Caching Executive White Paper

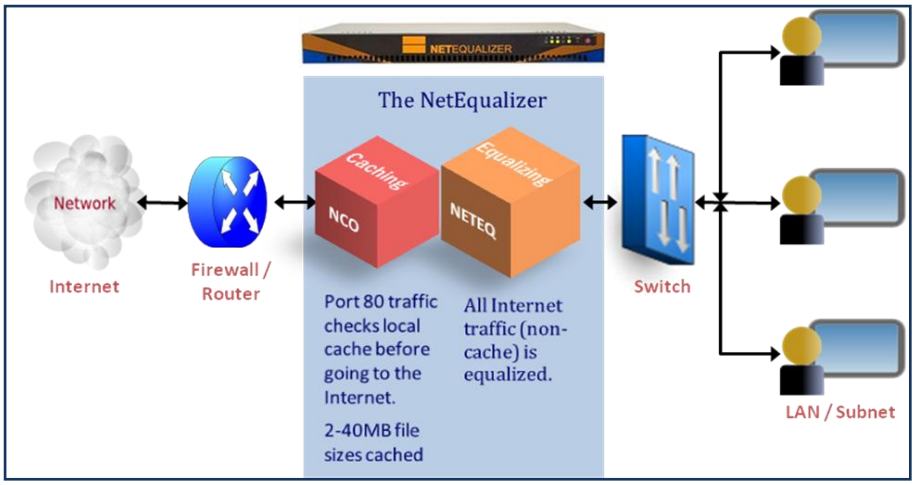
Over the last several years, the volume of static, deterministic Internet traffic has grown by leaps and bounds, to the point where it may comprise 40% and up of your Internet traffic. While behavior-based shaping on its own is a great solution for reducing congestion on your network, adding on caching is a complementary approach, and should be considered as part of your overall bandwidth management strategy, as caching reduces your overall Internet traffic volume. In this white paper, we discuss the capabilities of our add-on module, the NetEqualizer Caching Option (NCO).

What is the NetEqualizer Caching Option?

The ***NetEqualizer Caching Option (NCO) is an embedded caching capability*** that runs directly on the NetEqualizer 3000 and 4000 series. When NCO is activated, a squid proxy server and web cache daemon are loaded, along with proprietary NetEqualizer Caching configuration and integration software and a new internal solid-state drive (SSD).

NetEqualizers are 1U rack-mountable units, shaping bandwidth levels from 4Mbps - 5Gbps bi-directionally. NCO is available on NE3000 and NE4000 series. See Data Sheets for detailed specifications.

The NetEqualizer Caching Option is integrated with Equalizing, providing a comprehensive bandwidth management strategy. Traffic can be accessed from cache or accessed from the Internet and equalized, as needed. ***NCO caches all port 80 traffic file sizes from 2MB to 40MB, including YouTube videos.*** Any type of static content that is frequently accessed, will benefit from caching. *Note: We have built-in the capability to cache YouTube videos, which is not available in off-the-shelf Squid caching.*



NCO is integrated with Equalizing, providing a comprehensive bandwidth management strategy.

The benefits of caching to you are that your Internet traffic is reduced, thereby freeing up valuable resources for latency-sensitive, non-deterministic, variable traffic such as VoIP, emails, web chat, and web page browsing. Your users benefit too, as they will see faster download speeds (reduced latency) for frequently-accessed web content that is accesssed locally through the NetEqualizer Cache.

As you can see, ***Caching and Equalizing are complementary bandwidth management strategies***. Caching deals with large files, and Equalizing deals with small, bursty traffic. Equalizing is critical to ensure that your network congestion is reduced during peak traffic hours. More on this later on Page 2…

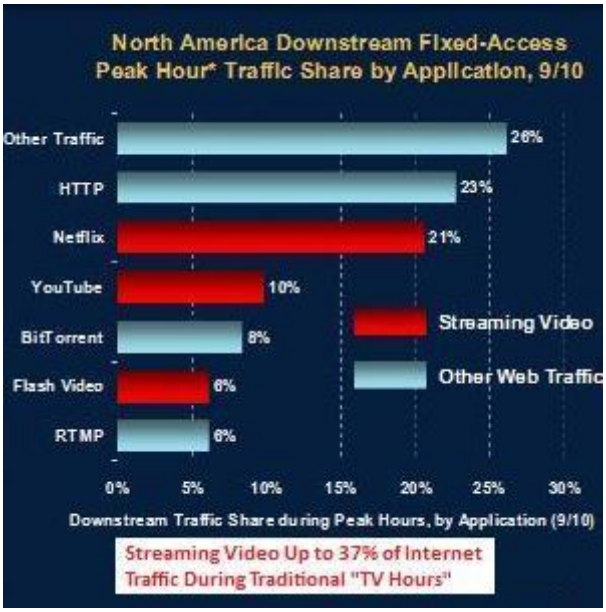
Why should I consider NetEqualizer Caching?

When a port 80 (HTTP) request is intiiated by a user on your network, the Netequalizer Cache is checked before going out to the Internet. If the content is found in cache, it is delivered up to the user without going out to the Internet - thereby reducing traffic on your Internet pipe. ***Caching helps to alleviate network congestion by reducing the traffic using your Internet bandwidth***. Content from cache is not Equalized, as it considered local traffic.

Only you can know whether caching will benefit your network. It depends on the amount of traffic you have that fits the caching pattern - namely, static, deterministic Internet traffic like YouTube videos. YouTube is an excellent candidate for caching, as YouTube videos are static, pre-recorded content that are posted to YouTube, and then downloaded at various volumes, based on whether the video has gone "viral". For a viral YouTube video, caching has immense benefits, as the reduction in Internet traffic will be significant.

NCO will cache any port 80 traffic between 2MB-40MB, including YouTube, HTTP, and Flash Video traffic, which comprised 39% of downstream peak hour traffic in September 2010 (from chart: YouTube 10% + HTTP 23% + Flash Video 6%.). *Note: We do not currently cache Netflix.*

The volume of static, deterministic Internet traffic is growing by leaps and bounds, to the point where it may comprise 37% or more of your Internet traffic during *peak hours *(TechCrunch, Nov.19, 2010 based on Morgan Stanley's Web 2.0 Summit presentation)*.
*Notes: *Peak hours are the periods during which bandwidth utilization is heaviest. They typically occur in the evening and last 3-5 hours. (e.g., peak hours for Netflix= 8-10pm). RTMP stands for real-time messaging protocol (Instant messaging). .*



Source: Sandvine Fall 2010 Global Internet Phenomena Report, Morgan Stanley Research.

How does NetEqualizer Caching compliment Equalizing?

Equalizing gives priority to short, bursty, latency-sensitive traffic. This is important to ensure that business-critical applications, such as VoIP, email, and web applications (including SaaS and cloud-based computing) get priority when your network is congested.

Large, static files, such as video, get lower priority when your Internet pipe is congested. With NetEqualizer Caching, you can achieve faster response times upon subsequent access for large static files, traffic that would otherwise be slowed down.

As you can see, Caching and Equalizing are complementary bandwidth management strategies. Caching deals with large files; Equalizing deals with small, bursty traffic. ***Equalizing is critical to ensure that your network congestion is reduced during peak traffic hours.***
For more technical details, please refer to this caching article from our blog site.

Caching compliments Equalizing	
Caching	**Equalizing**
Most effective for deterministic, static traffic, such as video.	Most effective for non-deterministic, variable traffic, such as VoIP, email, web applications.
Long, persistent traffic, such as files from 2MB-40MB, are stored in cache.	Short, bursty, latency-sensitive traffic gets priority (VoIP, email, web applications).
Reduces the amount of traffic flowing through Internet trunk.	Shapes all traffic flowing through Internet trunk to reduce congestion.
Low initial cost	Low initial cost
Little or no recurring cost or labor • Module is integrated with Equalizing	Little or no recurring cost or labor • No policy files to maintain • Yearly support is economical
Does not handle P2P traffic	Handles encrypted P2P without modifications or upgrades
Reporting via Squid Cache Manager • View cache hits and misses • View cache content and statistics	Reporting by behavior • Shows real-time traffic to help stop abuse • Graphs and charts available for history
Supports Net Neutrality	Supports Net Neutrality

To Learn More…

We would be a happy to discuss the NetEqualizer Caching Option (NCO) with you, to help you determine if this is the right solution for your business.

Please email sales@apconnections.net or call us at 303.997.1300 x103 (U.S. toll free # 888.287.2492) to schedule a discussion.

About APconnections, Inc.

APconnections is based in Lafayette, Colorado, USA. We develop cost-effective, easy-to-install and manage, traffic shaping appliances. Our NetEqualizer product family optimizes critical network bandwidth resources for any organization that purchases bandwidth in bulk and then redistributes or resells that bandwidth to disparate users with competing needs.

We released our first commercial offering in July 2003, and since then customers around the world have put our products into service. Our flexible and scalable solutions can be found at ISPs, WISPs, major universities, Fortune 500 companies, SOHOs and small businesses on six continents.