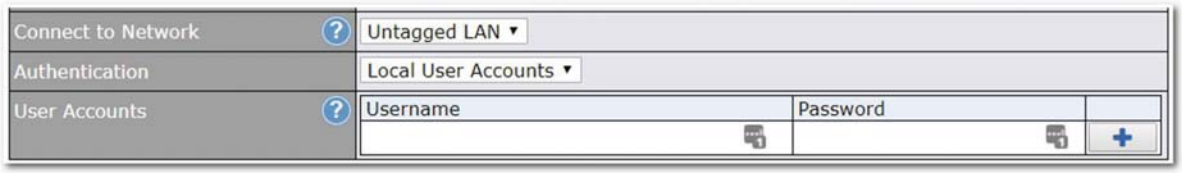
networks. PPTP has many well known security issues
Continue to configure authentication method.

### 9.1.2 Authentication Methods




| Authentication Method | |
|---|---|
| **Connect to Network** | Select the VLAN network for remote users to enable remote user access on. |
| **Authentication** | Determine the method of authenticating remote users |

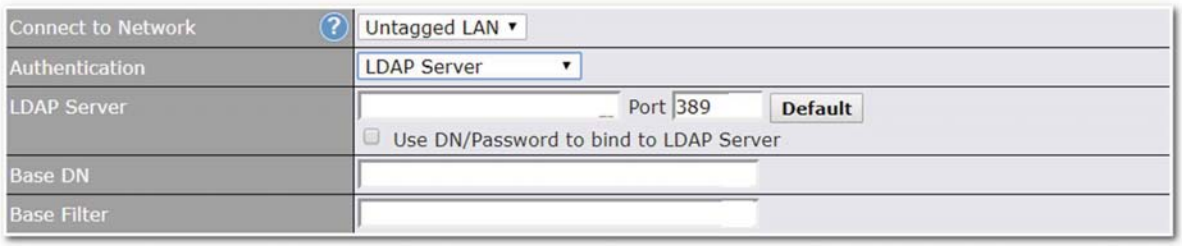
**User accounts:**

This setting allows you to define the Remote User Accounts.
Click Add to input username and password to create an account. After adding the user accounts, you can click on a username to edit the account password.

**Note:**

The username must contain lowercase letters, numerics, underscore(_), dash(-), at sign(@), and period(.) only.
The password must be between 8 and 12 characters long.

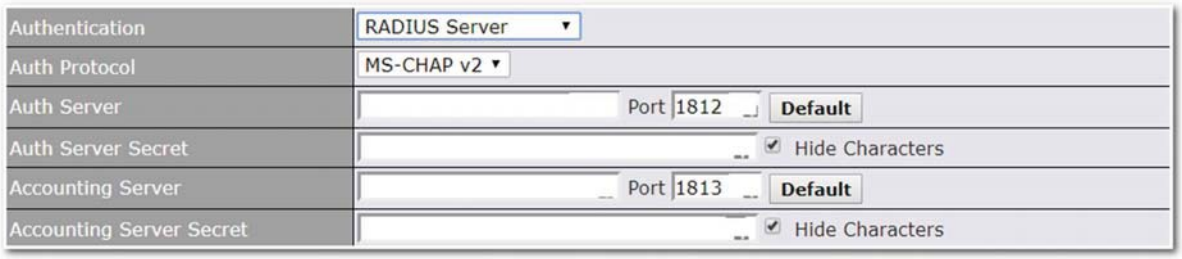
**LDAP Server:**




Enter the matching LDAP server details to allow for LDAP server authentication.

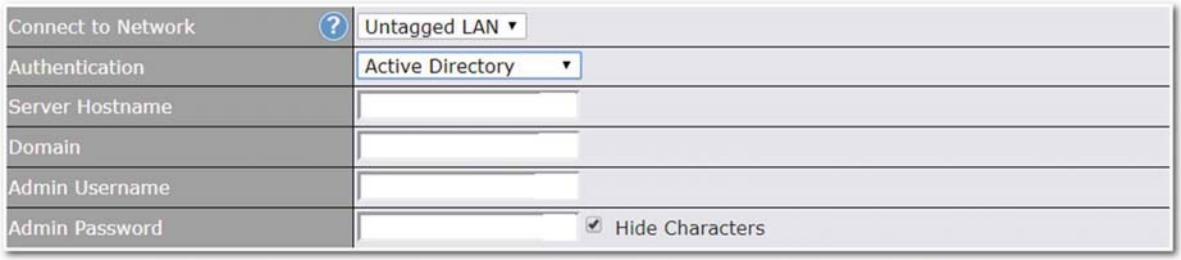
**Radius Server:**




Enter the matching Radius server details to allow for Radius server authentication.

**Active Directory:**




Enter the matching Active Directory details to allow for Active Directory server authentication.

## 9.2 Misc. Settings

### 9.2.1 High Availability

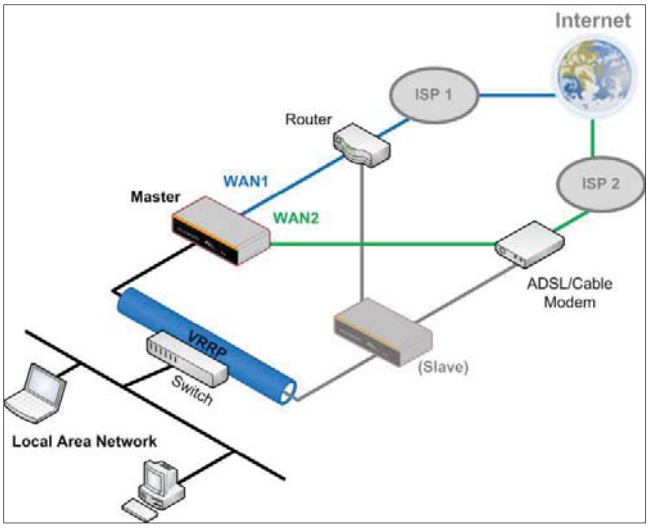
The Peplink Balance supports high availability (HA) configurations via an open standard virtual router redundancy protocol (VRRP, RFC 3768).

In an HA configuration, two same-model Peplink Balance units provide redundancy and failover in a master-slave arrangement. In the event that the master unit is down, the slave unit becomes active.

High availability will be disabled automatically where there is a drop-in connection configured on a LAN bypass port.

The following diagram illustrates an HA configuration with two Peplink Balance units and two Internet connections:




In the diagram, the WAN ports of each Peplink Balance unit connect to the router and to the modem. Both Peplink Balance units connect to the same LAN switch via a LAN port.

An elaboration on the technical details of the implementation of virtual router redundancy protocol (VRRP, RFC 3768) by the Balance follows:

- In an HA configuration, the two Peplink Balance units communicate with each other using VRRP over the LAN.
- The two Peplink Balance units broadcast heartbeat signals to the LAN at a frequency of one heartbeat signal per second.
- In the event that no heartbeat signal from the master Peplink Balance unit is received in 3 seconds (or longer) since the last heartbeat signal, the slave Peplink Balance unit becomes active.
- The slave Peplink Balance unit initiates the WAN connections and binds to a previously configured LAN IP address.
- At a subsequent point when the master Peplink Balance unit recovers, it will once again become active.

You can configure high availability at **Network>Misc. Settings>High Availability**.

Interface for Master Router

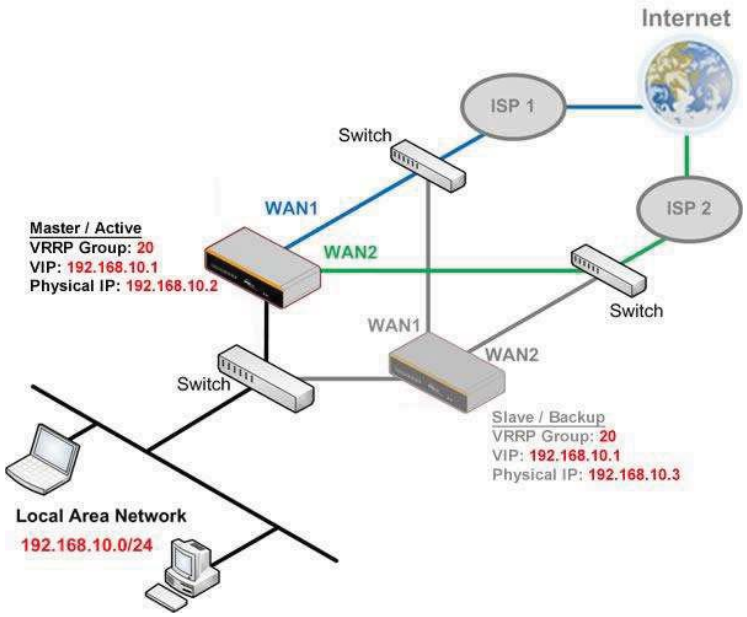

Interface for Slave Router

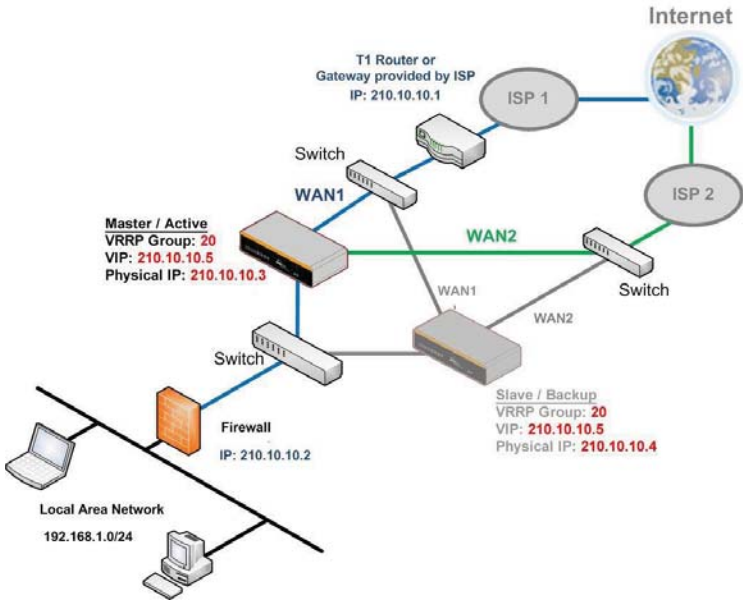
| High Availability | |
|---|---|
| **Enable** | Checking this box specifies that the Peplink Balance unit is part of a high availability configuration. |
| **Group Number** | This number identifies a pair of Peplink Balance units operating in a high availability configuration. The two Peplink Balance units in the pair must have the same **Group Number** value. |
| **Preferred Role** | This setting specifies whether the Peplink Balance unit operates in master or slave mode. Click the corresponding radio button to set the role of the unit. One of the units in the pair must be configured as the master, and the other unit must be configured as the slave. |
| **Resume Master Role Upon Recovery** | This option is displayed when **Master** mode is selected in **Preferred Role**. If this option is enabled, once the device has recovered from an outage, it will take over and resume its **Master** role from the slave unit. |
| **Configuration Sync.** | This option is displayed when **Slave** mode is selected in **Preferred Role**. If this option is enabled and the **Master Serial Number** entered matches with the actual master unit's, the master unit will automatically transfer the configuration to this unit. Please make sure the **LAN IP Address** and the **Subnet Mask** fields are set correctly in the LAN settings page. You can refer to the **Event Log** for the configuration synchronization status. |
| **Master Serial Number** | If **Configuration Sync.** is checked, the serial number of the master unit is required here for the feature to work properly. |
| **Virtual IP** | The HA pair must share the same **Virtual IP**. The **Virtual IP** and the **LAN Administration IP** must be under the same network. |
| **LAN Administration IP** | This setting specifies a LAN IP address to be used for accessing administration functionality. This address should be unique within the LAN. |
| **Subnet Mask** | This setting specifies the subnet mask of the LAN. |

| Important Note |
|---|
| For Balance routers in NAT mode, the virtual IP (VIP) should be set as the default gateway for all hosts sitting on the LAN segment. For example, a firewall sitting behind the Balance should set its default gateway as the virtual IP instead of the IP of the master Balance. |



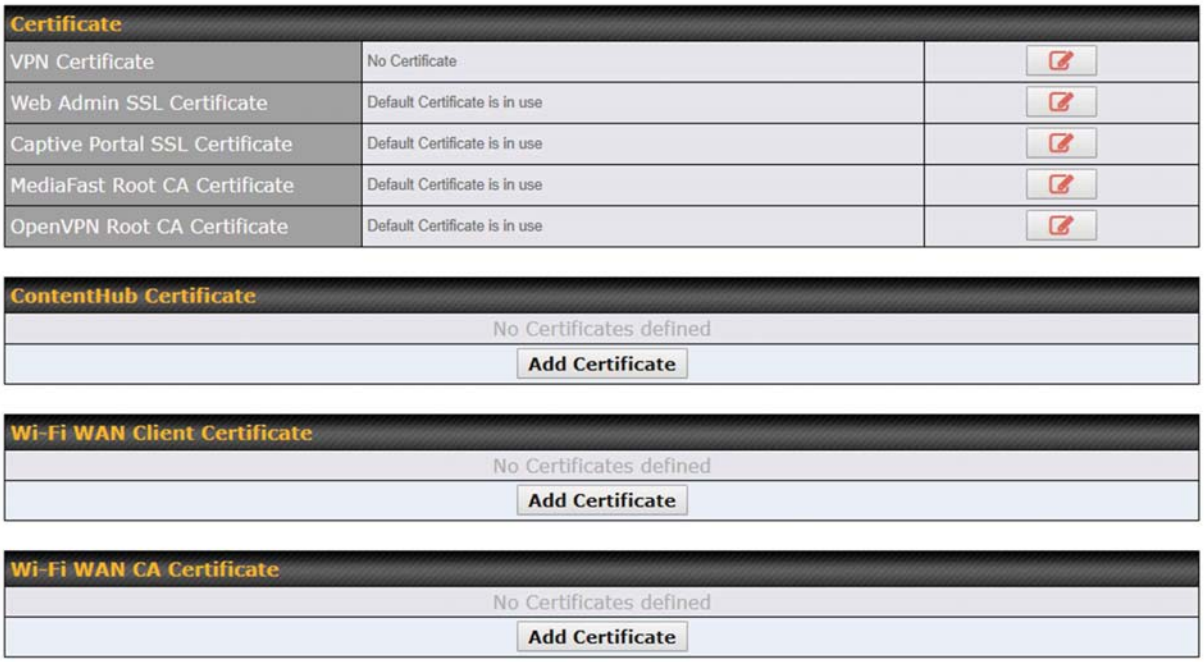

In drop-in mode, no other configuration needs to be set.




Please note that the drop-in WAN cannot be configured as a LAN bypass port while it is configured for high availability.

### 9.2.2 Certificate Manager




This section allows you to assign certificates for the local VPN, OpenVPN, Captive Portal, Mediafast, Contenthub, Wi-Fi WAN (Client and CA) and web admin SSL for extra security.

Read the following knowledgebase article for full instructions on how to create and import a self-signed certificate: https://forum.peplink.com/t/how-to-create-a-self-signed-certificate-and-import-it-to-a-peplink-product/

### 9.2.3 Service Forwarding

Service forwarding settings are located at **Network>Misc. Settings>Service Forwarding**.

| Service Forwarding | |
|---|---|
| **SMTP Forwarding** | When this option is enabled, all outgoing SMTP connections destined for any host at TCP port 25 will be intercepted. These connections will be redirected to a specified SMTP server and port number. SMTP server settings for each WAN can be specified after selecting **Enable**. |
| **Web Proxy Forwarding** | When this option is enabled, all outgoing connections destined for the proxy server specified in **Web Proxy Interception Settings** will be intercepted. These connections will be redirected to a specified web proxy server and port number. Web proxy interception settings and proxy server settings for each WAN can be specified after selecting **Enable**. |
| **DNS Forwarding** | When this option is enabled, all outgoing DNS lookups will be intercepted and redirected to the built-in DNS name server. If any LAN device is using the DNS name servers of a WAN connection, you may want to enable this option to enhance the DNS availability without modifying the DNS server setting of the clients. The built-in DNS name server will distribute DNS lookups to corresponding DNS servers of all available WAN connections. In this case, DNS service will not be interrupted, even if any WAN connection is down. |
| **Custom Service Forwarding** | When custom service forwarding is enabled, outgoing traffic with the specified TCP port will be forwarded to a local or remote server by defining its IP address and port number. |

## SMTP Forwarding

Some ISPs require their users to send e-mails via the ISP's SMTP server. All outgoing SMTP connections are blocked except those connecting to the ISP's. The Peplink Balance supports the interception and redirection of all outgoing SMTP connections (destined for TCP port 25) via a WAN connection to the WAN's corresponding SMTP server.


To enable the feature, select **Enable** under **SMTP Forwarding Setup**. Check **Enable Forwarding** for the WAN connection(s) that needs forwarding. Under **SMTP Server**, enter the ISP's e-mail server host name or IP address. Under **SMTP Port**, enter the TCP port number for each WAN.

The Peplink Balance will intercept SMTP connections. Choose a WAN port according to the outbound policy, and then forward the connection to the SMTP server, if the chosen WAN has enabled forwarding. If the forwarding is disabled for a WAN connection, SMTP connections for the WAN will be simply be forwarded to the connection's original destination.

**Note**

If you want to route all SMTP connections only to particular WAN connection(s), you should create a custom rule in outbound policy (see **Section 16.1**).

## Web Proxy Forwarding

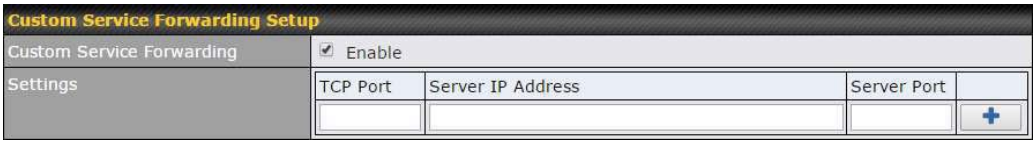

When this feature is enabled, the Peplink Balance will intercept all outgoing connections destined for the proxy server specified in **Web Proxy Server Interception Settings**. Then it will choose a WAN connection according to the outbound policy and forward the connection to the specified web proxy server and port number. Redirected server settings for each WAN can be set here. If forwarding is disabled for a WAN, then web proxy connections for that WAN will simply be forwarded to the connection's original destination.

## DNS Forwarding


When DNS forwarding is enabled, all clients' outgoing DNS requests will also be intercepted and forwarded to the built-in DNS proxy server.

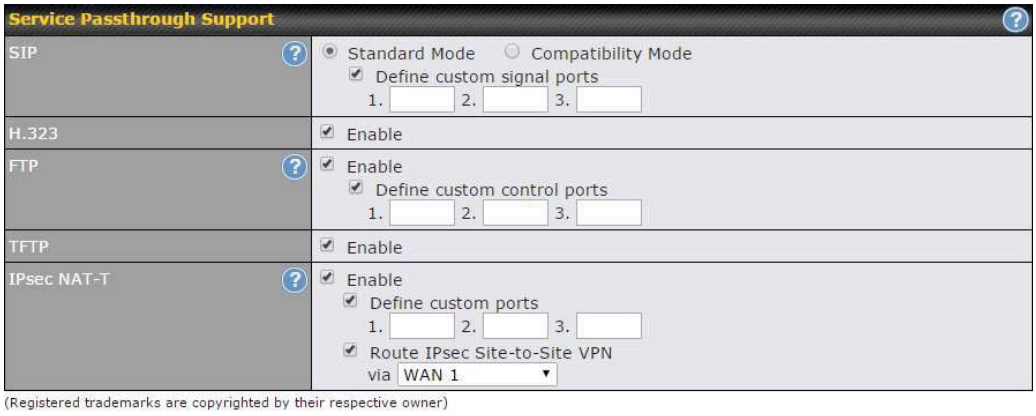
## Custom Service Forwarding




After clicking the **enable** checkbox, enter your TCP port for traffic heading to the router, and then specify the IP Address and Port of the server you wish to forward to the service to.

### 9.2.4 Service Passthrough

Service passthrough settings can be found at **Network>Misc. Settings>Service Passthrough**.



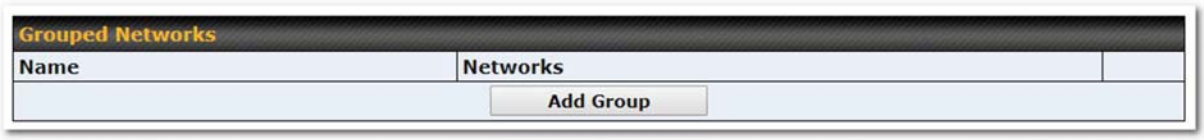

Some Internet services need to be specially handled in a multi-WAN environment. The Peplink Balance can handle these services such that Internet applications do not notice it is behind a multi-WAN router. Settings for service passthrough support are available here.

| Service Passthrough Support | |
|---|---|
| **SIP** | Session initiation protocol, aka SIP, is a voice-over-IP protocol. The Peplink Balance can act as a SIP application layer gateway (ALG) which binds connections for the same SIP |

| | |
|---|---|
| | session to the same WAN connection and translate IP address in the SIP packets correctly in NAT mode. Such passthrough support is always enabled and there are two modes for selection: **Standard Mode** and **Compatibility Mode**.<br>If your SIP server's signal port number is non-standard, you can check the box **Define custom signal ports** and input the port numbers to the text boxes. |
| **H.323** | With this option enabled, protocols that provide audio-visual communication sessions will be defined on any packet network and passthrough the Balance. |
| **FTP** | FTP sessions consist of two TCP connections; one for control and one for data. In a multi-WAN situation, they must be routed to the same WAN connection. Otherwise, problems will arise in transferring files. By default, the Peplink Balance monitors TCP control connections on port 21 for any FTP connections and binds TCP connections of the same FTP session to the same WAN.<br>If you have an FTP server listening on a port number other than 21, you can check **Define custom control ports** and enter the port numbers in the text boxes. |
| **TFTP** | The Peplink Balance monitors outgoing TFTP connections and routes any incoming TFTP data packets back to the client. Select **Enable** if you want to enable TFTP passthrough support. |
| **IPsec NAT-T** | This field is for enabling the support of IPsec NAT-T passthrough. UDP ports 500, 4500, and 10000 are monitored by default.<br>You may add more custom data ports that your IPsec system uses by checking **Define custom ports**. If the VPN contains IPsec site-to-site VPN traffic, check **Route IPsec Site-to-Site VPN** and choose the WAN connection to route the traffic to. |

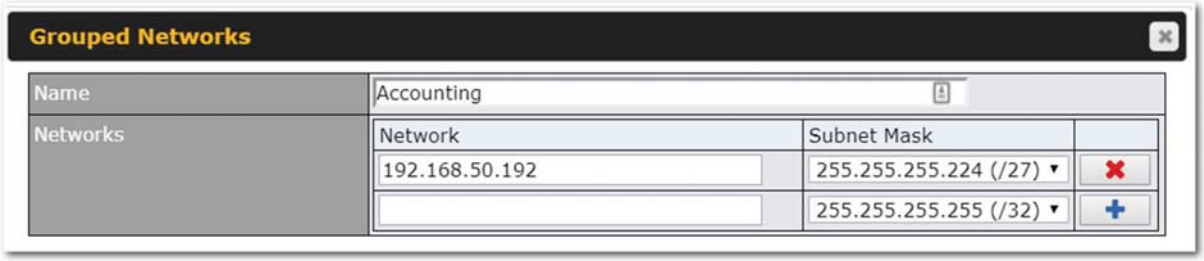
### 9.2.5 Grouped Networks



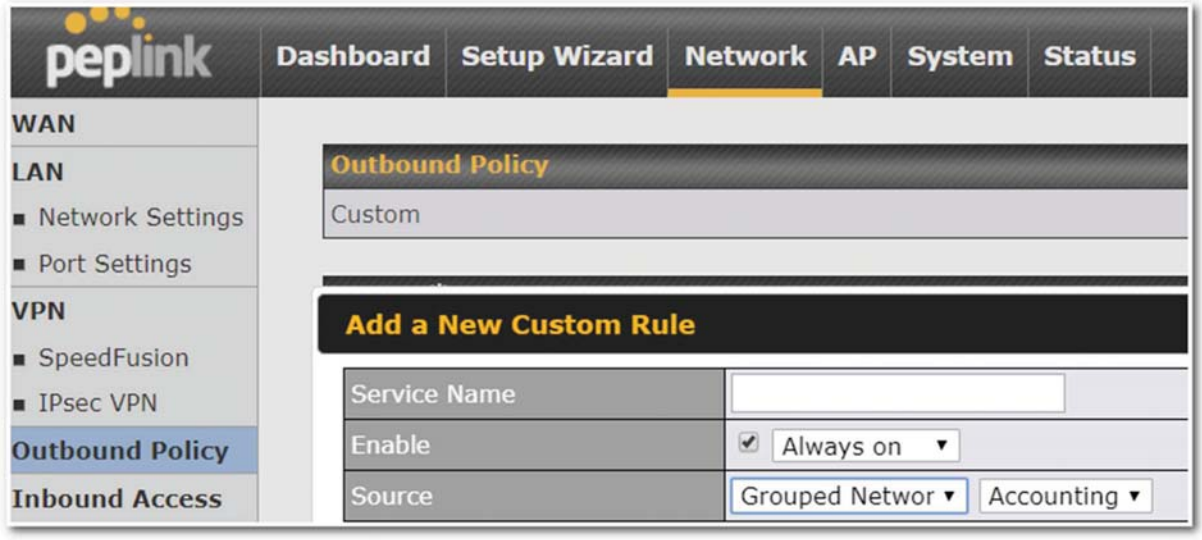

Using "Grouped Networks" you can group and name a range of IP addresses, which can then be used to define firewall rules or outbound policies.

Start by clicking on “add group” then fill in the appropriate field.
In this example we’ll create a group “accounting”
Click save when you have finished adding the required networks.




The grouped network “accounting” can now be used to configure a group policy or firewall rule.



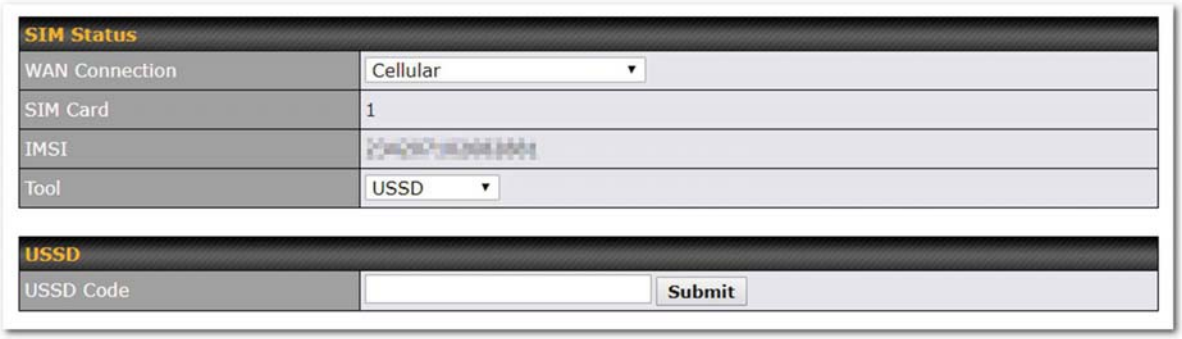

### 9.2.6 SIM Toolkit

The SIM Toolkit ,accessible via **Networks > Misc Settings > SIM Toolkit**, supports two functionalities, USSD and SMS.

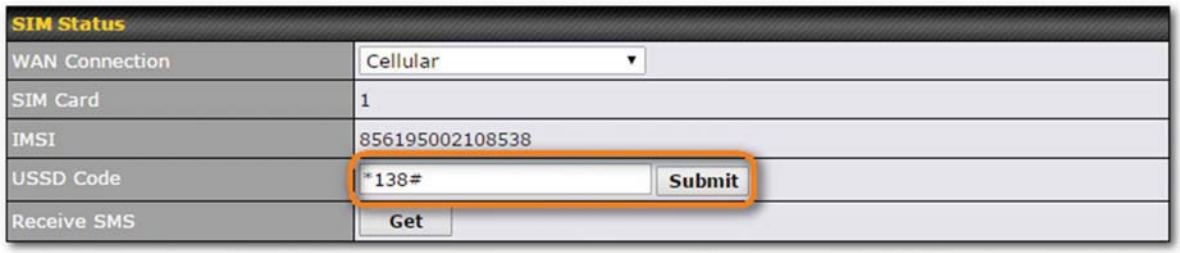
#### USSD

Unstructured Supplementary Service Data (USSD) is a protocol used by mobile phones to communicate with their service provider’s computers. One of the most common uses is to query the available balance.

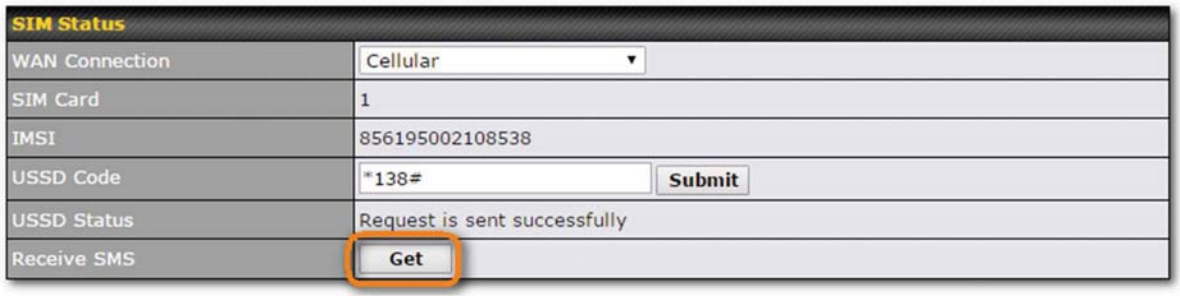
 



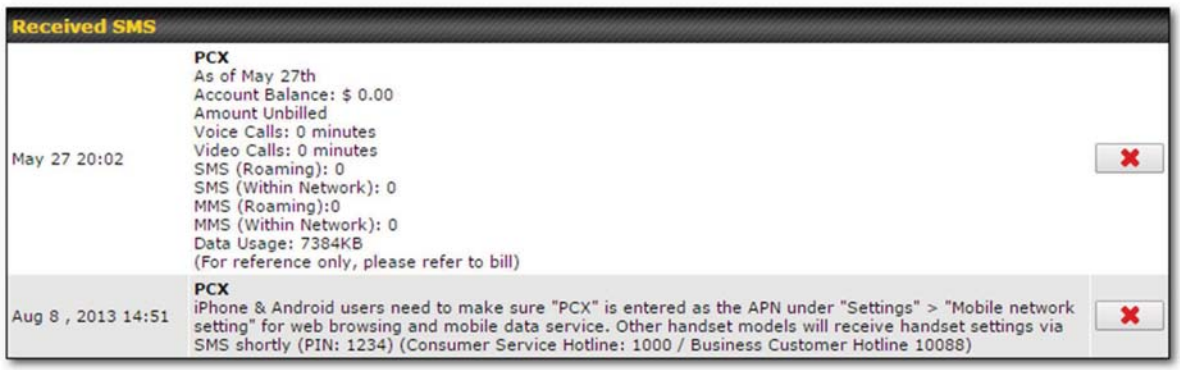

Enter your USSD code under the **USSD Code** text field and click **Submit**.




You will receive a confirmation. To check the SMS response, click **Get**.



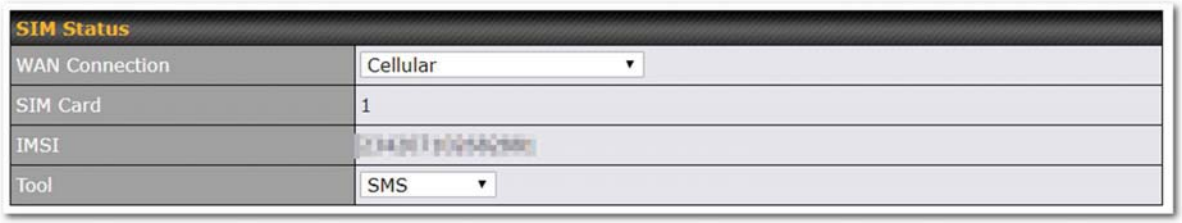

After a few minutes you will receive a response to your USSD code

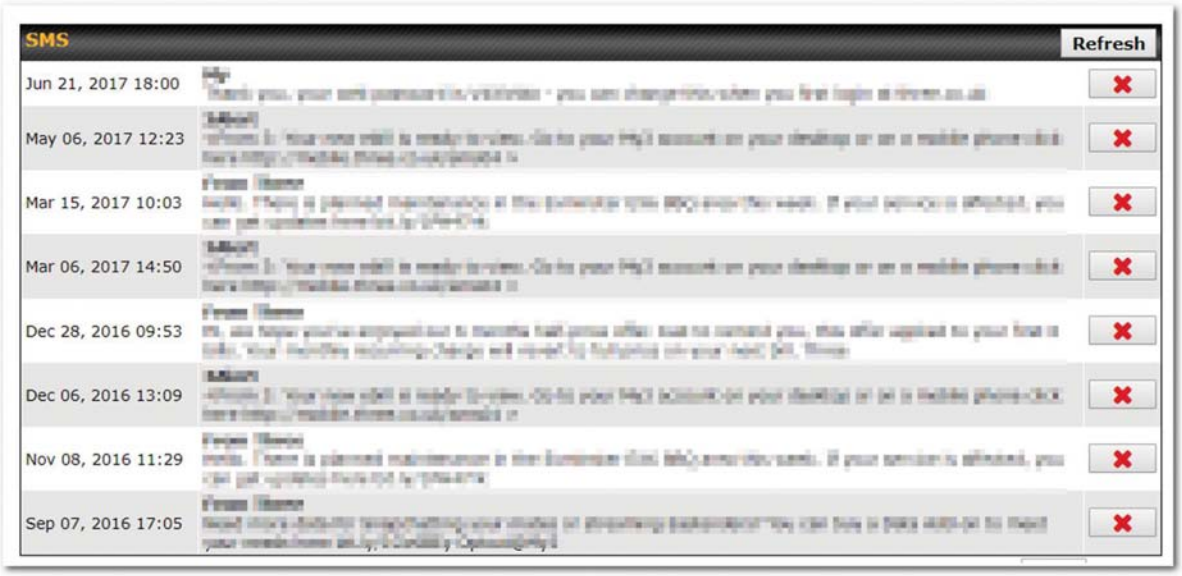


### SMS

The SMS option allows you to read SMS (text) messages that have been sent to the SIM in your Peplink router.



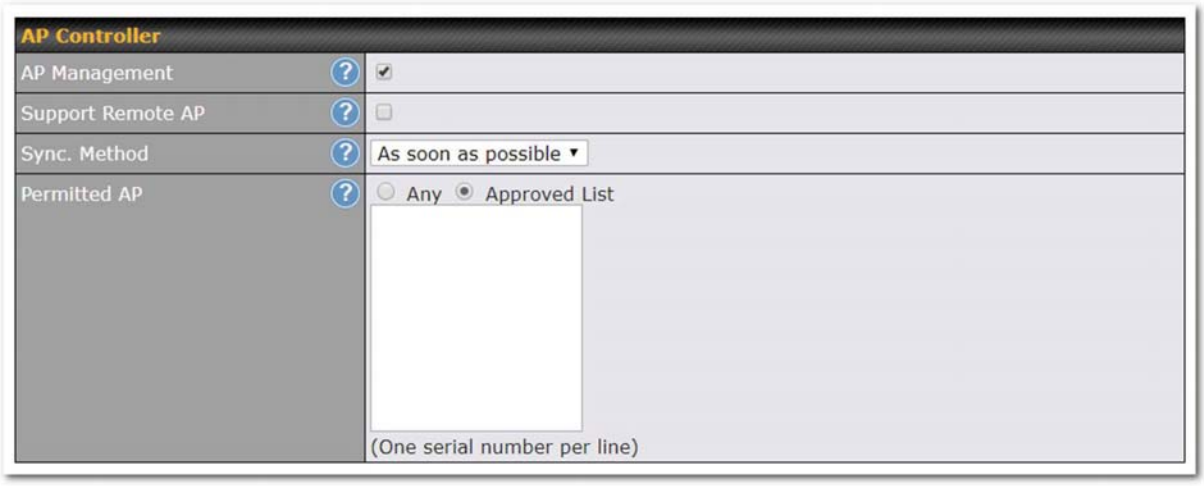

# 10 AP Tab

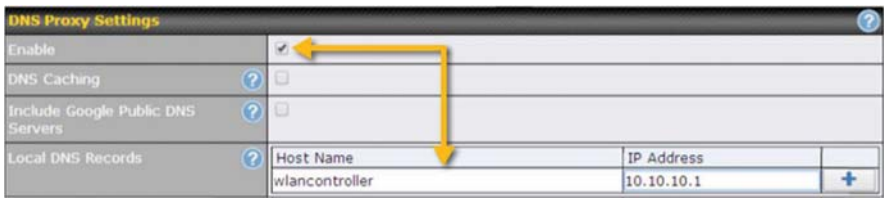
## 10.1 AP

### 10.1.1 AP Controller

Clicking on the **AP** tab will default to this menu, where you can view basic AP management options:

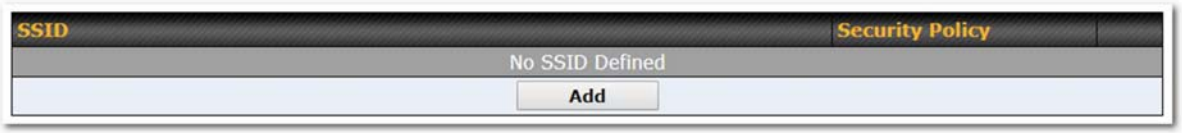



| AP Controller | |
|---|---|
| **AP Management** | The AP controller for managing Pepwave APs can be enabled by checking this box. When this option is enabled, the AP controller will wait for management connections originating from APs over the LAN on TCP and UDP port 11753. It will also wait for captive portal connections on TCP port 443. An extended DHCP option, **CAPWAP Access Controller addresses** (field 138), will be added to the DHCP server. A local DNS record, **AP Controller**, will be added to the local DNS proxy. |
| **Support Remote AP** | The AP controller supports remote management of Pepwave APs. When this option is enabled, the AP controller will wait for management connections originating from remote APs over the WAN on TCP and UDP port 11753. It will also wait for captive portal connections on TCP port 443.<br>The DHCP server and/or local DNS server of the remote AP's network should be configured in the **DNS Proxy Settings menu** under **Network>LAN**. The procedure is as follows:<br>1. Define an extended DHCP option, **CAPWAP Access Controller addresses** (field 138), in the DHCP server, where the values are the AP controller's public IP addresses; and/or<br>2. Create a local DNS record for the AP controller with a value corresponding to the AP controller's public IP address.<br>  <br> |

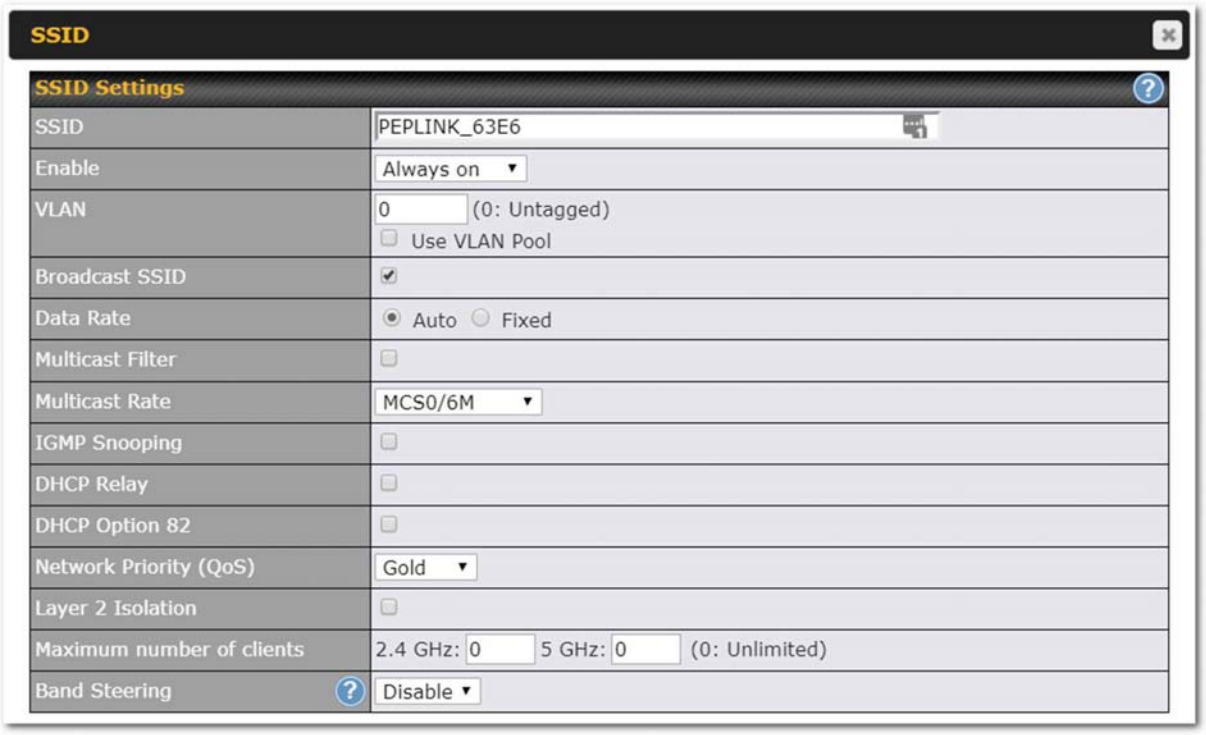
| | |
|---|---|
| **Sync. Method** | Select the required option to synchronize the managed AP's. Options are:<br>• As soon as possible (default)<br>• Progressively (synchronize AP's in groups)<br>• One at a time (synchronize one AP at a time) |
| **Permitted AP** | Access points to manage can be specified here. If **Any** is selected, the AP controller will manage any AP that reports to it. If **Approved List** is selected, only APs with serial numbers listed in the provided text box will be managed. |

### 10.1.2 Wireless SSID




Current SSID information appears in the **SSID** section. To edit an existing SSID, click its name in the list. To add a new SSID, click **Add**. Note that the following settings vary by model.
The below settings ishows a  new SSID window with Advanced Settings enabled (these are available by selecting the question mark in the top right corner).

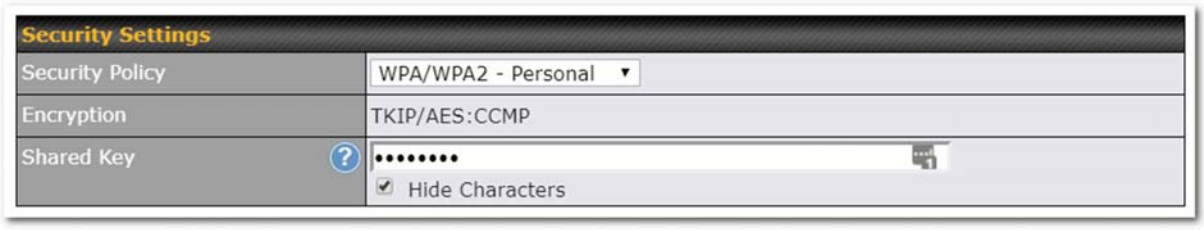



| SSID Settings | |
|---|---|
| **SSID** | This setting specifies the SSID of the virtual AP to be scanned by Wi-Fi clients. |
| **Enable** | Click the drop-down menu to apply a time schedule to this interface |
| **VLAN** | This setting specifies the VLAN ID to be tagged on all outgoing packets generated from this wireless network (i.e., packets that travel from the Wi-Fi segment through the Pepwave AP One unit to the Ethernet segment via the LAN port). The default value of this setting is **0**, which means VLAN tagging is disabled (instead of tagged with zero).<br>Use of a VLAN pool is enabled by selecting the checkbox. |
| **Broadcast SSID** | This setting specifies whether or not Wi-Fi clients can scan the SSID of this wireless network. **Broadcast SSID** is enabled by default. |
| **Data Rate** [A] | Select **Auto** to allow the Pepwave router to set the data rate automatically, or select **Fixed** and choose a rate from the displayed drop-down menu. |

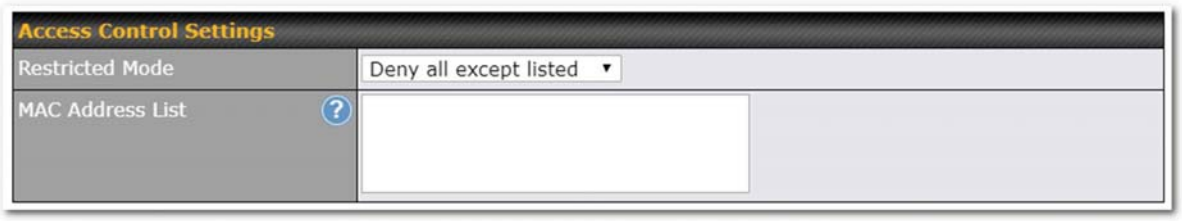
| | |
|---|---|
| **Multicast Filter**[A] | This setting enables the filtering of multicast network traffic to the wireless SSID. |
| **Multicast Rate**[A] | This setting specifies the transmit rate to be used for sending multicast network traffic. The selected **Protocol** and **Channel Bonding** settings will affect the rate options and values available here. |
| **IGMP Snooping** [A] | To allow the Pepwave router to listen to internet group management protocol (IGMP) network traffic, select this option. |
| **DHCP Relay** | Put the address of the DHCP server in this field..<br>DHCP requests will be relayed to this DHCP server |
| **DHCP Option 82** [A] | If you use a distributed DHCP server/relay environment, you can enable this option to provide additional information on the manner in which clients are physically connected to the network. |
| **Layer 2 Isolation** [A] | **Layer 2** refers to the second layer in the ISO Open System Interconnect model.<br>When this option is enabled, clients on the same VLAN, SSID, or subnet are isolated to that VLAN, SSID, or subnet, which can enhance security. Traffic is passed to upper communication layer(s). By default, the setting is disabled. |
| **Maximum Number of Clients** | Indicate the maximum number of clients that should be able to connect to each frequency. |
| **Band Steering** | To reduce 2.4 GHz band overcrowding, AP with band steering steers clients capable of 5 GHz operation to 5 GHz frequency.<br>Choose between:<br>**Force** - Clients capable of 5 GHz operation are only offered with 5 GHz frequency.<br>**Prefer** - Clients capable of 5 GHz operation are encouraged to associate with 5 GHz frequency. If the clients insist to attempt on 2.4 GHz frequency, 2.4 GHz frequency will be offered.<br>**Disable** - Default |

[A] - Advanced feature. Click the button on the top right-hand corner to activate.



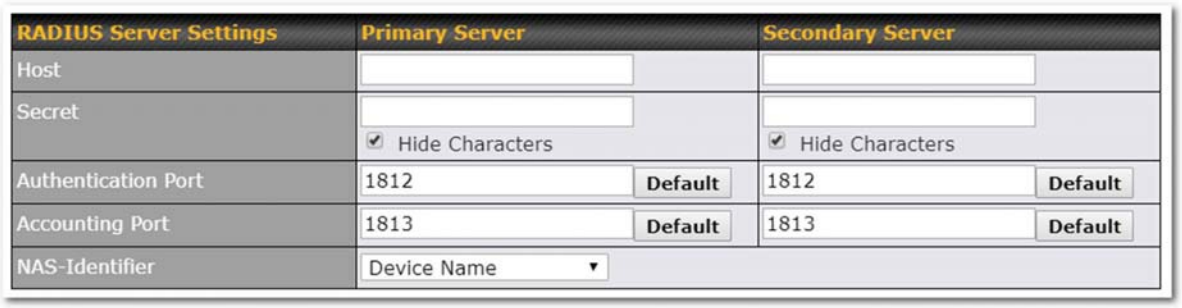

 

| Security Settings | |
|---|---|
| **Security Policy** | This setting configures the wireless authentication and encryption methods. Available options are :<br>● **Open (**No Encryption)<br>● **WPA2 -Personal** (AES:CCMP)<br>● **WPA2 – Enterprise**<br>● **WPA/WPA2 - Personal** (TKIP/AES: CCMP)<br>● **WPA/WPA2 – Enterprise**<br><br>When **WPA/WPA2 - Enterprise** is configured, RADIUS-based 802.1 x authentication is enabled. Under this configuration, the **Shared Key** option should be disabled. When using this method, select the appropriate version using the **V1**/**V2** controls. The security level of this method is known to be very high.<br>When **WPA/WPA2- Personal** is configured, a shared key is used for data encryption and authentication. When using this configuration, the **Shared Key** option should be enabled. Key length must be between eight and 63 characters (inclusive). The security level of this method is known to be high. |



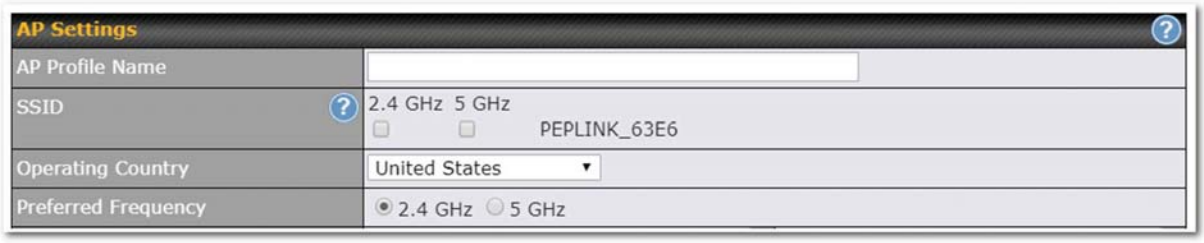

| Access Control | |
|---|---|
| **Restricted Mode** | The settings allow administrator to control access using MAC address filtering. Available options are **None**, **Deny all except listed**, and **Accept all except listed** |
| **MAC Address List** | Connection coming from the MAC addresses in this list will be either denied or accepted based on the option selected in the previous field.<br>If more than one MAC address needs to be entered, you can use a carriage return to separate them. |




| RADIUS Server Settings | |
|---|---|
| **Host** | Enter the IP address of the primary RADIUS server and, if applicable, the secondary RADIUS server. |
| **Secret** | Enter the RADIUS shared secret for the primary server and, if applicable, the secondary RADIUS server. |
| **Authentication Port** | In field, enter the UDP authentication port(s) used by your RADIUS server(s) or click the **Default** button to enter **1812**. |
| **Accounting Port** | In field, enter the UDP accounting port(s) used by your RADIUS server(s) or click the **Default** button to enter **1813**. |
| **NAS-Identifier** | Choose between **Device Name**, **LAN MAC address**, **Device Serial Number** and **Custom Value** |

### 10.1.3 AP > Profiles



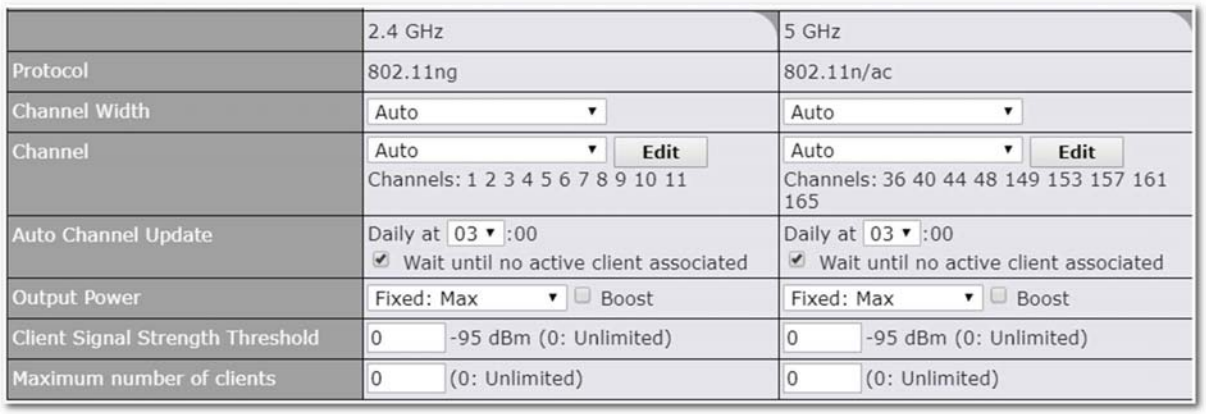

| AP Settings |
|---|

| | |
|---|---|
| **AP Profile Name** | Ap Profile name |
| **SSID** | You can select the wireless networks for 2.4 GHz or 5 GHz separately for each SSID. |
| **Operating Country** | This drop-down menu specifies the national/regional regulations which the Wi-Fi radio should follow.<br>• If a North American region is selected, RF channels 1 to 11 will be available and the maximum transmission power will be 26 dBm (400 mW).<br>• If European region is selected, RF channels 1 to 13 will be available. The maximum transmission power will be 20 dBm (100 mW).<br>NOTE: Users are required to choose an option suitable to local laws and regulations. |
| **Preferred Frequency** | Indicate the preferred frequency to use for clients to connect. |

**Important Note**

Per FCC regulation, the country selection is not available on all models marketed in the US. All US models are fixed to US channels only.



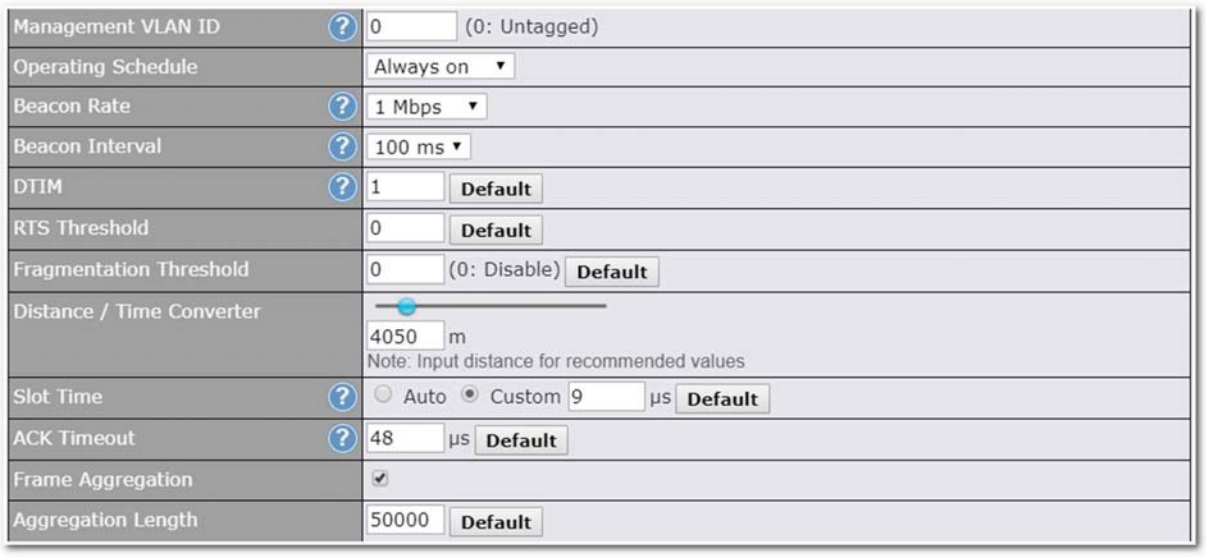

**AP Settings (part 2)**

| | |
|---|---|
| **Protocol** | This option allows you to specify whether 802.11b and/or 802.11g client association requests will be accepted. Available options are **802.11ng** and **802.11na**. By default, **802.11ng** is selected. |
| **Channel Width** | Available options are **20 MHz**, **40 MHz**, and **Auto (20/40 MHz)** . Default is **Auto (20/40 MHz),** which allows both widths to be used simultaneously. |

| | |
|---|---|
| **Channel** | This option allows you to select which 802.11 RF channel will be utilized. **Channel 1 (2.412 GHz)** is selected by default. |
| **Auto Channel Update** | Indicate the time of day at which update automatic channel selection. |
| **Output Power** | This option is for specifying the transmission output power for the Wi-Fi AP. There are 4 relative power levels available – **Max**, **High**, **Mid**, and **Low**. The actual output power will be bound by the regulatory limits of the selected country. |
| **Client Signal Strength Threshold** | This setting determines the maximum strength at which the Wi-Fi AP can broadcast |
| **Maximum number of clients** | This setting determines the maximum number of clients that can connect to this Wi-Fi frequency. |

Advanced Wi-Fi AP settings can be displayed by clicking the on the top right-hand corner of the **Wi-Fi AP Settings** section, which can be found at **AP>Settings**. Other models will display a separate section called **Wi-Fi AP Advanced Settings**, which can be found at **Advanced>Wi-Fi Settings**.



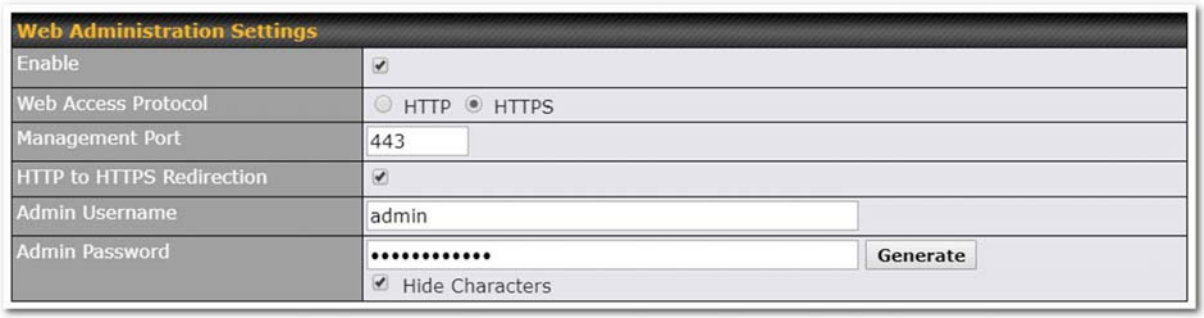

## Advanced AP Settings

| | |
|---|---|
| **Management VLAN ID** | This field specifies the VLAN ID to tag to management traffic, such as communication traffic between the AP and the AP Controller. The value is zero by default, which means that no VLAN tagging will be applied.<br>NOTE: Change this value with caution as alterations may result in loss of connection to the AP Controller. |
| **Operating Schedule** | Choose from the schedules that you have defined in System>Schedule. Select the schedule for the integrated AP to follow from the drop-down menu. |
| **Beacon Rate** [A] | This option is for setting the transmit bit rate for sending a beacon. By default, **1Mbps** is selected. |
| **Beacon Interval** [A] | This option is for setting the time interval between each beacon. By default, **100ms** is selected. |
| **DTIM** [A] | This field allows you to set the frequency for the beacon to include delivery traffic indication messages. The interval is measured in milliseconds. The default value is set to **1 ms**. |
| **RTS Threshold** [A] | The RTS (Request to Clear) threshold determines the level of connection required before the AP starts sending data. The recommended standard of the RTS threshold is around 500. |
| **Fragmentation Threshold** [A] | This setting determines the maximum size of a packet before it gets fragmented into multiple pieces. |
| **Distance / Time Convertor** | Select the range you wish to cover with your Wi-Fi, and the router will make recommendations for the Slot Time and ACK Timeout. |
| **Slot Time** [A] | This field is for specifying the unit wait time before transmitting a packet. By default, this field is set to **9 µs**. |
| **ACK Timeout** [A] | This field is for setting the wait time to receive an acknowledgement packet before performing a retransmission. By default, this field is set to **48 µs**. |
| **Frame Aggregation** [A] | This option allows you to enable frame aggregation to increase transmission throughput. |

[A] - Advanced feature, please click the button on the top right-hand corner to activate.




| Web Administration Settings | |
|---|---|
| **Enable** | Ticking this box enables web admin access for APs located on the WAN. |
| **Web Access Protocol** | Determines whether the web admin portal can be accessed through HTTP or HTTPS |
| **Management Port** | Determines the port at which the management UI can be accessed. |
| **HTTP to HTTPS redirection** | Redirects HTTP request to HTTPS |
| **Admin Username** | Determines the username to be used for logging into the web admin portal |
| **Admin Password** | Determines the password for the web admin portal on external AP. |

## 10.2 AP Controller Status

### 10.2.1 Info

A comprehensive overview of your AP can be accessed by navigating to **AP > Info**.

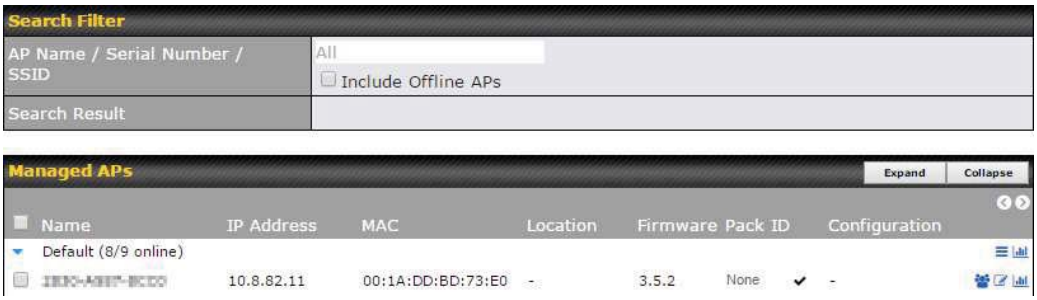
 


| AP Controller | |
|---|---|
| **License Limit** | This field displays the maximum number of AP your Balance router can control. You can purchase licenses to increase the number of AP you can manage. |
| **Frequency** | Underneath, there are two check boxes labeled **2.4 Ghz** and **5 Ghz**. Clicking either box will toggle the display of information for that frequency. By default, the graphs display the number of clients and data usage for both 2.4GHz and 5 GHz frequencies. |
| **SSID** | The colored boxes indicate the SSID to display information for. Clicking any colored box will toggle the display of information for that SSID. By default, all the graphs show information for all SSIDs. |
| **No. of APs** | This pie chart and table indicates how many APs are online and how many are offline. |
| **No.of Clients** | This graph displays the number of clients connected to each network at any given time. Mouse over any line on the graph to see how many clients connected to a specific SSID for that point in time. |
| **Data Usage** | This graph enables you to see the data usage of any SSID for any given time period. Mouse over any line on the graph to see the data usage by each SSID for that point in time. Use the buttons next to **Zoom** to select the time scale you wish to view. In addition, you could use the sliders at the bottom to further refine your timescale. |

### 10.2.2 Access Points (Usage)

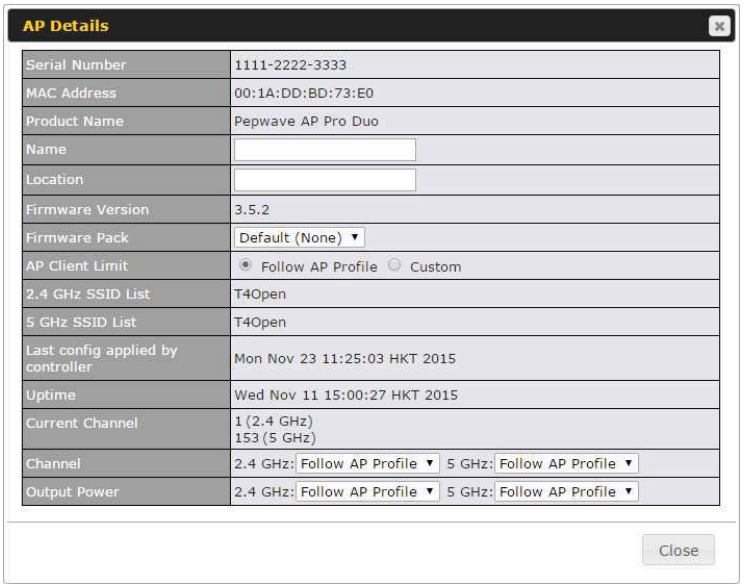
A detailed breakdown of data usage for each AP is available at **AP> Access Point**.




| Usage | |
|---|---|
| **AP Name/Serial Number** | This field enables you to quickly find your device if you know its name or serial number. Fill in the field to begin searching. Partial names and serial numbers are supported. |
| **Online Status** | This button toggles whether your search will include offline devices. |
| **Managed Wireless Devices** | This table shows the detailed information on each AP, including channel, number of clients, upload traffic, and download traffic. Click the blue arrows at the left of the table to expand and collapse information on each device group. You could also expand and collapse all groups by using the Expand Collapse buttons.<br>On the right of the table, you will see the following icons: .<br>Click the icon to see a usage table for each client: |


Click the icon to configure each client



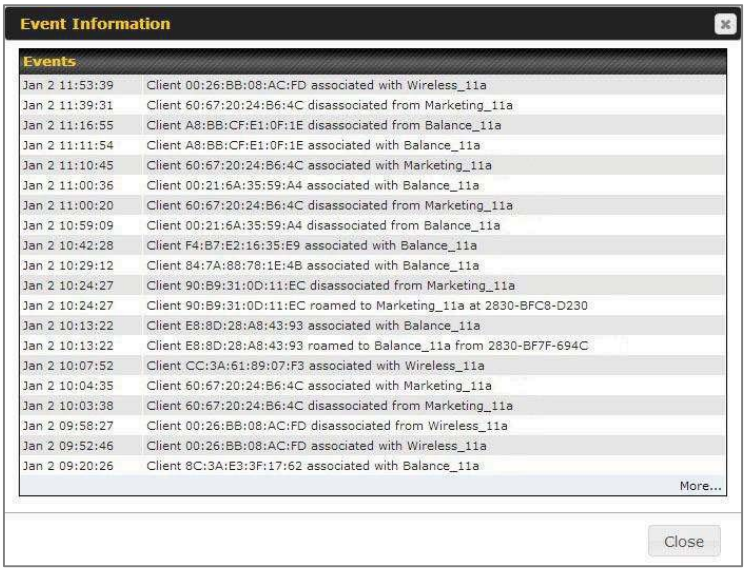

For easier network management, you can give each client a name and designate its location. You can also designate which firmware pack (if any) this client will follow, as well as the channels on which the client will broadcast.

Click the icon to see a graph displaying usage:


Click any point in the graphs to display detailed usage and client information for that device, using that SSID, at that point in time. On the **Data Usage by** menu, you can display the information by SSID or by AP send/receive rate.

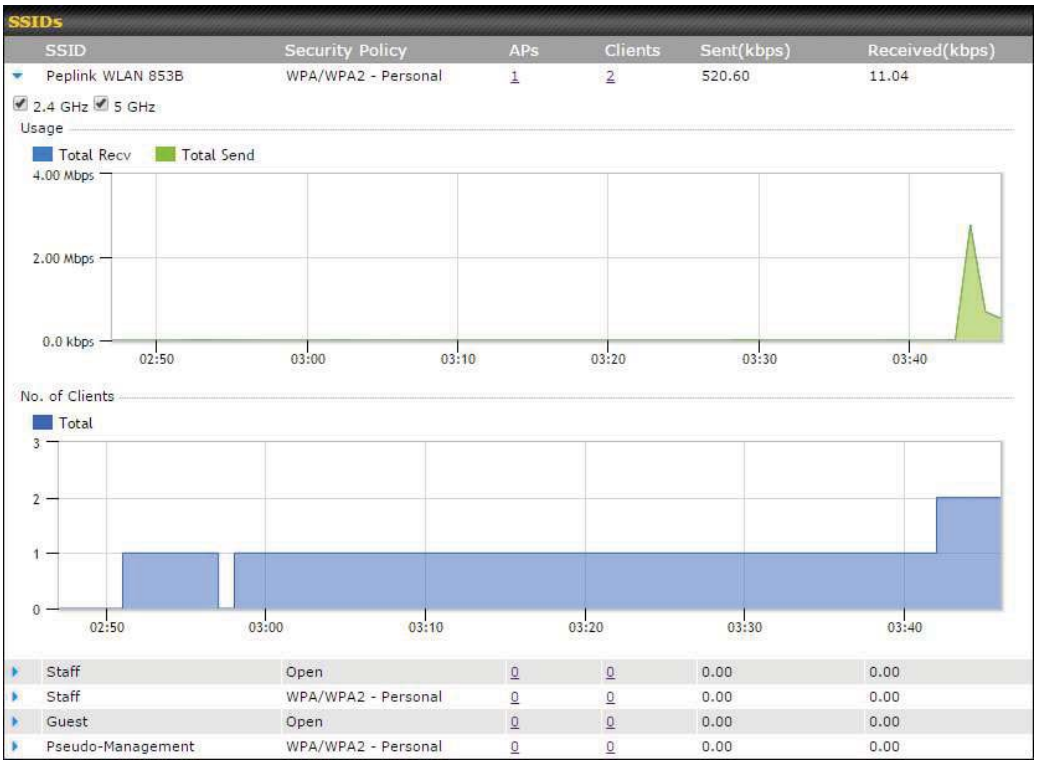
Click the **Event** tab next to **Wireless Usage** to view a detailed event log for that particular device:



### 10.2.3 Wireless SSID

In-depth SSID reports are available under AP > SSID.



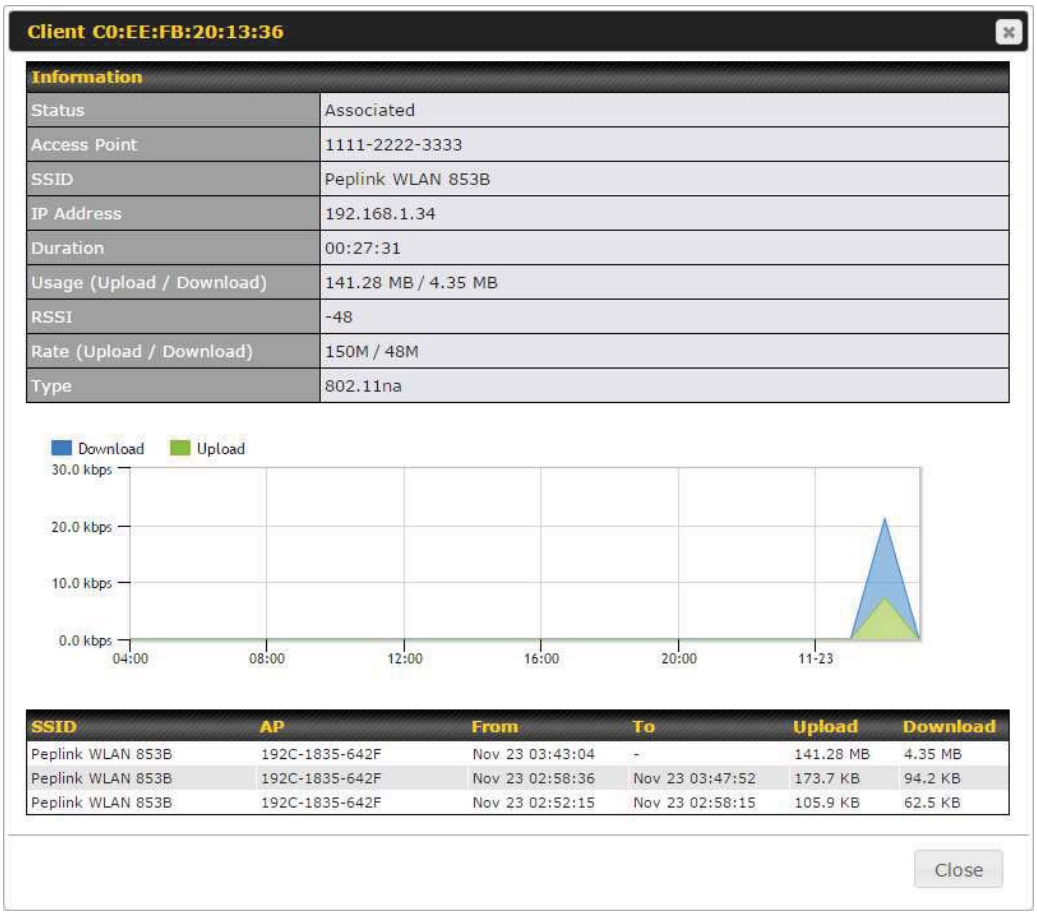

Click the blue arrow on any SSID to obtain more detailed usage information on each SSID.

### 10.2.4 Wireless Client

You can search for specific Wi-Fi users by navigating to **AP > Wireless Client**.

Here, you will be able to see your network's heaviest users as well as search for specific users. Click the ☆ icon to bookmark specific users, and click the icon for additional details about each user:




### 10.2.5 Nearby Device

A listing of near devices can be accessed by navigating to **AP > Controller Status > Nearby Device**.

Suspected Rogue APs

| BSSID | SSID | Channel | Encryption | Last Seen | Mark as |
|---|---|---|---|---|---|
| 00:1A:DD:EC:25:22 | Wireless | 11 | WPA2 | 10 hours ago | |
| 00:1A:DD:EC:25:23 | Accounting | 11 | WPA2 | 10 hours ago | |
| 00:1A:DD:EC:25:24 | Marketing | 11 | WPA2 | 11 hours ago | |
| 00:03:7F:00:00:00 | MYB1PUSH | 1 | WPA & WPA2 | 11 minutes ago | |
| 00:03:7F:00:00:01 | MYB1 | 1 | WPA2 | 15 minutes ago | |
| 00:1A:DD:B9:60:88 | PEPWAVE_CB7E | 1 | WPA & WPA2 | 5 minutes ago | |
| 00:1A:DD:BB:09:C1 | Micro_S1_1 | 6 | WPA & WPA2 | 1 hour ago | |
| 00:1A:DD:BB:52:A8 | MAX HD2 Gobi | 11 | WPA & WPA2 | 2 minutes ago | |
| 00:1A:DD:BF:75:81 | PEPLINK_05B5 | 4 | WPA & WPA2 | 1 minute ago | |
| 00:1A:DD:BF:75:82 | LK_05B5 | 4 | WPA2 | 1 minute ago | |
| 00:1A:DD:BF:75:83 | LK_05B5_VLAN22 | 4 | WPA2 | 1 minute ago | |
| 00:1A:DD:C1:ED:E4 | dev_captive_portal_test | 1 | WPA & WPA2 | 3 minutes ago | |
| 00:1A:DD:C2:E4:C5 | PEPWAVE_7052 | 11 | WPA & WPA2 | 2 hours ago | |
| 00:1A:DD:C3:F1:64 | dev_captive_portal_test | 6 | WPA & WPA2 | 6 minutes ago | |
| 00:1A:DD:C4:DC:24 | ssid_test | 8 | WPA & WPA2 | 2 minutes ago | |
| 00:1A:DD:C4:DC:25 | SSID New | 8 | WPA & WPA2 | 2 minutes ago | |
| 00:1A:DD:C5:46:04 | Guest SSID | 9 | WPA2 | 2 minutes ago | |
| 00:1A:DD:C5:47:04 | PEPWAVE_67B8 | 1 | WPA & WPA2 | 5 minutes ago | |
| 00:1A:DD:C5:4E:24 | G BR1 Portal | 2 | WPA2 | 2 minutes ago | |
| 00:1A:DD:C6:9A:48 | ssid_test | 8 | WPA & WPA2 | 2 hours ago | |

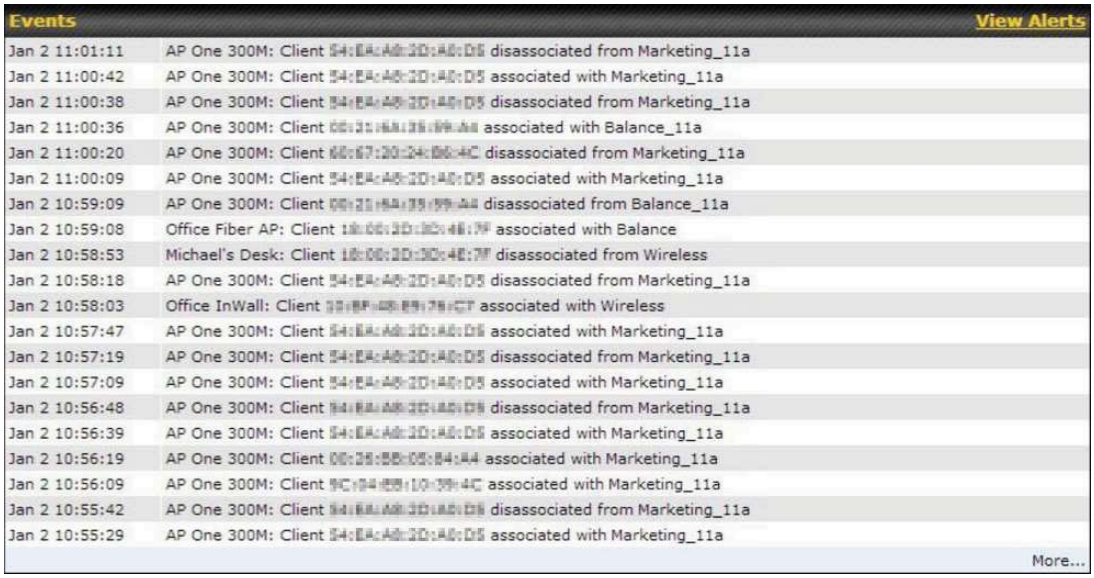
**Nearby Devices**

Hovering over the device MAC address will result in a popup with information on how this device was detected. Click the ☹ icons and the device will be moved to the bottom table of identified devices.

### 10.2.6 Event Log

You can access the AP Controller Event log by navigating to **AP > Controller Status > Event Log**.

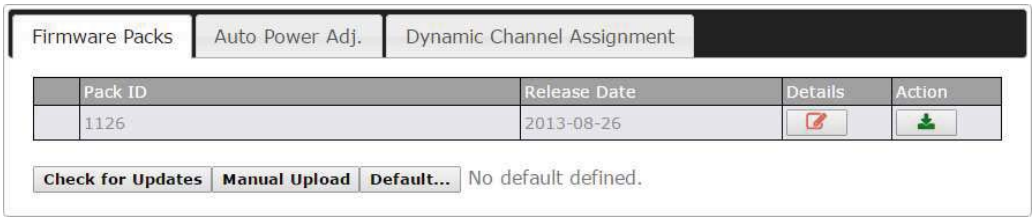



### Events

This event log displays all activity on your AP network, down to the client level. Use to filter box to search by MAC address, SSID, AP Serial Number, or AP Profile name. Click **View Alerts** to see only alerts, and click the **More…** link for additional records.

## 10.3 Toolbox

Additional tools for managing firmware packs, power adjustment, and channel assignment can be found at **AP>Toolbox**.




### Firmware Packs

This is the first menu that will appear. Here, you can manage the firmware of your AP. Clicking on  will display information regarding each firmware pack. To receive new firmware packs, you can either press Check for Updates to download new packs or you can press Manual Upload to manually upload a firmware pack. Press Default... to define which firmware pack is default.

# 11 System Tab

## 11.1 System

### 11.1.1 Admin Security

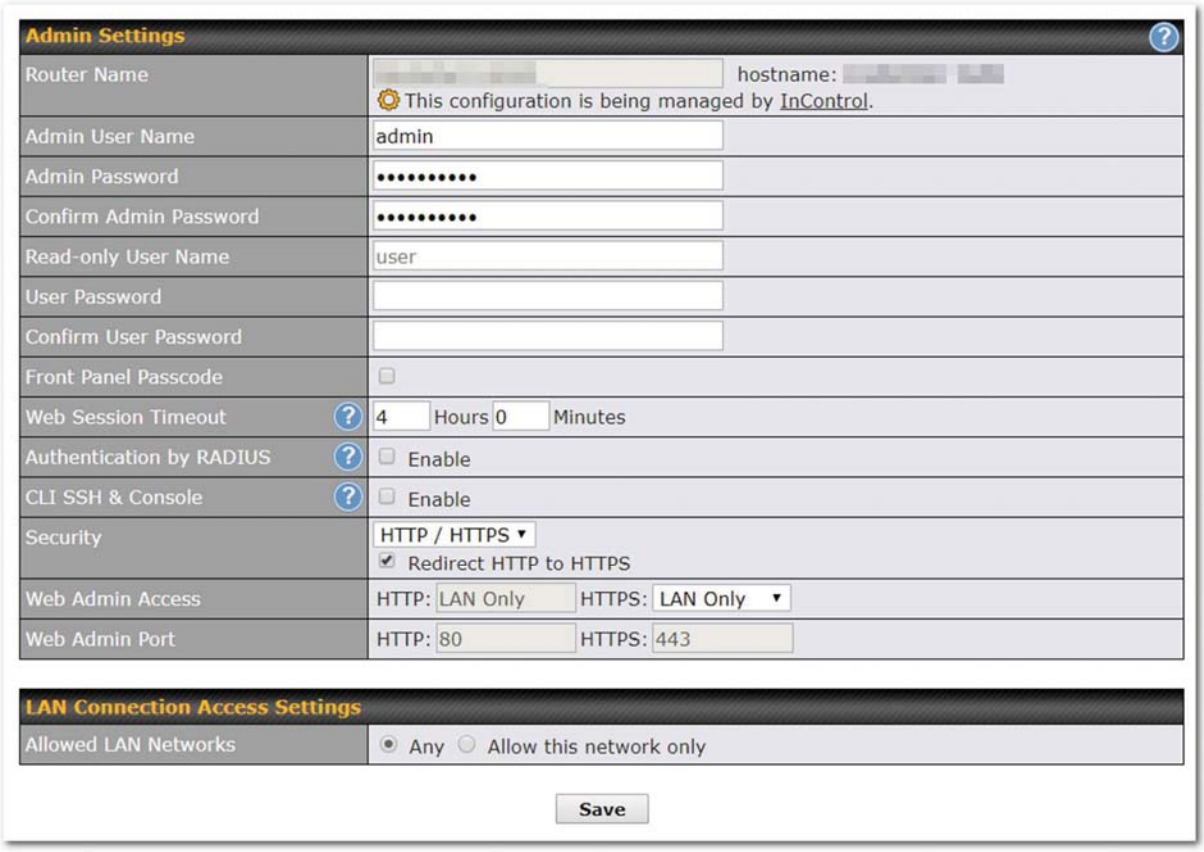
There are two types of user accounts available for accessing the web admin: *admin* and *user*. They represent two user levels: the admin level has full administrative access, while the user level is read-only. The user level can access only the device's status information; users cannot make any changes on the device.

A web login session will be logged out automatically when it has been idle longer than the **Web Session Timeout**. Before the session expires, you may click the **Logout** button in the web admin to exit the session.

**0 hours 0 minutes** signifies an unlimited session time. This setting should be used only in special situations, as it will lower the system security level if users do not log out before closing the browser. The **default** is 4 hours, 0 minutes.

For security reasons, after logging in to the web admin Interface for the first time, it is recommended to change the administrator password. Configuring the administration interface to be accessible only from the LAN can further improve system security. Administrative settings configuration is located at **System>Admin Security**.




| Admin Settings | |
|---|---|
| **Router Name** | This field allows you to define a name for this Pepwave router. By default, **Router Name** is set as **MAX_XXXX**, where *XXXX* refers to the last 4 digits of the unit's serial number. |
| **Admin User Name** | **Admin User Name** is set as *admin* by default, but can be changed, if desired. |
| **Admin Password** | This field allows you to specify a new administrator password. |
| **Confirm Admin Password** | This field allows you to verify and confirm the new administrator password. |
| **Read-only User Name** | **Read-only User Name** is set as *user* by default, but can be changed, if desired. |
| **User Password** | This field allows you to specify a new user password. Once the user password is set, the read-only user feature will be enabled. |

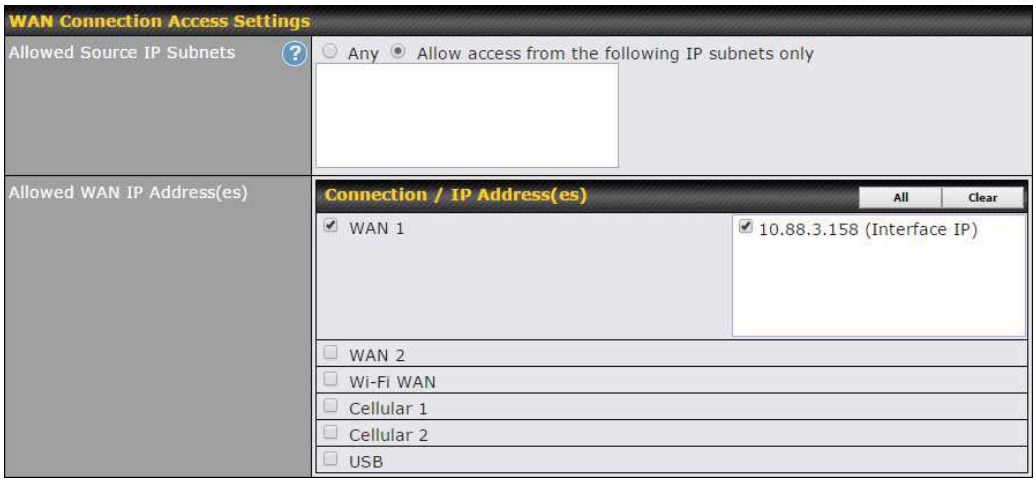
 

| | |
|---|---|
| **Confirm User Password** | This field allows you to verify and confirm the new user password. |
| **Web Session Timeout** | This field specifies the number of hours and minutes that a web session can remain idle before the Pepwave router terminates its access to the web admin interface. By default, it is set to **4 hours**. |
| **Authentication by RADIUS** | With this box is checked, the web admin will authenticate using an external RADIUS server. Authenticated users are treated as either "admin" with full read-write permission or “user” with read-only access. Local admin and user accounts will be disabled. When the device is not able to communicate with the external RADIUS server, local accounts will be enabled again for emergency access. Additional authentication options will be available once this box is checked. |
| **Auth Protocol** | This specifies the authentication protocol used. Available options are **MS-CHAP v2** and **PAP**. |
| **Auth Server** | This specifies the access address and port of the external RADIUS server. |
| **Auth Server Secret** | This field is for entering the secret key for accessing the RADIUS server. |
| **Auth Timeout** | This option specifies the time value for authentication timeout. |
| **Accounting Server** | This specifies the access address and port of the external accounting server. |
| **Accounting Server Secret** | This field is for entering the secret key for accessing the accounting server. |
| **Network Connection** | This option is for specifying the network connection to be used for authentication. Users can choose from LAN, WAN, and VPN connections. |
| **CLI SSH** | The CLI (command line interface) can be accessed via SSH. This field enables CLI support. For additional information regarding CLI, please refer to **Section 30.5.** |
| **CLI SSH Port** | This field determines the port on which clients can access CLI SSH. |
| **CLI SSH Access** | This menu allows you to choose between granting access to LAN and WAN clients, or to LAN clients only. |
| **Security** | This option is for specifying the protocol(s) through which the web admin interface can be accessed:<br>• HTTP<br>• HTTPS<br>• HTTP/HTTPS<br>HTTP to HTTPS redirection is enabled by default to force HTTPS access to the |

| | |
|---|---|
| | web admin interface. |
| **Web Admin Port** | This field is for specifying the port number on which the web admin interface can be accessed. |
| **Web Admin Access** | This option is for specifying the network interfaces through which the web admin interface can be accessed:<br>• LAN only<br>• LAN/WAN<br>If LAN/WAN is chosen, the **WAN Connection Access Settings** form will be displayed. |


| LAN Connection Access Settings | |
|---|---|
| **Allowed LAN Networks** | This field allows you to permit only specific networks or VLANs to access the Web UI. |




| WAN Connection Access Settings | |
|---|---|
| **Allowed Source IP Subnets** | This field allows you to restrict web admin access only from defined IP subnets.<br>• **Any** - Allow web admin accesses to be from anywhere, without IP address restriction.<br>• **Allow access from the following IP subnets only** - Restrict web admin access only from the defined IP subnets. When this is chosen, a text input area will be displayed beneath: |

| | |
|---|---|
| | The allowed IP subnet addresses should be entered into this text area. Each IP subnet must be in form of *w.x.y.z/m*, where *w.x.y.z* is an IP address (e.g., *192.168.0.0*), and *m* is the subnet mask in CIDR format, which is between 0 and 32 inclusively (For example, *192.168.0.0/24*).<br>To define multiple subnets, separate each IP subnet one in a line. For example:<br>• 192.168.0.0/24<br>• 10.8.0.0/16 |
| **Allowed WAN IP Address(es)** | This is to choose which WAN IP address(es) the web server should listen on. |

### 11.1.2 Firmware

Upgrading firmware can be done in one of three ways.
Using the router's interface to automatically check for an update, using the router's interface to manually upgrade the firmware, or using InControl2 to push an upgrade to a router.

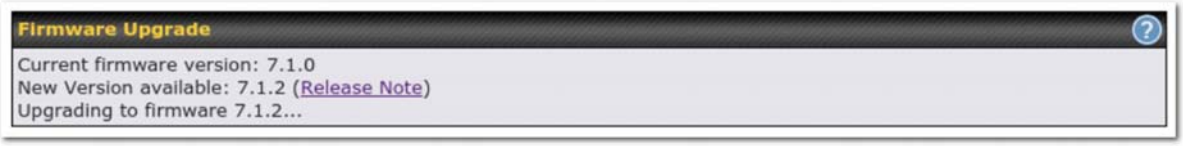
The automatic upgrade can be done from **System** > **Firmware**.


If an update is found the buttons will change to allow you to **Download and Update** the firmware.

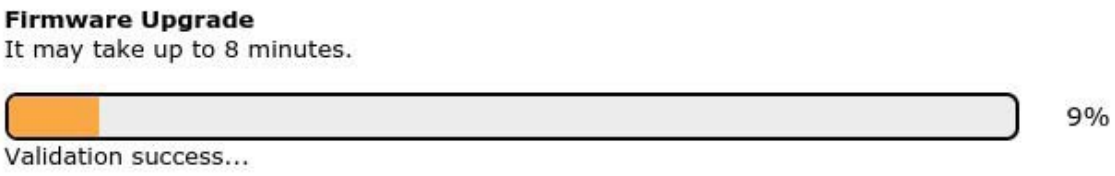

Click on the **Download and Upgrade** button. A prompt will be displayed advising to download the Current Active Configuration. Please click on the underlined download text. After downloading the current config click the **Ok** button to start the upgrade process.

The router will download and then apply the firmware. The time that this process takes will depend on your internet connection's speed.




The firmware will now be applied to the router*. The amount of time it takes for the firmware to upgrade will also depend on the router that's being upgraded.




***Upgrading the firmware will cause the router to reboot.**

### Web admin interface : install updates manually

In some cases, a special build may be provided via a ticket or it may be found in the forum. Upgrading to the special build can be done using this method, or using IC2 if you are using that to manage your firmware upgrades. A manual upgrade using the GA firmware posted on the site may also be recommended or required for a couple of reasons.

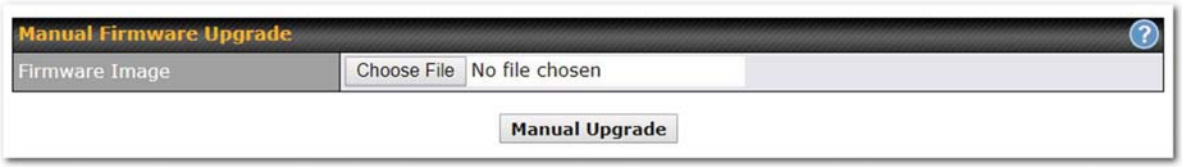
All of the Peplink/Pepwave GA firmware can be found here Navigate to the relevant product line (ie. Balance, Max, FusionHub, SOHO, etc). Some product lines may have a dropdown that lists all of the products in that product line. Here is a screenshot from the Balance line.


If the device has more than one firmware version the current hardware revision will be required to know what firmware to download.

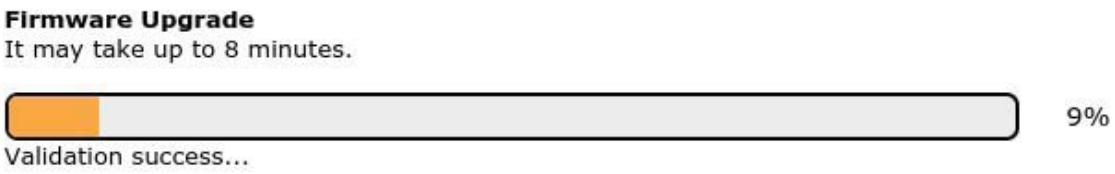
Navigate to System > Firmware and click the Choose File button under the Manual Firmware Upgrade section. Navigate to the location that the firmware was downloaded to select the ".img" file and click the Open button.

Click on the Manual Upgrade button to start the upgrade process.




A prompt will be displayed advising to download the Current Active Configuration. Please click on the underlined download text. After downloading the current config click the Ok button to start the upgrade process. The firmware will now be applied to the router*. The amount of time it takes for the firmware to upgrade will depend on the router that's being upgraded.




***Upgrading the firmware will cause the router to reboot.**

### The InControl method

Described in this knowledgebase article on our forum.

### 11.1.3 Time

The time server functionality enables the system clock of the Peplink Balance to be synchronized with a specified time server. The settings for time server configuration are located at **System>Time**.


| Time Settings | |
|---|---|
| **Time Zone** | This specifies the time zone (along with the corresponding Daylight Savings Time scheme) in which Peplink Balance operates. The **Time Zone** value affects the time stamps in the event log of the Peplink Balance and e-mail notifications. Check **Show all** to show all time zone options. |

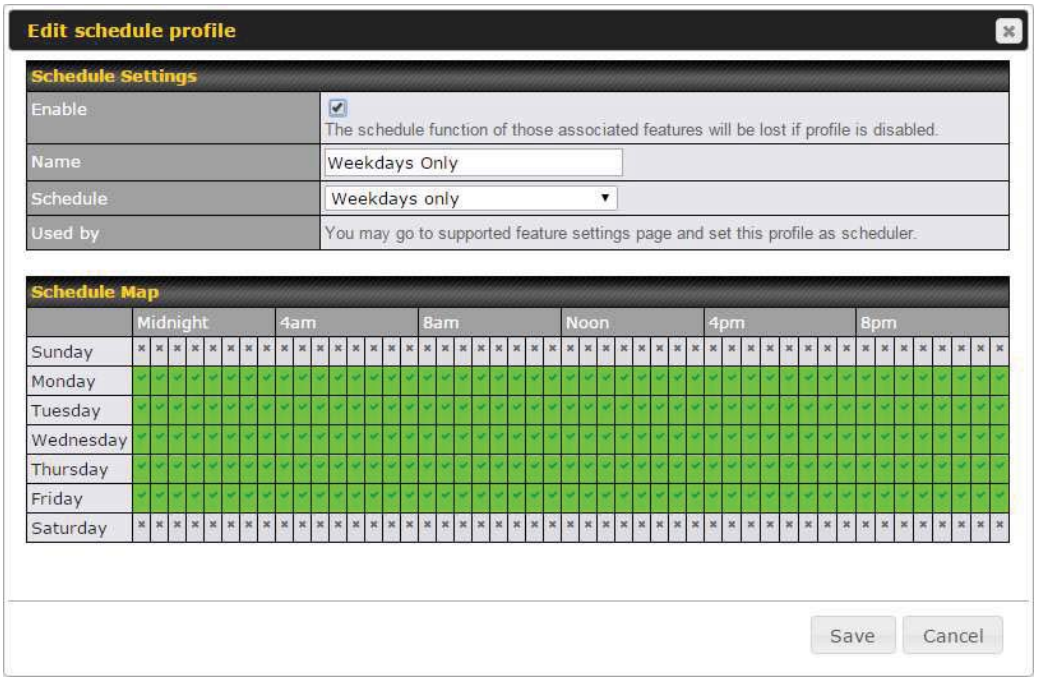
 

| | |
|---|---|
| **Time Server** | This setting specifies the NTP network time server to be utilized by the Peplink Balance. |

### 11.1.4 Schedule

Enable and disable different functions (such as WAN connections, outbound policy, and firewalls at different times, based on a user-scheduled configuration profile. The settings for this are located at **System > Schedule**


Enable scheduling, and then click on your schedule name or on the **New Schedule** button to begin.



| Edit Schedule Profile | |
|---|---|
| **Enabling** | Click this checkbox to enable this schedule profile. Note that if this is disabled, then any associated features will also have their scheduling disabled. |
| **Name** | Enter your desired name for this particular schedule profile. |
| **Schedule** | Click the drop-down menu to choose pre-defined schedules as your starting point. Please note that upon selection, previous changes on the schedule map will be deleted. |
| **Schedule Map** | Click on the desired times to enable features at that time period. You can hold your mouse for faster entry. |

### 11.1.5 Email Notification

The email notification functionality of the Peplink Balance provides a system administrator with up-to-date information on network status. The settings for configuring email notification are found at **System>Email Notification**.


| Email Notification Settings | |
|---|---|
| **Email Notification** | This setting specifies whether or not to enable email notification. If **Enable** is checked, the Peplink Balance will send email messages to system administrators when the WAN status changes or when new firmware is available. If **Enable** is not checked, email notification is disabled and the Peplink Balance will not send email messages. |
| **SMTP Server** | This setting specifies the SMTP server to be used for sending email. If the server requires |

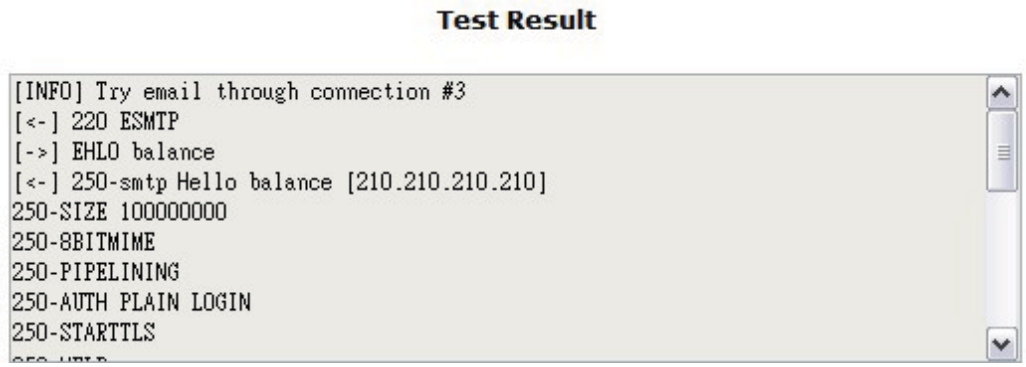
 

| | |
|---|---|
| | authentication, check **Require authentication**. |
| **SSL Encryption** | Check the box to enable SMTPS. When the box is checked, **SMTP Port** will be changed to **465** automatically. |
| **SMTP Port** | This field is for specifying the SMTP port number. By default, this is set to **25**; when **SSL Encryption** is checked, the default port number will be set to **465**. You may customize the port number by editing this field. Click **Default** to restore the number to its default setting. |
| **SMTP User Name / Password** | This setting specifies the SMTP username and password while sending email. These options are shown only if **Require authentication** is checked in the **SMTP Server** setting. |
| **Confirm SMTP Password** | This field allows you to verify and confirm the new administrator password. |
| **Sender's Email Address** | This setting specifies the email address which the Peplink Balance will use to send its reports. |
| **Recipient's Email Address** | This setting specifies the email address(es) to which the Peplink Balance will send email notifications. For multiple recipients, separate each email using the enter key. |

After you have finsihed setting up email notifications, you can click the **Test Email Notification** button to test the settings before saving. After **Test Email Notification** is clicked, you will see this screen to confirm the settings:


Click **Send Test Notification** to confirm. In a few seconds, you will see a message with detailed test results.




### 11.1.6 Event Log

Event log functionality enables event logging at a specified remote syslog server. The settings for configuring the remote system log can be found at **System>Event Log**.

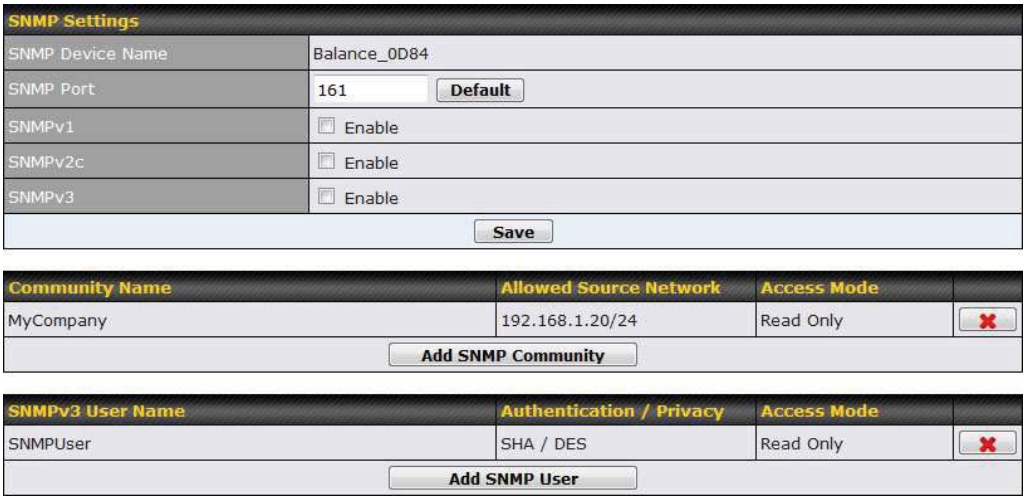

| Remote Syslog Settings | |
|---|---|
| **Remote Syslog** | This setting specifies whether or not to log events at the specified remote syslog server. |
| **Remote Syslog Host** | This setting specifies the IP address or hostname of the remote syslog server. |
| **Push Events** | The Peplink Balance can also send push notifications to mobile devices that have our Mobile Router Utility installed. Check the box to activate this feature. |
| peplink PEPWAVE | For more information on the Router Utility, go to: www.peplink.com/products/router-utility |

### 11.1.7 SNMP

SNMP or simple network management protocol is an open standard that can be used to collect

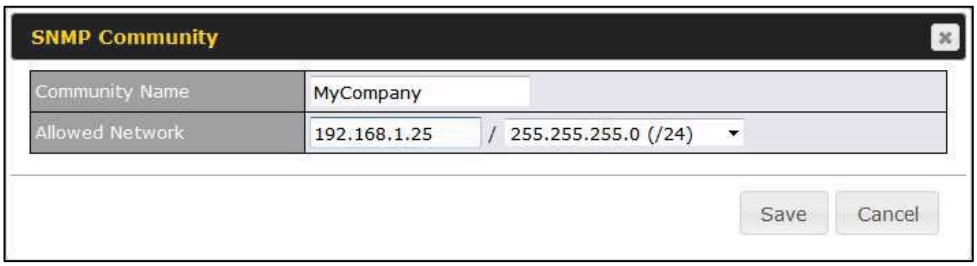
information about the Peplink Balance unit. SNMP configuration is located at **System>SNMP**.




| SNMP Settings | |
|---|---|
| **SNMP Device Name** | This field shows the router name defined at **System>Admin Security**. |
| **SNMP Port** | This option specifies the port which SNMP will use. The default port is **161**. |
| **SNMPv1** | This option allows you to enable SNMP version 1. |
| **SNMPv2** | This option allows you to enable SNMP version 2. |
| **SNMPv3** | This option allows you to enable SNMP version 3. |

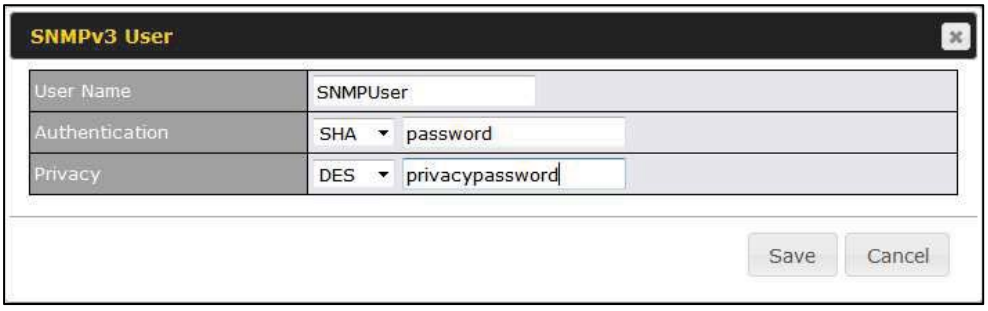
 

To add a community for either SNMPv1 or SNMPv2, click the **Add SNMP Community** button in the **Community Name** table, upon which the following screen is displayed:




| SNMP Community Settings | |
|---|---|
| **Community Name** | This setting specifies the SNMP community name. |
| **Allowed Source Subnet Address** | This setting specifies a subnet from which access to the SNMP server is allowed. Enter subnet address here (e.g., *192.168.1.0*) and select the appropriate subnet mask. |

To define a user name for SNMPv3, click **Add SNMP User** in the **SNMPv3 User Name** table, upon which the following screen is displayed:

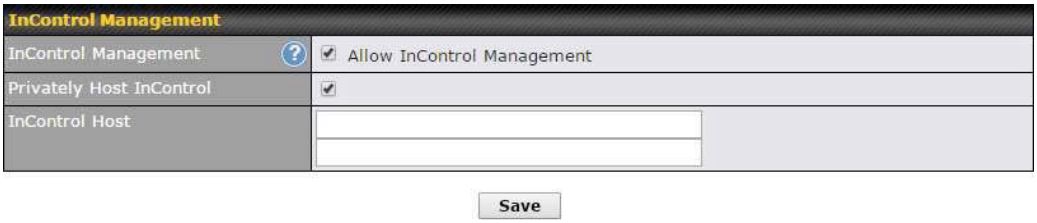



| SNMPv3 User Settings | |
|---|---|
| **User Name** | This setting specifies a user name to be used in SNMPv3. |
| **Authentication Protocol** | This setting specifies via a drop-down menu one of the following valid authentication protocols:<br>• NONE<br>• MD5 |

| | |
|---|---|
| | • SHA<br>When MD5 or SHA is selected, an entry field will appear for the password. |
| **Privacy Protocol** | This setting specifies via a drop-down menu one of the following valid privacy protocols:<br>• NONE<br>• DES<br>When DES is selected, an entry field will appear for the password. |

### 11.1.8 InControl




InControl is a cloud-based service which allows you to manage all of your Peplink and Pepwave devices with one unified system. With it, you can generate reports, gather statistics, and configure your devices automatically. All of this is now possible with InControl.

When this check box is checked, the device's status information will be sent to the Peplink InControl system. This device's usage data and configuration will be sent to the system if you enable the features in the system.

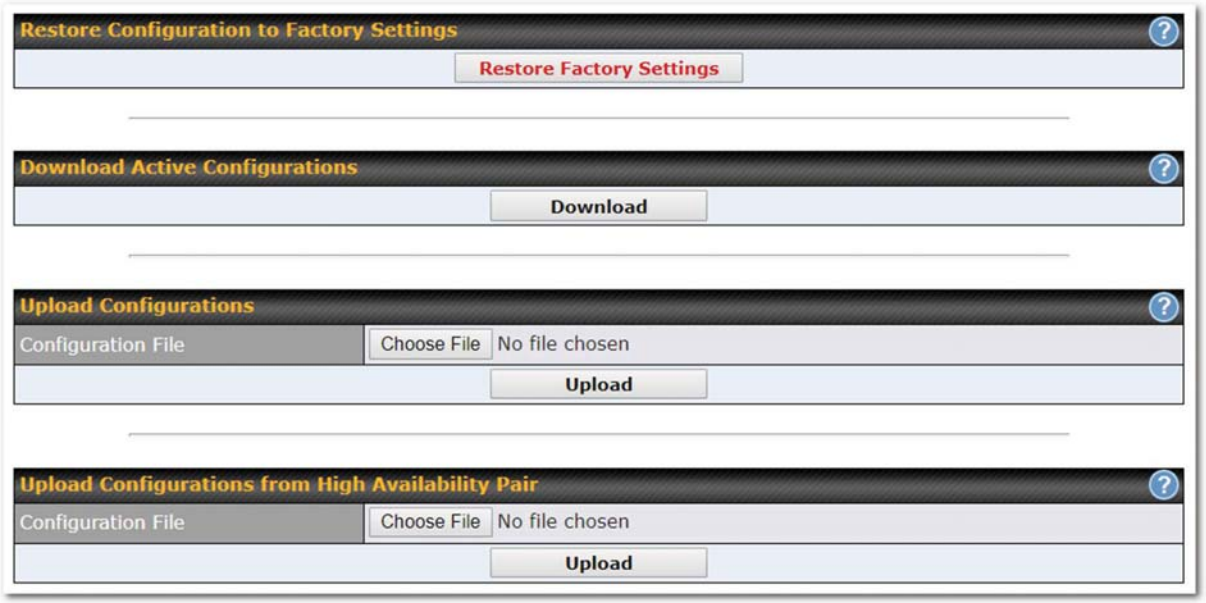
Alternately, you could also privately host InControl. Simply check the box beside the “Privately Host InControl” open, and enter the IP Address of your InControl Host.

You can sign up for an InControl account at https://incontrol2.peplink.com. You can register your devices under the account, monitor their status, see their usage reports, and receive offline notifications.

### 11.1.9 Configuration

Backing up Peplink Balance settings immediately after successful completion of initial setup is strongly recommended. The functionality to download and upload Peplink Balance settings is found at **System>Configuration**.




| Configuration | |
|---|---|
| **Restore Configuration to Factory Settings** | The **Restore Factory Settings** button is to reset the configuration to factory default settings. After clicking the button, you will need to click the **Apply Changes** button on the top right corner to make the settings effective. |
| **Download Active Configurations** | Click **Download** to backup the current active settings. |
| **Upload Configurations** | To restore or change settings based on a configuration file, click **Choose File** to locate the configuration file on the local computer, and then click **Upload**. The new settings can then be applied by clicking the **Apply Changes** button on the page header, or you can cancel the procedure by pressing **discard** on the main page of the web admin interface. |

| | |
|---|---|
| **Upload Configurations from High Availability Pair** | In a high availability (HA) configuration, the Balance unit can quickly load the configuration of its HA counterpart. To do so, click the **Upload** button. After loading the settings, configure the LAN IP address of the Peplink Balance unit so that it is different from the HA counterpart. |

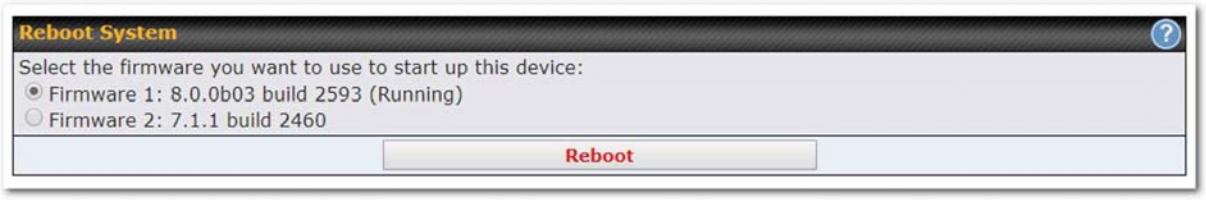
### 11.1.10 Feature Add-ons

Some balance models have features that can be activated upon purchase. Once the purchase is complete, you will receive an activation key. Enter the key in the **Activation Key** field, click **Activate**, and then click **Apply Changes**.


### 11.1.11 Reboot

This page provides a reboot button for restarting the system. For maximum reliability, the Peplink Balance Series can equip with two copies of firmware, and each copy can be a different version. You can select the firmware version you would like to reboot the device with. The firmware marked with **(Running)** is the current system boot up firmware.

**Please note that a firmware upgrade will always replace the inactive firmware partition.**

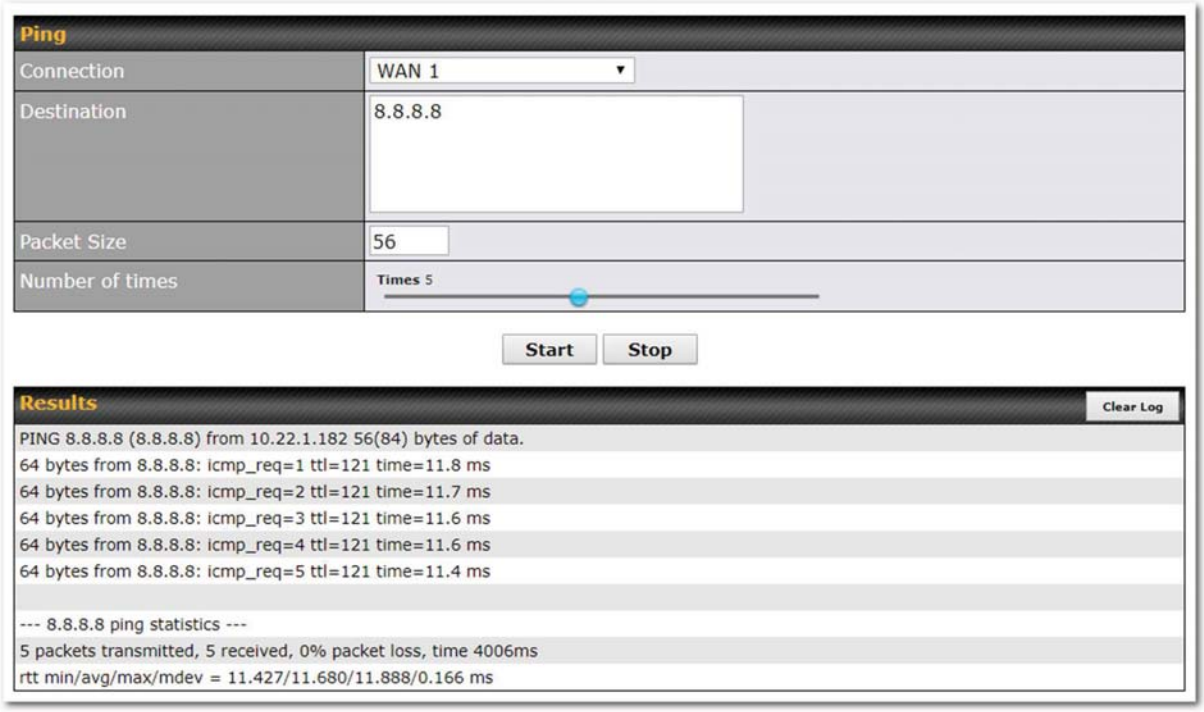


## 11.2 Tools

### 11.3 Ping

The ping test tool sends pings through a specific Ethernet interface or a SpeedFusion™ VPN connection. You can specify the number of pings in the field **Number of times** to a maximum number of 10 times. **Packet Size** can be set to a maximum of 1472 bytes. The ping utility is located at **System>Tools>Ping,** illustrated below:



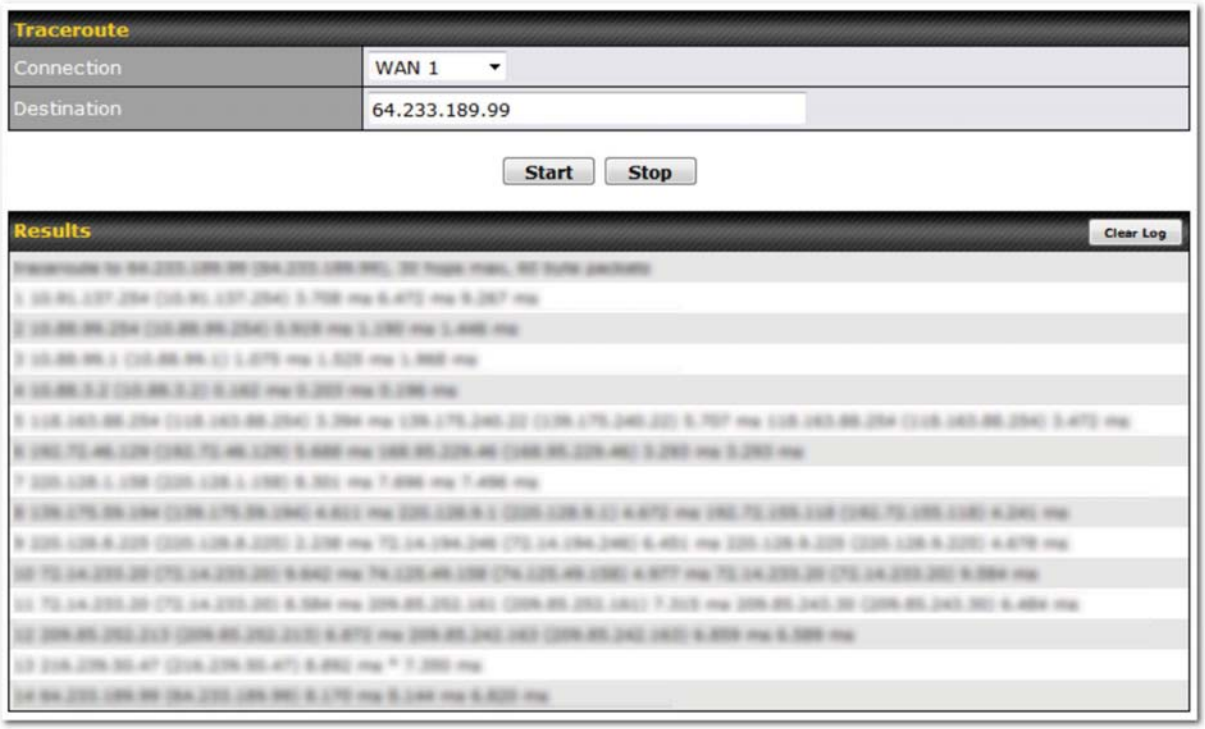

**Tip**

A system administrator can use the ping utility to manually check the connectivity of a particular LAN/WAN connection.

### 11.4 Traceroute

The traceroute test tool traces the routing path to the destination through a particular Ethernet interface or a SpeedFusion™ connection. The traceroute test utility is located at **System>Tools>Traceroute**.

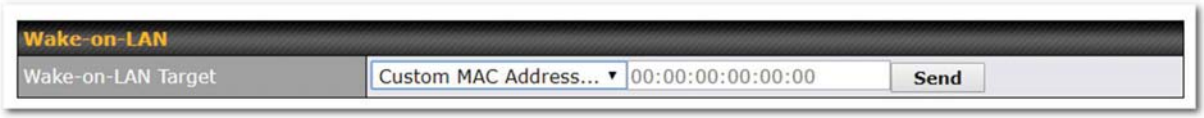



**Tip**

A system administrator can use the traceroute utility to analyze the connection path of a LAN/WAN connection.

## 11.5 Wake-on-LAN

Peplink routers can send special “magic packets” to any client specified from the Web UI. To access this feature, navigate to **System > Tools > Wake-on-LAN**



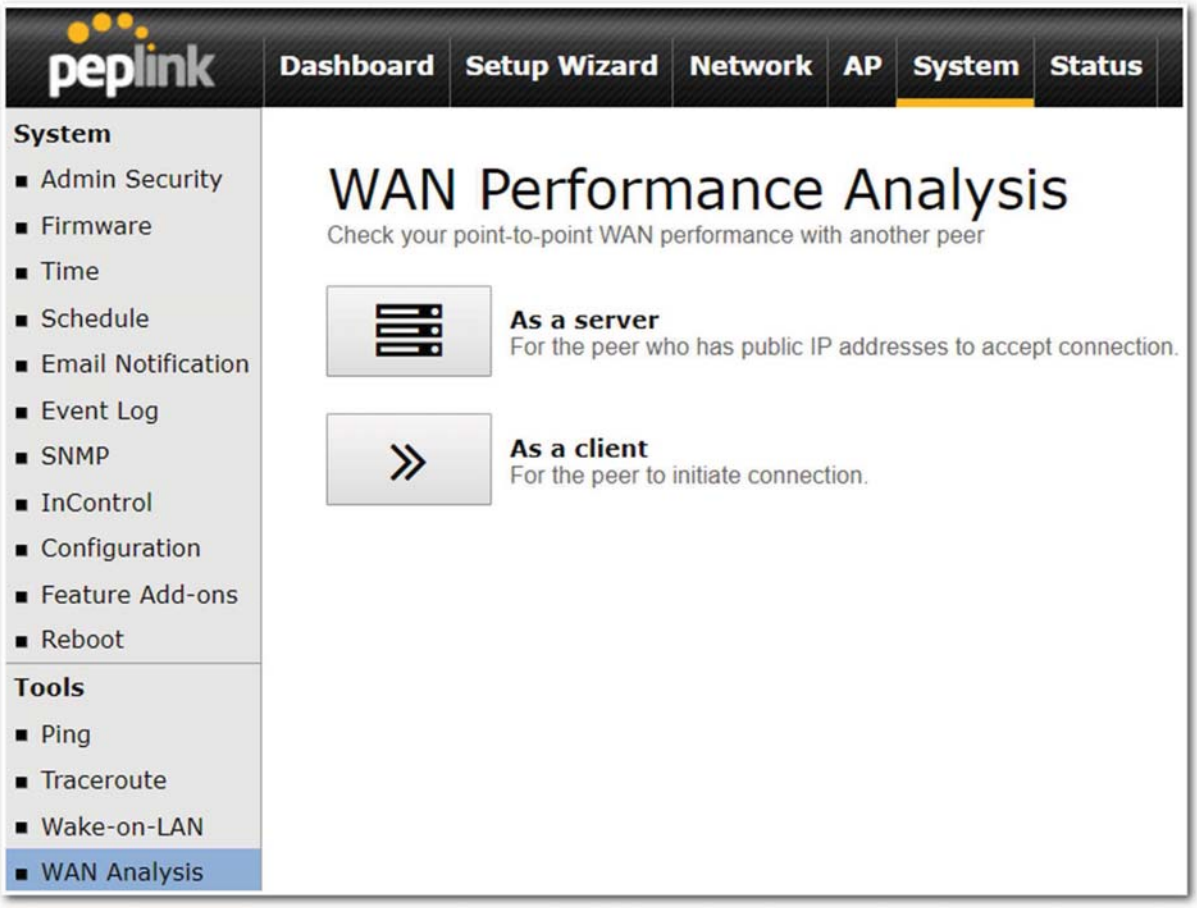

Select a client from the drop-down list and click **Send** to send a “magic packet”

## 11.6 WAN Analysis

The WAN Analysis feature allows you to run a WAN to WAN speedtest between 2 Peplink devices .

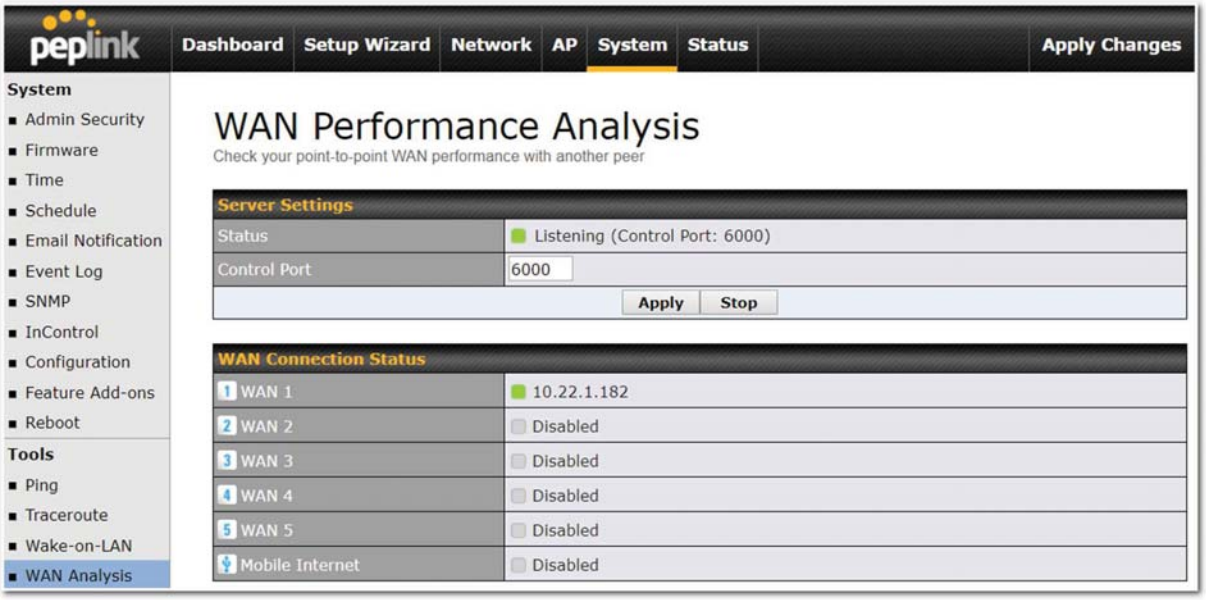
 

Youcan set a device up as a **Server** or a **Client**. One device must be set up as a server to run the speed tests and the server must have a public IP address. T



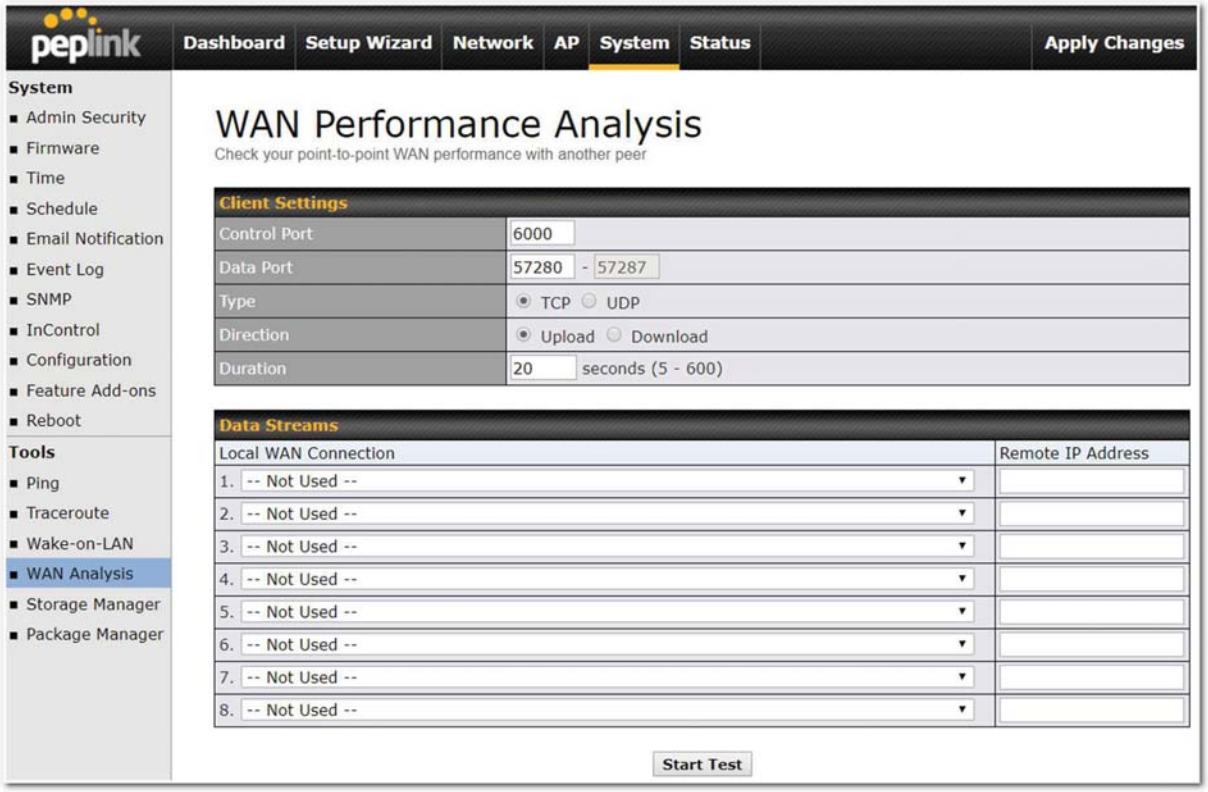

The default port is 6000 and can be changed if required. The IP address of the WAN interface will be shown in the **WAN Connection Status** section.



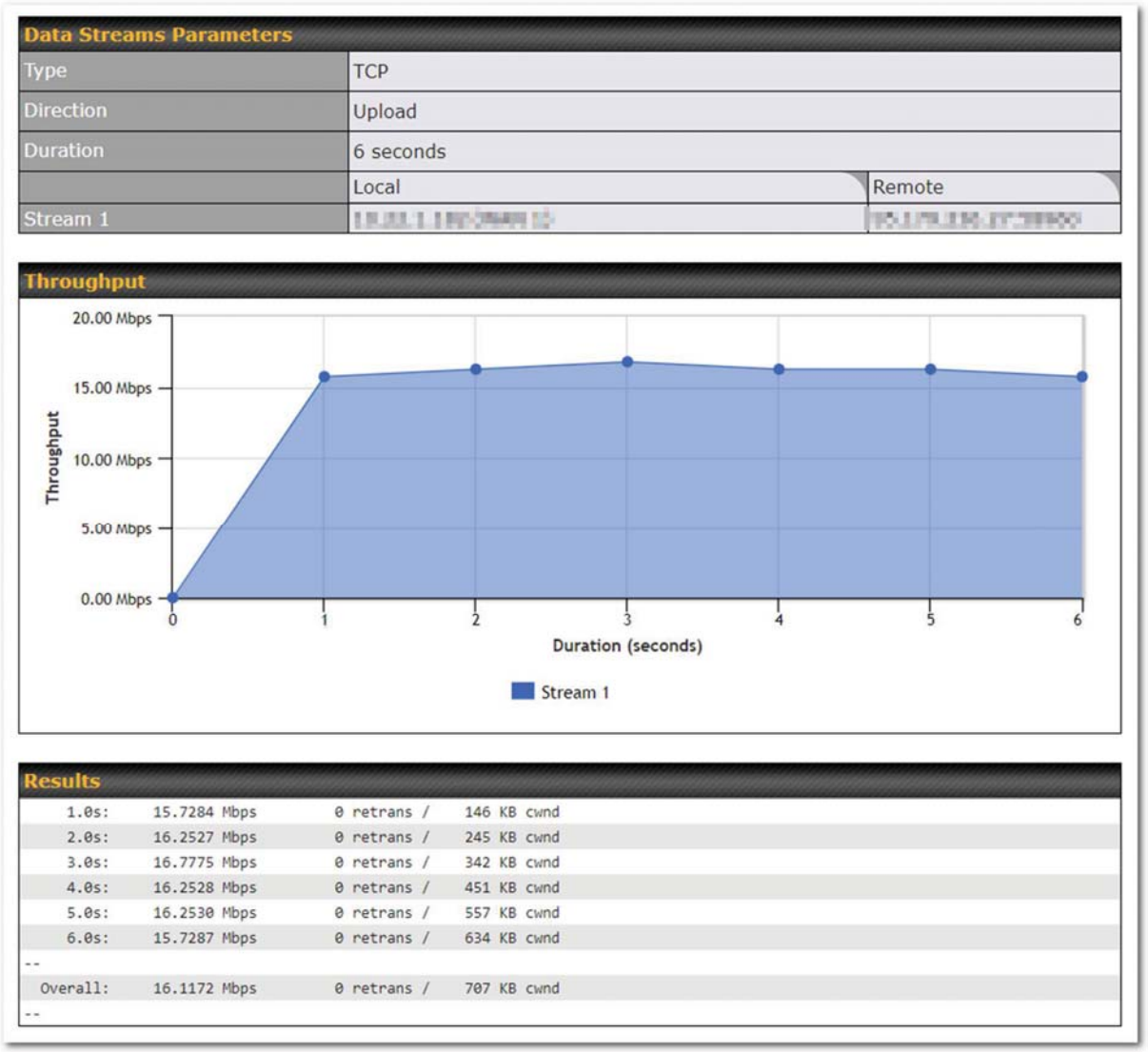

The client side has a few more settings that can be changed. Make sure that the **Control Port** matches what's been entered on the server side. Select the WAN(s) that will be used for testing and enter the Servers WAN IP address. Once all of the options have been set, click the **Start Test** button.




The test output will show the **Data Streams Parameters**, the **Throughput** as a graph, and the **Results**.




The test can be run again once it's complete by clicking the **Start** button or you can click **Close** and change the parameters for the test.

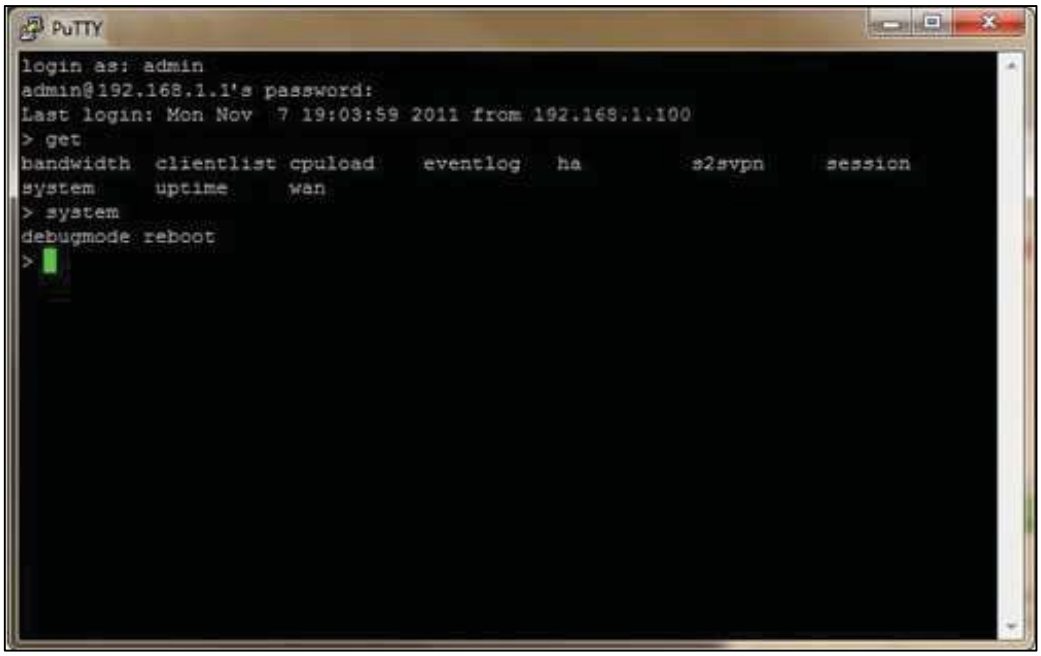
## 11.7 CLI (Command Line) Support

The serial console connector on some Peplink Balance units is RJ-45. To access the serial console port, prepare a RJ-45 to DB-9 console cable. Connect the RJ-45 end to the unit's console port and the DB-9 end to a terminal's serial port. The port setting will

be *115200,8N1*.

The serial console connector on other Peplink Balance units is a DB-9 male connector. To access the serial console port, connect a null modem cable with a DB-9 connector on both ends to a terminal with the port setting of *115200,8N1*.




# 12 Status Tab

## 12.1 Status

### 12.1.1 Device

System information is located at **Status>Device**.

| System Information | |
|---|---|
| Router Name | Mediafast |
| Model | Peplink MediaFast 500 |
| Product Code | MFA-500-B |
| Hardware Revision | 2 |
| Serial Number | |
| Firmware | 8.0.0b03 build 2593 |
| PepVPN Version | 8.0.0 |
| Modem Support Version | 1022 (Modem Support List) |
| Host Name | mediafast |
| Uptime | 54 days 23 hours 7 minutes |
| System Time | Wed Apr 17 14:08:23 BST 2019 |
| Content Filtering Database | Download (r20180514) Update |
| Diagnostic Report | Download |
| Remote Assistance | Turn On |

| MAC Address | |
|---|---|
| LAN | 10:56: |
| WAN 1 | 10:56: |
| WAN 2 | 10:56: |
| WAN 3 | 10:56: |
| WAN 4 | 10:56: |
| WAN 5 | 10:56: |

| System Information | |
|---|---|
| **Router Name** | This is the name specified in the **Router Name** field located at **System>Admin Security**. |
| **Model** | This shows the model name and number of this device. |
| **Hardware Revision** | This shows the hardware version of this device. |
| **Serial Number** | This shows the serial number of this device. |
| **Firmware** | This shows the firmware version this device is currently running. |
| **Uptime** | This shows the length of time since the device has been rebooted. |
| **System Time** | This shows the current system time. |
| **Diagnostic Report** | The **Download** link is for exporting a diagnostic report file required for system investigation. |
| **Remote Assistance** | Click **Turn on** to enable remote assistance. |

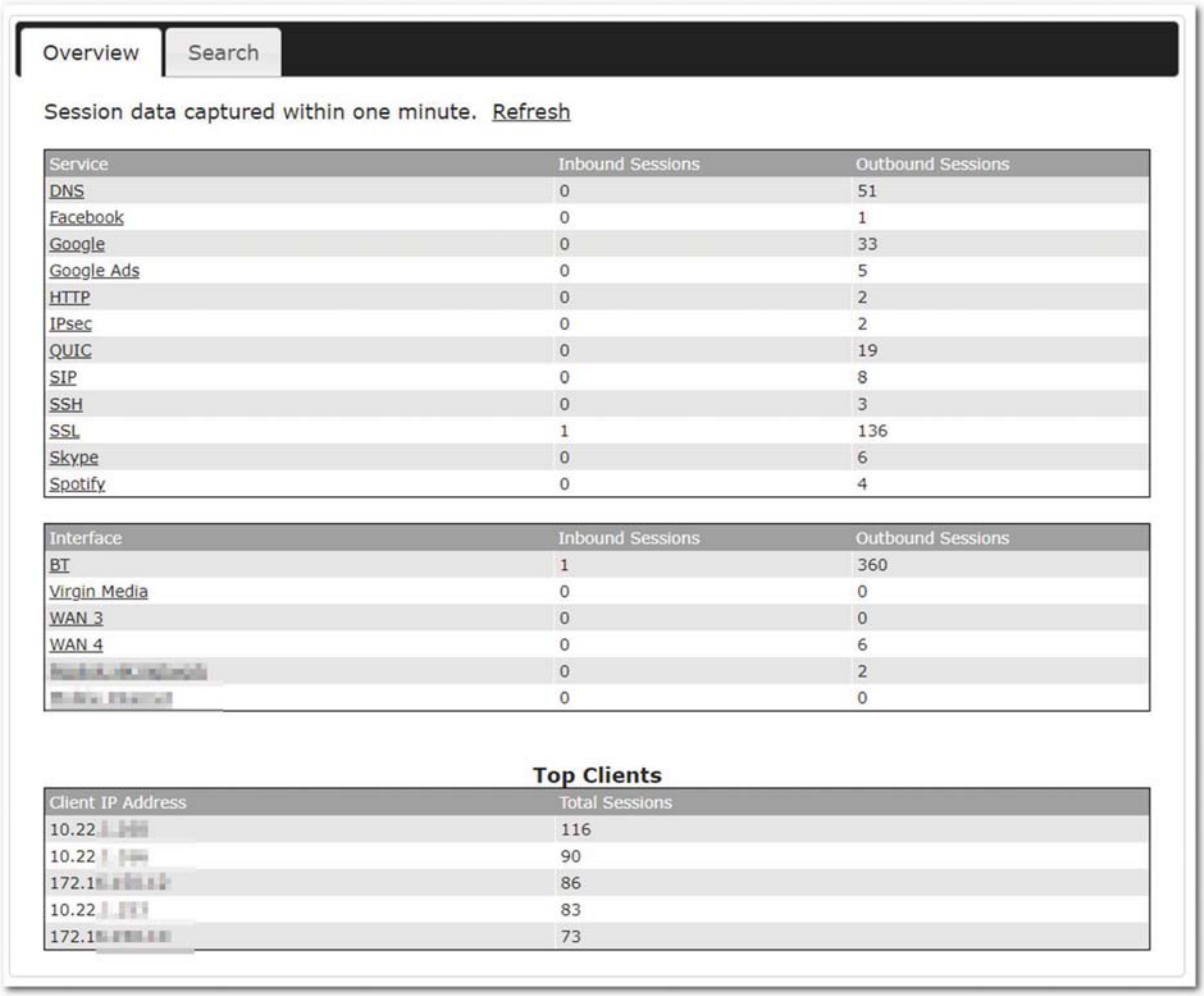
The second table shows the MAC address of each LAN/WAN interface connected.

| Important Note |
|---|
| If you encounter issues and would like to contact the Peplink Support Team (http://www.peplink.com/contact/), please download the diagnostic report file and attach it along with a description of your issue. In Firmware 5.1 or before, the diagnostic report file can be obtained at **System>Reboot**. |

### 12.1.2 Active Sessions

Information on active sessions can be found at **Status>Active Sessions>Overview**.

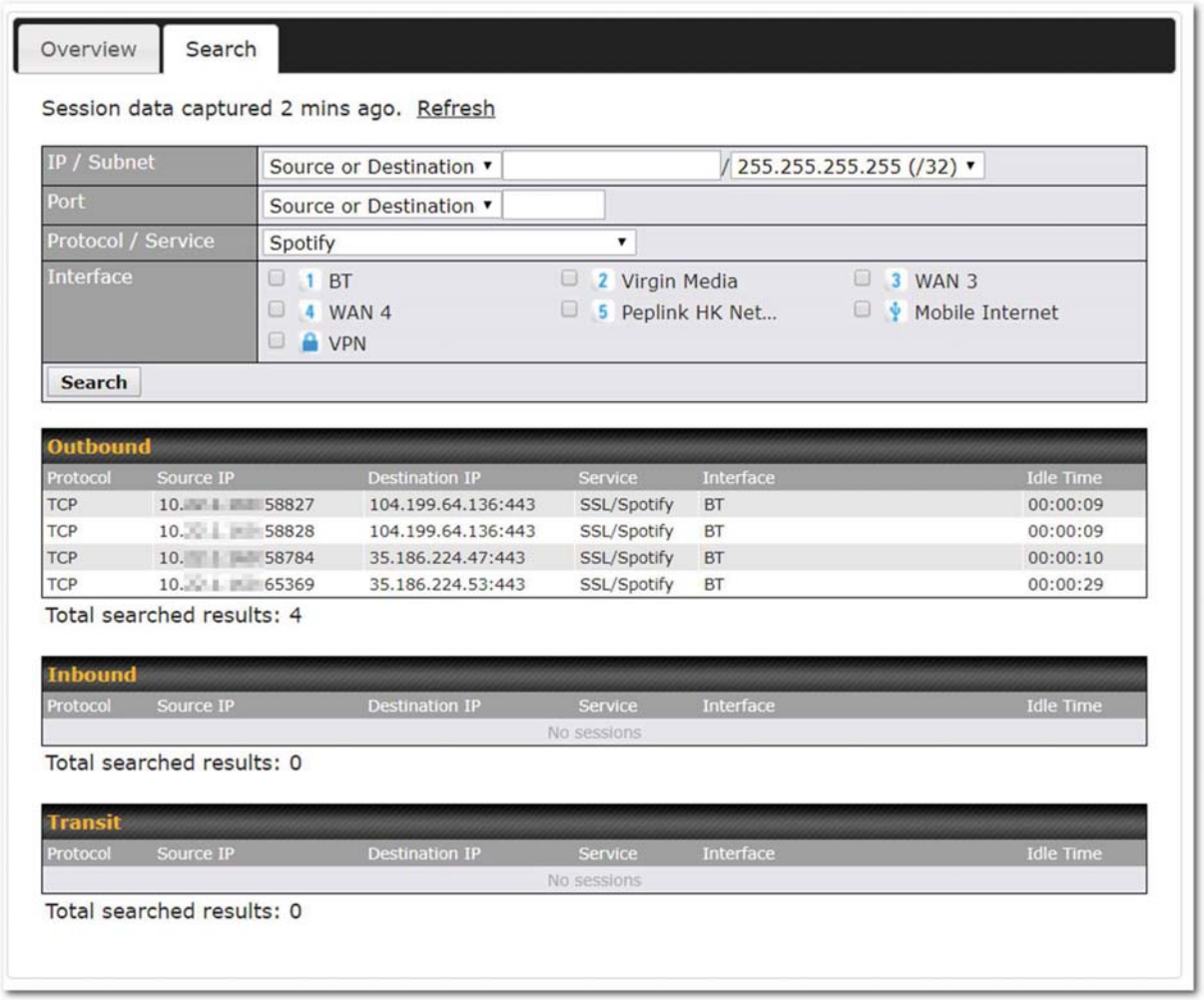
 




This screen displays the number of sessions initiated by each application. Click on each service listing for additional information. This screen also indicates the number of sessions initiated by each WAN port. Finally, you can see which clients are initiating the most sessions.

In addition, you can also perform a filtered search for specific sessions. You can filter by subnet, port, protocol, and interface. To perform a search, navigate to **Status>Active Sessions>Search**.




This **Active Sessions** section displays the active inbound / outbound sessions of each WAN connection on the Peplink Balance. A filter is available to help sort out the active session information. Enter a keyword in the field or check one of the WAN connection boxes for filtering.

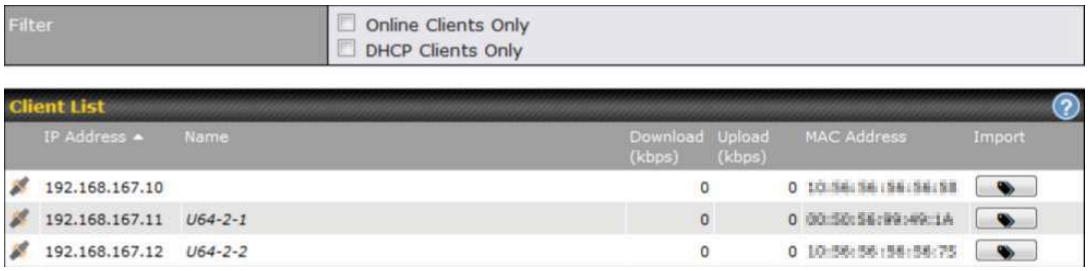
### 12.1.3 Client List

The client list table is located at **Status>Client List**. It lists DHCP and online client IP addresses**,** names (retrieved from the DHCP reservation table or defined by users),

current download and upload rate, and MAC address.

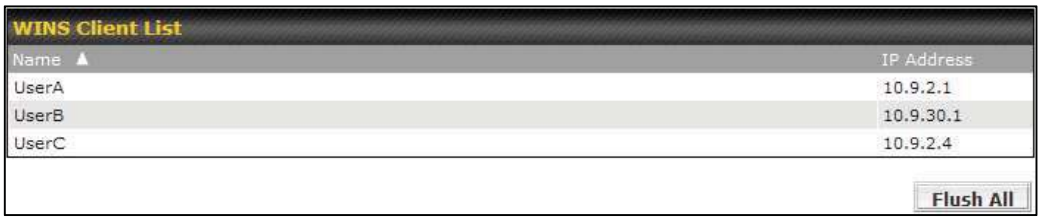
Clients can be imported into the DHCP reservation table by clicking the button on the right. Further update the record after the import by going to **Network>LAN**.




If the PPTP server SpeedFusion™, or AP controller is enabled, you may see the corresponding connection name listed in the **Name** field.

### 12.1.4 WINS Clients

The WINS client list table is located at **Status>WINS Client**.




The WINS client table lists the IP addresses and names of WINS clients. This option will only be available when you have enabled the WINS server The names of clients retrieved will be automatically matched into the Client List (see previous section). Click **Flush All** to flush all WINS client records.

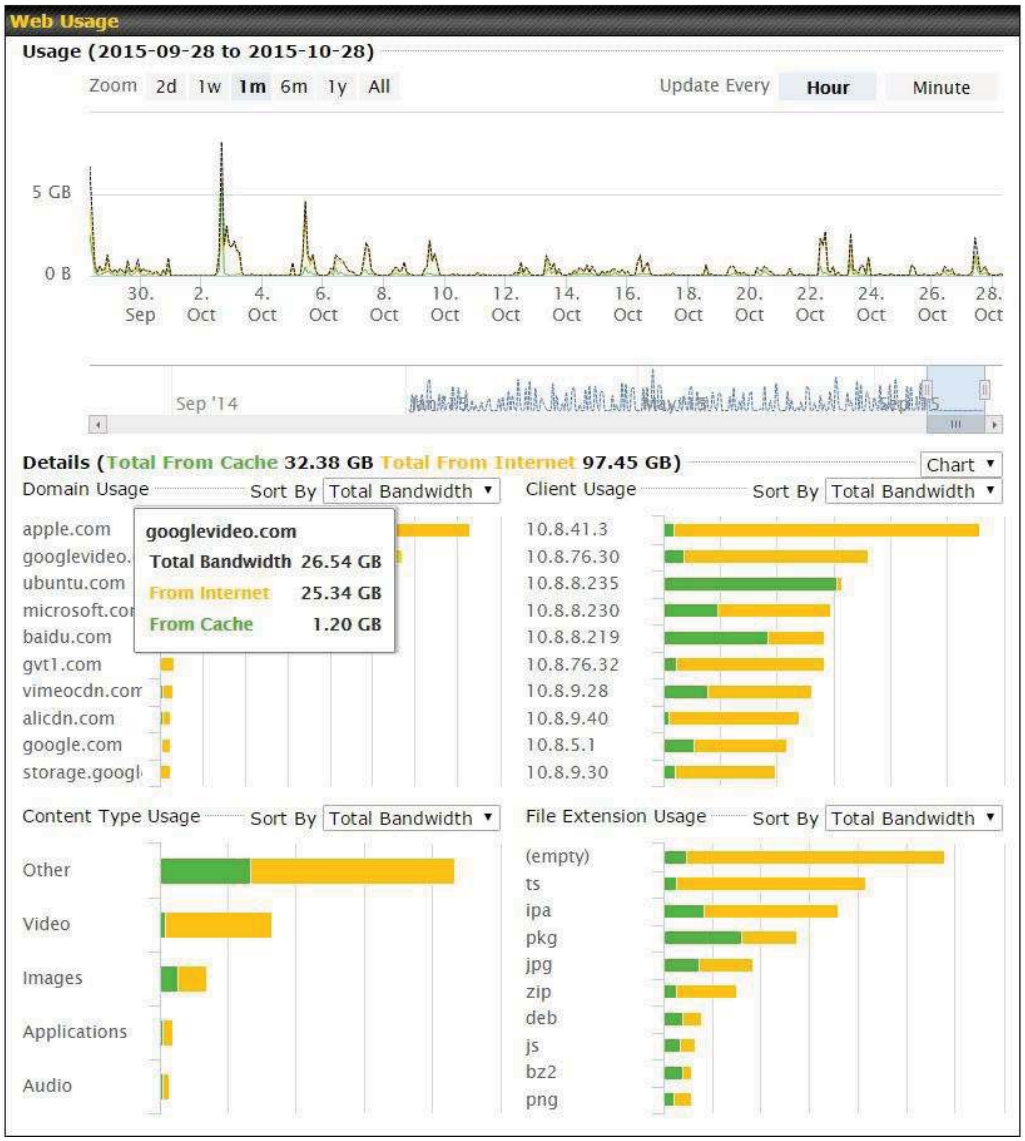
### 12.1.5 OSPF & RIPv2

Information on OSPF and RIPv2 routing setup can be found at **Status>OSPF & RIPv2**.

### 12.1.6 MediaFast

To get details on storage and bandwidth usage, select **Status>MediaFast**.

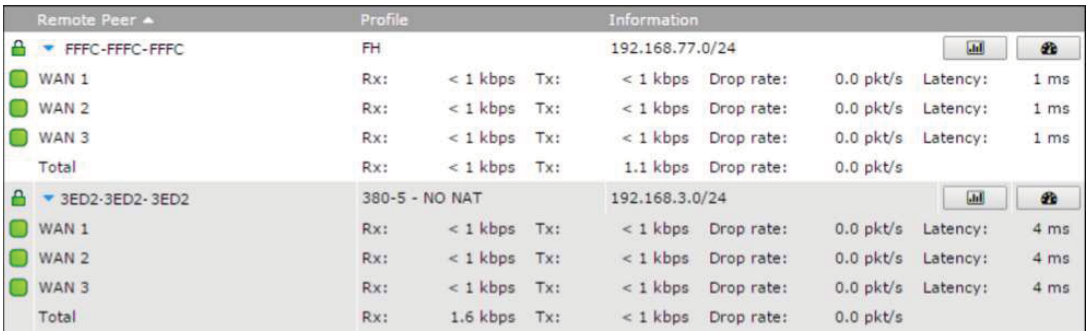



### 12.1.7 SpeedFusion Status

Current SpeedFusion™ status information is located at **Status>SpeedFusion™**. Details about SpeedFusion™ connection peers appears as below:

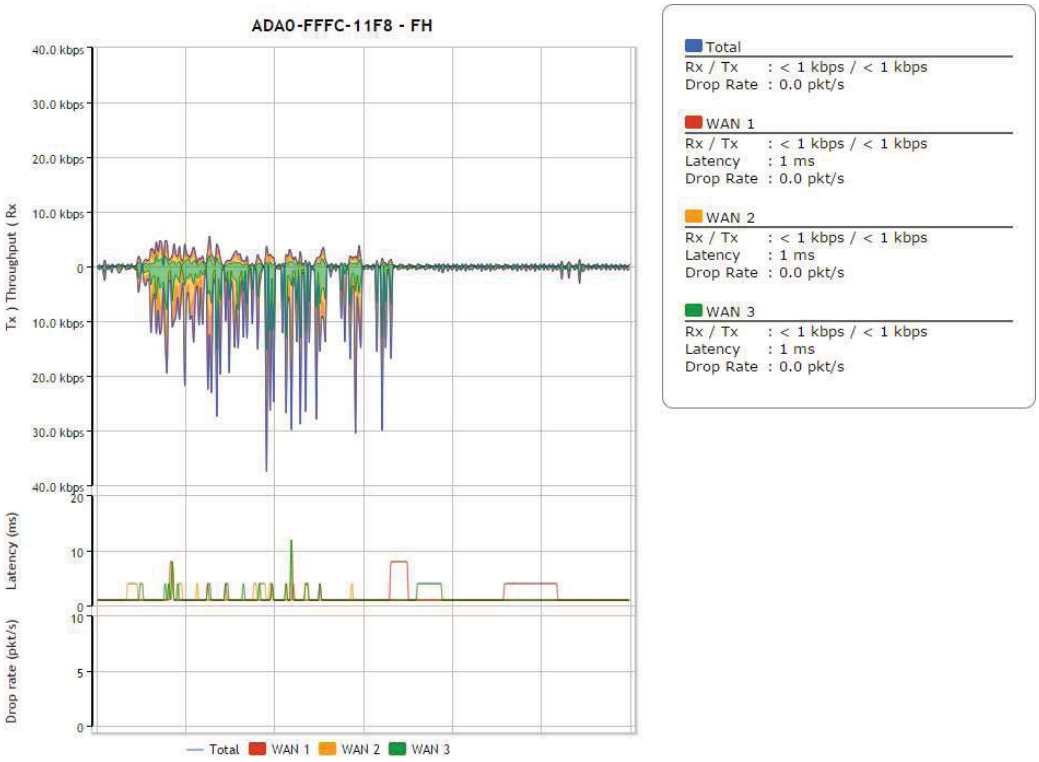
 


Click on the corresponding peer name to explore the WAN connection(s) status and subnet information of each VPN peer.



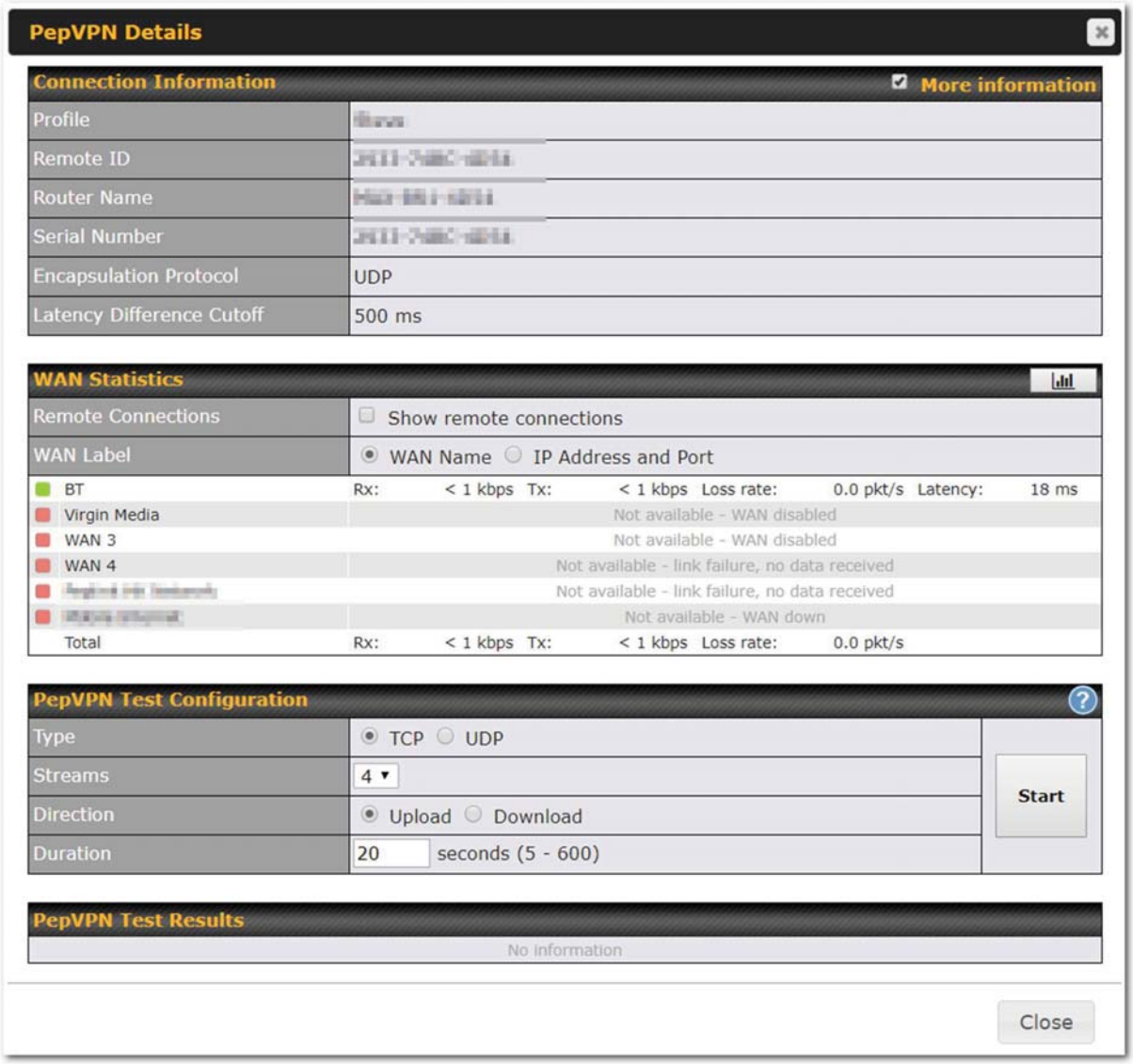

Click the  button for a chart displaying real-time throughput, latency, and drop-rate information for each WAN connection.




When pressing the  button, the following menu will appear:




The **connection information** shows the details of the selected PepVPN profile, consisting of the Profile name, **Router ID**, **Router Name** and **Serial Number** of the remote router

Advanced features for the PepVPN profile will also be shown when the **More Information** checkbox is selected.

The **WAN statistics** show information about the local and remote WAN connections (when **show**

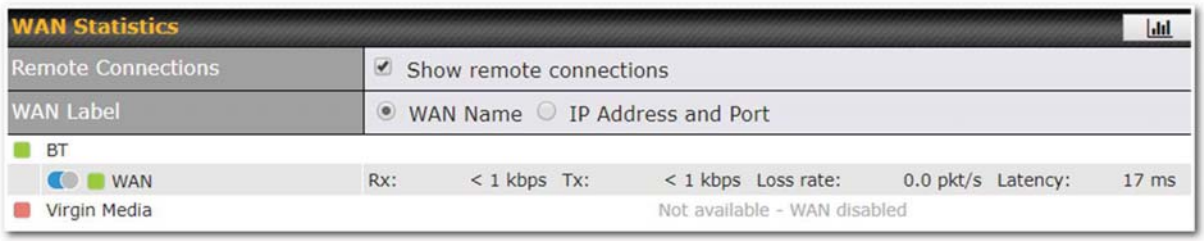
**Remote connections**) is selected.

The available details are **WAN Name, IP address** and **port** used for the Speedfusion connection. **Rx and Tx rates, Loss rate and Latency**.

Connections can be temporarily disabled by sliding the switch button next to a WAN connection to the left.

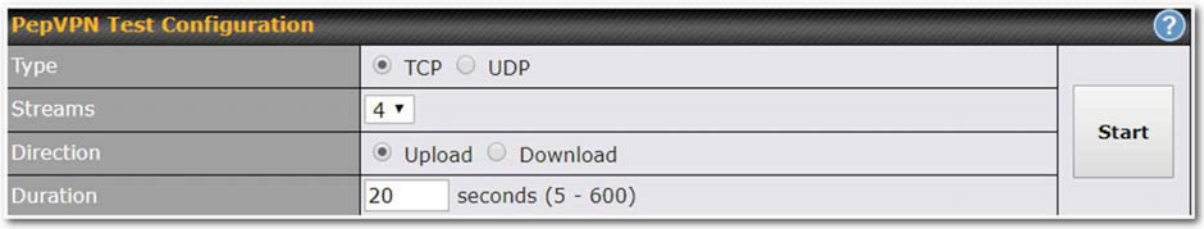
The wan-to-wan connection disabled by the switch is temporary and will be re-enabled after 15 minutes without any action.

This can be used when testing the PepVPN speed between two locations to see if there is interference or network congestion between certain WAN connections.




The PepVPN test configuration allows to configure and perform throughput tests.

THis is usually done after the initial installation of the routers and in case there are problems with aggregation.

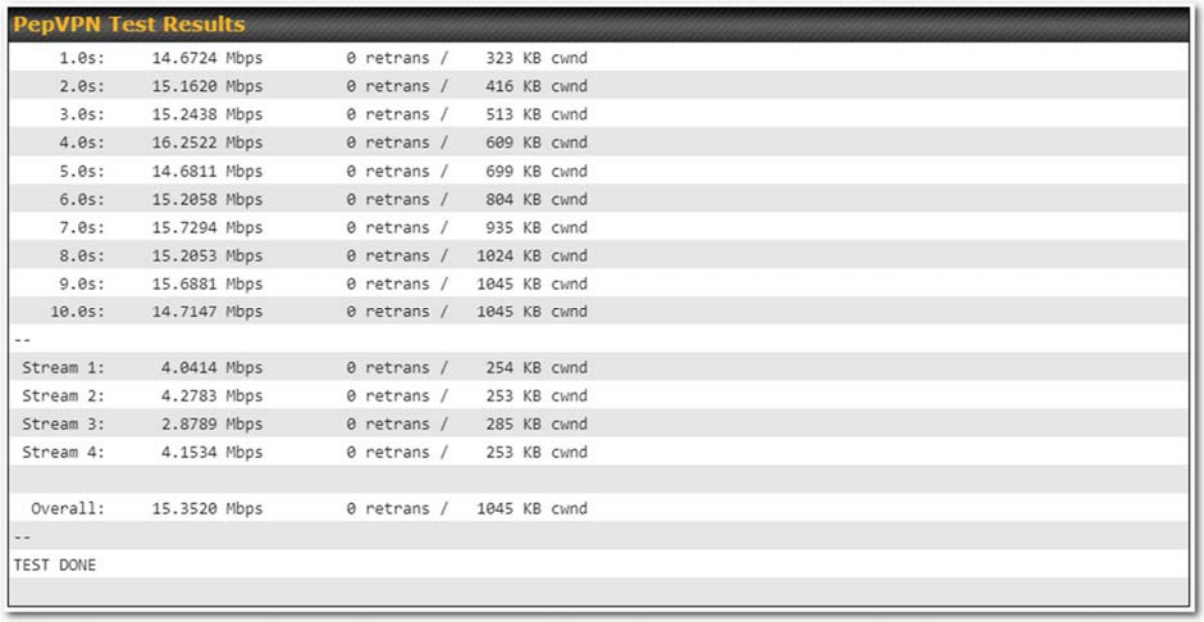



Press the Start button to perform throughput test according to the configured options.

If TCP is selected, 4 parallel streams will be generated to get the optimal results by default. This can be customized by selecting a different value of streams.

Using more streams will typically get better results if the latency of the tunnel is high.



PepVPN Test Results

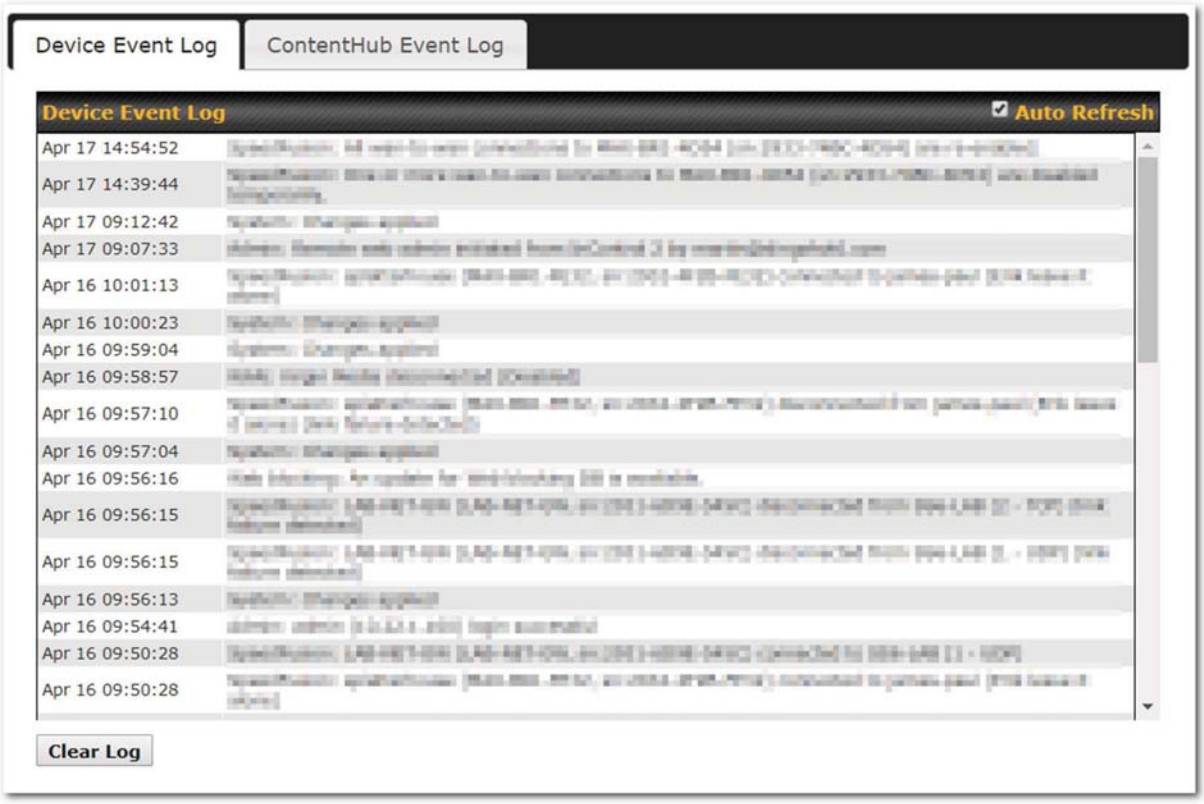
| | | | |
|---|---|---|---|
| 1.0s: | 14.6724 Mbps | 0 retrans / | 323 KB cwnd |
| 2.0s: | 15.1620 Mbps | 0 retrans / | 416 KB cwnd |
| 3.0s: | 15.2438 Mbps | 0 retrans / | 513 KB cwnd |
| 4.0s: | 16.2522 Mbps | 0 retrans / | 609 KB cwnd |
| 5.0s: | 14.6811 Mbps | 0 retrans / | 699 KB cwnd |
| 6.0s: | 15.2058 Mbps | 0 retrans / | 804 KB cwnd |
| 7.0s: | 15.7294 Mbps | 0 retrans / | 935 KB cwnd |
| 8.0s: | 15.2053 Mbps | 0 retrans / | 1024 KB cwnd |
| 9.0s: | 15.6881 Mbps | 0 retrans / | 1045 KB cwnd |
| 10.0s: | 14.7147 Mbps | 0 retrans / | 1045 KB cwnd |
| -- | | | |
| Stream 1: | 4.0414 Mbps | 0 retrans / | 254 KB cwnd |
| Stream 2: | 4.2783 Mbps | 0 retrans / | 253 KB cwnd |
| Stream 3: | 2.8789 Mbps | 0 retrans / | 285 KB cwnd |
| Stream 4: | 4.1534 Mbps | 0 retrans / | 253 KB cwnd |
| | | | |
| Overall: | 15.3520 Mbps | 0 retrans / | 1045 KB cwnd |
| -- | | | |
| TEST DONE | | | |

### 12.1.8 Event Log

Event log information is located at **Status>Event Log**.

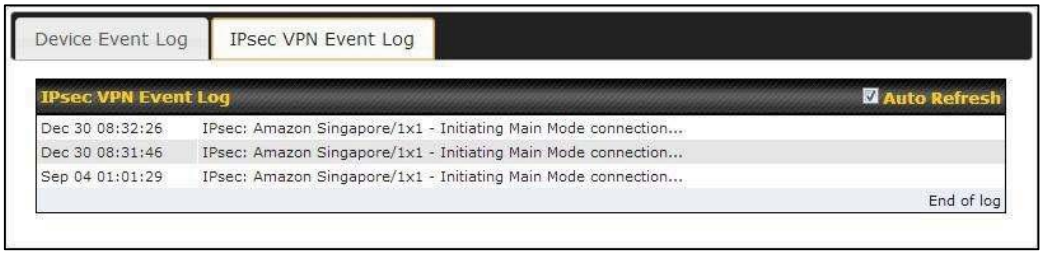
 

### Device Event Log




The log section displays a list of events that have taken place on the Peplink Balance unit. Check **Auto Refresh** to refresh log entries automatically. Click the **Clear Log** button to clear the log.

### IPsec Event Log




This section displays a list of events that have taken place within an IPsec VPN connection. Check the box next to **Auto Refresh** and the log will be refreshed automatically. For an AP event log, navigate to **AP>Info**.

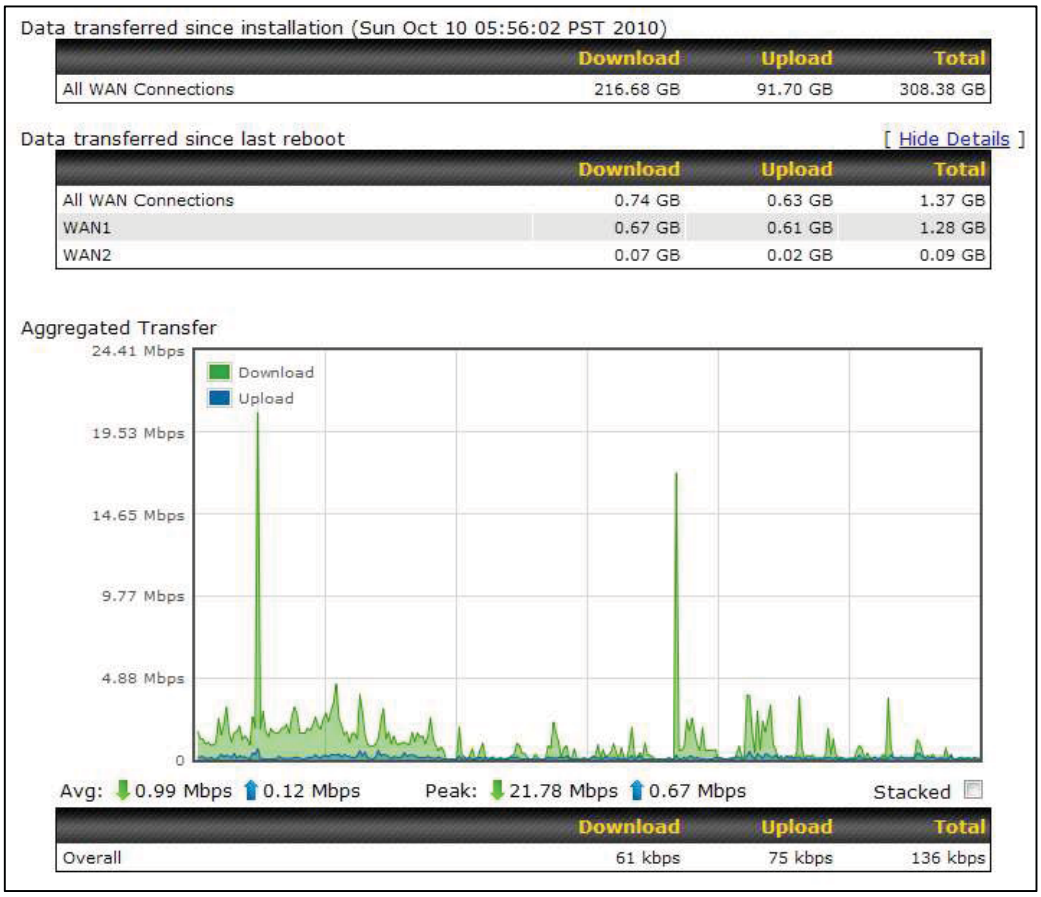
 

## 12.2 Bandwidth

This section shows the bandwidth usage statistics, located at **Status>Bandwidth**. Bandwidth usage at the LAN while the device is switched off (e.g., LAN bypass) is neither recorded nor shown.

### 12.2.1 Real-Time

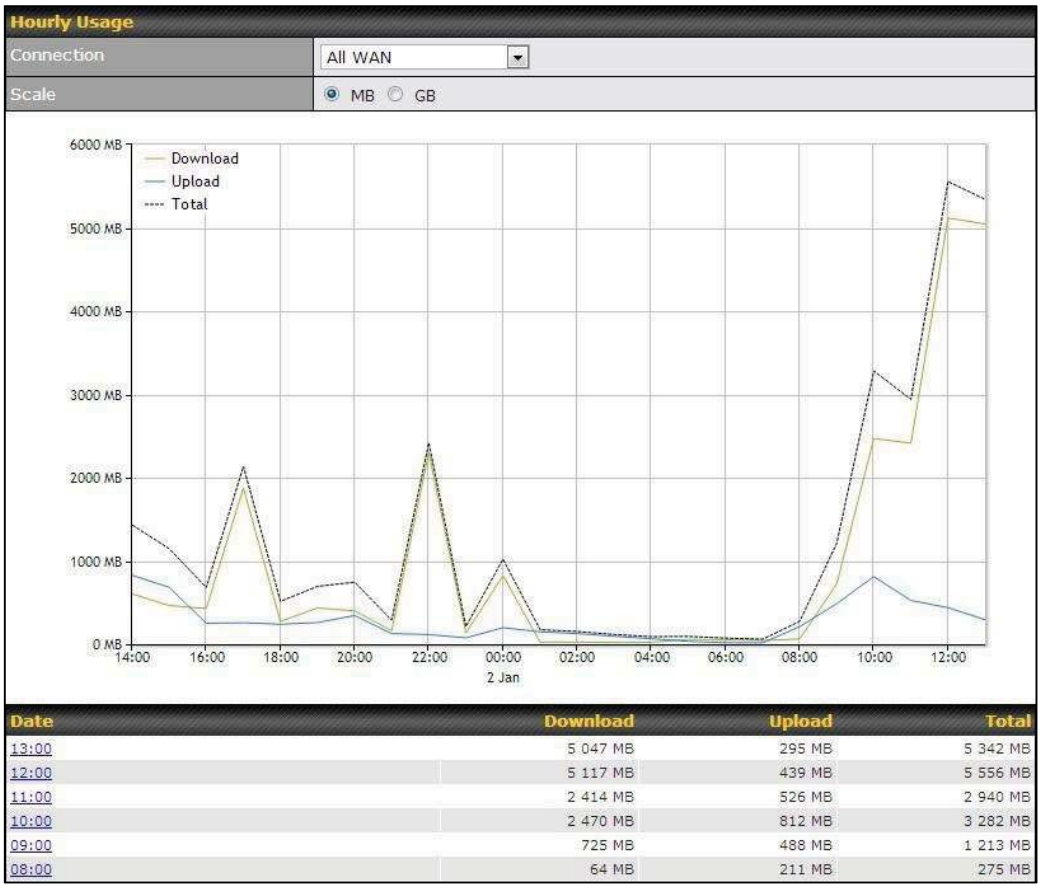
The **Data transferred since installation** table indicates how much network traffic has been processed by the device since the first bootup. The **Data transferred since last reboot** table indicates how much network traffic has been processed by the device since the last bootup.



### 12.2.2 Hourly

This page shows the hourly bandwidth usage for all WAN connections, with the option of viewing each individual connection. Select the desired connection to check from the drop-down menu.




| Date | Download | Upload | Total |
|---|---|---|---|
| 13:00 | 5 047 MB | 295 MB | 5 342 MB |
| 12:00 | 5 117 MB | 439 MB | 5 556 MB |
| 11:00 | 2 414 MB | 526 MB | 2 940 MB |
| 10:00 | 2 470 MB | 812 MB | 3 282 MB |
| 09:00 | 725 MB | 488 MB | 1 213 MB |
| 08:00 | 64 MB | 211 MB | 275 MB |

### 12.2.3 Daily

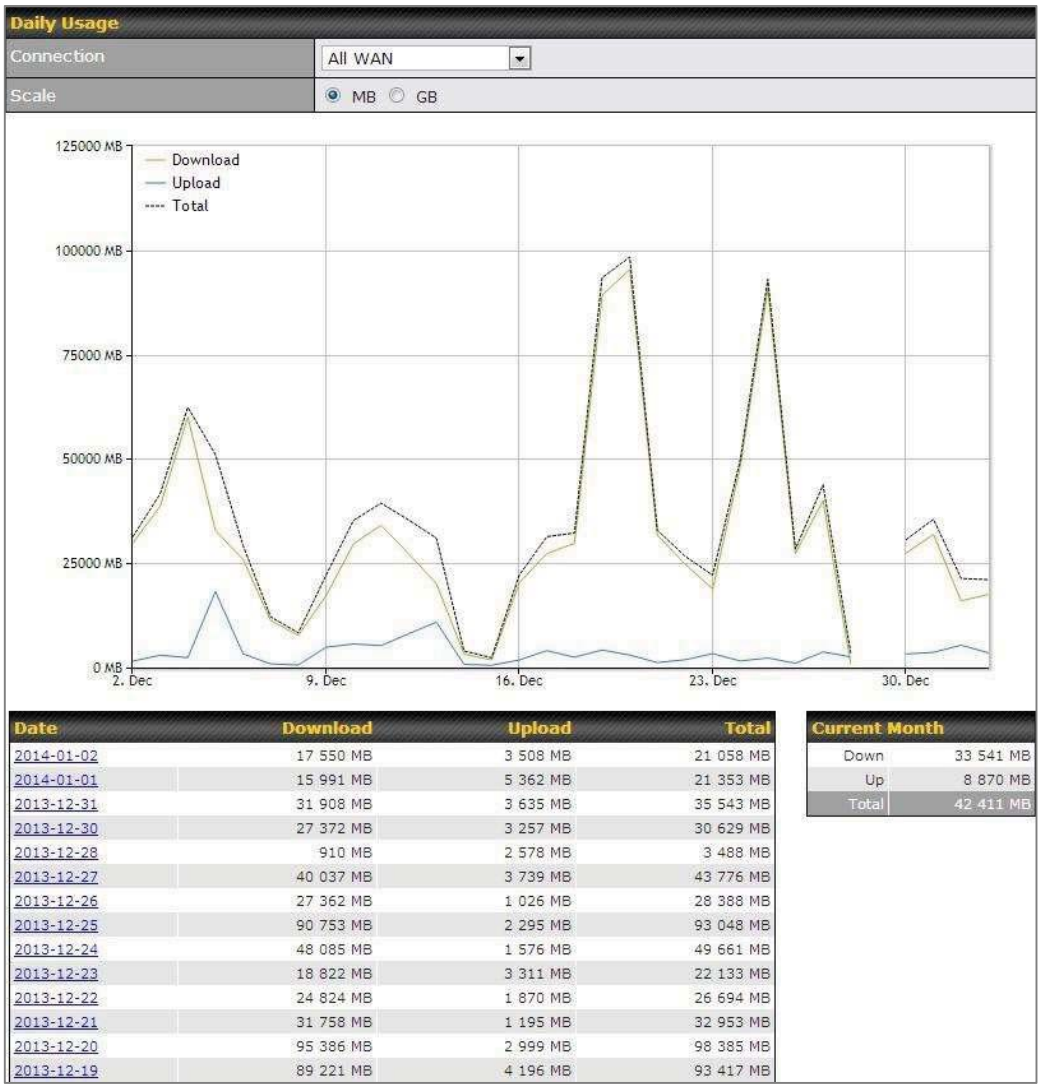
This page shows the daily bandwidth usage for all WAN connections, with the option of viewing each individual connection.

Select the connection to check from the drop-down menu. If you have enabled the **Bandwidth Monitoring** feature as shown in **Section 13.4,** the **Current Billing Cycle** table for that WAN connection will be displayed.

Click on a date to view the client bandwidth usage of that specific date. This feature is not available if you have selected to view the bandwidth usage of only a particular WAN connection. The scale of the graph can be set to display megabytes (**MB**) or gigabytes

(**GB**).

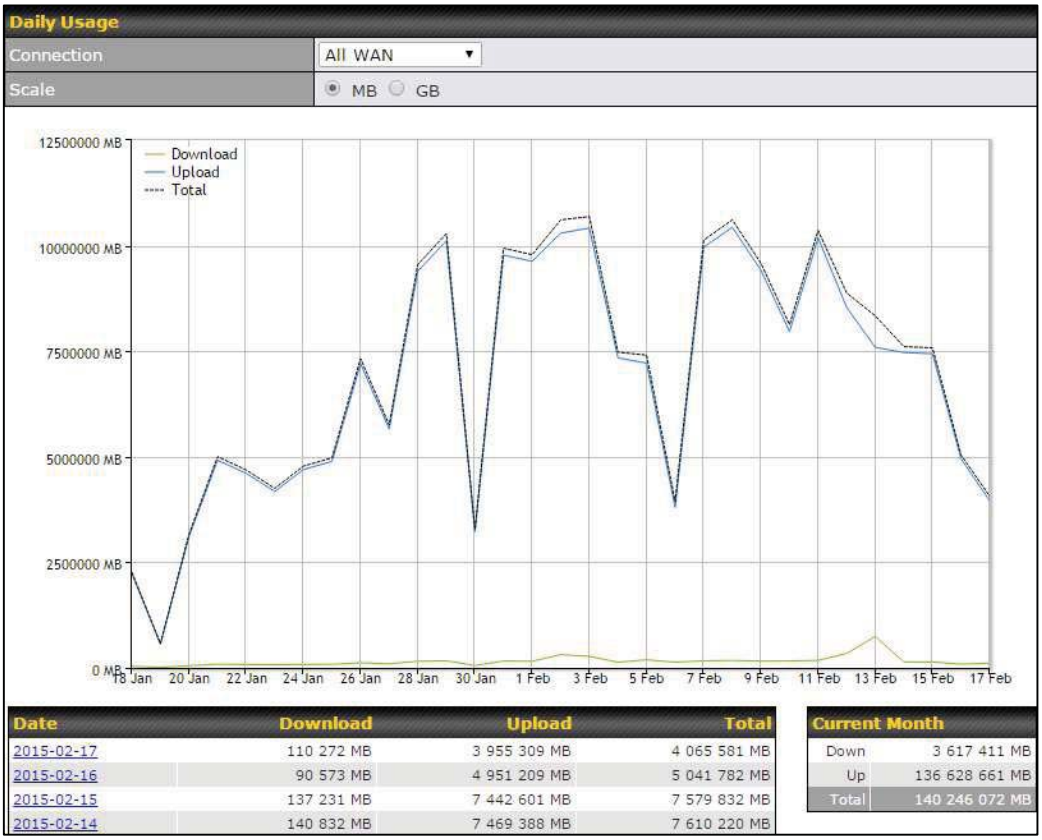



| Date | Download | Upload | Total |
|---|---|---|---|
| 2014-01-02 | 17 550 MB | 3 508 MB | 21 058 MB |
| 2014-01-01 | 15 991 MB | 5 362 MB | 21 353 MB |
| 2013-12-31 | 31 908 MB | 3 635 MB | 35 543 MB |
| 2013-12-30 | 27 372 MB | 3 257 MB | 30 629 MB |
| 2013-12-28 | 910 MB | 2 578 MB | 3 488 MB |
| 2013-12-27 | 40 037 MB | 3 739 MB | 43 776 MB |
| 2013-12-26 | 27 362 MB | 1 026 MB | 28 388 MB |
| 2013-12-25 | 90 753 MB | 2 295 MB | 93 048 MB |
| 2013-12-24 | 48 085 MB | 1 576 MB | 49 661 MB |
| 2013-12-23 | 18 822 MB | 3 311 MB | 22 133 MB |
| 2013-12-22 | 24 824 MB | 1 870 MB | 26 694 MB |
| 2013-12-21 | 31 758 MB | 1 195 MB | 32 953 MB |
| 2013-12-20 | 95 386 MB | 2 999 MB | 98 385 MB |
| 2013-12-19 | 89 221 MB | 4 196 MB | 93 417 MB |

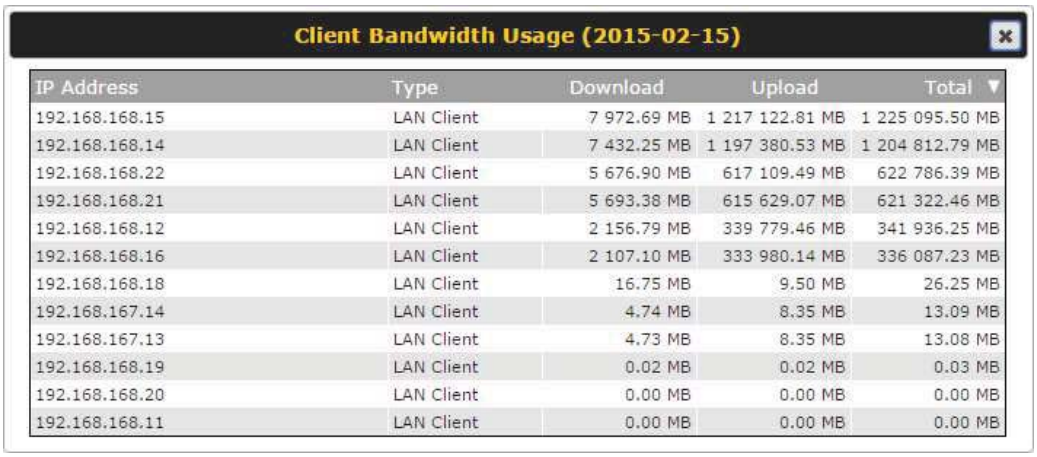
| Current Month | |
|---|---|
| Down | 33 541 MB |
| Up | 8 870 MB |
| Total | 42 411 MB |

Status




Click on a specific date to receive a breakdown of all client usage for that date.



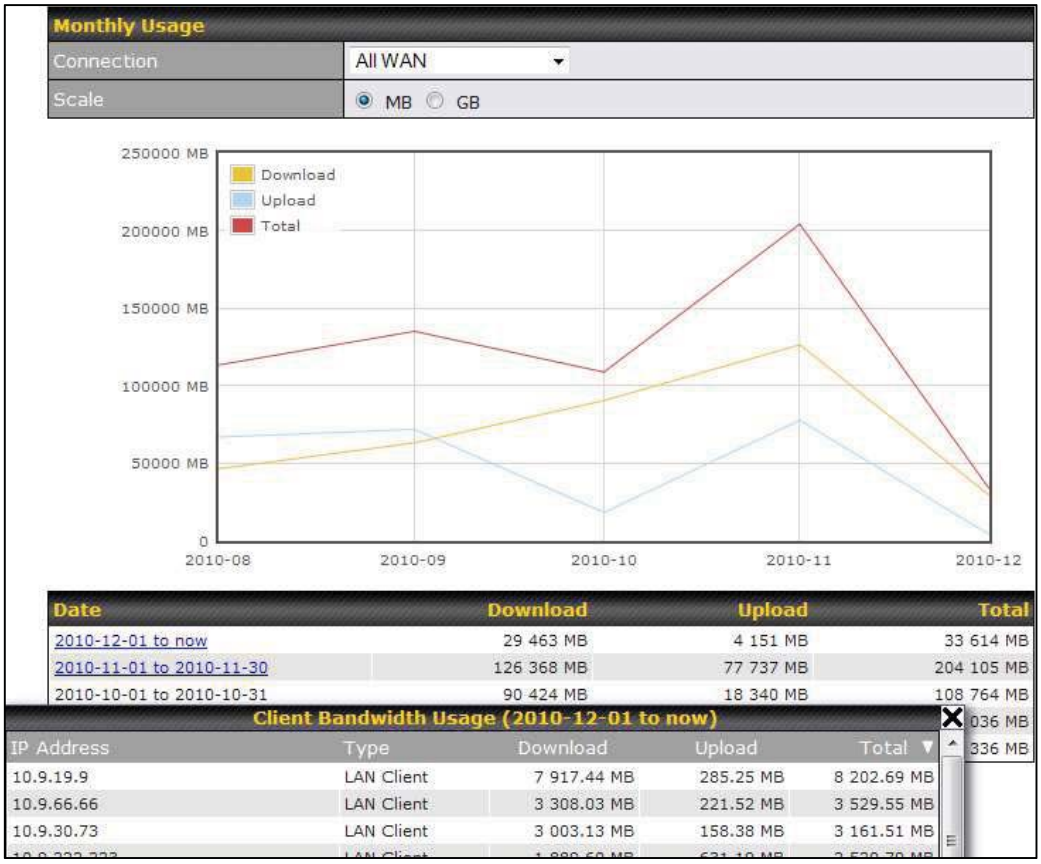

| IP Address | Type | Download | Upload | Total |
|---|---|---|---|---|
| 192.168.168.15 | LAN Client | 7 972.69 MB | 1 217 122.81 MB | 1 225 095.50 MB |
| 192.168.168.14 | LAN Client | 7 432.25 MB | 1 197 380.53 MB | 1 204 812.79 MB |
| 192.168.168.22 | LAN Client | 5 676.90 MB | 617 109.49 MB | 622 786.39 MB |
| 192.168.168.21 | LAN Client | 5 693.38 MB | 615 629.07 MB | 621 322.46 MB |
| 192.168.168.12 | LAN Client | 2 156.79 MB | 339 779.46 MB | 341 936.25 MB |
| 192.168.168.16 | LAN Client | 2 107.10 MB | 333 980.14 MB | 336 087.23 MB |
| 192.168.168.18 | LAN Client | 16.75 MB | 9.50 MB | 26.25 MB |
| 192.168.167.14 | LAN Client | 4.74 MB | 8.35 MB | 13.09 MB |
| 192.168.167.13 | LAN Client | 4.73 MB | 8.35 MB | 13.08 MB |
| 192.168.168.19 | LAN Client | 0.02 MB | 0.02 MB | 0.03 MB |
| 192.168.168.20 | LAN Client | 0.00 MB | 0.00 MB | 0.00 MB |
| 192.168.168.11 | LAN Client | 0.00 MB | 0.00 MB | 0.00 MB |

### 12.2.4 Monthly

This page shows the monthly bandwidth usage for each WAN connection. If you have enabled **Bandwidth Monitoring** feature as shown in **Section 13.4**, you can check the usage of each particular connection and view the information by **Billing Cycle** or by **Calendar Month**.

Click the first two rows to view the client bandwidth usage in the last two months. This feature is not available if you have chosen to view the bandwidth of an individual WAN connection. The scale of the graph can be set to display megabytes (**MB**) or gigabytes (**GB**).




Click on a specific month to receive a breakdown of all client usage for that month.

# Appendix A. Restoration of Factory Defaults

To restore the factory default settings on a Peplink Balance unit, perform the following:

**For Balance models with a reset button:**

1. Locate the reset button on the Peplink Balance unit.
2. With a paperclip, press and keep the reset button pressed.

Note: There is a dual function to the reset button.

Hold for 5-10 seconds for admin password reset (green status light starts blinking)

Hold for approximately 20 seconds for factory reset ( all WAN/LAN port lights start blinking)

**For Balance/MediaFast models with an LCD menu:**

- Use the buttons on front panel to control the LCD menu to go to **Maintenance**>**Factory Defaults**, and then choose **Yes** to confirm.

Afterwards, the factory default settings will be restored.

**Important Note**

All user settings will be lost after restoring the factory default settings. Regular backup of configuration parameters is strongly recommended.

# Appendix B. Routing under DHCP, Static IP, and PPPoE

The information in this appendix applies only to situations where the Peplink Balance operates a WAN connection under DHCP, Static IP, or PPPoE.

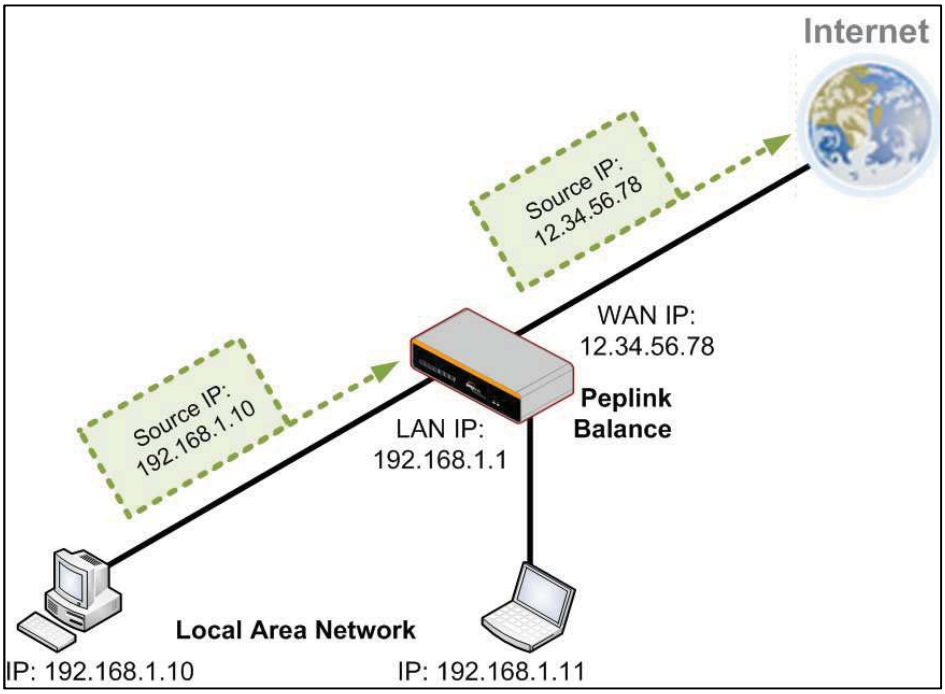
## B.1 Routing Via Network Address Translation (NAT)

When the Peplink Balance is operating under NAT mode, the source IP addresses of outgoing IP packets are translated to the WAN IP address of the Peplink Balance. With NAT, all LAN devices share the same WAN IP address to access the Internet (i.e., the WAN IP address of the Peplink Balance).

Operating the Peplink Balance in NAT mode requires only one WAN (Internet) IP address. In addition, operating in NAT mode also has security advantages because LAN devices are hidden behind the Peplink Balance. They are not directly accessible from the Internet and hence less vulnerable to attacks.

The following figure shows the packet flow in NAT mode:

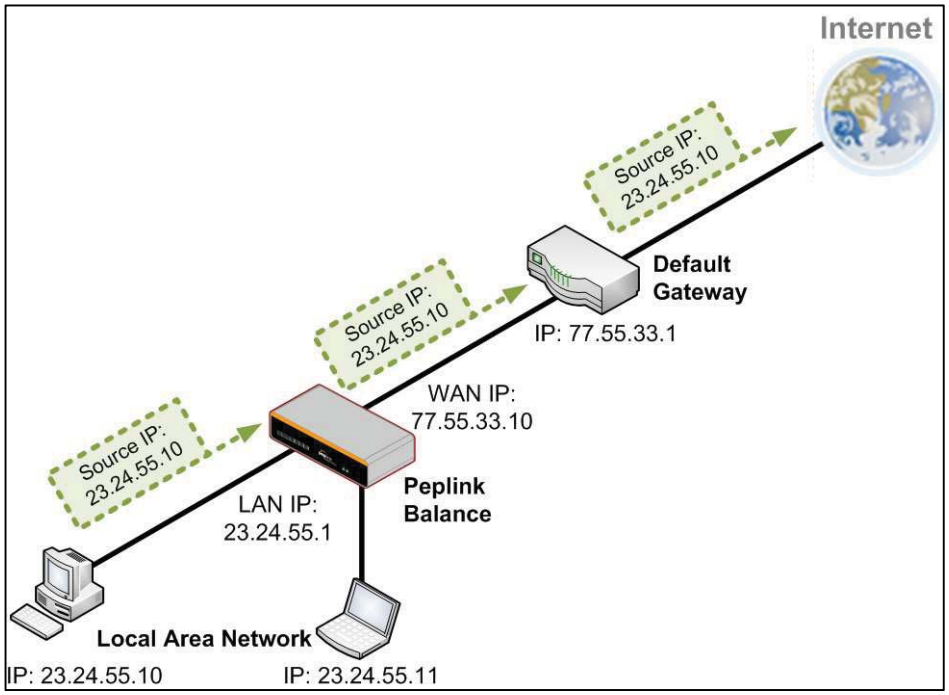



## B.2 Routing Via IP Forwarding

When the Peplink Balance is operating under IP forwarding mode, the IP addresses of IP packets are unchanged; the Peplink Balance forwards both inbound and outbound IP packets without changing their IP addresses.

The following figure shows the packet flow in IP forwarding mode:




# Appendix C. **Case Studies**

## MPLS Alternative

Our SpeedFusion enabled routers can be used to bond multiple low-cost/commodity Internet connections to replace an expensive managed business Internet connection, private leased line, MPLS, and frame relay without sacrificing reliability and availability.

Belows are typical deployment for using our Balance routers to replace expensive MPLS connection with commodity connections, such as ADSL, 3G, and 4G LTE links.

Special features of Balance 580: have high availability capability

Special features of Balance 2500: have high availability capability and capable of connecting to optical fiber based LAN through SFP+ connector

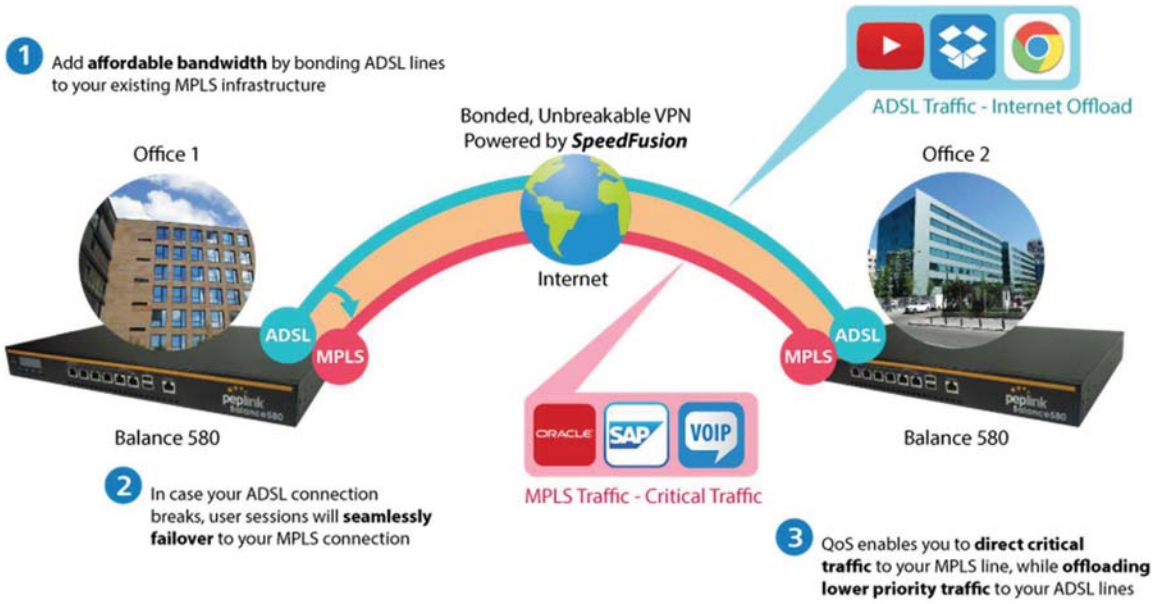
Our WAN-bonding routers which comprise our Balance series and MediaFast series

are capable of connecting multiple devices, and end users' networks to the Internet through multiple Internet connections.

Our MediaFast series routers have been helping students at many education institutions to enjoy uninterrupted learning

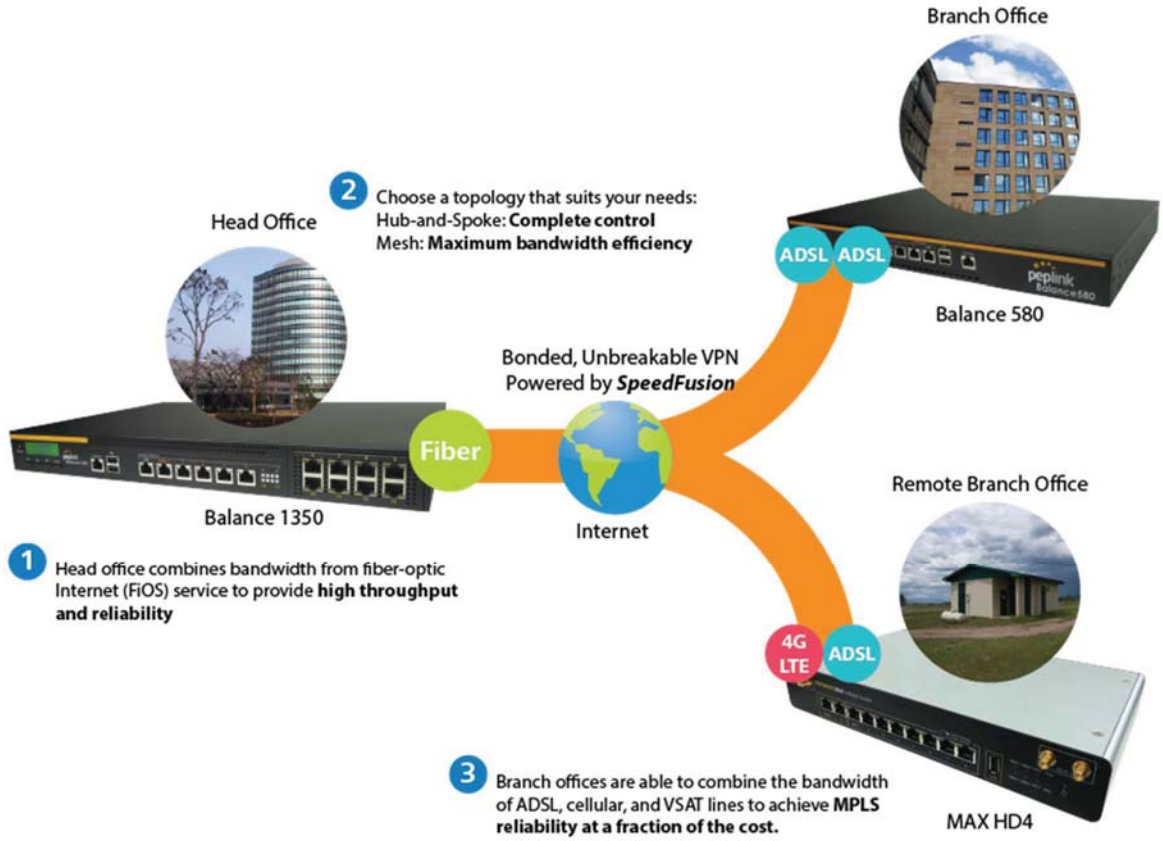
# Option 1: MPLS Supplement




Affordably increase your bandwidth by adding commodity ADSL links to your MPLS connection. SpeedFusion technology bonds all your connections together, enabling session-persistent, user-transparent hot failover. QoS support, bandwidth control, and traffic prioritization gives you total control over your network.

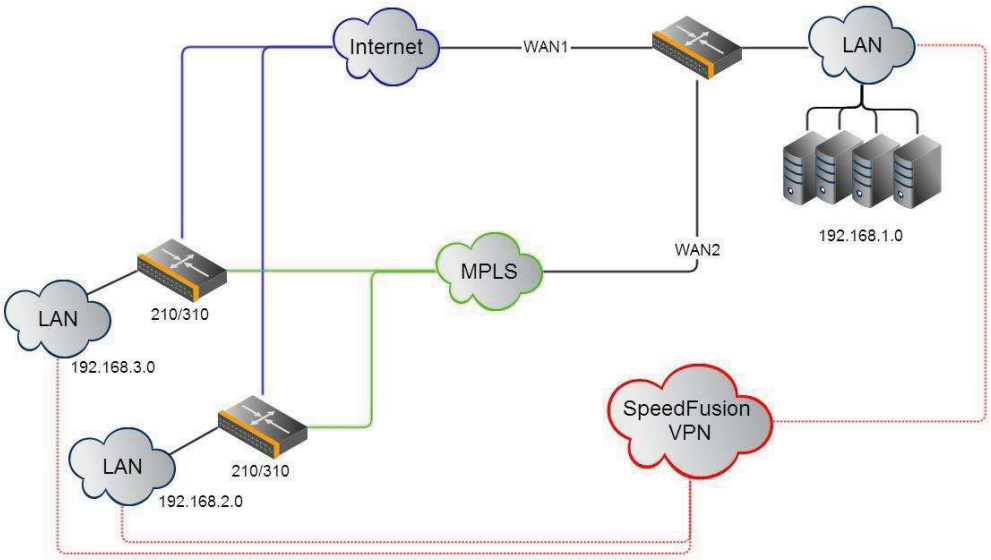
# Option 2: MPLS Alternative




Achieve faster speeds and greater reliability while paying only 20% of MPLS costs by connecting multiple ADSL, 3G, and 4G LTE links. Choose a topology that suits your requirements: a hub-and-spoke topology maximizes control over your network, while a meshed topology can reduce your bandwidth overhead by enabling your devices to form Unbreakable VPN connections directly with each other.

Here is an example of to supplement of existing Multi-Office MPLS network with DSL bonding through SpeedFusion using a Balance 580 at the headquarters and Balance 210/310 at branch offices.




**Environment:**

- This organization has one head office with and two branch offices, with most of the crucial information stored in a server room at the head office.
- They are connecting the offices together using a managed MPLS Solution. However, the MPLS Network is operating at capacity and upgrading the links is cost prohibitive.
- As the organization grows, it needs a cost-efficient way to to add more bandwidth to its wide area network.
- Internet access at the remote sites is sent via a web proxy at head office for corporate web filtering compliance.

**Requirement:**

- User sessions need to remain uninterrupted
- More bandwidth is required at the head office location for direct internet access.

**Recommended Solution:**

- Form a SpeedFusion tunnel between the branch offices and head office to bond the MPLS and additional DSL lines.
- SpeedFusion allows for hot failover, maintaining a persistent session while switching connections.

- The DSLs at head office can be used for direct internet access providing lots of cheap internet bandwidth.
- Head office can use outbound policies to send internet traffic out over the DSLs and only use the MPLS connection for speedfusion, freeing up bandwidth.

**Devices Deployed**: Balance 210, Balance 310, Balance 580

## Harrington Industrial Plastics


### Overview

Harrington Plastics, the US's largest industrial plastics distributor, was looking to upgrade its network equipment. Harrington's team came across Peplink and started thinking about MPLS alternatives. By choosing Peplink, they saved a fortune on upgrades and ended up with yearly savings of up to $100,000.

### Requirements

- Zero network outages
- Flexible resilience options
- Cost-effective solution

### Solution

- Peplink Balance 1350
- Peplink Balance 380
- Unbreakable VPN

**Benefits**

- Extreme savings of $100,000 per year
- 4x the bandwidth
- Seamless hardware failover
- Highly available network due to WAN diversity
- Highly cost-effective compared to competing solutions
- Easy resilience achieved by adding 4G USB modems

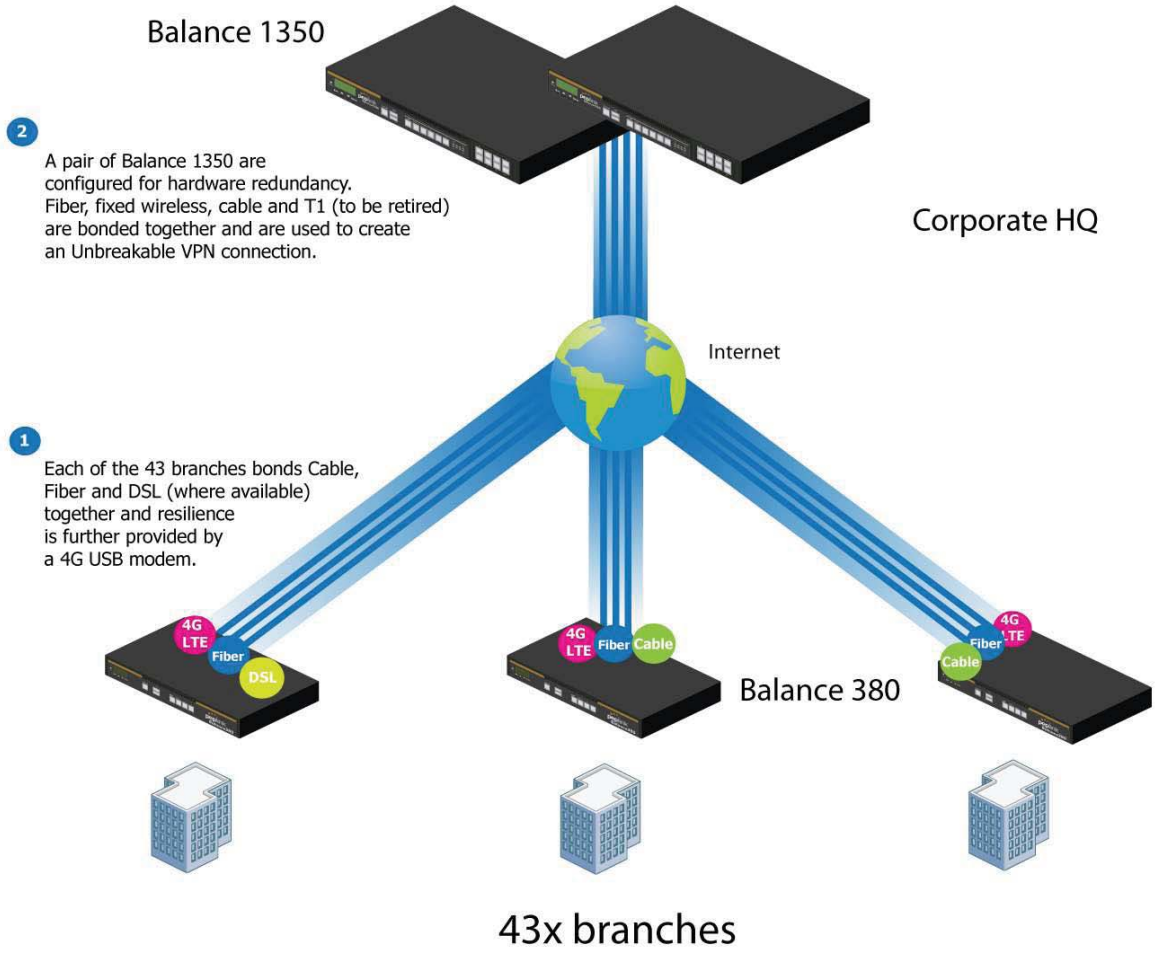
**Time For An Upgrade**

Harrington Industrial Plastics decided it was time to upgrade its network equipment. Its existing solution used redundant MPLS for site-to-site traffic and broadband connections for Internet access. Harrington is the US's largest distributor of industrial plastics piping, serving all industries with corrosive and high-purity applications. It requires peak performance at all times in order to serve its large customer base and 43 busy branches.

**Quick Deployment and Unbreakable Connectivity**

In evaluating an upgrade to its network infrastructure, it was only natural that Harrington settled on the best in the industry — Peplink. Peplink partner Frontier Computer Corporation was chosen to help design and deploy the solution. Since Peplink gear is so easy to configure and install, Harrington was able to design, prototype and roll out the entire solution to the corporate headquarters and all 43 branches within just one year.

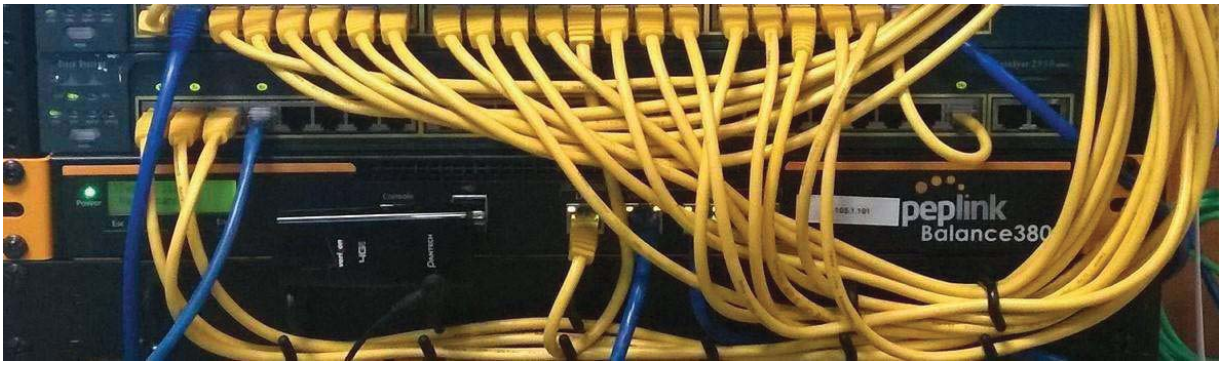
 




The corporate office houses a pair of redundant Balance 1350s for hardware resilience. Served by 4 separate links from multiple service providers, the network's chance of an outage is practically zero. All 43 branches are now equipped with a fleet of Balance 380s, bonding a combination of DSL, cable and fiber-optic links together with an additional 4G USB modem for added resilience. These work together to create an Unbreakable VPN connection to the Balance 1350s at the corporate office, connecting the final dot.

**Dependable, Resilient Networking that's also Very Budget-friendly**




Harrington Industrial Plastics couldn't be happier. They now benefit from an extremely reliable and cost-effective network. Supplying additional resilience is as easy as plugging in a 4G USB modem. Where the MPLS 768kb deployed previously had cost them $192000 a year for all 40 sites, their new solution is now only costing them $92000. Their total bandwidth has been bumped from 36 Mbps to 138 Mbps.

## PLUSS

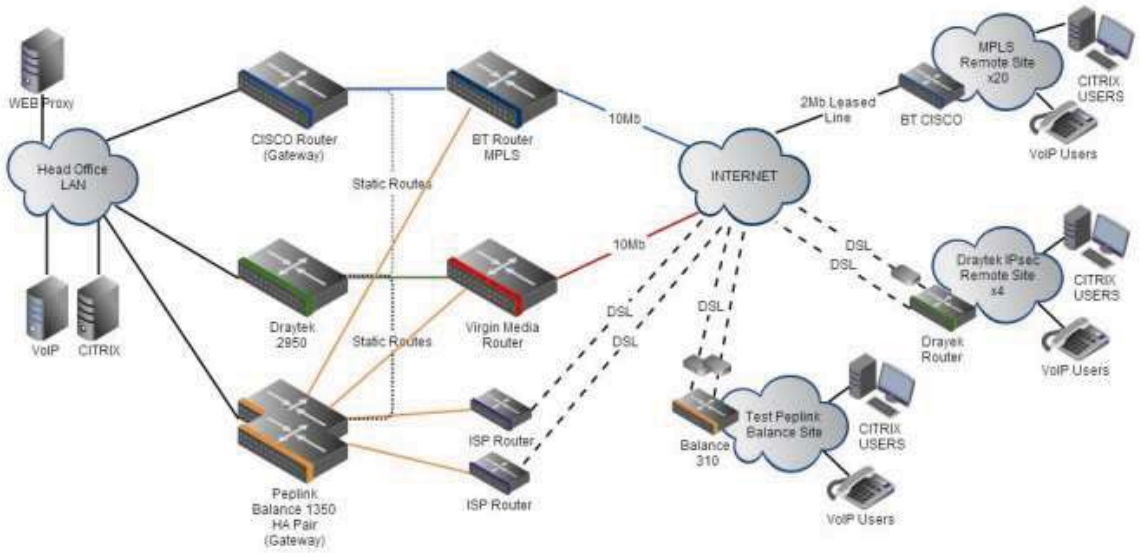
Peplink + Citrix + VoIP Adds Up to Fast, Cost-Effective WAN for Pluss


A Peplink customer since 2006, Pluss is a social enterprise that each year makes gainful employment a reality for more than 5000 disabled and disadvantaged UK citizens. With 37 locations and 300+ active users, Pluss makes heavy use of its WAN infrastructure, which until recently was built on managed MPLS lines.

Hoping to cut expenses and, if possible, boost performance at the same time, Steve Taylor, IT Manager at Pluss, set out to find a solution that would allow Pluss to replace costly MPLS service with a commodity alternative, such as DSL or EFM.

Steve found the solution Pluss needed in Peplink products, especially the Balance series of high-performance enterprise routers and SpeedFusion bonding technology. Pluss now powers its entire WAN infrastructure with simple-to-install, highly reliable, and cost-effective Peplink gear, which allows it to aggregate DSL and other commodity connections and replace expensive leased lines.




## Colégio Next - Enabling eLearning

Colégio Next, a recognized Apple Distinguished School - deploys over 500 iPads to its 600 students as a teaching and learning tool.

Despite being equipped with iPads, teachers and students alike were not making use of them. The reason for this was because of the slow network access speeds. Apps would not download and course contents were inaccessible. Often, having more than a couple students connected to the same Wi-Fi access point was enough to bring it to its knees.

Colégio Next needed a unique solution, so they contacted Peplink.

Requirements

- Solve network congestion problem caused by 600 students over rural Internet connections
- Wi-Fi that can handle 50+ users per classroom
- An affordable network infrastructure that can provide simultaneous access to media-rich educational content

Solution

- Peplink MediaFast
- Multi-WAN Content-caching router, tailor-made for Education networking.
- AP One 300M
- Enterprise grade AP, 5GHz Wi-Fi, up to 60 concurrent users.

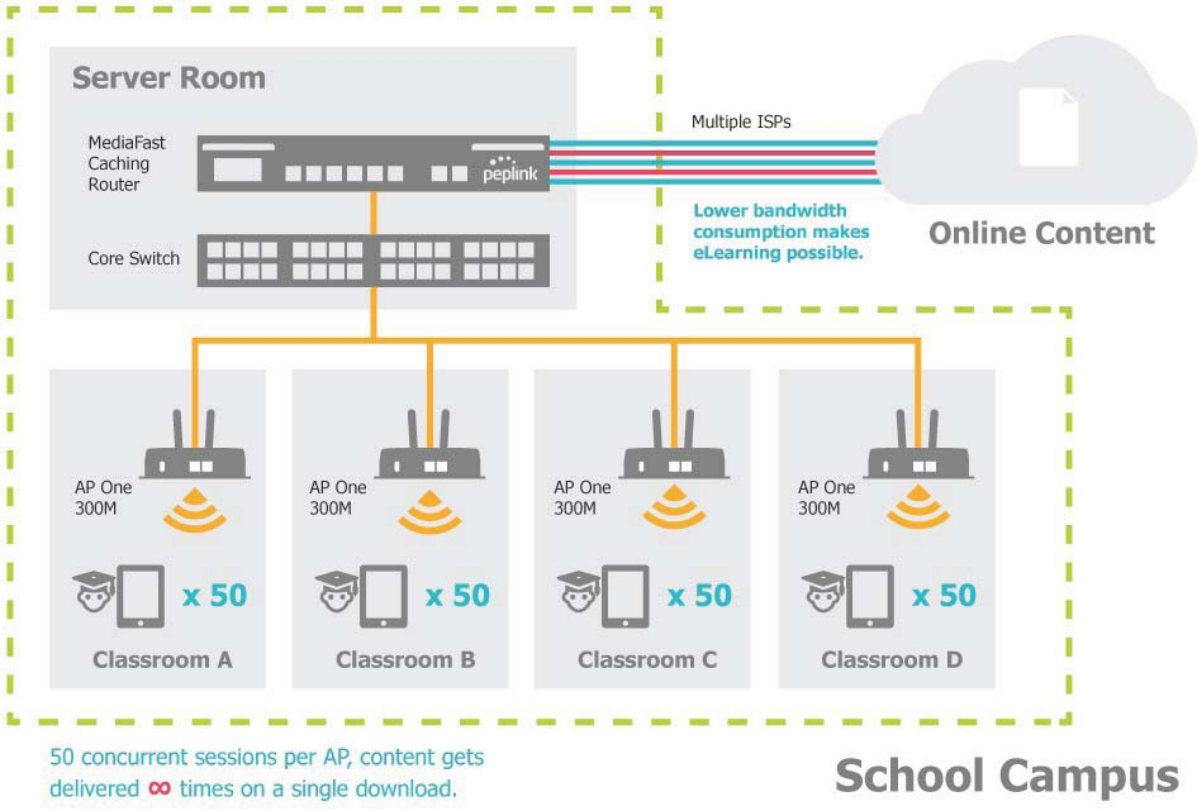
Benefits

- Instant, simultaneous access to media-rich educational content for 500+ iPads
- Wi-Fi connection stability for 50+ users per classroom, not achievable by other tested equipment
- Teachers, students and guests can be assigned access priority to available bandwidth, further preventing congestion
- iOS updates (often 2GB size) no longer congest the network as they are downloaded only once, cached on the MediaFast and then distributed to all iOS devices

- AP Controller makes MAC Address Filtering easy. Students are assigned to designated APs by their devices' MAC Address in order to prevent saturating any single AP.

- Flawless iPad AirPlay mirroring at all times
- iPads are used all day, reaching their full potential with a fast and stable network all the time
- Students are far more engaged and teachers rely on their iPads all day



## Performance Optimization

### Scenario

In this scenario, email and web browsing are the two main Internet services used by LAN users.

The mail server is external to the network. The connections are ADSL (WAN1, with slow uplink and fast downlink) and Metro Ethernet (WAN2, symmetric).

### Solution

For optimal performance with this configuration, individually set the WAN load balance according to the characteristics of each service.

- Web browsing mainly downloads data; sending e-mails mainly consumes upload bandwidth.
- Both connections offer good download speeds; WAN2 offers good upload speeds.
- Define WAN1 and WAN2's inbound and outbound bandwidths to be 30M/2M and 50M/50M, respectively. This will ensure that outbound traffic is more likely to be routed through WAN2.
- For HTTP, set the weight to 3:4.
- For SMTP, set the weight to 1:8, such that users will have a greater chance to be routed via WAN2 when sending e-mail.

## Maintaining the Same IP Address Throughout a Session

### Scenario

Some IP address-sensitive websites (for example, Internet banking) use both client IP address and cookie matching for session identification. Since load balancing uses different IP addresses, the session is dropped when a mismatched IP is detected, resulting in frequent interruptions while visiting such sites.

### Solution

Make use of the persistence functionality of the Peplink Balance. With persistence configured and the **By Destination** option selected, the Peplink Balance will use a consistent WAN connection for source-destination pairs of IP addresses, preventing sessions from being dropped.

With persistence configured and the option **By Source** is selected, the Peplink Balance uses a consistent WAN connection for same-source IP addresses. This option offers

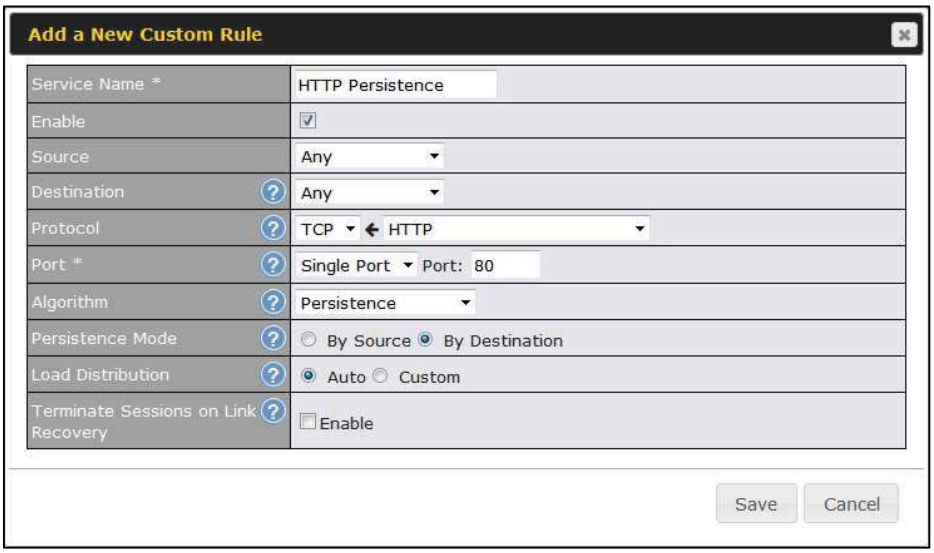
 

higher application compatibility but may inhibit the load balancing function unless there are many clients using the Internet.

### Settings

Set persistence in at **Advanced>Outbound Policy**.

Click **Add Rule**, select **HTTP** (TCP port 80) for web service, and select **Persistence**. Click **Save** and then **Apply Changes**, located at the top right corner, to complete the process.




**Tip**

A network administrator can use the traceroute utility to manually analyze the connection path of a particular WAN connection.

## Bypassing the Firewall to Access Hosts on LAN

### Scenario

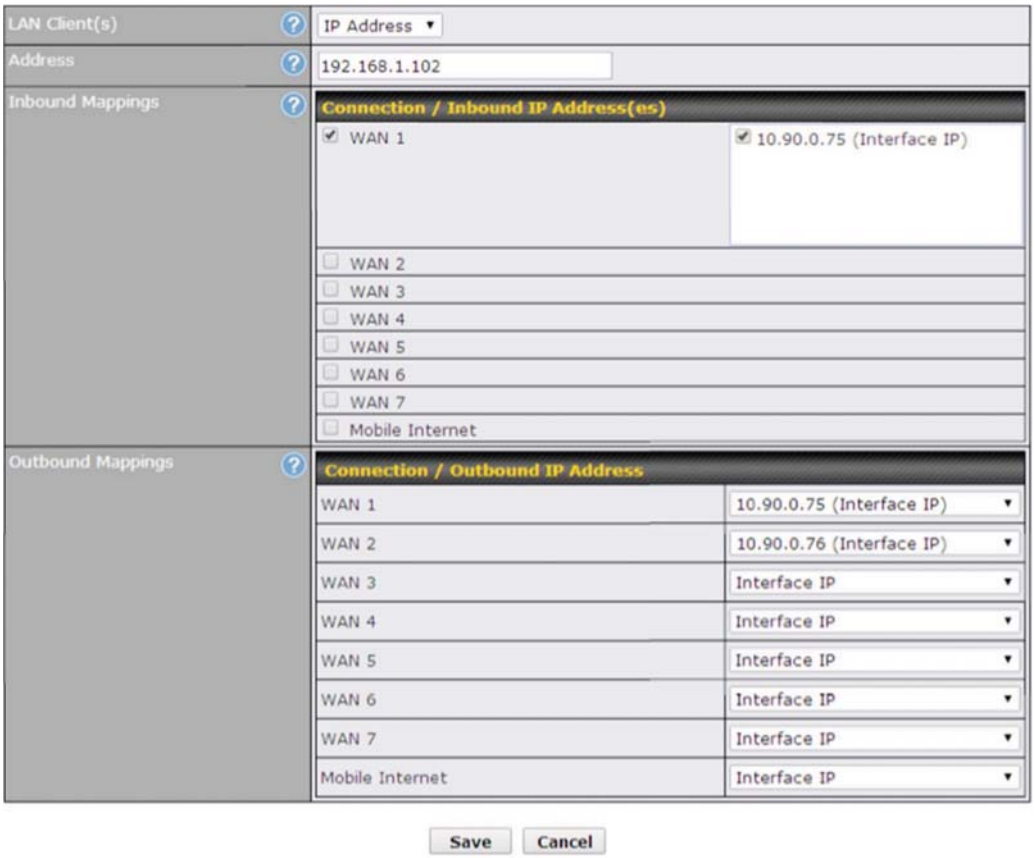
There are times when remote access to computers on the LAN is desirable; for example, when hosting web sites, online businesses, FTP download and upload areas, etc. In such cases, it may be appropriate to create an inbound NAT mapping for the network to allow some hosts on the LAN to be accessible from outside of the firewall.

### Solution

The web admin interface can be used to add an inbound NAT mapping to a host and to bind the host to the WAN connection(s) of your choice. To begin, navigate to **Network>NAT Mappings**.

In this example, the host with an IP address of 192.168.1.102 is bound to 10.90.0.75 of WAN1:




Click **Save** and then **Apply Changes**, located at the top right corner, to complete the process.

## Inbound Access Restriction

### Scenario

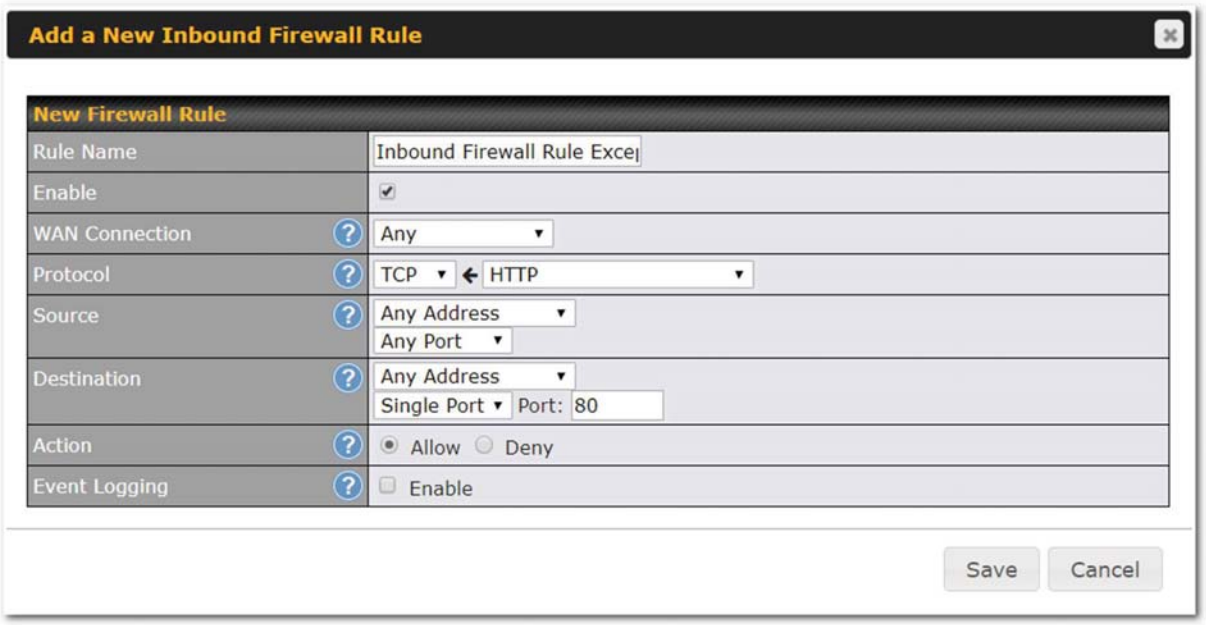
A firewall is required in order to protect the network from potential hacker attacks and other Internet security threats.

### Solution

Firewall functionality is built into the Peplink Balance. By default, inbound access is unrestricted. Enabling a basic level of protection involves setting up firewall rules.

For example, in order to protect your private network from external access, you can set up a firewall rule between the Internet and your private network. To do so, navigate to **Network>Firewall>Access Rules**. Then click the **Add Rule** button in the **Inbound Firewall Rules** table and change the settings according to the following screenshot:




After the fields have been entered as in the screenshot, click **Save** to add the rule. Afterwards, change the default inbound rule to **Deny** by clicking the **default** rule in the **Inbound Firewall Rules** table. Click **Apply Changes** on the top right corner to complete the process.

## Outbound Access Restriction

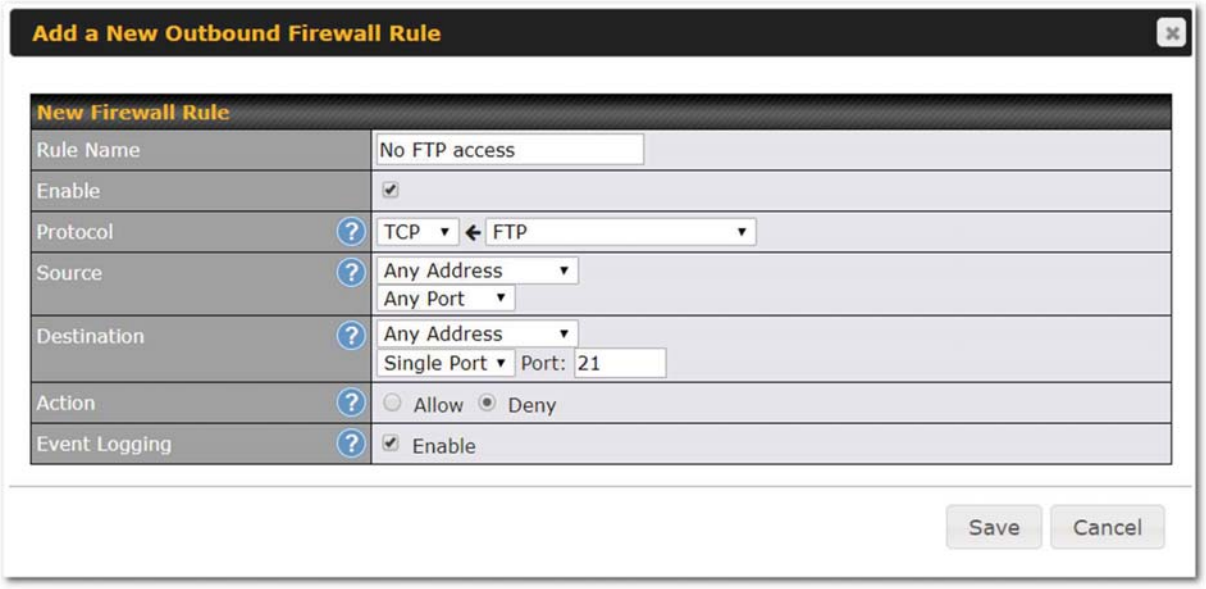
### Scenario

For security reasons, it may be appropriate to restrict outbound access. For example, you may want to prevent LAN users from using ftp to transfer files to and from the Internet. This can easily be achieved by setting up an outbound firewall rule with the Peplink Balance.

### Solution

To setup a firewall between the Internet and private network for outbound access, navigate to **Network>Firewall>Access Rules**. Click the **Add Rule** button in the **Outbound Firewall Rules** table, and then adjust settings according the screenshot:




After the fields have been entered as in the screenshot, click **Save** to add the rule. Click **Apply Changes** on the top right corner to complete the process.

# Appendix D. **Troubleshooting**

**Problem 1**

Outbound load is only distributed over one WAN connection.

**Solution**

Outbound load balancing can only be distribute traffic evenly between available WAN connections if many outbound connections are made. If there is only one user on the LAN and only one download session is made from his/her browser, the WAN connections cannot be fully utilized.

For a single user, download management applications are recommended. The applications can split a file into pieces and download the pieces simultaneously. Examples include: DownThemAll (Firefox Extension), iGetter (Mac), etc.

If the outbound traffic is going across the SpeedFusion™ tunnel, (i.e., transferring a file to a VPN peer) the bandwidth of all WAN connections will be bonded. In this case, all bandwidth will be utilized and a file will be transferred across all available WAN connections.

For additional details, please refer to this FAQ:

https://forum.peplink.com/t/speed-test-tool-for-combined-download-speed-in-multi-wan-environment/8457

**Problem 2**

I am using a download manager program (e.g., Download Accelerator Plus, DownThemAll, etc.). Why is the download speed still only that of a single link?

**Solution**

First, check whether all WAN connections are up. Second, ensure your download manager application has split the file into 3 parts or more. It is also possible that all of 2 or even 3 download sessions were being distributed to the same link by chance.

**Problem 3**

I am using some websites to look up my public IP address, e.g., www.whatismyip.com. When I press the browser's Refresh button, the server almost always returns the same address. Isn't the IP address supposed to be changing for every refresh?

**Solution**

The web server has enabled the **Keep Alive** function, which ensures that you use the

same TCP session to query the server. Try to test with a website that does not enable **Keep Alive**.

**Problem 4**

What can I do if I suspect a problem on my LAN connection?

**Solution**

You can test the LAN connection using ping. For example, if you are using DOS/Windows, at the command prompt, type *ping 192.168.1.1.* This pings the Peplink Balance device (provided that Peplink Balance's IP is 192.168.1.1) to test whether the connection to the Peplink Balance is OK.

**Problem 5**

What can I do if I suspect a problem on my Internet/WAN connection?

**Solution**

You can test the WAN connection using ping, as in the solution to Problem 4. As we want to isolate the problems from the LAN, ping will be performed from the Peplink Balance. By using **Ping**/**Traceroute** under the **Status** tab of the Peplink Balance, you may able to find the source of problem.

**Problem 6**

When I upload files to a server via FTP, the transfer stalls after a few kilobytes of data are sent. What should I do?

**Solution**

The maximum transmission unit (MTU) or MSS setting may need to be adjusted. By default, the MTU is set at 1440. Choose **Auto** for all of your WAN connections. If that does not solve the problem, you can try the MTU 1492 if a connection is DSL. If problem still persists, change the size to progressive smaller values until your problem is resolved (e.g., 1462, 1440, 1420, 1400, etc).

## Additional troubleshooting resources:

Peplink Community Forums: https://forum.peplink.com/

# Appendix E. **Declaration**

**CAUTION:**
**RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE. DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS**

## Federal Communication Commission Interference Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

## Radiation Exposure Statement :

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.

Note: The country code selection is for non-US models only and is not available to all US models. Per FCC regulation, all WiFi products marketed in US must fixed to US operation channels only.

## ISED Warning Statement

Industry Canada Statement

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:(1) This device may not cause interference; and(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

IC Radiation Exposure Statement

This equipment complies with Innovation, Science and Economic Development Canada RF exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated to ensure a minimum of 20 cm spacing to any person at all times.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

## EU Declaration of Conformity

This device complies with the essential requirements of the Radio Equipment Directive 2014/53/EU.

The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the Radio Equipment Directive 2014/53/EU.

The construction of the appliance is in accordance with the following standards:

EN 303 413 V1.1.1

EN 301 908-1 V11.1.1

EN 301 489-1 V2.2.0

EN 301 489-52 V1.1.0

EN 55032: 2015 + AC:2016

EN 61000-3-2: 2014

EN 61000-3-3: 2013

EN 55035: 2017

EN 62311: 2008

EN 62368-1:2014/AC:2015