



# Quick Start Guide

**\*\*\*Usernames & passwords are xxx'd out in this Demo Quick Start Guide.\*\*\***

**Author's Note:**

Congratulations on your NetEqualizer purchase! You are now on your way to achieving "Faster Networks, with Zero Maintenance, at the Best Prices". In fact, many network administrators find that they can set-up and configure a NetEqualizer on their network in just a few hours.

However, if you have any questions that you need help with during your install, our Support Team is here to help you. Please call Support at 303.997.1300 x102 or send an email to [support@apconnections.net](mailto:support@apconnections.net).

After you have completed your installation, if you would like a **complimentary review of your NetEqualizer configuration** from the Main Dashboard, *Click on -> [Run Diagnostics] and then select [Run Diagnostics]. Then Click on -> [Download Diagnostics] and Save File* to save the results as a .txt file, and email as an attachment (otherwise email will cut off content) to [support@apconnections.net](mailto:support@apconnections.net).

## Table of Contents

- Factory Default IP Settings..... 2**
- Installing the NetEqualizer..... 2**
  - Step #1: Cabling the NetEqualizer into your Network..... 2
  - Step #2: Configuring the NetEqualizer ..... 3
  - Step #3: Setting Up Equalizing ..... 8
  - Step #4: Validating & Backing Up Your Configuration .....10
- Appendix #1: Viewing Traffic ..... 11**
- Appendix #2: Troubleshooting your Setup ..... 13**
- Appendix #3: Syncing NetEqualizer Date/Time..... 14**

## Factory Default IP Settings

The IP settings to access the NetEqualizer web Graphical User Interface (web GUI) have been set to:

IP Setting	Parameter Name	Factory Default
Web GUI IP	BRIDGEIP	192.168.1.143
Web GUI Netmask	BRIDGENETMASK	255.255.255.0
Web GUI Gateway	BRIDGEROUTE	192.168.1.1

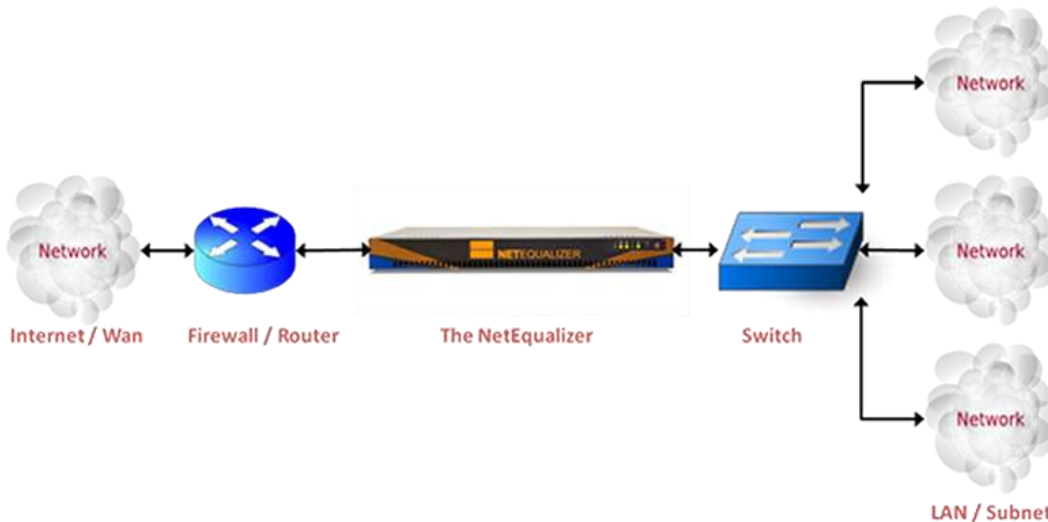
**Note:** The IP address for the NetEqualizer is used to access the web GUI (for management purposes only). All factory default settings can be changed from the web GUI, the command line, or the API.

## Installing the NetEqualizer

The NetEqualizer operates as a Transparent Bridge on your network. There is typically no need to change anything in your network configuration to install the appliance. Simply install the NetEqualizer between your Firewall/Router and Network Switch, or anywhere on your network that you can "see" the individual IP addresses and bandwidth that you want shaped (as shown in diagram below). Once installed, you will use the Factory Default Settings to access it via a web Graphical User Interface.

**Note:** Before you rack your NetEqualizer, we recommend that you **record the Serial #** \_\_\_\_\_ . You will need your Serial # to request your Final Key. It is located on a sticker on the left-hand side of the unit.

**Note:** We also recommend that you push in on the CompactFlash Card in the back of the unit to be sure it is fully seated.



## Step #1: Cabling the NetEqualizer into your Network

First, make sure that you **power on the NetEqualizer**. Do this by pressing the red power button to the right of the LED panel.

**Note:** We recommend that you install your NetEqualizer on a UPS, to protect from power surges and outages.



All of the NetEqualizer models (series 3000/4000/5000) have two Ethernet interfaces and a Management Port. We are now using port plugs to help distinguish the various interface ports on the NetEqualizer. We use four colors: 1) blue (WAN), 2) orange (LAN), 3) clear (Management Port) and 4) black (unused).

The easiest way to figure out the ports is to look at the port plug color. The LAN port is orange, the WAN port is blue, and the Management Port is clear. If you have upgraded to fiber interfaces, the LAN and WAN ports will be white. For further clarification, please see the "Where to Install the NetEqualizer" diagram below.

## Management Port (CLEAR)

First, find the Management Port (Eth2). As you face the back of the machine, Eth2 is on your top row LEFT (NE3000) or bottom row LEFT (NE4000/NE5000). Remove the clear port plug and then plug a *straight cable* into the Management Port (Eth2) and connect it to your Network Switch. If whatever you are plugging into does not have a built-in switch, then use a crossover cable. Once you have the Management Port connected, you can now configure your NetEqualizer.

## WAN Port (BLUE or WHITE)

Remove the blue port plug (white if fiber) and then plug a *crossover cable* into the WAN Port (Eth0) and connect it to the Firewall or Router. As you face the back of the machine, Eth0 is on your bottom row LEFT (NE3000), or top row RIGHT (NE4000/NE5000). If you have an auto-sensing Firewall or Router, you can use a straight cable or a crossover cable.

## LAN Port (ORANGE or WHITE)

Remove the orange port plug (white if fiber) and then plug a *straight cable* into the LAN Port (Eth1) and connect it to your

Network Switch. As you face the back of the machine, Eth1 is on your bottom row RIGHT (NE3000) or top row LEFT (NE4000/5000). If whatever you are plugging into does not have a built-in switch, then use a crossover cable.

Once your machine is on & connected, you should see green lights in the Power LED, Eth0, and Eth1 LEDs, as shown in the display panel picture on the previous page.

## Step #1A (optional): Access Point Configuration in a Wireless Network

Put your radios in bridging mode and set your Firewall/Router at your headend to do DHCP and NAT, instead of doing DHCP and NAT at your Access Points.

## Step #1B (optional): Setting LAN Port Speed and Duplex

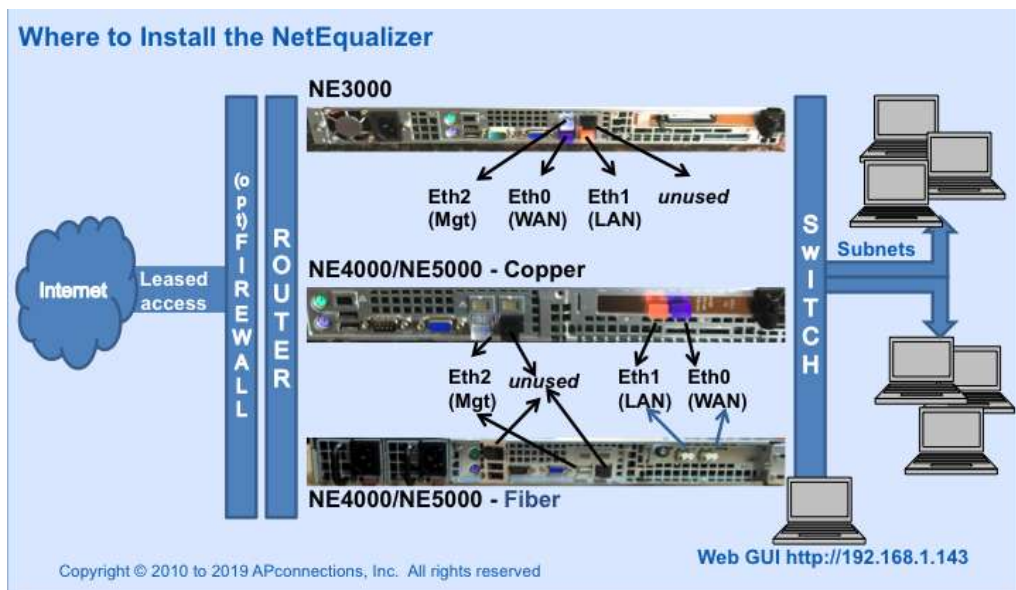
Occasionally, customers need to manually set LAN Port Speed and Duplex, as some Firewall/Routers do not auto-negotiate correctly with the NetEqualizer. If this is happening in your environment, you will see a large number of collisions and dropped packets as well as reduced network throughput. Although dropped packets are not a good thing, if you are seeing less than 1/10 of a percent (< 0.1%) of the total packets transmitted it will have no adverse effect on your network. If it starts to approach 1 percent (1%), you should follow [User Guide Appendix #2](#) to set this in your environment.

## Step #1C (optional): Firewalling off the NetEqualizer

If you do not install the NetEqualizer behind a firewall, you should use [Maintenance->Manage Firewall](#) to firewall off the NetEqualizer. See [User Guide Appendix #6](#) for detailed instructions.

## Step #1D (optional): Changing BIOS Restore on AC Power Loss

The NetEqualizer is set to "Restore on AC Power Loss - Last State." If you want it to power on automatically after power loss, change this to "Restore on AC Power Loss - Power On."



# Quick Start Guide



## Step #2: Configuring the NetEqualizer

Once the NetEqualizer is powered on and plugged in to your network, you need to access the web GUI to configure it. The web GUI is accessible out-of-the-box via the factory default IP address: <http://192.168.1.143>. If you have set up the Management Port as described in Step #1, you should now be able to access the web GUI.

### First, login to the NetEqualizer.

Use the factory default IP address: <http://192.168.1.143>.

When the Log In Screen appears, as shown at right, log in to the NetEqualizer using the factory default username and password:

Username = "xxx" and  
Password = "xxx".



You should now be logged in and see the NetEqualizer Main Dashboard, as shown below. Our enhanced Main Dashboard provides an intuitive visual display. We provide On/Off status for several of our Core Processes, and a graph of all current activity through the NetEqualizer. When you have finished your session, you can use Log Out (circled) to close the GUI.

Key Functions are accessible via the white buttons along the top, and Shortcuts for Common Tasks via the dark blue buttons right below. You can also easily see what software version and key level you have installed via the green buttons at right. Learn more about the Dashboard in our full [User Guide](#).

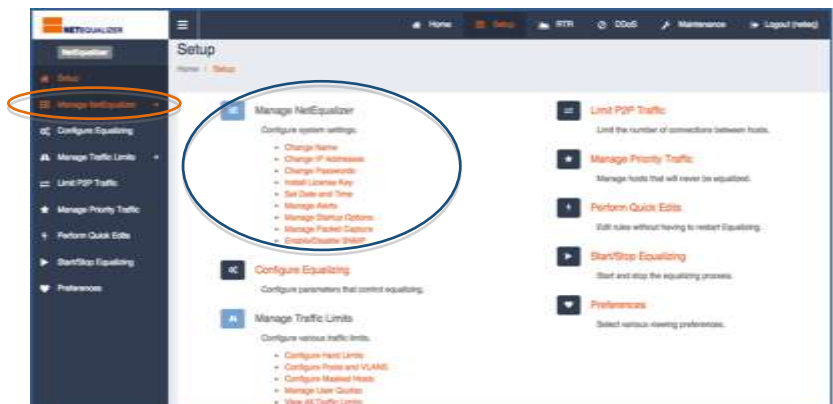


Your next steps to configure the NetEqualizer will be to change the default passwords, install your license key, change your IP addresses, and set the date/time and time zone. All of these functions are found under the Key Functions -> Setup button. To get started, [Click on -> \[Setup\]](#).



**Note:** In this guide, clicking on a button is shown in brackets as follows: [Click on -> \[button\]](#).

The Setup screen at right comes up. Note that the functions are all available by clicking on the links (orange text) in the Setup window. The Manage NetEqualizer links are circled in blue.



The Side Menu also can be used to navigate to functions. As Manage NetEqualizer is followed by a "+", it is an expandable menu. The Manage NetEqualizer Side Menu is circled in orange at right. Clicking on Manage NetEqualizer + expands to contain the same functions as listed in orange on the Setup screen.

**Note:** Clicking on a side menu item or a link (orange text) will bring up a new configuration window. This paradigm is repeated throughout the GUI.

## Step #2A: Change Web Admin GUI Password

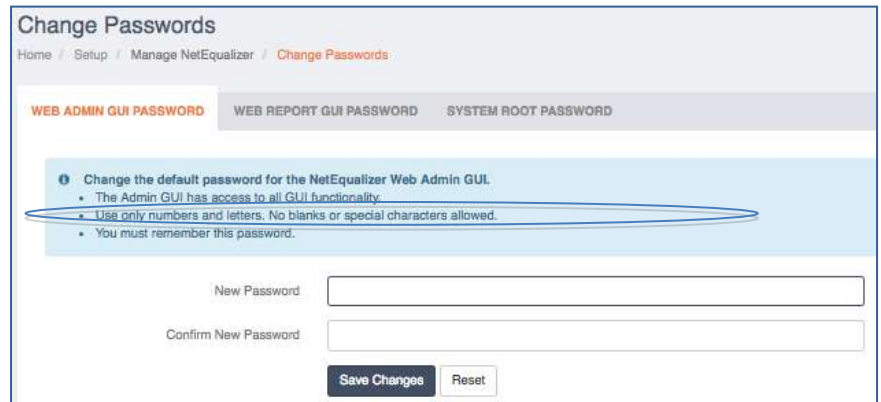


We recommend that you change the both the Web Admin GUI Password and the System Root Password. You can optionally set up a Web Report GUI Password if you want to offer reporting-only (RTR) access. To Change the Web Admin GUI Password, *Click on -> Manage NetEqualizer -> Change Passwords*. The following screen comes up, with the Web Admin GUI Password Tab open.

Type in a new Web Admin GUI Password, and retype to confirm it. GUI validation will check to ensure that you **use only letters and numbers in your password; do not use special characters**.

Once you have typed in your new password, *Click on -> [Save Changes]* to save.

If your change was accepted, you should see the following message:  
**“Success! Your password has been saved. Changes take effect immediately, so your browser may ask you to reauthenticate with the new password.”**



## Step #2B: Change the System Root Password

For security reasons, **it is required that you change your root password from the default**. Use an SSH client that supports secure shell version 2, like PuTTY.

*Click on -> System Root Password* to open the tab. Login as *xxx*. The password is pre-set to *xxx*.

From the keyboard or SSH type *passwd* to change the password for the Console/SSH access for the user root. Follow the prompts for the new password change.

**Note:** *Once you change the root password, you will be prompted to enter your new password before making other changes.*



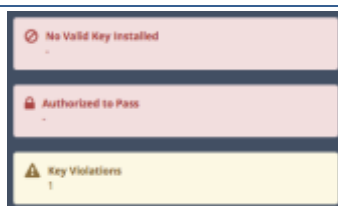
## Step #2C: Installing Your License Key

In order to use the NetEqualizer on your network, you need to have an authorized License Key from APconnections, Inc.

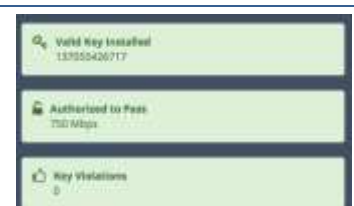
### Check if your License Key is Installed

You must install a License Key if one is not already installed. You can check this by going to the Main Dashboard. It will say how many Mbps or Gbps the unit is authorized for. This should match the License Key that you purchased.

If a valid License Key is NOT installed, the information buttons on the Main Dashboard will be red and display “No Valid Key Installed”, along with key violations, as shown at right.



If a valid License Key is installed, the information buttons on the Main Dashboard will be green and display your License Key and License Level in Mbps or Gbps, as shown below. This example is for a 750Mbps license.



# Quick Start Guide



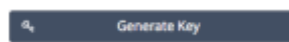
## Installing your License Key

There are several ways to navigate to installing your license key. On the Main Dashboard, you can [Click on -> \[No Valid Key Installed\]](#) or you can [Click on -> \[Setup\] -> Manage NetEqualizer -> Install License Key](#). The following screen comes up.

We have already performed Step 1 for you, and emailed you a License Key in an order confirmation email from [admin@apconnections.net](mailto:admin@apconnections.net). Once you find this email, proceed to Step 2. If you cannot find this email, proceed to Step 1.

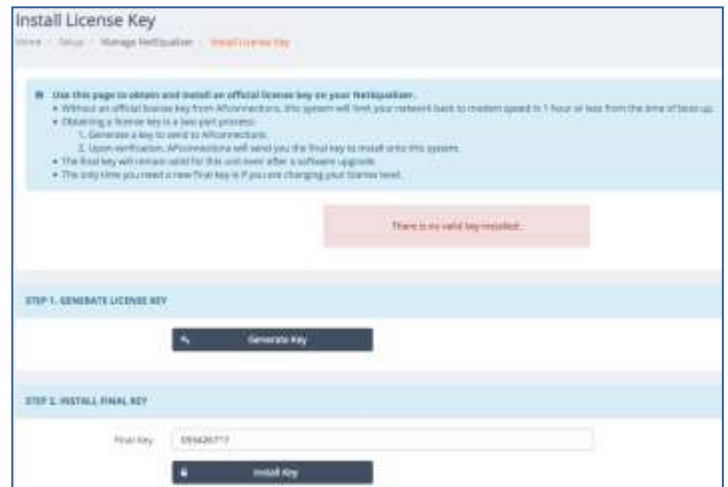
### Step 1 - Generate License Key

*Skip this step if you have your License Key.*

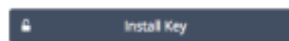


[Click on -> \[Generate Key\]](#).

Email the Generated Key and your unit's Serial Number (found on the side of the unit or recorded during Installing the NetEqualizer Step) to [admin@apconnections.net](mailto:admin@apconnections.net). Using this information, we will email your License Key, usually within one (1) hour during normal Business Hours.

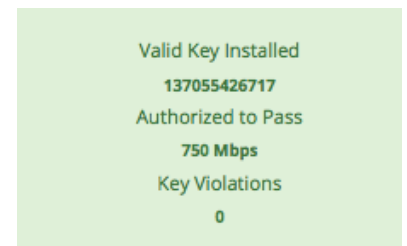


### Step 2 – Install Final Key



Once you have received your License Key, you must install it on the NetEqualizer. Under Install Final Key, type in your License Key and [Click on -> \[Install Key\]](#).

If your key was accepted, you will see **“Success! Installed key is valid.”**, along with your key and license level. In our example, we can now see **Valid Key Installed 137055426717. Authorized to Pass 750Mbps.**



**Note:** Step #2D and Step #2E require a reboot of your NetEqualizer. You can reboot ONCE if you wait until after Step #2E to click on Reboot NetEqualizer.



### Step #2D: Manage NetEqualizer -> Change IP Addresses

To change IP settings from the defaults, [Click on -> Manage NetEqualizer-> Change IP Addresses](#).

The following screen comes up.

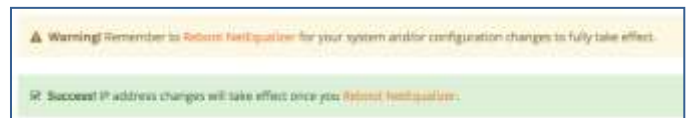
Type in your values to change the Web GUI IP (\*BRIDGEIP), Web GUI Netmask (\*BRIDGENETMASK), and Web GUI Gateway (\*BRIDGEROUTE). \* **Note:** These are the parameter names shown in the NetEqualizer Configuration File.

To save your changes, [Click on -> \[Save Changes\]](#).

To discard your changes, [Click on-> \[Reset\]](#).

Once you click on Save Changes, the Warning Message below right,

highlighted in yellow, and Success Message, highlighted in green, will appear. The Success Message can be dismissed. The Warning Message will continue to appear on your screen as a reminder until you reboot.



**Note:** Yellow warning messages, green success messages, and red error messages are used throughout the GUI.

# Quick Start Guide



To have your changes take effect right away, [Click on -> Reboot NetEqualizer](#) in either message. Once rebooted, it may take 3-5 minutes for the NetEqualizer process to reload. You can also choose to wait until after Step #2E (or later) to have your changes take effect. Click on Reboot NetEqualizer when you are ready for the changes to occur.

**Note:** Once you reboot, as the old GUI IP address is no longer valid, you will now need to login from your new GUI IP address.

## Step #2E: Set Date/Time and Time Zone



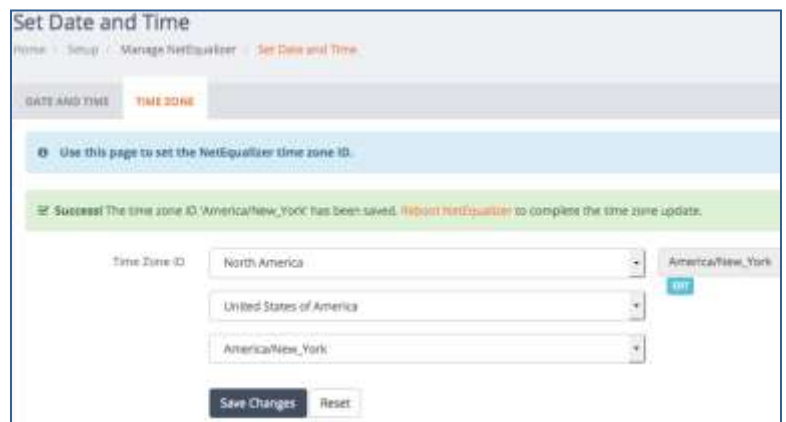
The NetEqualizer uses the date and time to correctly display data in our Real-Time Reporting (RTR) Traffic Graphs. Therefore, it is important to set your date, time, and time zone when installing your NetEqualizer, so that your graphs use the correct values. Once you have completed this step, you are ready to start up RTR Traffic Graphs, which we will do in [Appendix #1 – Viewing Traffic](#).

### Set Time Zone

In order to set your time zone, [Click on -> Manage NetEqualizer -> Set Date and Time](#). [Click on -> Time Zone](#) to open the Time Zone tab.

Click through the fields to set your Time Zone.  
[Click on -> Region](#), to set your region.  
[Click on -> Country](#), to set your country.  
[Click on -> Time Zone ID](#), to set your time zone.

Once set, you will see a Time Zone Name and three-letter acronym. In our example at right, we have selected the America/New\_York (EDT) Time Zone. To save your changes, [Click on -> \[Save Changes\]](#). To discard your changes, [Click on -> \[Reset\]](#).



Once you have saved your changes, you will need to reboot your NetEqualizer. [Click on -> Reboot NetEqualizer](#) in the success message. Once rebooted, it may take 3-5 minutes for the NetEqualizer process to reload. You can also choose to wait until later. Click on Reboot NetEqualizer when you are ready for the changes to occur.

### Set Date and Time

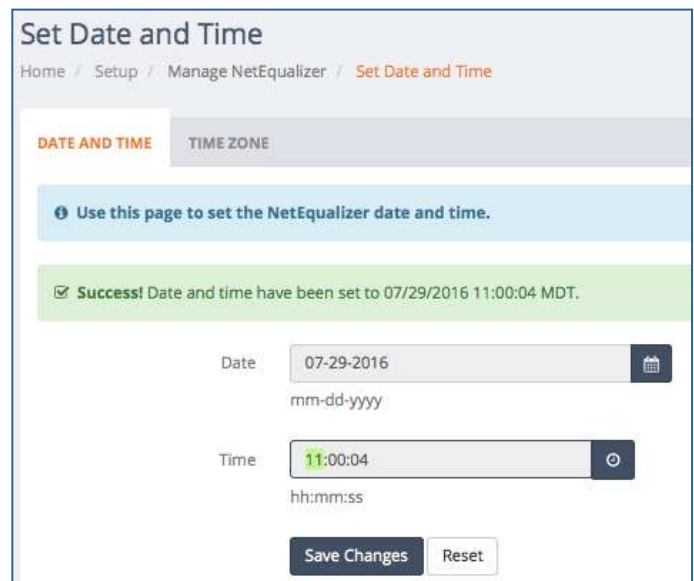
Now that your time zone is set, you are ready to set your date and time. [Click on -> Date and Time](#) to open the Date and Time tab. The screen at the right comes up.

Use this screen to enter the current date & time. [Click on -> Calendar icon](#) to change the date, which is in MM-DD-YYYY format. [Click on -> Timer icon](#) to change the time, which is in 24-hour format.

To save your changes, [Click on -> \[Save Changes\]](#).  
To discard your changes, [Click on -> \[Reset\]](#).

Once you save your changes, you will see a message similar to the following example: **Success! Date and time have been set to 07/29/2016 11:00:04 MDT.**

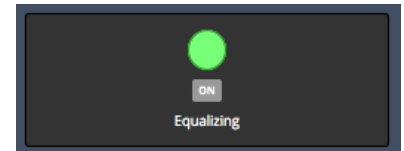
**Note:** We set Time Zone before setting Date and Time, as the Time will shift once a new Time Zone is selected.



Over time, the NetEqualizer time will drift (like all servers) unless synchronized to a clock. Follow the instructions in [Appendix #3](#) to sync your NetEqualizer's Date/Time with either Internet Time Servers or your own NTP Time server.

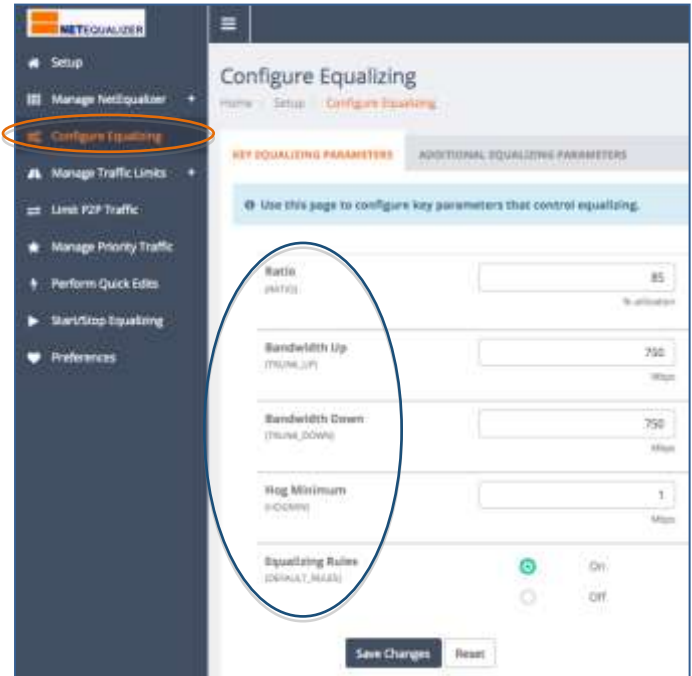
## Step #3: Setting Up Equalizing

The next step in setting up your NetEqualizer is to establish the values for five (5) **Key Equalizing Parameters** that must be set to control congestion on your network. In order to set these, the Equalizing process must be ON. Go to the Main Dashboard. If Equalizing is OFF (red), *Click on -> [Equalizing]-> [Start Equalizing]*. Now Equalizing will show as ON (green), as at right.



### Step #3A: Key Equalizing Parameters - Ratio, Bandwidth, Hog Minimum

Now you can set the **Key Equalizing Parameters**. *Click on -> Setup -> Configure Equalizing*. The screen at right comes up, with Configure Equalizing highlighted on the side menu (circled in orange), defaulted to the Key Equalizing Parameters Tab. Key Equalizing Parameters (circled in blue) are used as follows in Equalizing:



1. **Ratio** (RATIO) determines when Equalizing should kick-in.
2. **Bandwidth Up** (TRUNK\_UP) and **Bandwidth Down** (TRUNK\_DOWN) are set to the size of your network pipe. As we equalize bi-directionally, we need both.
3. When **Equalizing Rules** (DEFAULT\_RULES) = **ON** look at every connection (IP pair) in the Active Connections (BRAIN) table and put a PENALTY on those that are over **Hog Minimum** (HOGMIN). Equalizing automatically gives connections < HOGMIN priority, while connections > HOGMIN are slowed down by adding a PENALTY.

**Note:** The parameter name that you will see in the NetEqualizer Logfile is shown in (CAPITALS).

### Key Equalizing Parameters

Parameter	Unit	Default	What you can set to...	Tips
<b>Ratio</b> (RATIO)	Percentage	85	<i>1-100</i>	Default of 85% works for most networks. To be more aggressive, use 70 or 75%. To be less aggressive, raise it to 90%.
<b>Bandwidth Up</b> (TRUNK_UP)	Mbps (Megabits per second)	15360	<i>Size of your Outbound network pipe.</i> Traffic from the LAN to the WAN (Internet).	Always set to your License Level or lower. License Level is shown as ## in the message "The system is authorized to pass ## Mbps."
<b>Bandwidth Down</b> (TRUNK_DOWN)	Mbps	15360	<i>Size of your Inbound network pipe.</i> Traffic from the WAN (internet) to the LAN.	Always set to your License Level or lower. License Level is shown as ## in the message "The system is authorized to pass ## Mbps."
<b>Hog Minimum</b> (HOGMIN)	Mbps	1 (1000 Kbps)	For networks of size: <i>50Mbps 1.0</i> <i>200Mbps 1.5</i> <i>1Gbps 4.0</i>	Default of 0.5Mbps (500 kbps) is set so that VoIP, email, web-based applications, web surfing, and chat is below Hog Minimum.
<b>Equalizing Rules</b> (DEFAULT_RULES)	On/Off toggle	On	<i>Leave at Default of "On"</i> .	Must be "On" for Equalizing to kick in. Turn off during installation if you want to run throughput tests.

After you change these settings, *Click on -> [Save Changes]* to save. *Click on -> [Reset]* to discard.



In our example above, we set Bandwidth Up and Down to 750Mbps, Hog Minimum to 1, and kept Ratio at 85%. Once your settings are saved, as you have changed Bandwidth Up/Down, you will be prompted to Restart Equalizing to apply your changes (see screen below). [Click on -> \[Restart Equalizing\]](#) to have your new values take effect.



Once you have restarted equalizing, you will see **“Success! Equalizing has been restarted.”**. Equalizing is now configured. To validate your settings, from the Main Dashboard, [Click on -> Common Tasks -> \[Show Configuration\]](#) and review the settings for RATIO, TRUNK\_UP, TRUNK\_DOWN, and HOGMIN.

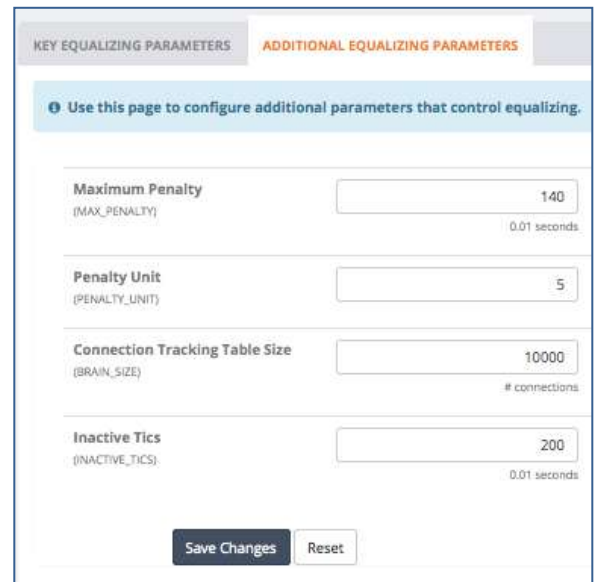


### Step #3B: Additional Equalizing Parameters

You may also need to tune your **Penalty Unit** and **Connection Tracking Table Size** to optimize for your network pipe. Maximum Penalty and Inactive Tics are rarely changed. See table below for tips and recommendations on what you should set these parameters to, based on your network size.

[Click on -> Setup -> Configure Equalizing -> Additional Equalizing Parameters Tab](#). The screen at right comes up.

After you change these settings, [Click on -> \[Save Changes\]](#) to save changes or [Click on -> \[Reset\]](#) to discard changes.



Additional Equalizing Parameters				
Parameter	Unit	Default Value	What you can set to...	Tips
Maximum Penalty (MAX_PENALTY)	Hundredths of seconds	140	Rarely changed from Default value.	Should be greater than PENALTY UNIT and less than 200.
Penalty Unit (PENALTY_UNIT)	N/A	5	For networks of size: >= 10Mbps to < 50Mbps 2 - 3 >= 50 Mbps 1	PENALTY_UNIT is the minimum penalty that will be inflicted on a packet when a penalty is set up on an IP address. Values for this variable are integers in the range 1 - 100, with 1 being the least restrictive.
Connection Tracking Table Size (BRAIN_SIZE)	Number of Connections (IP pairs) to track in one (1) second.	10000	For networks of size: < 100Mbps 20000 >= 100Mbps & < 1Gbps 30000 >= 1Gbps 40000	How many connections (IP pairs) to keep track of at one time during any given second.
Inactive Tics (INACTIVE_TICS)	Hundredths of seconds	200	Rarely changed from Default value. 100-800	1 (100) to 8 (800) seconds. Time something tracked in Connection Tracking Table without activity.

## Congratulations!

**Your NetEqualizer is now installed & configured, actively reducing congestion on your network.**

## Step #4: Validating & Backing Up Your Configuration

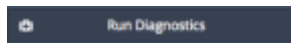
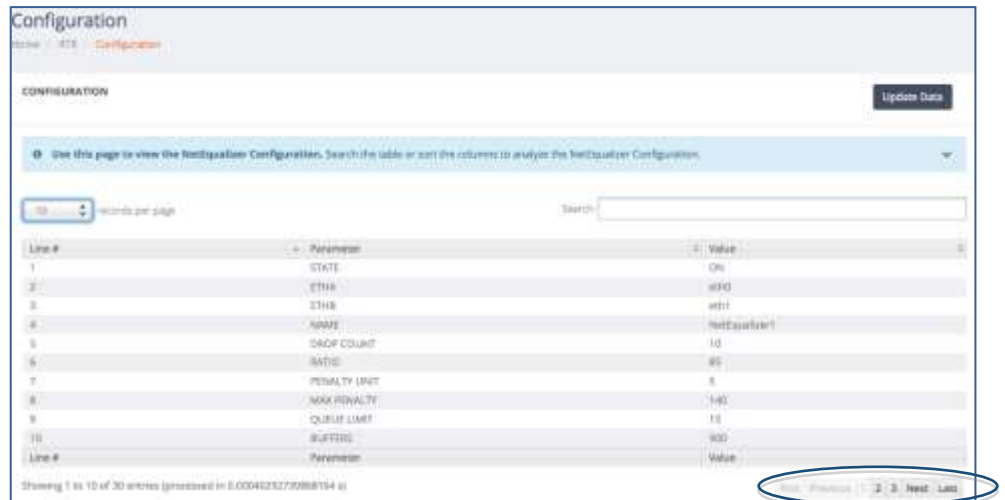
### Step #4A: Validating Your Configuration Settings

To see your current configuration, from the Main Dashboard, *Click on -> Common Tasks -> [Show Configuration]*. The following screen comes up.

You can validate all of your parameter settings by scrolling through your Configuration pages (circled in blue).

To validate Equalizing, review the settings for RATIO, TRUNK\_UP, TRUNK\_DOWN, HOGMIN, and DEFAULT RULES.

To validate any limits that you have set, click on "Last" and review the final lines of your configuration file.



If you would like us to review your configuration, *Click on -> Common Tasks -> [Run Diagnostics] -> [Run Diagnostics]*. Email the results as a .txt file attachment (otherwise email will cut off content) with the subject: "Check My Configuration" and mail to [support@apconnections.net](mailto:support@apconnections.net). We will call or email you within one (1) business day to go through your configuration settings.

### More Validation Resources

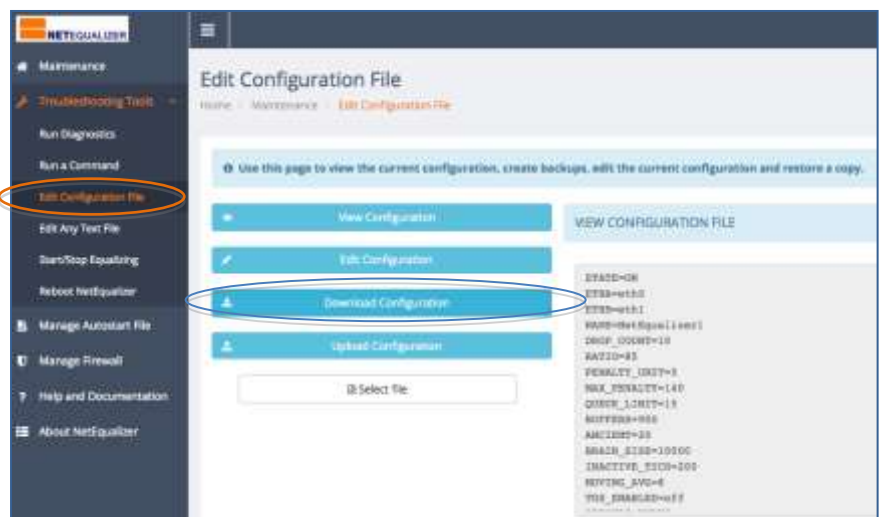
- User Guide: <http://www.netequalizer.com/manuals/UserGuide.pdf>
- FAQ Guide: <http://www.netequalizer.com/tsfaq.htm>
- Support Archive: <http://netequalizernews.com/netequalizer-support-archives/>

### Step #4B: Backing Up Your Configuration Settings

Now that you have validated your setup, we recommend that you download your Configuration and save to a safe place. While we include a backup CF card with each NetEqualizer shipped, this does not contain your custom configuration settings.

*Click on Common Tasks -> [Maintenance] -> Troubleshooting Tools -> Edit Configuration File* (circled in orange).

The screen at right comes up. *Click on -> [Download Configuration]* (circled in blue) and save off **NetEqConfig-YYYYMMDD-HHMM.txt** file to a backup location.

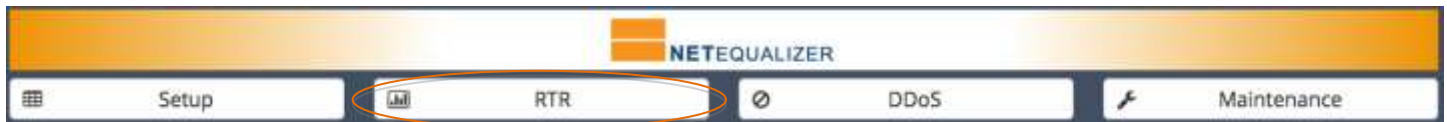


## Appendix #1: Viewing Traffic

Once the NetEqualizer is inline on your network, you can view what is happening in several ways:

### Real-Time Reporting (RTR)

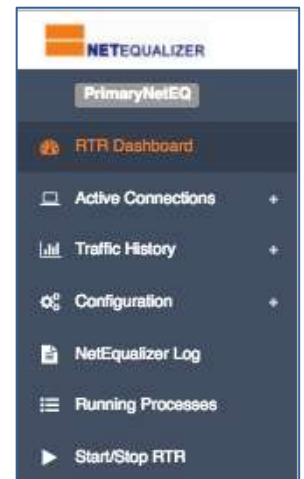
One of the things that has always differentiated the NetEqualizer from other monitoring and shaping tools is that we *have the actual data for every user accurately updated by the second*. Thus, we are able to make shaping decisions based on usage every second. We display this data in Real-Time Reporting (RTR), our reporting capability imbedded within the NetEqualizer Dashboard. With RTR, you will be able to slice and dice network usage and network process data in more meaningful ways, to help you better manage your network. We include a sampling below, read about all RTR reports in our [User Guide](#). From the Main Dashboard, [Click on ->\[RTR\]](#).



The RTR Side Menu at right will be displayed. Use this menu to access all the charts and graphs available in RTR.

From the RTR Side Menu, [click on -> Active Connections -> View Active Connections](#) to see a live look at the BRAIN table of the NetEqualizer. Active Connections is sortable and searchable, so that you can focus on the connections you are most interested in viewing.

Use this to easily find bandwidth hogs by sorting on Wavg (1<sup>st</sup> circle in blue below) and displaying largest to smallest (descending). You can search by any IP address to view all traffic for any particular user by IP. You can also click on the links below any IP address to view associated IP Reports. We also now show if penalties are currently being applied to the traffic flow, as shown by the red “yes” value in the Penalty field (2<sup>nd</sup> circle in blue below).



### Active Connections Table

Index	SRC Port	DST Port	Wavg (Mbps)	Avg (Mbps)	DST	SRC	Ptcl	Port	Pool	Penalty
1	443	60328	1.774144	17.258304	192.168.1.113 classlan11p	173.194.54.216 classlan1p	TCP	2	3	yes
2	57137	443	0.18148	0.154864	ec2-54-152-146-216. compute-1.amazonaws. com. class1p	192.168.1.100 classlan1p	TCP	1	0	no
3	60328	443	0.057016	0.537632	173.194.54.216 classlan1p	192.168.1.113 classlan1p	TCP	1	3	yes

## Traffic Trends & History

You can view traffic graphs by IP, Host Names, VLAN, Pool, or your entire network, to see bandwidth usage at this moment or in time intervals up to 4 weeks. In order to view data, you need to first start RTR. From the RTR Side Menu, [Click on -> Start/Stop RTR -> \[Start RTR\]](#). All processes should now be ON and highlighted in green.

To start populating data in the RTR tables, and to use the Traffic History Reports, [Click on -> Traffic History -> Manage Tracked Hosts](#). Enter in the IPs or IP ranges (subnets) or Host Names that you wish to track. After 10 minutes, you will be able to view Traffic History.

[Click on -> Traffic History -> Traffic History by Host/Pool/VLAN](#) to view a Traffic Graph. In the example at right, we have selected "by IP Address" and entered "192.168.1.113". The graph shows download and upload usage for 192.168.1.113 over 10 minutes.



## Top Downloaders & Top Uploaders

[Click on -> Traffic History -> Top Downloaders](#) or [Top Uploaders](#) to see the top bandwidth users on your network. In the example at right, you can see download for all traffic (IPs) over 1 day. 192.168.1.104 is the largest downloader, and 192.168.1.108 is 2<sup>nd</sup> largest.

You can filter the report to top downloaders for All Traffic, or for a Pool, VLAN, or Subdomain (circled in blue at right).



## NetEqualizer Log

From the RTR Side Menu, [Click on -> NetEqualizer Log](#). Here you can see what connections are being made and if anything is currently being given a Penalty (slowed down).

In the example at right, new penalties are shown in orange (NEW PENALTY), reduced penalties in green (DECREASE) and increased penalties in red (INCREASE). When a penalty is being removed, it is shown in gray (REMOVE). If you are under RATIO on your network, you will not have penalties.



ID	Status	Message
76	NEW PENALTY	06/20/17 16:51:08 PENALTY IP: 192.168.1.112 157.240.136.17 POOL: 0 Traffic Up; Traffic Down: 1000000 Progress: 000000 VLAN: TCP BUFP: 345704 BUFP: 1400 [DELAY: 9.700s]
75	REMOVE	06/20/17 16:51:07 PENALTY REMOVE: 192.168.1.112 157.240.136.17 POOL: 0 TOS: 1
74	REMOVE	06/20/17 16:51:06 PENALTY REMOVE: 192.168.1.112 157.240.136.16 POOL: 0 TOS: 1
73	REMOVE	06/20/17 16:51:05 PENALTY INCREASE: 192.168.1.112 157.240.136.17 to 6 POOL: 0 TOS: 1
72	REMOVE	06/20/17 16:51:04 PENALTY DECREASE: 192.168.1.112 157.240.136.16 to 6 POOL: 0 TOS: 1
71	REMOVE	06/20/17 16:51:03 PENALTY INCREASE: 192.168.1.112 157.240.136.16 to 6 POOL: 0 TOS: 1
70	REMOVE	06/20/17 16:51:02 PENALTY DECREASE: 192.168.1.112 157.240.136.16 to 6 POOL: 0 TOS: 1
69	REMOVE	06/20/17 16:50:57 Traffic up: 1.0776 Traffic down: 254594 POOL: 0
68	REMOVE	06/20/17 16:50:57 Traffic up: 13917 Traffic down: 254594 POOL: 0
67	REMOVE	06/20/17 16:50:46 INCREASE PENALTY IP: 192.168.1.112 157.240.136.17 POOL: 0 Traffic Up; Traffic Down: 1160076 Progress: 000000 VLAN: TCP BUFP: 1400 [DELAY: 10.700s]
66	REMOVE	06/20/17 16:50:47 INCREASE PENALTY IP: 192.168.1.112 157.240.136.17 POOL: 0 Traffic Up; Traffic Down: 1634738 Progress: 000000 VLAN: TCP BUFP: 1400 [DELAY: 10.700s]
65	REMOVE	06/20/17 16:50:43 PENALTY IP: 192.168.1.112 157.240.136.17 POOL: 0 Traffic Up; Traffic Down: 1070000 Progress: 000000 VLAN: TCP BUFP: 345704 BUFP: 1400 [DELAY: 8.700s]

Read our Real-Time Reporting section in our full [User Guide](#) to see all that RTR has to offer.



## Appendix #2: Troubleshooting your Setup

### Troubleshooting Guide

<i>If you do not see enough traffic flowing through your network...</i>	Make sure Bandwidth Up (TRUNK_UP) and Bandwidth Down (TRUNK_DOWN) are set correctly for your bandwidth. See <a href="#">Key Equalizing Parameters Table</a> .
<i>If you want to shape less strictly (let larger types of traffic through)...</i>	Increase the size of Hog Minimum (HOGMIN), based on your network pipe size. Hog Minimum should be set to at least .2Mbps (30,000 bps) if you want VoIP, email, web-based applications, and web surfing to flow freely. See <a href="#">Key Equalizing Parameters Table</a> for recommended settings.
<i>If you have a lot of users and a very busy network...</i>	Make sure that your Connection Tracking Table Size (BRAIN_SIZE) is set correctly, based on the size of your network. Depending on how many users you have and their activity, you may need to increase this. See <a href="#">Additional Equalizing Parameters Table</a> for recommended settings.
<i>If you think that shaping is too severe...</i>	If you feel you're penalizing too harshly then reduce your Penalty Unit (PENALTY_UNIT). The faster the trunk the less radical the PENALTY should be. PENALTY_UNIT will adjust that. Recommendations in <a href="#">Additional Equalizing Parameters</a> .
<i>If you have local traffic going through the NetEq...</i>	If you have traffic that is purely local (not going to or from the Internet) that you do not want shaped, you can use MASKING. Masked traffic will not be shaped (see <a href="#">User Guide</a> ).
<i>If you are seeing issues with web or DNS servers...</i>	Set Individual Connection Limits for special servers like DNS or Web Servers if they are part of a subnet that is being connection limited. Set to a high value, such as 3000.
<i>If you are seeing "Key Violations" messages on the Main Screen...</i>	Key violations occur when you go over your total bandwidth throughput licensed on the NetEqualizer. For example, for a 50Mbps license, you are allowed to pass up to 50Mbps in and 50Mbps out. If your NetEqualizer is connected to a switch or router or firewall at more than 50Mbps (such as 100Mbps or 1Gbps connection), it is possible for some local machine on one side to try talking to another one of your local machines on the other side at this higher speed. In order to stay within your license, you have several options: 1) (preferred) you can MASK this local traffic (see <a href="#">User Guide</a> "Masking Off Traffic") or 2) you can lock down your NetEqualizer ports (see <a href="#">User Guide</a> Appendix #2).



## Appendix #3: Syncing NetEqualizer Date/Time

Follow the instructions below, either #2A (Sync to your NTP Time Server) or #2B (Sync to Internet Time Servers), but NOT both. If you prefer to use a CLI, you can edit the /root/settime.sh and /root/crontab files via SSH with a text editor.

### Synchronize NetEqualizer Date/Time with NTP Time Server (2A) OR Internet Time Server (2B)

#	Click on...	Type in....
1	<i>Click on -&gt; Maintenance -&gt; Troubleshooting Tools -&gt; Edit Any Text File.</i>	Type in <code>/root/settime.sh</code> and <i>Click on -&gt; [Edit]</i> to open this file.
2	Update settime.sh. file as needed. Type either #2A or #2B, NOT both.	<div style="display: flex; justify-content: space-between;"> <div style="width: 48%;"> <p><b>#2A. Sync to your NTP Time Server</b> You need to update the commands included to sync to your NTP Time Server. Replace <code>--debian</code> with your ntp time server IP.</p> <pre><code>/usr/sbin/ntpdate 10.0.0.1 &lt;return&gt; /sbin/hwclock --localtime --systohc &lt;return&gt;</code></pre> <p><b>You MUST make sure to hit &lt;return&gt; to force an EOL character after each line.</b></p> <p><i>Click on -&gt; [Save]</i> to save changes. On the next screen, you will see "Your request is complete".</p> </div> <div style="width: 48%;"> <p><b>#2B. Sync to Internet Time Servers</b> Commands to sync to the Internet Time Server area already included in the settime.sh file.</p> <p>Make sure file looks as follows:</p> <pre><code>/usr/sbin/ntpdate-debian &lt;return&gt; /sbin/hwclock --localtime --systohc &lt;return&gt;</code></pre> <p><i>Click on -&gt; [Save]</i> to save any changes. On the next screen, you will see "Your request is complete".</p> </div> </div>
3	<i>Click on -&gt; Maintenance -&gt; Troubleshooting Tools -&gt; Edit Any Text File.</i>	<p><b>You MUST make sure to hit &lt;return&gt; to force an EOL character after the line.</b></p> <p>Type in <code>/root/crontab</code> to open this file. Replace file contents with the following: Type in <code>*/* * * * * /root/settime.sh &lt;return&gt;</code></p> <p><i>Click on -&gt; [Save]</i> to save changes. On the next screen, you will see "Your request is complete".</p>
4	<i>Click on -&gt; Maintenance -&gt; Manage Autostart File.</i>	<p>The Edit Autostart file Tab comes up. To have the sync persist upon reboot, you must add this to the Autostart file.</p> <p>Type in <code>crontab /root/crontab</code> on a new line right ABOVE the line that says <code>thedata=`date`</code>.</p> <p><i>Click on -&gt; [Save]</i> to save changes. On the next screen, you will see "Your request is complete".</p>
5	<i>Click on -&gt; Maintenance -&gt; Troubleshooting Tools -&gt; Reboot NetEqualizer.</i>	<p><b>Reboot in order to start your time sync. This is also needed so that real-time reporting (RTR) recognizes the new time.</b></p> <p>Please note that any data that you have in RTR will be lost upon reboot. If RTR was started previously, you must restart it. See instructions in <a href="#">Appendix #1: Viewing Traffic</a>.</p>