

NETEQUALIZER

College and University Guide



In working with information technology leaders at universities, colleges, boarding schools, and university housing over the years, we've repeatedly heard the same issues and challenges facing network administrators. Here are just a few:



- We need to provide 24/7 access to the web in the dormitories.
- We need to support multiple campuses (and WAN connections between campuses).
- We have thousands of students, and hundreds of administrators and professors, all sharing the same pipe.
- We need to give priority to classroom videos used for educational purposes.
- Our students want to play games and watch videos (e.g. YouTube).
- We get calls if instant messaging & email are not responding instantaneously.
- We need to manage P2P traffic.

In this article, we'll talk about how the NetEqualizer has been used to solve these issues for many private and public colleges, universities, boarding schools, and in university housing facilities around the world.

We need to provide 24/7 access to the web in the dormitories.

Once you put the NetEqualizer in place, it handles traffic shaping around the clock. You simply need to define the size of your network pipe, establish the level of total bandwidth usage (default is 85%) at which you want shaping to kick in, make sure that the defaults are "on," and that's it.

In general, the NetEqualizer is installed between your Router and your Switch, acting as a transparent bridge once in place. It will reside passively in your network until bandwidth shaping is needed, and when the set level of congestion is reached, it kicks in to smooth your network traffic.

There are additional parameters that you can set to customize your NetEqualizer implementation. However, many of our customers find that they do not need to make any changes to the default settings in order for their network performance to improve dramatically.

We need to support multiple campuses (and WAN connections between campuses).

Each NetEqualizer handles traffic shaping for an individual Internet connection. If you have one Internet pipe shared across multiple campuses, you would only install one NetEqualizer on that pipe. University customers that need to support multiple

NetEqualizer Key Functions

- Behavior-based bandwidth shaping (aka "equalizing")
- Plug-and-play, low-maintenance solution
- Effective P2P control
- Reduces RIAA requests
- CALEA compliant
- Prioritizes sensitive applications such as VoIP
- Shapes up to 5 Gbps
- Up to 40,000 users
- Pricing starting at \$1525

Who's Using the NetEqualizer?

- Over 250 colleges and universities worldwide
- Over 100 boarding schools and university housing facilities

What NetEqualizer Users Are Saying...

I had been looking for a dynamic equal-bandwidth policy based unit for quite some time, and had been unsuccessful. The NetEqualizer was a fraction of the cost of other solutions, took me all of five minutes to configure, and works wonderfully. I have had many students come to my office for the express purpose of thanking me for buying more bandwidth, which I didn't - I just replaced our Packeteer with a NetEqualizer.

-- Josiah, Hampshire College

We are very pleased with the NetEqualizer. It's been rock solid for the school year and we have received positive feedback from the students in our residences.

-- Martin Laferriere, Laurentian University

NetEqualizer is great! We've really had no issues at all. We literally dropped it in line and experienced the difference over Packeteer right away. Complaints from students dropped as well.

-- Russ Leathe, Gordon College



campuses, each with separate Internet connections, do so by installing a NetEqualizer at each campus. In cases where multiple NetEqualizers are required to support a multiple campus set-up, generous package-discounts are available.

We have thousands of students, and hundreds of administrators and professors, all sharing the same pipe.

The NetEqualizer is not licensed per user. Rather, the NetEqualizer license is tied to the size of your network pipe. It can be updated as the size of your pipe is increased, typically by purchasing a NetEqualizer license upgrade. Also, unlike other solutions on the market, you pay a *one-time license fee* for the NetEqualizer, and then only a small yearly support fee to cover software upgrades and support questions.

So, you can size your network to support your anticipated number of patrons, and then purchase the NetEqualizer that matches your network pipe size, knowing that you have the option of a license upgrade for more users later on. For more details on our sizing recommendations, see our contention ratio blog post [Can Your ISP Support Video for All?](#), which specifically addresses the needs of administrators.

Furthermore, if you need to architect your network to support full redundancy, you can buy a second NetEqualizer and put it in place as either a cold backup or in hot swappable mode.

We need to give priority to classroom videos used for educational purposes.

The NetEqualizer has a feature to enable you to designate specific IP addresses as “priority.” Those IP addresses will be immune to bandwidth control and will not be equalized. Therefore, if you have particular servers or websites that you use in the classroom (e.g. blackboard.com), you can identify these to the NetEqualizer, and they will be considered priority traffic.

We recommend that you consider prioritizing specific IP addresses if you utilize live streaming video, such as from an online educational website (e.g. blackboard.com). Otherwise, you should not need to set a priority host.

Our students want to play games and watch video (e.g. YouTube).

We have written a lot about YouTube, which is definitely considered a bandwidth hog. Bottom line, the NetEqualizer will add latency to “hog” traffic when the network is congested (over 85% utilization, or whatever setting you choose). This will add delay to the YouTube videos, while enabling other users to continue working with low-bandwidth applications, such as email and web surfing. This concept of “fairness” enables your network to continue providing quick response times to the majority of your users while restricting the network hogs.

Gamers will typically see *improved* performance once a NetEqualizer is in place. Gaming traffic by its very nature will get priority, just like emails and VoIP. This is true 99% of the time. However, there is an exception to this; Second Life seems to be a game that can take up to a T1-worth of bandwidth per player.

What is great about bandwidth shaping is that it is *fair*. Low-bandwidth users do not have to share the pain of a slow, congested network with the network-

hogging applications. Your students and administrators expect email and web surfing to be responsive, and with equalizing, they will be.

For example: suppose you have 950 students and 50 administrators using the network, as follows:

- 95 percent are web surfing
 - Of these, 20 percent are also on Skype calls
 - Another 30 percent are also watching YouTube and running chat sessions
- 5 percent are watching YouTube

In this example, if your trunk is saturated, the NetEqualizer would add latency to the YouTube streams (since they are the most bandwidth intensive), leaving all the other streams alone. So instead of having your network crash completely, a few YouTube videos would break up for a few seconds, and then when conditions abated, they would be allowed to run.

Notice that the exact allocations per user do not matter. We do not try to hit fixed allocations, we just put delay on the nastiest “hog” traffic until the bandwidth usage overall drops back to 85 percent (or the setting you choose). This quickly takes the delay away until your network is no longer congested. The value is that you get the best possible usage of your network bandwidth without having to micro-manage your network.

To learn more about our thoughts on YouTube, please review our blog posting [How Much YouTube Can the Internet Handle?](#)

We get calls if instant messaging and email are not responding instantaneously.

As mentioned above, the NetEqualizer looks at individual streams and adds latency to network “hogs” when the network is congested. Since instant messaging and email are both low-bandwidth applications, they will be given priority. Our college and university users find that they get fewer complaints about the network once the NetEqualizer is in place *as the majority of the users see improved network response times.*

Another common application used in the college and university environment is Citrix, from Citrix Systems (NASDAQ: CTXS), which offers a virtual desktop to provide access to software and applications for students, administrators, and professors. We have had great success providing priority for Citrix environments with our standard “default” NetEqualizer set-up.

We need to manage P2P traffic.

The NetEqualizer can spot P2P and related applications based on our default setup. Over the past several years, with hundreds of installations, we have found that our default rules act like a general antibiotic effectively controlling all P2P traffic, regardless of whether it’s encrypted or not.

The key is NetEqualizer’s focus on connection limits. With a single command, a system-wide connection limit can be set that applies to all hosts, external or internal to the network. If any host starts sending large numbers of messages, as is the case with P2P traffic, it will automatically be contained before causing a wide-scale network slowdown.

Many application shaping devices are labor-intensive, requiring administrators to manage and update policy files to block P2P traffic, and this only works for unencrypted P2P. Alternatively, the NetEqualizer does a better job of blocking both encrypted and unencrypted P2P, simply by limiting connections on your network.

However, this doesn’t mean P2P must be blocked completely. The NetEqualizer can be set to enforce P2P rules only when your network is congested, thus allowing users to access legitimate P2P downloads at most times.

For more information...

Although we’ve covered a few of the most pressing issues colleges, universities and boarding schools face, we understand that everyone’s situation can be different. So, to learn more about how the NetEqualizer might specifically help your institution, please contact us at sales@apconnections.net or call us at 303.997.1300 x103.

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.

About the NetEqualizer Product Family

NetEqualizer appliances are bandwidth shaping systems designed to optimize your Internet Connection, while giving priority to your important business and data applications. The flexible, scalable, and cost-effective bandwidth control products can be deployed in both corporate and service provider networks.

NetEqualizer is available in a range of configurations from 4Mbps up to 5 gigabits.