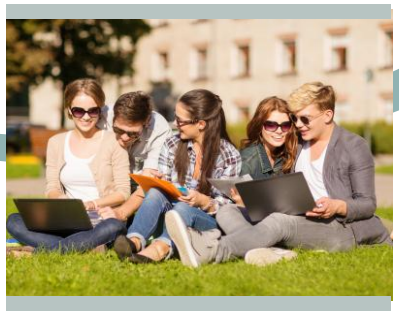
NETEQUALIZER

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 an affordable, low maintenance bandwidth shaping solution.
- We have thousands of students, and hundreds of administrators and professors, all sharing the same pipe.
- We get calls if online learning applications, VoIP, & email are not responding instantaneously.
- We need to manage P2P traffic, and reduce RIAA/MPAA requests.
- We need to give priority to classroom videos.
- Our students want to play games and watch videos (e.g. YouTube).
- We need to support multiple campuses (and WAN connections between campuses).

NetEqualizer Key Functions

- Fairness-based bandwidth shaping ("equalizing") based on behavior.
- Automatically prioritizes latency-sensitive applications such as SaaS, cloud-based applications, email, web browsing & VoIP over bandwidth hogs.
- Low-maintenance. No policy files to maintain.
- Controls both encrypted & unencrypted P2P.
- *HEOA technology deterrent.* Reduces RIAA/MPAA requests.
- CALEA compliant.
- Shapes up to 10 Gbps bi-directionally.
- License-upgradeable in the field.
- Affordably priced from $3,750 to $22,000. Read our *blog article on ROI.*

Who's Using the NetEqualizer?

- Over 250 colleges and universities worldwide
- Over 200 schools (including boarding schools & university housing facilities)

About APconnections, Inc.

APconnections is an innovation-driven technology company that delivers best-in-class network traffic management solutions to give our customers better networks, with zero maintenance, at the best prices.
We specialize in turnkey bandwidth shaping and intrusion prevention system (IPS) appliances. APconnections is based in Lafayette, Colorado, USA. We released our first commercial offering in July 2003, and since then thousands of customers all over the world have put our products into service. Today, our flexible and scalable solutions can be found in many types of public and private organizations of all sizes across the globe, including: Fortune 500 companies, major universities, K-12 schools, and Internet Providers on six (6) continents.

Call or email to talk to an engineer: 303.997.1300 x103
sales@apconnections.net

What customers are saying...

The power of the unit is both connection limits and shaping large bandwidth streams; everyone gets a piece of the inbound/outbound pie, and if the trunk is not saturated, they also get max performance.

… I love this machine! (and RIAA notices are virtually nil...and no student complaints about slow Internet!) Did I mention that I love this machine? The device has a great return on investment; had we put it in prior to increasing our bandwidth, we could have probably kept our old ISP contract size for another year or so before increasing. I would urge anyone who manages bandwidth for any reason to give NetEqualizer a chance to show how easy and cost effective a solution it can be.

Andrew Wolf, *Linfield College*

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.

Great product and support!! We have used NetEqualizer for about 6 years. We manage 200MB and will be increasing to 350MB. Very pleased with the results on how it uses 'fairness' principles.

We were spending about 2-3 hours per day managing the packeteer… now with the NetEqualizer its maybe 2-3 hours a year. The time we do spend on it is for reports and upgrades. Stuff that is important to management.

Russ Leathe, *Gordon College*

NetEqualizer has been used to solve these issues and challenges for many private and public colleges and universities around the world.

We need an affordable, low maintenance bandwidth shaping solution.

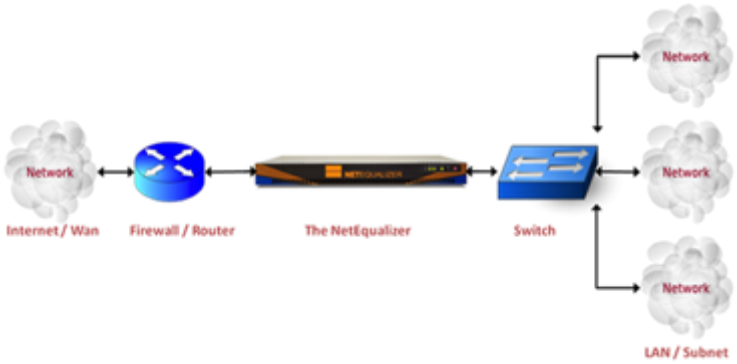
NetEqualizer is intended to be a “set it and forget it” type solution. Once you install and configure your NetEqualizer, it handles traffic shaping around the clock with little additional maintenance from your network administrator.

Configuring Equalizing is as simple as three steps:

1) Define the size of your inbound & outbound Internet pipe,
2) Establish the level of total bandwidth usage at which you want equalizing to kick in (default is 85%), and
3) Make sure that equalizing is “on".

We believe that traffic shaping can be affordable. Our NetEqualizer units range from $3,750 to $22,000, licensed bi-directionally to shape 20Mbps to 10Gbps. Our yearly fees for access to software upgrades, support, and hardware warranties are under $3,000. In addition, under our Lifetime Buyer Protection Policy, we also protect your initial investment by offering a trade-in credit towards a new unit when it is time to retire a unit. We offer a compelling ROI, helping you to optimize your Internet resources.

The NetEqualizer is typically installed between your Router and your Switch, acting as a transparent bridge. As we do not perform deep packet inspection (DPI), we maintain Net Neutrality for traffic passing through the NetEqualizer.



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

What is great about NetEqualizer bandwidth shaping (aka "equalizing") 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, faculty, and administrators *expect web applications, email, VoIP, and web surfing to be responsive, and with equalizing, they will be.*

For example, suppose you have 5000 students, 100 administrators, and 200 faculty using the network:

- 85% are web surfing
- 60% are also running web-based applications (e.g. online learning)
- 50% are running chat sessions
- 40% are also using email
- 30% are also watching YouTube

In this example, if your trunk were saturated, equalizing would kick in and would add latency to the YouTube streams watched by 30%, 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 when conditions abated, they would be allowed to run. The majority of the traffic on the network is well-behaved, short/bursty bandwidth uses, such as web surfing, web-based applications, chat sessions, and email and so will not be penalized.

Notice that bandwidth 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 below 85 percent* (or the setting you choose). The value is that you get the best possible usage of your bandwidth without having to micro-manage your network.

In addition to Equalizing, there are shaping parameters that you can set to customize your NetEqualizer implementation. One that colleges & universities like to use is our concept of "Pools", which are shared bandwidth limits. Typically, Pools are defined to split out bandwidth to either groups (faculty, staff, and students) or buildings (residence halls) giving them separate bandwidth allocations. Think of a Pool as a mini virtual NetEqualizer, as each Pool is shaped when it becomes congested (typically 85%).

Another is setting up multiple configurations to kick in at different times of day, typically used to provide more bandwidth to the residence halls during nighttime hours.

We get calls if web applications, VoIP, and email are not responding instantaneously.

The NetEqualizer looks at individual streams and adds latency to network "hogs" when the network is congested. Since web applications (such as online learning), VoIP, and email all consume bandwidth as short/bursty type applications, they will automatically 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*. If VoIP includes video Skype, you will need to assess configuration strategies if you are considering making it a priority. Video Skype is considered a network hog, and would be equalized during congested periods.

A common web-based application used in the college and university environment is online learning, such as Blackboard, from Blackboard, Inc. Online learning usually encompasses a web-based portal to facilitate learning, for use by students, administrators, and professors. We have had great success automatically providing priority for online learning environments with our standard configuration.

We need to manage P2P traffic and reduce MPAA/RIAA requests.

The NetEqualizer can spot P2P traffic based on our default setup. 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 slowdown.

Faster Networks

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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. The NetEqualizer does a better job of blocking both encrypted and unencrypted P2P, simply by limiting connections on your network. We are listed as part of the Educause HEOA Role Models (http://www.educause.edu) under acceptable technology deterrents to reduce RIAA/MPAA requests.

We need to give priority to classroom videos.

The NetEqualizer has a feature to enable you to designate specific IP addresses as "priority traffic." Those IP addresses will be immune to bandwidth control and will not be equalized. Therefore, if you have particular internal or external hosted video servers that you use in the classroom, 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. Otherwise, you should not need to set priority traffic.

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 online learning applications, email and web surfing. This concept of "fairness" enables your network to continue providing quick response times
to most of your users while restricting network hogs.

To learn more about our thoughts on YouTube, please review our blog posting How Much YouTube Can the Internet Handle? We also offer a NetEqualizer Caching Option (NCO) as an add-on, for those interested in caching YouTube and other port 80 files of sizes 2MB-40MB (read our FAQ).

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 (except Second Life which can use a full T1 per player).

We need to support multiple 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 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.

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. Register for our price list for full details.

You can size your network to support your anticipated number of users, and then purchase the NetEqualizer that matches your network pipe size, knowing that you have the option of a license upgrade at any time.

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 (active/passive) mode.

For more information...

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