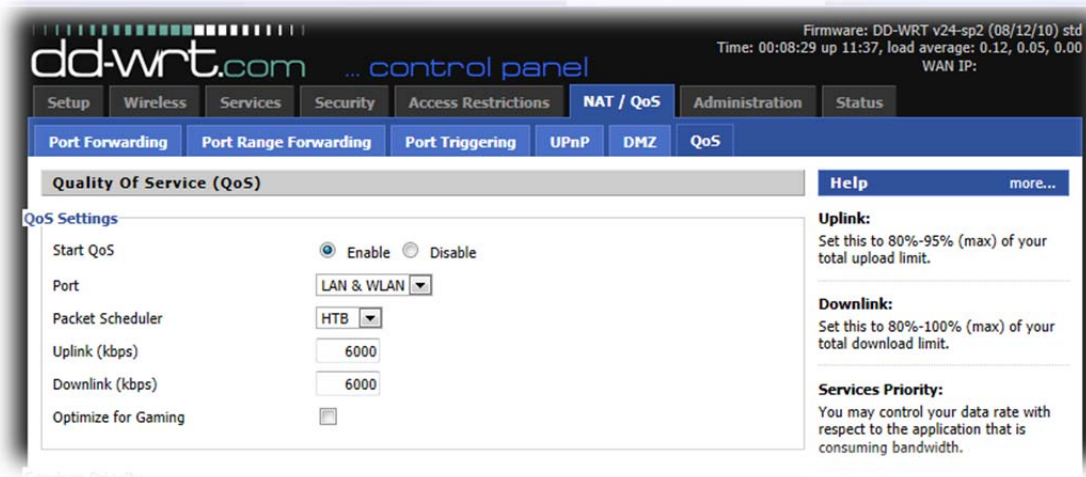


Figure 2. Router Bandwidth Configurations

PC Setup

The PC needs an application to generate enough traffic to quickly saturate the total bandwidth of 6Mbps. P2P download software fits the bill pretty well. , BitTorrent is a good test application and it can be downloaded for free from <http://www.bittorrent.com>.

The download sources must have enough bandwidth to create the needed download traffic. The CentOS Linux DVD ISO is a good choice. To make it fast, two or more torrent files can be used to download simultaneously:

- http://linux.mirrors.es.net/centos/5/isos/x86_64/CentOS-5.7-x86_64-bin-1to8.torrent
- http://linux.mirrors.es.net/centos/6/isos/x86_64/CentOS-6.2-x86_64-LiveDVD.torrent

Run the Demo

AMD Quick Stream has a default profile that sets *youtube.com*, *netflix.com*, etc., as high priority (priority 3). The functionality can be verified easily by comparing the video playback with and without **AMD Quick Stream** installed.

Please note that when using Internet browsers to play online videos, we should make sure the video data is not cached by the previous test runs. The browser cache/history needs to be cleaned up **before each test run** to ensure accurate numbers.

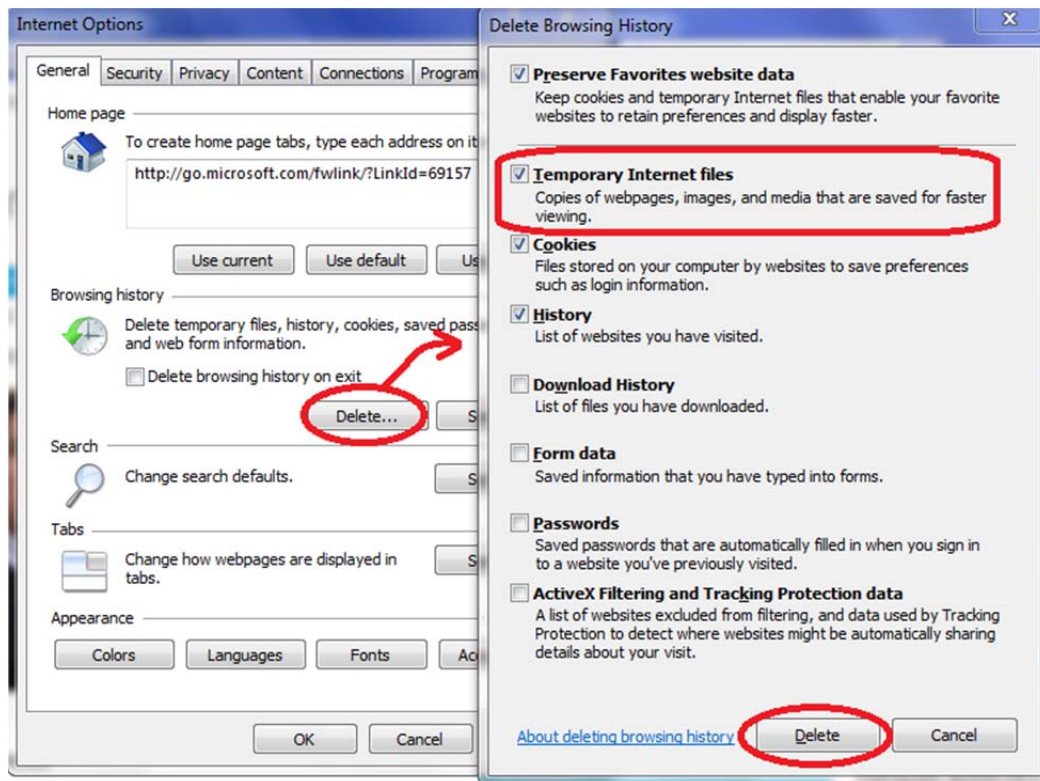



Figure3. Cleanup IE Cache Files

Figure 3 illustrates how to clean the cached files from Internet Explorer (IE) with the “Internet options” dialog box. This dialog can be invoked by selecting “Internet options” on the “Tools” menu (or  on the upper-right corner of the browser window). Make sure at least “Temporary Internet files” are selected to be deleted.

Note that **AMD Quick Stream** supports IE, Firefox and Chrome browsers at this time. It cannot recognize the URLs accessed by other browsers.

Run Without AMD Quick Stream

1. Launch BitTorrent and add the pre-downloaded torrent files if not yet added.

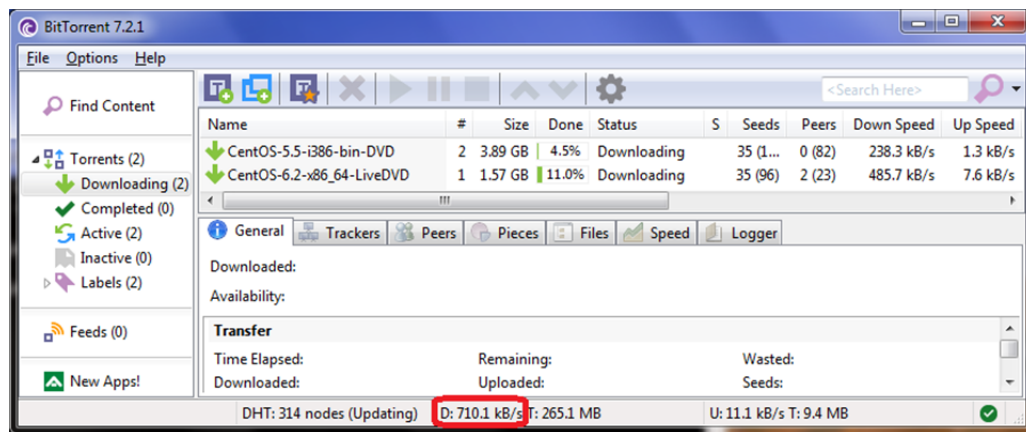


Figure 4. BitTorrent Download

2. Wait for BitTorrent’s total download bandwidth to reach 600kB/s or above.
3. After cleaning up the Internet browser cache, navigate to www.youtube.com. Choose an HD video that is at least a few minutes long to play. A good source is “Beautiful nature scenery (1080p HD)”: <http://www.youtube.com/watch?v=YW8p8JO2hQw>
Make sure to set the playback resolution to “1080p HD”. Observe.

Without **AMD Quick Stream**, BitTorrent dominates the bandwidth. The YouTube video stutters frequently (re-buffers) and sometimes even fails to start at all.

Run With AMD Quick Stream

Now install **AMD Quick Stream** and run exactly the same test sequence as above. Make sure the browser cache has been cleaned up.

With **AMD Quick Stream** in control, the YouTube video will be able to run smoothly even though BitTorrent is trying to steal all of the bandwidth with massive and chaotic download flows. Users will be able to enjoy smooth HD video delivery with no interruptions or stuttering.

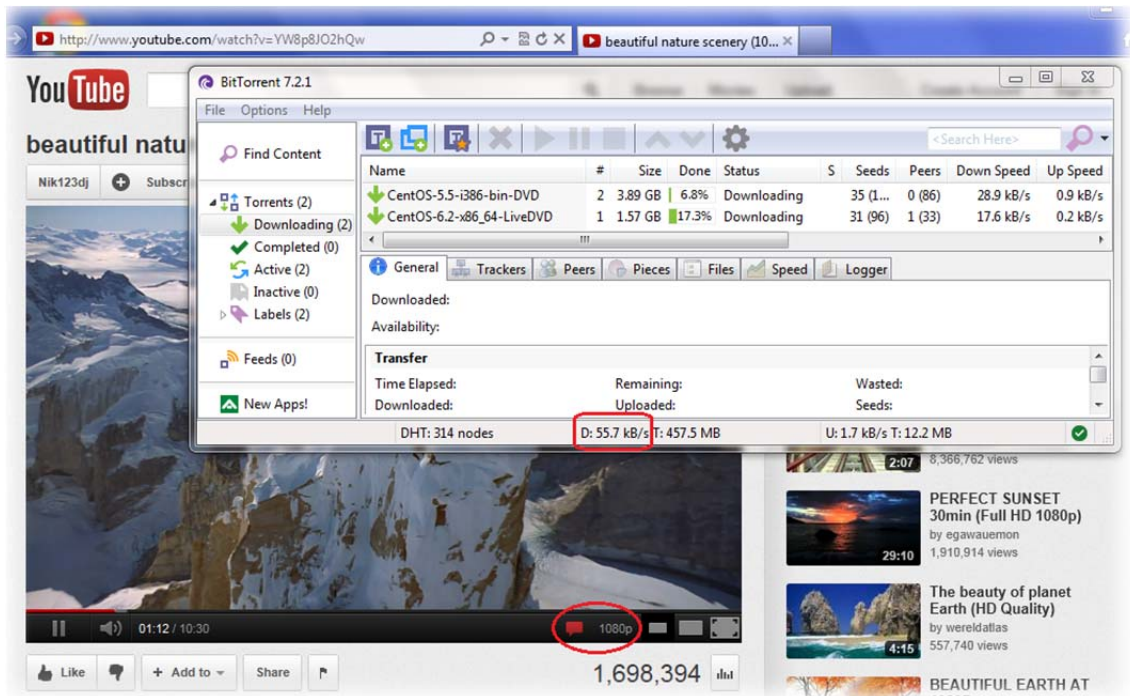



Figure 5. AMD Quick Stream Boosts High-Priority Applications

Notice that the download bandwidth of BitTorrent has been greatly reduced to make room for the HD video. If you close the browser or just stop the video from playing, the high-priority application stops using its bandwidth and BitTorrent quickly climbs back to its full download speed and takes all of the bandwidth.

Create and Activate a Profile (v2.0)

AMD Quick Stream 2.0 allows the end users to create their own Profiles and activate any of them. HTTP Content-type can be used to classify the applications, in addition to the application name and the browsing URL. The following simple procedure showcases these features.

On the main GUI of **AMD Quick Stream**, click the  button. This brings up the Profile Management dialog box. Click “New” button at the bottom of the window. A new input box pops up asking about the name of the new Profile. Enter “Test Profile” and press the OK button. See figure 6:

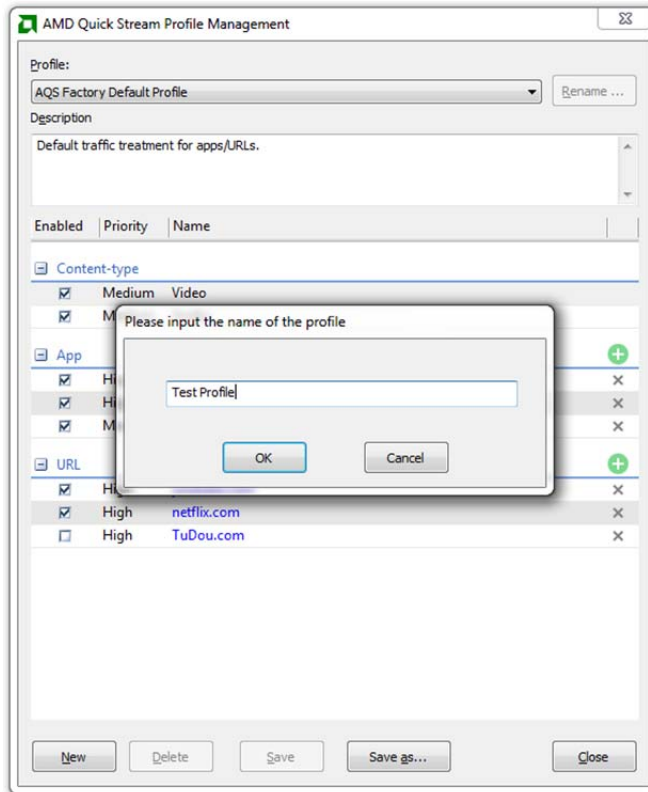


Figure 6. Creating a New Profile

Now a blank Profile named “Test Profile” is created. Let’s disable all the special treatment of the applications by unchecking the check boxes before Video and Audio Content-types (See Figure 7 below). Press “Save” then “Close” button.

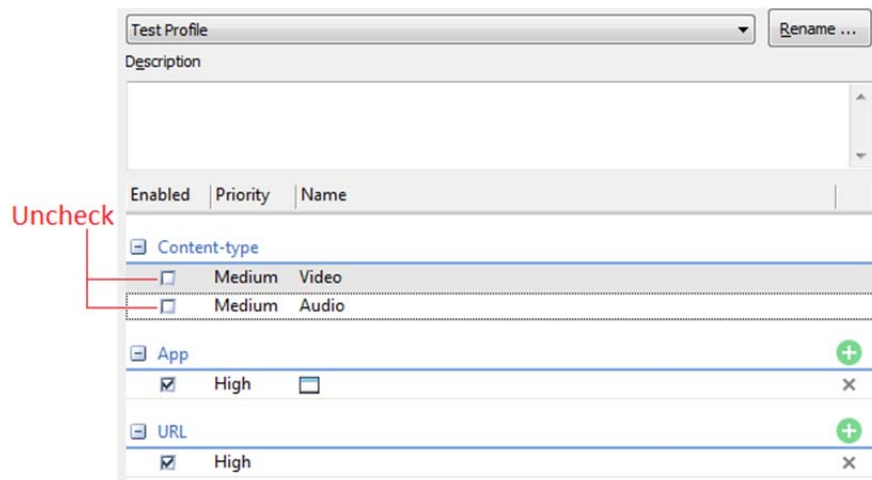


Figure 7. New Test Profile

Now go back to the main GUI and activate this new Profile:

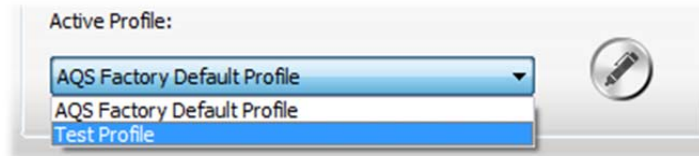



Figure 8. Activate the Test Profile

Re-run the test and the quality of the YouTube video will be poor again.

Now click  to show the Profile Management dialog box again. The current Profile shown should be the Test Profile. Re-check the Content-type check boxes to enable them once again. Save and Close the dialog box. Run the test again and the videos in the web browsers will run smoothly again.

Tips and Tricks

The effectiveness of **AMD Quick Stream** depends on its bi-directional measurement of the real bandwidth. Some ISPs allow huge bursts of data initially which may affect the time to calculate total bandwidth. Sometimes it may take a short while (20 ~ 30 seconds) for the video to take advantage. We can eliminate this if we let the BitTorrent traffic run for about a minute before we start the video.

Technical Support

For OEM technical support of AMD Quick Stream Technology, please send emails to:

oem_aqs_support@appexnetworks.com

About AppEx Networks

Established in 2006, AppEx Networks has been developing WAN optimization technologies and products to improve the QoE (Quality of user Experience) of network applications. Today, AppEx products have gained wide acceptance among enterprises, government agencies, educational institutions, internet/cloud service providers, and telecom operators, including Global Fortune 500 companies.

Headquartered in Cupertino, California, AppEx has core R & D team in Silicon Valley, engineering team in Beijing, China, and sales coverage in the U.S. and Asia-Pacific regions.

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