Multi-Orbit Series

User Manual

Peplink Products:

MAX Orbit 2 / MAX Orbit 4 / MAX Orbit 8

Peplink Firmware 8.6.0
June 2026

Table of Contents

Introduction and Scope

Peplink routers provide link aggregation and load balancing across multiple WAN connections, allowing a combination of technologies like multi-orbit satellite, Ethernet, and Wi-Fi to be utilized to connect to the Internet.

The Multi-Orbit Series has a range of SD-WAN products suitable for many different deployments and markets. Entry level models such as the MAX Orbit 2 are suitable for smaller sites or branch offices. High-capacity models such as the MAX Orbit 8 are suitable for larger organizations and head offices.

This manual covers setting up Peplink routers and provides an introduction to their features and usage.

Tips

Want to know more about Peplink routers? Visit our YouTube Channel for a video introduction!

https://youtu.be/13M-JHRAICA

Glossary

The following terms, acronyms, and abbreviations are frequently used in this manual:

Term	Definition
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
FQDN	Fully Qualified Domain Name
HTTP	Hyper-Text Transfer Protocol
ICMP	Internet Control Message Protocol
IP	Internet Protocol
LAN	Local Area Network
MAC Address	Media Access Control Address
MTU	Maximum Transmission Unit
MSS	Maximum Segment Size
NAT	Network Address Translation
PPPoE	Point to Point Protocol over Ethernet
QoS	Quality of Service
SNMP	Simple Network Management Protocol
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
VPN	Virtual Private Network
VRRP	Virtual Router Redundancy Protocol
WAN	Wide Area Network
WINS	Windows Internet Name Service
WLAN	Wireless Local Area Network

1 Product Features

Peplink routers enable all LAN users to share broadband Internet connections, and they provide advanced features to enhance Internet access.

Our Multi-Orbit Series routers connect to multiple satellite terminals through their Orbit WAN ports, and allow simultaneous Internet connections across multiple satellite links. These connections can be bonded together using our SpeedFusion technology. This allows better reliability, larger bandwidth, and increased coverage compared to using only one satellite link.

Below is a list of supported features on Peplink routers. Features vary by model. For more information, please see peplink.com/products.

1.1 Supported Network Features

1.1.1 WAN

- Ethernet WAN connection in full/half duplex
- Static IP support for PPPoE
- USB mobile connection(s)
- Wi-Fi WAN connection
- Network address translation (NAT)/port address translation (PAT)
- Inbound and outbound NAT mapping
- IPsec NAT-T and PPTP packet passthrough
- MAC address clone and passthrough
- Customizable MTU and MSS values
- WAN connection health check
- Dynamic DNS (supported service providers: changeip.com, dyndns.org, no-ip.org, tzo.com and DNS-O-Matic)
- Ping, DNS lookup, and HTTP-based health check

1.1.2 LAN

- Wi-Fi AP
- Ethernet LAN ports
- DHCP server on LAN
- Extended DHCP option support
- Static routing rules
- VLAN on LAN support

1.1.3 VPN

- SpeedFusion VPN with SpeedFusion™
- SpeedFusion VPN performance analyzer
- X.509 certificate support
- VPN load balancing and failover among selected WAN connections
- Bandwidth bonding and failover among selected WAN connections
- IPsec VPN for network-to-network connections (works with Cisco and Juniper)
- Ability to route Internet traffic to a remote VPN peer
- Optional pre-shared key setting
- SpeedFusion™ throughput, ping, and traceroute tests
- PPTP server
- PPTP and IPsec passthrough

1.1.4 Firewall

- Outbound (LAN to WAN) firewall rules
- Inbound (WAN to LAN) firewall rules per WAN connection
- Intrusion detection and prevention
- Specification of NAT mappings
- Outbound firewall rules can be defined by destination domain name

1.1.5 Captive Portal

- Splash screen of open networks, login page for secure networks
- Customizable built-in captive portal
- Supports linking to outside page for captive portal

1.1.6 Outbound Policy

- Link load distribution per TCP/UDP service
- Persistent routing for specified source and/or destination IP addresses per TCP/UDP service
- Traffic prioritization and DSL optimization
- Prioritize and route traffic to VPN tunnels with Priority and Enforced algorithms

1.1.7 AP Controller

- Configure and manage Peplink AP devices
- Review the status of connected APs

1.1.8 QoS

- Quality of service for different applications and custom protocols
- User group classification for different service levels
- Bandwidth usage control and monitoring on group- and user-level
- Application prioritization for custom protocols and DSL/cable optimization

1.2 Other Supported Features

- User-friendly web-based administration interface
- HTTP and HTTPS support for web admin interface (default redirection to HTTPS)
- Configurable web administration port and administrator password
- Firmware upgrades, configuration backups, ping, and traceroute via web admin interface
- Remote web-based configuration (via WAN and LAN interfaces)
- Time server synchronization
- SNMP
- Email notification
- Read-only user access for web admin
- Shared IP drop-in mode
- Authentication and accounting by RADIUS server for web admin
- Built-in WINS servers*
- Syslog
- SIP passthrough
- PPTP packet passthrough
- Event log
- Active sessions
- Client list
- WINS client list *
- UPnP / NAT-PMP
- Real-time, hourly, daily, and monthly bandwidth usage reports and charts
- IPv6 support
- Support USB tethering on Android 2.2+ phones

* Not supported on MAX Surf-On-The-Go, and BR1 variants

2 Multi-Orbit Series Router Overview

2.1 MAX Orbit 2

2.1.1 Panel Appearance

2.1.2 LED Indicators

The statuses indicated by the front panel LEDs are as follows:

Status Indicators		
Status	OFF	System initializing
	Red	Booting up or busy
	Blinking red	Boot up error
	Green	Ready

Cellular Indicators		
Orbit	OFF	No Starlink connected
	Blinking Slowly	One or more Starlink dish not detected or obstructed
	Green	All connected Orbit port detected Starlink dish

Wi-Fi Indicators		
Wi-Fi / Wi-Fi AP	OFF	Disabled intermittent
	ON	Connected to wireless network(s)

LAN Ports		
Right LED	Green	1000 Mbps
	OFF	10 Mbps / 100 Mbps or port is not connected
Left LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port Type	Auto MDI/MDI-X ports	

Orbit Port		
Right LED	Green	1000 Mbps
	OFF	10 Mbps / 100 Mbps or port is not connected
Left LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port Type	Auto MDI/MDI-X ports	

2.5GE Orbit Port		
Right LED	Green	2.5 Gbps
	Orange	1000 Mbps
	OFF	10 Mbps / 100 Mbps or port is not connected
Left LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port Type	Auto MDI/MDI-X ports	

2.2 MAX Orbit 4

2.2.1 Panel Appearance

2.2.2 LED Indicators

Status Indicators		
Status	OFF	System initializing
	Red	Booting up or busy
	Blinking red	Boot up error
	Green	Ready

Orbit Indicators		
Orbit	OFF	No Starlink connected
	Blinking Slowly	One or more Starlink dish not detected or obstructed
	Green	All connected Orbit port detected Starlink dish

Wi-Fi Indicators		
Wi-Fi / Wi-Fi AP	OFF	Disabled intermittent
	ON	Connected to wireless network(s)

WAN / LAN Ports		
Right LED	Green	2.5 Gbps
	Orange	1000 Mbps
	OFF	10 Mbps / 100 Mbps or port is not connected
Left LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port Type	Auto MDI/MDI-X ports	

Orbit Port		
Right LED	Green	1000 Mbps
	OFF	10 Mbps / 100 Mbps or port is not connected
Left LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port Type	Auto MDI/MDI-X ports	

2.3 MAX Orbit 8

2.3.1 Panel Appearance

2.3.2 LED Behaviour

Power and Status Indicators	
Status	OFF – Upgrading firmware
	Red – Booting up or busy
	Blinking red – Boot up error
	Green – Ready

Orbit Indicators		
Orbit	OFF	No Starlink connected
	Blinking Slowly	One or more Starlink dish not detected or obstructed
	Green	All connected Orbit port detected Starlink dish

WAN / LAN Port (10GBASE-T)		
Right	Green	10 Gbps
	Orange	1000 Mbps / 2500 Mbps
	OFF	100 Mbps

Left	OFF	Port is not connected
	Blinking	Data is transferring
	ON	Port is connected without traffic
2.5GE Orbit Ports		
Green LED	ON	PoE+ Ready
	OFF	PoE Off
Orange LED	OFF	Port is not connected
	Blinking	Data is transferring
	ON	Port is connected without traffic
Port Type		Auto MDI/MDI-X ports
SFP+ Ports		
Green LED	OFF	Port is not connected
	Blinking	Data is transferring
	ON	Port is connected without traffic

Console Ports	
Console Port	Reserved for engineering use

3 Advanced Feature Summary

3.1 Drop-in Mode and LAN Bypass: Transparent Deployment

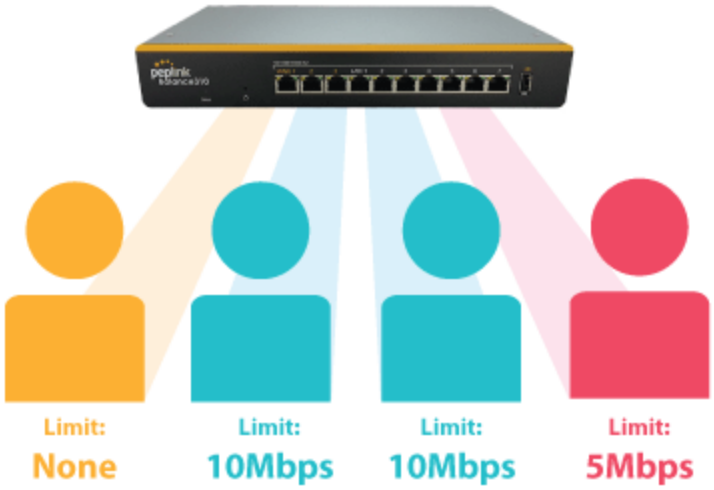
As your organization grows, it may require more bandwidth, but modifying your network can be tedious. In **Drop-in Mode**, you can conveniently install your Peplink router without making any changes to your network. For any reason your Peplink router loses power, the **LAN Bypass** will safely and automatically bypass the Peplink router to resume your original network connection.

Note: Drop-in mode is compatible for All MAX models except MAX BR1 IP67

3.2 QoS: Clearer VoIP

VoIP and videoconferencing are highly sensitive to latency. With QoS, Peplink routers can detect VoIP traffic and assign it the highest priority, giving you crystal-clear calls.

3.3 Per-User Bandwidth Control



With per-user bandwidth control, you can define bandwidth control policies for up to 3 groups of users to prevent network congestion. Define groups by IP address and subnet, and set bandwidth limits for every user in the group.

3.4 High Availability via VRRP

When your organization has a corporate requirement demanding the highest availability with no single point of failure, you can deploy two Peplink routers in High Availability mode. With High Availability mode, the second device will take over when needed.

Compatible with: MAX Orbit 2, MAX Orbit 4, MAX Orbit 8

3.5 USB Modem and Android Tethering

For increased WAN diversity, plug in a USB LTE modem as a backup. Peplink routers are compatible with over **200 modem types**. You can also tether to smartphones running Android 4.1.X and above.

Compatible with: MAX Orbit 4, MAX Orbit 8

3.6 Built-In Remote User VPN Support

Use OpenVPN or L2TP with IPsec to safely and conveniently connect remote clients to your private network. L2TP with IPsec is supported by most devices, but legacy devices can also connect using PPTP.

Click here for the full instructions on setting up L2TP with IPsec.
Click here for the full instructions on setting up OpenVPN connections

3.7 DPI Engine

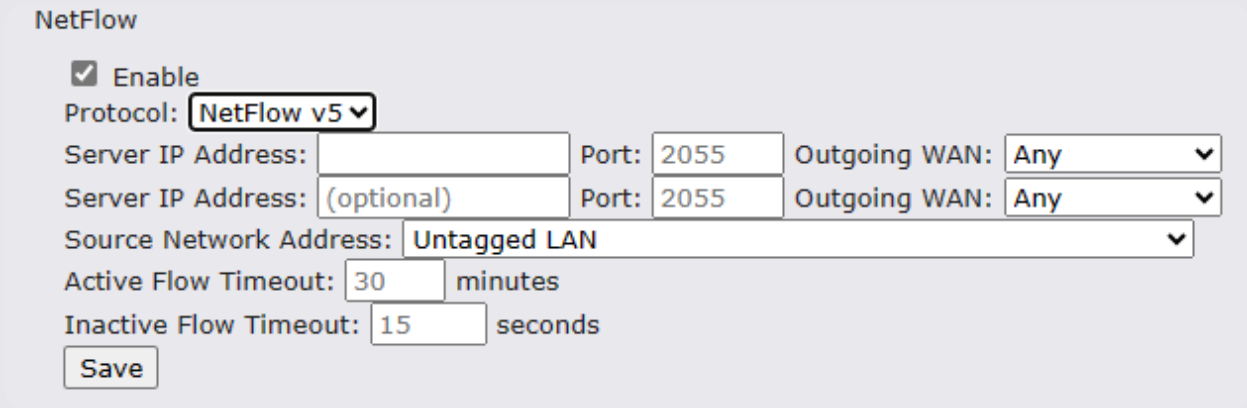
The DPI report written in the updated KB article will show further information on InControl2 through breaking down application categories into subcategories.

https://forum.peplink.com/t/ic2-deep-packet-inspection-dpi-reports-and-everything-you-need-to-know-about-it/10151/

3.8 NetFlow

NetFlow protocol is used to track network traffic. Tracking information from NetFlow can be sent to the NetFlow collector, which analyzes data and generates reports for review.

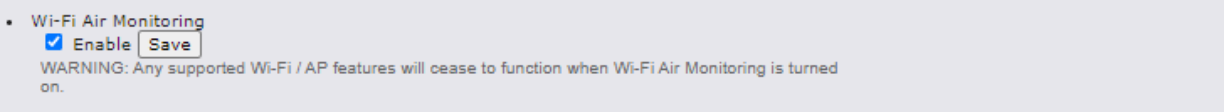
Note: To enable this feature, go to https://<Device's IP>/cgi-bin/MANGA/support.cgi



3.9 Wi-Fi Air Monitoring

Peplink routers support Wi-Fi “Air Monitoring Mode” which is used to troubleshoot remotely and proactively monitor Wi-Fi and WAN performance. The report can be viewed under InControl 2 > Reports > AirProbe Reports after enabling Wi-Fi Air Monitoring.

Note: To enable this feature, go to https://<Device's IP>/cgi-bin/MANGA/support.cgi



3.10 SP Default Configuration

The SP Default Configuration feature written in the updated KB article allows for the provisioning of custom made settings (a.k.a. InControl2 configuration) via the Ethernet LAN port and is ideal for those wanting to do a bulk deployment of many Peplink devices.

Note: If you would like to use this feature, please contact your purchase point (Eg.VAD).

3.11 Peplink Relay

Cloud Service Providers often restrict access to certain applications. With SFC Relay, you can route traffic before going out to the Internet, allowing access to previously restricted applications experienced with the public SpeedFusion Cloud nodes. Available as an add-on for your enterprise branch router or as an upgradable license to your Peplink router, SFC Relay is sure to impress you and any peers you give access to.

https://youtu.be/99XcwlDH-TA?si=BC2uo3vUKMgBzmD3

3.12 DNS over HTTPS (DoH)

DoH provides the benefits of communicating DNS information over a secure HTTPS connection in an encrypted manner. The protocol offers increased privacy and confidentiality by preventing data interception and man-in-the-middle attacks.

3.13 Peplink InTouch

InTouch is Peplink's zero-touch remote network management solution, leveraging InControl 2 and a SpeedFusion Connect (formerly known as SpeedFusion Cloud) data plan. This service extends a network administrator's ability to reach any device UI backed by a Peplink/Peplink router. To configure InTouch, all you need is a valid InControl 2 subscription, a SpeedFusion Connect data plan, and a Peplink/Peplink router (which requires the latest 8.2.0 firmware).

To watch a demonstration and read the FAQ, visit
https://www.peplink.com/enterprise-solutions/intouch/

Or learn to configure InTouch at **https://youtu.be/zg0iavHGkJw**

3.14 Synergy Mode

Synergy mode is a cascade multiple devices and combine the number of WANs to a single device virtually. All the WANs on the Synergized Device will appear as native WAN interfaces at the Synergy Controller and it can be managed like the built-in WAN interfaces.

https://forum.peplink.com/t/synergy-mode-(firmware-8.3.0)/639be7d8af8c71a6f3050323/

3.15 Virtual WAN on VLAN

The Virtual WAN Activation License allows you to create 1 x virtual WAN on a particular VLAN, on either WAN or LAN interface. This means that you can create a virtual WAN on VLAN for a WAN port, or a virtual WAN on VLAN for a LAN port.
https://forum.peplink.com/t/b20x-virtual-wan-activation-license-faq/6204bac7d90b9e6355e96e8d/1

4 Installation

The following section details connecting Peplink routers to your network.

4.1 Preparation

Before installing your Peplink router, please prepare the following as appropriate for your installation:

- At least one Internet/WAN access account and/or Wi-Fi access information
- Depending on network connection type(s), one or more of the following:
    - **Ethernet WAN**: A 10/100/1000BaseT UTP cable with RJ45 connector
    - **USB**: A USB modem
    - **Wi-Fi WAN**: Wi-Fi antennas
- A computer installed with the TCP/IP network protocol and a supported web browser. Supported browsers include Microsoft Internet Explorer 11 or above, Mozilla Firefox 24 or above, Apple Safari 7 or above, and Google Chrome 18 or above.

4.2 Constructing the Network

At a high level, construct the network according to the following steps:

1. With an Ethernet cable, connect a computer to one of the LAN ports on the Peplink router. Repeat with different cables for up to 4 computers to be connected.
2. Connect either another Ethernet cable or a USB modem to one of the WAN ports or USB ports respectively, or connect to Wi-Fi as WAN on the Peplink router. Repeat the same process for any additional WAN ports.
3. Connect the power adapter to the power connector on the rear panel of the Peplink router, and then plug it into a power outlet.

4.3 Configuring the Network Environment

To ensure that the Peplink router works properly in the LAN environment and can access the Internet via WAN connections, please refer to the following setup procedures:

- LAN configuration

  For basic configuration, refer to **Section 8, Connecting to the Web Admin Interface**.

  For advanced configuration, go to **Section 9, Configuring the LAN Interface(s)**.

- WAN configuration

  For basic configuration, refer to **Section 8, Connecting to the Web Admin Interface**.

  For advanced configuration, go to **Section 9.2, Captive Portal**.

5 Connecting to the Web Admin Interface

1. Start a web browser on a computer that is connected with the Peplink router through the LAN.
2. To connect to the router's web admin interface, enter the following LAN IP address in the address field of the web browser:

   http://192.168.50.1

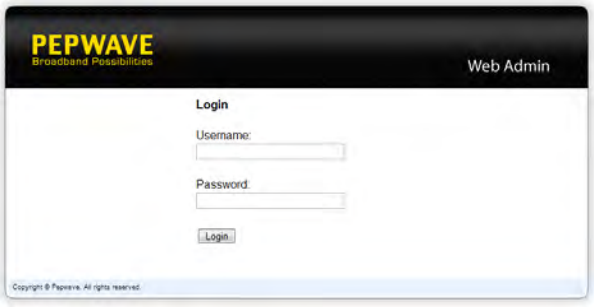
   (This is the default LAN IP address for Peplink routers.)

3. Enter the following to access the web admin interface.

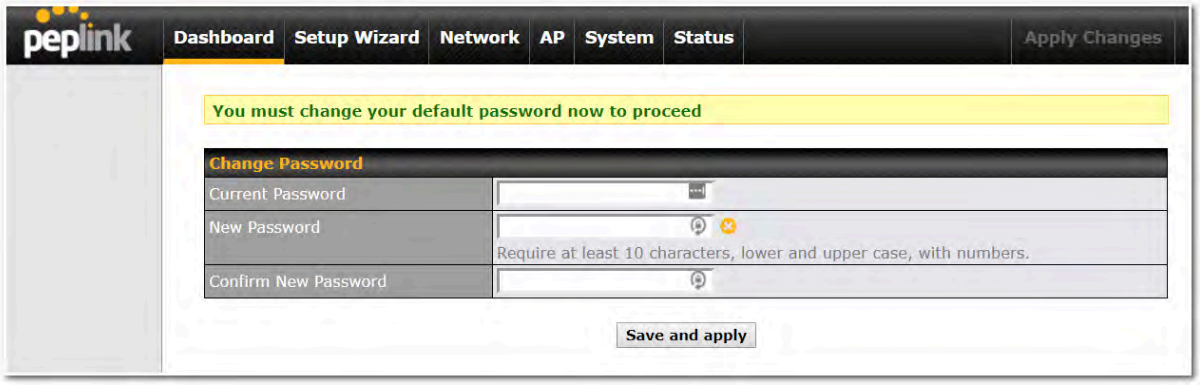
   Username: admin

   Password: admin

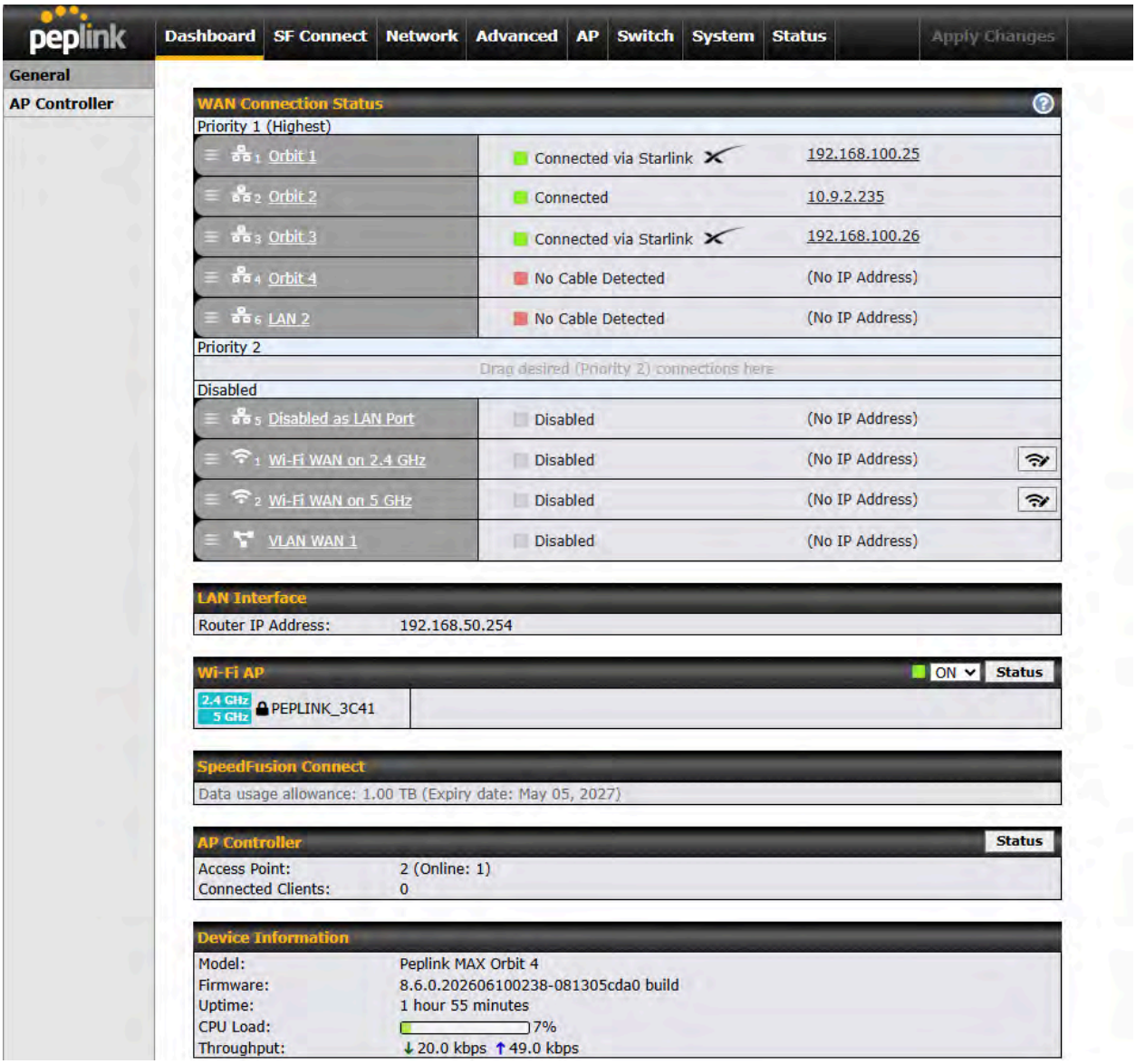
   (This is the default username and password for Peplink routers).



- You must change the default password on the first successful logon.
- Password requirements are: A minimum of 10 lower AND upper case characters, including at least 1 number.
- When HTTP is selected, the URL will be redirected to HTTPS by default.



After successful login, the **Dashboard** of the web admin interface will be displayed.



The **Dashboard** shows current Orbit, WAN, LAN, and Wi-Fi AP statuses. Here, you can change WAN connection priority and switch on/off the Wi-Fi AP. For further information on setting up these connections, please refer to **Sections 8** and **9.**

Device Information displays details about the device, including model name, firmware version, and uptime. For further information, please refer to **Section 22.**

Important Note

Configuration changes (e.g. WAN, LAN, admin settings, etc.) will take effect only after clicking the **Save** button at the bottom of each page. The **Apply Changes** button causes the changes to be saved and applied.

6 SpeedFusion Connect

With Peplink products, your device is able to connect to SpeedFusion Connect without the use of a second endpoint. This service has wide access to a number of SpeedFusion endpoints hosted from around the world, providing your device with unbreakable connectivity wherever you are.*

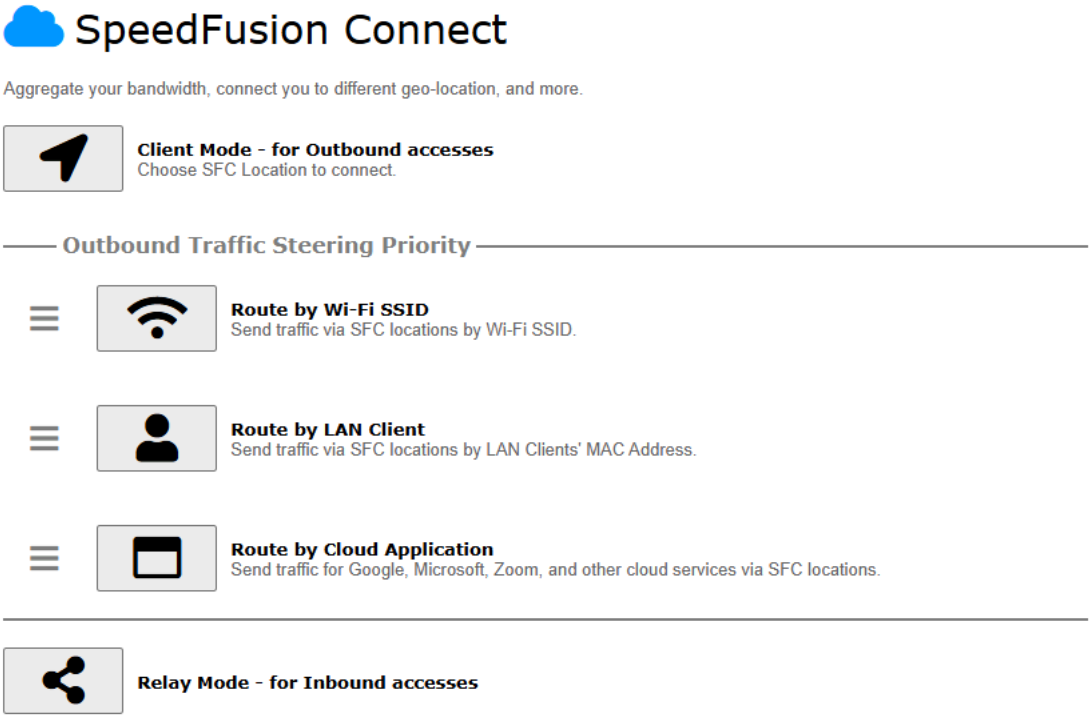
*SpeedFusion Connect is supported in firmware version 8.1.0 and above. SpeedFusion Connect is a subscription basis. SpeedFusion Connect license can be purchased at https://estore.peplink.com/ **> SpeedFusion Service > SpeedFusion Connect**.

6.1 Activate SpeedFusion Connect Service

All Care plans now come with SpeedFusion Connect included. This data allowance will automatically begin and end in accordance with your warranty. No activation is required.

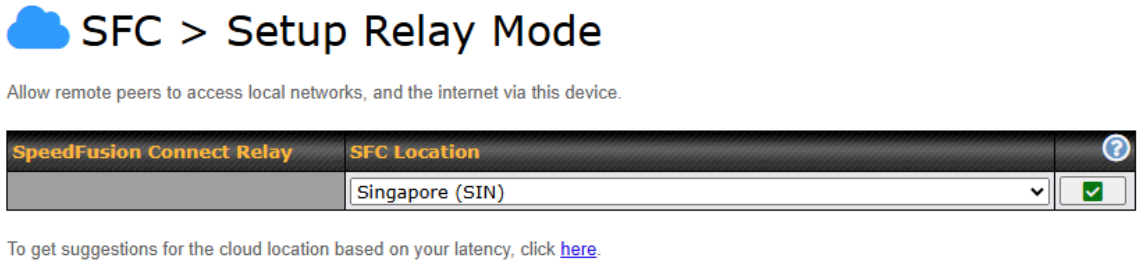
6.2 Enable SpeedFusion Connect

Access the Web Admin of the device you want to create as the Peplink Relay Server, navigating to the "**SFC Protect**" tab.



To setup a Peplink Relay Mode, select "**Relay Mode – for Inbound accesses**" > Choose the **SFC Protect Location** you wish to connect to > Click on the **Green tick button** to confirm the change.

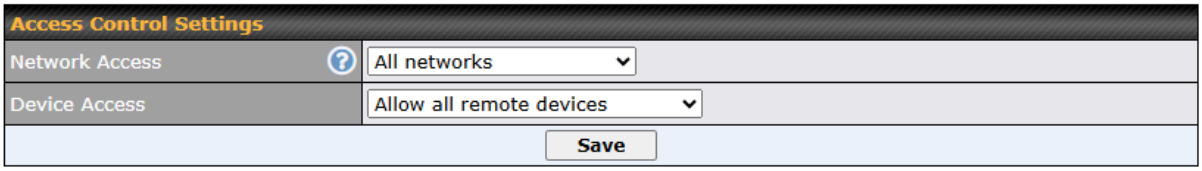
User may also get the suggestions cloud location based on latency by click "here".



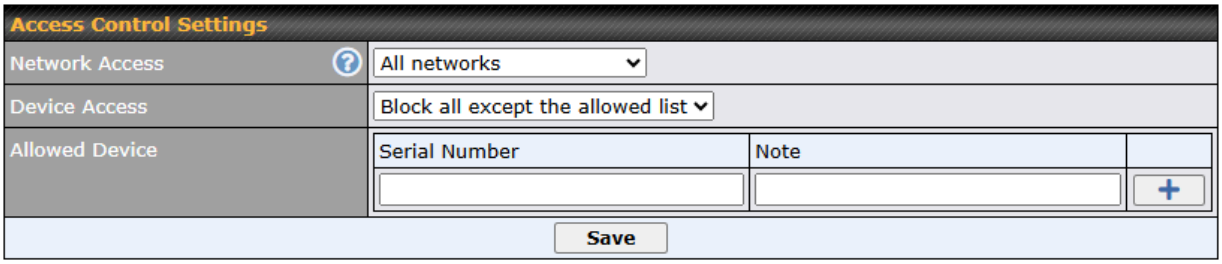
The Protect private networks option blocks traffic from Relay Clients to private IP address ranges, including:

- 10.0.0.0/8
- 100.64.0.0/10
- 172.16.0.0/12
- 192.168.0.0/16
- 169.254.0.0/16

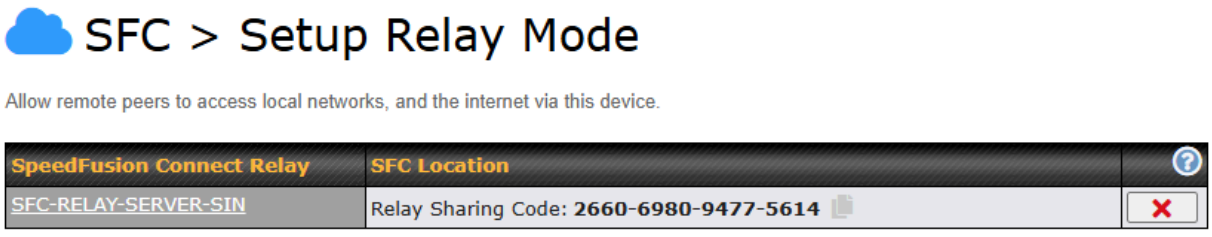
Enabling this option prevents access to these private networks from Relay Clients to protect your private networks and devices. This can improve the security of your local network against unwanted traffic from Relay Clients.



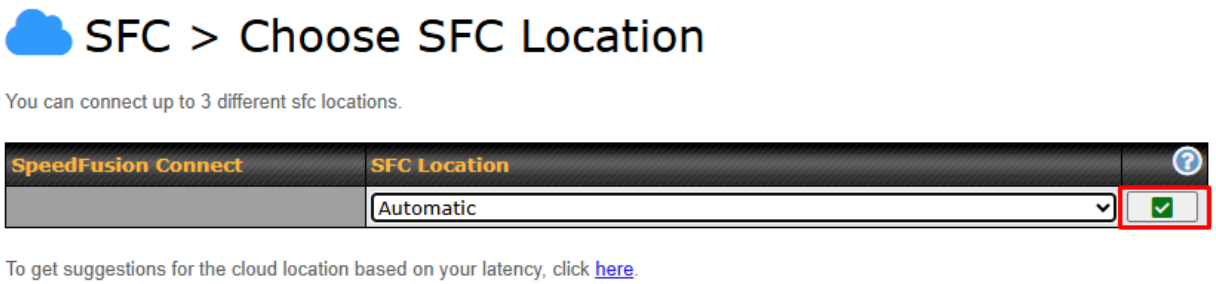
To block other devices from connecting, select “Block all except the allowed list” and add allowed devices serial number under the list.



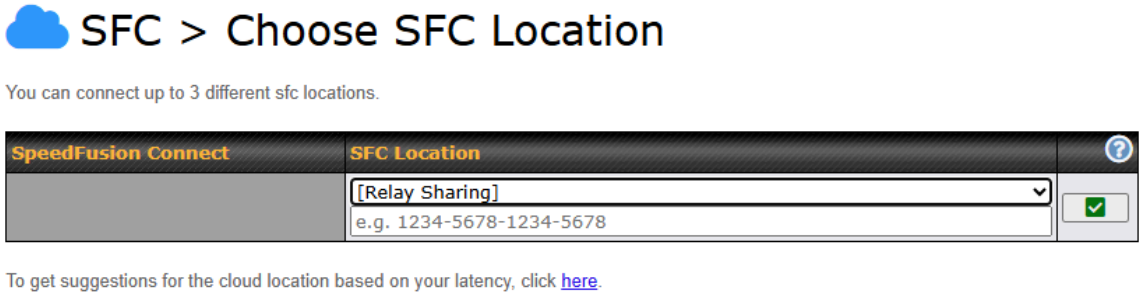
The Relay Sharing Code will be generated, and other peers can use this code to establish a SpeedFusion Connect Protect that will forward the traffics to this device, allowing them to access local networks and the internet via your WAN connection.



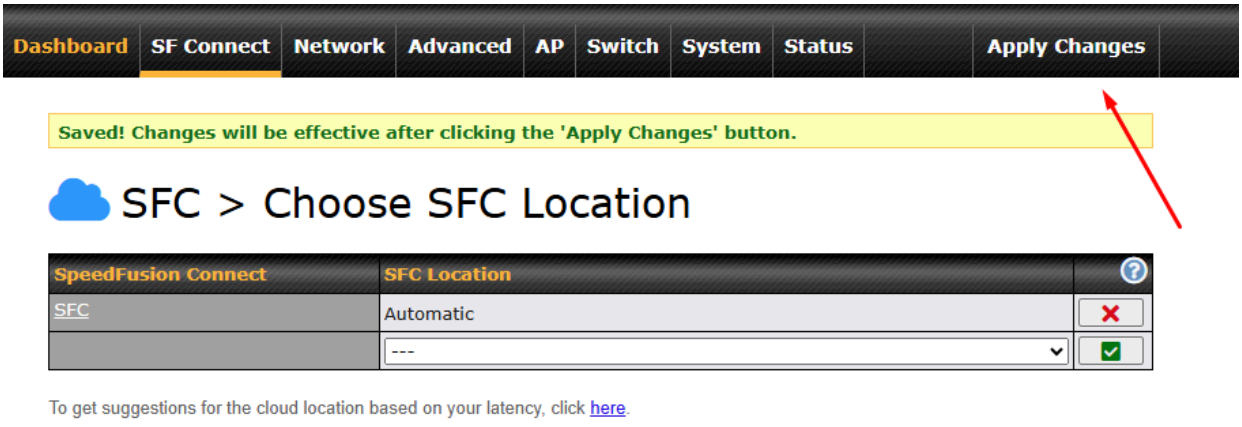
To connect to SpeedFusion Connect Protect, you can select a **SFC Protect Location** of your choice, or simply and **Automatic** then the device will establish connection to the neareset SFC Protect server.
Choose **Automatic > Click on the green tick button** to confirm the change.



Or you may select **Relay Sharing** and use your **Relay Sharing Code** to create a profile if you have set up a Peplink Relay Client on another device.

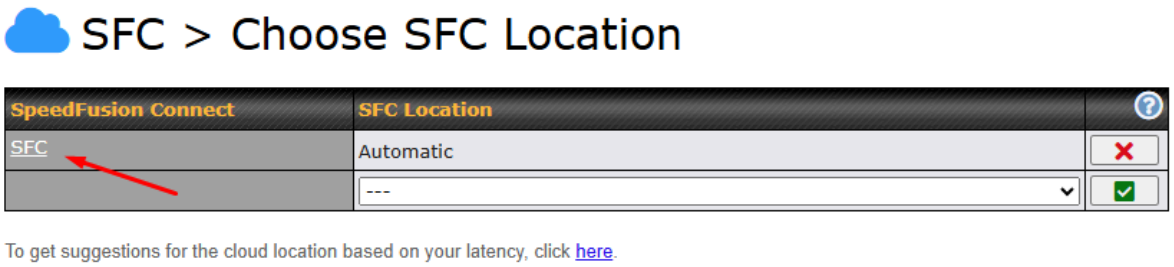


Click on **Apply Changes** to save the change.

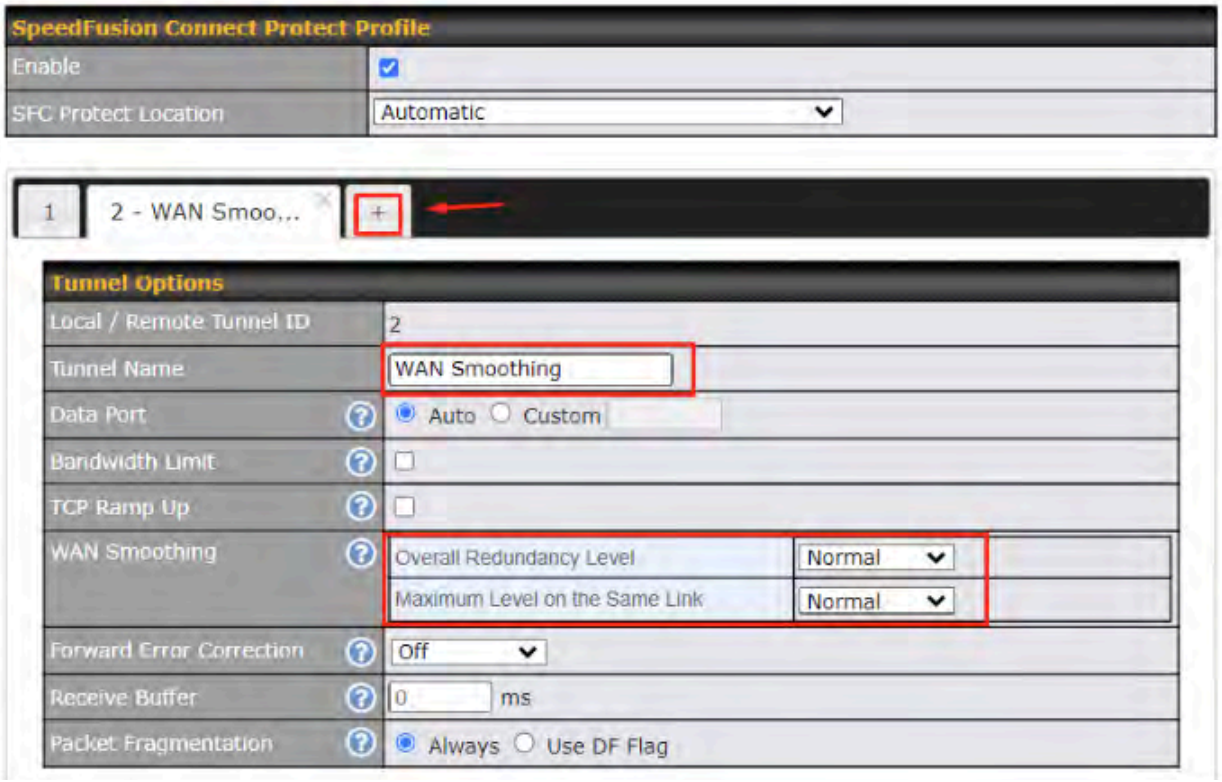


By default, the router will build a SpeedFusion tunnel to the SpeedFusion Connect Protect.

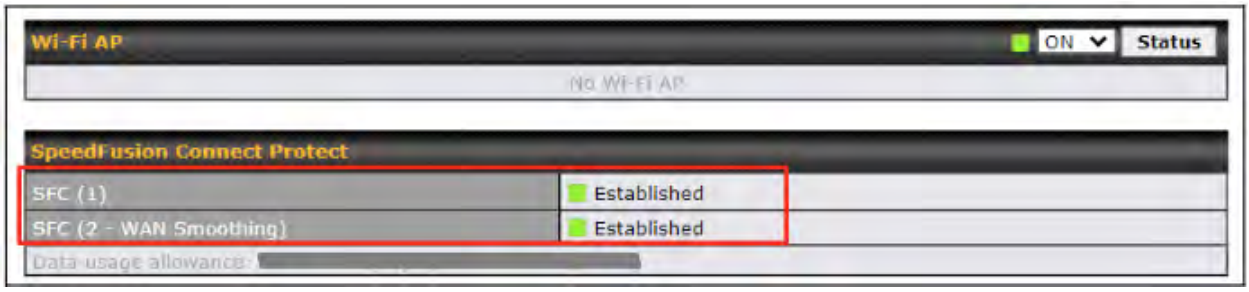
If you are running a latency sensitive service like video streaming or VOIP, a WAN Smoothing sub-tunnel can be created. Navigate to Navigate to **SFC Protect > Client Mode – for Outbound accesses > SFC**.



A SpeedFusion Connect Protect Profile configuration window will pop out. Click on the **+** sign to create the WAN Smoothing sub-tunnel.



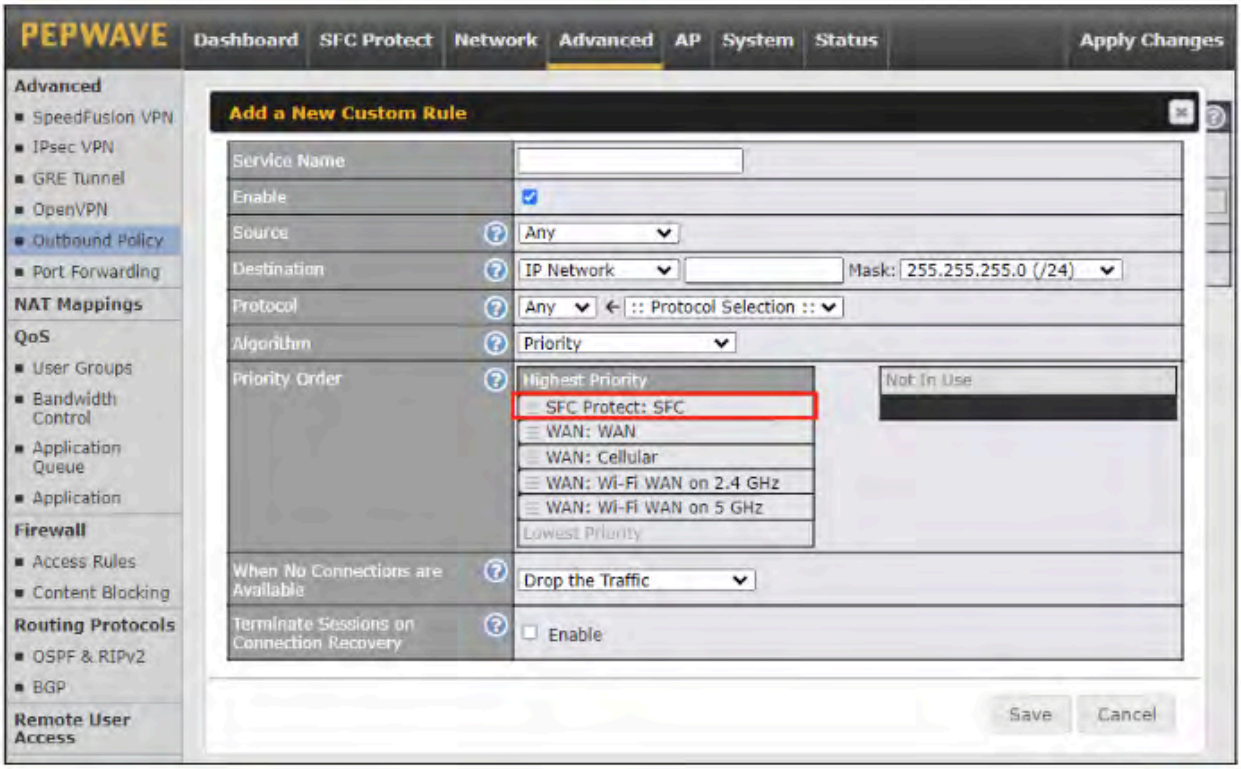
Click on **Save** and **Apply Changes** to save the configuration. Now, the router has 2 Speedfusion tunnels to the SpeedFusion Connect Protect.

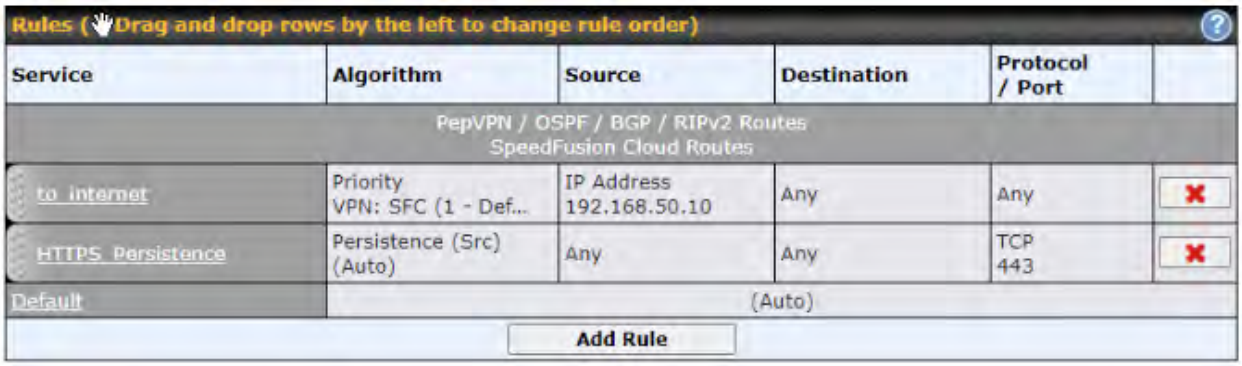


Data usage allowance is able to check from the below SpeedFusion Connect from Dashboard.

Status	
Data usage allowance: [remaining data] (Expiry date: 2025)	Remaining SFC data usage occurs.
Fair usage policy (Expiry date: 2025)	Device with active care plan but exceeded SFC data usage. This mode will reduce the throughput to 10 Mbps

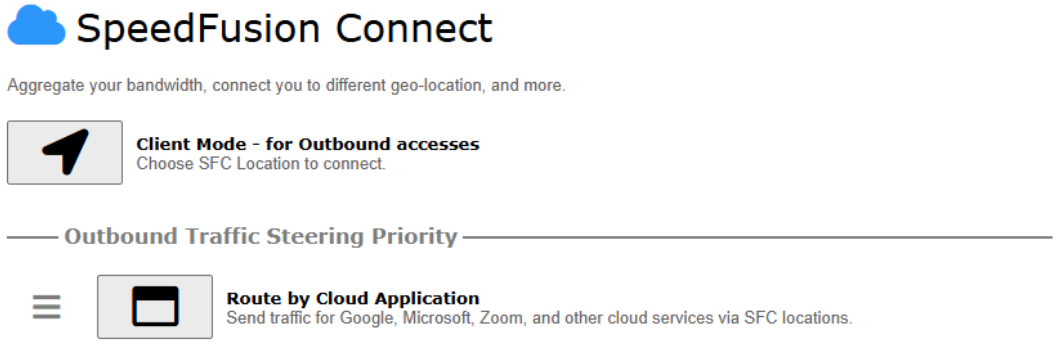
Create an outbound policy to steer the internet traffic to go into SFC Protect. Please go to **Advanced > Outbound Policy**, click on **Add Rule** to create a new outbound policy.





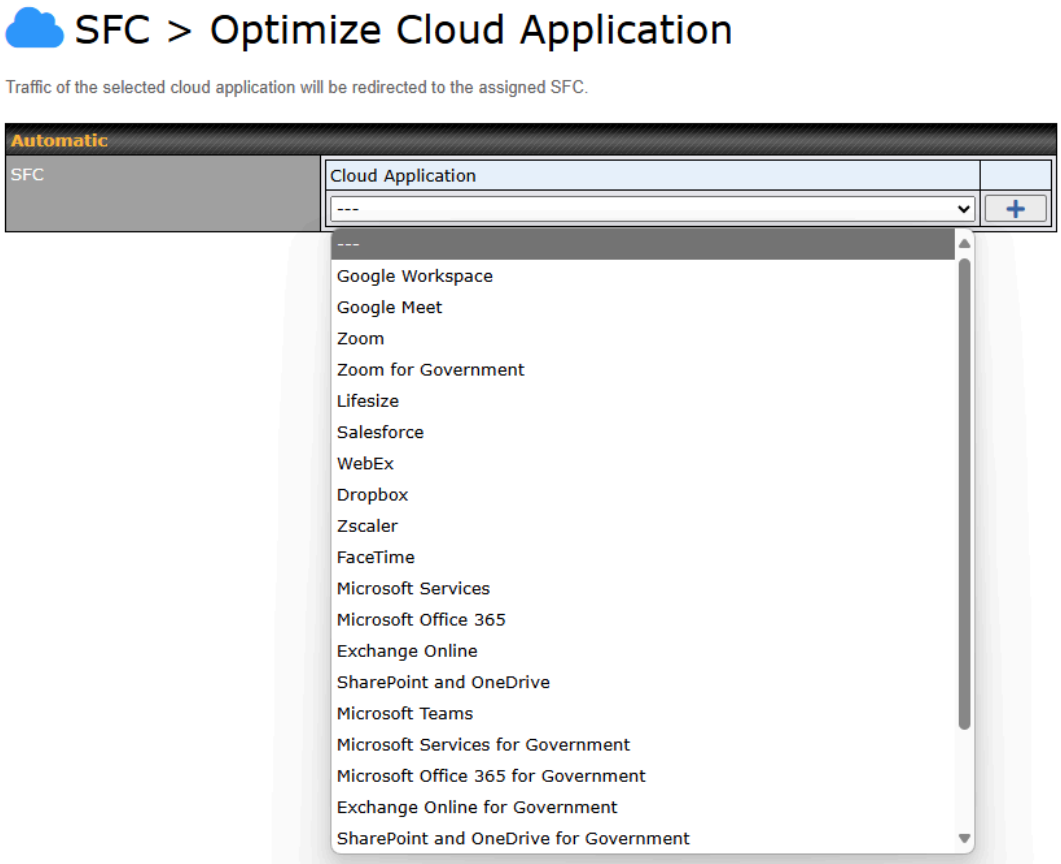
6.3 Route by Cloud Application

Optimize Cloud Application allows you to route Internet traffic through SpeedFusion Connect Protect based on the application. Go to **SFC Protect > Route by Cloud Application.**



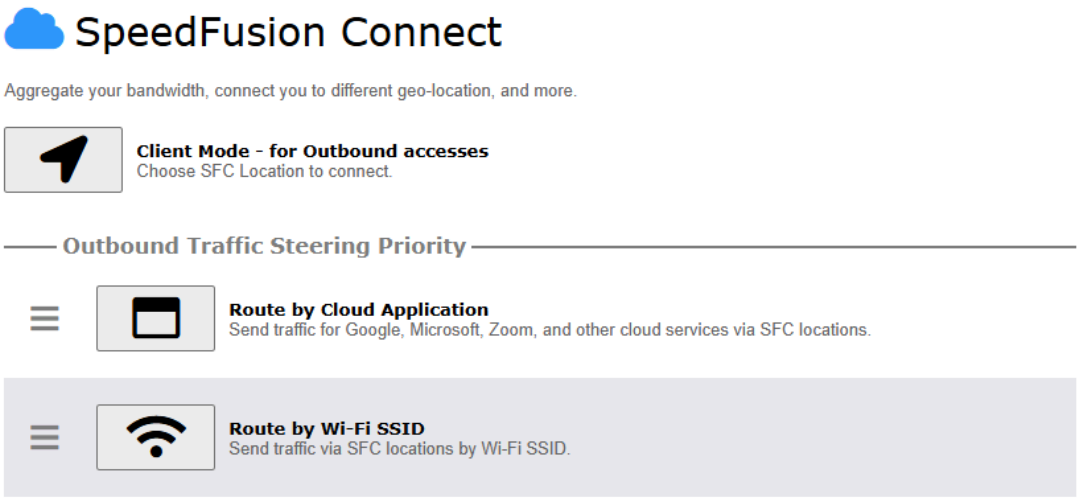
Select a Cloud application to route through SpeedFusion Connect Protect from the drop down list > Click  > Save > Apply Changes.

Click the  to remove a selected Cloud application from routing through SpeedFusion Connect Protect.

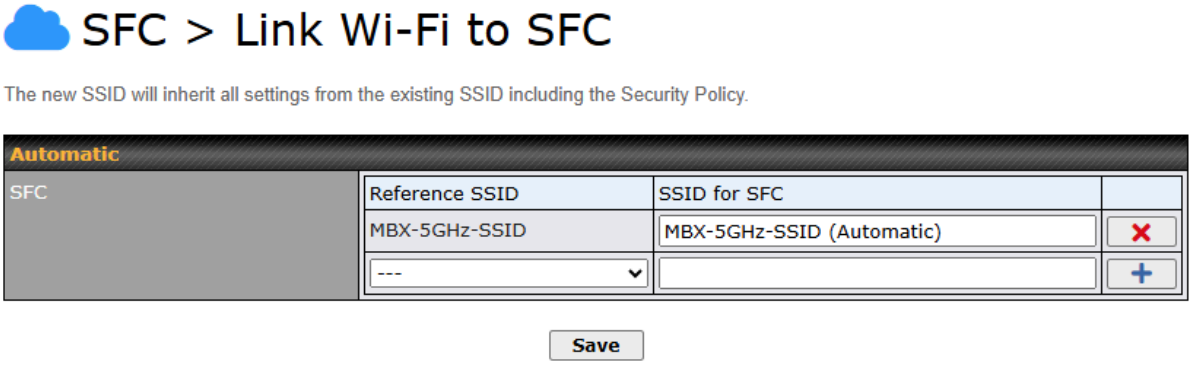


6.4 Route by Wi-Fi SSID

SpeedFusion Connect Protect provides a convenient way to route the Wi-Fi client to the cloud from **SFC Protect > Route by Wi-Fi SSID**.



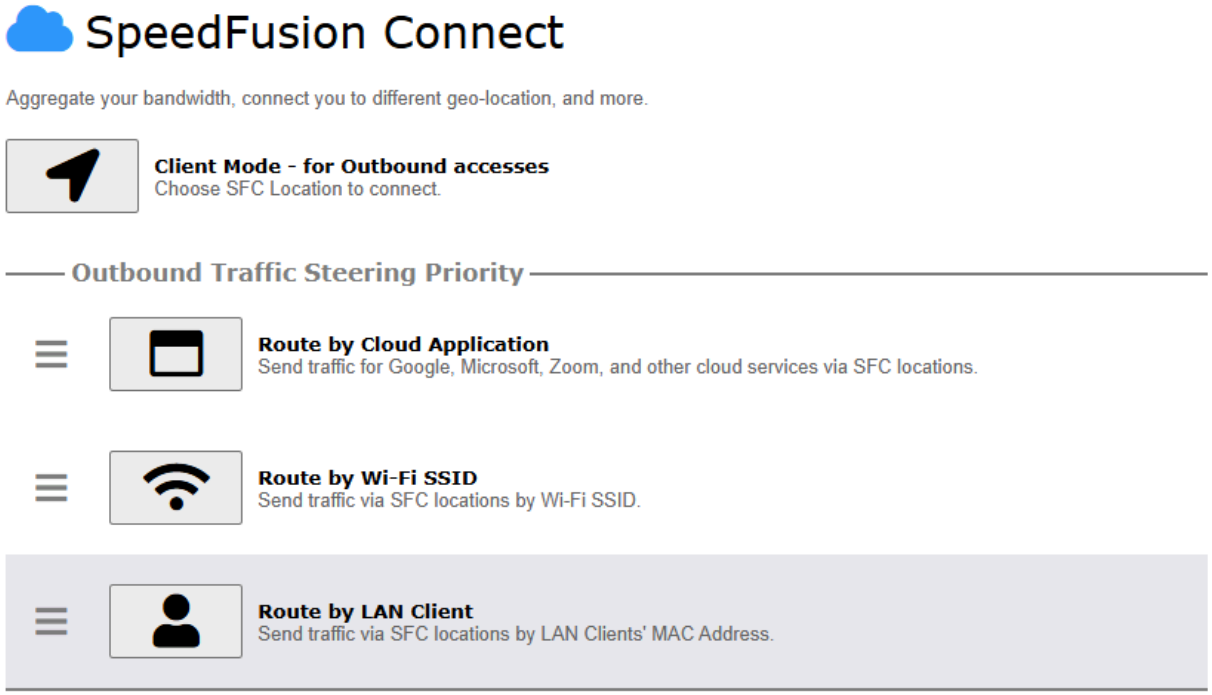
Create a new SSID for SFC Protect. The new SSID will inherit all settings from one of the existing SSIDs including the Security Policy. Then click **Save** followed by **Apply Changes**.



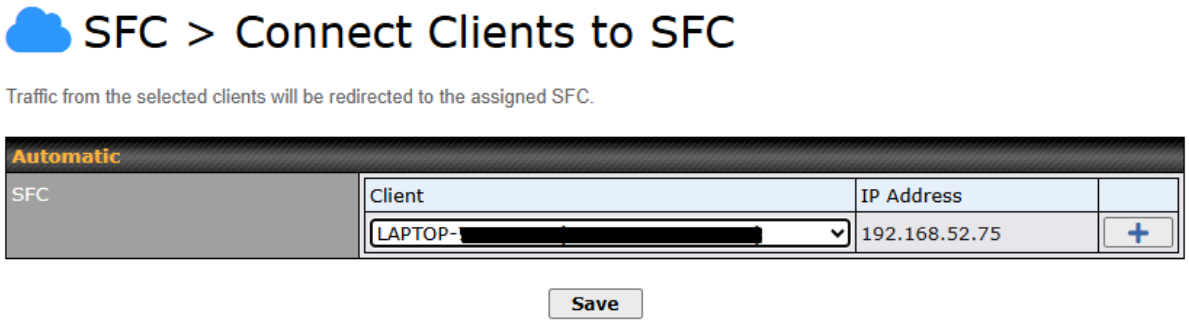
SFC Protect SSID will be shown on **Dashboard**.

6.5 Route by LAN Client

SpeedFusion Connect Protect provides a convenient way to route the LAN client to the cloud from **SFC Protect > Route by LAN Client**.



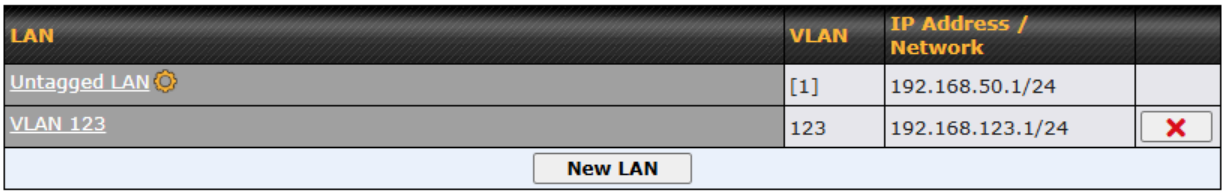
Choose a client from the drop down list > Click **+** > Save > Apply Changes.



7 Configuring the LAN Interface(s)

7.1 Basic Settings

LAN interface settings are located at **Network > LAN > Network Settings**. Navigating to that page will show the following dashboard:

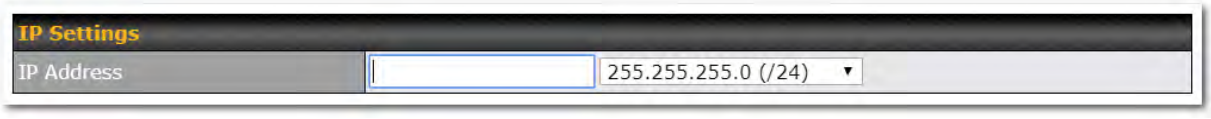


This represents the LAN interfaces that are active on your router (including VLAN). A gray "X" means that the VLAN is used in other settings and cannot be deleted. You can find which settings are using the VLAN by hovering over the gray "X".

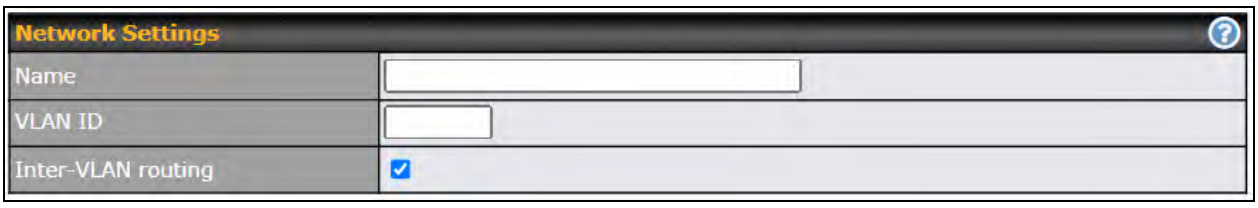
Alternatively, a red "X" means that there are no settings using the VLAN. You can delete that VLAN by clicking the red "X"

Note: Default VLAN 1 is used for untagged LAN. Unused VLAN will be assigned if user has configured VLAN 1 for some other LAN network in previous firmware version.

Clicking on any of the existing LAN interfaces (or creating a new one) will show the following :

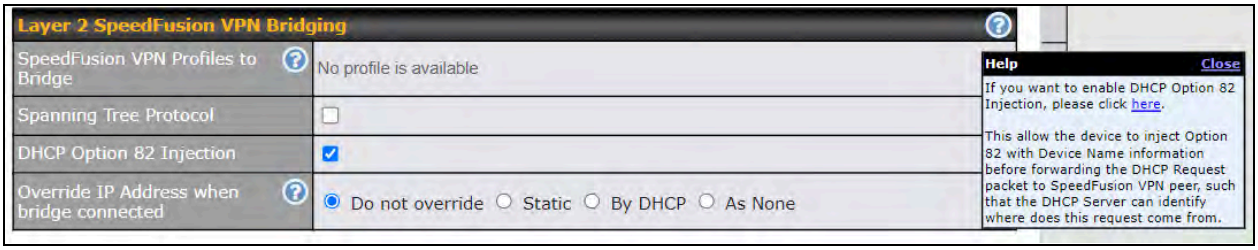


IP Settings	
IP Address	The IP address and subnet mask of the Peplink router on the LAN.

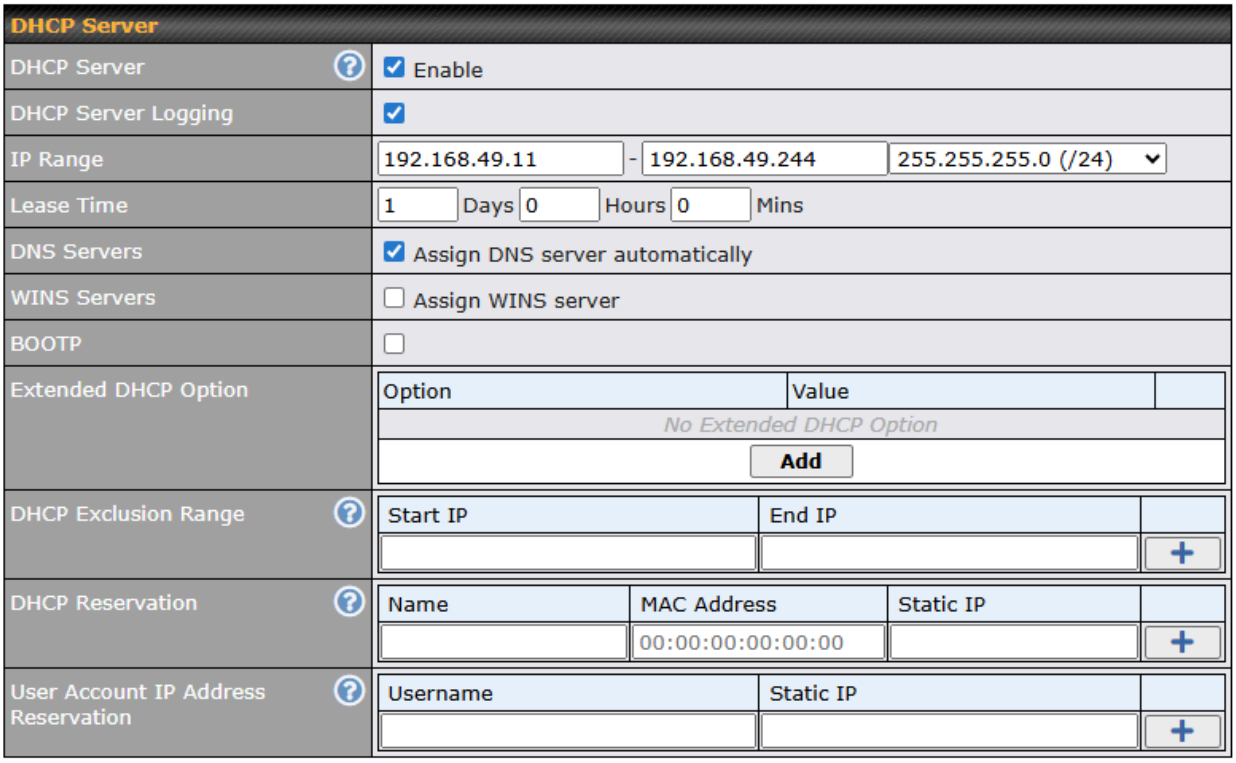


Network Settings	
Name	Enter a name for the LAN.

VLAN ID	Enter a number for your VLAN
Inter-VLAN routing	Check this box to enable routing between virtual LANs.



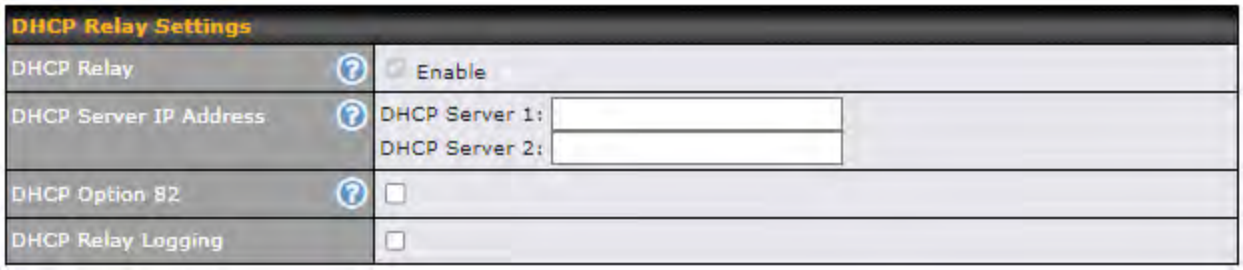
Layer 2 SpeedFusion VPN Bridging	
SpeedFusion VPN Profiles to Bridge	The remote network of the selected SpeedFusion VPN profiles will be bridged with this local LAN, creating a Layer 2 SpeedFusion VPN, they will be connected and operate like a single LAN, and any broadcast or multicast packets will be sent over the VPN.
Spanning Tree Protocol	Click the box will enable STP for this layer 2 profile bridge.
DHCP Option 82	Click on the question Mark if you want to enable DHCP Option 82. This allows the device to inject Option 82 with Router Name information before forwarding the DHCP Request packet to a SpeedFusion VPN peer, such that the DHCP Server can identify where the request originates from.
Override IP Address when bridge connected	Select "Do not override" if the LAN IP address and local DHCP server should remain unchanged after the Layer 2 SpeedFusion VPN is up. If you choose to override the IP address when the VPN is connected, the device will not act as a router, and most Layer 3 routing functions will cease to work.



DHCP Server Settings	
DHCP Server	When this setting is enabled, the Peplink router's DHCP server automatically assigns an IP address to each computer that is connected via LAN and configured to obtain an IP address via DHCP. The Peplink router's DHCP server can prevent IP address collisions on the LAN. To enable DHCP bridge relay, please click the icon on this menu item.
DHCP Server Logging	Enable logging of DHCP events in the eventlog by selecting the checkbox.
IP Range	These settings allocate a range of IP addresses that will be assigned to LAN computers by the Peplink router's DHCP server.
Lease Time	This setting specifies the length of time throughout which an IP address of a DHCP client remains valid. Upon expiration of **Lease Time**, the assigned IP address will no longer be valid and the IP address assignment must be renewed.
DNS Servers	This option allows you to input the DNS server addresses to be offered to DHCP clients. If **Assign DNS server automatically** is selected, the Peplink router's built-in DNS server address (i.e., LAN IP address) will be offered.
BOOTP	Check this box to enable BOOTP on older networks that still require it.

Extended DHCP Option	In addition to standard DHCP options (e.g. DNS server address, gateway address, subnet mask), you can specify the value of additional extended DHCP options, as defined in RFC 2132. With these extended options enabled, you can pass additional configuration information to LAN hosts. To define an extended DHCP option, click the **Add** button, choose the option to define, and then enter its value. For values that are in IP address list format, you can enter one IP address per line in the provided text area input control. Each option can be defined once only.
DHCP Reservation	This setting reserves the assignment of fixed IP addresses for a list of computers on the LAN. The computers to be assigned fixed IP addresses on the LAN are identified by their MAC addresses. The fixed IP address assignment is displayed as a cross-reference list between the computers' names, MAC addresses, and fixed IP addresses. **Name** (an optional field) allows you to specify a name to represent the device. MAC addresses should be in the format of **00:AA:BB:CC:DD:EE**. Press + to create a new record. Press ✖ to remove a record. Reserved clients information can be imported from the **Client List**, located at **Status>Client List**. For more details, please refer to **Section 22.3.**
User Account IP Address Reservation	This setting reserves the fixed IP addresses assignment for the list of Remote User Access accounts.

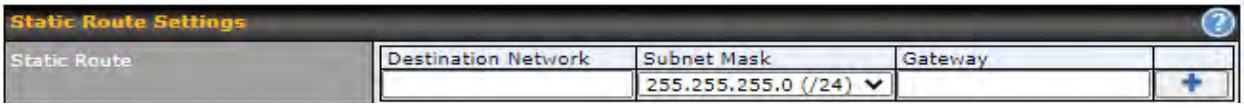
To configure DHCP relay, first click the button found next to the **DHCP Server** option to display the settings.



DHCP Relay Settings	
Enable	Check this box to turn on DHCP relay. Click the icon to disable DHCP relay.
DHCP Server IP Address	Enter the IP addresses of one or two DHCP servers in the provided fields. The DHCP servers entered here will receive relayed DHCP requests from the LAN. For active-passive DHCP server configurations, enter active and passive DHCP server relay IP addresses in **DHCP Server 1** and **DHCP Server 2.**
DHCP Option 82	DHCP Option 82 includes device information as relay agent for the attached client when forwarding DHCP requests from client to server. This option also embeds the device's MAC address and network name in circuit and remote IDs. Check this box to enable DHCP Option 82.

DHCP Relay Logging	Enable logging of DHCP Relay events in the eventlog by selecting the checkbox.

Once DHCP is set up, configure **LAN Physical Settings**, **Static Route Settings**, and **DNS Proxy Settings** as noted above.



Static Route Settings	
Static Route	This table is for defining static routing rules for the LAN segment. A static route consists of the network address, subnet mask, and gateway address. The address and subnet mask values are in *w.x.y.z* format. The local LAN subnet and subnets behind the LAN will be advertised to the VPN. Remote routes sent over the VPN will also be accepted. Any VPN member will be able to route to the local subnets. Press + to create a new route. Press ✖ to remove a route.

[A] - Advanced feature, please click the button on the top right hand corner of the Static Route section to activate and configure Virtual Network Mapping to resolve network address conflict with remote peers.

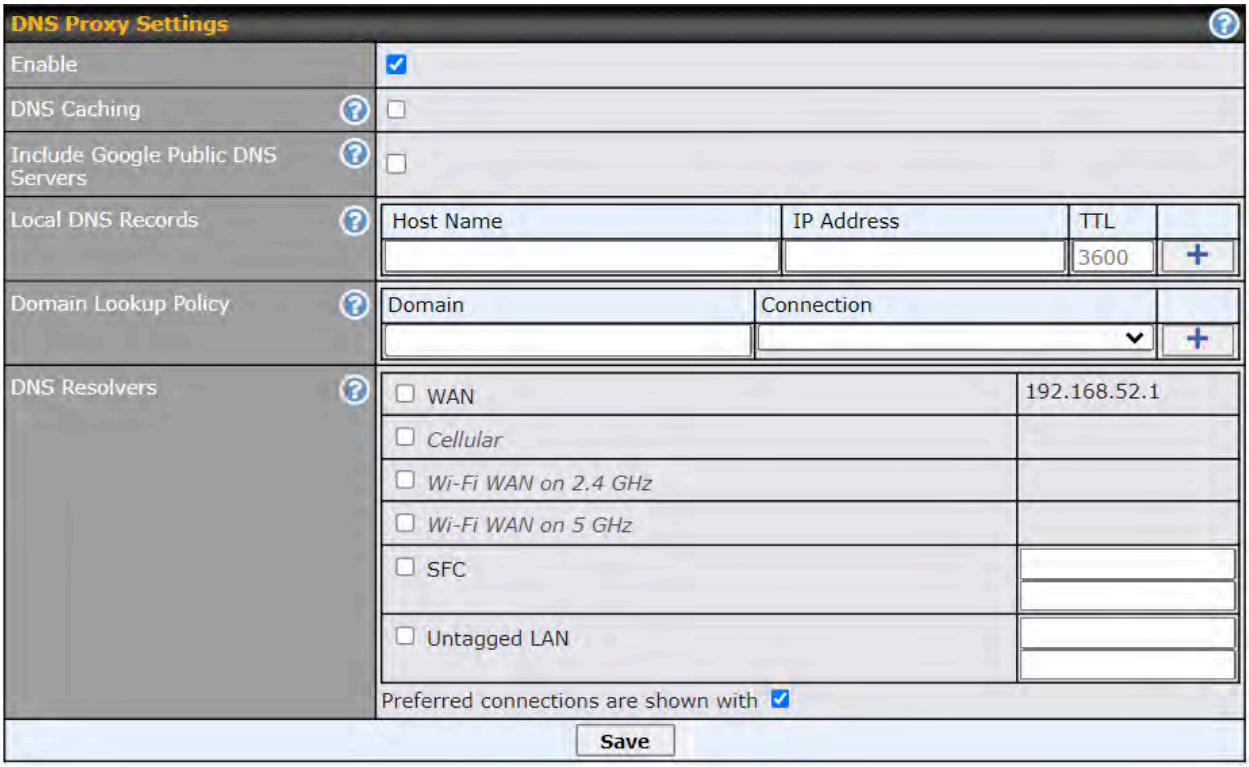
In case of a network address conflict with remote peers (i.e. SpeedFusion VPN / IPsec VPN / IP Forwarding WAN are considered as remote connections), you can define Virtual Network Mapping to resolve it.

Note: OSPF & RIPv2 settings should be updated as well to avoid advertising conflicted networks.

For further details on virtual network mapping watch this video:

https://youtu.be/C1FMdZCn3Z8

Virtual Network Mapping	
One-to-One NAT	Every IP Address in the Local Network has a corresponding unique Virtual IP Address for NAT. Traffic originating from the Local Network to remote connections will be SNAT'ed and behave like coming from the defined Virtual Network. While traffic initiated by remote peers to the Virtual Network will be DNAT'ed accordingly.
Many-to-One NAT	The subnet range defined in Local Network will be mapped to a single Virtual IP Address for NAT. Traffic can only be initiated from local to remote, and these traffic will be NAT'ed and behaves like coming from the same Virtual IP Address.

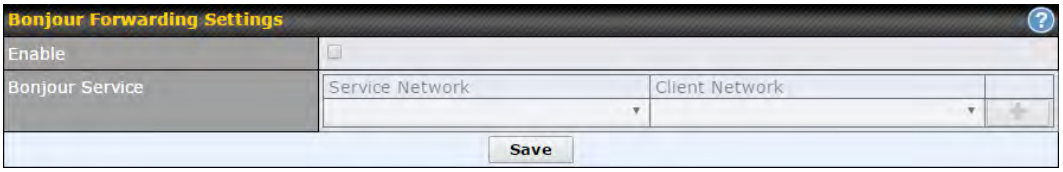


DNS Proxy Settings	
Enable	To enable the DNS proxy feature, check this box, and then set up the feature at **Network > LAN > DNS Proxy Settings**. A DNS proxy server can be enabled to serve DNS requests originating from LAN/PPTP/SpeedFusion™ peers. Requests are forwarded to the **DNS servers/resolvers** defined for each WAN connection.
DNS Caching	This field is to enable DNS caching on the built-in DNS proxy server. When the option is enabled, queried DNS replies will be cached until the records' TTL has been reached. This feature can help improve DNS lookup time. However, it cannot return the most up-to-date result for those frequently updated DNS records. By default, **DNS Caching** is disabled.
Include Google Public DNS Servers	When this option is **enabled**, the DNS proxy server will also forward DNS requests to Google's Public DNS Servers, in addition to the DNS servers defined in each WAN. This could increase the DNS service's availability. This setting is disabled by default.
Local DNS Records	This table is for defining custom local DNS records. A static local DNS record consists of a host name and IP address. When looking up the host name from the LAN to LAN IP of the Peplink router, the corresponding IP address will be returned. Press + to create a new record. Press ✖ to remove a record.
Domain Lookup Policy	DNS Proxy will lookup the domain names defined in this table using the specified connections only.

DNS Resolvers [A]	This field specifies which DNS servers can receive forwarded DNS requests. If no DNS server is selected, then all of them will be selected by default. If you wish to select a SpeedFusion VPN peer, enter the IP address(es) of the VPN peer's DNS server. Incoming queries will be forwarded to one of the selected servers. If none of the selected servers can be reached, then the router will forward incoming queries to all servers with healthy WAN connections.

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

Finally, if needed, configure Bonjour forwarding, Apple's zero configuration networking protocol. Once VLAN configuration is complete, click **Save** to store your changes.

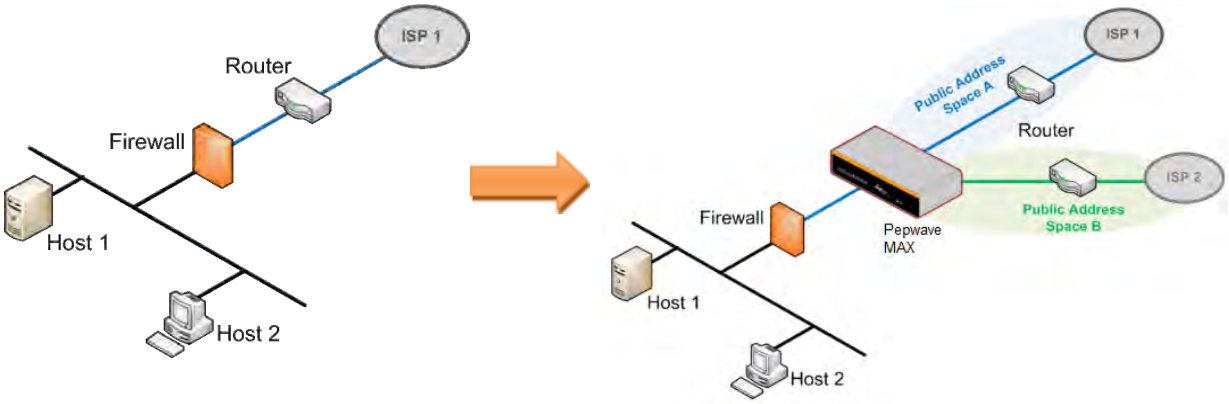


Bonjour Forwarding Settings	
Enable	Check this box to turn on Bonjour forwarding.
Bonjour Service	Choose **Service** and **Client** networks from the drop-down menus, and then click + to add the networks. To delete an existing Bonjour listing, click ✖.

Drop-In Mode

Drop-in mode (or transparent bridging mode) eases the installation of the Peplink MAX on a live network between the firewall and router, such that changes to the settings of existing equipment are not required.

The following diagram illustrates drop-in mode setup:

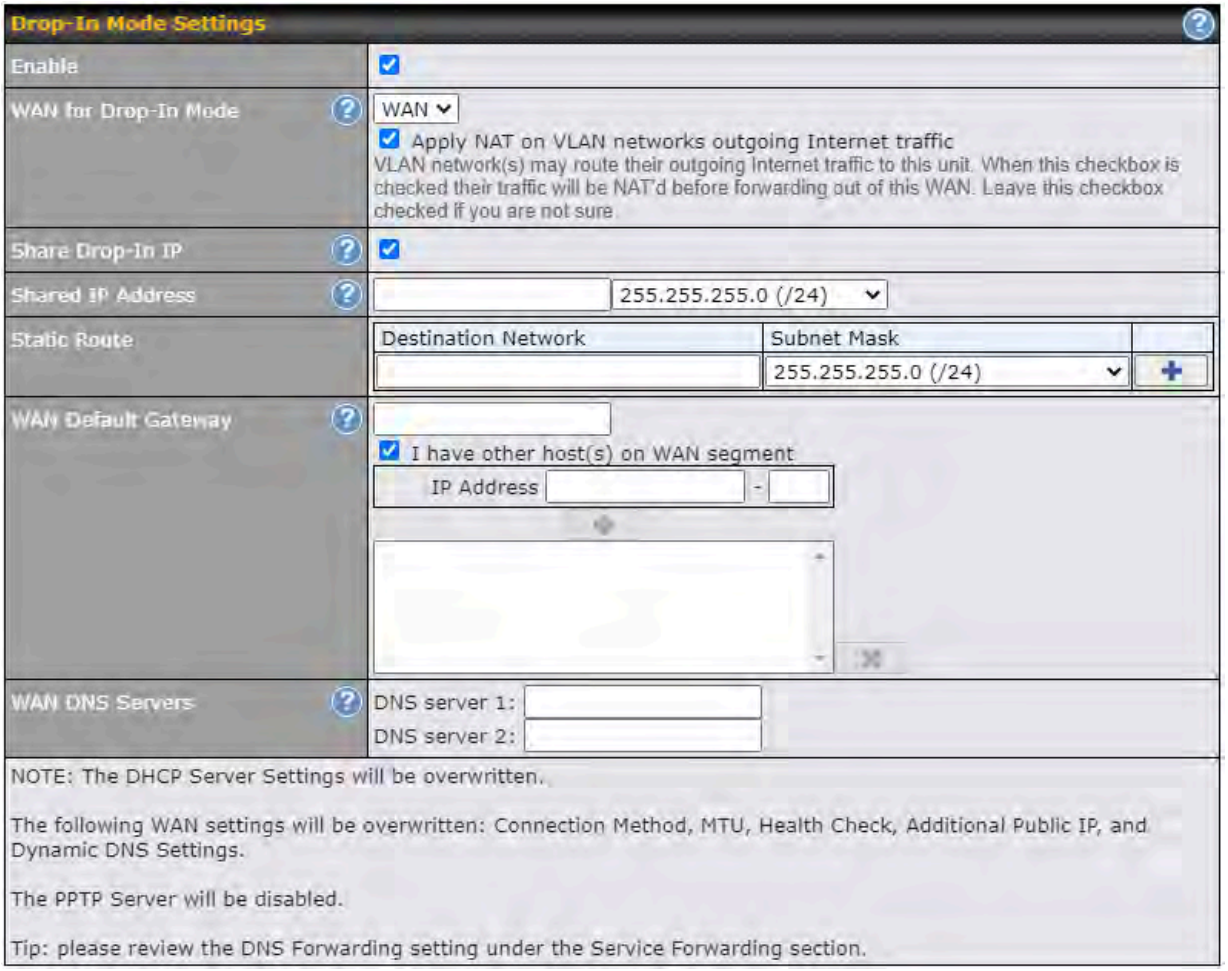


Check the box Enable to enable the Drop-in Mode. After enabling this feature and selecting the WAN for Drop-in mode, various settings including the WAN's connection method and IP address will be automatically updated.

When drop-in mode is enabled, the LAN and the WAN for drop-in mode ports will be bridged. Traffic between the LAN hosts and WAN router will be forwarded between the devices. In this case, the hosts on both sides will not notice any IP or MAC address changes.

After successfully setting up the Peplink MAX as part of the network using drop-in mode, it will, depending on model, support one or more WAN connections. Some MAX units also support multiple WAN connections after activating drop-in mode, though a SpeedFusion license may be required to activate more than one WAN port.

Please note the Drop-In Mode is mutually exclusive with VLAN.



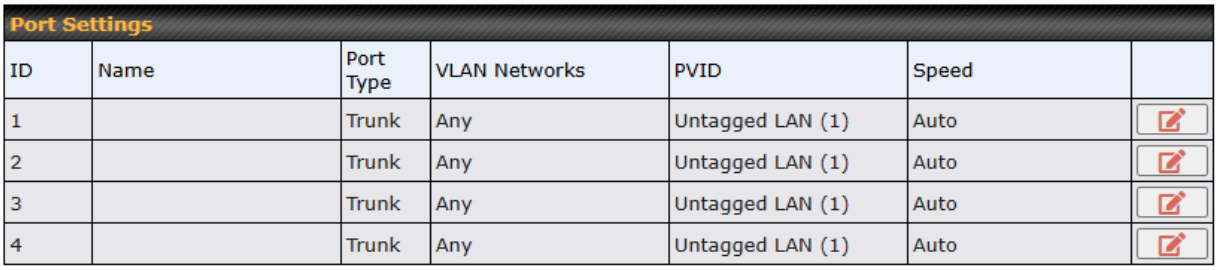
Drop-in Mode Settings	
Enable	Drop-in mode eases the installation of the Peplink MAX on a live network between the existing firewall and router, such that no configuration changes are required on existing equipment. Check the box to enable the drop-in mode feature.
WAN for Drop-In Mode	Select the WAN port to be used for drop-in mode. If **WAN** is selected, the high availability feature will be disabled automatically.
Shared Drop-In IP[A]	When this option is enabled, the passthrough IP address will be used to connect to WAN hosts (email notification, remote syslog, etc.). The MAX will listen for this IP address when WAN hosts access services provided by the MAX (web admin access from the WAN, DNS server requests, etc.). To connect to hosts on the LAN (email notification, remote syslog, etc.), the default gateway address will be used. The MAX will listen for this IP address when LAN hosts access services provided by the MAX (web admin access from the WAN, DNS proxy, etc.).

Shared IP Address[A]	Access to this IP address will be passed through to the LAN port if this device is not serving the service being accessed. The shared IP address will be used in connecting to hosts on the WAN (e.g., email notification, remote syslog, etc.) The device will also listen on the IP address when hosts on the WAN access services served on this device (e.g., web admin accesses from WAN, DNS server, etc.)
WAN Default Gateway	Enter the WAN router's IP address in this field. If there are more hosts in addition to the router on the WAN segment, click the button next to "WAN Default Gateway" and check the other **host(s) on the WAN segment** box and enter the IP address of the hosts that need to access LAN devices or be accessed by others.
WAN DNS Servers	Enter the selected WAN's corresponding DNS server IP addresses.

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

7.2 Port Settings

To configure port settings, navigate to **Network > Port Settings**

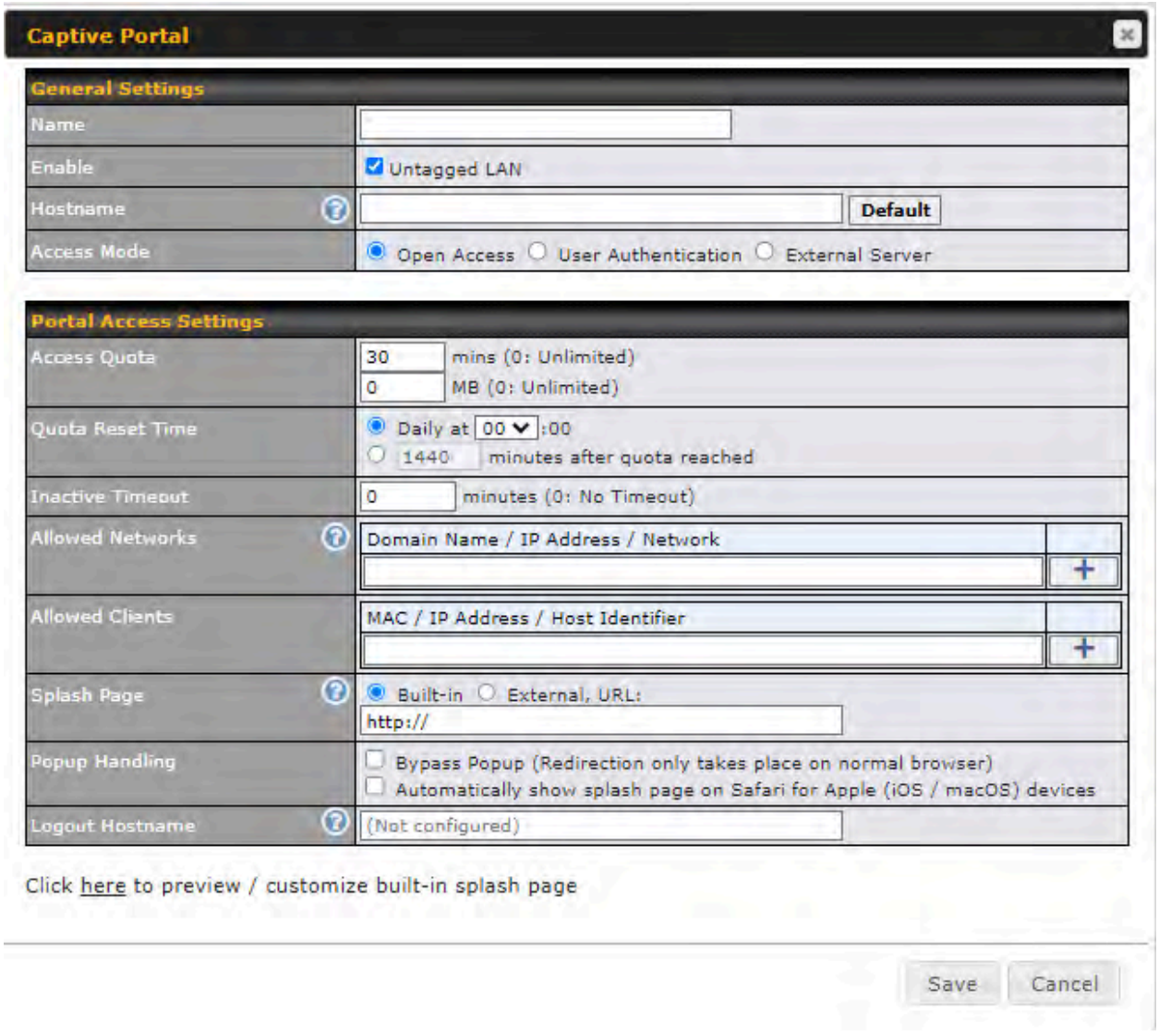


On this screen, you can enable specific ports, as well as determine the speed of the LAN ports, whether each port is a trunk or access port, as well as which VLAN each link belongs to, if any.

Untagged frames received by the port are classified to a VLAN indicated by Port VLAN Identifier (PVID). All frames from the VLAN are untagged on egress.PVID option is only configurable when Port Type is set to "Trunk".

7.3 Captive Portal

The captive portal serves as a gateway that clients have to pass if they wish to access the internet using your router. To configure, navigate to **Network > LAN > Captive Portal**.



Captive Portal Settings	
Name	Enter the name for the Captive Portal.
Enable	Check **Enable** and then, optionally, select the LANs/VLANs that will use the captive portal.
Hostname	To customize the portal's form submission and redirection URL, enter a new URL in this field. To reset the URL to factory settings, click **Default**.

Access Mode

Click **Open Access** to allow clients to freely access your router. Click **User Authentication** to force your clients to authenticate before accessing your router.

Select **External Server** to use the Captive Portal with a HotSpot system.

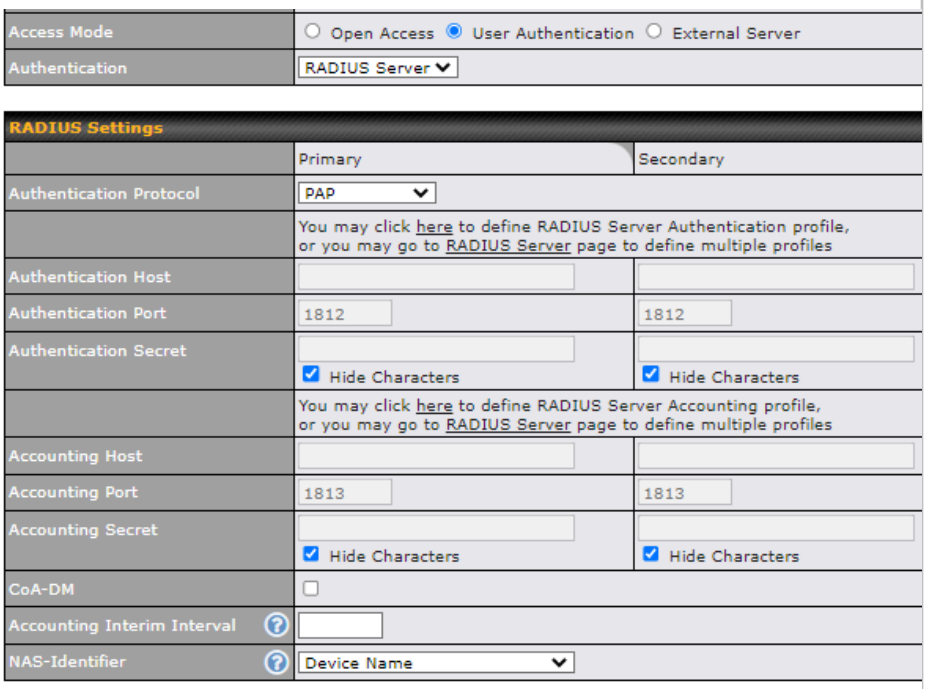
As described in the following knowledgebase article:

https://forum.peplink.com/t/using-hotspotsystem-wi-fi-on-Peplink-max-routers/

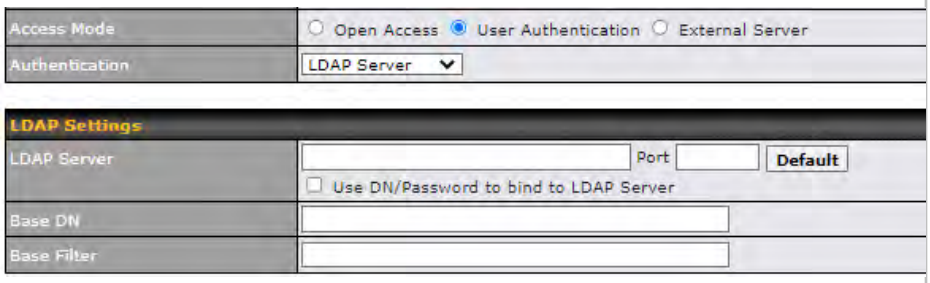
Authentication

When selecting the "**User Authentication**" in the Access Mode field, you will see the available option for the Authentication via drop-down list:

- RADIUS Server



- LDAP Server

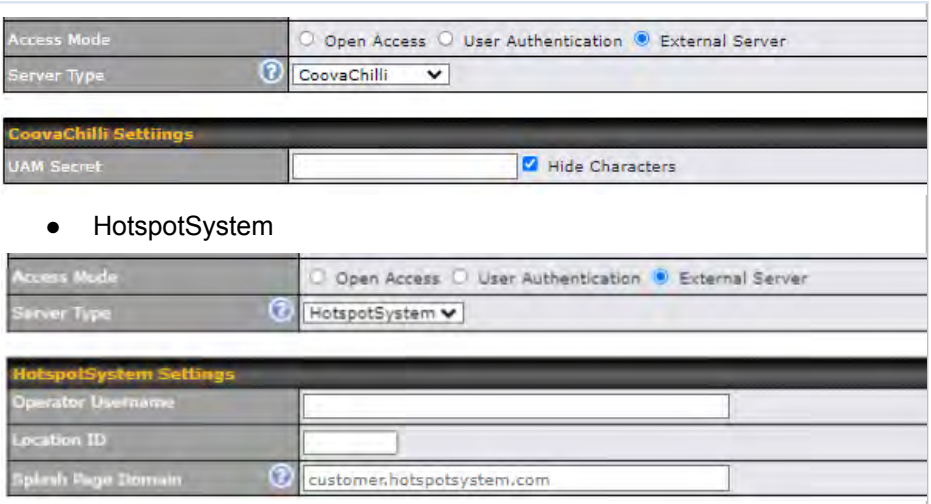


Fill in the necessary information to complete your connection to the server and enable authentication.

External Server

When selecting the "**External Server**" in the Access Mode field, you will see the available option for the Service Type via drop-down list:

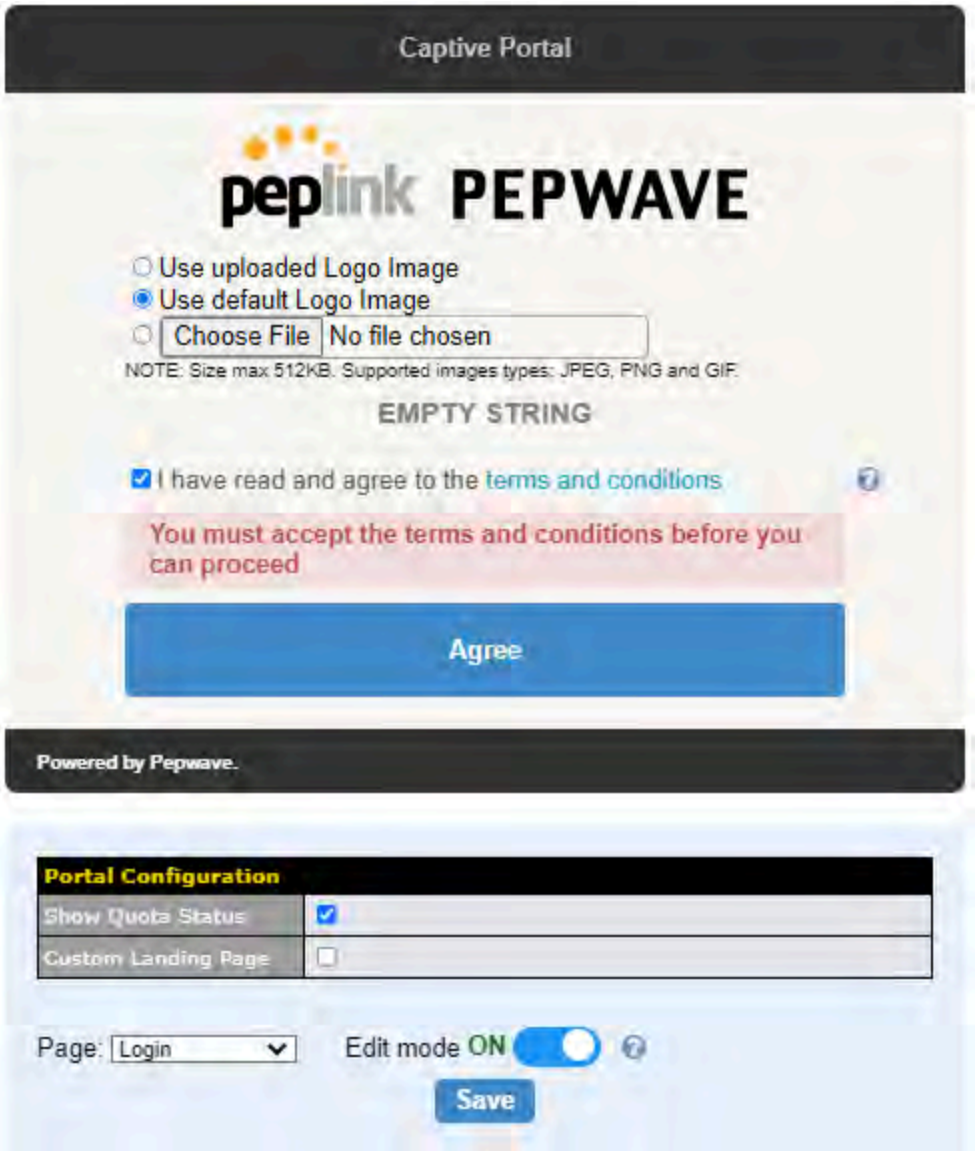
- CoovaChilli



- HotspotSystem

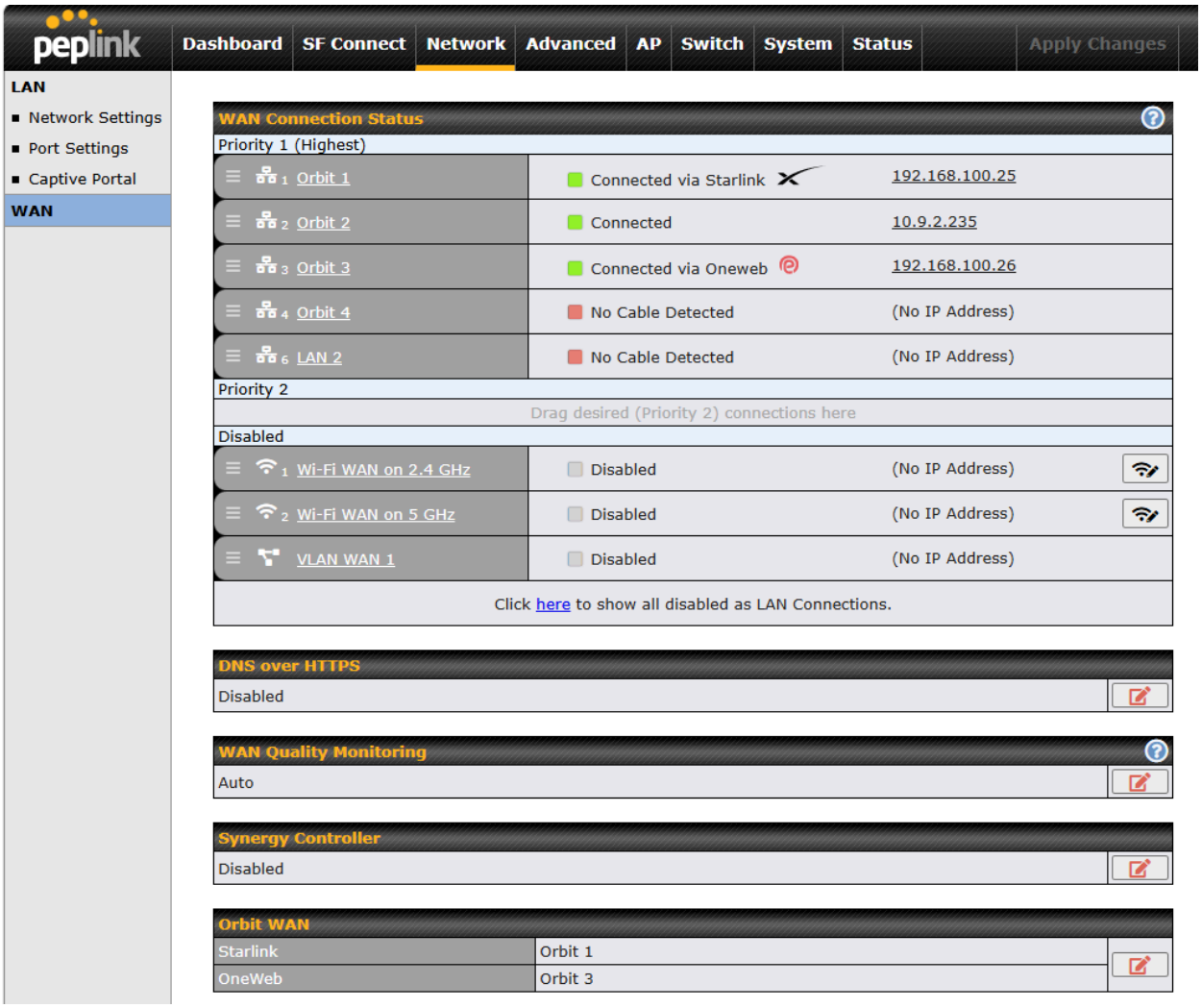
Fill in the necessary information to complete your connection to the server and enable authentication.

Access Quota	Set a time and data cap to each user's Internet usage.
Quota Reset Time	This menu determines how your usage quota resets. Setting it to **Daily** will reset it at a specified time every day. Setting a number of **minutes after quota reached** establish a timer for each user that begins after the quota has been reached.
Inactive Timeout	Clients will get disconnected when the inactive the configured time is reached. Default 0: no timeout
Allowed Networks	Add networks that can bypass the captive Portal in this field. To whitelist a network, enter the domain name / IP address here and click  . To delete an existing network from the list of allowed networks, click the  button next to the listing.
Allowed Clients	Add MAC address and /or IP addresses for client devices that are allowed to bypass the Captive Portal. Clients accessing these domains and IP addresses will not be redirected to the splash page.
Splash Page	Here, you can choose between using the Peplink router's built-in captive portal and redirecting clients to a URL you define.
Popup Handling	Configurable options for popup handling: - Bypass Popup (Redirection only takes place on normal browser) - Automatically show splash page on Safari for Apple (iOS / macOS) devices
Logout Hostname	A hostname that can be used to logout captive portal when being accessed on browser.
Customize splash page	Click on the provided link in the Captive portal profile to customize the splash page. A new browser tab is opened with a WYSIWYG editor of the splash page o edit the content, click on the corresponding element after switching Edit Mode to ON.



8 Configuring the WAN Interface(s)

WAN Interface settings are located at **Network > WAN**. To reorder WAN priority, drag on the appropriate WAN by holding the left mouse button, move it to the desired priority (the first one would be the highest priority, the second one would be lower priority, and so on), and drop it by releasing the mouse button.



To able a particular WAN connection, drag on the appropriate WAN by holding the left mouse button, move it the **Disabled** row, and drop it by releasing the mouse button.

You can also set priorities on the **Dashboard**. Click the **WAN** button in the corresponding row to modify the connection setting.

Important Note

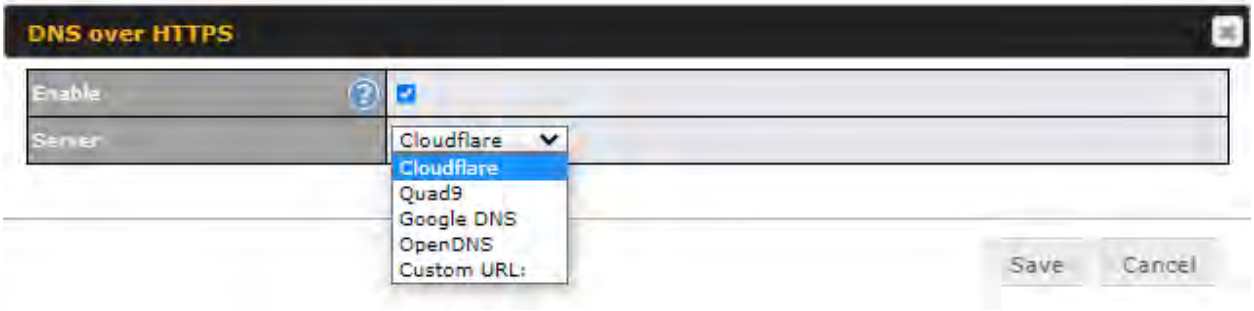
Connection details will be changed and become effective immediately after clicking the **Save and Apply** button.

IPv6

You can also enable IPv6 support in this section.

DNS over HTTPS (DoH)

You can enable DoH (DNS over HTTPS) support in this section.



DNS over HTTPS	
Enable	When this option is enabled, the DNS proxy server will use HTTPS connections to forward DNS requests to the DoH resolver; it will not fallback to traditional UDP DNS options.
Server	The options to configure DoH with a predefined server are: • Cloudflare - The DNS server IP addresses for **Cloudflare** will be using 1.1.1.1, which is unfiltered. • Quad9 - The DNS server IP addresses for **Quad9** will be using 9.9.9.9 and 142.112.112.112, which is malware blocking and DNSSEC. • Google DNS - The DNS server IP addresses for **Google DNS** will be using 8.8.8.8 and 8.8.4.4, which is RFC8484 standard. • OpenDNS - The DNS server IP addresses for **OpenDNS** will be using 208.67.222.222 and 208.67.220.220, which is standard DNS. • Custom URL - You may select **Custom URL:**, and enter the **resolver URL** and **IP address**.

WAN Quality Monitoring

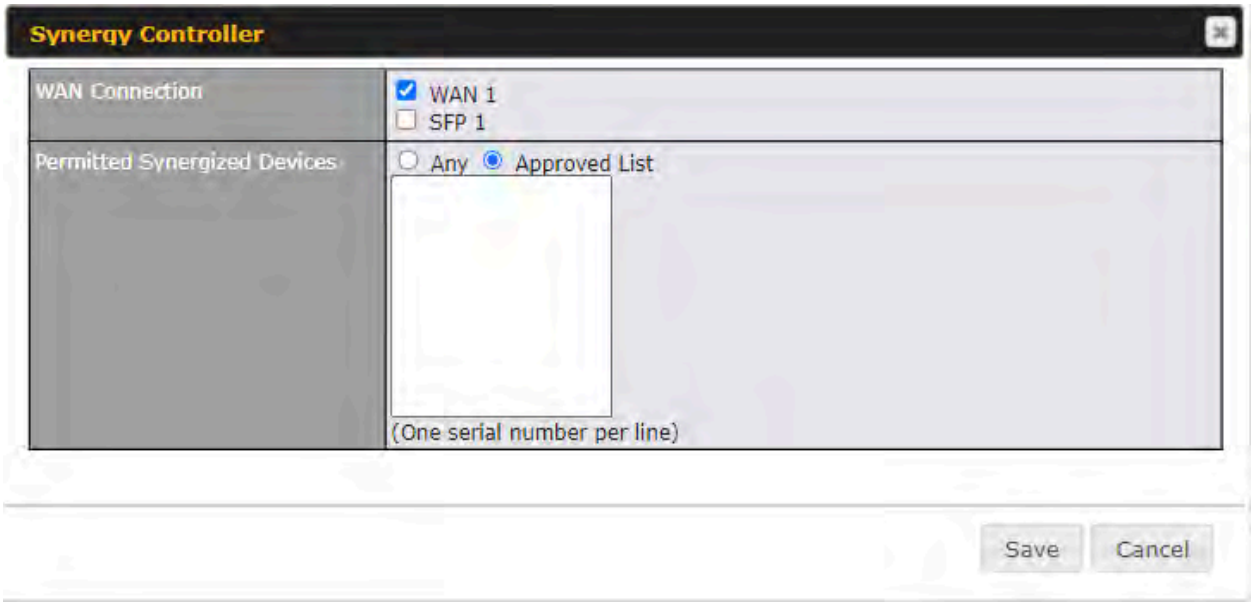
This settings advice how WAN Quality information is being gathered.

By default, WAN Quality will always be observed and gathered automatically. With customized choice of WAN connections, the device will always observe WAN Quality of those selected WAN connections. Other WAN connections may stop observing WAN Quality information if it is not necessary for the underlying features.

Synergy Mode

You can enable the Synergy Controller in this section.

You may click this  to enable the Synergy Controller. By default, the setting is disabled.

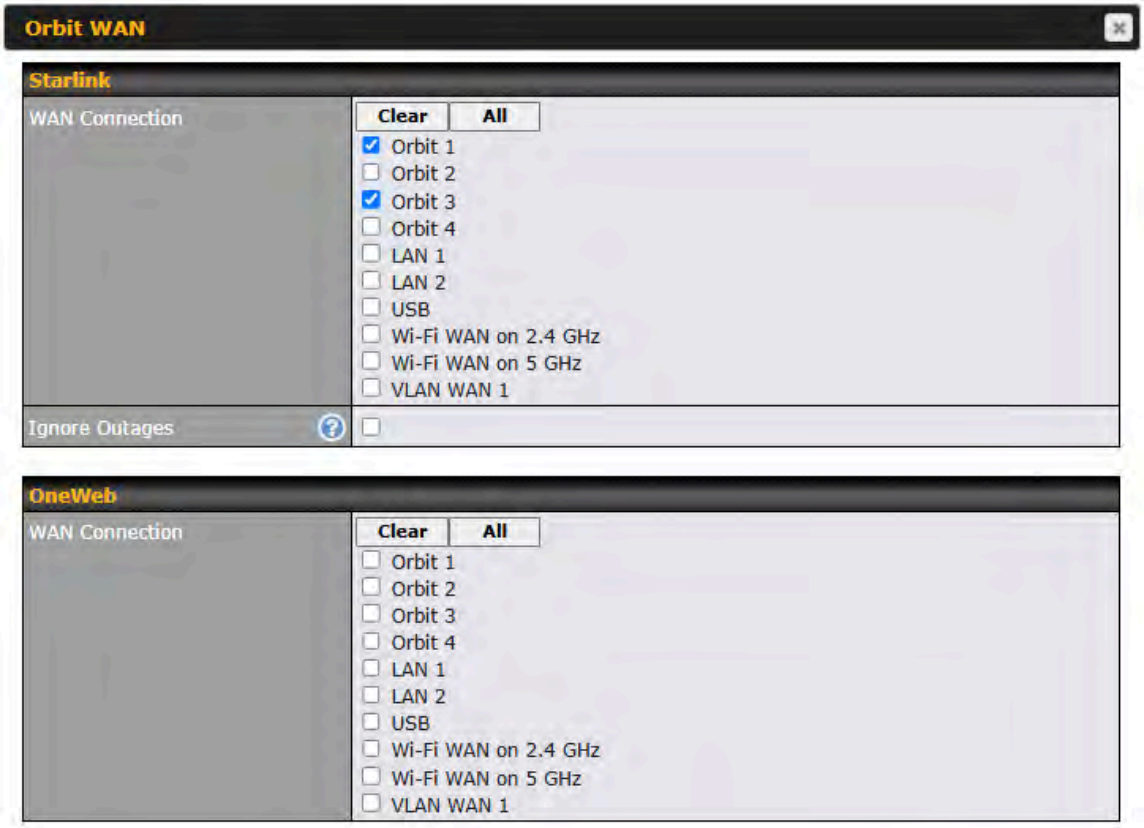


You may select the WAN connection to use as a Synegy Link which will connect to synergized devices.

Orbit WAN

The option is to enable Starlink / OneWeb management on the selected WAN connection.

You may click this  to show the WAN connection list to select which WAN connection to enable the management.



Starlink	
WAN connection	WAN option to enable Starlink management.
Ingnore Starlink Outages	Enable the device to ignore all outages (e.g., obstructed, no downlink, no pings). The WAN will only go down when its health check fails.
OneWeb	
WAN connection	WAN option to enable OneWeb management.

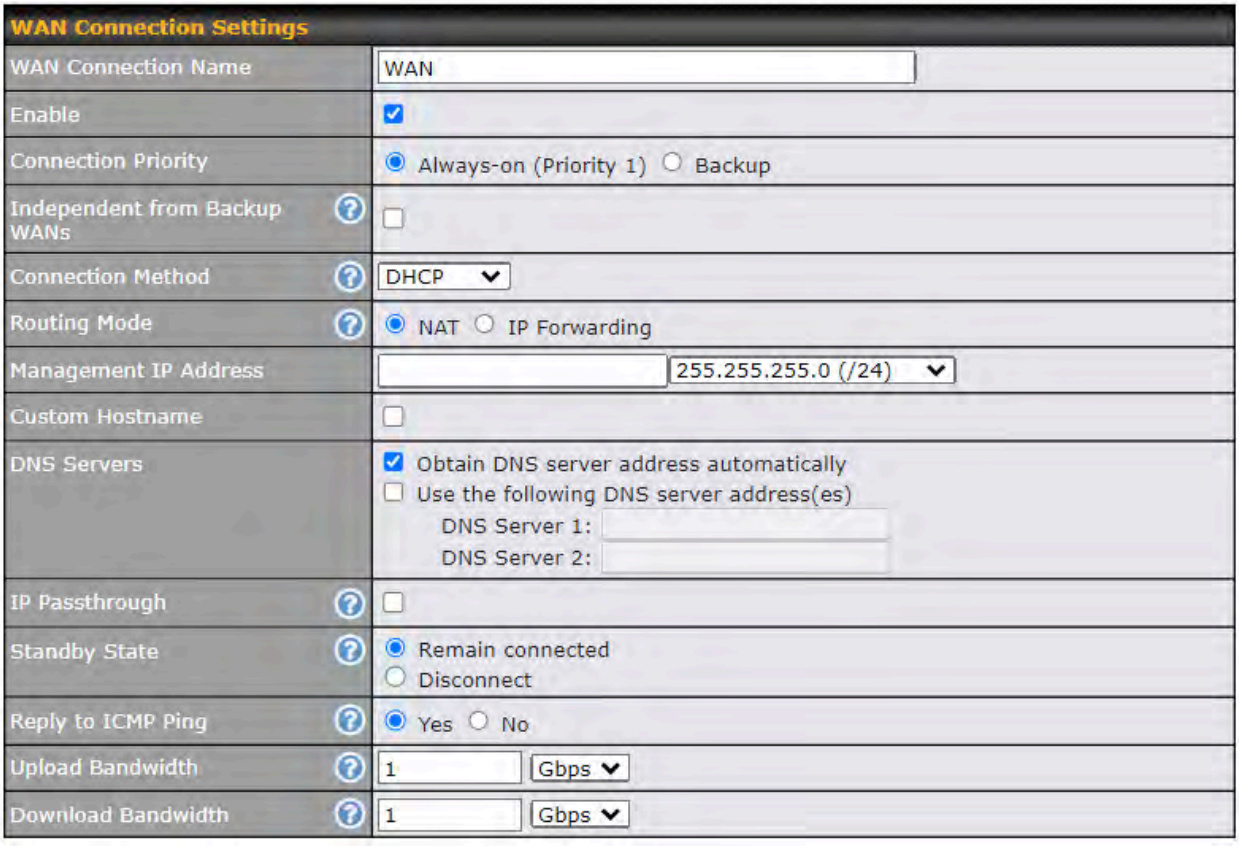
8.1 Orbit WAN / Ethernet WAN

There are four possible connection methods for the Ethernet WAN connection:

1. DHCP
2. Static IP
3. PPPoE
4. L2TP
5. GRE

8.1.1 DHCP Connection

The DHCP connection method is suitable if the ISP provides an IP address automatically using DHCP (e.g., satellite modem, WiMAX modem, cable, Metro Ethernet, etc.).



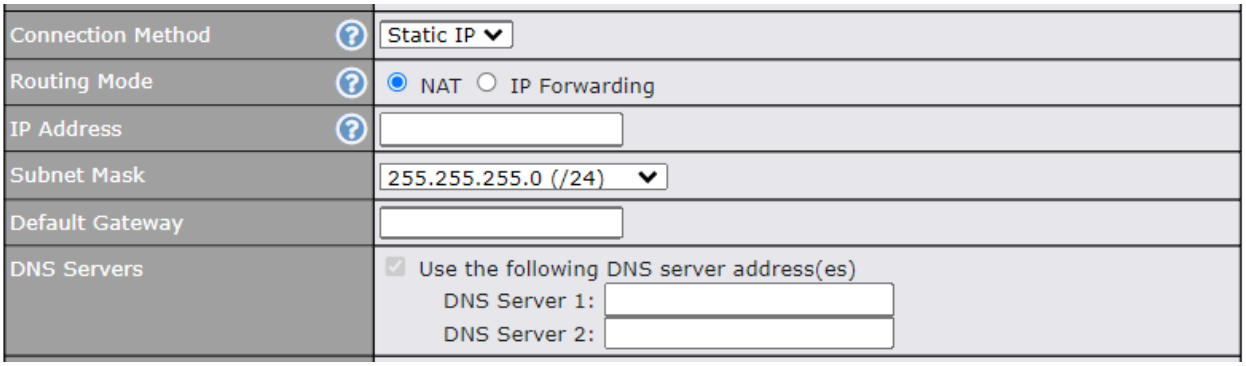
DHCP Connection Settings	
WAN Connection Name	Enter a name to represent this WAN connection.
Enable	This setting enables the WAN connection. If schedules have been defined,

	you will be able to select a schedule to apply to the connection.
Connection Priority	This option allows you to configure the WAN connection whether for normal daily usage or as a backup connection only. If **Always-on** is chosen, the WAN connection will be kept on continuously, regardless of the priority of other WAN connections. If **Backup** is chosen, the WAN connection will depend on other WAN connections. It will not be used when one or more higher priority dependent WAN connections are connected.
Independent from Backup WANs	If this is checked, the connection will be working independent from other Backup WAN connections. Those in **Backup Priority** will ignore the status of this WAN connection, and will be used when none of the other higher priority connections are available.
Routing Mode	NAT allows substituting the real address in a packet with a mapped address that is routable on the destination network. By clicking the help icon in this field, you can display the **IP Forwarding** option, if your network requires it.
Management IP Address	**Management IP Address** is available for configuration when you click **here** for other DHCP settings. This option allows you to configure the management IP address for the DHCP WAN connection.
Custom Hostname	If your service provider's DHCP server requires you to supply a hostname value upon acquiring an IP address, you may enter the value here. If your service provider does not provide you with the value, you can safely bypass this option.
DNS Servers	Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) servers to be used when a DNS lookup is routed through this connection. Selecting **Obtain DNS server address automatically** results in the DNS servers being assigned by the WAN DHCP server to be used for outbound DNS lookups over the connection. (The DNS servers are obtained along with the WAN IP address assigned from the DHCP server.) When **Use the following DNS server address(es)** is selected, you may enter custom DNS server addresses for this WAN connection into the **DNS Server 1** and **DNS Server 2** fields.

IP Passthrough	When this **IP Passthrough** option is active, after the ethernet WAN connection is up, the router's DHCP server will offer the connection's IP address to one LAN client. All incoming or outgoing traffic will be routed without NAT. Regardless the WAN connection's state, the router always binds to the LAN IP address (Default: 192.168.50.1). So when the ethernet WAN is connected, the LAN client could access the router's web admin by manually configuring its IP address to the same subnet as the router's LAN IP address (e.g. 192.168.50.10). Note: when this option is firstly enabled, the LAN client may not be able to refresh its IP address to the ethernet WAN IP address in a timely fashion. The LAN client may have to manually renew its IP address from DHCP server. After this option is enabled, the DHCP lease time will be 2 minutes. I.e. the LAN client could refresh its IP address and access the network at most one minute after the ethernet WAN connection goes up.
Standby State	This option allows you to choose whether to remain connected when this WAN connection is no longer in the highest priority and has entered the standby state. When **Remain connected** is chosen, upon bringing up this WAN connection to active, it will be immediately available for use. If this WAN connection is charged by connection time, you may want to set this option to **Disconnect** so that connection will be made only when needed. SpeedFusion VPN may use connected standby WAN for failover if link failure detected on the higher priority WAN, you can set this option to Disconnect to avoid data passing through.
Reply to ICMP PING	If the checkbox is **unticked**, this option is disabled and the system will not reply to any ICMP ping echo requests to the WAN IP addresses of this WAN connection. Default: **ticked** (Yes)
Upload Bandwidth	This field refers to the maximum upload speed. This value is referenced when default weight is chosen for outbound traffic and traffic prioritization. A correct value can result in effective traffic prioritization and efficient use of upstream bandwidth.
Download Bandwidth	This field refers to the maximum download speed. Default weight control for outbound traffic will be adjusted according to this value.

8.1.2 Static IP Connection

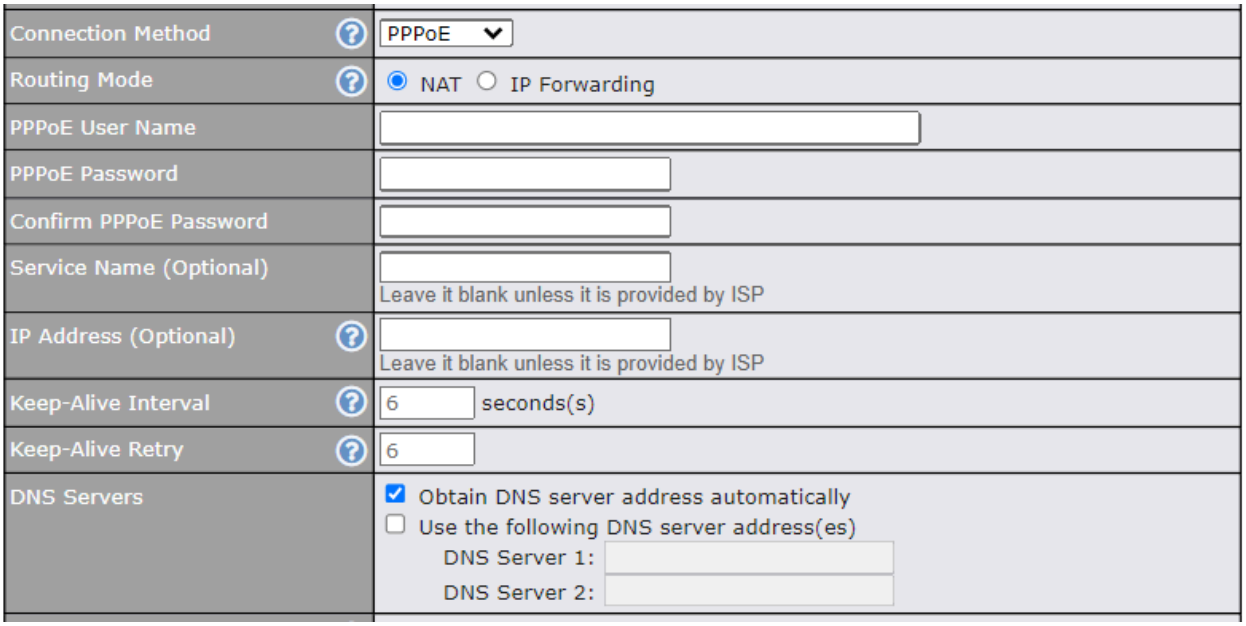
The Static IP connection method is suitable if your ISP provides a static IP address to connect directly.



Static IP Settings	
Routing Mode	NAT allows substituting the real address in a packet with a mapped address that is routable on the destination network. By clicking the help icon in this field, you can display the **IP Forwarding** option, if your network requires it.
IP Address / Subnet Mask / Default Gateway	These settings allow you to specify the information required in order to communicate on the Internet via a fixed Internet IP address. The information is typically determined by and can be obtained from the ISP.
DNS Servers	Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) servers to be used when a DNS lookup is routed through this connection. Selecting **Obtain DNS server address automatically** results in the DNS servers being assigned by the WAN DHCP server to be used for outbound DNS lookups over the connection. (The DNS servers are obtained along with the WAN IP address assigned from the DHCP server. When **Use the following DNS server address(es)** is selected, you may enter custom DNS server addresses for this WAN connection into the **DNS Server 1** and **DNS Server 2** fields.

8.1.3 PPPoE Connection

The PPPoE connection method is suitable if your ISP provides a login ID/password to connect via PPPoE.

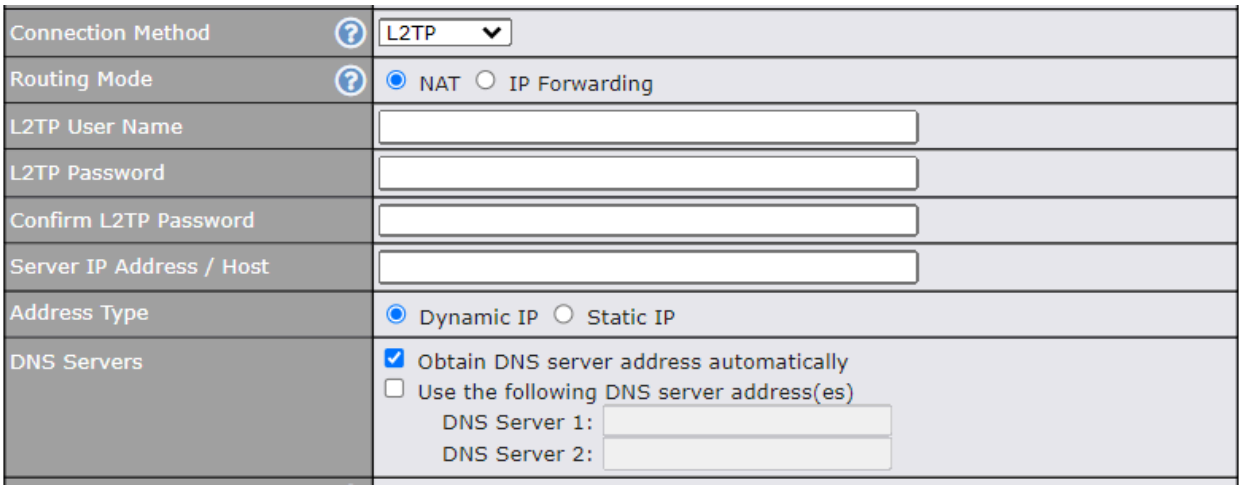


PPPoE Settings	
Routing Mode	NAT allows substituting the real address in a packet with a mapped address that is routable on the destination network. By clicking the help icon in this field, you can display the **IP Forwarding** option, if your network requires it.
PPPoE Username / Password	Enter the required information in these fields in order to connect via PPPoE to the ISP. The parameter values are determined by and can be obtained from the ISP.
Confirm PPPoE Password	Verify your password by entering it again in this field.
Service Name (Optional)	Service name is provided by the ISP. **Note: Leave this field blank unless it is provided by your ISP.**
IP Address (Optional)	If your ISP provides a PPPoE IP address, enter it here. **Note: Leave this field blank unless it is provided by your ISP.**
Keep Alive Interval	This is the time interval between each Keep-Alive packet.
Keep-Alive Retry	This is the number of consecutive Keep-Alive check failures before treating PPPoE connection as down.
DNS Servers	Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) servers to be used when a DNS lookup is routed through this connection.

	Selecting **Obtain DNS server address automatically** results in the DNS servers being assigned by the WAN DHCP server to be used for outbound DNS lookups over the connection. (The DNS servers are obtained along with the WAN IP address assigned from the DHCP server.) When **Use the following DNS server address(es)** is selected, you may enter custom DNS server addresses for this WAN connection into the **DNS Server 1** and **DNS Server 2** fields.

8.1.4 L2TP Connection

L2TP has all the compatibility and convenience of PPTP with greater security. Combine this with IPsec for a good balance between ease of use and security.

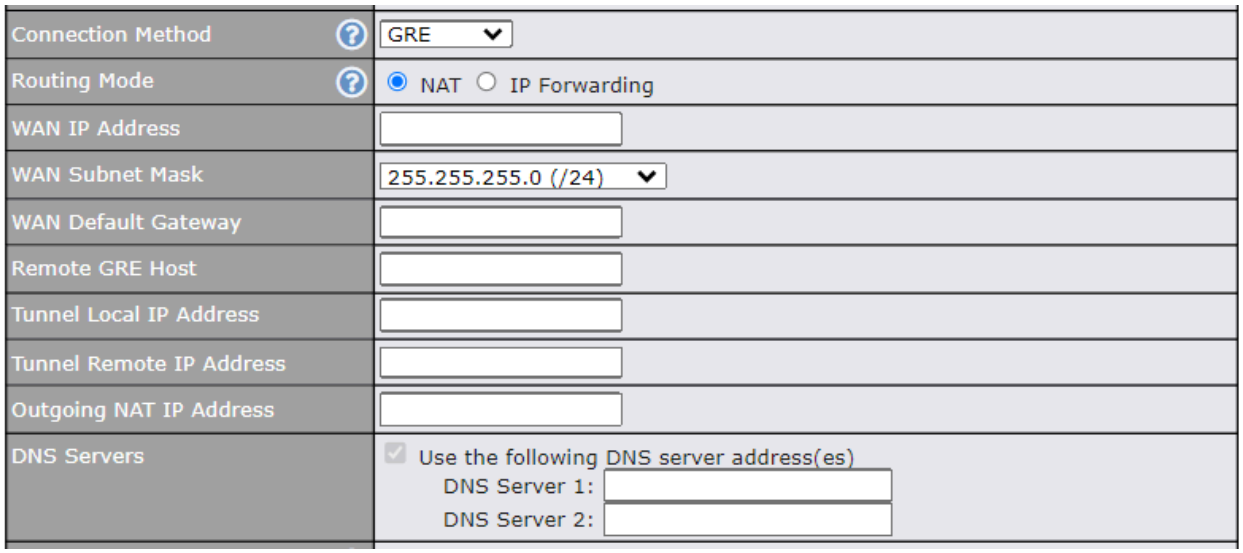


L2TP Settings	
Routing Mode	NAT allows substituting the real address in a packet with a mapped address that is routable on the destination network. By clicking the help icon in this field, you can display the **IP Forwarding** option, if your network requires it.
L2TP Username / Password	Enter the required information in these fields in order to connect via L2TP to your ISP. The parameter values are determined by and can be obtained from your ISP.
Confirm L2TP Password	Verify your password by entering it again in this field.
Server IP Address / Host	L2TP server address is a parameter which is provided by your ISP. **Note: Leave this field blank unless it is provided by your ISP**.
Address Type	Your ISP will also indicate whether the server IP address is Dynamic or Static. Please click the appropriate value.

DNS Servers	Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) servers to be used when a DNS lookup is routed through this connection. Selecting **Obtain DNS server address automatically** results in the DNS servers assigned by the PPPoE server to be used for outbound DNS lookups over the WAN connection. (The DNS servers are obtained along with the WAN IP address assigned from the PPPoE server.) When **Use the following DNS server address(es)** is selected, you can enter custom DNS server addresses for this WAN connection into the **DNS server 1** and **DNS server 2** fields.

8.1.5 GRE Connection

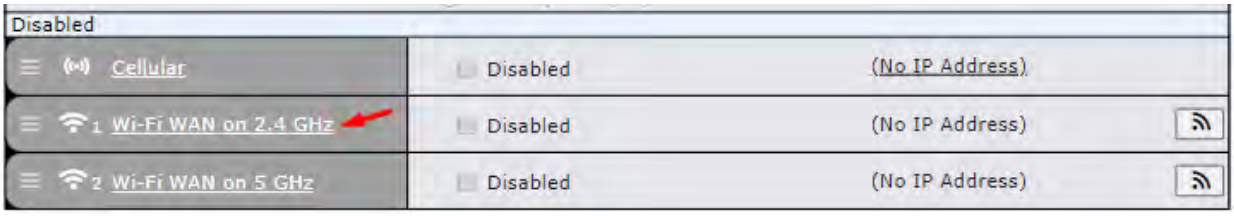
This connection method is suitable if your ISP provides a static WAN IP and Tunnel IP via GRE.



GRE Settings	
Routing Mode	NAT allows substituting the real address in a packet with a mapped address that is routable on the destination network. By clicking the help icon in this field, you can display the **IP Forwarding** option, if your network requires it.
WAN IP Address / Subnet Mask / Default Gateway	These settings allow you to specify the information required in order to communicate on the Internet via a fixed Internet IP address. The information is typically determined by and can be obtained from the ISP.
Remote GRE Host	This field allows you to enter the IP address of the remote GRE.

Tunnel Local IP Address	This field allows you to enter the IP address of the local tunnel for the GRE tunnel connection.
Tunnel Remote IP Address	This field allows you to enter the IP address of the remote tunnel for the GRE tunnel connection.
Outgoing NAT IP Address	This field is to enter the NAT IP address for outgoing via GRE tunnel.
DNS Servers	Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) servers to be used when a DNS lookup is routed through this connection. Selecting **Obtain DNS server address automatically** results in the DNS servers assigned by the PPPoE server to be used for outbound DNS lookups over the WAN connection. (The DNS servers are obtained along with the WAN IP address assigned from the PPPoE server.) When **Use the following DNS server address(es)** is selected, you can enter custom DNS server addresses for this WAN connection into the **DNS server 1** and **DNS server 2** fields.

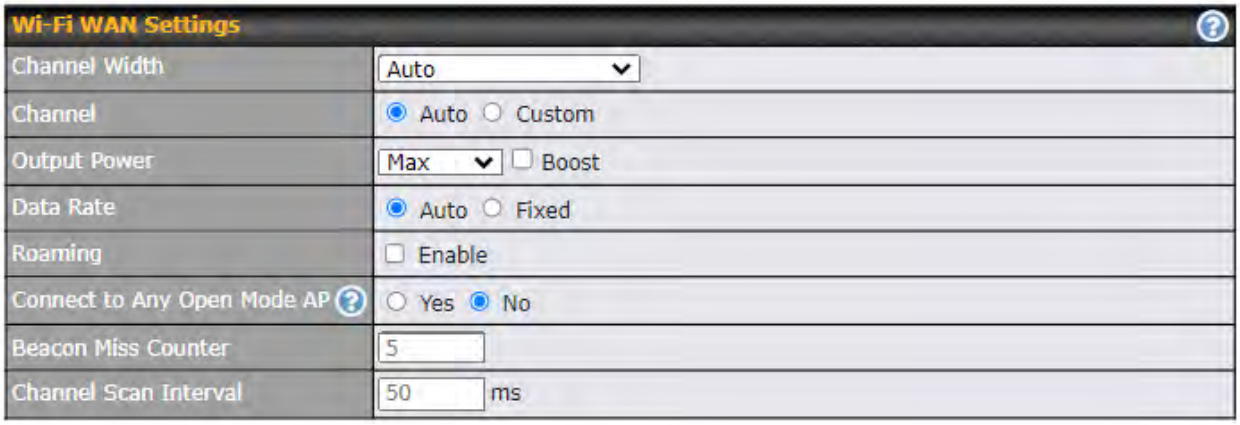
8.2 Wi-Fi WAN



To access/configure the Wi-Fi WAN settings, click **Network > Wi-Fi WAN Connection Name**.

WAN Connection Settings	
WAN Connection Name	Enter a name to represent this Wi-Fi WAN connection.
Enable	Click the checkbox to toggle the on and off state of this connection.
Connection Priority	This option allows you to configure the WAN connection whether for normal daily usage or as a backup connection only. If **Always-on** is chosen, the WAN connection will be kept on continuously, regardless of the priority of other WAN connections. If **Backup** is chosen, the WAN connection will depend on other WAN connections. It will not be used when one or more higher priority dependent WAN connections are connected.
Independent from Backup WANs	If this is checked, the connection will be working independent from other Backup WAN connections. Those in Backup Priority will ignore the status of this WAN connection, and will be used when none of the other higher priority connections are available.

Routing Mode	This option allows you to select the routing method to be used in routing IP frames via the WAN connection. The mode can be either NAT (Network Address Translation) or IP Forwarding. In the case if you need to choose IP Forwarding for your scenario. Click the button to enable IP Forwarding.
Standby State	This setting specifies the state of the WAN connection while in standby. The available options are **Remain Connected** and **Disconnect**.
Reply to ICMP PING	If this setting is disabled, the WAN connection will not respond to ICMP ping requests. By default, this setting is enabled.



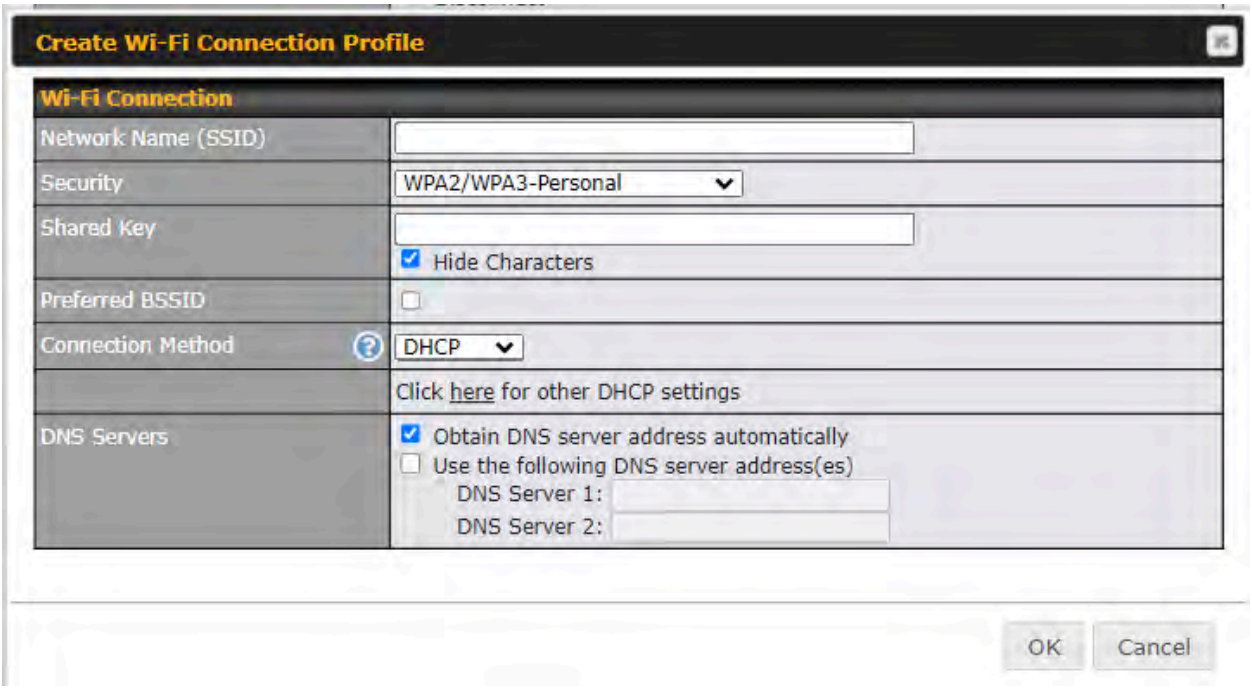
Wi-Fi WAN Settings	
Channel Width	Select the channel width for this Wi-Fi WAN. 20MHz will have greater support for older devices using 2.4Ghz, while 40MHz is appropriate for networks with newer devices that connect using 5Ghz
Channel	Determine whether the channel will be automatically selected. If you select custom, the following table will appear: 
Output Power	If you are setting up a network with many Wi-Fi devices in close proximity, then you can configure the output power here. Click the “boost” button for additional power. However, with that option ticked, output power may exceed local regulatory limits.

Data Rate	Selecting Auto will enable the router to automatically determine the best data rate, while manually selecting a rate will force devices to connect using the fixed rate.
Roaming	Checking this box will enable Wi-Fi roaming. Click the icon for additional options.
Connect to Any Open Mode AP	This option is to specify whether the Wi-Fi WAN will connect to any open mode access points it finds.
Beacon Miss Counter	This sets the threshold for the number of missed beacons.
Channel Scan Interval	Configure Channel Scan Interval in ms.

8.2.1 Creating Wi-Fi Connection Profiles

You can manually create a profile to connect to a Wi-Fi connection. This is useful for creating a profile for connecting to hidden-SSID access points. Click **Network > Wi-Fi WAN > Create Profile…** to get started.

This will open a window similar to the one shown below

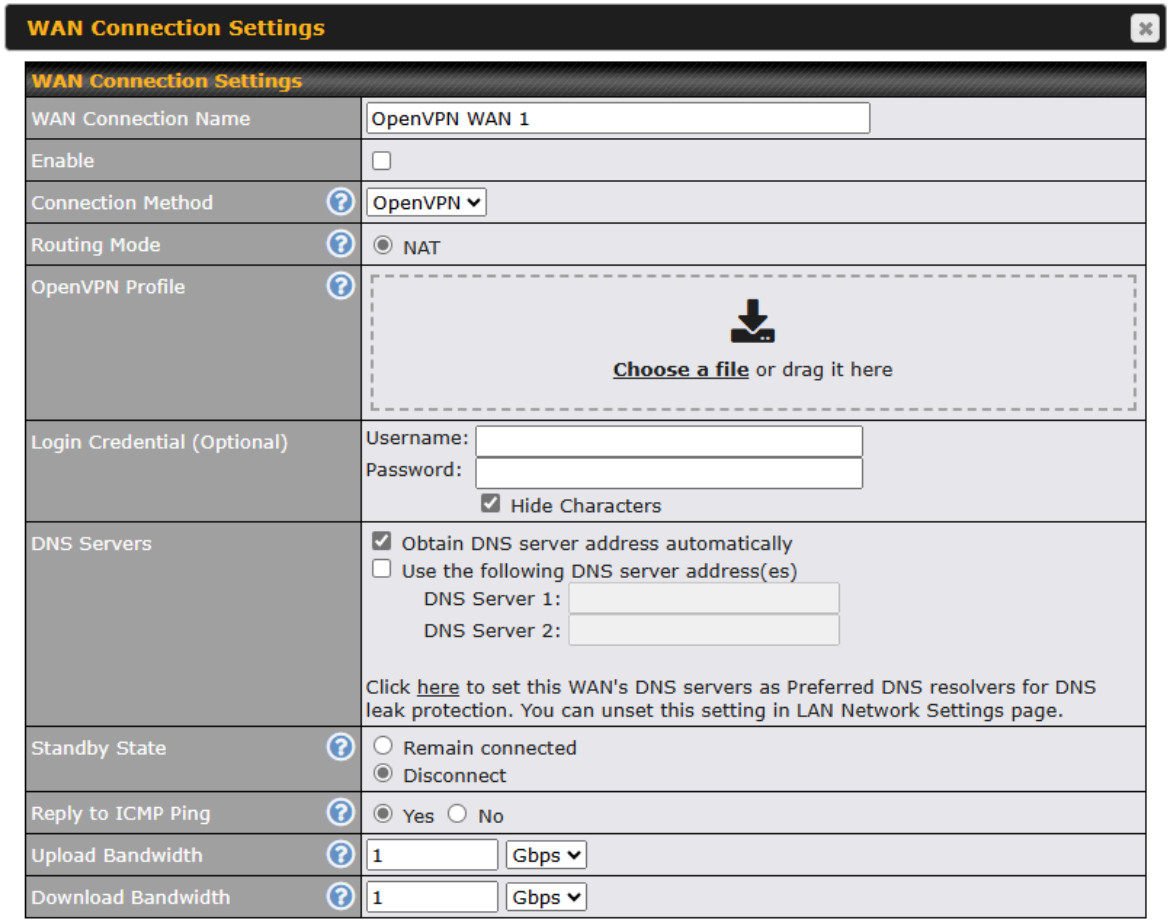


Wi-Fi Connection Profile Settings	
Network Name (SSID)	Enter a name to represent this Wi-Fi connection.
Security	This option allows you to select which security policy is used for this wireless network. Available options: • **Open** • **WEP** • **Enhanced Open (OWE)** • **WPA3 -Personal** • **WPA2/WPA3 -Personal** • **WPA/ WPA2 – Personal** • **WPA/ WPA2 – ENterprise** • **802.1X with dynamic WEP key**
Shared Key	Enter the password for the wireless network.
Preffered BSSID	Configure the BSSID. The BSSID is the MAC address of the wireless access point (WAP).
Connected Method	Choose DHCP or Static IP for the Wi-Fi WAN connection method.
DNS Servers	Configure the DNS servers that this WAN connection should use.

8.3 OpenVPN WAN

OpenVPN WAN is a standalone “WAN” which will appear in both your router and your InControl2 dashboards. You will be able to configure the priority of the physical WANs to connect to the OpenVPN server (similar to IPsec’s “WAN Connection Priority”). You can also customize OpenVPN’s outbound policy, firewall, etc.

* OpenVPN WAN license is required. Click on the below link for more details.
https://forum.peplink.com/t/introducing-the-openvpn-wan-license-partner-discussion/30291



WAN Connection Settings	
WAN Connection Name	Enter a name to represent this WAN connection.
Enable	This setting enables the WAN connection. If schedules have been defined, you will be able to select a schedule to apply to the connection.
Connection Method	OpenVPN.
Routing Mode	This field shows that **NAT** (network address translation) will be applied to the traffic routed over this WAN connection. **IP Forwarding** is available when you click the link in the help  icon.
OpenVPN Profile	Upload the OpenVPN profile (.ovpn) from the OpenVPN server.
Login Credential (Optional)	This field is optional to key in the respective username and password to connect to OpenVPN server if needed.
DNS Servers	Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) servers to be used when a DNS lookup is routed through this connection. Selecting Obtain DNS server address automatically results in the DNS servers assigned by the WAN DHCP server being used for outbound DNS lookups over the connection. (The DNS servers are obtained along with the WAN IP address assigned by the DHCP server.) When the following DNS server address(es) is selected, you may enter custom DNS server addresses for this WAN connection into the DNS server 1 and DNS server 2 fields.

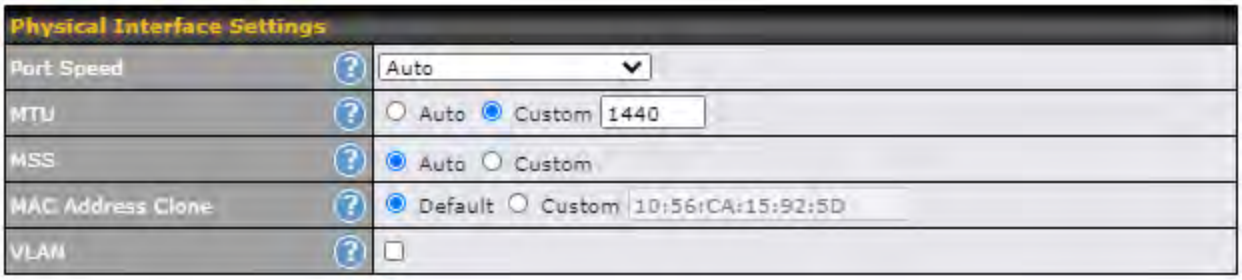
Connection Priority	This option allows you to configure the WAN connection whether for normal daily usage or as a backup connection only. If **Always-on** is chosen, the WAN connection will be kept on continuously, regardless of the priority of other WAN connections. If **Backup** is chosen, the WAN connection will depend on other WAN connections. It will not be used when one or more higher priority dependent WAN connections are connected.
Standby State	This option allows you to choose whether to remain connected when this WAN connection is no longer in the highest priority and has entered the standby state. When **Remain connected** is chosen, upon bringing up this WAN connection to active, it will be immediately available for use. If this WAN connection is charged by connection time, you may want to set this option to **Disconnect** so that connection will be made only when needed. SpeedFusion VPN may use connected standby WAN for failover if link failure detected on the higher priority WAN, you can set this option to Disconnect to avoid data passing through.
Reply to ICMP PING	If the checkbox is **unticked**, this option is disabled and the system will not reply to any ICMP ping echo requests to the WAN IP addresses of this WAN connection. Default: **ticked** (Yes)
Upload Bandwidth	This field refers to the maximum upload speed. This value is referenced when default weight is chosen for outbound traffic and traffic prioritization. A correct value can result in effective traffic prioritization and efficient use of upstream bandwidth.
Download Bandwidth	This field refers to the maximum download speed. Default weight control for outbound traffic will be adjusted according to this value.

Physical Interface Settings (OpenVPN)

MTU	This field is for specifying the Maximum Transmission Unit value of the WAN connection. An excessive MTU value can cause file downloads stall shortly after connected. You may consult your ISP for the connection's MTU value. Default value is 1440.
Uplink Connection Priority	Specify the order of WAN connections to be used to establish this OpenVPN connection. The healthy WAN with highest priority will be used. When Failback on Connection Recovery is enabled, once a higher priority WAN is recovered, OpenVPN connection will be disconnected and use that WAN to establish the connection again.

8.4 Physical Interface Settings (Common)

The remaining WAN-related settings are common to the WAN connection:



Physical Interface Settings	
Speed	This is the port speed of the WAN connection. It should be set to the same speed as the connected device in case of any port negotiation problems. When a static speed is set, you may choose whether to advertise its speed to the

	peer device or not. Advertise Speed is selected by default. You can choose not to advertise the port speed if the port has difficulty in negotiating with the peer device. Default: Auto
MTU	This field is for specifying the Maximum Transmission Unit value of the WAN connection. An excessive MTU value can cause file downloads stall shortly after connected. You may consult your ISP for the connection's MTU value. Default value is 1440.
MSS	This field is for specifying the Maximum Segment Size of the WAN connection. When Auto is selected, MSS will be depended on the MTU value. When Custom is selected, you may enter a value for MSS. This value will be announced to remote TCP servers for maximum data that it can receive during the establishment of TCP connections. Some Internet servers are unable to listen to MTU setting if ICMP is filtered by firewall between the connections. Normally, MSS equals to MTU minus 40. You are recommended to reduce the MSS only if changing of the MTU value cannot effectively inform some remote servers to size down data size. Default: Auto
MAC Address Clone	Some service providers (e.g. cable network) identify the client's MAC address and require client to always use the same MAC address to connect to the network. If it is the case, you may change the WAN interface's MAC address to the client PC's one by entering the PC's MAC address to this field. If you are not sure, click the Default button to restore to the default value.
VLAN	Check the box to assign a VLAN to the interface.

8.5 WAN Health Check

To ensure traffic is routed to healthy WAN connections only, the Peplink router can periodically check the health of each WAN connection. The health check settings for each WAN connection can be independently configured via **Network > WAN Connection Name**

Health Check Settings	
Method	This setting specifies the health check method for the WAN connection. This value can be configured as **Disabled**, **PING**, **DNS Lookup**, or **HTTP**. The default method is **DNS Lookup**. For mobile Internet connections, the value of **Method** can be configured as **Disabled** or **SmartCheck**.
Health Check Disabled	

When **Disabled** is chosen in the **Method** field, the WAN connection will always be considered as up. The connection will **NOT** be treated as down in the event of IP routing errors.

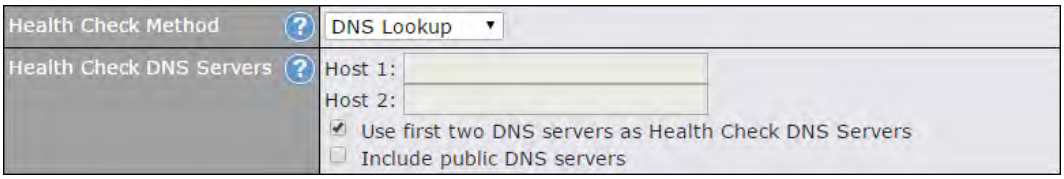
Health Check Method: PING

ICMP ping packets will be issued to test the connectivity with a configurable target IP address or hostname. A WAN connection is considered as up if ping responses are received from either one or both of the ping hosts.

PING Hosts

This setting specifies IP addresses or hostnames with which connectivity is to be tested via ICMP ping. If **Use first two DNS servers as Ping Hosts** is checked, the target ping host will be the first DNS server for the corresponding WAN connection. Reliable ping hosts with a high uptime should be considered. By default, the first two DNS servers of the WAN connection are used as the ping hosts.

Health Check Method: DNS Lookup



DNS lookups will be issued to test connectivity with target DNS servers. The connection will be treated as up if DNS responses are received from one or both of the servers, regardless of whether the result was positive or negative.

Health Check DNS Servers

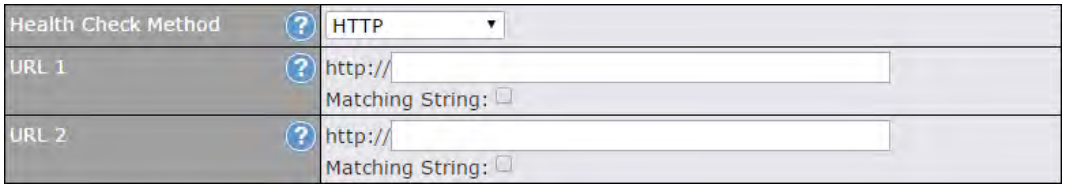
This field allows you to specify two DNS hosts' IP addresses with which connectivity is to be tested via DNS lookup.

If **Use first two DNS servers as Health Check DNS Servers** is checked, the first two DNS servers will be the DNS lookup targets for checking a connection's health. If the box is not checked, **Host 1** must be filled, while a value for **Host 2** is optional.

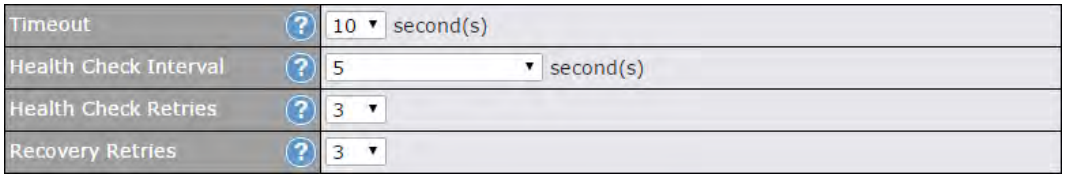
If **Include public DNS servers** is selected and no response is received from all specified DNS servers, DNS lookups will also be issued to some public DNS servers. A WAN connection will be treated as down only if there is also no response received from the public DNS servers.

Connections will be considered as up if DNS responses are received from any one of the health check DNS servers, regardless of a positive or negative result. By default, the first two DNS servers of the WAN connection are used as the health check DNS servers.

Health Check Method: HTTP	
HTTP connections will be issued to test connectivity with configurable URLs and strings to match.	



URL1	**WAN Settings>WAN Edit>Health Check Settings>URL1** HTTP request will be sent according to the specified URL. Health check result is determined based on the HTTP response status code. Status code 2xx, 301 and 302 are classified as success. If Matching String is provided, health check will be determined as success only when the HTTP response content contains the specified string.
URL 2	**WAN Settings>WAN Edit>Health Check Settings>URL2** If **URL2** is also provided, a health check will pass if either one of the tests passed.



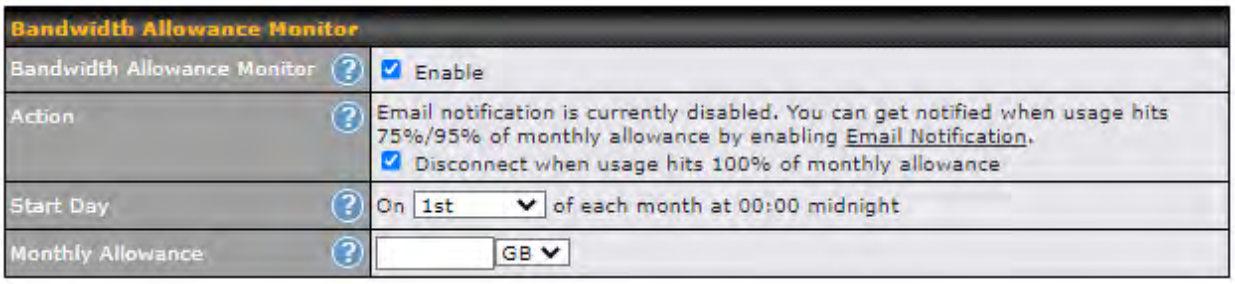
Other Health Check Settings	
Timeout	This setting specifies the timeout in seconds for ping/DNS lookup requests. The default timeout is **5 seconds**.
Health Check Interval	This setting specifies the time interval in seconds between ping or DNS lookup requests. The default health check interval is **5 seconds**.
Health Check Retries	This setting specifies the number of consecutive ping/DNS lookup timeouts after which the Peplink router will treat the corresponding WAN connection as down. Default health retries is set to **3**. Using the default **Health Retries** setting of **3**, the corresponding WAN connection will be treated as down after three consecutive timeouts.
Recovery Retries	This setting specifies the number of consecutive successful ping/DNS lookup responses that must be received before the Peplink router treats a previously down WAN connection as up again. By default, **Recover Retries** is set to **3**. Using the default setting, a WAN connection that is treated as down will be considered as up again upon receiving three consecutive successful ping/DNS lookup responses.

Automatic Public DNS Server Check on DNS Test Failure

When the health check method is set to **DNS Lookup** and health checks fail, the Peplink router will automatically perform DNS lookups on public DNS servers. If the tests are successful, the WAN may not be down, but rather the target DNS server malfunctioned. You will see the following warning message on the main page:

> ⚠ **Failed to receive DNS response from the health-check DNS servers for WAN connection 3. But public DNS server lookup test via the WAN passed. So please check the DNS server settings.**

8.6 Bandwidth Allowance Monitoring

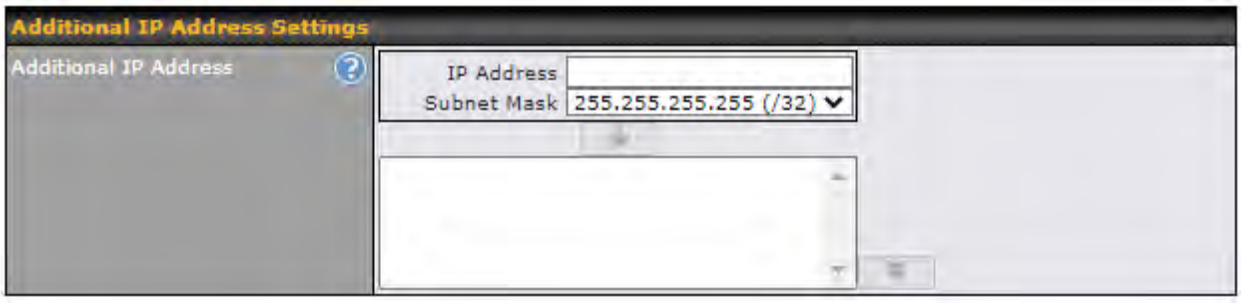


Bandwidth Allowance Monitor	
Action	If **Email Notification** is enabled, you will be notified by email when usage hits 75% and 95% of the monthly allowance. If **Disconnect when usage hits 100% of monthly allowance** is checked, this WAN connection will be disconnected automatically when the usage hits the monthly allowance. It will not resume connection unless this option has been turned off or the usage has been reset when a new billing cycle starts.
Start Day	This option allows you to define which day of the month each billing cycle begins.
Monthly Allowance	This field is for defining the maximum bandwidth usage allowed for the WAN connection each month.

Disclaimer

Due to different network protocol overheads and conversions, the amount of data reported by this Peplink device is not representative of actual billable data usage as metered by your network provider. Peplink disclaims any obligation or responsibility for any events arising from the use of the numbers shown here.

8.7 Additional Public IP address



Additional Public IP Settings	
IP Address List	**IP Address List** represents the list of fixed Internet IP addresses assigned by the ISP in the event that more than one Internet IP address is assigned to this WAN connection. Enter the fixed Internet IP addresses and the corresponding subnet mask, and then click the **Down Arrow** button to populate IP address entries to the **IP Address List**.

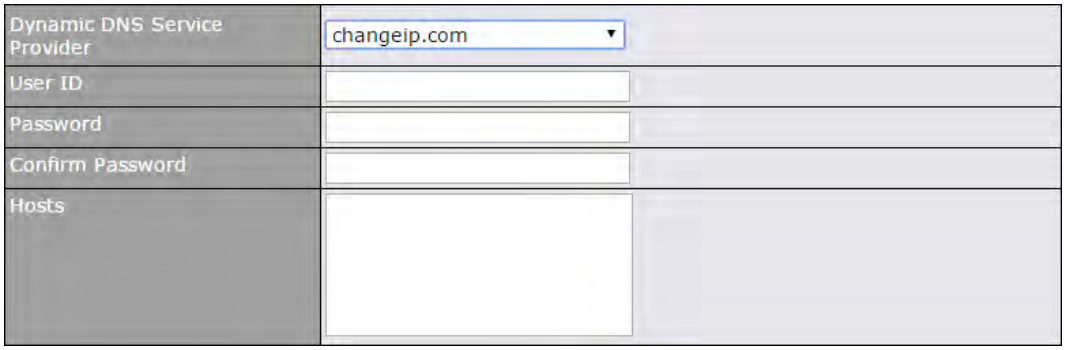
8.8 Dynamic DNS Settings

Peplink routers are capable of registering the domain name relationships to dynamic DNS service providers. Through registration with dynamic DNS service provider(s), the default public Internet IP address of each WAN connection can be associated with a host name. With dynamic DNS service enabled for a WAN connection, you can connect to your WAN's IP address from the external, even if its IP address is dynamic. You must register for an account from the listed dynamic DNS service providers before enabling this option.

If the WAN connection's IP address is a reserved private IP address (i.e., behind a NAT router), the public IP of each WAN will be automatically reported to the DNS service provider.

Either upon a change in IP addresses or every 23 days without link reconnection, the Peplink router will connect to the dynamic DNS service provider to perform an IP address update within the provider's records.

The settings for dynamic DNS service provider(s) and the association of hostname(s) are configured via **Network > WAN > Details > Dynamic DNS Service Provider/Dynamic DNS Settings**.

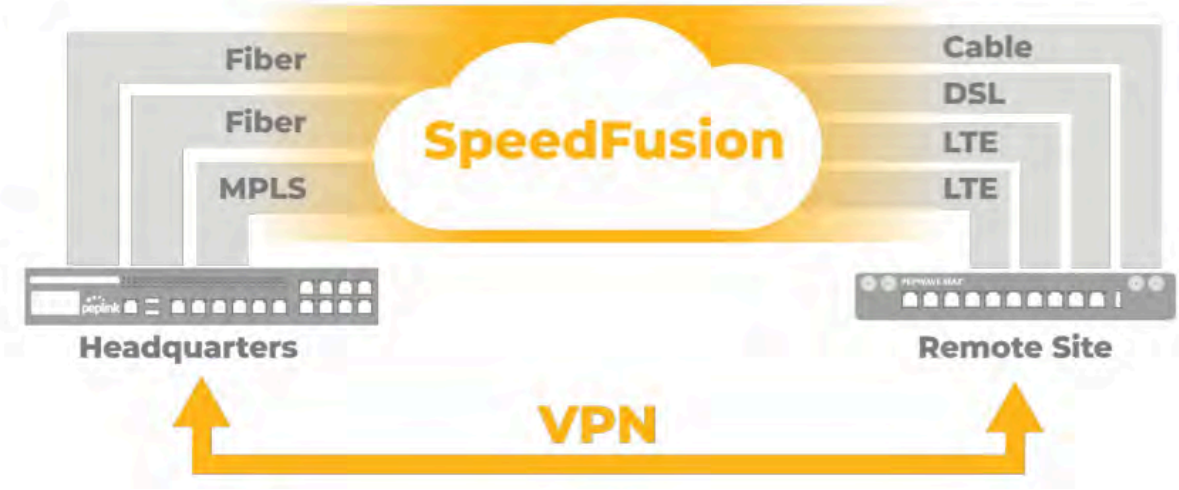


Dynamic DNS Settings	
Dynamic DNS	This setting specifies the dynamic DNS service provider to be used for the WAN based on supported dynamic DNS service providers: • Disabled • changeip.com • dyndns.org • no-ip.org • DNS-O-Matic • Others… Support custom Dynamic DNS servers by entering its URL. Works with any service compatible with DynDNS API. Select **Disabled** to disable this feature.
User ID/ Username / Email	This setting specifies the registered user name for the dynamic DNS service.
Password	This setting specifies the password for the dynamic DNS service.
Hosts	This field allows you to specify a list of host names or domains to be associated with the public Internet IP address of the WAN connection. If you need to enter more than one host, use a carriage return to separate them.

Important Note

In order to use dynamic DNS services, appropriate host name registration(s) and a valid account with a supported dynamic DNS service provider are required. A dynamic DNS update is performed whenever a WAN's IP address changes (e.g., the IP is changed after a DHCP IP refresh, reconnection, etc.). Due to dynamic DNS service providers' policy, a dynamic DNS host will automatically expire if the host record has not been updated for a long time. Therefore the Peplink router performs an update every 23 days, even if a WAN's IP address has not changed.

9 SpeedFusion VPN



Peplink bandwidth bonding SpeedFusion™ is our patented technology that enables our SD-WAN routers to bond multiple Internet connections to increase site-to-site bandwidth and reliability. SpeedFusion functionality securely connects your Peplink router to another Peplink or Peplink device (Peplink Balance 210/310/380/580/710/1350 only). Data, voice, or video communications between these locations are kept confidential across the public Internet.

Bandwidth bonding SpeedFusion™ is specifically designed for multi-WAN environments. In case of failures and network congestion at one or more WANs, other WANs can be used to continue carrying the network traffic.

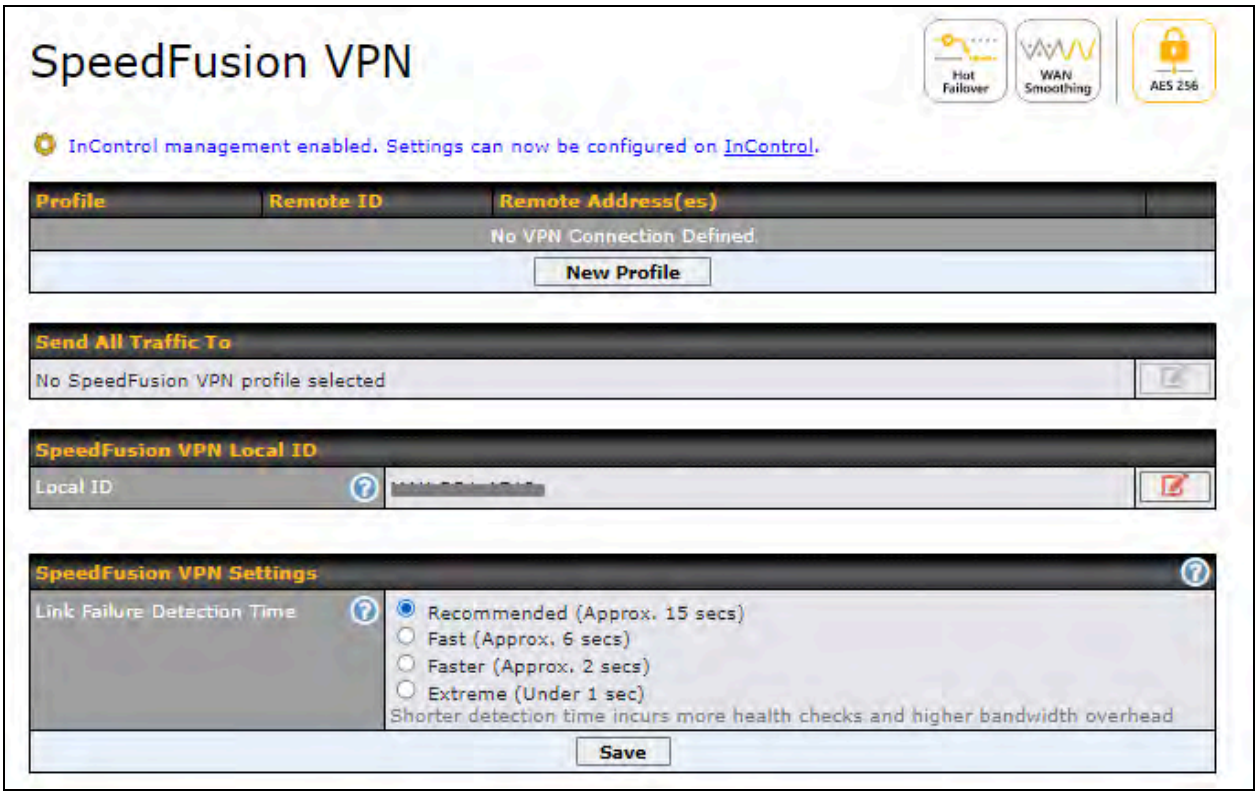
Different models of our SD-WAN routers have different numbers of site-to-site connections allowed. End-users who need to have more site-to-site connections can purchase a SpeedFusion license to increase the number of site-to-site connections allowed.

Peplink routers can aggregate all WAN connections' bandwidth for routing SpeedFusion™ traffic. Unless all the WAN connections of one site are down, Peplink routers can keep the VPN up and running.

VPN bandwidth bonding is supported in Firmware 5.1 or above. All available bandwidth will be utilized to establish the VPN tunnel, and all traffic will be load balanced at packet level across all links. VPN bandwidth bonding is enabled by default.

9.1 SpeedFusion VPN

To configure SpeedFusion VPN, navigate to **Advanced > SpeedFusion VPN**.

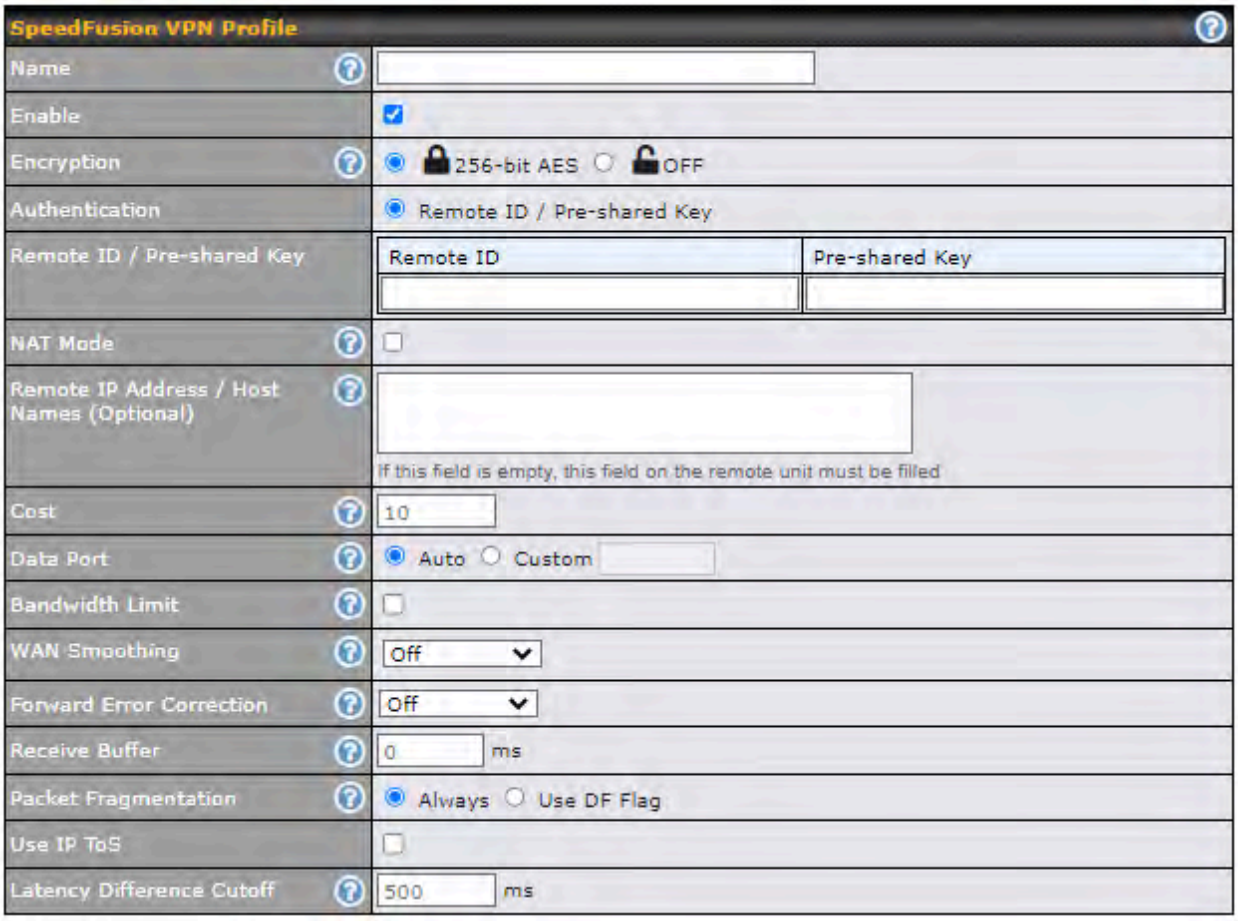


The local LAN subnet and subnets behind the LAN (defined under **Static Route** on the LAN settings page) will be advertised to the VPN. All VPN members (branch offices and headquarters) will be able to route to local subnets.

Note that all LAN subnets and the subnets behind them must be unique. Otherwise, VPN members will not be able to access each other.

All data can be routed over the VPN using the 256-bit AES encryption standard. To configure, navigate to **Advanced > SpeedFusion VPN** and click the **New Profile** button to create a new VPN profile (you may have to first save the displayed default profile in order to access the **New Profile** button). Each profile specifies the settings for making VPN connection with one remote Peplink or Peplink device. Note that available settings vary by model.

A list of defined SpeedFusion connection profiles and a **Link Failure Detection Time** option will be shown. Click the **New Profile** button to create a new VPN connection profile for making a VPN connection to a remote Peplink or Peplink device via the available WAN connections. Each profile is for making a VPN connection with one remote Peplink or Peplink Device.



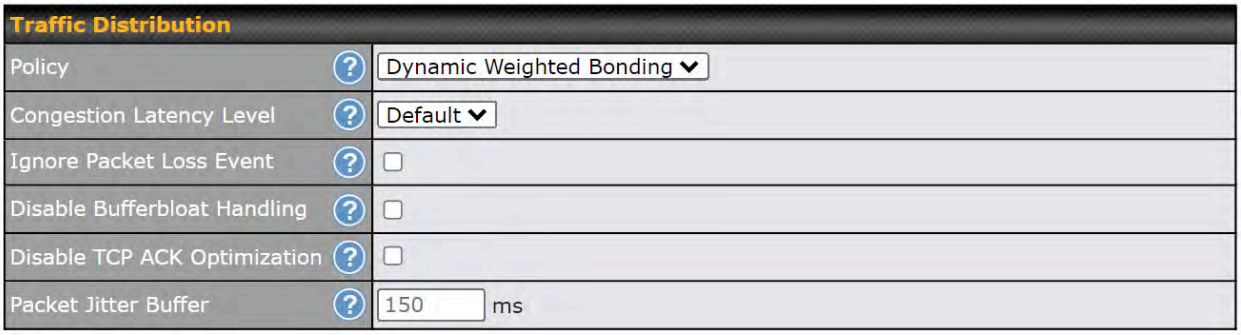
SpeedFusion VPN Profile Settings	
Name	This field is for specifying a name to represent this profile. The name can be any combination of alphanumeric characters (0-9, A-Z, a-z), underscores (_), dashes (-), and/or non-leading/trailing spaces ( ).
Enable	When this box is checked, this VPN connection profile will be enabled. Otherwise, it will be disabled.
Encryption	By default, VPN traffic is encrypted with **256-bit AES**. If **Off** is selected on both sides of a VPN connection, no encryption will be applied.
Authentication	Select from **By Remote ID Only**, **Preshared Key**, or **X.509** to specify the method the Peplink MAX will use to authenticate peers. When selecting **By Remote ID Only**, be sure to enter a unique peer ID number in the **Remote ID** field.
Remote ID / Pre-shared Key	This optional field becomes available when **Remote ID / Pre-shared Key** is selected as the Peplink router's VPN **Authentication** method, as explained above. **Pre-shared Key** defines the pre-shared key used for this particular VPN connection. The VPN connection's session key will be further protected by the pre-shared key. The connection will be up only if the pre-shared keys on each side match. When the peer is running firmware 5.0+, this setting will be ignored.

	Enter Remote IDs either by typing out each Remote ID and Pre-shared Key, or by pasting a CSV. If you wish to paste a CSV, click the  icon next to the "Remote ID / Preshared Key" setting.
Remote ID/Remote Certificate	These optional fields become available when **X.509** is selected as the Peplink MAX's VPN authentication method, as explained above. To authenticate VPN connections using X.509 certificates, copy and paste certificate details into these fields. To get more information on a listed X.509 certificate, click the **Show Details** link below the field.
Allow Shared Remote ID	When this option is enabled, the router will allow multiple peers to run using the same remote ID.
NAT Mode	Check this box to allow the local DHCP server to assign an IP address to the remote peer. When **NAT Mode** is enabled, all remote traffic over the VPN will be tagged with the assigned IP address using network address translation.
Remote IP Address / Host Names (Optional)	If **NAT Mode** is not enabled, you can enter a remote peer's WAN IP address or hostname(s) here. If the remote uses more than one address, enter only one of them here. Multiple hostnames are allowed and can be separated by a space character or carriage return. Dynamic-DNS host names are also accepted. This field is optional. With this field filled, the Peplink MAX will initiate connection to each of the remote IP addresses until it succeeds in making a connection. If the field is empty, the Peplink MAX will wait for connection from the remote peer. Therefore, at least one of the two VPN peers must specify this value. Otherwise, VPN connections cannot be established.
Cost	Define path cost for this profile. OSPF will determine the best route through the network using the assigned cost. Default: 10
Data Port	This field is used to specify a UDP port number for transporting outgoing VPN data. If **Default** is selected, UDP port 4500 will be used. Port 32015 will be used if the remote unit uses Firmware prior to version 5.4 or if port 4500 is unavailable. If **Custom** is selected, enter an outgoing port number from 1 to 65535. Click the  icon to configure data stream using TCP protocol [EXPERIMENTAL].In the case TCP protocol is used, the exposed TCP session option can be authorised to work with TCP accelerated WAN link.
Bandwidth Limit	Define maximum download and upload speed to each individual peer. This functionality requires the peer to use SpeedFusion VPN version 4.0.0 or above.
WAN Smoothing	While using SpeedFusion VPN, utilize multiple WAN links to reduce the impact of packet loss and get the lowest possible latency at the expense of extra bandwidth consumption. This is suitable for streaming applications where the average bitrate requirement is much lower than the WAN's available bandwidth.

	Off - Disable WAN Smoothing. Normal - The total bandwidth consumption will be at most 2x of the original data traffic. Medium - The total bandwidth consumption will be at most 3x of the original data traffic. High - The total bandwidth consumption depends on the number of connected active tunnels.
Forward Error Correction	Forward Error Correction (FEC) can help to recover packet loss by using extra bandwidth to send redundant data packets. Higher FEC level will recover packets on a higher loss rate link. The expected overhead of Low is 13.3% and High is 26.7%. Require peer using SpeedFusion VPN version 8.0.0 and above.
Receive Buffer	Receive Buffer can help to reduce out-of-order packets and jitter, but will introduce extra latency to the tunnel. Default is 0 ms, which disables the buffer, and maximum buffer size is 2000 ms.
Packet Fragmentation	If the packet size is larger than the tunnel's MTU, it will be fragmented inside the tunnel in order to pass through. Select Always to fragment any packets that are too large to send, or Use DF Flag to only fragment packets with Don't Fragment bit cleared. This can be useful if your application does Path MTU Discovery, usually sending large packets with DF bit set, if allowing them to go through by fragmentation, the MTU will not be detected correctly.
Use IP ToS[A]	Checking this button enables the use of IP ToS header field.
Latency Difference Cutoff[A]	Traffic will be stopped for links that exceed the specified millisecond value with respect to the lowest latency link. (e.g. Lowest latency is 100ms, a value of 500ms means links with latency 600ms or more will not be used)

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

To enable Layer 2 Bridging between SpeedFusion VPN profiles, navigate to **Network > LAN > Basic Settings > *LAN Profile Name*** and refer to instructions in section 9.1



Traffic Distribution	
Policy	This option allows you to select the desired out-bound traffic distribution policy: ● Bonding - Aggregate multiple WAN-to-WAN links into a single higher throughput tunnel. ● Dynamic Weighted Bonding - Aggregates WAN-to-WAN links with similar latencies. By default, Bonding is selected as a traffic distribution policy.
Congestion Latency Level	For most WANs, especially on satellite and wireless networks, the latency will increase when the link becomes more congested. Setting the **Congestion Latency Level** to **Low** will treat the link as congested more aggressively. Setting it to **High** will allow the latency to increase more before treating it as congested.
Ignore Packet Loss Event	By default, when there is packet loss, it is considered as a congestion event. If this is not the case, select this option to ignore the packet loss event.
Disable Bufferbloat Handling	Bufferbloat is a phenomenon on the WAN side when it is congested. The latency can become very high due to buffering on the uplink. By default, the Dynamic Weighted Bonding policy will try its best to mitigate bufferbloat by reducing TCP throughput when the WAN is congested. However, as a side effect, the tunnel might not achieve maximum bandwidth. Selecting this option will **disable** the bufferbloat handling mentioned above.
Disable TCP ACK Optimization	By default, TCP ACK will be forwarded to remote peers as fast as possible. This will consume more bandwidth, but may help to improve TCP performance as well. Selecting this option will **disable** the TCP ACK optimization mentioned above.
Packet Jitter Buffer	The default jitter buffer is 150ms, and can be modified from 0ms to 500ms. The jitter buffer may increase the tunnel latency. If you want to keep the latency as low as possible, you can set it to 0ms to disable the buffer. **Note**: If the Receive Buffer is set, the Packet Jitter Buffer will be automatically disabled.

WAN Connection Priority

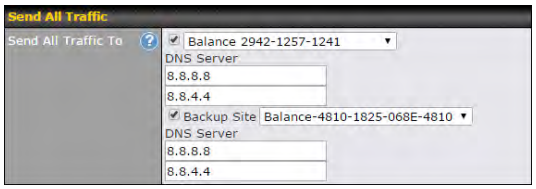
WAN Connection Priority

If your device supports it, you can specify the priority of WAN connections to be used for making VPN connections. WAN connections set to **OFF** will never be used. Only available WAN connections with the highest priority will be used.

To enable asymmetric connections, connection mapping to remote WANs, cut-off latency, and packet loss suspension time, click the button.

Send All Traffic To

This feature allows you to redirect all traffic to a specified SpeedFusion VPN connection. Click the button to select your connection and the following menu will appear:



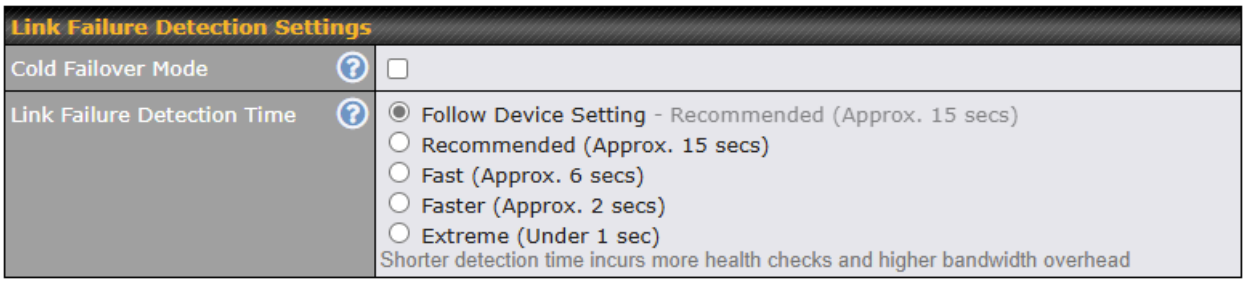
You could also specify a DNS server to resolve incoming DNS requests. Click the checkbox next to **Backup Site** to designate a backup SpeedFusion profile that will take over, should the main SpeedFusion VPN connection fail.

Outbound Policy/SpeedFusion VPN Outbound Custom Rules

Some models allow you to set outbound policy and custom outbound rules from **Advanced>SpeedFusion VPN**. See **Section 14** for more information on outbound policy settings.

SpeedFusion VPN Local ID

The local ID is a text string to identify this local unit when establishing a VPN connection. When creating a profile on a remote unit, this local ID must be entered in the remote unit's **Remote ID** field. Click the icon to edit **Local ID**.



Link Failure Detection Settings

Cold Failover Mode	Enabling Cold Failover Mode turns off link failure detection for standby WAN-to-WAN links, helping to lower bandwidth consumption.
Link Failure Detection Time	The bonded VPN can detect routing failures on the path between two sites over each WAN connection. Failed WAN connections will not be used to route VPN traffic. Health check packets are sent to the remote unit to detect any failure. The more frequently checks are sent, the shorter the detection time, although more bandwidth will be consumed. When **Recommended** (default) is selected, a health check packet is sent every five seconds, and the expected detection time is 15 seconds. When **Fast** is selected, a health check packet is sent every three seconds, and the expected detection time is six seconds. When **Faster** is selected, a health check packet is sent every second, and the

	expected detection time is two seconds. When **Extreme** is selected, a health check packet is sent every 0.1 second, and the expected detection time is less than one second.

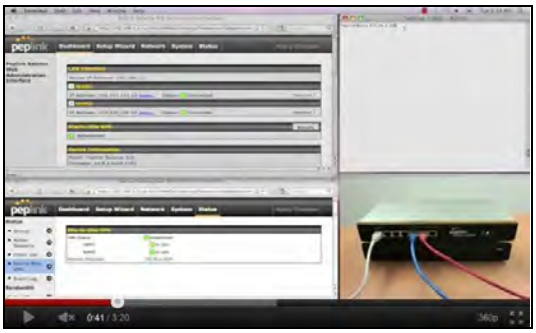
[A] - Advanced feature, please click the button on the top right-hand corner to activate.

Important Note

Peplink proprietary SpeedFusion™ uses TCP port 32015 and UDP port 4500 for establishing VPN connections. If you have a firewall in front of your Peplink devices, you will need to add firewall rules for these ports and protocols to allow inbound and outbound traffic to pass through the firewall.

Tip

Want to know more about VPN sub-second session failover? Visit our YouTube Channel for a video tutorial!



http://youtu.be/TLQgdpPSY88

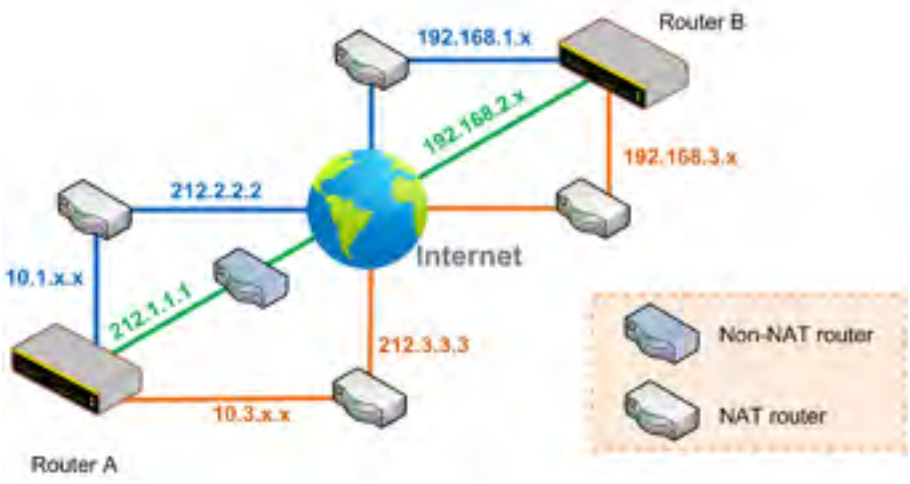
9.2 The Peplink Router Behind a NAT Router

Peplink routers support establishing SpeedFusion™ over WAN connections which are behind a NAT (network address translation) router.

To enable a WAN connection behind a NAT router to accept VPN connections, you can configure the NAT router in front of the WAN connection to inbound port-forward TCP port 32015 to the Peplink router.

If one or more WAN connections on Unit A can accept VPN connections (by means of port forwarding or not), while none of the WAN connections on the peer Unit B can do so, you should enter all of Unit A's public IP addresses or hostnames into Unit B's **Remote IP Addresses / Host Names** field. Leave the field in Unit A blank. With this setting, a SpeedFusion™ connection can be set up and all WAN connections on both sides will be utilized.

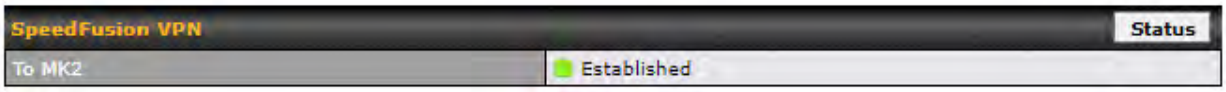
See the following diagram for an example of this setup in use:



One of the WANs connected to Router A is non-NAT'd (*212.1.1.1*). The rest of the WANs connected to Router A and all WANs connected to Router B are NAT'd. In this case, the **Peer IP Addresses / Host Names** field for Router B should be filled with all of Router A's hostnames or public IP addresses (i.e., *212.1.1.1*, *212.2.2.2*, and *212.3.3.3*), and the field in Router A can be left blank. The two NAT routers on WAN1 and WAN3 connected to Router A should inbound port-forward TCP port 32015 to Router A so that all WANs will be utilized in establishing the VPN.

9.3 SpeedFusion VPN Status

SpeedFusion VPN status is shown in the Dashboard. The connection status of each connection profile is shown as below.



After clicking the **Status** button at the top right corner of the SpeedFusion™ table, you will be forwarded to **Status > SpeedFusion VPN**, where you can view subnet and WAN connection information for each VPN peer.

IP Subnets Must Be Unique Among VPN Peers
The entire interconnected SpeedFusion™ network is a single non-NAT IP network. Avoid duplicating subnets in your sites to prevent connectivity problems when accessing those subnets.

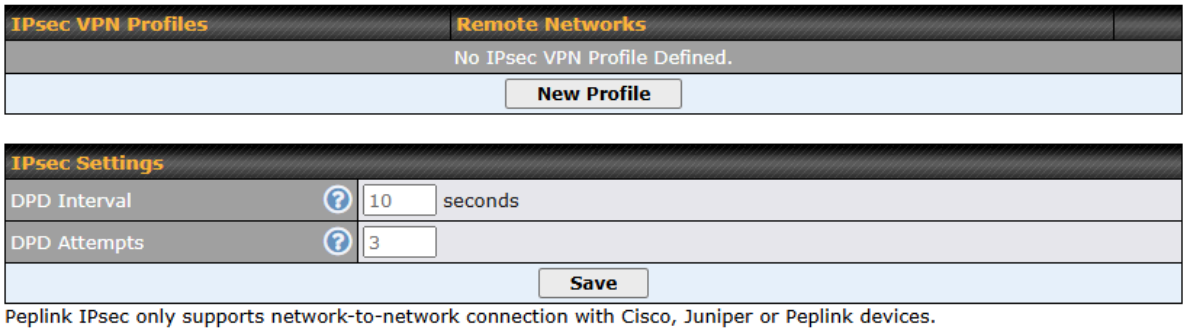
10 IPsec VPN

IPsec VPN functionality securely connects one or more branch offices to your company's main headquarters or to other branches. Data, voice, and video communications between these locations are kept safe and confidential across the public Internet.

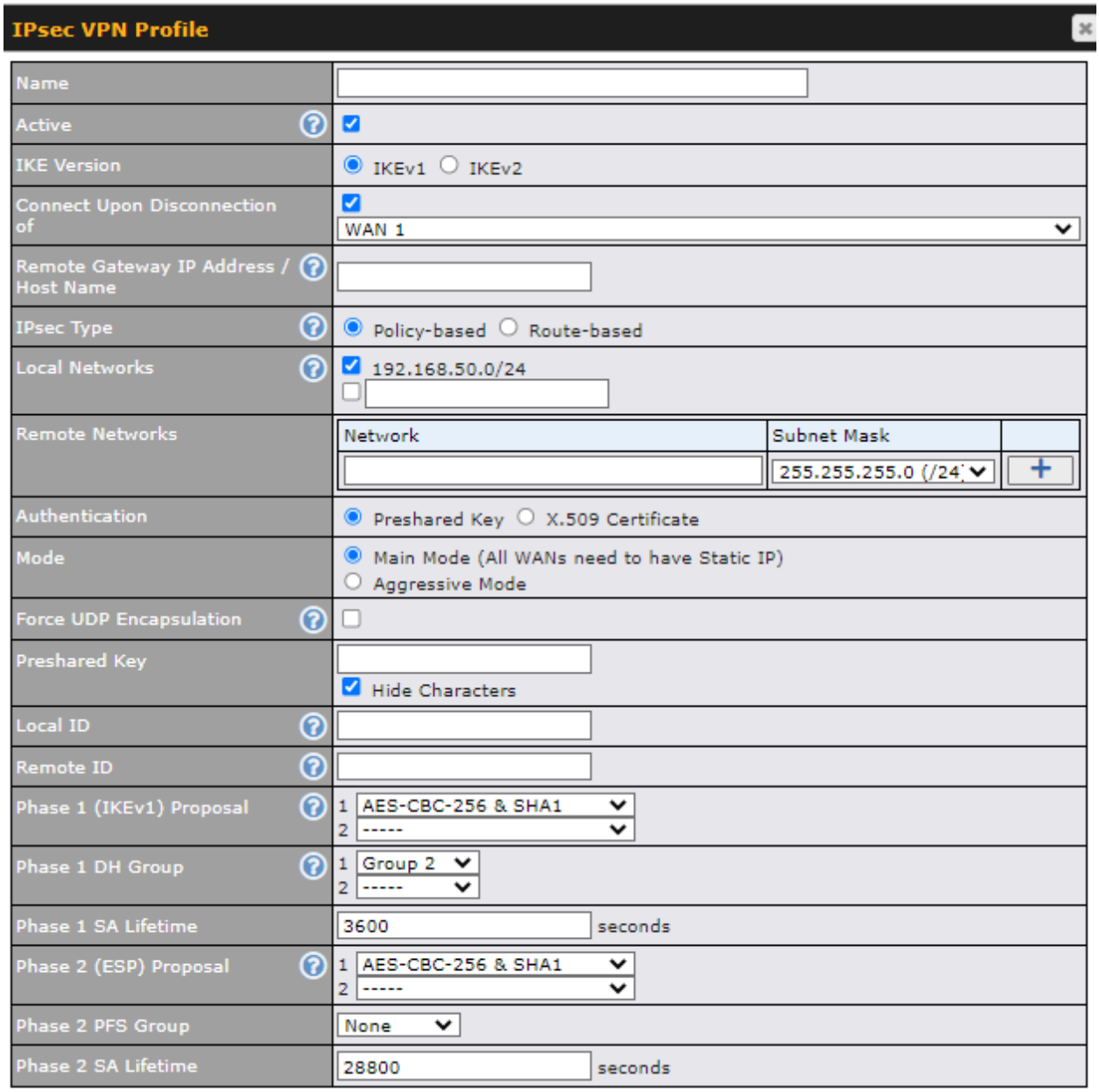
IPsec VPN on Peplink routers is specially designed for multi-WAN environments. For instance, if a user sets up multiple IPsec profiles for a multi-WAN environment and WAN1 is connected and healthy, IPsec traffic will go through this link. However, should unforeseen problems (e.g., unplugged cables or ISP problems) cause WAN1 to go down, our IPsec implementation will make use of WAN2 and WAN3 for failover.

10.1 IPsec VPN Settings

Many Peplink products can make multiple IPsec VPN connections with Peplink, Peplink, Cisco, and Juniper routers. Note that all LAN subnets and the subnets behind them must be unique. Otherwise, VPN members will not be able to access each other. All data can be routed over the VPN with a selection of encryption standards, such as 3DES, AES-128, and AES-256. To configure IPsec VPN on Peplink devices that support it, navigate to **Advanced>IPsec VPN.**



Click the **New Profile** button to create new IPsec VPN profiles that make VPN connections to remote Peplink, Cisco, or Juniper routers via available WAN connections. To edit any of the profiles, click on its associated connection name in the leftmost column.



IPsec VPN Profile Settings	
Name	This field is for specifying a local name to represent this connection profile.
Active	When this box is checked, this IPsec VPN connection profile will be enabled. Otherwise, it will be disabled.
IKE Version	Two versions of the IKE standards are available: • IKEv1 • IKEv2

Connect Upon Disconnection of	Check this box and select a WAN to connect to this VPN automatically when the specified WAN is disconnected.
Remote Gateway IP Address / Host Name	Enter the remote peer's public IP address. For **Aggressive Mode**, this is optional.
IPsec Type	Policy-based - (default) All the matched traffic as defined in Local Networks and Remote Networks will be routed to this IPsec connection, this cannot be overridden by other routing methods. Route-based - Outbound Policy rule is required to route traffic to this tunnel and comes with more flexibility to control how to route traffic compared to Policy-based. If you want to modify the traffic selector instead of using the default (0.0.0.0/0). **Note**: This option is available for certain following models only: • MAX: BR1 ENT, Transit, 700 HW3 or above, HD2 HW5 or above, HD4
Local Networks	Enter the local LAN subnets here. If you have defined static routes, they will be shown here. Using NAT, you can map a specific local network / IP address to another, and the packets received by remote gateway will appear to be coming from the mapped network / IP address. This allow you to establish IPsec connection to a remote site that has one or more subnets overlapped with local site. Two types of NAT policies can be defined: One-to-One NAT policy: if the defined subnet in Local Network and NAT Network has the same size, for example, policy "192.168.50.0/24 > 172.16.1.0/24" will translate the local IP address 192.168.50.10 to 172.16.1.10 and 192.168.50.20 to 172.16.1.20. This is a bidirectional mapping which means clients in remote site can initiate connection to the local clients using the mapped address too. Many-to-One NAT policy: if the defined NAT Network on the right hand side is an IP address (or having a network prefix /32), for example, policy "192.168.1.0/24 > 172.168.50.1/32" will translate all clients in 192.168.1.0/24 network to 172.168.50.1. This is a unidirectional mapping which means clients in remote site will not be able to initiate connection to the local clients.
Remote Networks	Enter the LAN and subnets that are located at the remote site here.
Authentication	To access your VPN, clients will need to authenticate by your choice of methods. Choose between the **Preshared Key** and **X.509 Certificate** methods of

	authentication.
Mode	Choose **Main Mode** if both IPsec peers use static IP addresses. Choose **Aggressive Mode** if one of the IPsec peers uses dynamic IP addresses.
Force UDP Encapsulation	For forced UDP encapsulation regardless of NAT-traversal, tick this checkbox.
Pre-shared Key	This defines the peer authentication pre-shared key used to authenticate this VPN connection. The connection will be up only if the pre-shared keys on each side match.
Remote Certificate (pem encoded)	Available only when **X.509 Certificate** is chosen as the **Authentication** method, this field allows you to paste a valid X.509 certificate.
Local ID	In **Main Mode**, this field can be left blank. In **Aggressive Mode**, if **Remote Gateway IP Address** is filled on this end and the peer end, this field can be left blank. Otherwise, this field is typically a U-FQDN.
Remote ID	In **Main Mode**, this field can be left blank. In **Aggressive Mode**, if **Remote Gateway IP Address** is filled on this end and the peer end, this field can be left blank. Otherwise, this field is typically a U-FQDN.
Phase 1 (IKE) Proposal	In **Main Mode**, this allows setting up to six encryption standards, in descending order of priority, to be used in initial connection key negotiations. In **Aggressive Mode**, only one selection is permitted.
Phase 1 DH Group	This is the Diffie-Hellman group used within IKE. This allows two parties to establish a shared secret over an insecure communications channel. The larger the group number, the higher the security. **Group 2**: **1024-bit** is the default value. **Group 5**: **1536-bit** is the alternative option.
Phase 1 SA Lifetime	This setting specifies the lifetime limit of this Phase 1 Security Association. By default, it is set at **3600** seconds.
Phase 2 (ESP) Proposal	In **Main Mode**, this allows setting up to six encryption standards, in descending order of priority, to be used for the IP data that is being transferred. In **Aggressive Mode**, only one selection is permitted.
Phase 2 PFS Group	Perfect forward secrecy (PFS) ensures that if a key was compromised, the attacker will be able to access only the data protected by that key. **None** - Do not request for PFS when initiating connection. However, since there is no valid reason to refuse PFS, the system will allow the connection to use PFS if requested by the remote peer. This is the default value. **Group 2**: 1024-bit Diffie-Hellman group. The larger the group number, the higher the security. **Group 5**: **1536-bit** is the third option.

Phase 2 SA Lifetime	This setting specifies the lifetime limit of this Phase 2 Security Association. By default, it is set at **28800** seconds.

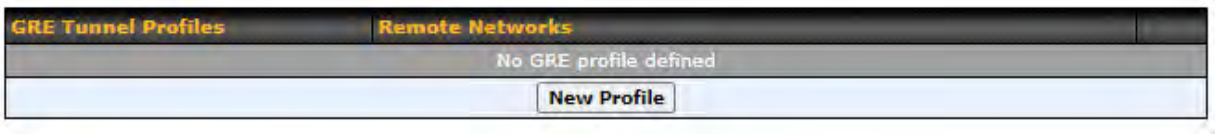
WAN Connection Priority	
WAN Connection	Select the appropriate WAN connection from the drop-down menu.

IPsec Settings	
DPD Interval	Time interval between Dead Peer Detection (DPD) messages (R_U_THERE in IKEv1 or INFORMATIONAL in IKEv2) that check if the peer is still active when no other traffic is present. Default: 10 seconds (2–30 seconds)
DPD Attempts	Total number of DPD messages sent before the peer is considered unreachable. Default: 3 times (2-10 times)

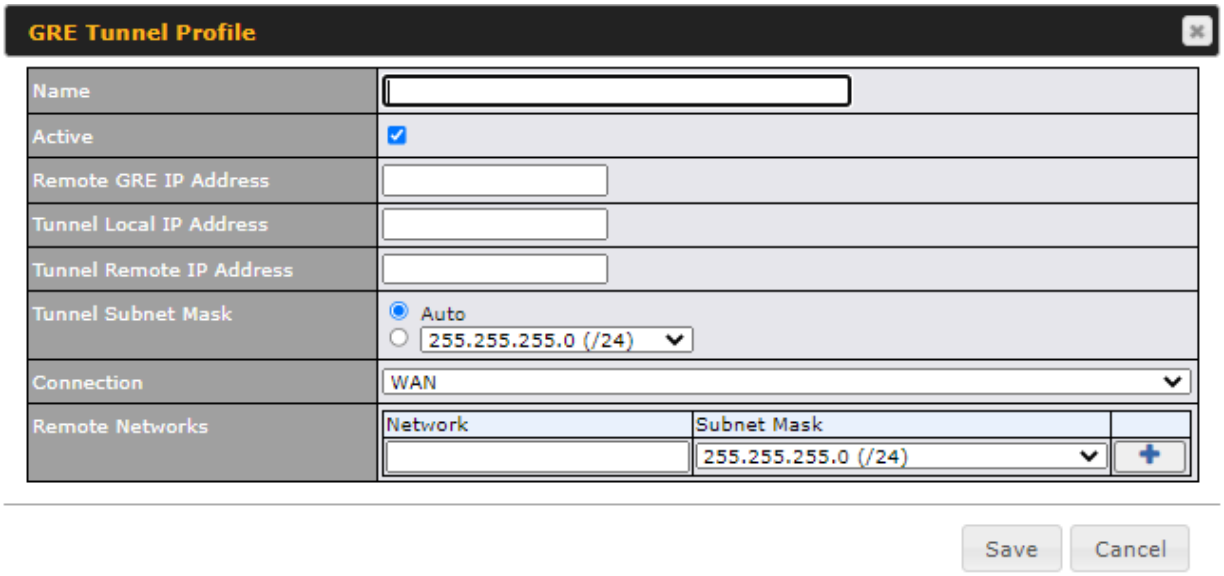
11 GRE Tunnel

Generic Routing Encapsulation (GRE) is a tunneling protocol that can encapsulate a wide variety of network layer protocols inside virtual point-to-point links over an Internet Protocol network. A GRE tunnel is similar to IPSec or SpeedFusion VPN.

To configure a GRE Tunnel, navigate to **Advanced > GRE Tunnel**.



Click the **New Profile** button to create new GRE tunnel profiles that establish tunnel connections to remote tunnel endpoints via available WAN connections. To edit the profiles, click on its associated connection name in the leftmost column.

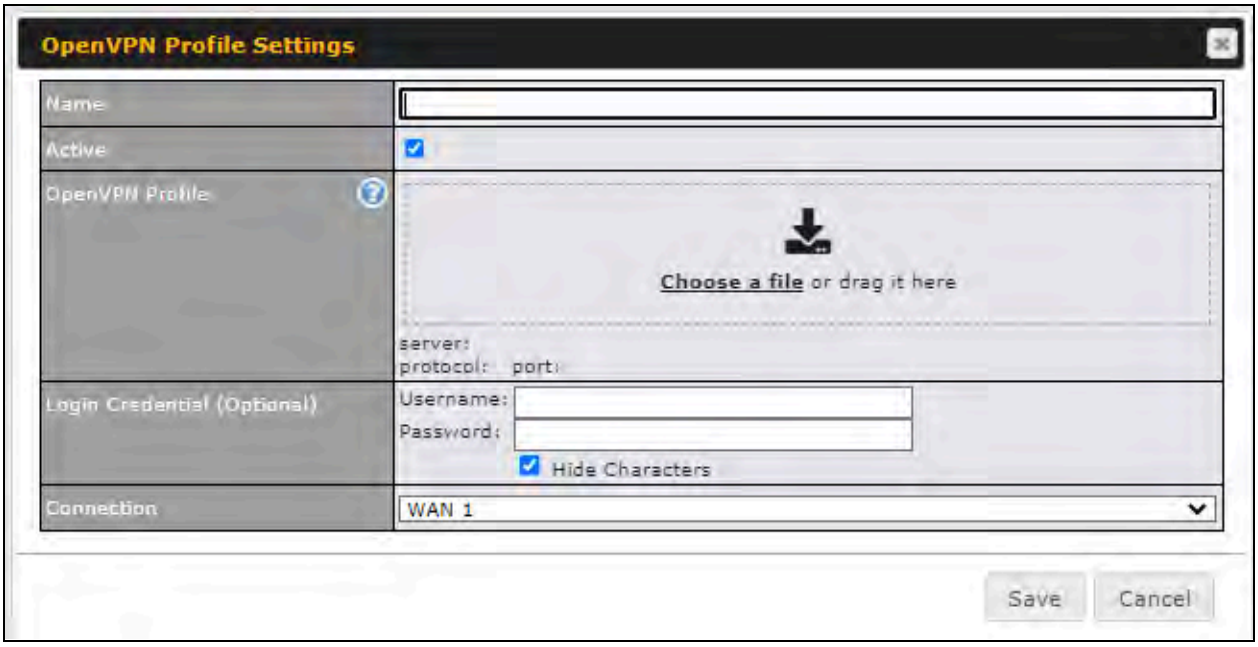


GRE Tunnel Profile Settings	
Name	This field is for specifying a name to represent this GRE Tunnel connection profile.
Active	When this box is checked, this GRE Tunnel connection profile will be enabled. Otherwise, it will be disabled.
Remote GRE IP Address	This field is for entering the remote GRE's IP address
Tunnel Local IP Address	This field is for specifying the tunnel source IP address.
Tunnel Remote IP Address	This field is for specifying the tunnel destination IP address
Tunnel Subnet Mask	This field is to select the subnet mask that is to be used for the GRE tunnel.
Connection	Select the appropriate WAN connection from the drop-down menu.
Remote Networks	Input the LAN and subnets that are located at the remote site here.

12 OpenVPN

OpenVPN is a site to site VPN mode that can encapsulate a wide variety of network layer protocols inside virtual point-to-point links over an Internet Protocol network.

To configure a OpenVPN, navigate to **Advanced > OpenVPN** and click the **New Profile**.



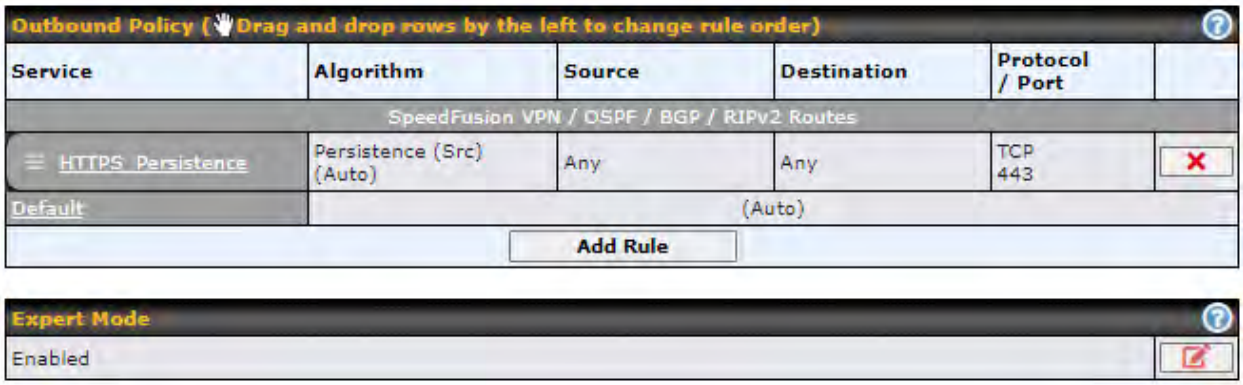
OpenVPN Profile Settings	
Name	This field is for specifying a name to represent this OpenVPN profile.
Active	When this box is checked, this OpenVPN connection profile will be enabled. Otherwise, it will be disabled.
OpenVPN Profile	Upload the OpenVPN configuration (.ovpn) file from your service provider.
Login Credential (Optional)	This option is an optional for you to enter the username and password to login for the OpenVPN connection if the profile need to login.
Connection	Select the appropriate WAN connection from the drop-down menu.

13 Outbound Policy

Peplink routers can flexibly manage and load balance outbound traffic among WAN connections.

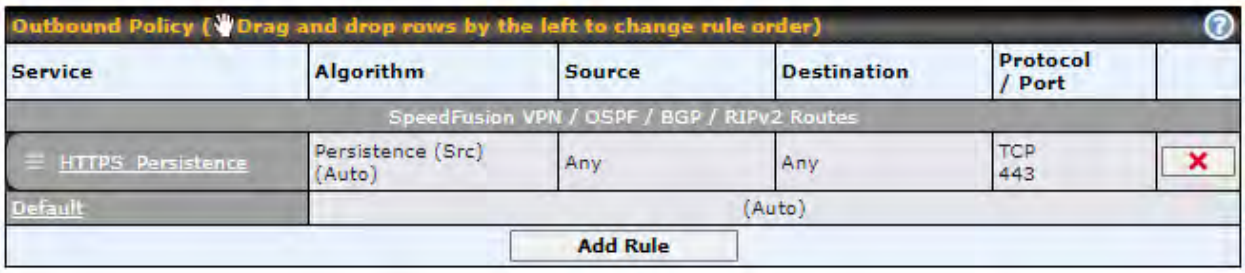
Important Note
Outbound policy is applied only when more than one WAN connection is active.

The settings for managing and load balancing outbound traffic are located at **Advanced > Outbound Policy**.



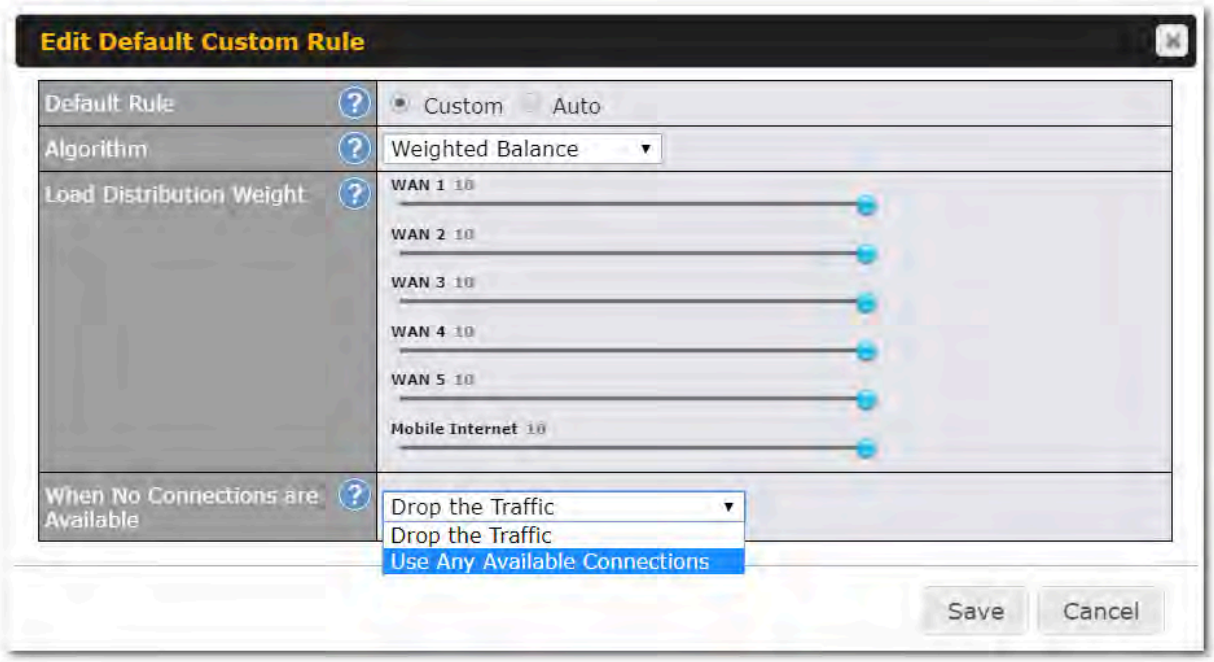
13.1 Adding Rules for Outbound Policy

The menu underneath enables you to define Outbound policy rules:



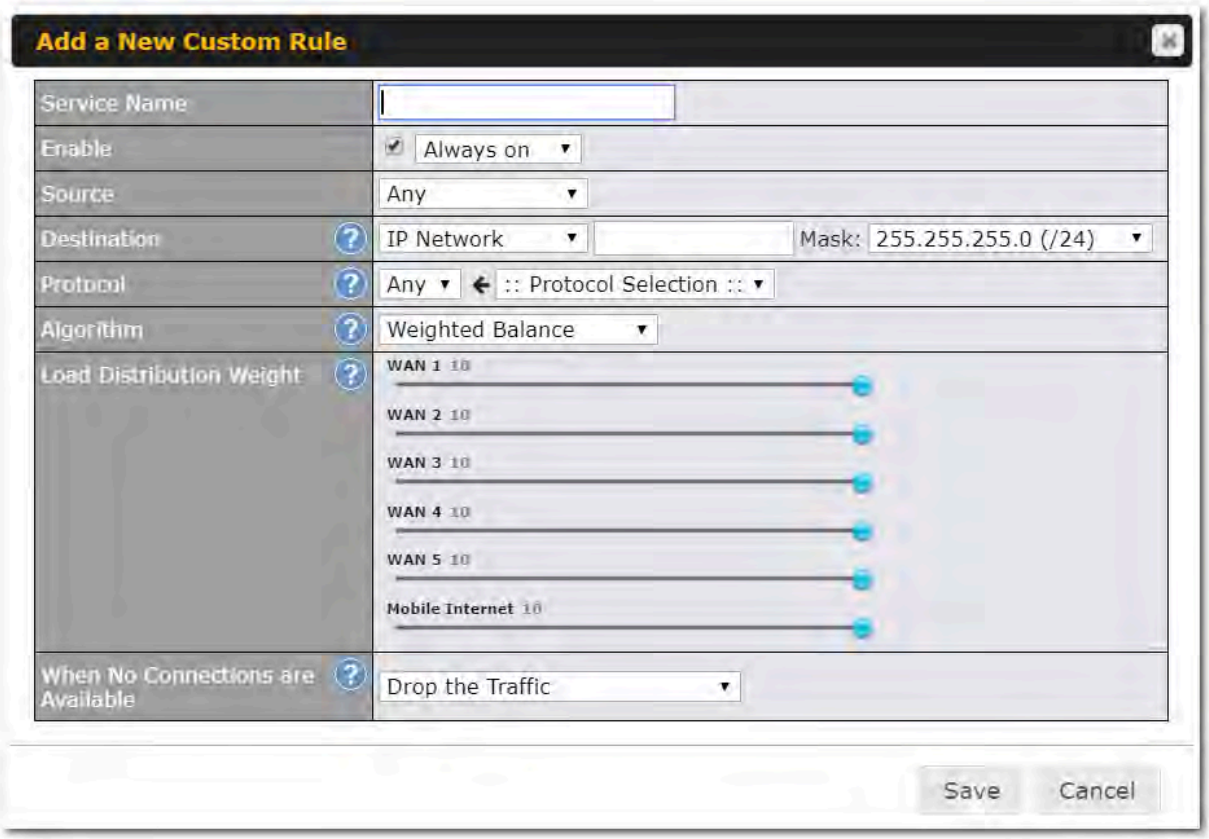
The bottom-most rule is **Default**. Edit this rule to change the device's default manner of controlling outbound traffic for all connections that do not match any of the rules above it. Under the **Service** heading, click **Default** to change these settings.

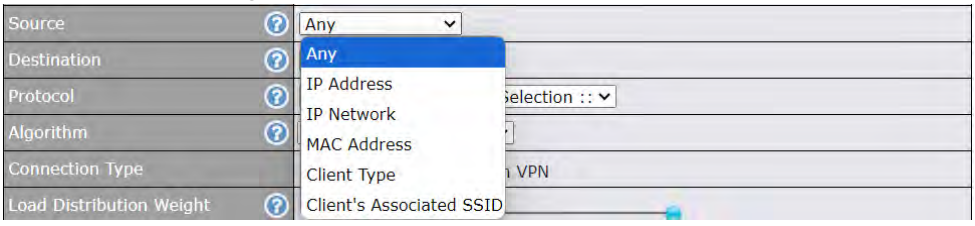
To rearrange the priority of outbound rules, drag and drop them into the desired sequence.



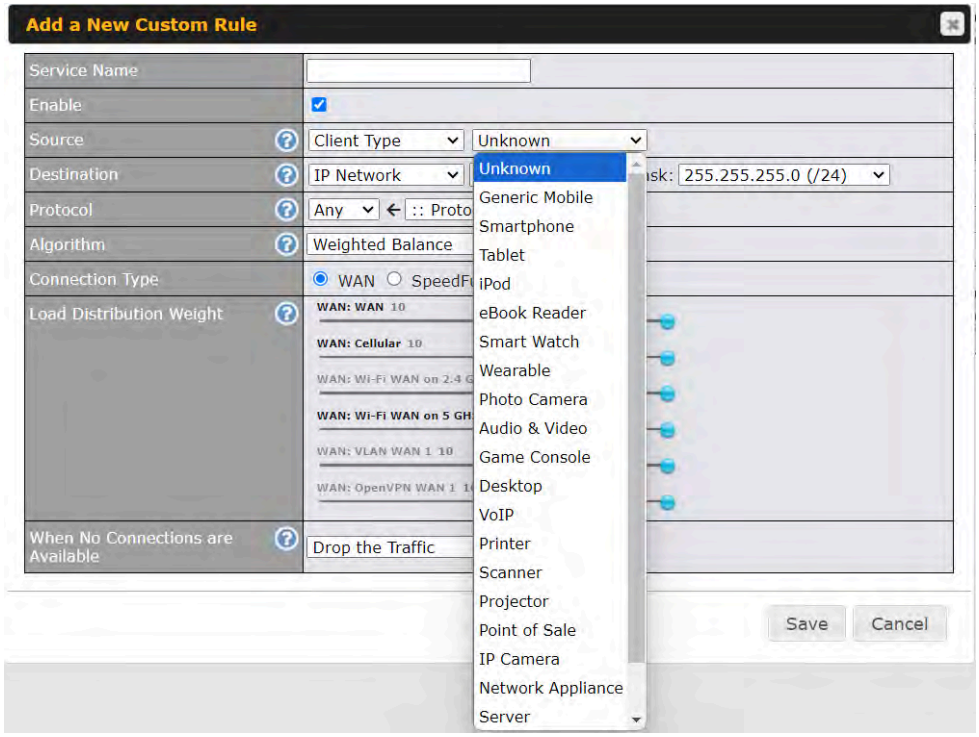
By default, **Auto** is selected as the **Default Rule**. You can select **Custom** to change the algorithm to be used. Please refer to the upcoming sections for the details on the available algorithms.

To create a custom rule, click **Add Rule** at the bottom of the table.



New Custom Rule Settings	
Service Name	This setting specifies the name of the outbound traffic rule.
Enable	This setting specifies whether the outbound traffic rule takes effect. When **Enable** is checked, the rule takes effect: traffic is matched and actions are taken by the Peplink router based on the other parameters of the rule. When **Enable** is unchecked, the rule does not take effect: the Peplink router disregards the other parameters of the rule. Click the drop-down menu next to the checkbox to apply a time schedule to this custom rule.
Source	This specifies the source IP address(es) and port number(s) to be matched for the firewall rule. Any, IP Address, IP Network, MAC Address, Client Type (for Outbound and Internal Firewall only), and Client's Associated SSID can be specified as the Source setting, as indicated in the following screenshots:  When you select Client Type as the Source, a drop-down list will appear for you to choose

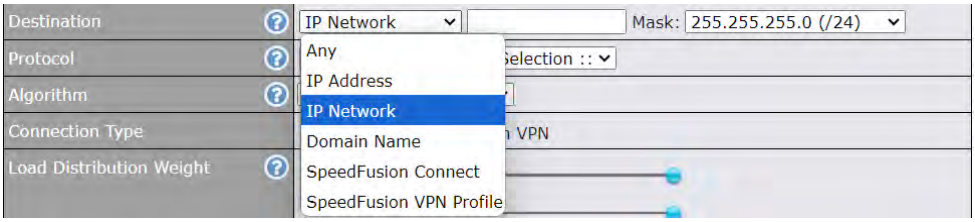
the different types of client devices.



In addition, a single port, or a range of ports, can be specified for the **Source** settings.

Destination

This specifies the destination IP address(es) and port number(s) to be matched for the firewall rule. Any, IP Address, IP Network, Domain Name, SpeedFusion Connect, and SpeedFusion VPN Profile can be specified as the **Destination** setting, as indicated in the following screenshots:



In addition, a single port or a range of ports can be specified for the settings.

Protocol and Port

This setting specifies the IP protocol and port of traffic that matches this rule. Via a drop-down menu, the following protocols can be specified:

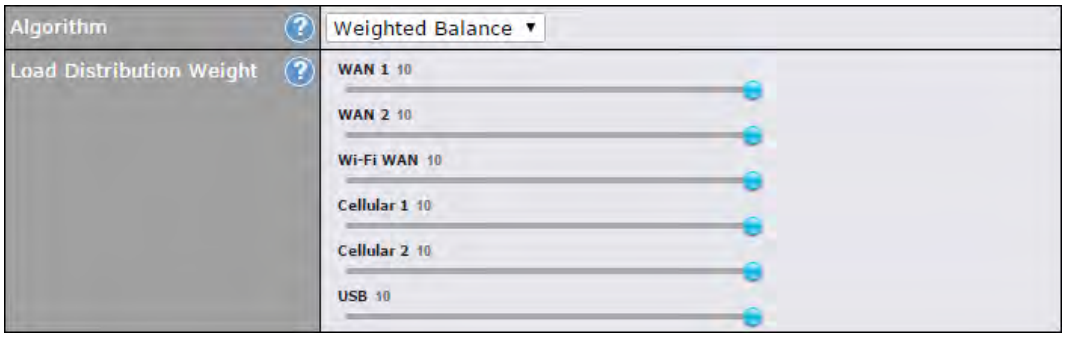
- Any
- TCP
- UDP
- IP
- DSCP

Alternatively, the **Protocol Selection Tool** drop-down menu can be used to automatically fill in the protocol and port number of common Internet services (e.g., HTTP, HTTPS, etc.) After selecting an item from the **Protocol Selection Tool** drop-down menu, the protocol

	and port number remains manually modifiable.
Algorithm	This setting specifies the behavior of the Peplink router for the custom rule. One of the following values can be selected (Note that some Peplink routers provide only some of these options): • Weighted Balance • Persistence • Enforced • Priority • Overflow • Least Used • Lowest Latency • Fastest Response Time For a full explanation of each Algorithm, please see the following article: https://forum.peplink.com/t/exactly-how-do-peplinks-load-balancing-algorithmns-work/8059
Load Distribution Weight	This is to define the outbound traffic weight ratio for each WAN connection.
When No connections are available	This field allows you to configure the default action when all the selected Connections are not available. **Drop the Traffic** - Traffic will be discarded. **Use Any Available Connections** - Traffic will be routed to any available Connection, even it is not selected in the list. **Fall-through to Next Rule** - Traffic will continue to match the next Outbound Policy rule just like this rule is inactive.
Terminate Sessions on Connection Recovery	This setting specifies whether to terminate existing IP sessions on a less preferred WAN connection in the event that a more preferred WAN connection is recovered. This setting is applicable to the **Priority** algorithms. By default, this setting is disabled. In this case, existing IP sessions will not be terminated or affected when any other WAN connection is recovered. When this setting is enabled, existing IP sessions may be terminated when another WAN connection is recovered, such that only the preferred healthy WAN connection(s) is used at any point in time.

13.1.1 Algorithm: Weighted Balance

This setting specifies the ratio of WAN connection usage to be applied on the specified IP protocol and port. This setting is applicable only when **Algorithm** is set to **Weighted Balance**.



The amount of matching traffic that is distributed to a WAN connection is proportional to the weight of the WAN connection relative to the total weight. Use the sliders to change each WAN's weight.

For example, with the following weight settings:

- Ethernet WAN1: 10
- Ethernet WAN2: 10
- Wi-Fi WAN: 10
- Orbit WAN 1: 10
- Orbit WAN 2: 10
- USB: 10

Total weight is 60 = (10 +10 + 10 + 10 + 10 + 10).

Matching traffic distributed to Ethernet WAN1 is 16.7% = (10 / 60 x 100%.

Matching traffic distributed to Ethernet WAN2 is 16.7% = (10 / 60) x 100%.

Matching traffic distributed to Wi-Fi WAN is 16.7% = (10 / 60) x 100%.

Matching traffic distributed to Orbit WAN 1 is 16.7% = (10 / 60) x 100%.

Matching traffic distributed to Orbit WAN 2 is 16.7% = (10 / 60) x 100%.

Matching traffic distributed to USB is 16.7% = (10 / 60) x 100%.

13.1.2 Algorithm: Persistence

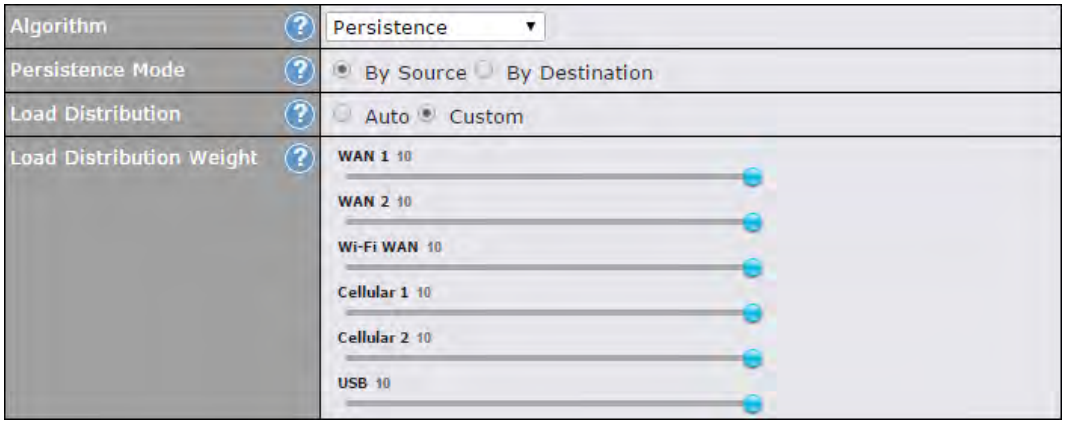
The configuration of persistent services is the solution to the few situations where link load distribution for Internet services is undesirable. For example, for security reasons, many e-banking and other secure websites terminate the session when the client computer's Internet IP address changes mid-session.

In general, different Internet IP addresses represent different computers. The security concern is that an IP address change during a session may be the result of an unauthorized intrusion attempt. Therefore, to prevent damages from the potential intrusion, the session is terminated

upon the detection of an IP address change.

Peplink routers can be configured to distribute data traffic across multiple WAN connections. Also, the Internet IP depends on the WAN connections over which communication actually takes place. As a result, a LAN client computer behind the Peplink router may communicate using multiple Internet IP addresses. For example, a LAN client computer behind a Peplink router with three WAN connections may communicate on the Internet using three different IP addresses.

With the persistence feature, rules can be configured to enable client computers to persistently utilize the same WAN connections for e-banking and other secure websites. As a result, a client computer will communicate using one IP address, eliminating the issues mentioned above.



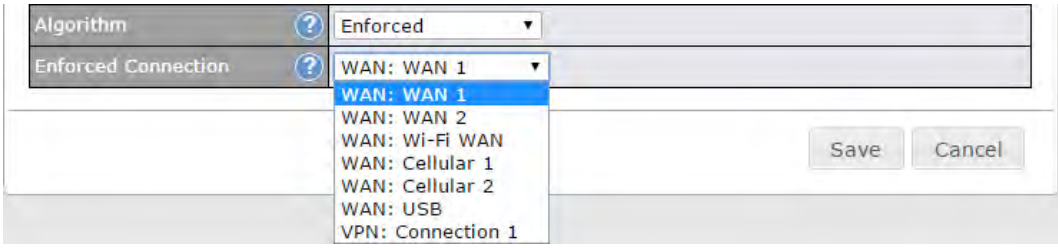
There are two persistent modes: **By Source** and **By Destination**.

By Source:	The same WAN connection will be used for traffic matching the rule and originating from the same machine, regardless of its destination. This option will provide the highest level of application compatibility.
By Destination:	The same WAN connection will be used for traffic matching the rule, originating from the same machine, and going to the same destination. This option can better distribute loads to WAN connections when there are only a few client machines.

The default mode is **By Source**. When there are multiple client requests, they can be distributed (persistently) to WAN connections with a weight. If you choose **Auto** in **Load Distribution**, the weights will be automatically adjusted according to each WAN's **Downstream Bandwidth** which is specified in the WAN settings page). If you choose **Custom**, you can customize the weight of each WAN manually by using the sliders.

13.1.3 Algorithm: Enforced

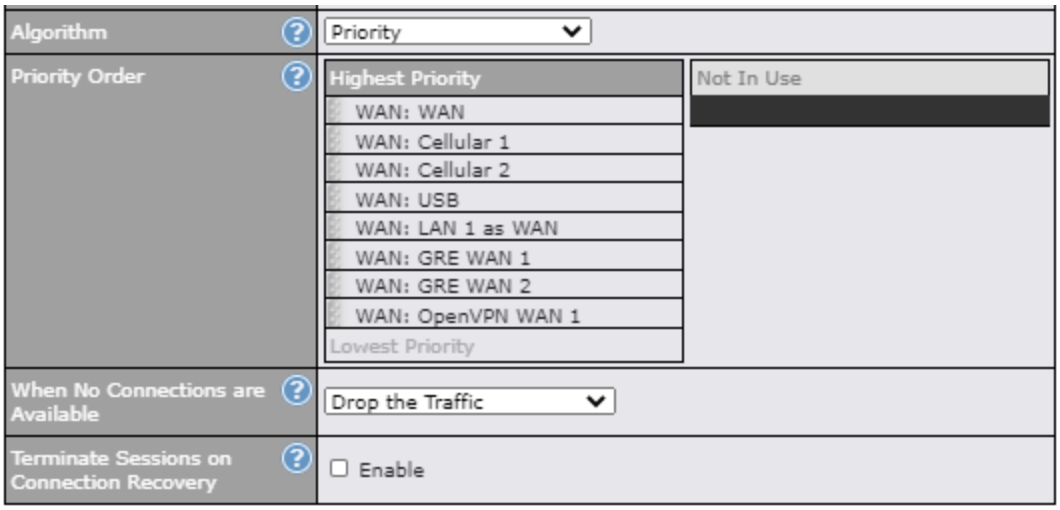
This setting specifies the WAN connection usage to be applied on the specified IP protocol and port. This setting is applicable only when **Algorithm** is set to **Enforced**.



Matching traffic will be routed through the specified WAN connection, regardless of the health check status of the WAN connection. Starting from Firmware 5.2, outbound traffic can be enforced to go through a specified SpeedFusion™ connection.

13.1.4 Algorithm: Priority

This setting specifies the priority of the WAN connections used to route the specified network service. The highest priority WAN connection available will always be used for routing the specified type of traffic. A lower priority WAN connection will be used only when all higher priority connections have become unavailable.

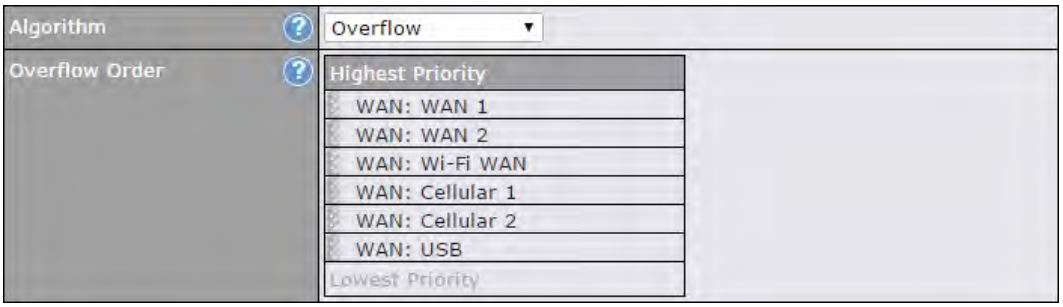


Starting from Firmware 5.2, outbound traffic can be prioritized to go through SpeedFusion™ connection(s). By default, VPN connections are not included in the priority list.

Tip
Configure multiple distribution rules to accommodate different kinds of services.

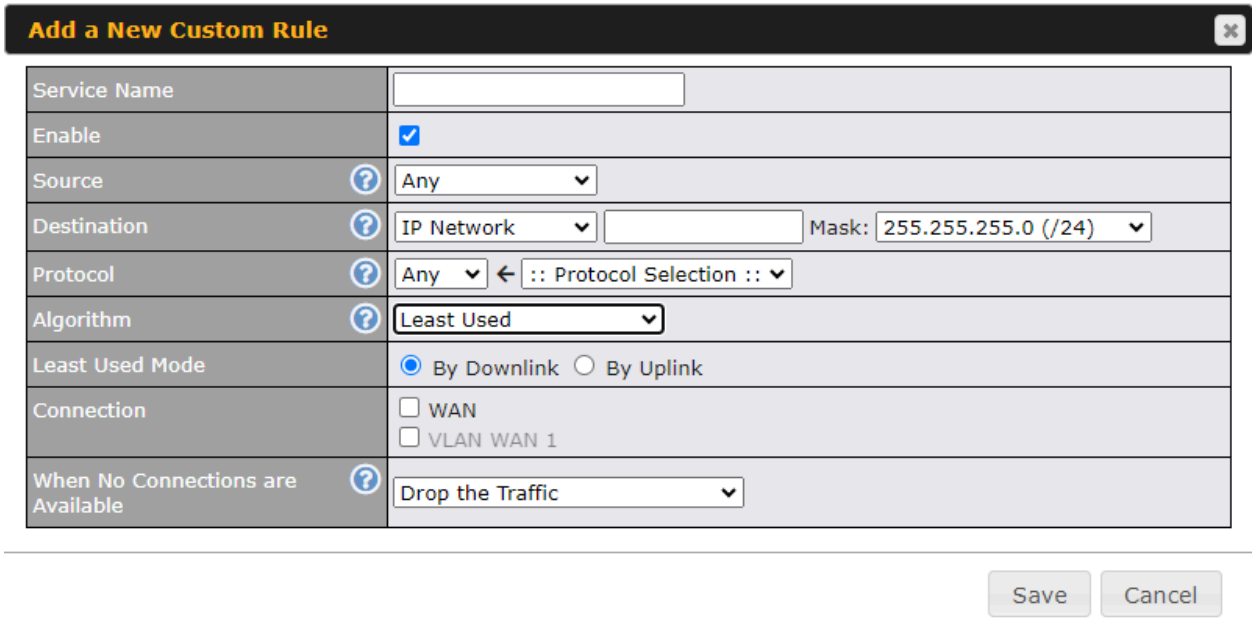
13.1.5 Algorithm: Overflow

The traffic matching this rule will be routed through the healthy WAN connection that has the highest priority and is not in full load. When this connection gets saturated, new sessions will be routed to the next healthy WAN connection that is not in full load.



Drag and drop to specify the order of WAN connections to be used for routing traffic. Only the highest priority healthy connection that is not in full load will be used.

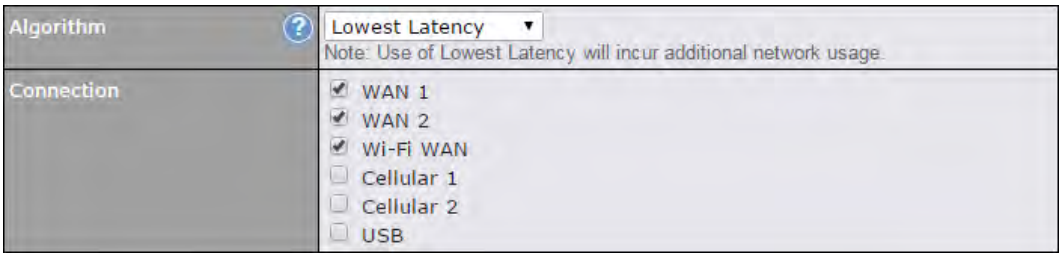
13.1.6 Algorithm: Least Used



By default, traffic matching this rule will be routed through the healthy WAN connection that is selected in the '**Connection**' and has the most available download bandwidth. You can change it to 'By Uplink' to choose the connection that has the most available upload bandwidth.

The available download/upload bandwidth of a WAN connection is calculated from the total download/upload bandwidth specified on the WAN settings page and the current download/upload usage. The available bandwidth and WAN selection are determined every time an IP session is established.

13.1.7 Algorithm: Lowest Latency



The traffic matching this rule will be routed through the healthy WAN connection that is selected in **Connection** and has the lowest latency. Latency checking packets are issued periodically to a nearby router of each WAN connection to determine its latency value. The latency of a WAN is the packet round trip time of the WAN connection. Additional network usage may be incurred as a result.

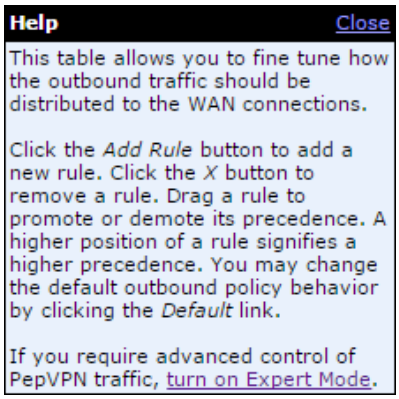
Tip

The roundtrip time of a 6M down/640k uplink can be higher than that of a 2M down/2M up link because the overall round trip time is lengthened by its slower upload bandwidth, despite its higher downlink speed. Therefore, this algorithm is good for two scenarios:

- All WAN connections are symmetric; or
- A latency sensitive application must be routed through the lowest latency WAN, regardless of the WAN's available bandwidth.

13.1.8 Expert Mode

Expert Mode is available on some Peplink routers for use by advanced users. To enable the feature, click on the help icon and click **turn on Expert Mode**.



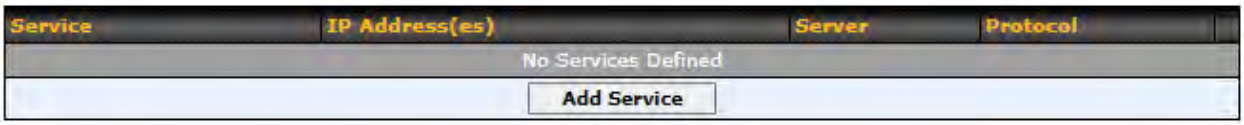
In Expert Mode, a new special rule, **SpeedFusion™ Routes**, is displayed in the **Custom Rules** table. This rule represents all SpeedFusion™ routes learned from remote VPN peers. By default, this bar is on the top of all custom rules. This position means that traffic for remote VPN subnets will be routed to the corresponding VPN peer. You can create custom **Priority** or **Enforced** rules and move them

above the bar to override the SpeedFusion™ routes.

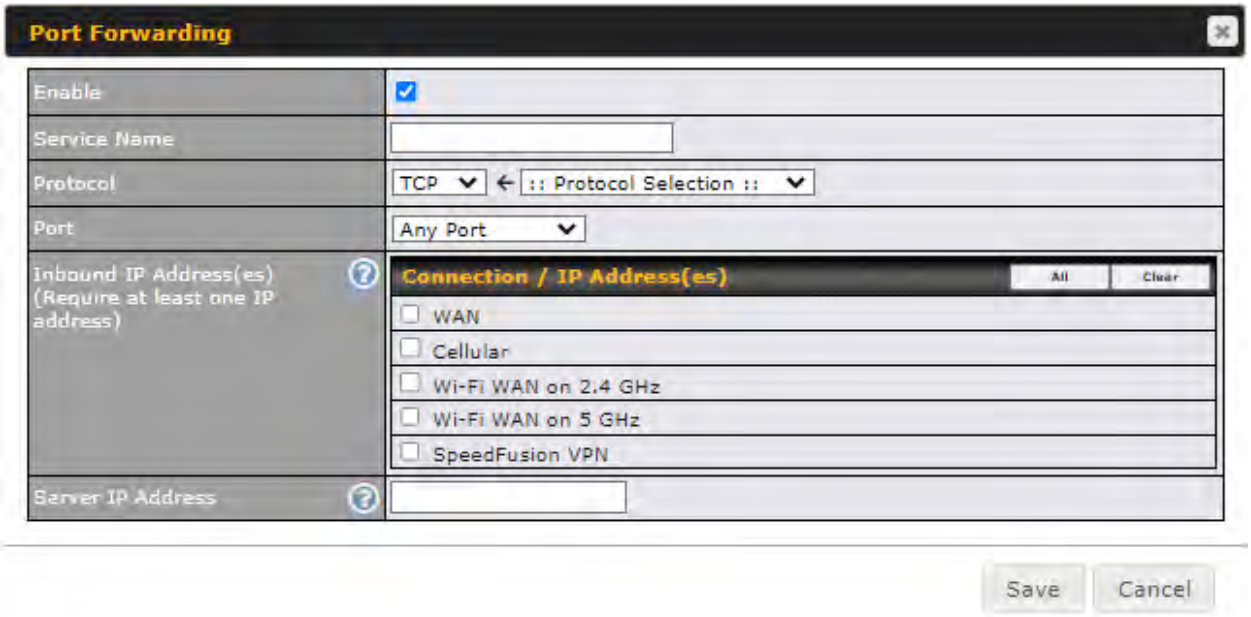
Upon disabling Expert Mode, all rules above the bar will be removed.

14 Port Forwarding

Peplink routers can act as a firewall that blocks, by default, all inbound access from the Internet. By using port forwarding, Internet users can access servers behind the Peplink router. Inbound port forwarding rules can be defined at **Advanced > Port Forwarding**.



To define a new service, click **Add Service**.



Port Forwarding Settings	
Enable	This setting specifies whether the inbound service takes effect. When **Enable** is checked, the inbound service takes effect: traffic is matched and actions are taken by the Peplink router based on the other parameters of the rule. When this setting is disabled, the inbound service does not take effect: the Peplink router disregards the other parameters of the rule.
Service Name	This setting identifies the service to the system administrator. Valid values for this setting consist of only alphanumeric and underscore "_" characters.

Protocol	The **IP Protocol** setting, along with the **Port** setting, specifies the protocol of the service as TCP, UDP, ICMP, or IP. Traffic that is received by the Peplink router via the specified protocol at the specified port(s) is forwarded to the LAN hosts specified by the **Servers** setting. Please see below for details on the **Port** and **Servers** settings. Alternatively, the **Protocol Selection Tool** drop-down menu can be used to automatically fill in the protocol and a single port number of common Internet services (e.g. HTTP, HTTPS, etc.). After selecting an item from the **Protocol Selection Tool** drop-down menu, the protocol and port number remain manually modifiable.
Port	The **Port** setting specifies the port(s) that correspond to the service, and can be configured to behave in one of the following manners: **Any Port**, **Single Port**, **Port Range**, **Port Map**, and **Range Mapping**  **Any Port**: all traffic that is received by the Peplink router via the specified protocol is forwarded to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Any Port**, all TCP traffic is forwarded to the configured servers.  **Single Port**: traffic that is received by the Peplink router via the specified protocol at the specified port is forwarded via the same port to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Single Port** and **Service Port** 80, TCP traffic received on port 80 is forwarded to the configured servers via port 80.  **Port Range**: traffic that is received by the Peplink router via the specified protocol at the specified port range is forwarded via the same respective ports to the LAN hosts specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Port Range** and **Service Ports** 80-88, TCP traffic received on ports 80 through 88 is forwarded to the configured servers via the respective ports.  **Port Mapping**: traffic that is received by Peplink router via the specified protocol at the specified port is forwarded via a different port to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Port Mapping**, **Service Port** 80, and **Map to Port** 88, TCP traffic on port 80 is forwarded to the configured servers via port 88. (Please see below for details on the **Servers** setting.)

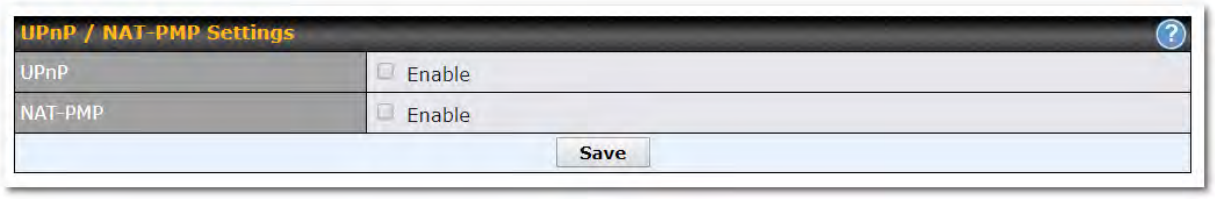
	 **Range Mapping**: traffic that is received by the Peplink router via the specified protocol at the specified port range is forwarded via a different port to the servers specified by the **Servers** setting.
Inbound IP Address(es)	This setting specifies the WAN connections and Internet IP address(es) from which the service can be accessed.
Server IP Address	This setting specifies the LAN IP address of the server that handles the requests for the service.

14.1 UPnP / NAT-PMP Settings

UPnP and NAT-PMP are network protocols which allow a computer connected to the LAN port to automatically configure the router to allow parties on the WAN port to connect to itself. That way, the process of inbound port forwarding becomes automated.

When a computer creates a rule using these protocols, the specified TCP/UDP port of all WAN connections' default IP address will be forwarded.

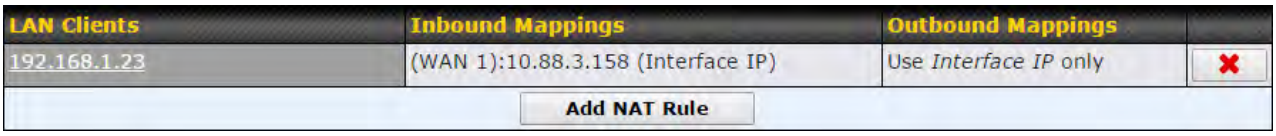
Check the corresponding box(es) to enable UPnP and/or NAT-PMP. Enable these features only if you trust the computers connected to the LAN ports.



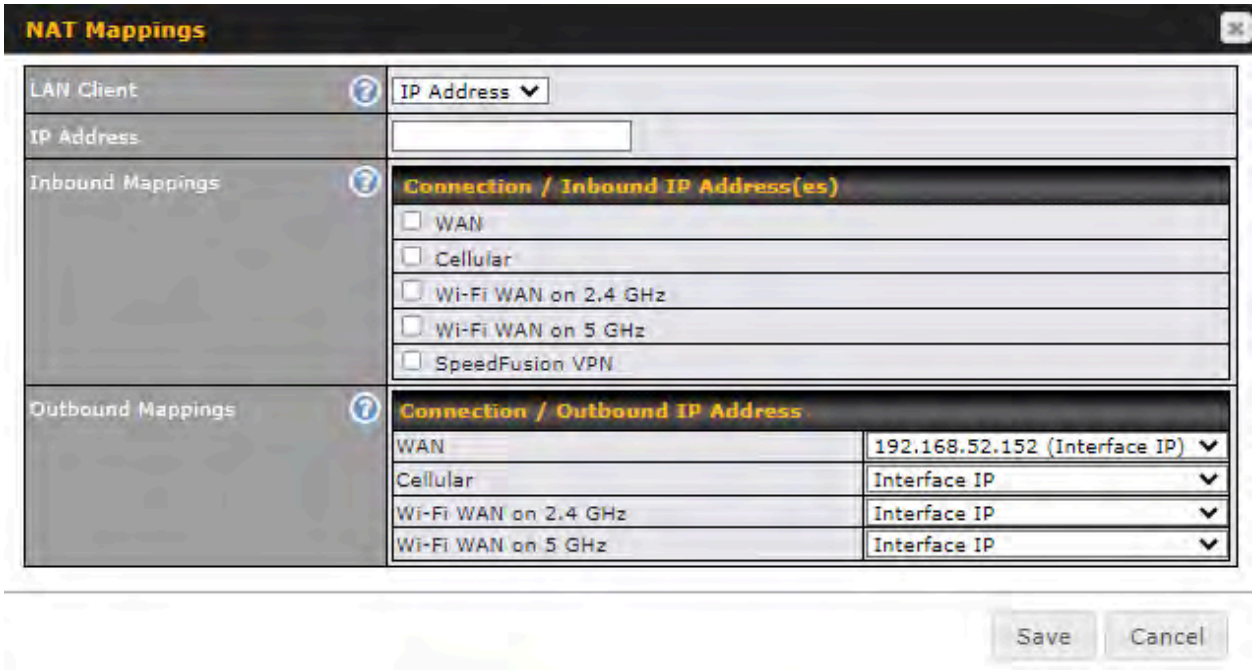
When the options are enabled, a table listing all the forwarded ports under these two protocols can be found at **Status > UPnP / NAT-PMP**.

15 NAT Mappings

NAT mappings allow IP address mapping of all inbound and outbound NAT'd traffic to and from an internal client IP address. Settings to configure NAT mappings are located at **Advanced > NAT Mappings**.



To add a rule for NAT mappings, click **Add NAT Rule**.



NAT Mapping Settings	
LAN Client	NAT mapping rules can be defined for a single LAN **IP Address**, an **IP Range**, or an **IP Network**.
IP Address	This refers to the LAN host's private IP address. The system maps this address to a number of public IP addresses (specified below) in order to facilitate inbound and outbound traffic. This option is only available when **IP Address** is selected.
IP Range	The IP range is a contiguous group of private IP addresses used by the LAN host. The system maps these addresses to a number of public IP addresses (specified below) to facilitate outbound traffic. This option is only available when **IP Range** is selected.

IP Network	The IP network refers to all private IP addresses and ranges managed by the LAN host. The system maps these addresses to a number of public IP addresses (specified below) to facilitate outbound traffic. This option is only available when **IP Network** is selected.
Inbound Mappings	This setting specifies the WAN connections and corresponding WAN-specific Internet IP addresses on which the system should bind. Any access to the specified WAN connection(s) and IP address(es) will be forwarded to the LAN host. This option is only available when **IP Address** is selected in the **LAN Client(s)** field. **Note that:** inbound mapping is not needed for WAN connections in drop-in mode or IP forwarding mode. Also note that each WAN IP address can be associated to one NAT mapping only.
Outbound Mappings	This setting specifies the WAN IP addresses that should be used when an IP connection is made from a LAN host to the Internet. Each LAN host in an IP range or IP network will be evenly mapped to one of each selected WAN's IP addresses (for better IP address utilization) in a persistent manner (for better application compatibility). **Note that:** if you do not want to use a specific WAN for outgoing accesses, you should still choose default here, then customize the outbound access rule in the **Outbound Policy** section. Also note that WAN connections in drop-in mode or IP forwarding mode are not shown here.

Click **Save** to save the settings when configuration has been completed.

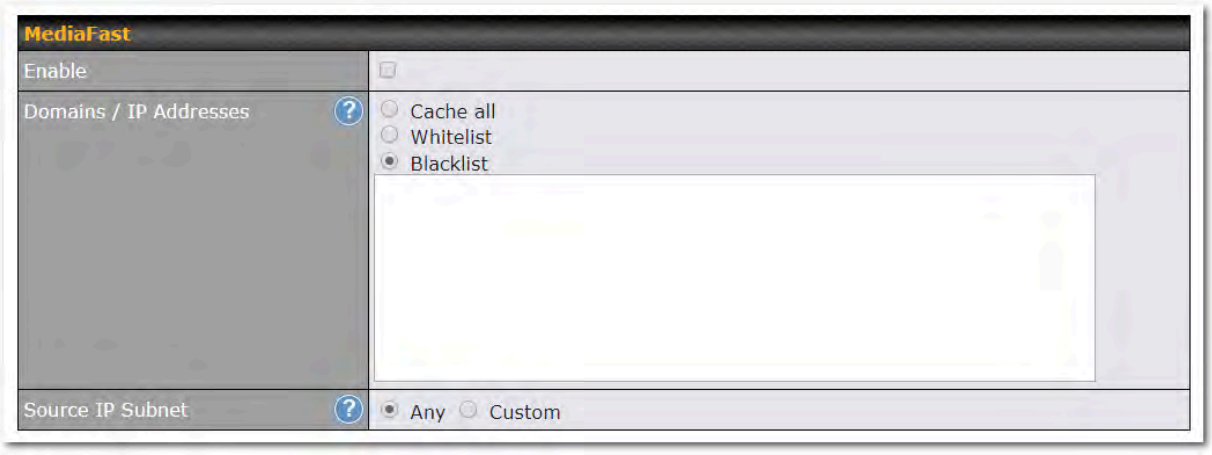
Important Note
Inbound firewall rules override the **Inbound Mappings** settings.

16 Media Fast

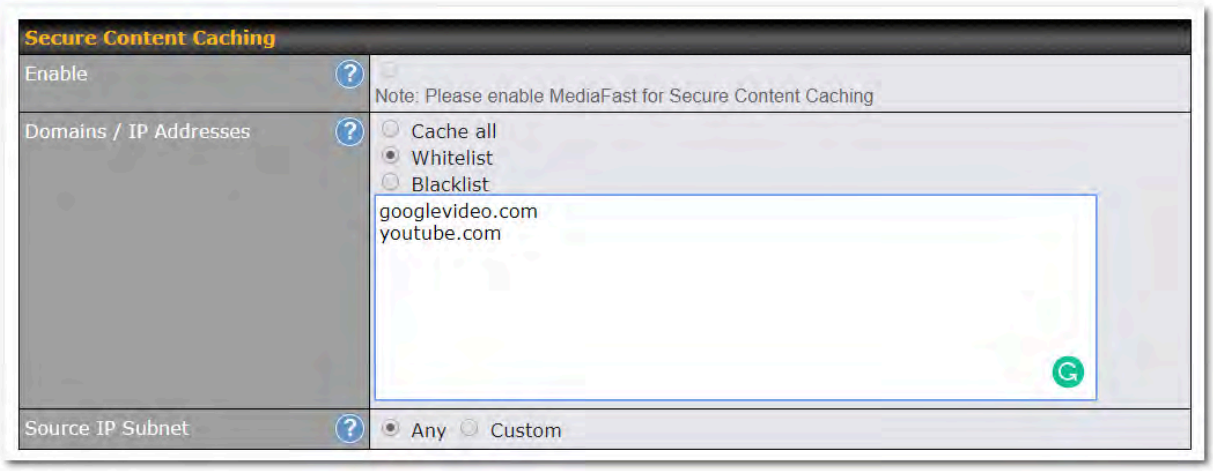
MediaFast settings can be configured from the **Advanced** menu.

16.1 Setting Up MediaFast Content Caching

To access MediaFast content caching settings, select **Advanced > Cache Control**

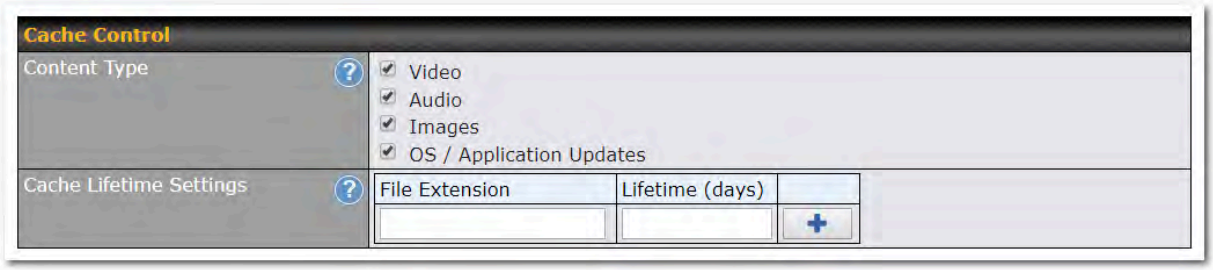


MediaFast	
Enable	Click the checkbox to enable MediaFast content caching.
Domains / IP Addresses	Choose to **Cache on all domains**, or enter domain names and then choose either **Whitelist** (cache the specified domains only) or **Blacklist** (do not cache the specified domains).
Source IP Subnet	This setting allows caching to be enabled on custom subnets only. If "Any" is selected, then caching will apply to all subnets.



The **Secure Content Caching** menu operates identically to the **MediaFast** menu, except it is for secure content cachting accessible through https://.
In order for Mediafast devices to cache and deliver HTTPS content, every client needs to have the necessary certificates installed*.

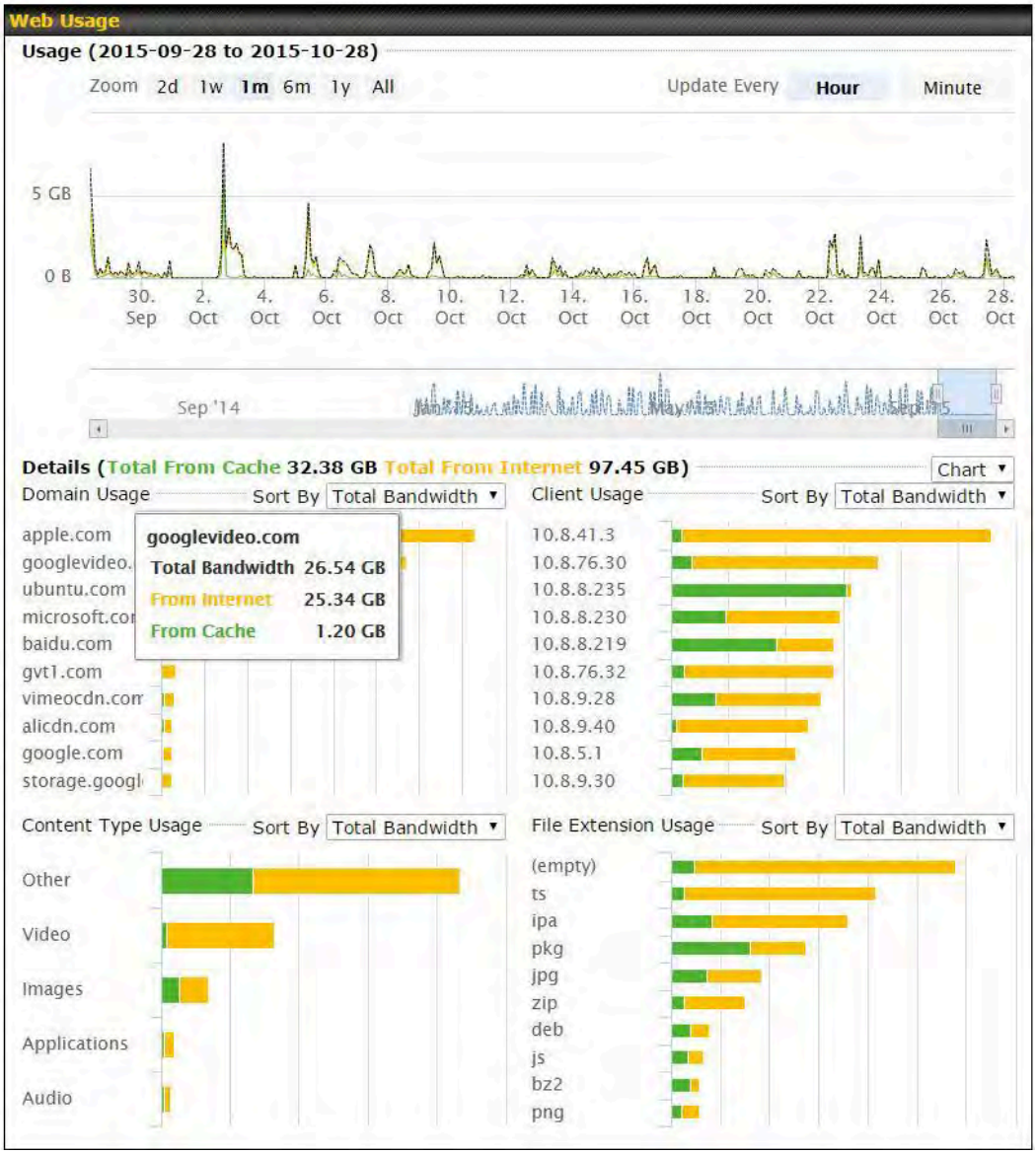
*See https://forum.peplink.com/t/certificate-installation-for-mediafast-https-caching/



Cache Control	
Content Type	Check these boxes to cache the listed content types or leave boxes unchecked to disable caching for the listed types.
Cache Lifetime Settings	Enter a file extension, such as JPG or DOC. Then enter a lifetime in days to specify how long files with that extension will be cached. Add or delete entries using the controls on the right.

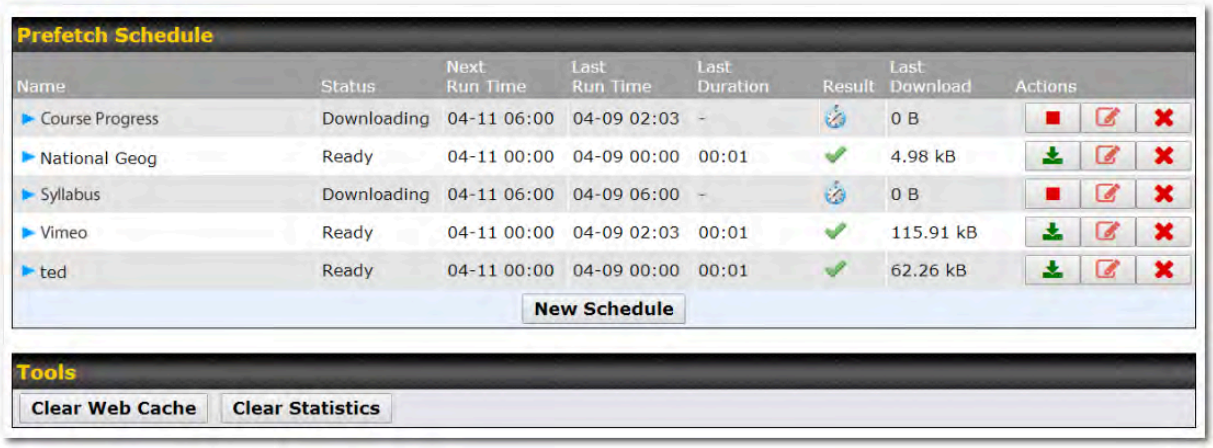
16.2 Viewing MediaFast Statistics

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

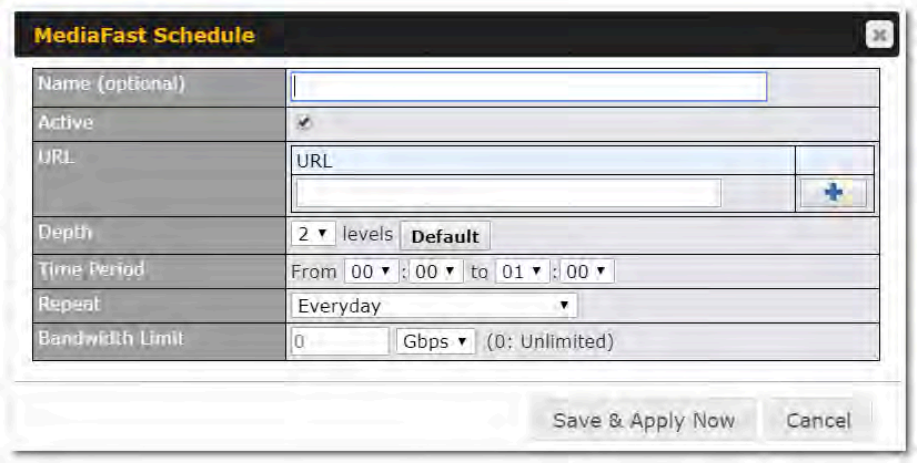


16.3 Prefetch Schedule

Content prefetching allows you to download content on a schedule that you define, which can help to preserve network bandwidth during busy times and keep costs down. To access MediaFast content prefetching settings, select **Advanced > Prefetch Schedule**.



Prefetch Schedule Settings	
Name	This field displays the name given to the scheduled download.
Status	Check the status of your scheduled download here.
Next Run Time/Last Run Time	These fields display the date and time of the next and most recent occurrences of the scheduled download.
Last Duration	Check this field to ensure that the most recent download took as long as expected to complete. A value that is too low might indicate an incomplete download or incorrectly specified download target, while a value that is too long could mean a download with an incorrectly specified target or stop time.
Result	This field indicates whether downloads are in progress ( ) or complete ( ).
Last Download	Check this field to ensure that the most recent download file size is within the expected range. A value that is too low might indicate an incomplete download or incorrectly specified download target, while a value that is too long could mean a download with an incorrectly specified target or stop time. This field is also useful for quickly seeing which downloads are consuming the most storage space.
Actions	To begin a scheduled download immediately, click . To cancel a scheduled download, click . To edit a scheduled download, click . To delete a scheduled download, click .

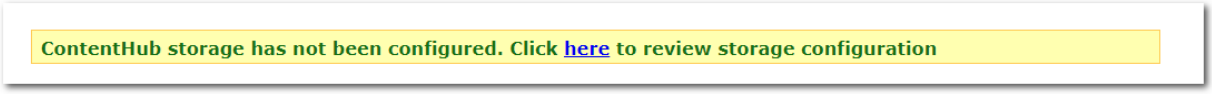
New Schedule	Click to begin creating a new scheduled download. Clicking the button will cause the following screen to appear:  Simply provide the requested information to create your schedule.
Clear Web Cache	To clear all cached content, click this button. Note that this action cannot be undone.
Clear Statistics	To clear all prefetch and status page statistics, click this button.

17 Edge Computing

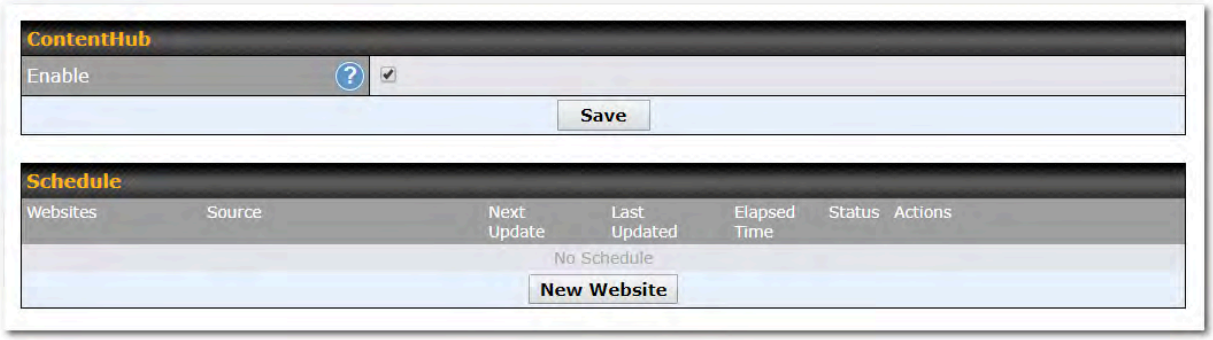
ContentHub allows you to deliver webpages and applications to users connected to the SSID using the local storage on your router, like the Max HD2/HD4 with Mediafast, which can store up to 8GB of media. Users will be able to access news, articles, videos, and access your web app without the need for internet access.
The ContentHub can be used to provide infotainment to connected users on transport.

17.1 Configuring the ContentHub

ContentHub storage needs to be configured before content can be uploaded to the ContentHub. Click on the link on the information panel to configure storage.



To access ContentHub, navigate to **Advanced** > **ContentHub** and check the **Enable** box.



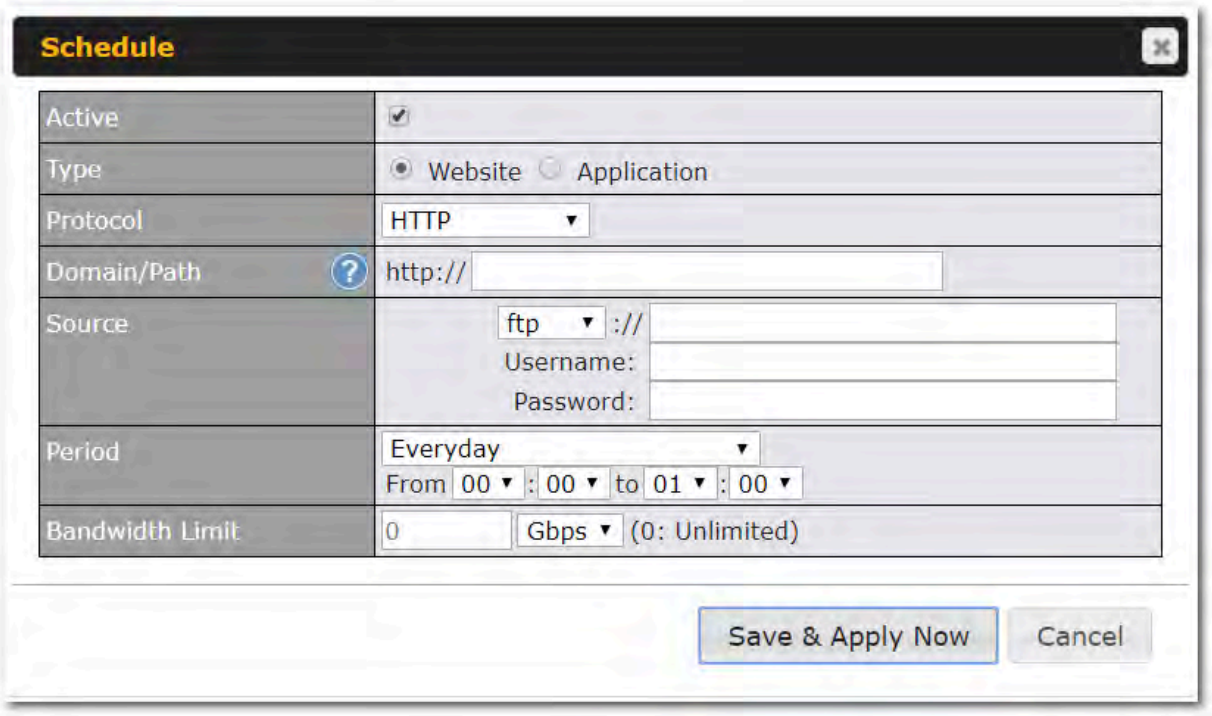
On an external server, configure content (a website or application) that will be synced to the ContentHub. For example, an html5 website.

To configure a website or application as content, follow the steps below.

17.2 Configure a website for ContentHub

This option allows you to sync a website to the Peplink router. This website will then be published with the specified domain from the router itself and makes the content available to the client via the HTTP/HTTPS protocol.
Only FTP sync is supported for this type of ContentHub content.
The content should be uploaded to an FTP server before you sync it with ContentHub.

Click **New Website** and a window with the following configuration options will appear:



Schedule	
Active	Checking the box toggles the activation of the content.
Type	Select the type of content: Website or Application.
Protocol	Configure the protocol to be used: HTTP, HTTPS or both.
Domain/Path	Enter the URL for the ContenHub to use as the domain name for client access (such as http://mytest.com).
Method	Only applicable for **Application** type content. Choose between sync or file upload.
Source	Enter the details of the server that the content will be downloaded from. Enter credentials under **Username** and **Password**.
Period	This field determines how often the router will search for updates to the source content.
Bandwidth Limit	Set a bandwidth limit for clients.

Click “**Save & Apply Now**” to activate the changes. A screenshot of the display after configuration is shown below:

The content will be synced regularly according to the time set in the **Period** that was configured earlier.

If you want to activate the sync manually, you can click the “  ” icon. The “Status” column will display the sync progress. When the sync is completed, a summary will be displayed, as shown in the screenshot below:

To access the content, open a browser in the MFA’s client and enter the domain details that were configured earlier (such as http://mytest.com).

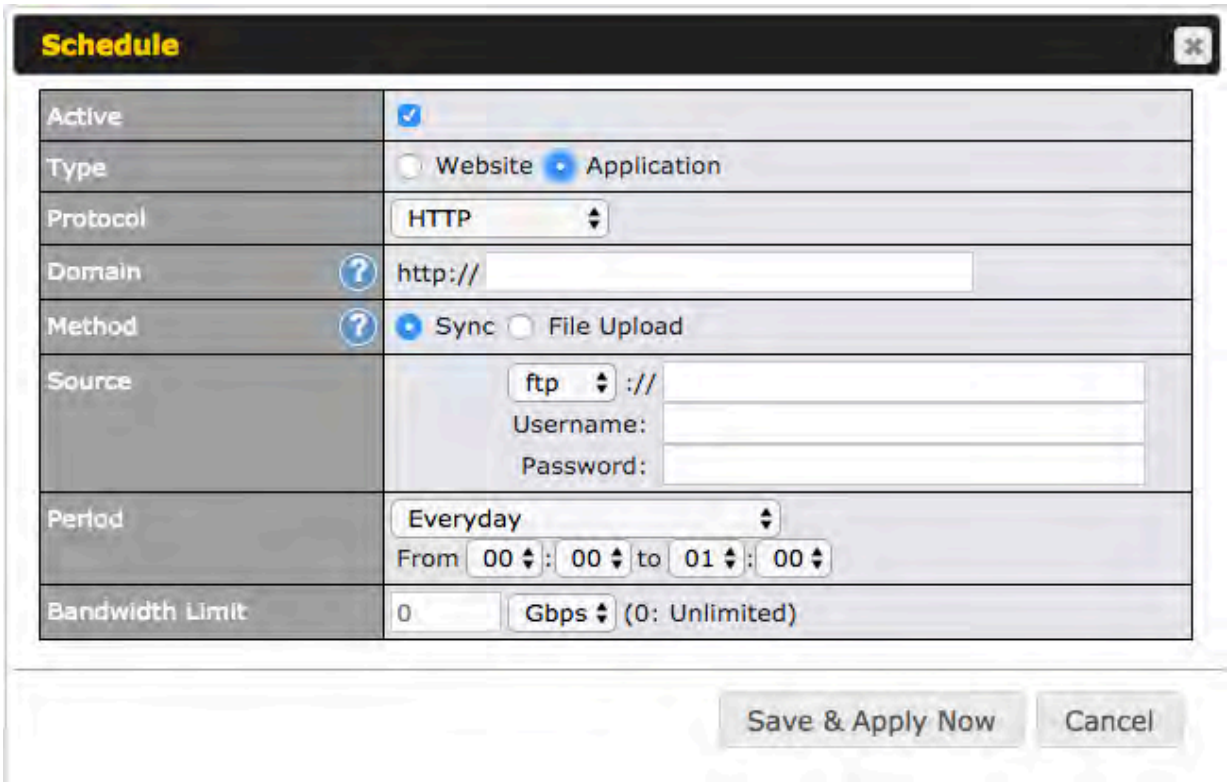
17.3 Configure an application for ContentHub

MediaFast routers allow you to configure and publish any application from the router itself by using one of the supported frameworks below:

- Python (version 2.7.12)
- Ruby (version 2.3.3)
- Node.js (version 6.9.2)

Install the desired framework under “Package Manager” as shown below:

After installing the framework, change the ”Type” to “Application” and configure the website.



The setting is the same as the Website type (refer to the description in the section above).

Application type content need to be packed as explained below:

1. Implement two bash script files, start.sh and stop.sh in the root folder, to start and stop your application. The MediaFast router will only execute start.sh and stop.sh when the corresponding website is enabled and disabled respectively.
2. Compress the application files and the bash script to .tar.gz format.
3. Upload this tar file to the router.

18 Docker

MediaFast enabled routers can host Docker containers when running Firmware 7.1 or later.

Docker is an open platform for developing, shipping, and running applications.

From Firmware version 7.1.0 and upwards, it is possible to install and run Docker Containers on your Peplink routers with MediaFast, such as the MAX HD2 and the MAX HD4.

Due to the nature of Docker and its unlimited variables, this feature is supported by Peplink up to the point of creating a running Docker Container.

Information about Docker can be found on the Docker Documentation site:

https://docs.docker.com/ 2

This will allow you to run a file sharing platform (ownCloud), a web server (WordPress, Joomla!) , a learning platform (Moodle), or a visualisation tool for viewing large scale data (Kibana).

When creating a new Docker Container, the Peplink router will search through the Docker Hub repository. https://hub.docker.com/explore/ 7

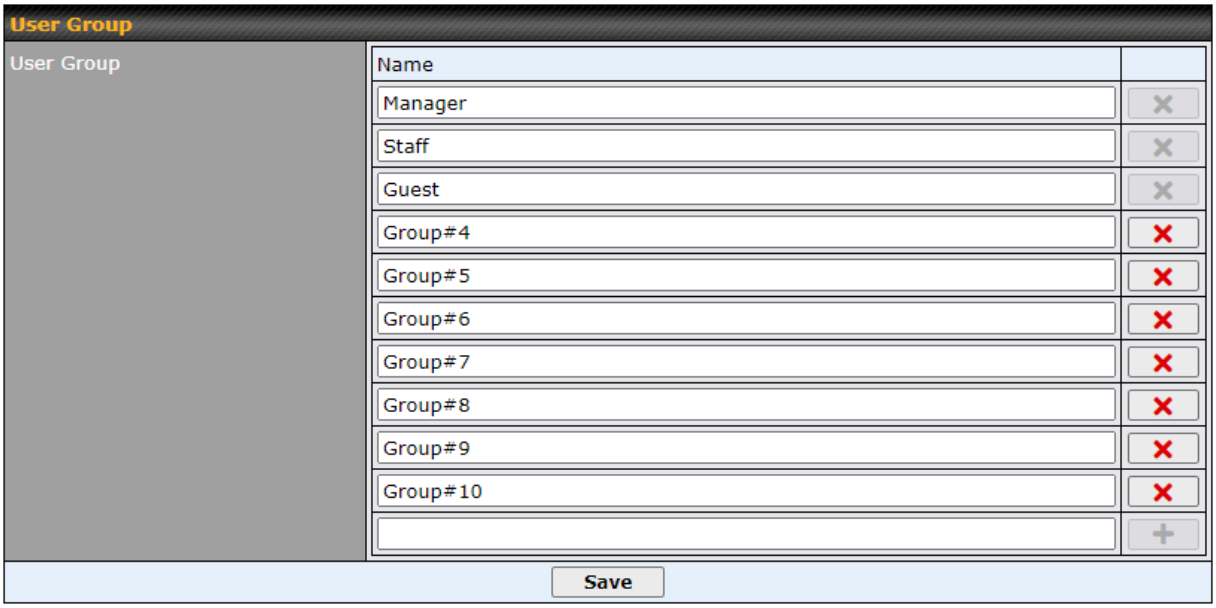
For detailed configuration instructions, refer to our knowledge base:

https://forum.peplink.com/t/how-to-run-a-docker-application-on-a-peplink-mediafast-router/16021

19 QoS

19.1 User Groups

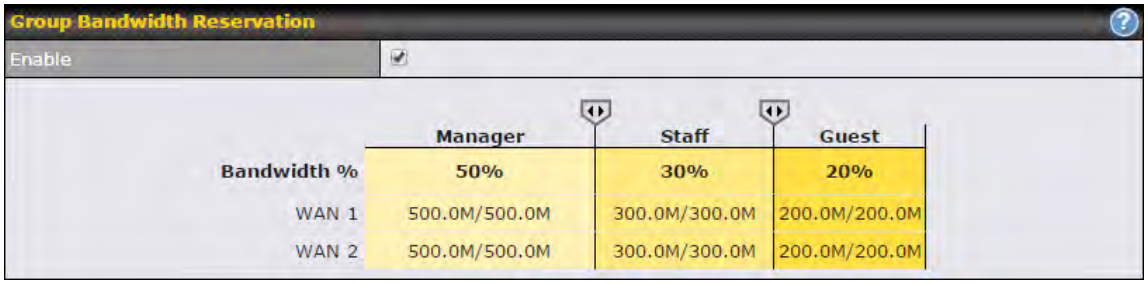
Other than the three default user groups, you can add more user groups by entering the group name into the column and clicking the '**+**' button. The user group limit is up to 10.



19.2 Bandwidth Control

This section is to define how much minimum bandwidth will be reserved to each user group when a WAN connection is **in full load**. When this feature is enabled, a slider with two indicators will be shown. You can move the indicators to adjust each group's weighting. The lower part of the table shows the corresponding reserved download and uploads bandwidth value of each connection.

By default, **50%** of bandwidth has been reserved for Manager, **30%** for Staff, and **20%** for Guest.

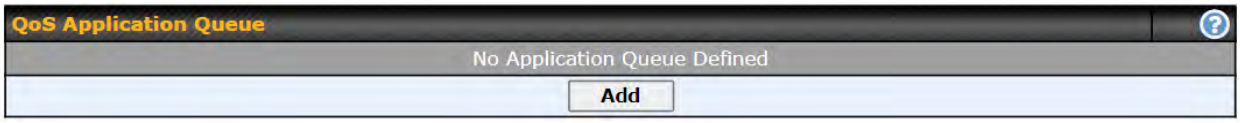


You can define a maximum download speed (over all WAN connections) and upload speed (for

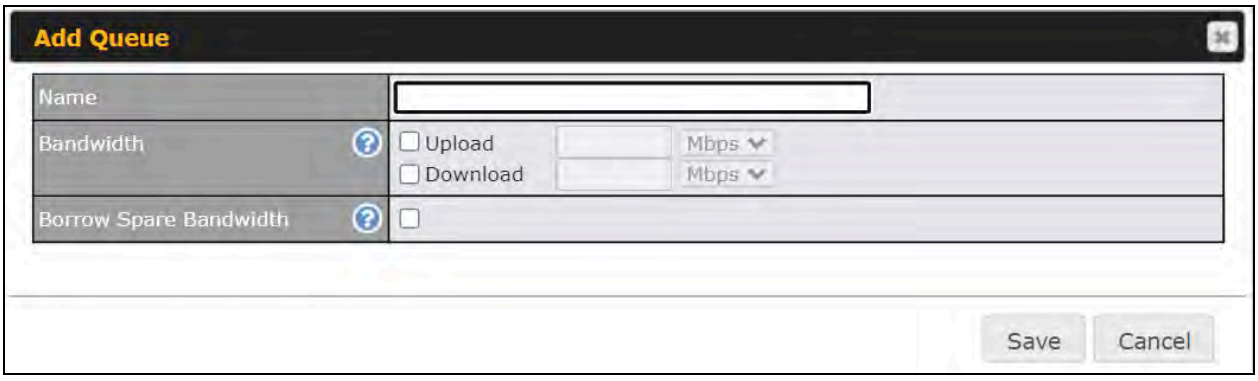
each WAN connection) that each individual Staff and Guest member can consume. No limit can be imposed on individual Managers. By default, download and upload bandwidth limits are set to unlimited (set as **0**).

19.3 Application Queue

This section is to define the QoS Application Queue. You can set guaranteed bandwidth for a queue and assign it to applications.



Click the Add button to create the QoS Application Queue.



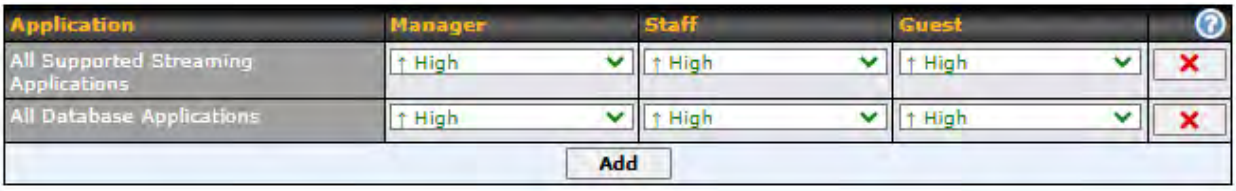
Add Queue	
Name	This setting specifies a name for the QoS Application Queue.
Bandwidth	Bandwidth to be reserved (for each WAN connection) for this queue. When WAN is congested, this bandwidth will remain available for applications assigned to this queue.
Borrow Spare Bandwidth	Enable this option if you want this queue to utilize WAN's unused bandwidth.

19.4 Application

19.4.1 Application Prioritization

On many Peplink routers, you can choose whether to apply the same prioritization settings to all user groups or customize the settings for each group.

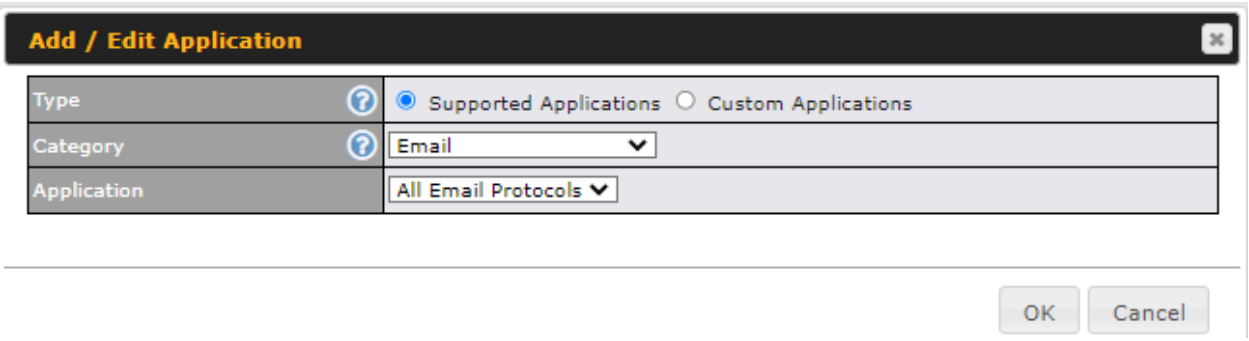
Three application priority levels can be set: ↑ **High**,— **Normal**, and ↓ **Low**. Peplink routers can detect various application traffic types by inspecting the packet content. Select an application by choosing a supported application, or by defining a custom application manually. The priority preference of supported applications is placed at the top of the table. Custom applications are at the bottom.



19.4.2 Prioritization for Custom Applications

Click the **Add** button to define a custom application. Click the button ✖ in the **Action** column to delete the custom application in the corresponding row.

When **Supported Applications** is selected, the Peplink router will inspect network traffic and prioritize the selected applications. Alternatively, you can select **Custom Applications** and define the application by providing the protocol, scope, port number, and DSCP value.



19.4.3 DSL/Cable Optimization

DSL/cable-based WAN connections have lower upload bandwidth and higher

download bandwidth. When a DSL/cable circuit's uplink is congested, the download bandwidth will be affected. Users will not be able to download data at full speed until the uplink becomes less congested. **DSL/Cable Optimization** can relieve such an issue. When it is enabled, the download speed will become less affected by the upload traffic. By default, this feature is disabled.

19.4.4 SpeedFusion VPN Traffic Optimization

To enable this option to allow SpeedFusion VPN traffic has highest priority when WAN is congested.

20 Firewall

A firewall is a mechanism that selectively filters data traffic between the WAN side (the Internet) and the LAN side of the network. It can protect the local network from potential hacker attacks, access to offensive websites, and/or other inappropriate uses.

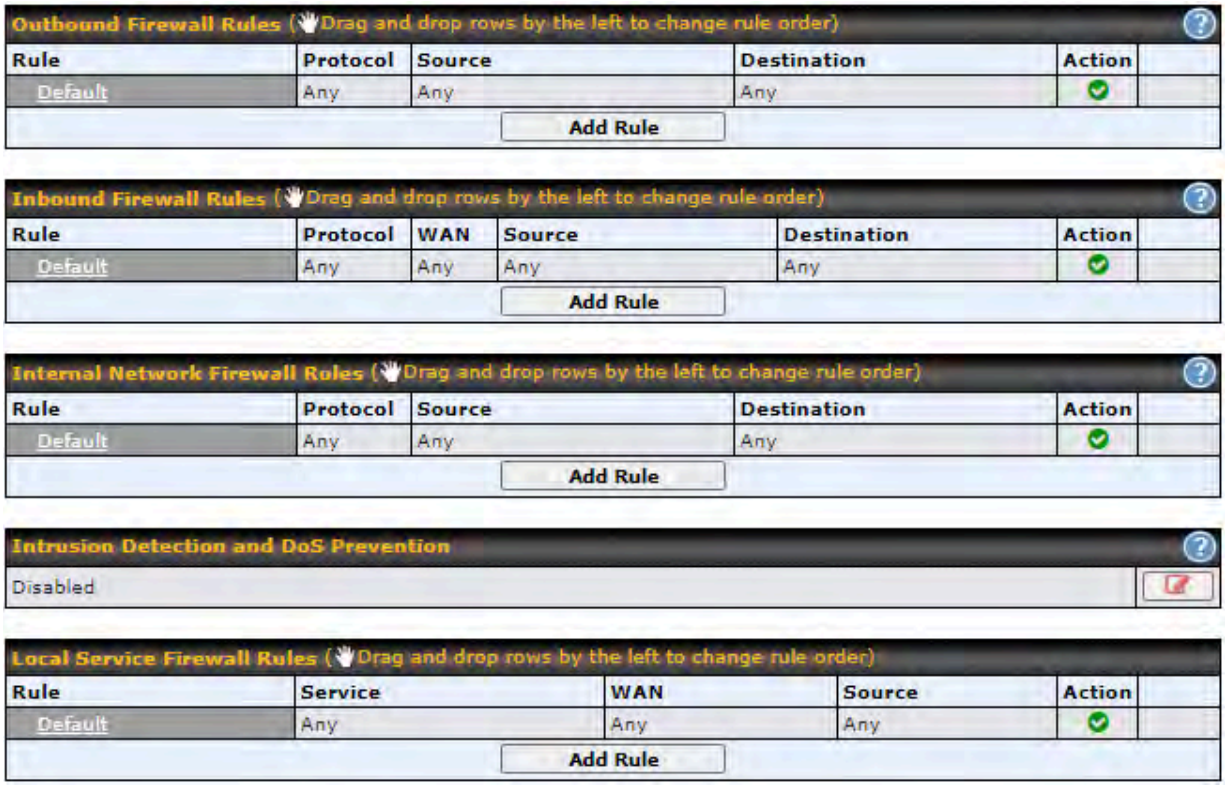
The firewall functionality of Peplink routers supports the selective filtering of data traffic in both directions:

-
-
- Outbound (LAN to WAN)
- Inbound (WAN to LAN)
- Internal Network (VLAN to VLAN)
- Local Service

The firewall also supports the following functionality:

- Intrusion detection and DoS prevention
- Web blocking

With SpeedFusion™ enabled, the firewall rules also apply to VPN tunneled traffic.



Outbound Firewall Rules (Drag and drop rows by the left to change rule order)

Rule	Protocol	Source	Destination	Action
Default	Any	Any	Any	

Add Rule

Inbound Firewall Rules (Drag and drop rows by the left to change rule order)

Rule	Protocol	WAN	Source	Destination	Action
Default	Any	Any	Any	Any	

Add Rule

Internal Network Firewall Rules (Drag and drop rows by the left to change rule order)

Rule	Protocol	Source	Destination	Action
Default	Any	Any	Any	

Add Rule

Intrusion Detection and DoS Prevention

Disabled

Local Service Firewall Rules (Drag and drop rows by the left to change rule order)

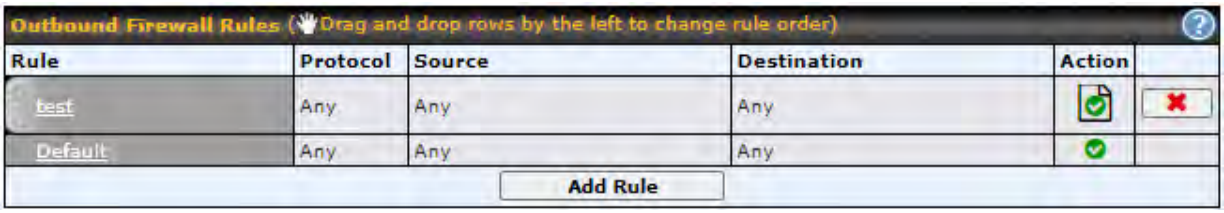
Rule	Service	WAN	Source	Action
Default	Any	Any	Any	

Add Rule

20.1 Access Rules

Outbound Firewall Rules

The outbound firewall settings are located at **Advanced > Firewall > Access Rules.**

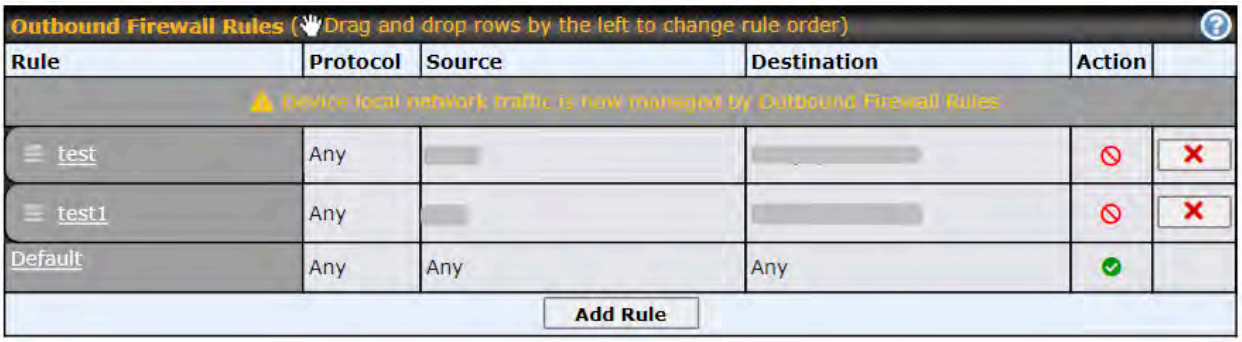


Outbound Firewall Rules (Drag and drop rows by the left to change rule order)

Rule	Protocol	Source	Destination	Action	
test	Any	Any	Any		
Default	Any	Any	Any		

Add Rule

To enable or disable the Outbound Firewall to manage device local network traffic, click on the help icon and click here, the screen will show below.



Note

To utilize the Outbound Firewall Rule to block the Peplink device from contacting InControl 2. may refer to the link below:

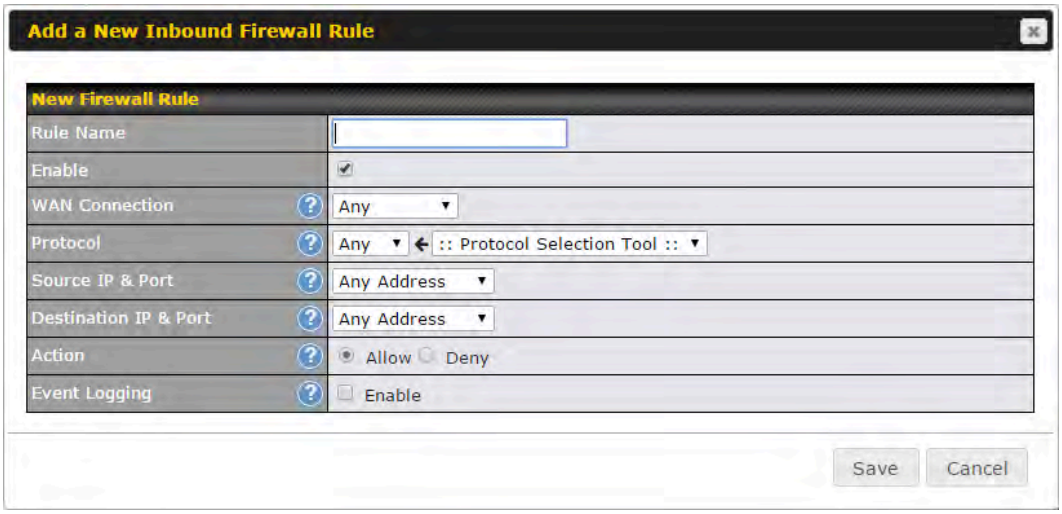
https://forum.peplink.com/t/faq-prevent-device-reaching-incontrol-2./63f48fdfd466df34ab475f55/

Click **Add Rule** to display the following screen:

Inbound Firewall Rules

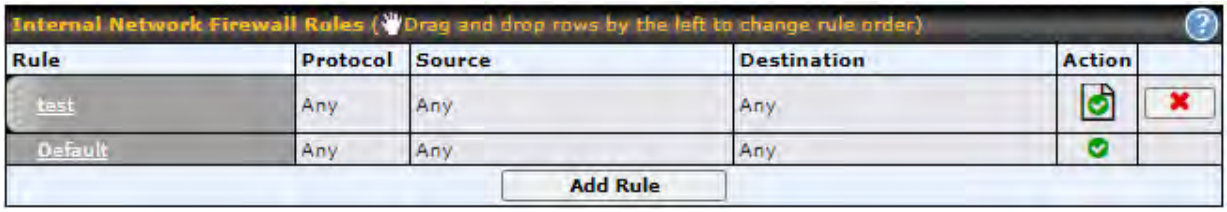
Inbound firewall settings are located at **Advanced > Firewall > Access Rules.**

Click **Add Rule** to display the following screen:

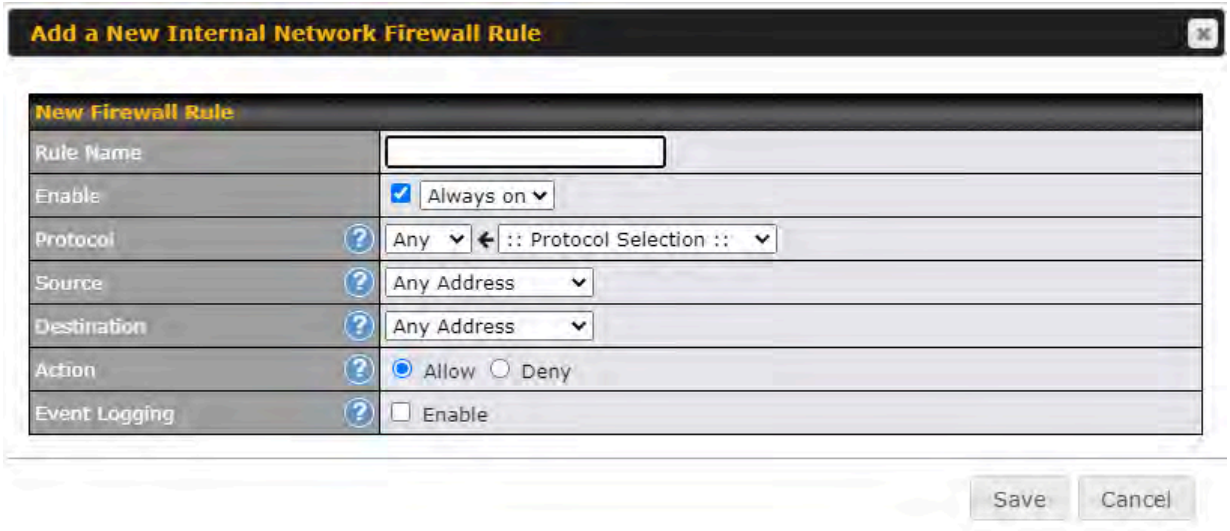


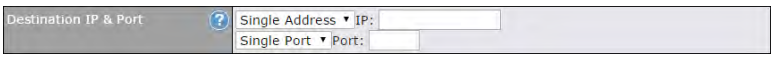
Internal Network Firewall Rules

Internal Network firewall settings are located at **Advanced > Firewall > Access Rules.**



Click **Add Rule** to display the following window:



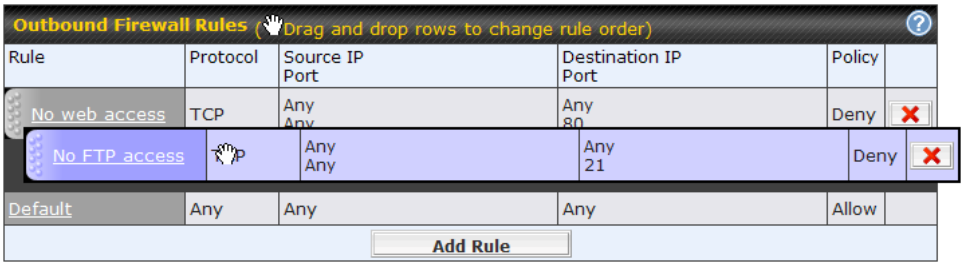
Inbound / Outbound / Internal Network Firewall Settings	
Rule Name	This setting specifies a name for the firewall rule.
Enable	This setting specifies whether the firewall rule should take effect. If the box is checked, the firewall rule takes effect. If the traffic matches the specified protocol/IP/port, actions will be taken by the Peplink router based on the other parameters of the rule. If the box is not checked, the firewall rule does not take effect. The Peplink router will disregard the other parameters of the rule. Click the dropdown menu next to the checkbox to place this firewall rule on a time schedule.
WAN Connection (Inbound)	Select the WAN connection that this firewall rule should apply to.
Protocol	This setting specifies the protocol to be matched. Via a drop-down menu, the following protocols can be specified: • **Any** • **TCP** • **UDP** • **ICMP** • **DSCP** • **IP** Alternatively, the **Protocol Selection Tool** drop-down menu can be used to automatically fill in the protocol and port number of common Internet services (e.g., HTTP, HTTPS, etc.) After selecting an item from the **Protocol Selection Tool** drop-down menu, the protocol and port number remains manually modifiable.
Source IP & Port	This specifies the source IP address(es) and port number(s) to be matched for the firewall rule. A single address, or a network, can be specified as the **Source IP & Port** setting, as indicated by the following screenshot:  In addition, a single port, or a range of ports, can be specified for the **Source IP & Port** settings.
Destination IP & Port	This specifies the destination IP address(es) and port number(s) to be matched for the firewall rule. A single address, or a network, can be specified as the **Destination IP & Port** setting, as indicated by the following screenshot:  In addition, a single port, or a range of ports, can be specified for the **Destination IP & Port** settings.

Action	This setting specifies the action to be taken by the router upon encountering traffic that matches the both of the following: • Source IP & port • Destination IP & port With the value of **Allow** for the **Action** setting, the matching traffic passes through the router (to be routed to the destination). If the value of the **Action** setting is set to **Deny**, the matching traffic does not pass through the router (and is discarded).
Event Logging	This setting specifies whether or not to log matched firewall events. The logged messages are shown on the page **Status>Event Log**. A sample message is as follows: Aug 13 23:47:44 Denied CONN=Ethernet WAN SRC=20.3.2.1 DST=192.168.1.20 LEN=48 PROTO=TCP SPT=2260 DPT=80 • **CONN:** The connection where the log entry refers to • **SRC:** Source IP address • **DST:** Destination IP address • **LEN:** Packet length • **PROTO:** Protocol • **SPT:** Source port • **DPT:** Destination port

Click **Save** to store your changes. To create an additional firewall rule, click **Add Rule** and repeat the above steps.

To change a rule's priority, simply drag and drop the rule:

- Hold the left mouse button on the rule.
- Move it to the desired position.
- Drop it by releasing the mouse button.



To remove a rule, click the button.

Rules are matched from top to bottom. If a connection matches any one of the upper rules, the matching process will stop. If none of the rules match, the **Default** rule will be applied. By default,

the **Default** rule is set as **Allow** for Outbound, Inbound and Internal Network access.

Tip

If the default inbound rule is set to **Allow** for NAT-enabled WANs, no inbound Allow firewall rules will be required for inbound port forwarding and inbound NAT mapping rules. However, if the default inbound rule is set as **Deny**, a corresponding Allow firewall rule will be required.

Intrusion Detection and DoS Prevention

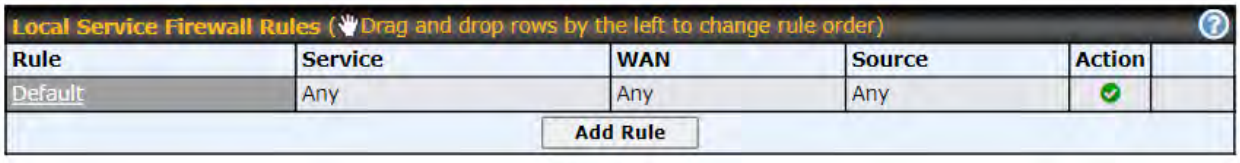
Peplink routers can detect and prevent intrusions and denial-of-service (DoS) attacks from the Internet. To turn on this feature, click , check the **Enable** check box, and press the **Save** button.

When this feature is enabled, the Peplink router will detect and prevent the following kinds of intrusions and denial-of-service attacks.

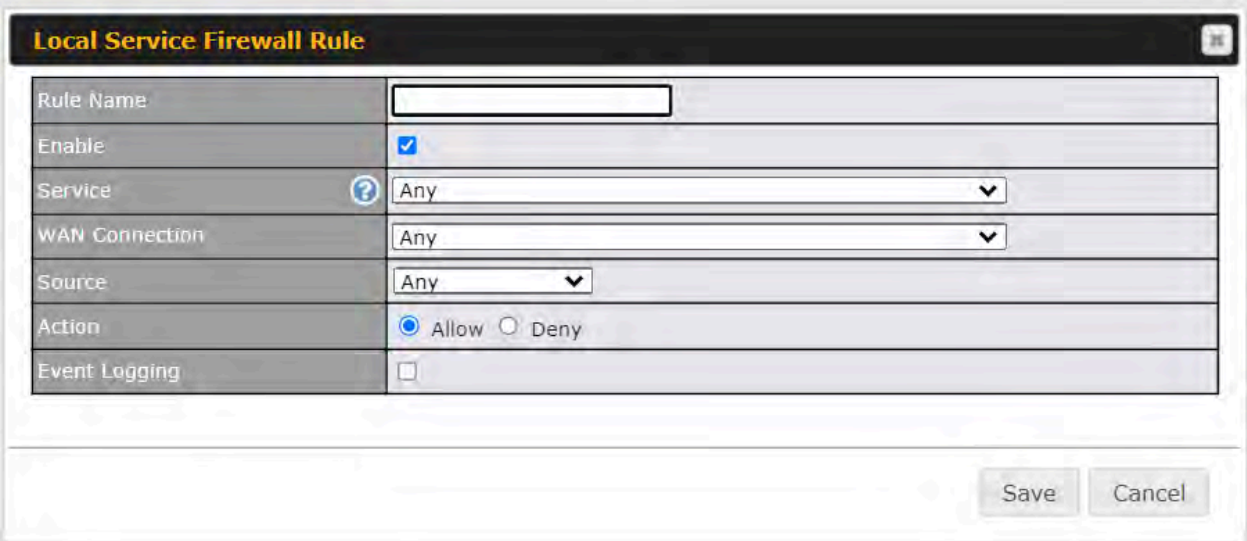
- Port scan
  - NMAP FIN/URG/PSH
  - Xmas tree
  - Another Xmas tree
  - Null scan
  - SYN/RST
  - SYN/FIN
- SYN flood prevention
- Ping flood attack prevention

Local Service Firewall Rules

For every WAN inbound traffic to local service, rules will be matched to take the defined action. The Local Service firewall settings are located at **Advanced > Firewall > Access Rules**.



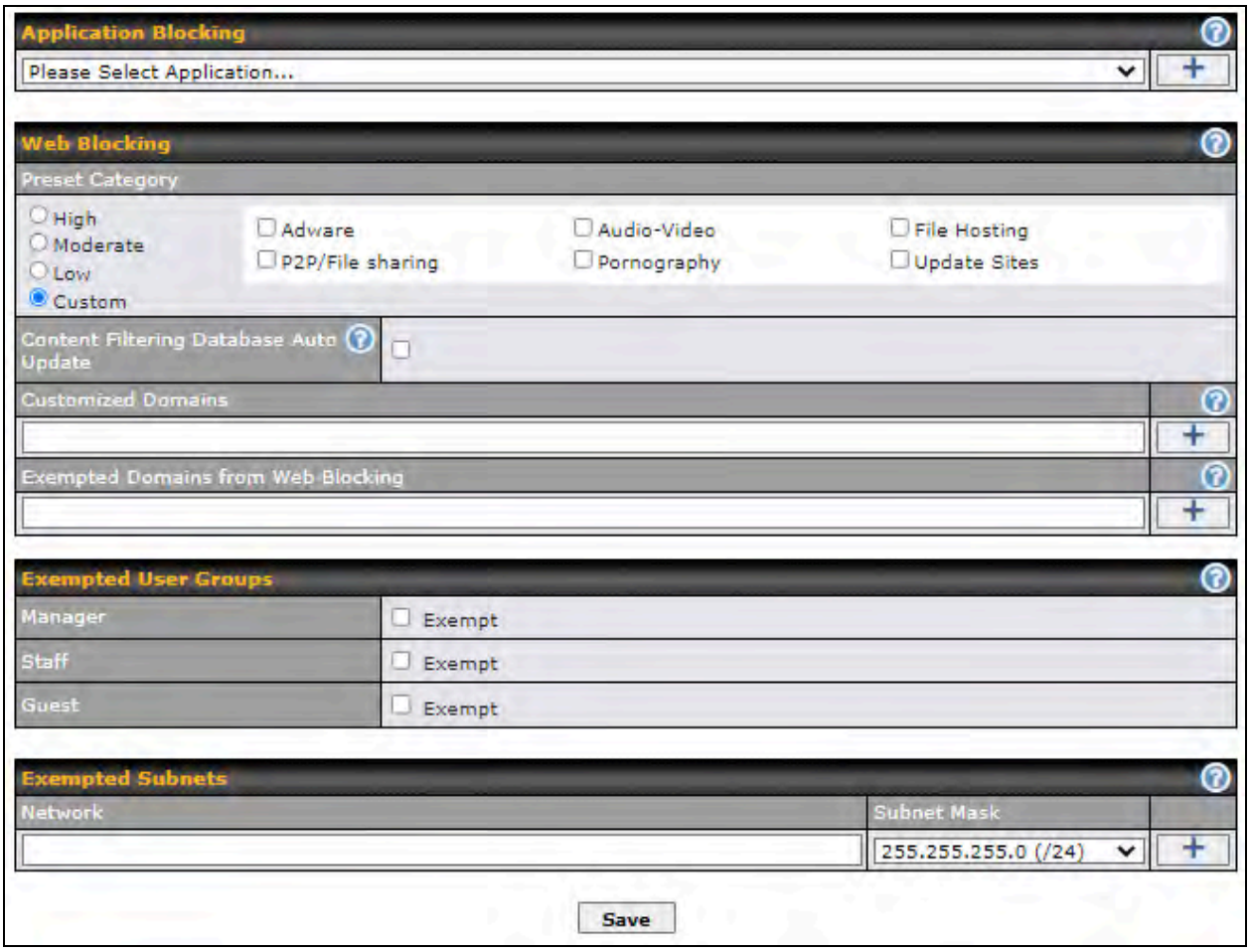
Click **Add Rule** to display the following window:



Local Service Firewall Settings	
Rule Name	This setting specifies a name for the firewall rule.
Enable	This setting specifies whether the firewall rule should take effect. If the box is checked, the firewall rule takes effect. If the traffic matches the specified protocol/IP/port, actions will be taken by Peplink Balance based on the other parameters of the rule. If the box is not checked, the firewall rule does not take effect. The Peplink Balance will disregard the other parameters of the rule. Click the dropdown menu next to the checkbox to place this firewall rule on a time schedule.
Service	This option allows you to define the supported local service to be matched. If Any is chosen, the firewall rule will match to all supported local services from the list. Via a drop-down menu, the following services can be specified: • Any • SpeedFusion / PepVPN Handshake • SpeedFusion / PepVPN Data Port • Web Admin Access • DNS Server • SNMP Server • KVM Management Port • KVM VNC Port • FusionSIM Agent / Remote SIM Proxy
WAN Connection	Select the WAN connection that this firewall rule should apply to.
Source	This specifies the source IP address and IP Network to be matched for the firewall rule.
Action	With the value of **Allow** for the **Action** setting, the matching traffic passes through the router (to be routed to the destination). If the value of the **Action** setting is set to **Deny**, the matching traffic does not pass through the router (and is discarded).

Event Logging	This setting specifies whether or not to log matched firewall events. The logged messages are shown on the page **Status>Event Log**. A sample message is as follows: Aug 13 23:47:44 Denied CONN=Ethernet WAN SRC=20.3.2.1 DST=192.168.1.20 LEN=48 PROTO=TCP SPT=2260 DPT=80 • **CONN:** The connection where the log entry refers to • **SRC:** Source IP address • **DST:** Destination IP address • **LEN:** Packet length • **PROTO:** Protocol • **SPT:** Source port • **DPT:** Destination port

20.2 Content Blocking



20.2.1 Application Blocking

Choose applications to be blocked from LAN/PPTP/SpeedFusion VPN peer clients' access, except for those on the Exempted User Groups or Exempted Subnets defined below.

20.2.2 Web Blocking

Defines website domain names to be blocked from LAN/PPTP/SpeedFusion VPN peer clients' access except for those on the Exempted User Groups or Exempted Subnets defined below.

If "foobar.com" is entered, any web site with a host name ending in foobar.com will be blocked, e.g. www.foobar.com, foobar.com, etc. However, "myfoobar.com" will not be blocked.

You may enter the wild card ".*" at the end of a domain name to block any web site with a host name having the domain name in the middle. If you enter "foobar.*", then "www.foobar.com", "www.foobar.co.jp", or "foobar.co.uk" will be blocked. Placing the wild card in any other position is

not supported.

The device will inspect and look for blocked domain names on all HTTP and HTTPS traffic.

20.2.3 Customized Domains

Enter an appropriate website address, and the Peplink MAX will block and disallow LAN/PPTP/SpeedFusionTM peer clients to access these websites. Exceptions can be added using the instructions in Sections 20.1.3.2 and 20.1.3.3.

You may enter the wild card ".*" at the end of a domain name to block any web site with a host name having the domain name in the middle. For example, If you enter "foobar.*," then "www.foobar.com," "www.foobar.co.jp," or "foobar.co.uk" will be blocked. Placing the wild card in any other position is not supported.

The Peplink MAX will inspect and look for blocked domain names on all HTTP traffic. Secure web (HTTPS) traffic is not supported.

20.2.4 Exempted User Groups

Check and select pre-defined user group(s) who can be exempted from the access blocking rules. User groups can be defined at **QoS>User Groups** section. Please refer to **Section 17.1** for details.

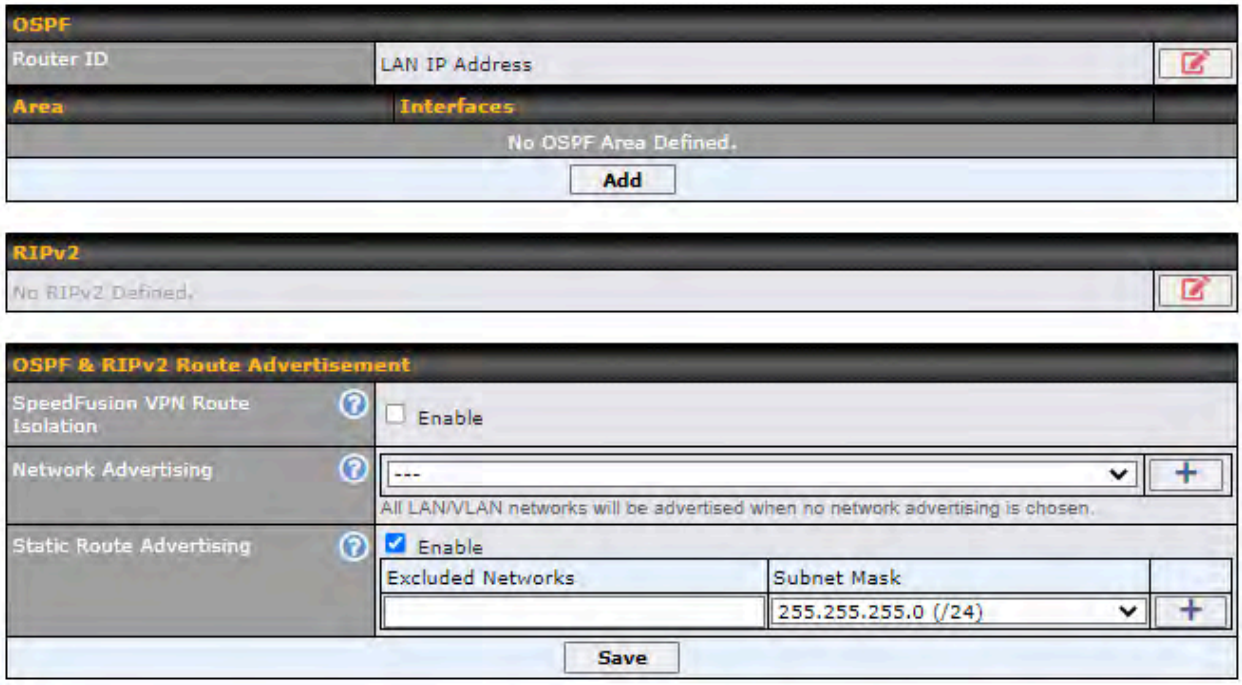
20.2.5 Exempted Subnets

With the subnet defined in the field, clients on the particular subnet(s) can be exempted from the access blocking rules.

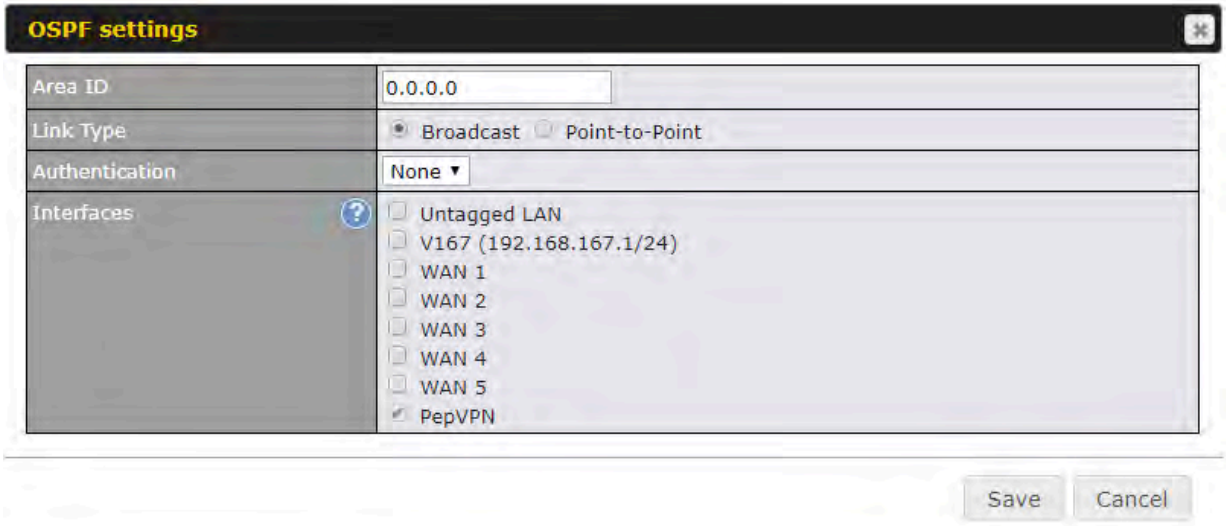
21 Routing Protocols

21.1 OSPF & RIPv2

The Peplink supports OSPF and RIPv2 dynamic routing protocols.
Click the **Advanced** tab from the top bar, and then click the **Routing Protocols > OSPF & RIPv2** item on the sidebar to reach the following menu:

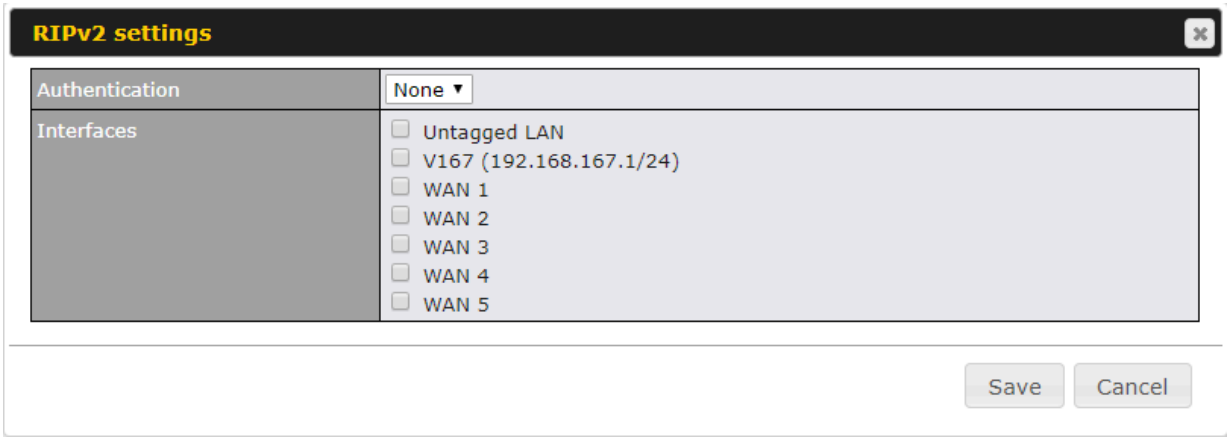


OSPF	
Router ID	This field determines the ID of the router. By default, this is specified as the WAN IP address. If you want to specify your own ID, enter it into the **Custom** field.
Area	This is an overview of the OSPF areas that you have defined. Clicking on the name under Area allows you to configure the connection. To define a new area, click **Add**. To delete an existing area, click on the ✖.

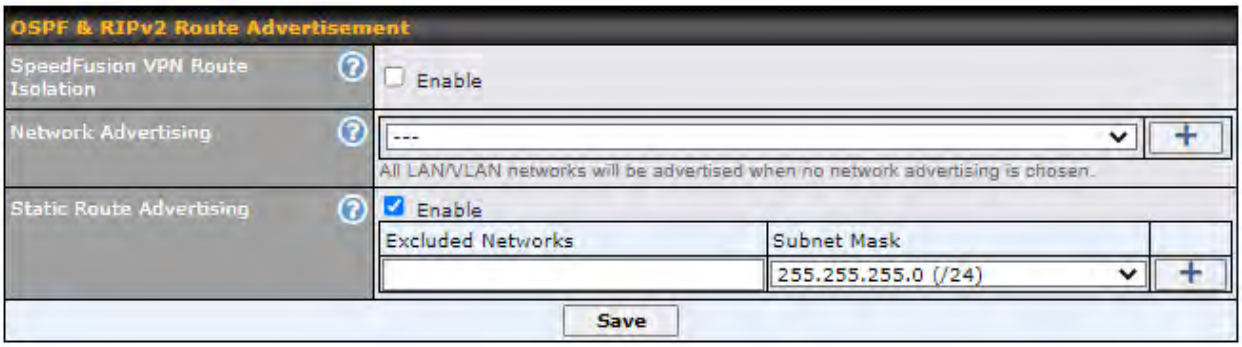


OSPF Settings	
Area ID	Assign a name to be applied to this group. Machines linked to this group will send and receive related OSPF packets, while unlinked machines will ignore them.
Link Type	Choose the type of network that this area will use.
Authentication	If an authentication method is used, select one from this drop-down menu. Available options are **MD5** and **Text**. Authentication key(s) may be input next to the drop-down menu after selecting an authentication method.
Interfaces	Select the interface(s) that this area will use to listen to and deliver OSPF packets.

To access RIPv2 settings, click on .



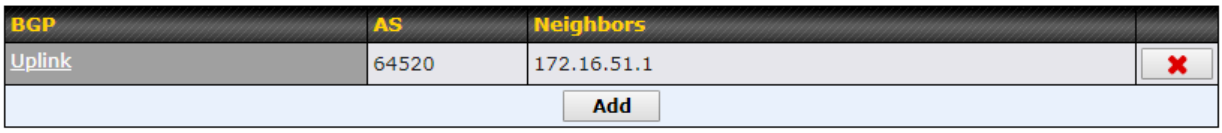
RIPv2 Settings	
Authentication	If an authentication method is used, select one from this drop-down menu. Available options are **MD5** and **Text**. Authentication key(s) may be input next to the drop-down menu after selecting an authentication method.
Interfaces	Select the interface(s) that this area will use to listen to and deliver RIPv2 packets.



OSPF & RIPv2 Route Advertisement	
SpeedFusion VPN Route Isolation	Isolate SpeedFusion VPN peers from each other. Received SpeedFusion VPN routes will not be forwarded to other SpeedFusion VPN peers to reduce bandwidth consumption..
Network Advertising	Networks to be advertised over OSPF & RIPv2. If no network is selected, all LAN / VLAN networks will be advertised by default.
Static Route Advertising	Enabling OSPF & RIPv2 Route Advertising allows it to advertise LAN static routes over OSPF & RIPv2. Static routes on the Excluded Networks table will not be advertised.

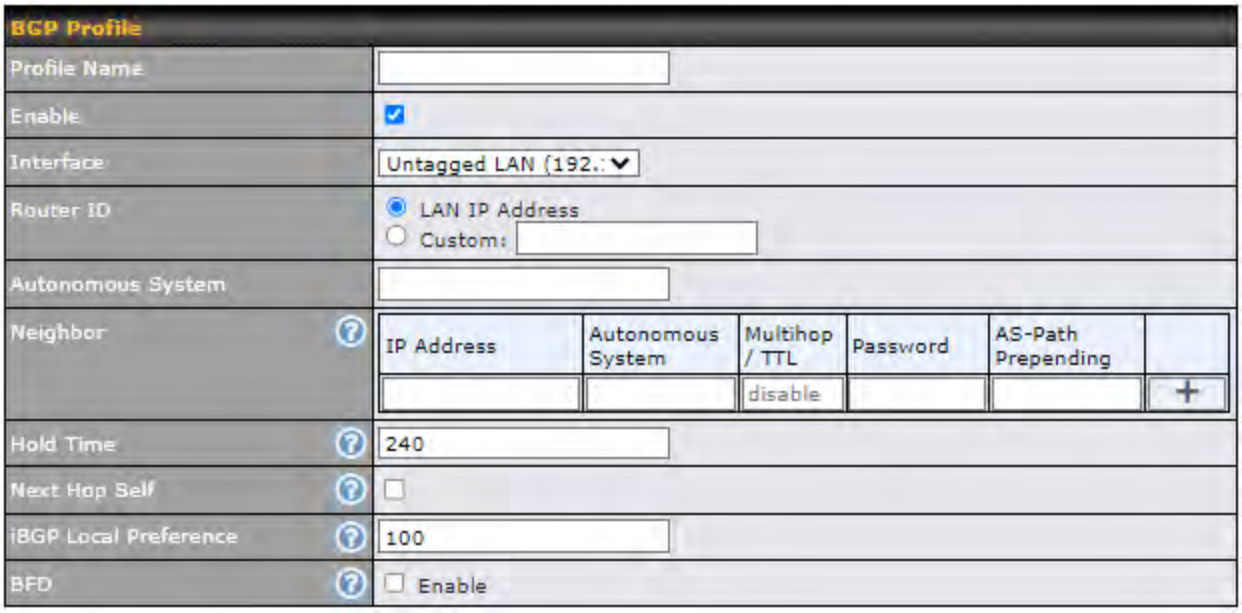
21.2 BGP

Click the **Advanced** tab along the top bar, and then click the **BGP** item on the sidebar to configure BGP.



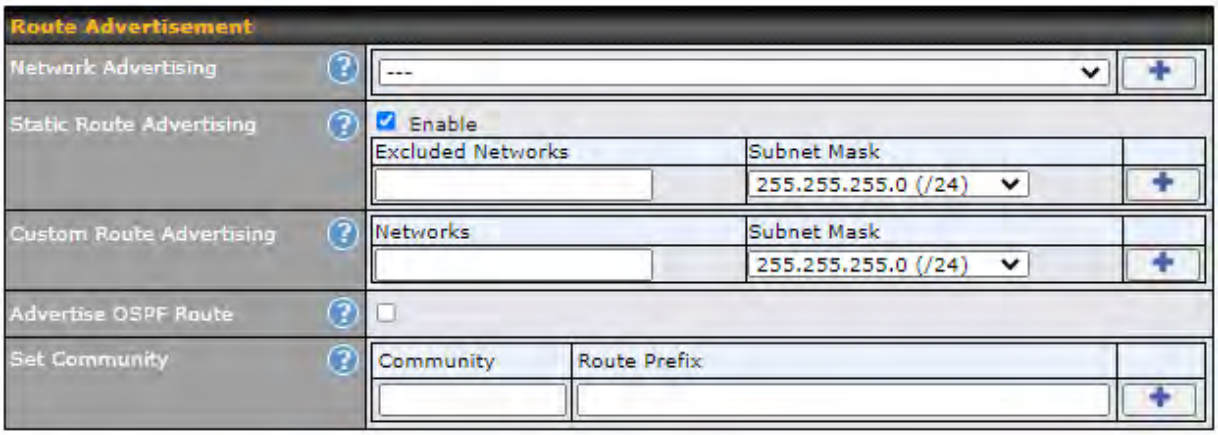
Click the "**x**" to delete a BGP profile.

Click "**Add**" to create a new BGP profile.



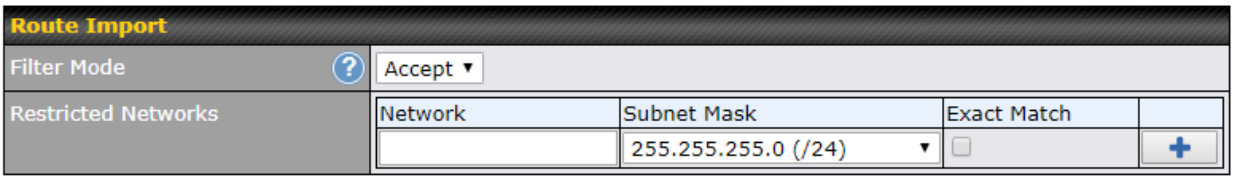
BGP Profile	
Name	This field specifies the name that represents this profile.
Enable	When this box is checked, this BGP profile will be enabled. If it is left unchecked, it will be disabled.
Interface	The interface in which the BGP neighbor is located.
Router ID	This field specifies the unique IP as the identifier of the local device running BGP.
Autonomous System	The Autonomous System Number (ASN) assigned to this profile.
Neighbor	BGP Neighbors and their details.
IP address	The IP address of the Neighbor.
Autonomous System	The Neighbor's ASN.
Multihop/TTL	This field determines the Time-to-live (TTL) of BGP packets. Leave this field blank if the BGP neighbor is directly connected, otherwise you must specify a TTL value. This option should be used if the configured Neighbor's IP address does not match the selected Interface's network subnets. The TTL value must be between 2 to 255.
Password	(Optional) Assign a password for MD5 authentication of BGP sessions.
AS-Path Prepending:	AS path to be prepended to the routes received from this Neighbor. Values must be ASN and separated by commas. For example: inputting "64530,64531" will prepend "64530, 64531" to received

	routes.
Hold Time	Wait time in seconds for a keepalive message from a Neighbor before considering the BGP connection as stalled. The value must be either 0 (infinite hold time) or between 3 and 65535 inclusively. Default: 240
Next Hop Self	Enable this option to advertise your own source address as the next hop when propagating routes.
iBGP Local Preference	This is the metric advertised to iBGP Neighbors to indicate the preference for external routes. The value must be between 0 to 4294967295 inclusively. Default: 100
BFD	Enable this option to add Bidirectional Forwarding Detection for path failure. All directly connected Neighbors that use the same physical interface share the same BFD settings. All mulithop Neighbors share the same multihop BFD settings. You can configure BFD settings in the BGP profile listing page after this option is enabled.

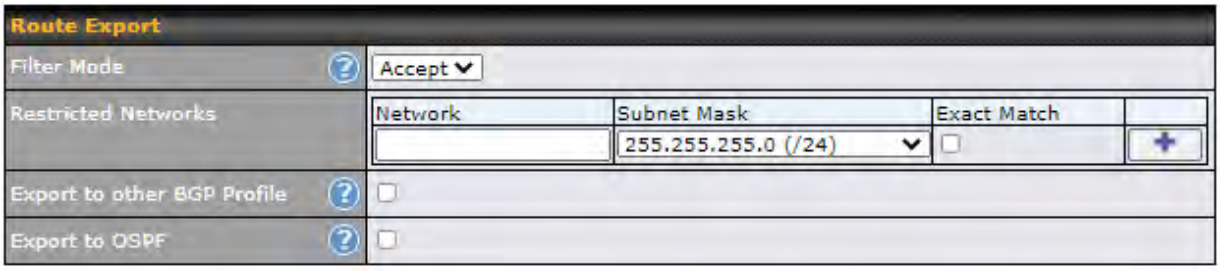


Network Advertising	Select the Networks that will be advertised to the BGP Neighbor.
Static Route Advertising	Enable this option to advertise static LAN routes. Static routes that match the Excluded Networks table will not be advertised.
Custom Route Advertising	Additional routes to be advertised to the BGP Neighbor.
Advertise OSPF Route	When this box is checked, every learnt OSPF route will be advertised.
Set Community	Assign a prefix to a Community.

	Community: Two numbers in new-format. e.g. 65000:21344 Well-known communities: no-export 65535:65281 no-advertise 65535:65282 no-export-subconfed 65535:65283 no-peer 65535:65284 Route Prefix: Comma separated networks. e.g. 172.168.1.0/24,192.168.1.0/28



Filter Mode	This field allows for the selection of the filter mode for route import. **None**: All BGP routes will be accepted. **Accept**: Routes in "Restricted Networks" will be accepted, routes not in the list will be rejected. **Reject**: Routes in "Blocked Networks" will be rejected, routes not in the list will be accepted.
Restricted Networks / Blocked Networks	This field specifies the network(s) in the “route import” entry. **Exact Match:** When this box is checked, only routes with the same Network and Subnet Mask will be filtered. Otherwise, routes within the Networks and Subnets will be filtered.

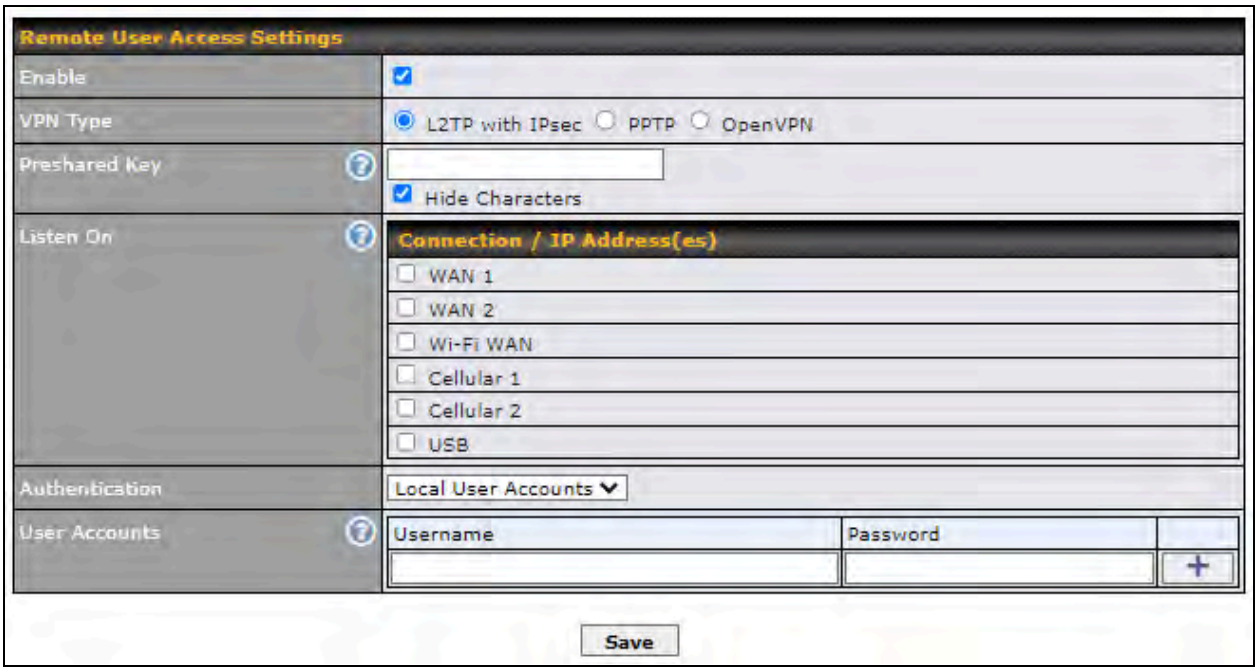


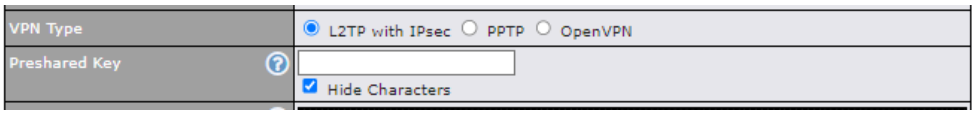
Filter Mode	This field allows for the selection of the filter mode for route export.

	None: All BGP routes will be accepted. **Accept**: Routes in "Restricted Networks" will be accepted, routes not in the list will be rejected. **Reject**: Routes in "Blocked Networks" will be rejected, routes not in the list will be accepted.
Restricted Networks / Blocked Networks	This field specifies the network(s) in the “route export” entry. **Exact Match:** When this box is checked, only routes with the same Network and Subnet Mask will be filtered. Otherwise, routes within the Networks and Subnets will be filtered.
Export to other BGP Profile	When this box is checked, routes learnt from this BGP profile will be exported to other BGP profiles.
Export to OSPF	When this box is checked, routes learnt from this BGP profile will be exported to the OSPF routing protocol.

22 Remote User Access

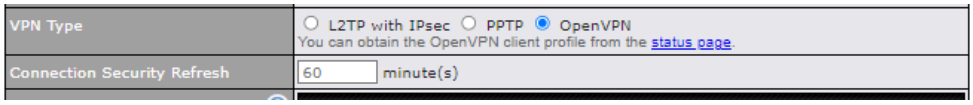
A remote-access VPN connection allows an individual user to connect to a private business network from a remote location using a laptop or desktop computer connected to the Internet. Networks routed by a Peplink router can be remotely accessed via OpenVPN, L2TP with IPsec or PPTP. To configure this feature, navigate to **Advanced > Remote User Access** and choose the required VPN type.



Remote User Access Settings	
Enable	When this box is checked, this Remote User Access profile will be enabled. If it is left unchecked, it will be disabled.
VPN Type	This field allows you to select the VPN type for the remote user access connection. The available options are: • L2TP with IPsec  If L2TP with IPsec is selected, it may need to enter the pre-shared key for the remote user access. • PPTP

If PPTP selected, there is no additional configuration required. The Point-to-Point Tunneling Protocol (PPTP) is an obsolete method for implementing virtual private networks. PPTP has many well known security issues

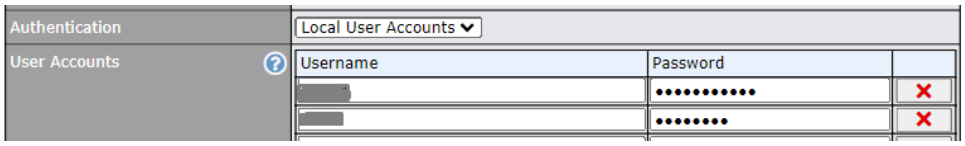
- OpenVPN



If the OpenVPN is selected, the OpenVPN Client profile can be downloaded from the **Status > Device** page after the configuration has been saved.

You have a choice between 2 different OpenVPN Client profiles:

- **"Route all traffic" profile**
  Using this profile, VPN clients will send all the traffic through the OpenVPN tunnel
- **"Split tunnel" profile**
  Using this profile, VPN clients will ONLY send those traffic designated to the untagged LAN and VLAN segment through the OpenVPN tunnel.

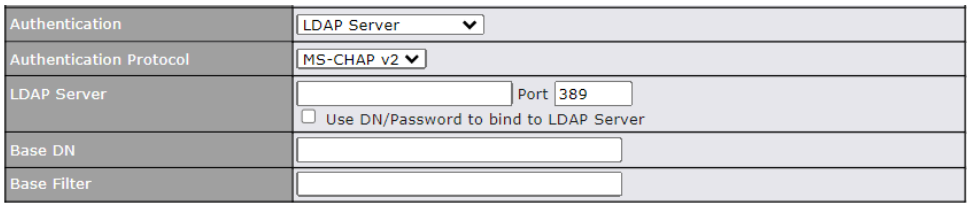
Pre-shared Key	If **L2TP with IPsec** is selected in the VPN Type, enter the pre shared key in the text field. Please note that remote devices will need this preshared key to access the Balance.
Disabled Weak Ciphers	You may click the button to show in the Pre-shared key and enable this option. When checked, weak ciphers such as 3DES will be disabled. Please note: Legacy and Android devices may not able to connect.
Connection Security Refresh	If **OpenVPN** is selected in the VPN Type, this settings is for specifying the interval for refreshing the connection.
Listen On	This setting is for specifying the WAN IP addresses that allow remote user access.
Port	If **OpenVPN** is selected in the VPN Type, the **Port** setting specifies the port(s) that correspond to the service.
Authentication	Determine the method of authenticating remote users: • **Local 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:

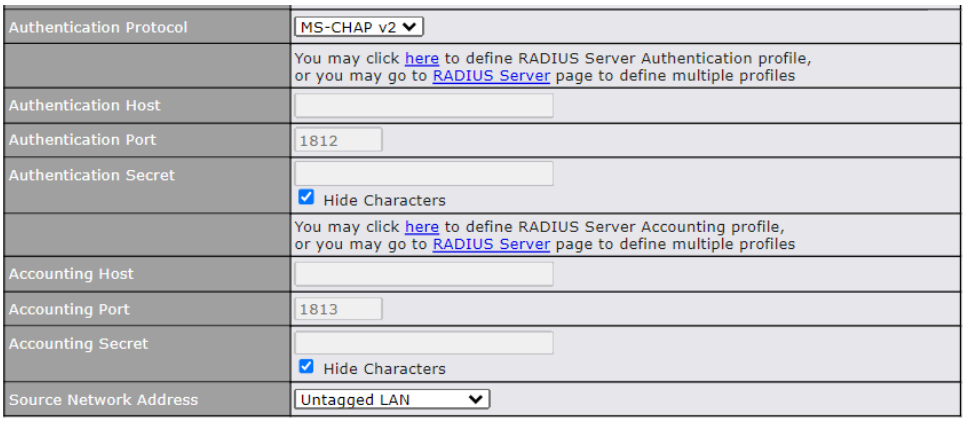
The username must contain lowercase letters, numerics, underscore(_), dash(-), at sign(@), and period(.) only.
The password must be between 8 and 12 characters long

- **LDAP Server**



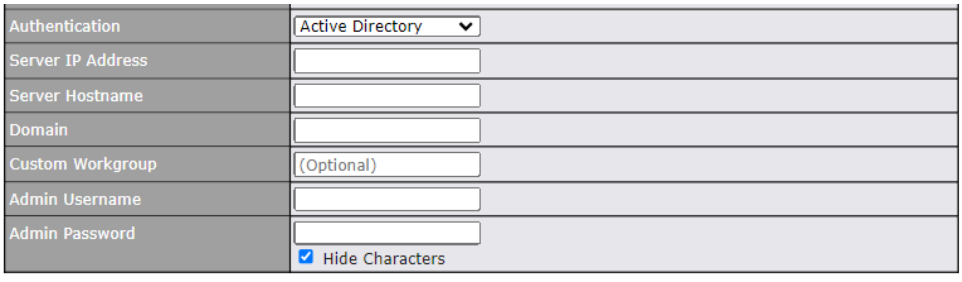
Enter the matching LDAP server details to allow for LDAP server authentication.

- **Radius Server**



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

- **Active Diretory**



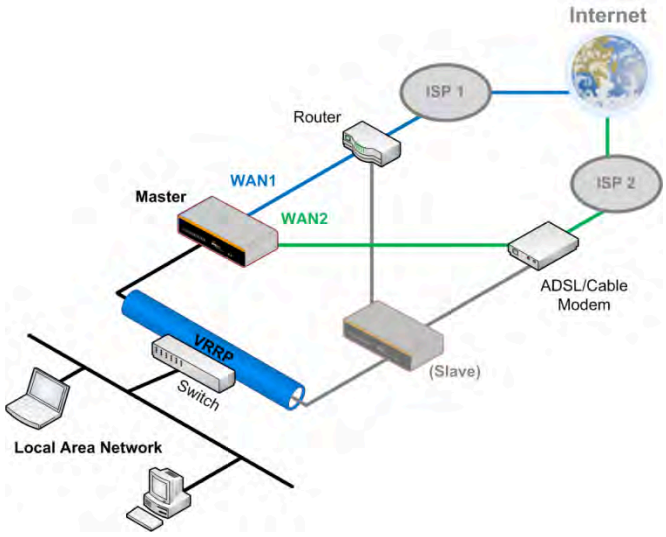
Enter the matching Active Directory details to allow for Active Directory server authentication.

23 Miscellaneous Settings

The miscellaneous settings include configuration for High Availability, Certificate Manager, service forwarding, service passthrough, GPS forwarding, GPIO, Groupe Networks (depending the feature is supported on the model of Peplink router that is being used).

23.1 High Availability

Many Peplink routers support high availability (HA) configurations via an open standard virtual router redundancy protocol (VRRP, RFC 3768). In an HA configuration, two Peplink routers 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.



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

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

- In an HA configuration, the two Peplink routers communicate with each other using VRRP over the LAN.
- The two Peplink routers 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 router is received in 3 seconds (or longer) since the last heartbeat signal, the slave Peplink router becomes active.
- The slave Peplink router initiates the WAN connections and binds to a previously

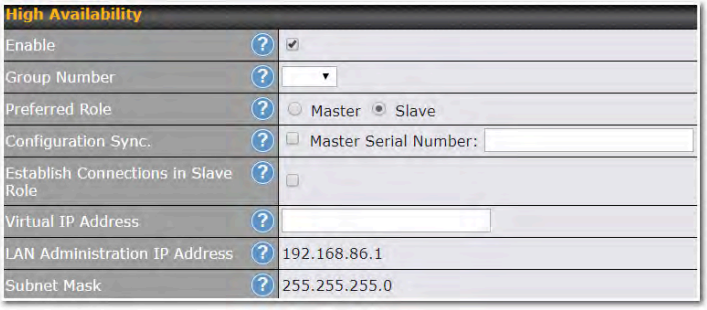
configured LAN IP address.

- At a subsequent point when the master Peplink router recovers, it will once again become active.

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

Interface for Master Router

Interface for Slave Router

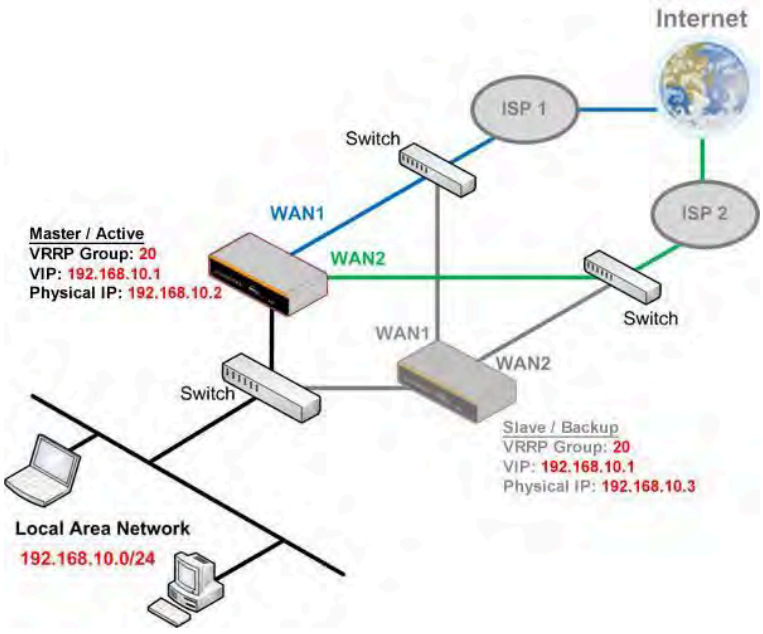


High Availability	
Enable	Checking this box specifies that the Peplink router is part of a high availability configuration.
Group Number	This number identifies a pair of Peplink routers operating in a high availability configuration. The two Peplink routers in the pair must have the same **Group Number** value.
Preferred Role	This setting specifies whether the Peplink router 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**

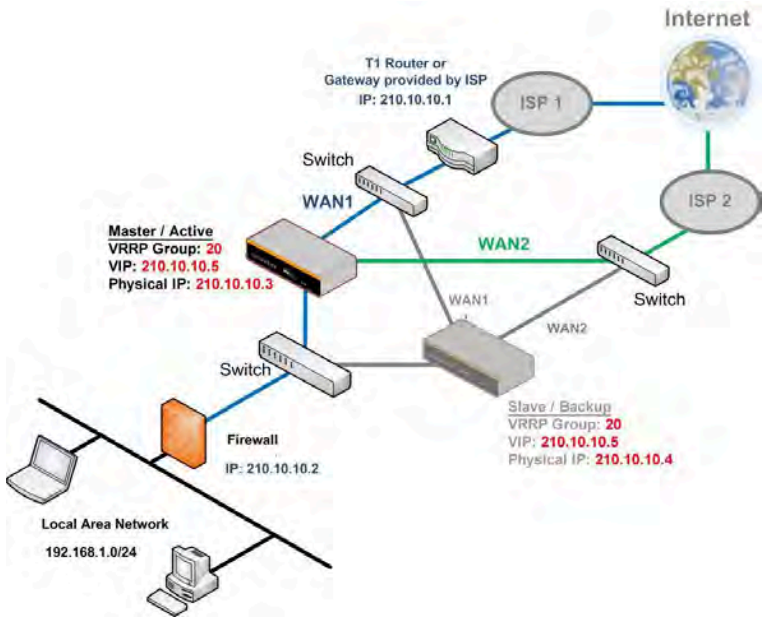
	Administration IP must be under the same network.
LAN Administration IP	This setting specifies a LAN IP address to be used for accessing administration functionality. This address should be unique within the LAN.
Subnet Mask	This setting specifies the subnet mask of the LAN.

Important Note

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



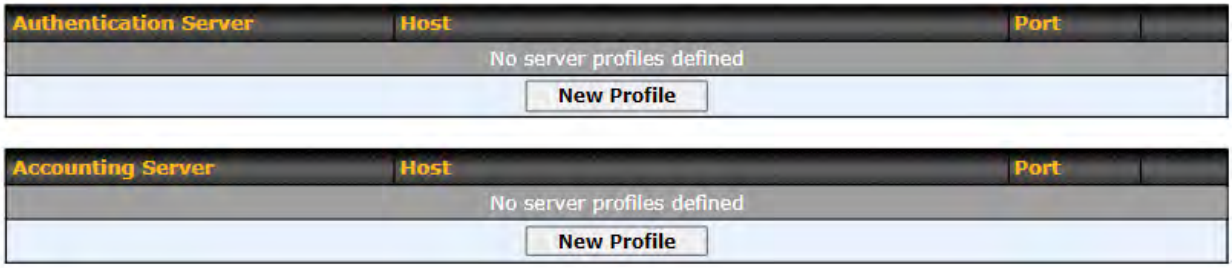
In drop-in mode, no other configuration needs to be set.



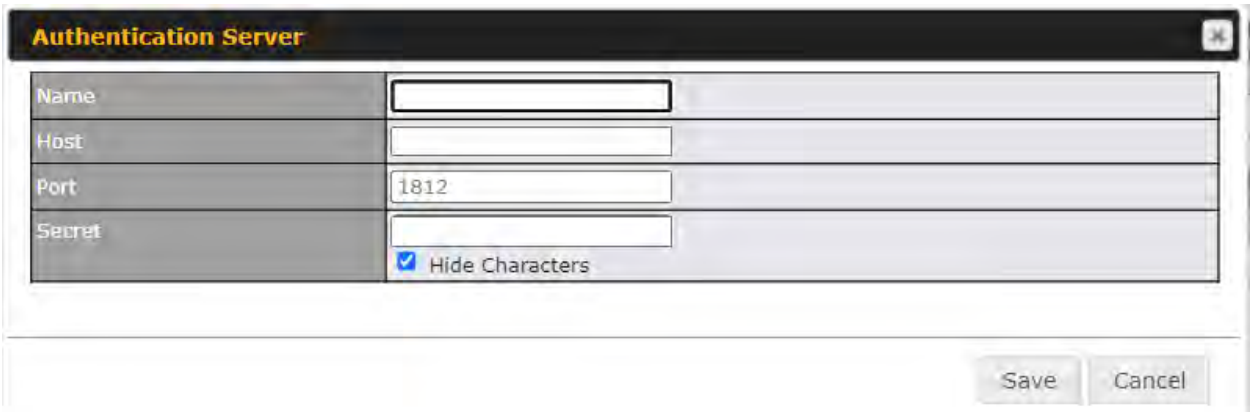
Please note that the drop-in WAN cannot be configured as a LAN bypass port while it is configured for high availability.

23.2 RADIUS Server

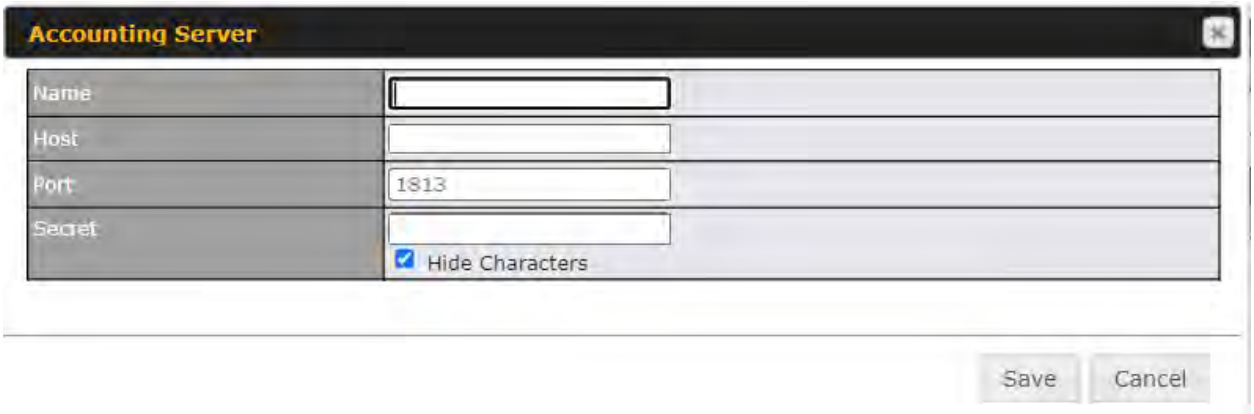
RADIUS Server settings are located at **Advanced > Misc. Settings > RADIUS Server**.



To configure the Authentication Server and Accounting Server, click **New Profile** to display the following screen:

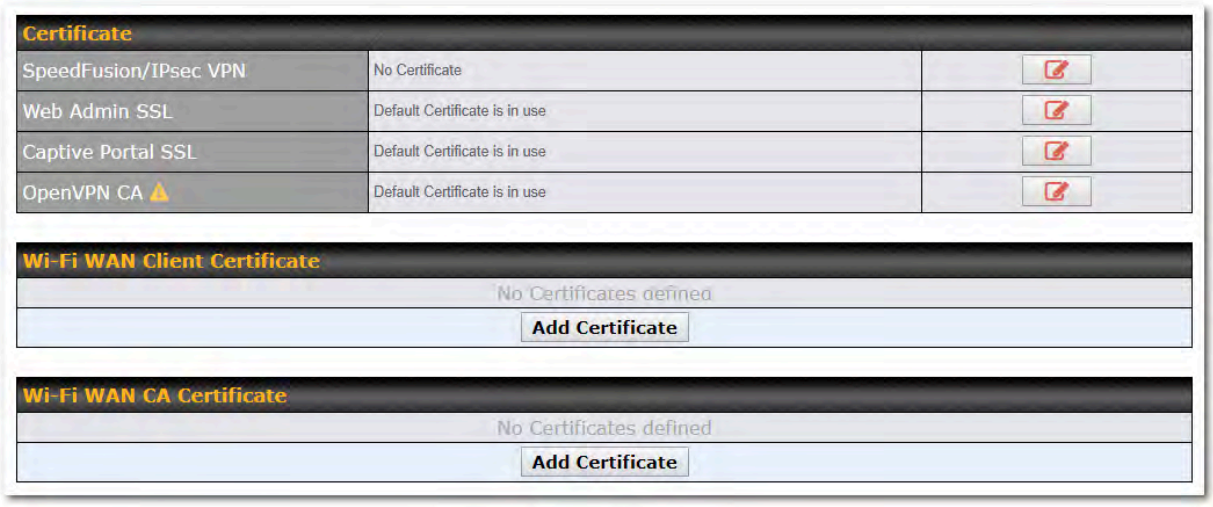


Authentication Server	
Name	This field is for specifying a name to represent this profile.
Host	Specifies the IP address or hostname of the RADIUS server host.
Port	This setting specifies the UDP destination port for authentication requests. By default, the port number is 1812.
Secret	This field is for entering the secret key for communicating to the RADIUS server.



Accounting Server	
Name	This field is for specifying a name to represent this profile.
Host	Specifies the IP address or hostname of the RADIUS server host.
Port	This setting specifies the UDP destination port for accounting requests. By default, the port number is 1813.
Secret	This field is for entering the secret key for communicating to the RADIUS server.

23.3 Certificate Manager



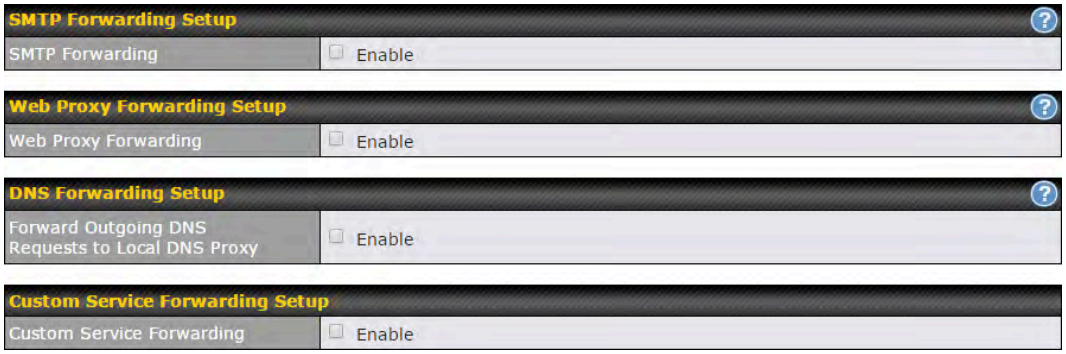
This section allows for certificates to be assigned to the local VPN, Web Admin SSL, Captive Portal SSL, OpenVPN CA, Wi-Fi WAN Client certificate and Wi-Fi WAN CA Certificate.

The following knowledge base article describes how to create self-signed certificates and import it to a Peplink Product.

https://forum.peplink.com/t/how-to-create-a-self-signed-certificate-and-import-it-to-a-peplink-product/

23.4 Service Forwarding

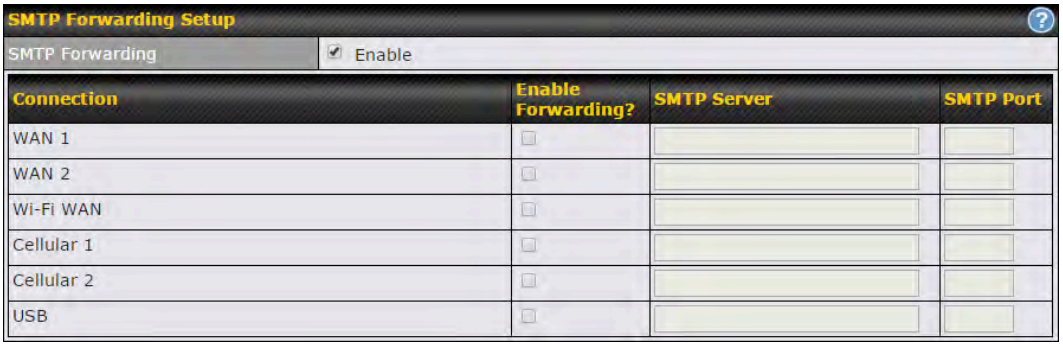
Service forwarding settings are located at **Advanced > Misc. Settings > Service Forwarding**.



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.

23.4.1 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. Peplink routers support intercepting and redirecting all outgoing SMTP connections (destined for TCP port 25) via a WAN connection to the WAN's corresponding SMTP server.



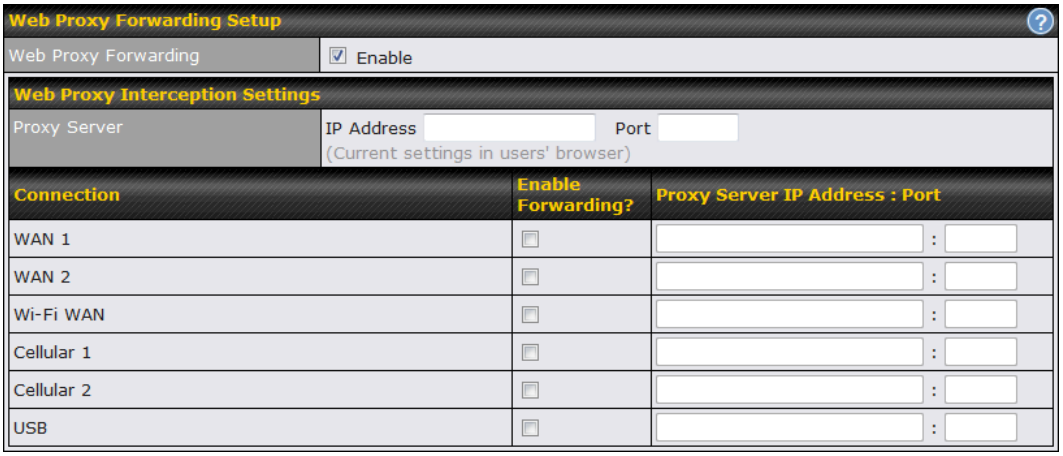
To enable the feature, select **Enable** under **SMTP Forwarding Setup**. Check **Enable Forwarding** for the WAN connection(s) that needs forwarding. Under **SMTP Server**, enter the ISP's e-mail server host name or IP address. Under **SMTP Port**, enter the TCP port number for each WAN.

The Peplink router 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 14.2**).

23.4.2 Web Proxy Forwarding

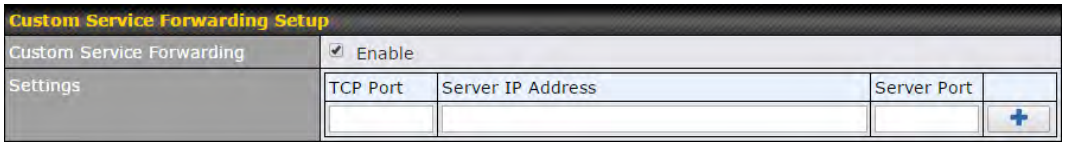


When this feature is enabled, the Peplink router will intercept all outgoing connections destined for the proxy server specified in **Web Proxy Interception Settings**, choose a WAN connection with reference to the outbound policy, and then forward them to the specified web proxy server and port number.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

23.4.3 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.

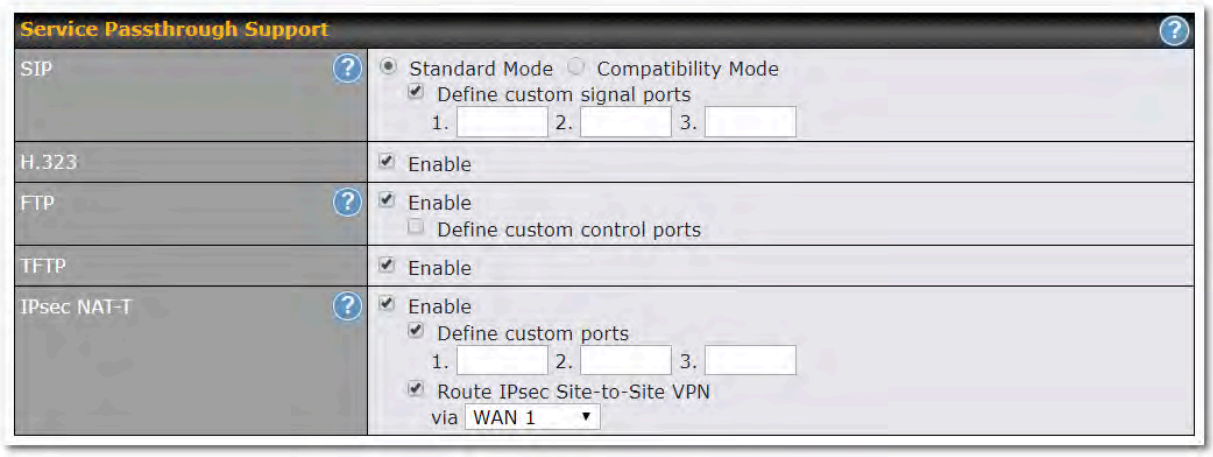
23.4.4 Custom Service Forwarding



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.

23.5 Service Passthrough

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



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

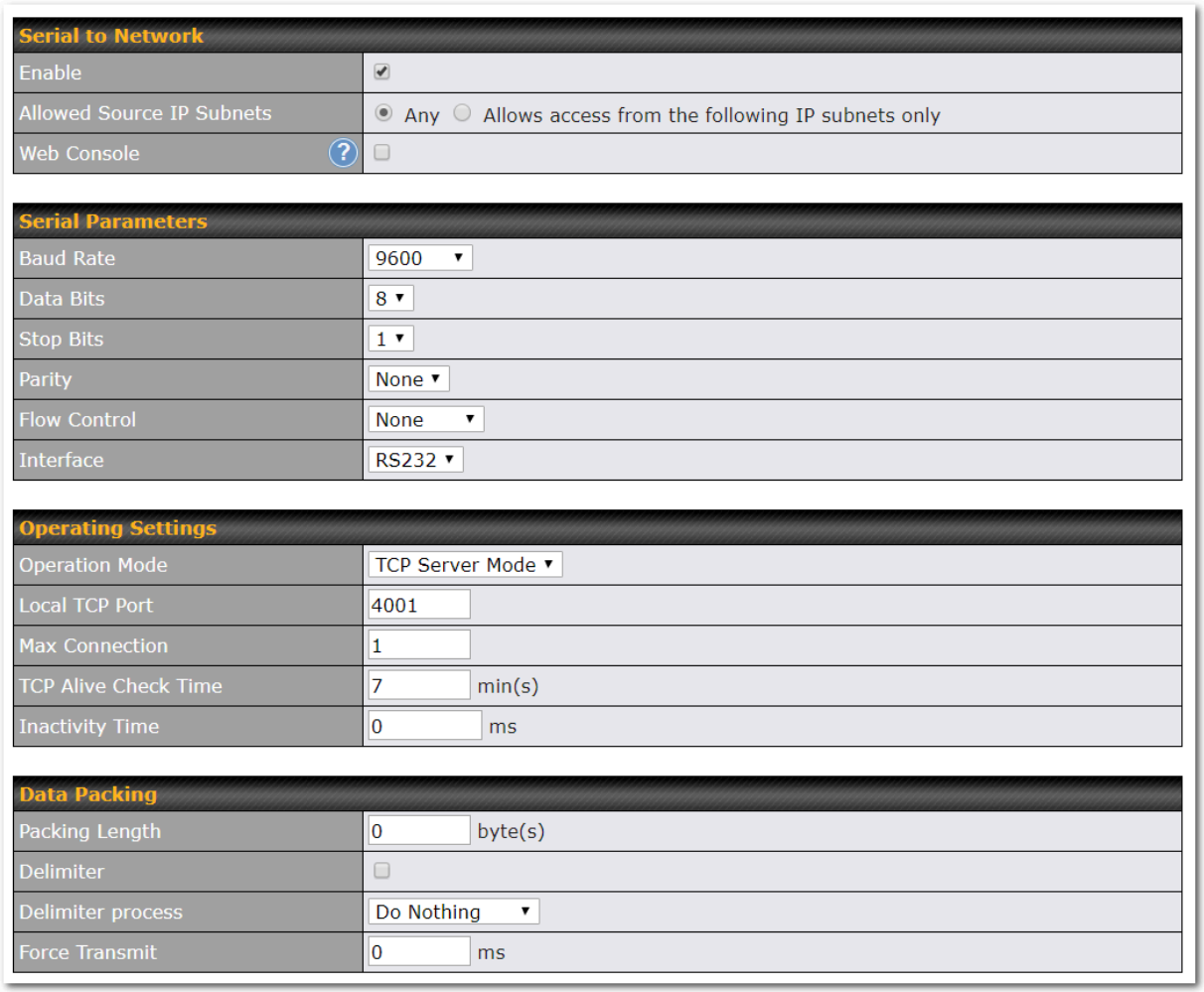
Service Passthrough Support	
SIP	Session initiation protocol, aka SIP, is a voice-over-IP protocol. The Peplink router can act as a SIP application layer gateway (ALG) which binds connections for the same SIP session to the same WAN connection and translate IP address in the SIP packets correctly in NAT mode. Such passthrough support is always enabled, and there are two modes for selection: **Standard Mode** and **Compatibility Mode**. 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 pass through the Peplink router.
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 router monitors TCP control connections on port 21 for any FTP connections and binds TCP connections of the same FTP session to the same WAN. 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 router 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. 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.

23.6 UART

Selected Peplink MAX routers feature a RS-232 serial interface on the built-in terminal block. The RS-232 serial interface can be used to connect to a serial device and make it accessible over an TCP/IP network.

The serial interface can be enabled and parameters can be set on the web admin page under **Advanced > UART**. Make sure they match the serial device you are connecting to.



There are 4 pins i.e. TX, RX, RTS, CTS on the terminal block for serial connection and they correspond to the pins in a DB-9 connector as follows:

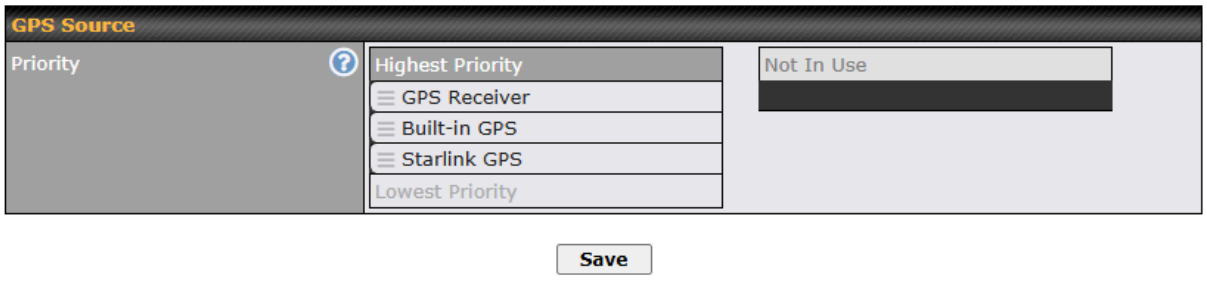
DB-9	Peplink MAX Terminal Block
Pin 1	–
Pin 2	Rx (rated -+25V)
Pin 3	Tx (rated -+12V)
Pin 4	–
Pin 5	–
Pin 6	–
Pin 7	RTS
Pin 8	CTS
Pin 9	–

The RS232 serial interface is not an isolated RS232. External galvanic isolation may be added if required.

Be sure to check whether your serial cable is a null modem cable, commonly known as crossover cable, or a straight through cable. If in doubt, swap Rx and Tx, and RTS and CTS, at the other end and give it another go.

Once connected, your serial device should be accessible on your Peplink MAX router LAN IP address at the specified TCP port.

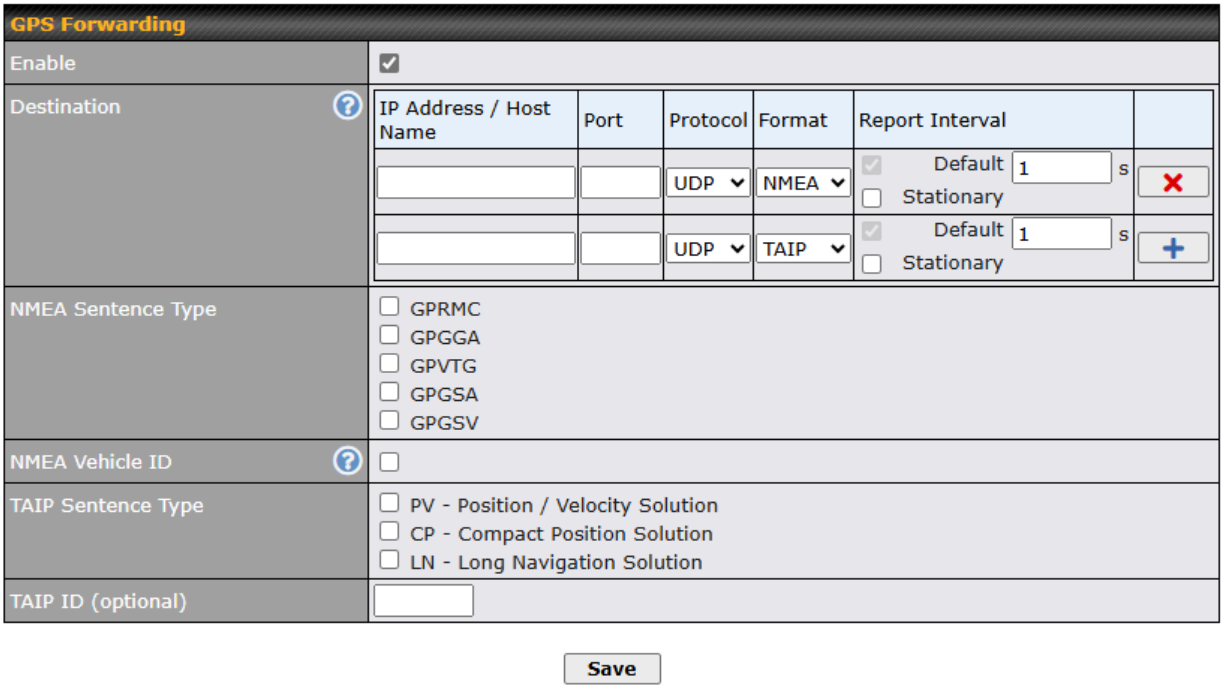
23.7 GPS



This settings is to specific the priority of the GPS source to be used for receiving GPS data. The device will always use the highest priority GPS source to receive GPS data. A lower priority GPS source will only be used when all higher priority GPS source data is invalid or unavailable. GPS source type will be shows on the Dashboard map.

23.8 GPS Forwarding

Using the GPS forwarding feature, some Peplink routers can automatically send GPS reports to a specified server. To set up GPS forwarding, navigate to **Advanced > Misc. Settings > GPS Forwarding**.

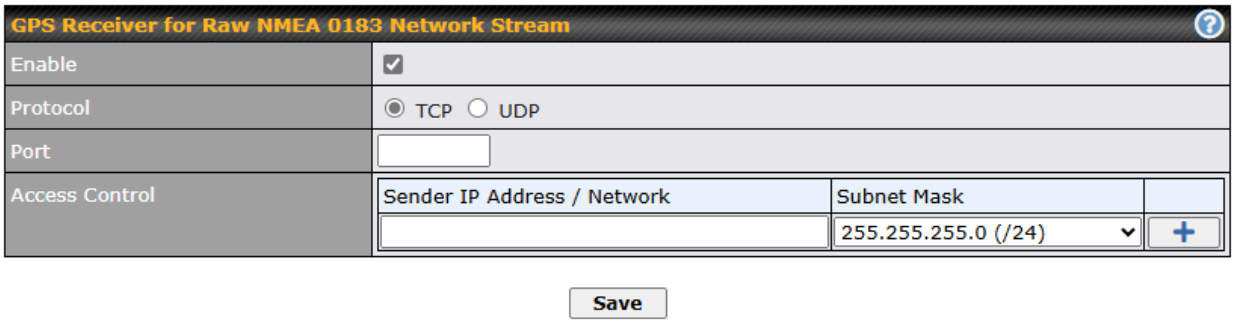


GPS Forwarding

Enable Check this box to turn on GPS forwarding.

Server	Enter the name/IP address of the server that will receive GPS data. Also specify a port number, protocol (**UDP** or **TCP**), Format (**NMEA** or **TAIP**) and a report interval. Click  to save these settings.
NMEA Sentence Type	If you've chosen to send GPS reports in NMEA format, select one or more sentence types for sending the data (**GPRMC**, **GPGGA**, **GPVTG**, **GPGSA**, and **GPGSV**).
Vehicle ID	The vehicle ID will be appended in the last field of the NMEA sentence. Note that the NMEA sentence will become customized and non-standard.
TAIP Sentence Type/TAIP ID (optional)	If you've chosen to send GPS reports in TAIP format, select one or more sentence types for sending the data (**PV—Position / Velocity Solution** and **CP—Compact Velocity Solution**). You can also optionally include an ID number in the **TAIP ID** field.

23.9 GPS Receiver



GPS Receiver for Raw NMEA 0183 Network Stream	
Enable	Check this box to turn on GPS forwarding.
Protocol	Select protocol **TCP** or **UDP**
Port	Specific port number.
Access Control	Enter the IP address / Network of the sender. Click  to save these settings.

23.10 Ignition Sensing

Ignition Sensing detects the ignition signal status of a vehicle it is installed in.

This feature allows the router to start up or shut down when the engine of that vehicle is started or turned off.

The time delay setting between ignition off and power down of the router is a configurable setting, which allows the router to stay on for a period of time after the engine of a vehicle is turned off.

Note: Ignition Sensing is supported on MAX Orbit 2 and MAX Orbit 4 only. MAX Orbit 8 does not support Ignition Sensing.

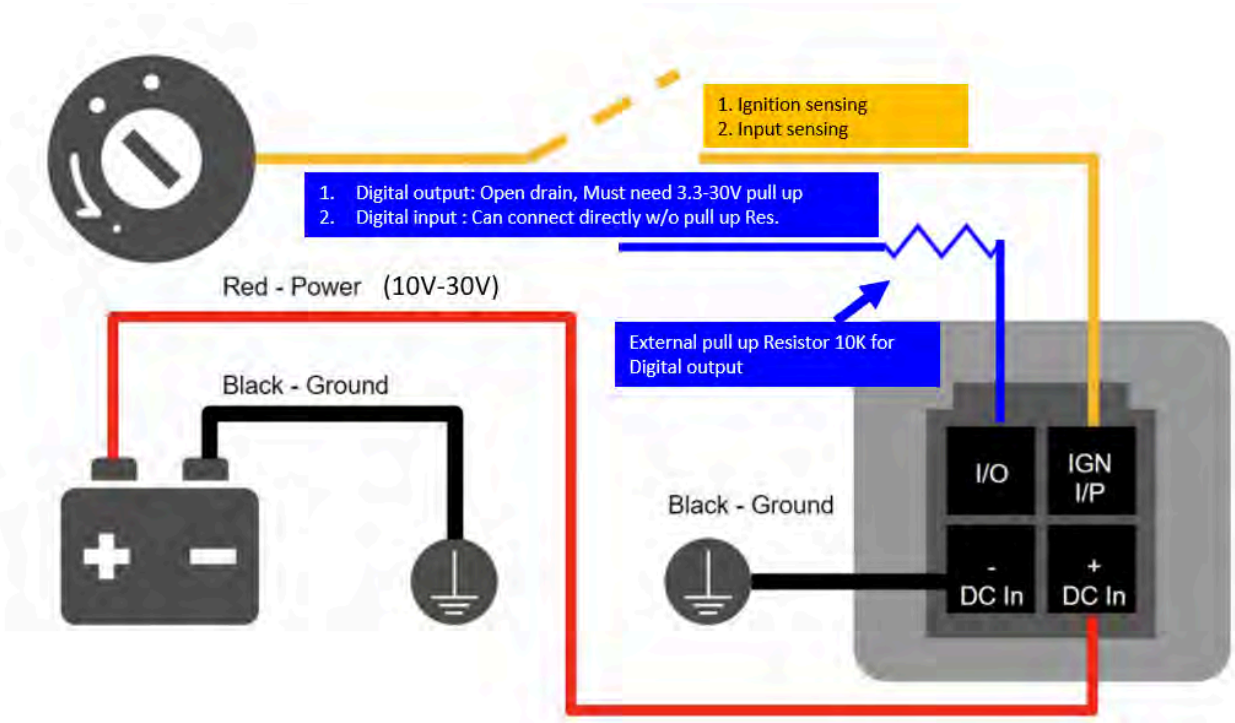
Ignition Sensing installation

Function		Colour Wire
I/O	optional *	Brown
IGN I/P	connected to positive feed on the ignition **	Orange
DC IN -	connected to permanent negative feed (ground)	Black
DC IN +	connected to permanent positive feed (power)	Red

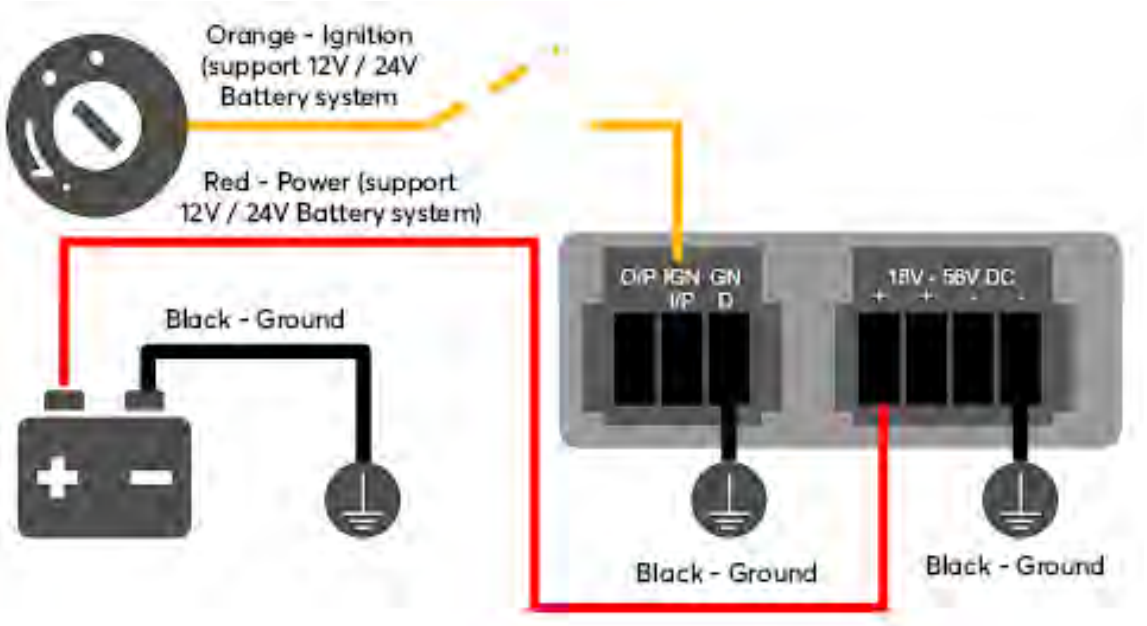
* Currently not functional; will be used for additional features in future firmware.

** Connecting IGN I/P is optional and is needed only if the Ignition Sensing feature is configured.

Connectivity diagram for devices with 4-pin connector



Connectivity diagram for devices with terminal block connection



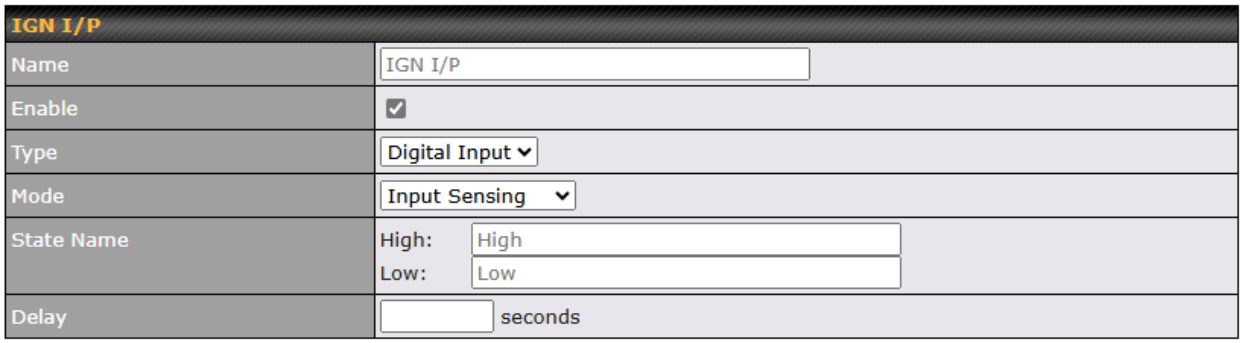
GPIO Menu

Note: This feature is applicable for certain models that come with a GPIO interface.

Ignition Sensing options can be found in **Advanced > Misc. Settings > GPIO.**
The configurable option for Ignition Input is **Delay;** the time in seconds that the router stays powered on after the ignition is turned off.

a.) Ignition sensing: 9-30V active high for IGN purpose

b.) Input Sensing: I/O input



The O/P (connected to the I/O pin on a 4 pin connector) can be configured as a digital input, a digital output, or an analog input.

Digital Input – the connection supports input sensing; it reads the external input and determines if the settings should be 'High' (on) or 'Low' (off).

State Name - This field is to custom names shows on event log when digital input is high or low.

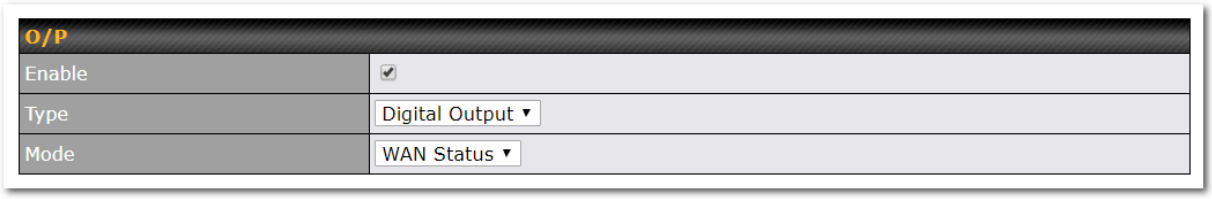
a.) Digital output:

Open drain for IO output. It is required to add an external pull up resistor of 10K for 3.3-30V pull up voltage.

(DO NOT exceed 250mA)

3.3-30V active high, 0.05-0.5V active low(mapping to 3.3-30V pull up voltage)

b.) Digital input: I/O input



Note: The Digital Output state (on/off) upon rebooting the device may vary depending on the model, eg. MAX BR1 MK2 = Persistent; MAX Transit Mini with ContentHub = Reset to default, etc.

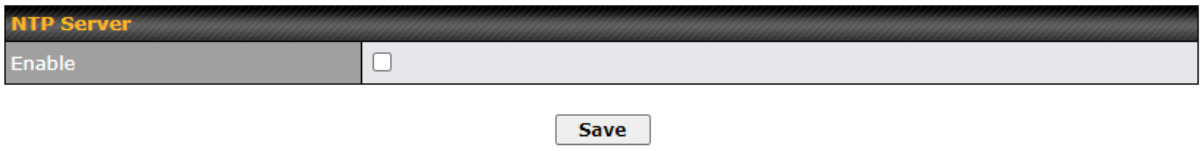
Analog Input - to be confirmed. In most cases, it should read the external input and determine the voltage level.

23.11 NTP Server

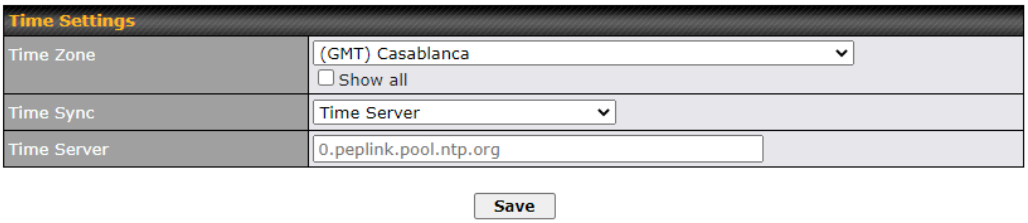
Peplink routers can now serve as a local NTP server. Upon start up, it is now able to provide connected devices with the accurate time, precise UTC from either an external NTP server or via GPS and ensuring that connected devices always receive the correct time.

Compatible with: MAX Orbit 2, MAX Orbit 4, MAX Orbit 8

NTP Server setting can be found via: **Advanced > Misc. Settings > NTP Server**

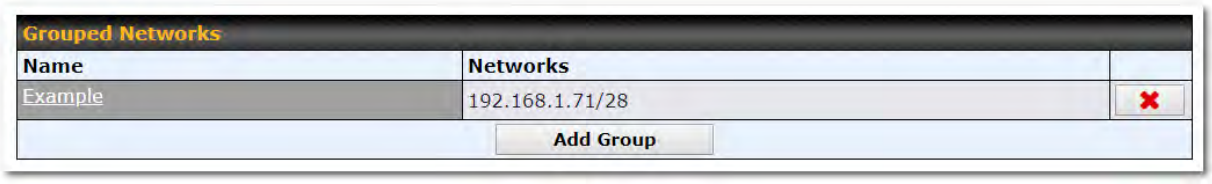


Time Settings can be found at **System > Time > Time Settings**

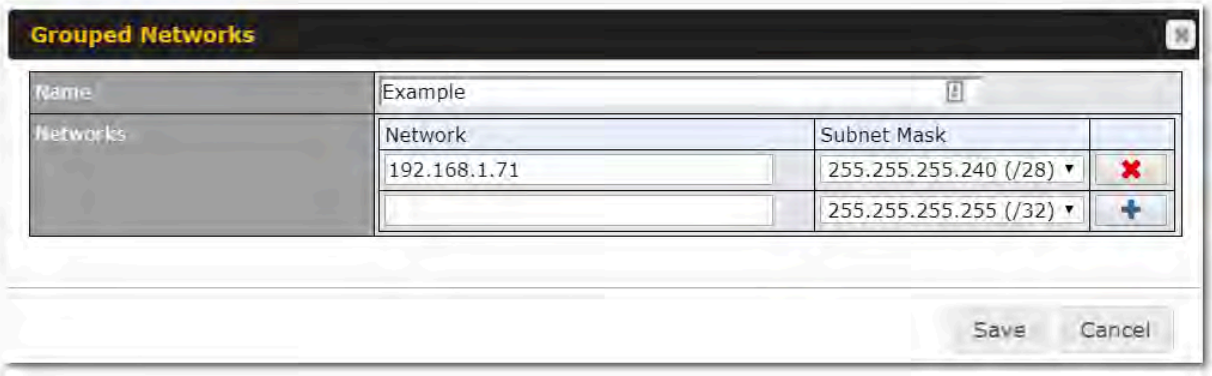


23.12 Grouped Networks

Advanced > Misc. Settings > Grouped Networks allows to configure destination networks in grouped format.



Select Add group to create a new group with single IPaddresses or subnets from different VLANs.

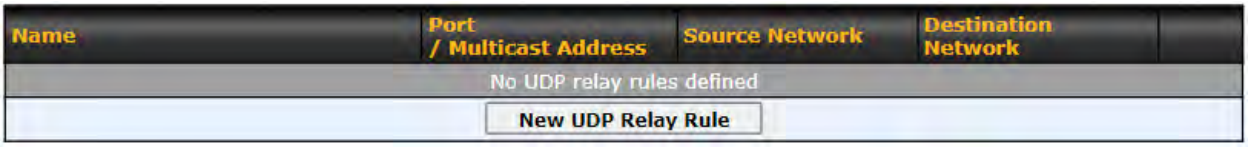


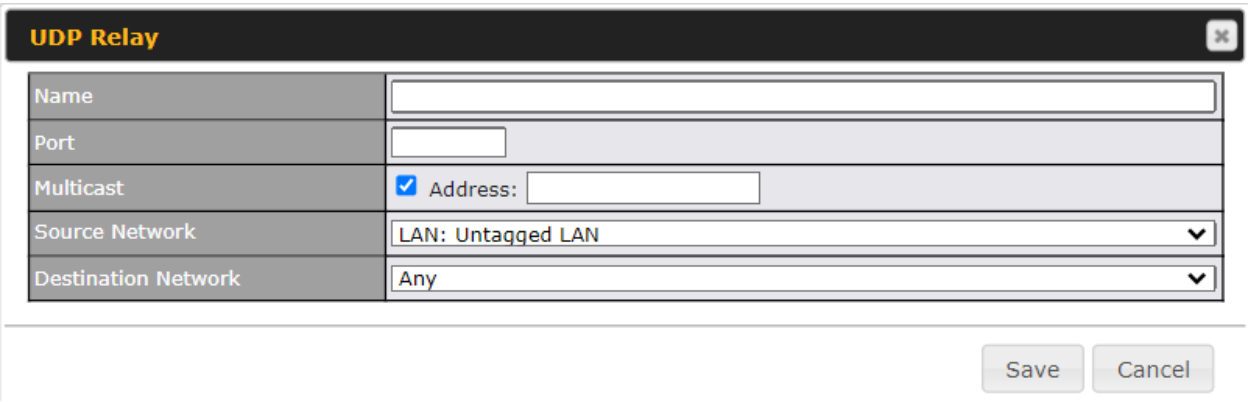
The created network groups can be used in outbound policies, firewall rules.

23.13 UDP Relay

You may define the UDP relay by clicking the **Advanced > Misc Settings > UDP Relay**. You can click  to enable the UDP relay to relay UDP Broadcast or Multicast traffic for LAN/VLAN/SpeedFusion VPN.

Click "*New UDP Relay Rule*" to define the relay rule.



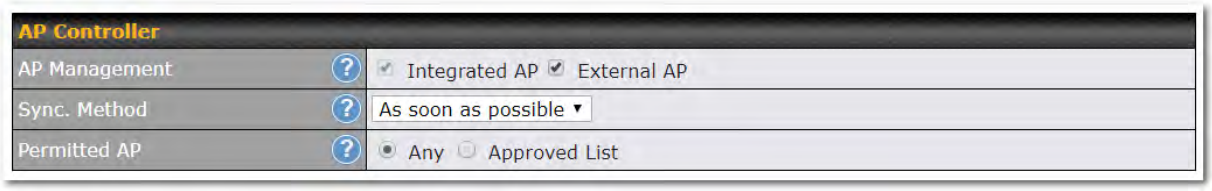


UDP Relay	
Name	This field is for specifying a name to represent this profile.
Port	This feid is to enter the specific port number for the UDP relay
Multicast	If Multicast is not selected, it will broadcast relay rule. If Multicast is selected, you may need to enter a valid multicast address.
Secure Network	Select the specific connection as a source network to where the device is to relay UDP Broadcast packets.
Destination Network	You may select the specific connection from the drop-down list or may custom combination network as a destination network that receives the UDP packet relays.

24 AP

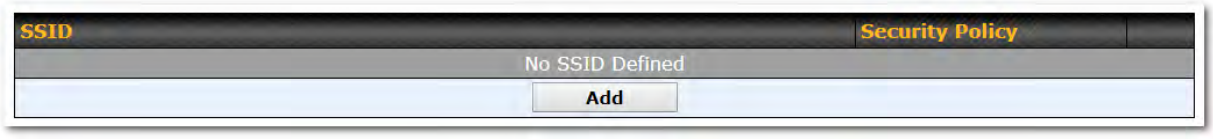
24.1 AP Controller

The AP controller acts as a centralized controller of Peplink Access Points.
With this feature, users can customize and manage up to 1500 Access Points from a single Peplink router interface.
To configure, navigate to the **AP** tab. and the following screen appears.

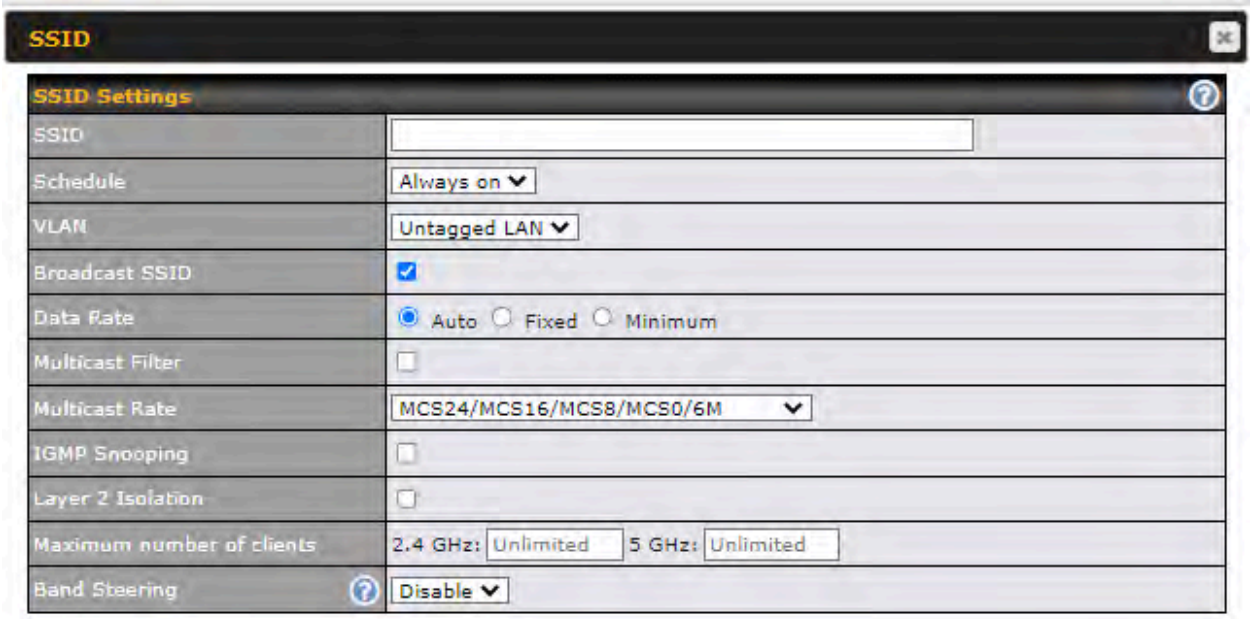


AP Controller	
AP Management	The AP controller for managing Peplink APs can be enabled by checking this box. When this option is enabled, the AP controller will wait for management connections originating from APs over the LAN on TCP and UDP port 11753. It will also wait for captive portal connections 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.
Sync Method	• As soon as possible • Progressively • One 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.

24.2 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.
Schedule	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 Peplink 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).
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 Peplink 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 Peplink router to listen to internet group management protocol (IGMP) network traffic, select this option.
Layer 2 Isolation [A]	**Layer 2** refers to the second layer in the ISO Open System Interconnect model. 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 the upper communication layer(s). By default, the setting is disabled.
Maximum Number of Clients [A]	Indicate the maximum number of clients that should be able to connect to each frequency.
Band Steering [A]	To reduce 2.4 GHz band overcrowding, AP with band steering steers clients capable of 5 GHz operation to 5 GHz frequency. Choose between: **Force** - Clients capable of 5 GHz operation are only offered with 5 GHz frequency. **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. **Disable** - Default

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

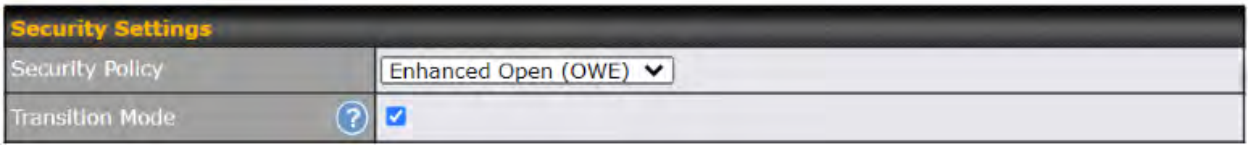
Security Settings

Security Policy

This setting configures the wireless authentication and encryption methods. Available options are:

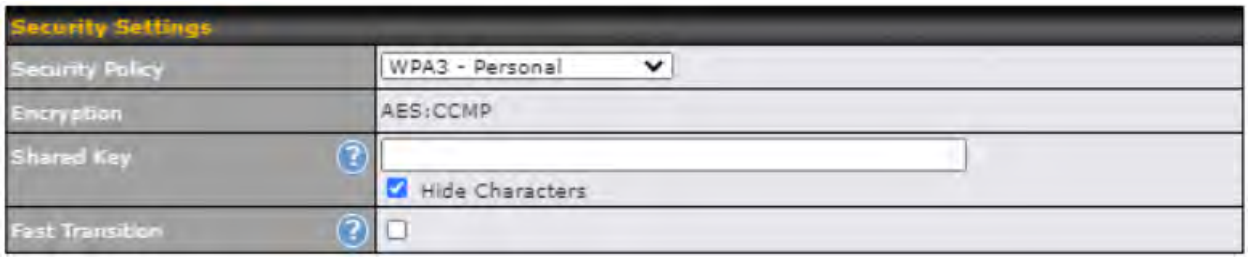
- **Open (No Encryption)**
- **Enhanced Open (OWE)**
- **WPA3 – Personal (AES:CCMP)**
- **WPA3 – Enterprise (AES:CCMP)**
- **WPA2/WPA3 – Personal (AES:CCMP)**
- **WPA2 – Personal (AES:CCMP)**
- **WPA2 – Enterprise (AES:CCMP)**
- **WPA/WPA2 – Personal (TKIP/AES: CCMP)**
- **WPA/WPA2 – Enterprise (TKIP/AES: CCMP)**

To allow any Wi-Fi client to access your AP without authentication, select **Open (No Encryption)**. Details of each available authentication method follow.



Enhanced Open (OWE)

Transition Mode	With the option enabled, legacy clients will be able to connect in Open mode. With the option disabled, legacy clients will not be able to connect. OWE-supported clients will always connect in OWE mode.



WPA3 – Personal

Shared Key	Enter a passphrase of between 8 and 63 alphanumeric characters to create a passphrase used for data encryption and authentication. Click **Hide / Show Character**s to toggle visibility.
Fast Transition	Fast Transition [802.11r] When this option is ticked, the transition process for a mobile client

is improved as it moves between access points.

WPA3 – Enterprise

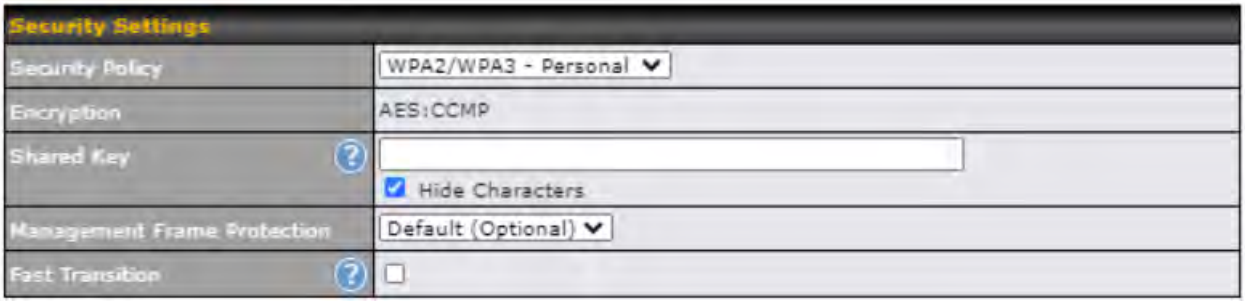
802.1X Version

Choose **v1** or **v2** of the 802.1x EAPOL. When **v1** is selected, both **v1** and **v2** clients can associate with the access point. When **v2** is selected, only **v2** clients can associate with the access point. Most modern wireless clients support **v2**. For stations that do not support **v2**, select **v1**. The default is **v2**.

Fast Transition

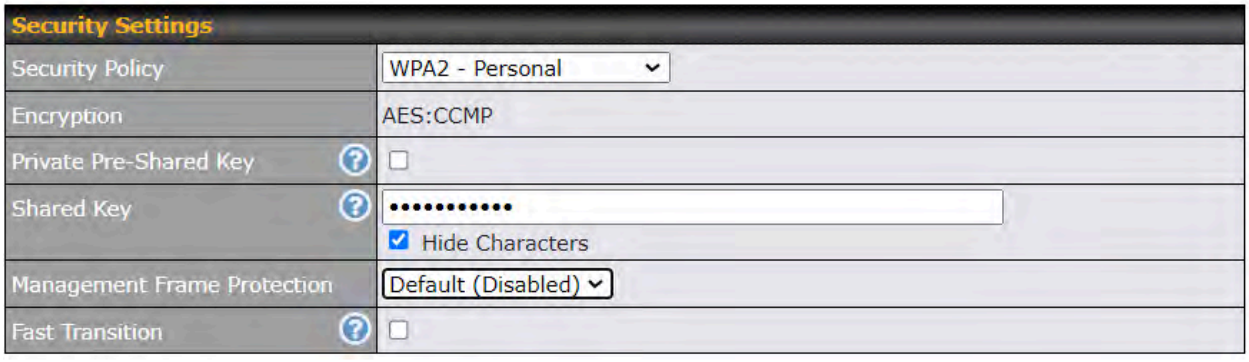
Fast Transition

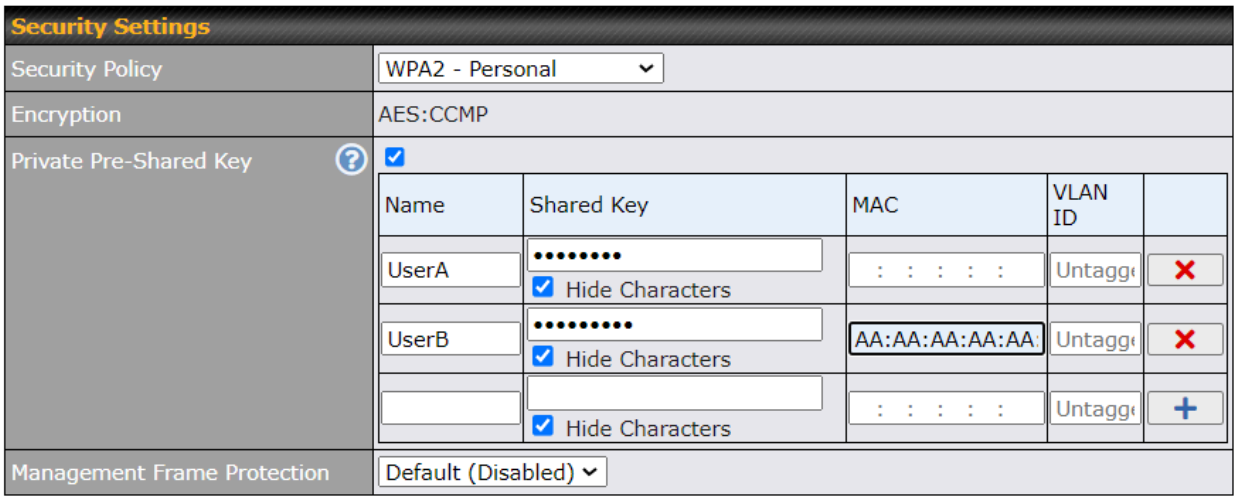
[802.11r] When this option is ticked, the transition process of a mobile client is improved as it moves between access points.



WPA2/WPA3 – Personal

Shared Key	Enter a passphrase of between 8 and 63 alphanumeric characters to create a passphrase used for data encryption and authentication. Click **Hide / Show Characters** to toggle visibility.
Management Frame Protection	This feature protects stations against forged management frames spoofed from other devices. Frames that are protected include Disassociation, Deauthentication, and QoS Action.
Fast Transition	Fast Transition [802.11r] When this option is ticked, the transition process of a mobile client is improved as it moves between access points.





WPA2 – Personal

Private Shared Key

Enable the Private Pre-Shared Key (PPSK) option to set unique pre-shared keys for individual users or groups on the same SSID. Please provide the following information for each user or group:

Name (Optional)

Name for the profile

Shared Key

The passphrase key is used for data encryption and authentication. You can click “Hide/Show Characters” to toggle the visibility of the shared key.

MAC (Optional)	By default, all MAC addresses are allowed. If a specific MAC address is entered, only that device can access this WiFi SSID using the provided shared key.
VLAN ID (Optional)	The VLAN is assigned to the user upon logging into the WiFi. If not specified, the user will be assigned to the default untagged LAN.

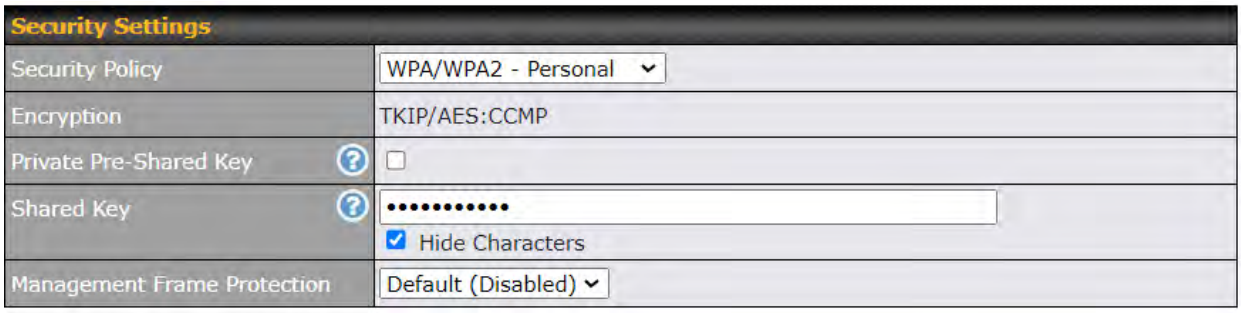
*Each “Shared Key + MAC” combination must be unique in a different profile.

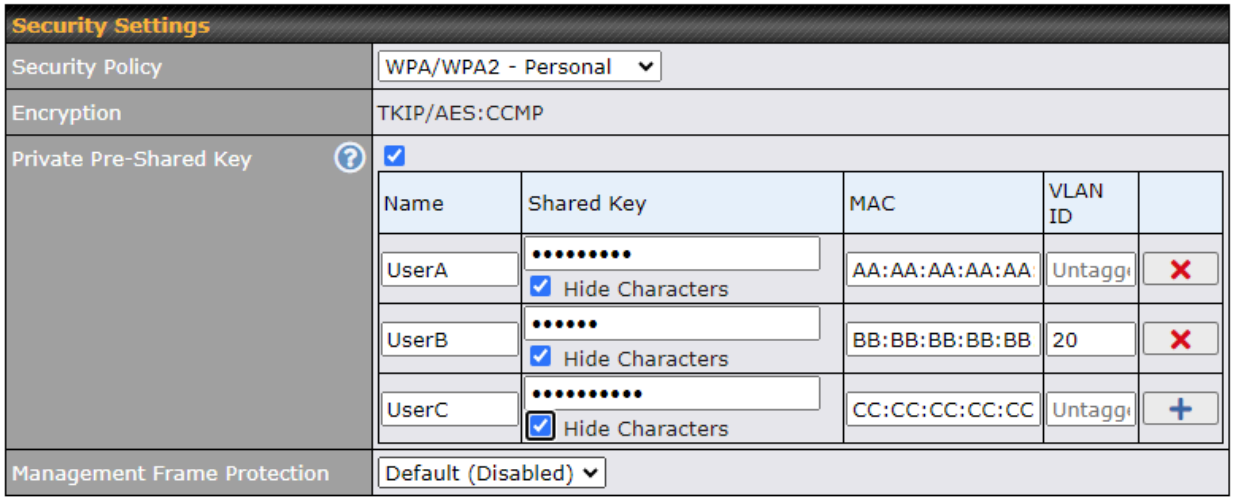
Shared Key	Enter a passphrase of between 8 and 63 alphanumeric characters to create a passphrase used for data encryption and authentication. Click **Hide / Show Characters** to toggle visibility.
Management Frame Protection	This feature protects stations against forged management frames spoofed from other devices. Frames that are protected include Disassociation, Deauthentication, and QoS Action.
Fast Transition	Fast Transition [802.11r] When this option is ticked, the transition process of a mobile client

is improved as it moves between access points.

WPA2 – Enterprise

802.1X Version	Choose **v1** or **v2** of the 802.1x EAPOL. When **v1** is selected, both **v1** and **v2** clients can associate with the access point. When **v2** is selected, only **v2** clients can associate with the access point. Most modern wireless clients support **v2**. For stations that do not support **v2**, select **v1**. The default is **v2**.
Management Frame Protection	This feature protects stations against forged management frames spoofed from other devices. Frames that are protected include Disassociation, Deauthentication, and QoS Action.
Fast Transition	Fast Transition [802.11r] When this option is ticked, the transition process of a mobile client is improved as it moves between access points.





WPA/WPA2 – Personal

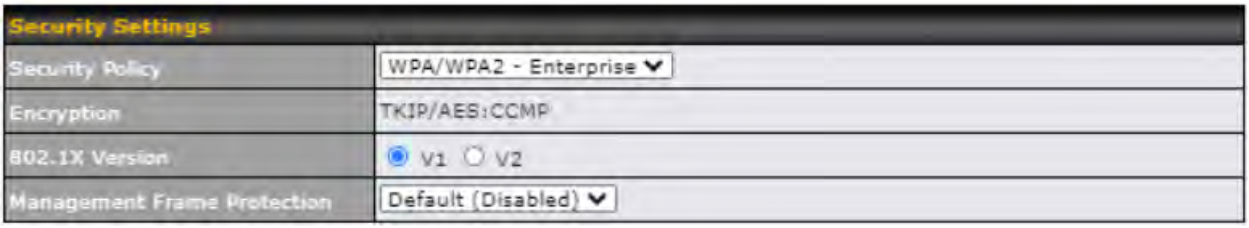
Private Shared Key	Enable the Private Pre-Shared Key (PPSK) option to set unique pre-shared keys for individual users or groups on the same SSID. Please provide the following information for each user or group:

Name (Optional)	Name for the profile
Shared Key	The pass-phrase key is used for data encryption and authentication. You can click “Hide/Show Characters” to toggle the visibility of the shared key.
MAC (Optional)	By default, all MAC addresses are allowed. If a specific MAC address is entered, only that device can access this WiFi SSID using the provided shared key.
VLAN ID (Optional)	The VLAN is assigned to the user upon logging into the WiFi. If not specified, the user will be assigned to the default untagged LAN.

*Each “Shared Key + MAC” combination must be unique in a different

profile.

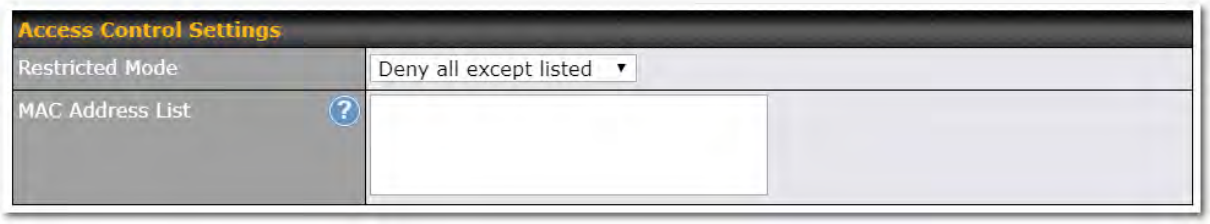
Shared Key	Enter a passphrase of between 8 and 63 alphanumeric characters to create a passphrase used for data encryption and authentication. Click **Hide / Show Characters** to toggle visibility.
Management Frame Protection	This feature protects stations against forged management frames spoofed from other devices. Frames that are protected include Disassociation, Deauthentication and QoS Action.



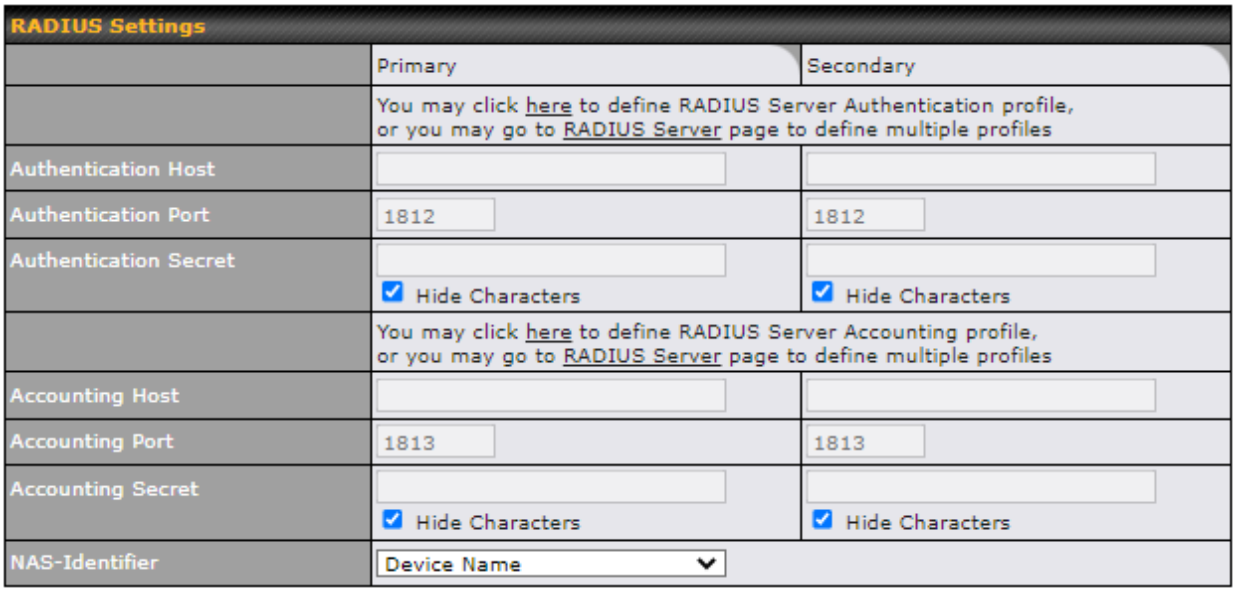
WPA/WPA2 – Enterprise

802.1X Version	Choose **v1** or **v2** of the 802.1x EAPOL. When **v1** is selected, both v1 and v2 clients can associate with the access point. When **v2** is selected, only v2 clients can associate with the access point. Most modern wireless clients support v2. For stations that do not support v2, select **v1**. The default is **v2**.
Management Frame	This feature protects stations against forged management frames spoofed from other devices. Frames that are protected include Disassociation,

Protection	Deauthentication and QoS Action.

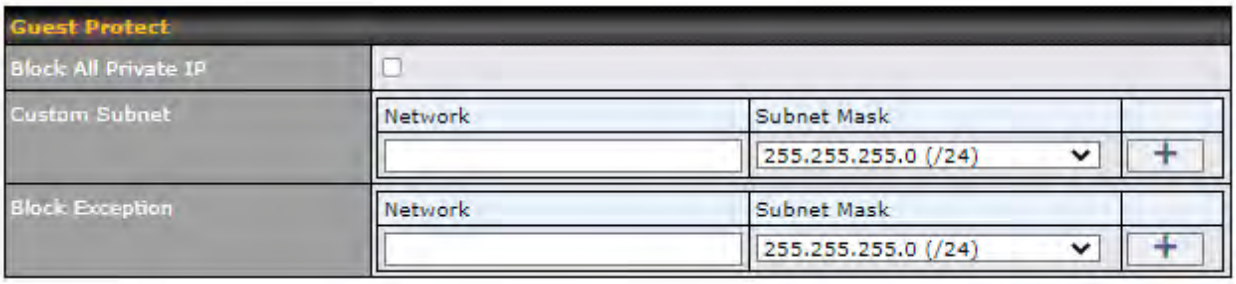


Access Control	
Restricted Mode	The settings allow the administrator to control access using MAC address filtering. Available options are **None**, **Deny all except listed**, **Accept all except listed** and **Radius MAC Authentication.**
MAC Address List	Connection coming from the MAC addresses in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

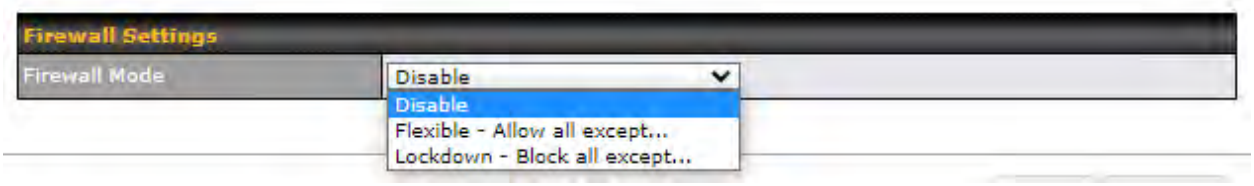


RADIUS Settings	
Authentication Host	This field is for specifying the IP address of the primary RADIUS server for Authentication and, if applicable, the secondary RADIUS server.

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

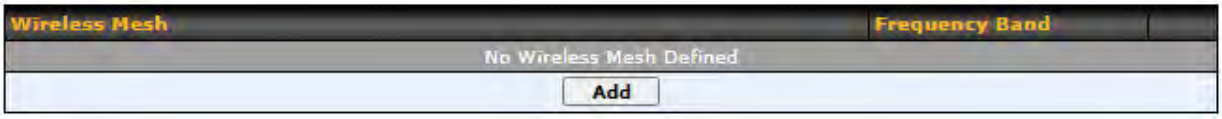


Guest Protect	
Block All Private IP	Check this box to deny all connection attempts by private IP addresses.
Custom Subnet	To create a custom subnet for guest access, enter the IP address and choose a subnet mask from the drop-down menu.
Block Exception	To block access from a particular subnet, enter the IP address and choose a subnet mask from the drop-down menu.



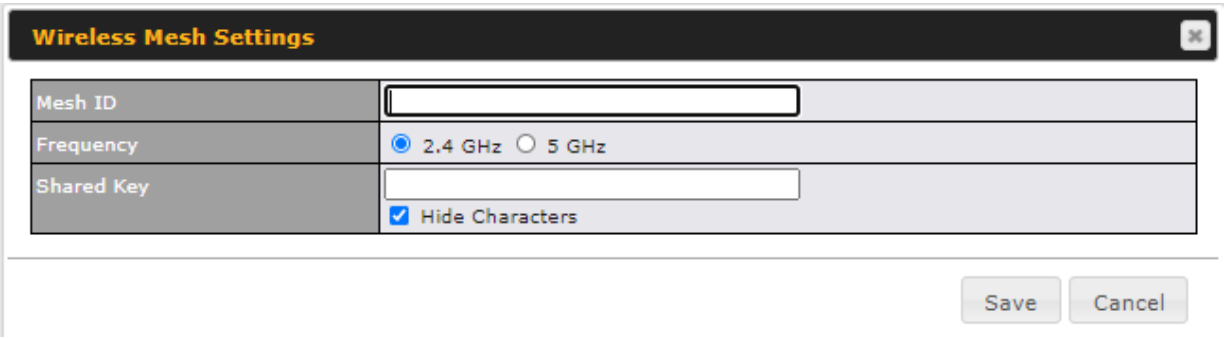
Firewall Settings	
Firewall Mode	The settings allow administrators to control access to the SSID based on Firewall Rules. Available options are **Disable, Lockdown - Block all except...** and **Flexible -Allow all except…**
Firewall Exceptions	Create Firewall Rules based on **Port, IP Network, MAC address** or **Domain Name**

24.3 Wireless Mesh



Wireless Mesh Support is available on devices running 802.11ac (Wi-Fi 5) and above. Along with the AP Controller, mesh network extensions can be established, which can expand network coverage. Note that the Wireless Mesh settings need to match the Mesh ID and Shared Key of the other devices on the same selected frequency band.

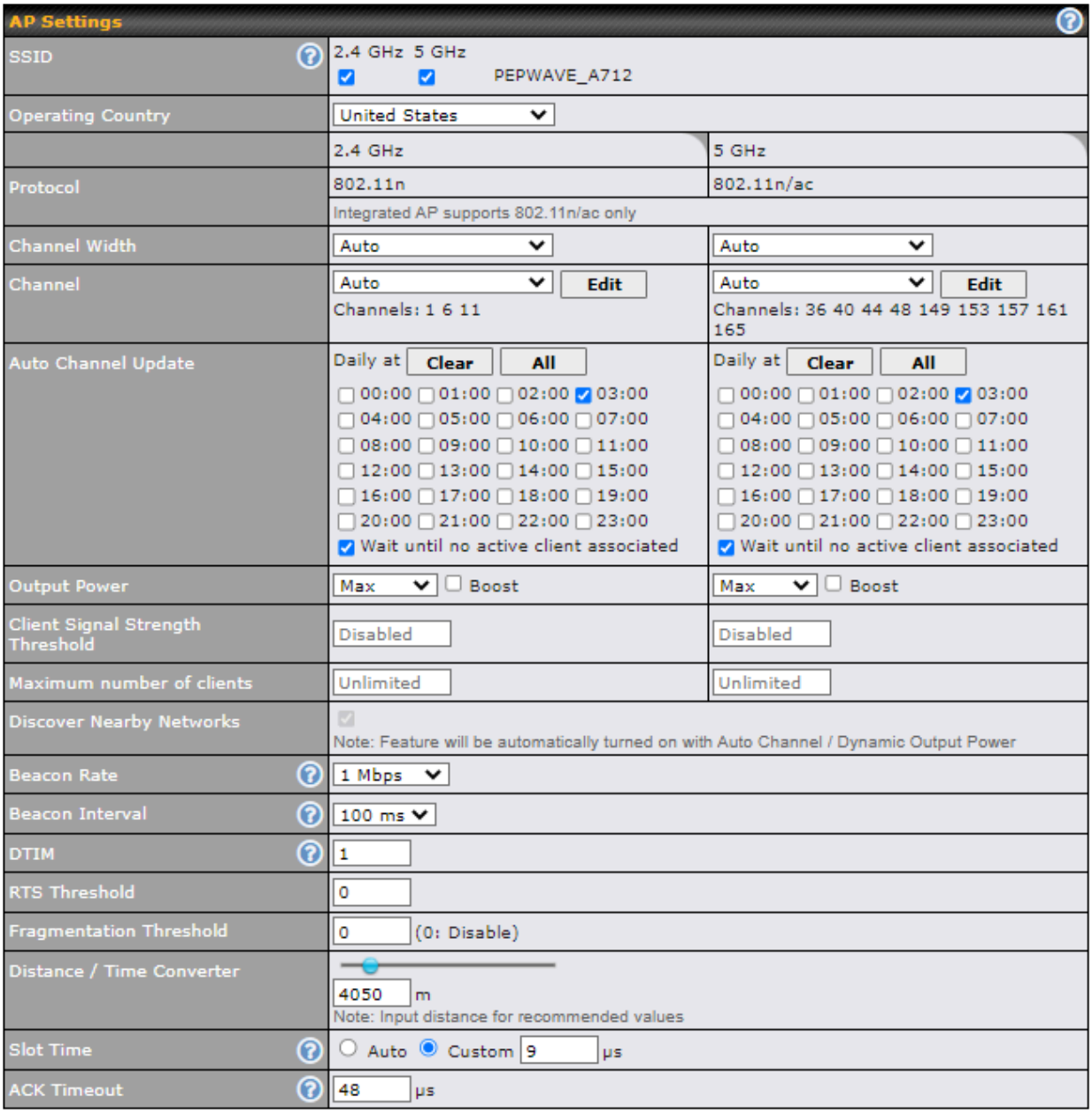
To create a new Wireless Mesh profile, go to **AP** > **Wireless Mesh**, and click **Add**.



Wireless Mesh Settings	
Mesh ID	Enter a name to represent the Mesh profile.
Frequency	Select the 2.4GHz or 5GHz frequency to be used.
Shared Key	Enter the shared key in the text field. Please note that it needs to match the shared keys of the other APs in the Wireless Mesh settings. Click **Hide / Show Characters** to toggle visibility.

24.4 Settings

To configure the AP settings, navigating to **AP > Settings** :



AP Settings	
SSID	These buttons specify which wireless networks will use this AP profile. You can also select the frequencies at which each network will transmit. Please note that the Peplink MAX does not detect whether the AP is capable of transmitting at

	both frequencies. Instructions to transmit at unsupported frequencies will be ignored by the AP.
Operating Country	This drop-down menu specifies the national / regional regulations which the AP should follow. • 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). • If European region is selected, RF channels 1 to 13 will be available. The maximum transmission power will be 20 dBm (100 mW). Note: Users are required to choose an option suitable to local laws and regulations. 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.
Preferred Frequency	These buttons determine the frequency at which access points will attempt to broadcast. This feature will only work for APs that can transmit at both 5.4GHz and 5GHz frequencies.
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	There are three options: 20 MHz, 20/40 MHz, and 40 MHz. With this feature enabled, the Wi-Fi system can use two channels at once. Using two channels improves the performance of the Wi-Fi connection.
Channel	This drop-down menu selects the 802.11 channel to be utilized. Available options are from 1 to 11 and from 1 to 13 for the North America region and Europe region, respectively. (Channel 14 is only available when the country is selected as Japan with protocol 802.11b.) If **Auto** is set, the system will perform channel scanning based on the scheduled time set and choose the most suitable channel automatically.
Auto Channel Update	Indicate the time of day at which update automatic channel selection.
Output Power	This drop-down menu determines the power at which the AP under this profile will broadcast. When fixed settings are selected, the AP will broadcast at the specified power level, regardless of context. When **Dynamic** settings are selected, the AP will adjust its power level based on its surrounding APs in order to maximize performance. The **Dynamic: Auto** setting will set the AP to do this automatically. Otherwise, the **Dynamic: Manual** setting will set the AP to dynamically adjust only if instructed to do so. If you have set **Dynamic:Manual**, you can go to **AP>Toolbox>Auto Power Adj.** to give your AP further instructions. If you click the **Boost** checkbox, the AP under this profile will transmit using additional power. Please note that using this option with several APs in close proximity will lead to increased interference.

Client Signal Strength Threshold	This field determines that maximum signal strength each individual client will receive. The measurement unit is megawatts.
Max number of Clients	This field determines the maximum clients that can be connected to APs under this profile.
Management VLAN ID	This field specifies the VLAN ID to tag to management traffic, such as AP to AP controller communication traffic. The value is **0** by default, meaning that no VLAN tagging will be applied. Note: change this value with caution as alterations may result in loss of connection to the AP controller.
Discover Nearby Networks[A]	This option is to turn on and off to scan the nearby the AP. **Note**: Feature will be automatically turned on with Auto Channel / Dynamic Output Power
Beacon Rate[A]	This drop-down menu provides the option to send beacons in different transmit bit rates. The bit rates are **1Mbps**, **2Mbps**, **5.5Mbps**, **6Mbps**, and **11Mbps**.
Beacon Interval[A]	This drop-down menu provides the option to set the time between each beacon send. Available options are **100ms**, **250ms**, and **500ms**.
DTIM[A]	This field provides the option to set the frequency for beacon to include delivery traffic indication message (DTIM). The interval unit is measured in milliseconds.
RTS Threshold[A]	This field provides the option to set the minimum packet size for the unit to send an RTS using the RTS/CTS handshake. Setting **0** disables this feature.
Fragmentation Threshold[A]	Determines the maximum size (in bytes) that each packet fragment will be broken down into. Set 0 to disable fragmentation.
Distance/Time Converter[A]	Select the distance you want your Wi-Fi to cover in order to adjust the below parameters. Default values are recommended.
Slot Time[A]	This field provides the option to modify the unit wait time before it transmits. The default value is **9µs**.
ACK Timeout[A]	This field provides the option to set the wait time to receive acknowledgement packet before doing retransmission. The default value is **48µs**.

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

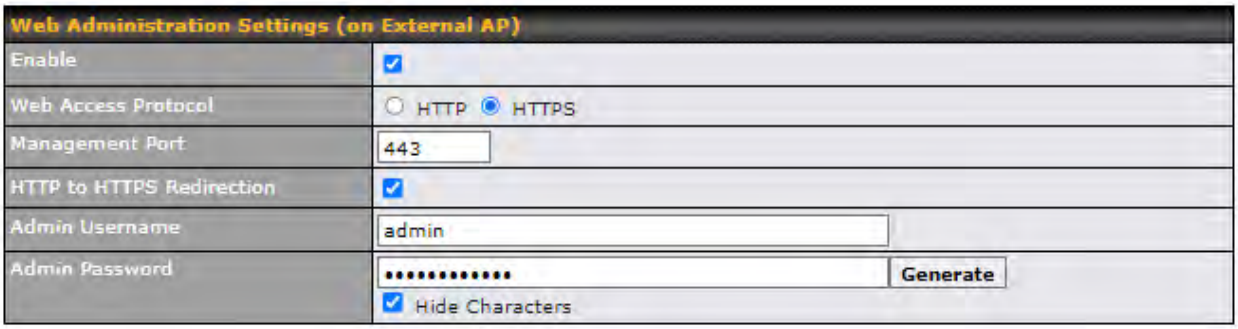
Important Note

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.

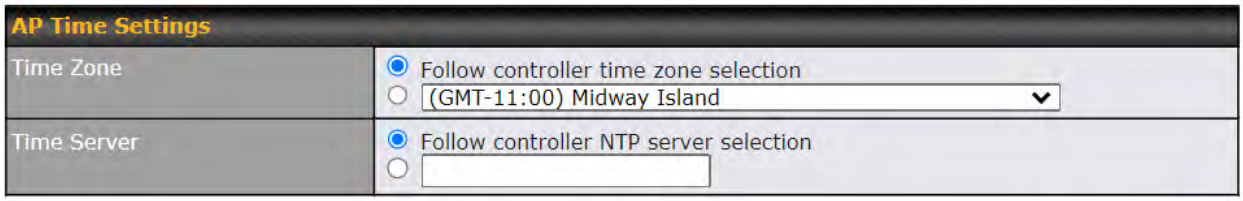
The device with integrated AP can operate under the Wi-Fi Operating Mode, and the default setting is **WAN + AP** mode:

Note: This option is available for selected devices only (HD2/HD4 and HD2/HD4 MBX).

Integrated AP	
WAN	In this mode, all Wi-Fi will operate as Wi-Fi WAN and no integrated Wi-Fi AP will be operated on this device. If Wi-Fi Operating mode is choosing **WAN**, The status indicated by the front panel LED is as follows: - Wi-Fi 1 is Green if Wi-Fi WAN 1 is enabled. - Wi-Fi 2 is Green if Wi-Fi WAN 2 is enabled.
WAN + AP	In this mode, some Wi-Fi will operate as Wi-Fi WAN. Some other Wi-Fi WANs will be forced offline and their Wi-Fi resources will be reserved for integrated Wi-Fi AP operations. If Wi-Fi Operating mode is choosing **WAN + AP**, The status indicated by the front panel LED is as follows: - Wi-Fi 1 is Green if WI-FI WAN is enabled. - Wi-Fi 2 is Green if Wi-Fi AP is ON.
AP	In this mode, all Wi-Fi functions as integrated Wi-Fi AP. All Wi-Fi WANs will be forced to go offline. If Wi-Fi Operating mode is choosing **AP**, The status indicated by the front panel LED is as follows: - W-Fi 1 is Green, if there is any Wireless SSID is selected 2.4GHz. - W-Fi 2 is Green, if there is any Wireless SSID is selected 5GHz.



Web Administration Settings (on External AP)	
Enable	Check the box to allow the Peplink router to manage the web admin access information of the AP.
Web Access Protocol	These buttons specify the web access protocol used for accessing the web admin of the AP. The two available options are **HTTP** and **HTTPS**.
Management Port	This field specifies the management port used for accessing the device.
HTTP to HTTPS Redirection	This option will be available if you have chosen **HTTPS** as the **Web Access Protocol**. With this enabled, any HTTP access to the web admin will redirect to HTTPS automatically.
Admin User Name	This field specifies the administrator username of the web admin. It is set as *admin* by default.
Admin Password	This field allows you to specify a new administrator password. You may also click the **Generate** button and let the system generate a random password automatically.



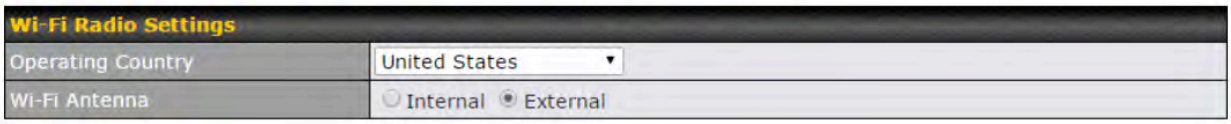
This allows users to configure AP Time Settings (both Timezone and NTP) in AP Controller.

AP Time Settings	
Time Zone	This field is to select the time zone for the AP controller.
Time Server	This field is to select the time server for the AP controller.

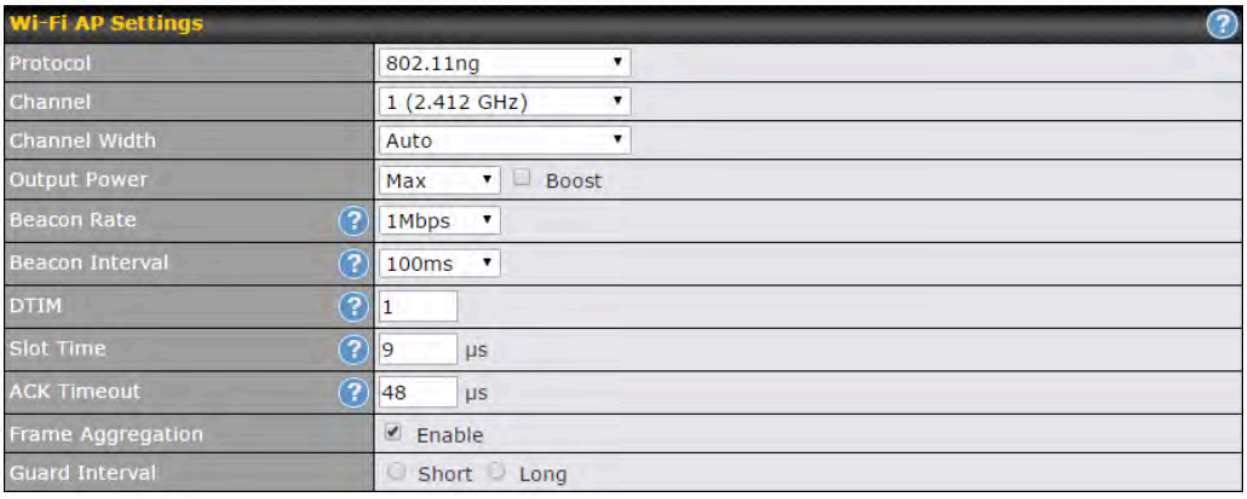
This settings is to allow user to manage external AP's controller unreachable action. When **Manage Unreachable Action** is checked, there will have 2 options which are "**None**" and "**Radio Off**".

This is an option to enable client load balancing for AP Controller. When the option is enabled, it is trying to balance the station count on APs within the same profile.

Some Peplink models displays a screen similar to the one shown below, navigating to **AP > Settings**:



Wi-Fi Radio Settings	
Operating Country	This option sets the country whose regulations the Peplink router follows.
Wi-Fi Antenna	Wi-Fi Antenna Choose from the router's internal or optional external antennas, if so equipped.



Wi-Fi AP Settings	
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	This option allows you to select which 802.11 RF channel will be used. **Channel 1 (2.412 GHz)** is selected by default.
Channel Width	**Auto (20/40 MHz)** and **20 MH**z are available. The default setting is **Auto (20/40 MHz)**, which allows both widths to be used simultaneously.
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.
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.
DITM[A]	This field allows you to set the frequency for the beacon to include a delivery traffic indication message. The interval is measured in milliseconds. The default value is set to **1 ms**.
Slot Time[A]	This field is for specifying the wait time before the Router transmits a packet. By default, this field is set to **9 µs**.
ACK Time[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 Aggreagtion[A]	This option allows you to enable frame aggregation to increase transmission throughput.
Guard Interval[A]	This setting allows choosing a short or long guard period interval for your transmissions.

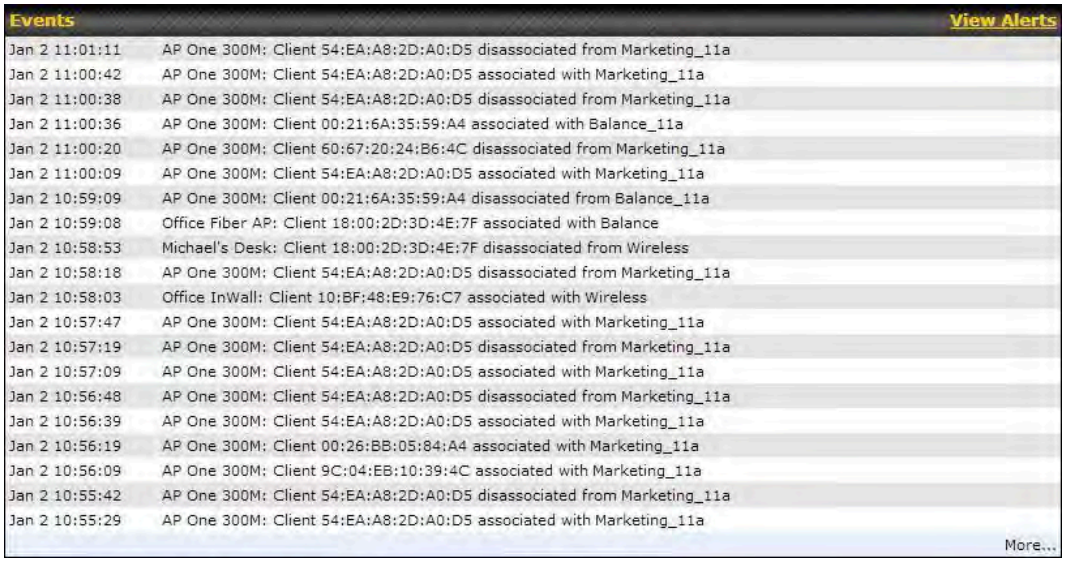
25 AP Controller Status

25.1 Info

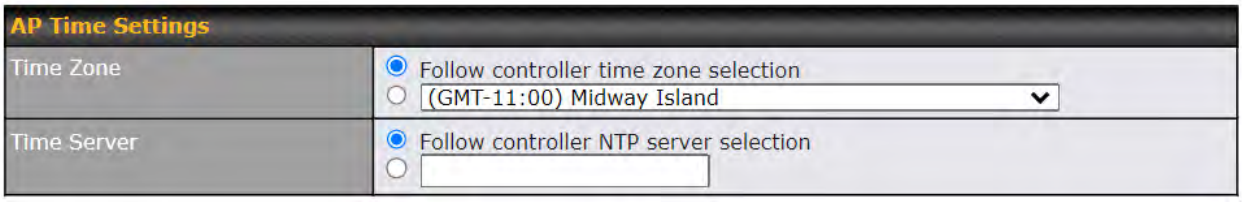
A comprehensive overview of your AP can be accessed by navigating to **AP > Controller Status > Info**.

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.



Events
This event log displays all activity on your AP network, down to the client level. Click **View Alerts** to see only alerts, and click the **More…** link for additional records.



This allow user to configure AP Time Settings (both Timezone and NTP) in AP Controller.

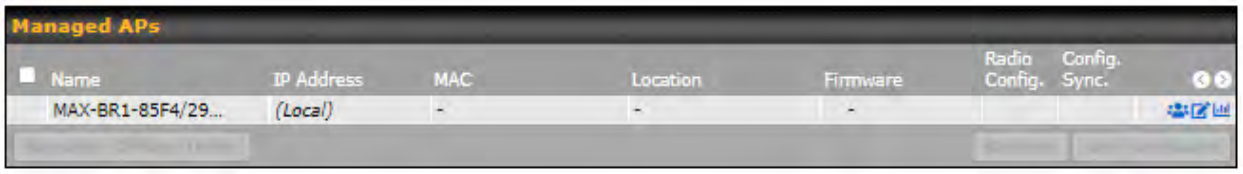
AP Time Settings	
Time Zone	Ths field is to select the time zone for the AP controller.
Time Server	Ths field is to select the time server for the AP controller.

This settings is to allow user to manage external AP's controller unreachable action. When **Manage Unreachable Action** is checked, there will have 2 options which are "**None**" and "**Radio Off**".

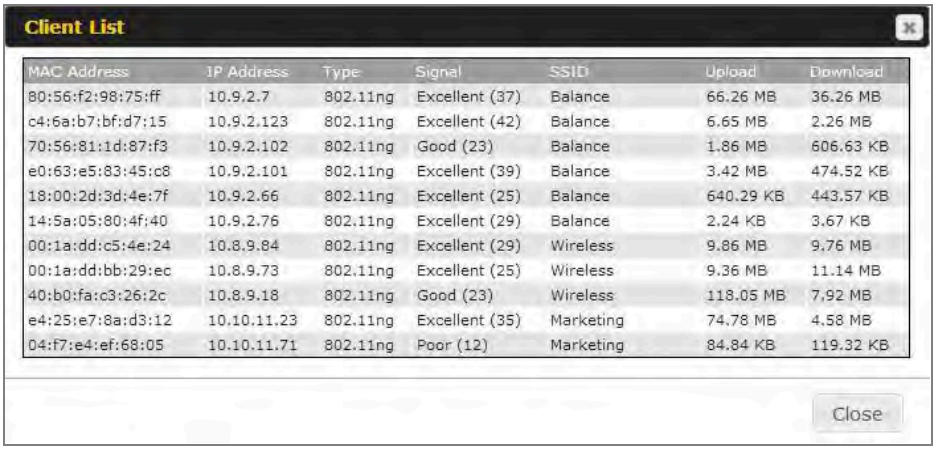
This is an option to enable client load balancing for AP Controller. When the option is enabled, it is trying to balance the station count on APs within the same profile.

25.2 Access Point

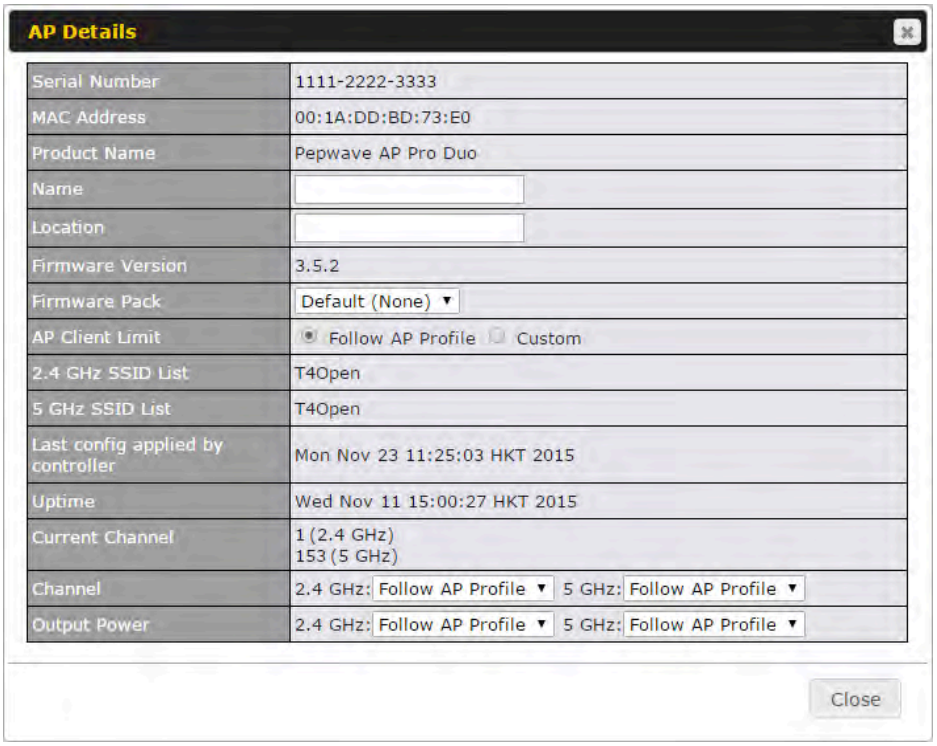
A detailed breakdown of data usage for each AP is available at **AP > Controller Status > Access Point**.



Managed APs	
Managed APs	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. On the right of the table, you will see the following icons: . Click the icon to see a usage table for each client:



Click the icon to configure each client

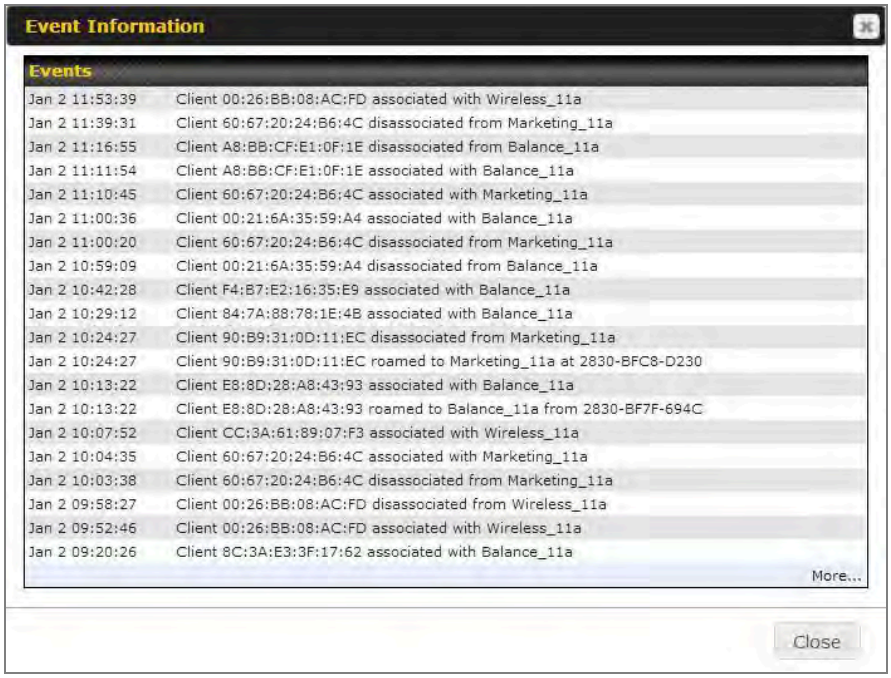


For easier network management, you can give each client a name and designate its location. You can also designate which firmware pack (if any) this client will follow, as well as the channels on which the client will broadcast.

Click the icon to see a graph displaying usage:

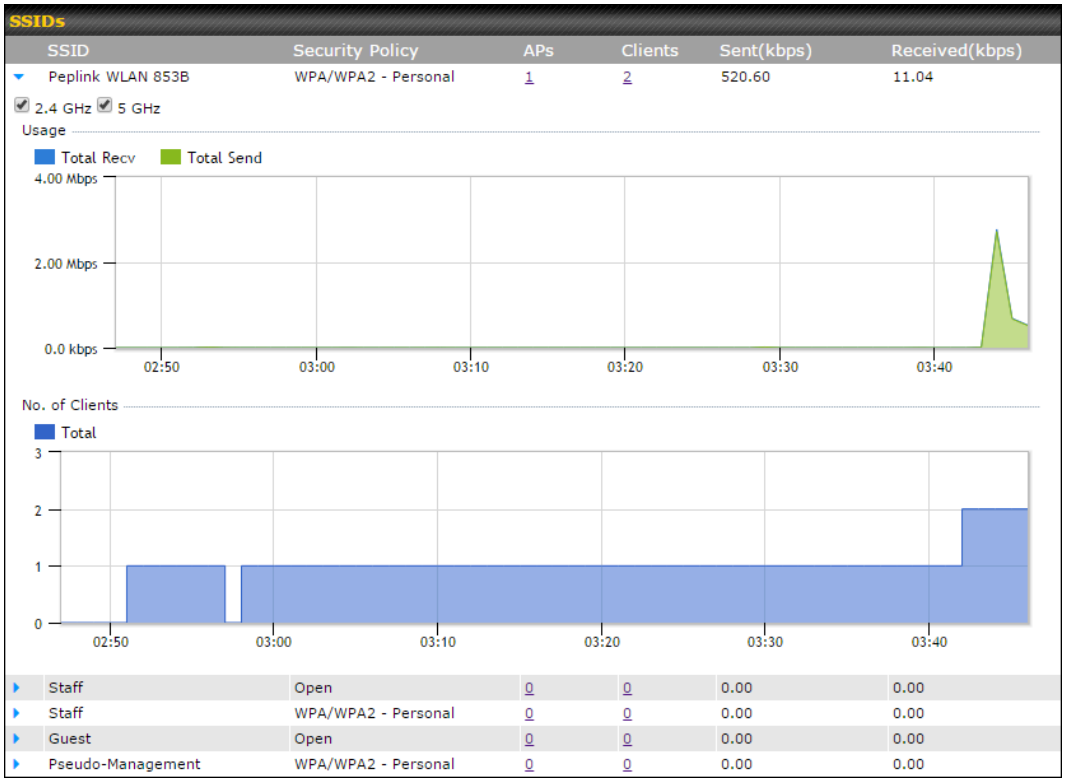
Click any point in the graphs to display detailed usage and client information for that device, using that SSID, at that point in time. On the **Data Usage by** menu, you can display the information by SSID or by AP send/receive rate.

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



25.3 Wireless SSID

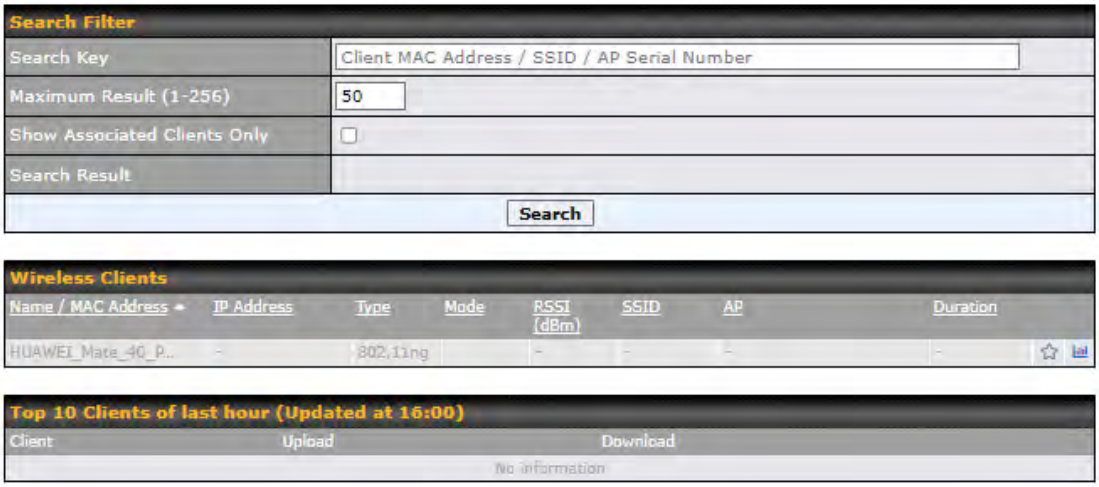
In-depth SSID reports are available under **AP > Controller Status > Wireless SSID**.



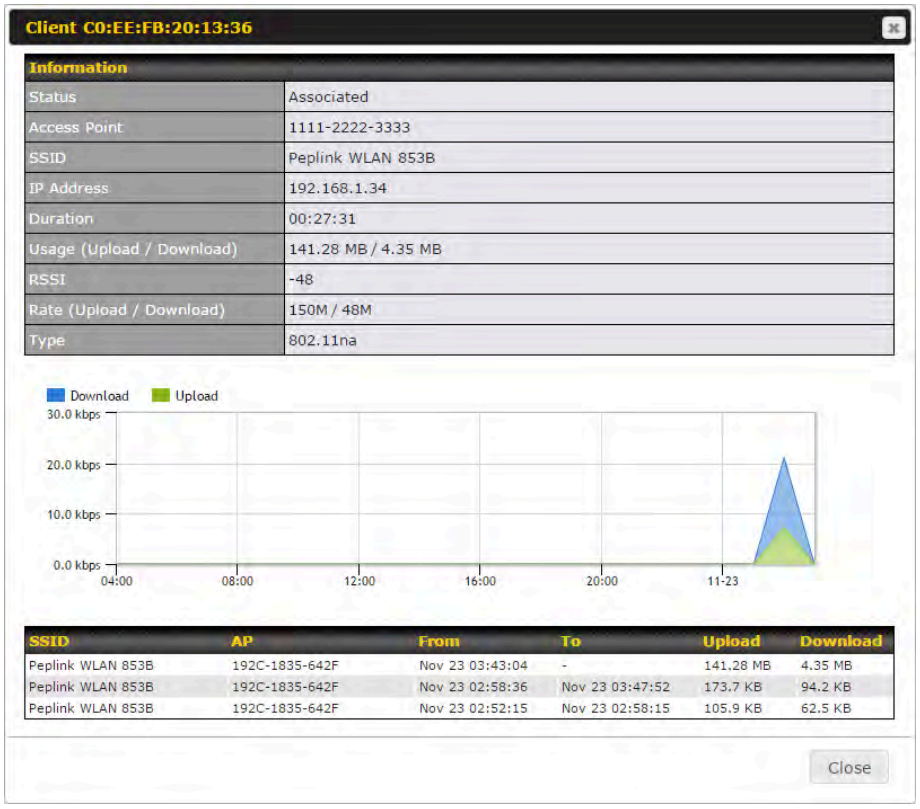
Click the blue arrow on any SSID to obtain more detailed usage information on each SSID.

25.4 Wireless Client

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

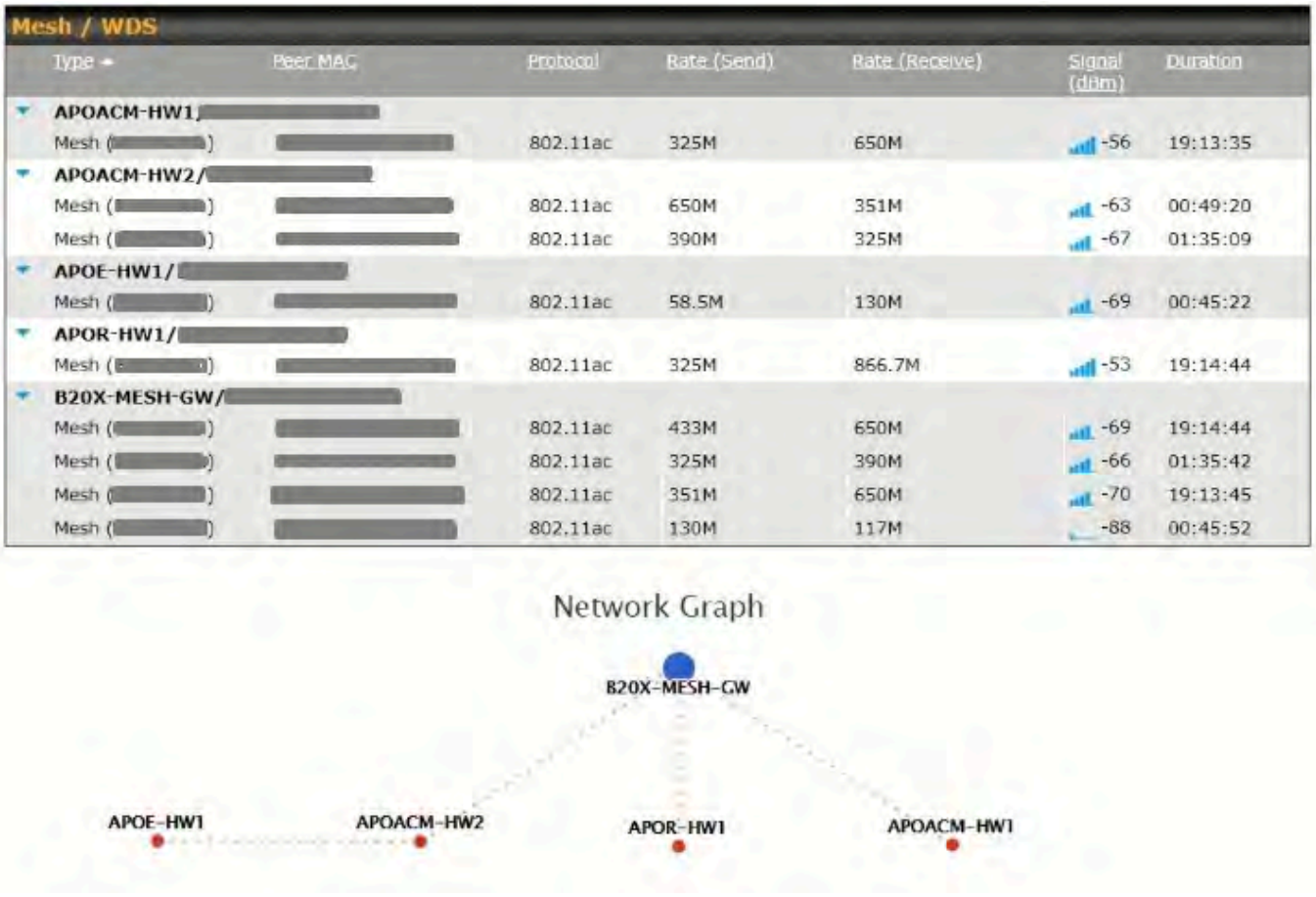


Here, you will be able to see your network's heaviest users as well as search for specific users. Click the ☆ icon to bookmark specific users, and click the icon for additional details about each user:



25.5 Mesh / WDS

Mesh / WDS allows you to monitor the status of your wireless distribution system (WDS) or Mesh, and track activity by MAC address by navigating to **AP > Controller Status > Mesh / WDS**. This table shows the detailed information of each AP, including protocol, transmit rate (sent / received), signal strength, and duration.

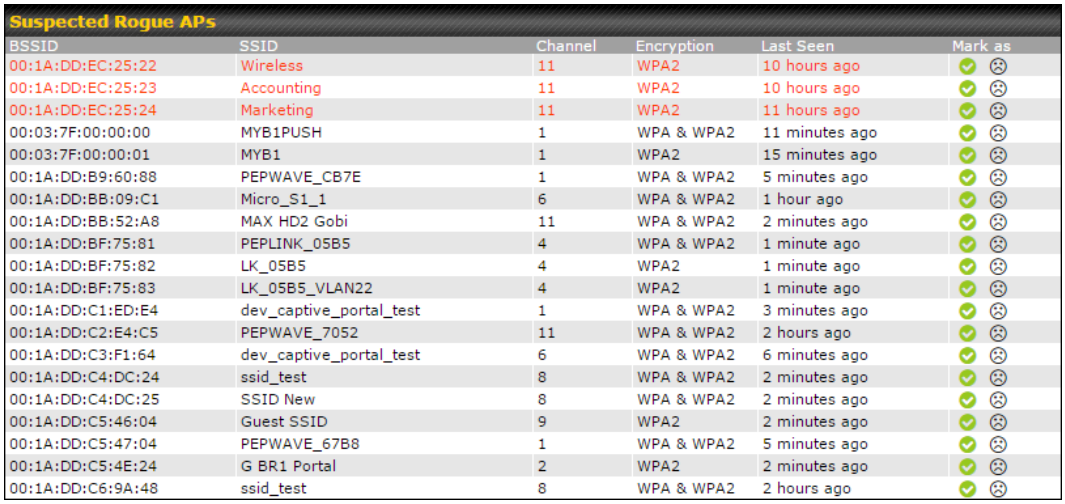


Mesh / WDS

Type	Peer MAC	Protocol	Rate (Send)	Rate (Receive)	Signal (dBm)	Duration
APOACM-HW1/						
Mesh		802.11ac	325M	650M	-56	19:13:35
APOACM-HW2/						
Mesh		802.11ac	650M	351M	-63	00:49:20
Mesh		802.11ac	390M	325M	-67	01:35:09
APOE-HW1/						
Mesh		802.11ac	58.5M	130M	-69	00:45:22
APOR-HW1/						
Mesh		802.11ac	325M	866.7M	-53	19:14:44
B20X-MESH-GW/						
Mesh		802.11ac	433M	650M	-69	19:14:44
Mesh		802.11ac	325M	390M	-66	01:35:42
Mesh		802.11ac	351M	650M	-70	19:13:45
Mesh		802.11ac	130M	117M	-88	00:45:52

25.6 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	

Suspected Rogue 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.

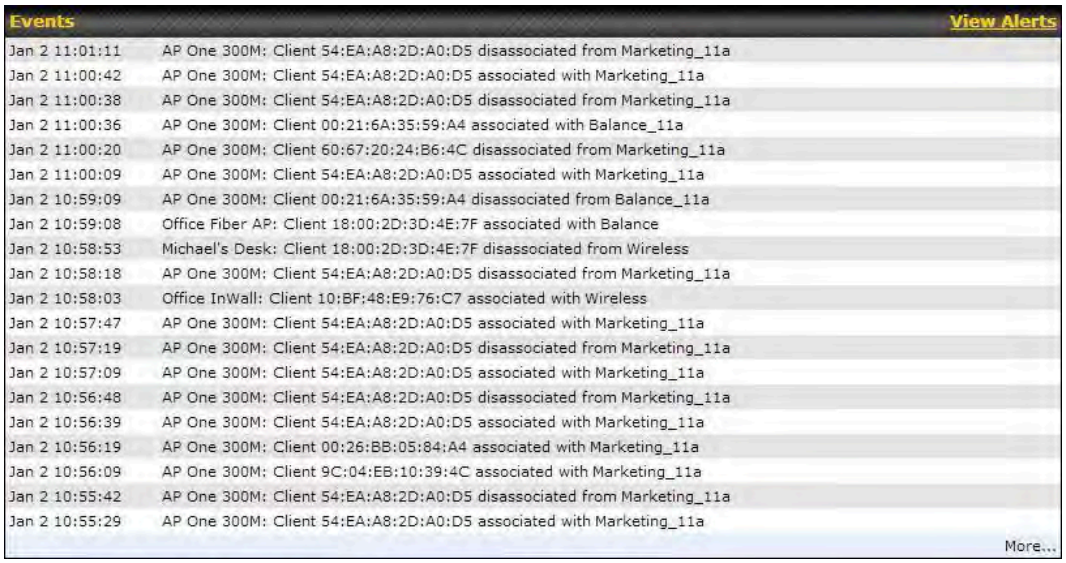
25.7 Event Log

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

Filter

Search key	Client MAC Address / Wireless SSID / AP Serial Number / AP Profile Name
Time	From hh:mm to hh:mm
Alerts only	☐

Search



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.

26 Toolbox

Tools for managing firmware packs can be found at **AP > Toolbox**.

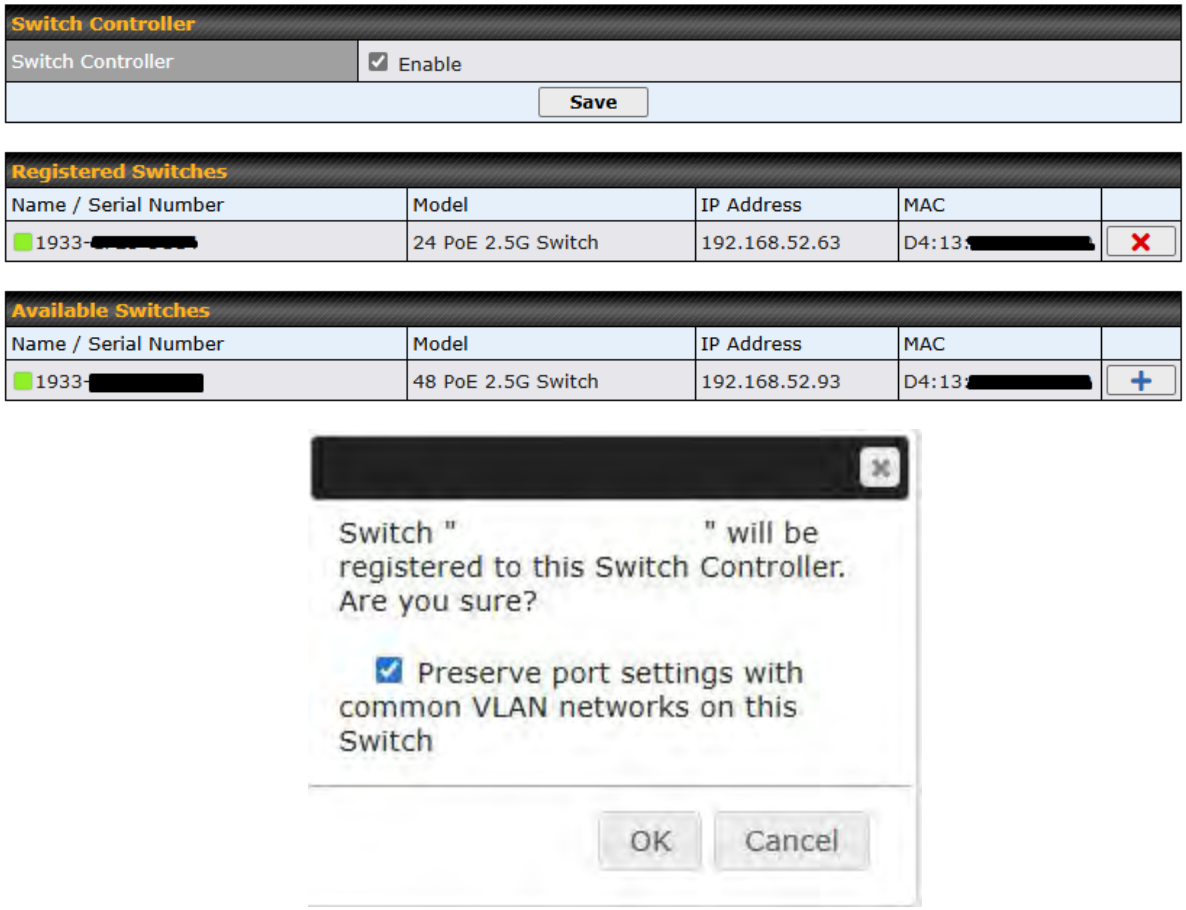
Firmware Packs

Here, you can manage the firmware of your AP. Clicking on  will result in information regarding each firmware pack. To receive new firmware packs, you can click **Check for Updates** to download new packs, or you can click **Manual Upload** to manually upload a firmware pack. Click **Default** to define which firmware pack is default.

27 Switch

27.1 Switch Controller

Navigate to **Switch Tab > Switch Controller > Controller**.



Switch Controller	
Registered Switches	List of registered switches. Press “X” to remove the selected switch from the list.
Available Switches	List of available switches connected to the device. Press “+” to register the selected switch to the Registered Switches list. Note: When option “Preserve port settings with common VLAN networks on this Switch” is tick when register selected switch, the port settings which

VLANs are defined in Switch Controller will be preserved. Else, will be replaced by VLAN 1.

NOTE: PoE 2.5G Switch will only be managed by either InControl or Device switch controller. Do not enable the Switch Controller if the switch needs to be managed by InControl.

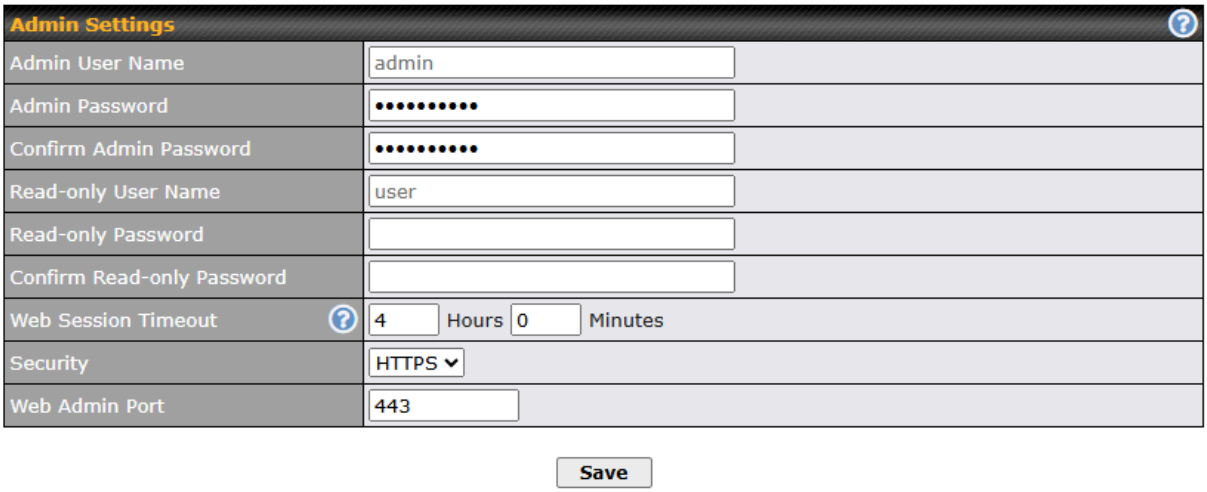
27.2 Admin Security

Navigate to **Switch Tab > Switch Controller > Admin Security**.

There are two types of user accounts available for accessing the Web Admin: ***admin*** and ***user***. The ***admin*** login has full administrative access, while the ***user*** login 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.

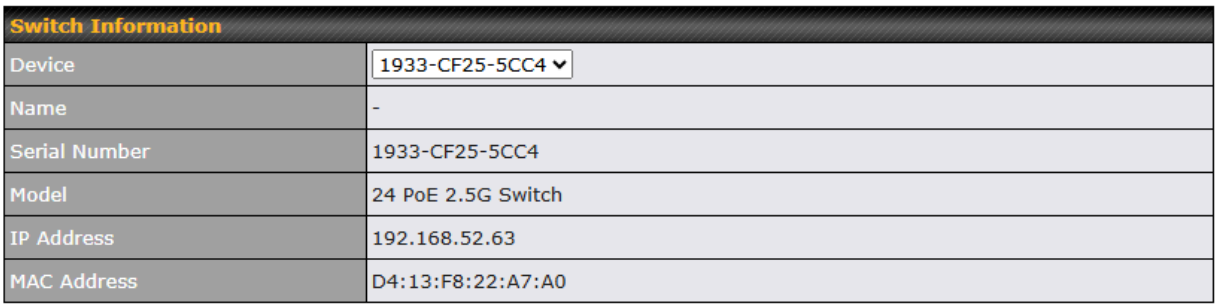
0 hours 0 minutes signifies an unlimited session time. This setting should be used only in special situations, as it will lower the system security level if users do not log out before closing the browser. The **default** is 4 hours, 0 minutes.

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	
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.
Read-only 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 Read-only 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**.
Security	This option is for specifying the protocol(s) through which the web admin interface can be accessed: ○ HTTP ○ HTTPS Default will be HTTPS.
Web Admin Port	This field is for specifying the port number on which the web admin interface can be accessed.

27.3 Switch Information

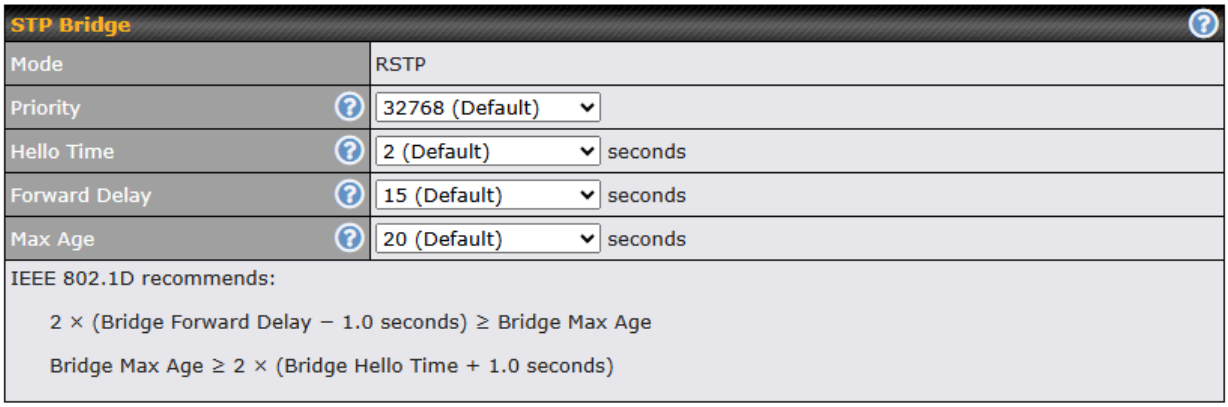


Switch Information	
Device	1933-CF25-5CC4
Name	-
Serial Number	1933-CF25-5CC4
Model	24 PoE 2.5G Switch
IP Address	192.168.52.63
MAC Address	D4:13:F8:22:A7:A0

Switch Information	
Device	Drop down list to select Switch to be configured.
Name	Name of the switch.(not sure where to define)
Serial Number	Selected switch serial number.
Model	Selected switch model.
IP Address	Uplink IP address of the selected switch.
MAC Address	Selected switch MAC address.

27.4 STP

Navigate to **Switch Tab > STP.**



STP Bridge	
Mode	RSTP
Priority	This field specifies the bridge priority for root switch election. The switch with the lowest bridge priority is elected as the root switch (Default value: 32768).
Hello Time (A)	Time between each exchange of bridge protocol data units (BPDU). (Default value: 2 seconds).
Forward Delay (A)	Delay used by STP Bridges to transit Root and Designated Ports to Forwarding. (Default value: 15 seconds).
Max Age (A)	Maximum age of the information transmitted by the bridge when it is the Root Bridge. (Default value: 20 seconds).

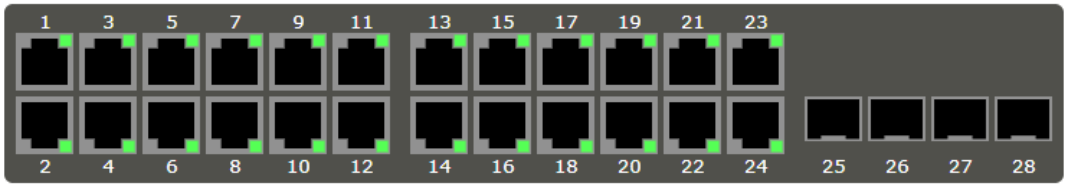
(A) – Advanced feature. Click the  button on the top right-hand corner to activate.

27.5 Switch Ports

Navigate to **Switch Tab > Interfaces > Switch Ports**.

For each port, you can set PoE scheduling, port type (Trunk and Access), as well as the VLAN

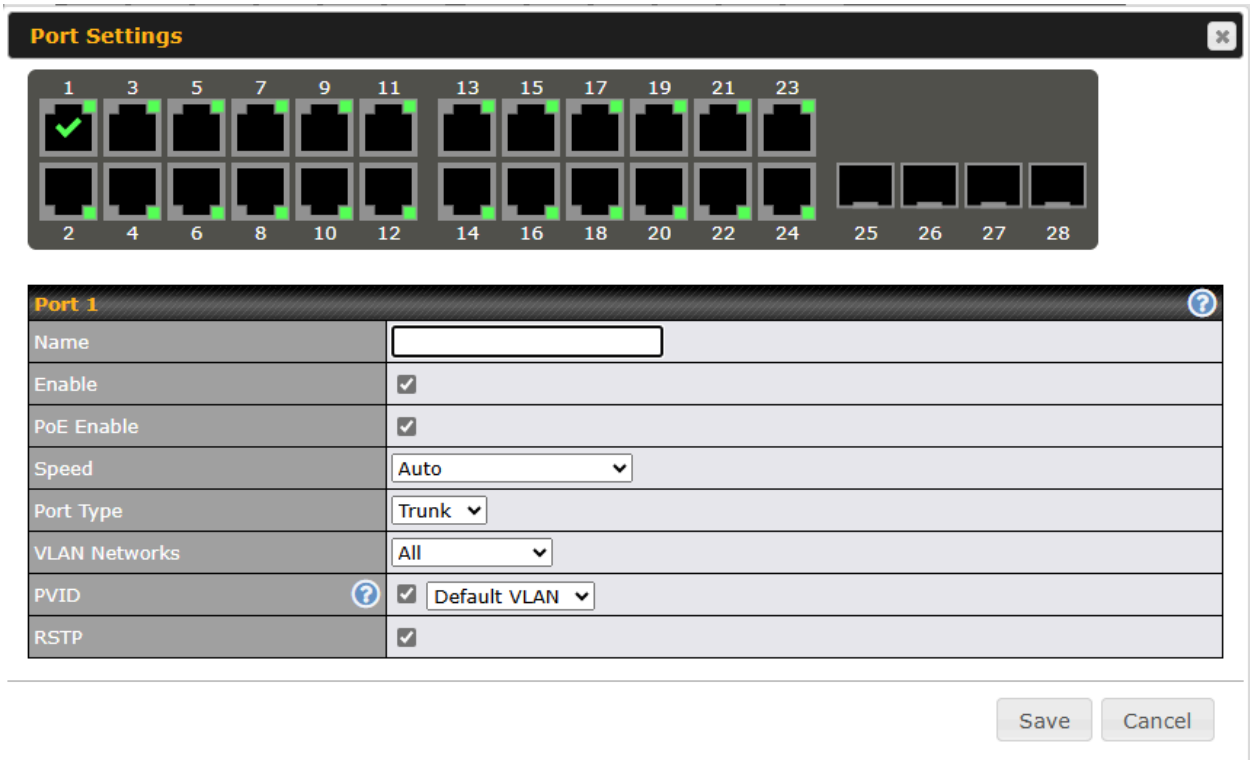
which they belong to.



Port Settings

ID	Name	Port Type	VLAN Networks	PVID	PoE	RSTP	
1		Trunk	All	Default VLAN - Auto	✓	✓	
2		Trunk	All	Default VLAN - Auto	✓	✓	
3		Trunk	All	Default VLAN - Auto	✓	✓	
4		Trunk	All	Default VLAN - Auto	✓	✓	
5		Trunk	All	Default VLAN - Auto	✓	✓	
6		Trunk	All	Default VLAN - Auto	✓	✓	
7		Trunk	All	Default VLAN - Auto	✓	✓	
8		Trunk	All	Default VLAN - Auto	✓	✓	
9		Trunk	All	Default VLAN - Auto	✓	✓	
10		Trunk	All	Default VLAN - Auto	✓	✓	
11		Trunk	All	Default VLAN - Auto	✓	✓	
12		Trunk	All	Default VLAN - Auto	✓	✓	
13		Trunk	All	Default VLAN - Auto	✓	✓	
14		Trunk	All	Default VLAN - Auto	✓	✓	

To configure port, you may click on the port icon or the pen icon from the Port Settings table to show the Port parameters.



Port Settings	
Name	Set a name for the port
Enable checkbox	Enables / Disables the Port
PoE Enable checkbox	Enables / Disables PoE on the Port
Speed^	Set the port speed to Auto, 10 Mbps half/full duplex or 100 Mbps half/full duplex, or 1GB full duplex.
Port Type	Set as Trunk or Access
VLAN Networks	Designate one or more VLANs to be used on this port.

PVID**	Untagged frames received by the port are classified to a VLAN indicated by Port VLAN Identifier (PVID). All frames from the VLAN are untagged on egress.**
RSTP checkbox	Enables or Disables Rapid Spanning Tree Protocol

** PVID option is only configurable when Port Type is set to “Trunk”.

^ Configuration options on certain ports are configurable port speeds to 2.5 Gbps. May refer to the datasheet or label below switch ports.

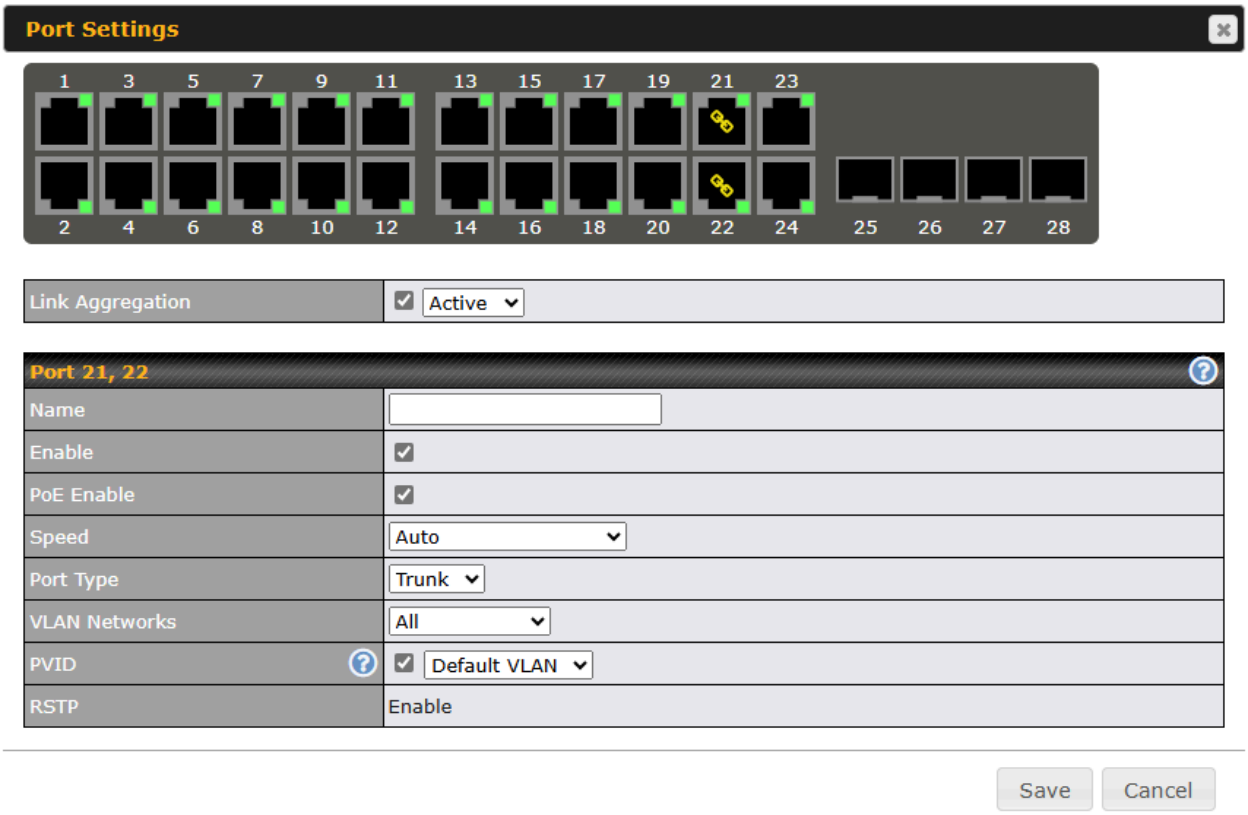
^ Configurable options on SFP+ ports are similar as above, but configurable port speeds are between 100 Mbps Full Duplex up to 10 Gbps Full Duplex.

27.6 LACP (802.3ad) Configuration

LACP is part of the IEEE specification 802.3ad and allows you to bundle several physical ports to form a single logical channel.

Bundling multiple physical ports into a single logical link allows you to increase throughput beyond the limitations of a single connection and provides redundancy in case one link goes down.

Select multiple ports by clicking on them and selecting the **Link Aggregation** checkbox to enable link aggregation for the selected ports.



28 System Settings

28.1 Admin Security

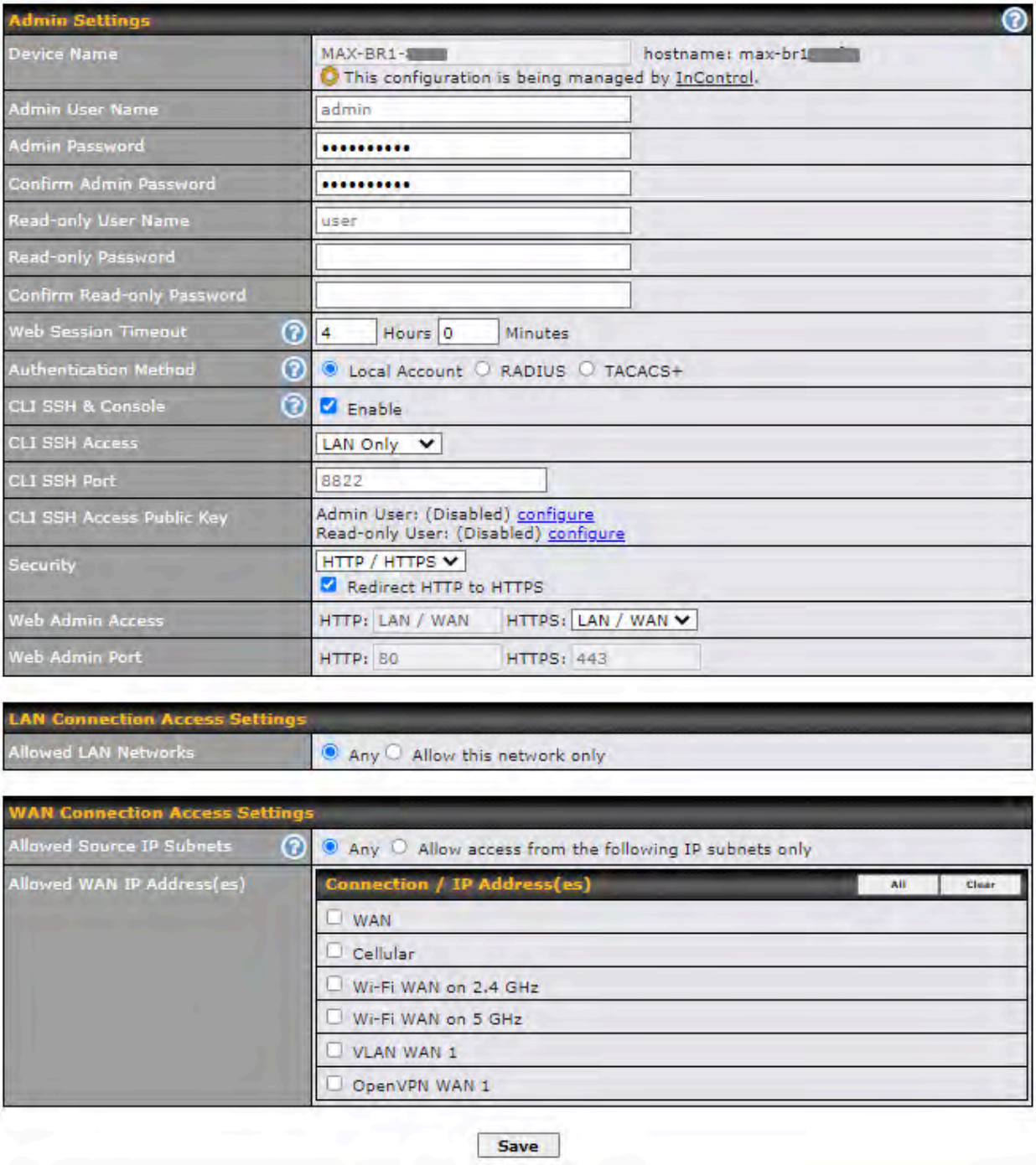
There are two types of user accounts available for accessing the web admin: *admin* and *user*. They represent two user levels: the admin level has full administrative access, while the user level is read-only. The user level can access only the device's status information; users cannot make any changes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

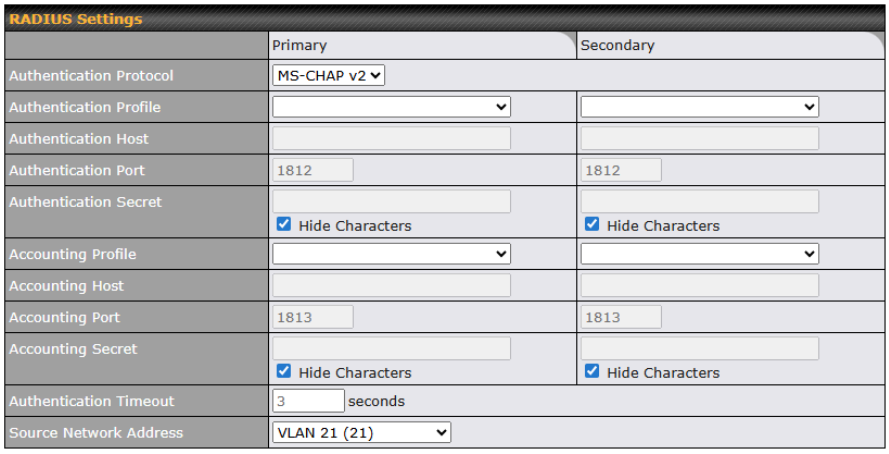
For security reasons, after logging in to the web admin Interface for the first time, it is recommended to change the administrator password. Configuring the administration interface to be accessible only from the LAN can further improve system security. Administrative settings

configuration is located at **System > Admin Security**.



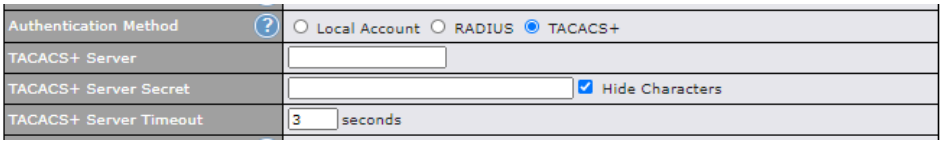
Admin Settings	
Device Name	This field allows you to define a name for this Peplink router. By default, **Device**

	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.
Read-only 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 Read-only 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 Peplink router terminates its access to the web admin interface. By default, it is set to **4 hours**.
Authentication Method	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. Available options: • Local Account • RADIUS (Secondary is optional as a backup)



Authentication Protocol	This specifies the authentication protocol used. Available options are **MS-CHAP v2** and **PAP**.
Authentication Host	This specifies the IP address or hostname of the RADIUS server host.
Authentication Port	This setting specifies the UDP destination port for authentication requests.
Authentication Secret	This field is for entering the secret key for accessing the RADIUS server.
Accounting Host	This specifies the IP address or hostname of the RADIUS server host.
Accounting Port	This setting specifies the UDP destination port for accounting requests.
Accounting Secret	This field is for entering the secret key for accessing the accounting server.
Authentication Timeout	This option specifies the time value for authentication timeout

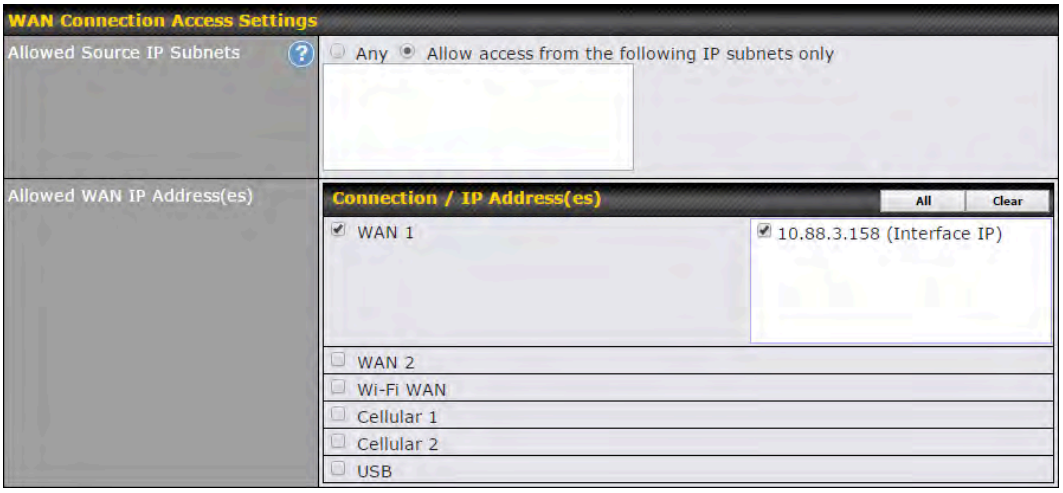
- TACACS+



TACACS+ Server	This specifies the access address of the external TACACS+ server.
TACACS+ Server Secret	This field is for entering the secret key for accessing the RADIUS server.
TACACS+ Server Timeout	This option specifies the time value for TACACS+ timeout

CLI SSH & Console	The CLI (command line interface) can be accessed via SSH. This field enables CLI support. For additional information regarding CLI, please refer to **Section 31.5.**
CLI SSH Access	This menu allows you to choose between granting access to LAN and WAN clients, or to LAN clients only.

CLI SSH Port	This field determines the port on which clients can access CLI SSH.
CLI SSH Access Public Key	This field is for entering the Public Key for Admin Users and Read-only Users to access CLI SSH.
Security	This option is for specifying the protocol(s) through which the web admin interface can be accessed: • HTTP • HTTPS • HTTP/HTTPS HTTP to HTTPS redirection is enabled by default to force HTTPS access to the web admin interface.
Web Admin Access	This option is for specifying the network interfaces through which the web admin interface can be accessed: • LAN only • LAN/WAN If LAN/WAN is chosen, the **WAN Connection Access Settings** form will be displayed.
Web Admin Port	This field is for specifying the port number on which the web admin interface can be accessed.



WAN Connection Access Settings	
Allowed Source IP Subnets	This field allows you to restrict web admin access only from defined IP subnets. • **Any** - Allow web admin accesses to be from anywhere, without IP address restriction. • **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:

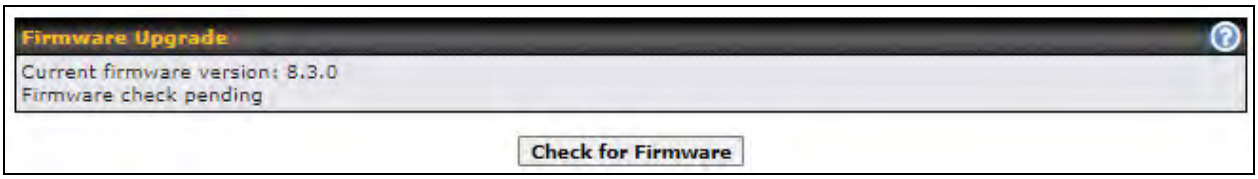
	The allowed IP subnet addresses should be entered into this text area. Each IP subnet must be in form of *w.x.y.z/m*, where *w.x.y.z* is an IP address (e.g., *192.168.0.0*), and *m* is the subnet mask in CIDR format, which is between 0 and 32 inclusively (For example, *192.168.0.0/24*). To define multiple subnets, separate each IP subnet one in a line. For example: • 192.168.0.0/24 • 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.

28.2 Firmware

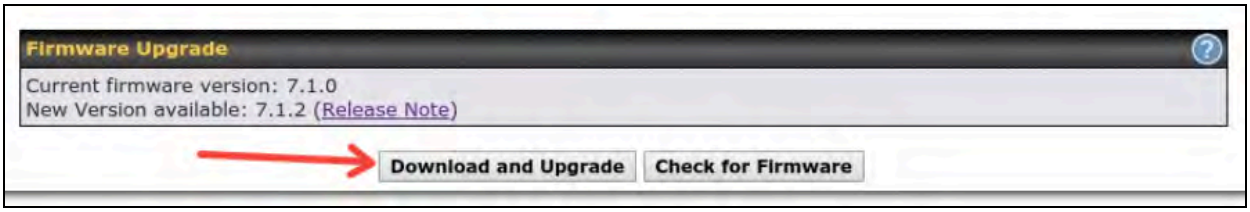
Web admin interface : automatically check for updates

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**.

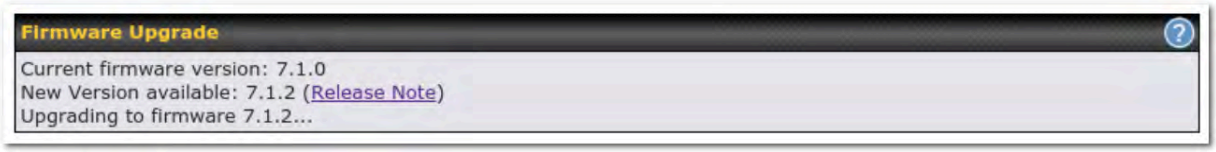


If an update is found the buttons will change to allow you to **Download and Update** the firmware.

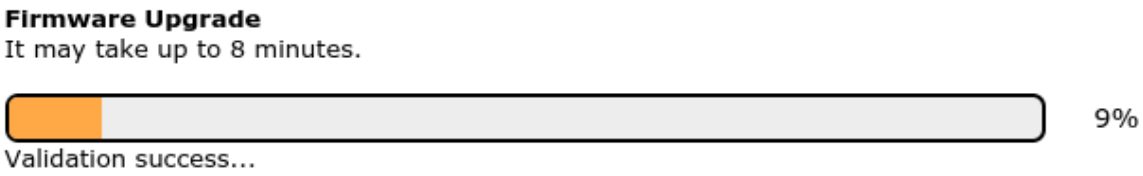


Click on the **Download and Upgrade** button. A prompt will be displayed advising to download the Current Active Configuration. Please click on the underlined download text. After downloading the current config click the **Ok** button to start the upgrade process.

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.

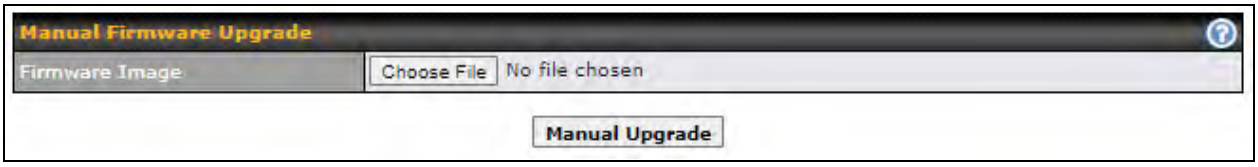
All of the Peplink/Peplink GA firmware can be found here Navigate to the relevant product line (ie. Balance, Max, FusionHub, etc). Some product lines may have a dropdown that lists all of the products in that product line. Here is a screenshot from the Balance line.

Product	Hardware Revision	Firmware Version	Download Link	Release Notes	User Manual
Balance 1350	HW2	7.1.2	Download	PDF	PDF
Balance 1350	HW1	6.3.4	Download	PDF	PDF
Balance 20	HW1-6	7.1.2	Download	PDF	PDF
Balance 210	HW4	7.1.2	Download	PDF	PDF

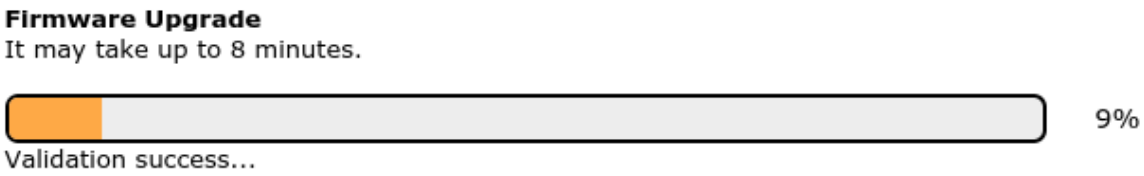
If the device has more than one firmware version the current hardware revision will be required to know what firmware to download.

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.



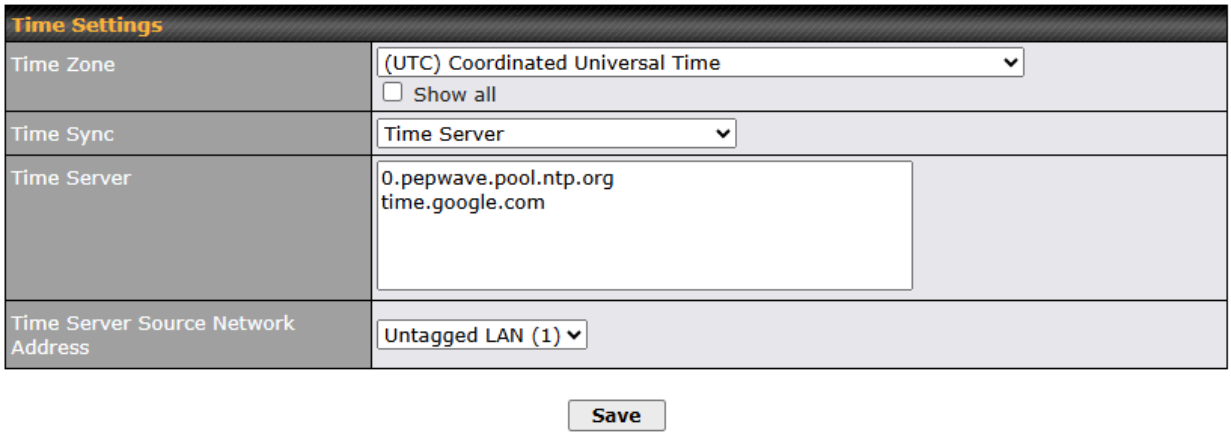
**Upgrading the firmware will cause the router to reboot.*

The InControl method

Described in this knowledgebase article on our forum.

28.3 Time

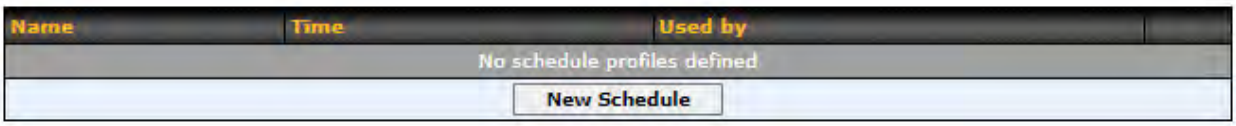
Time Settings enables the system clock of the Peplink router to be synchronized with a specified time server. Time settings are located at **System>Time**.



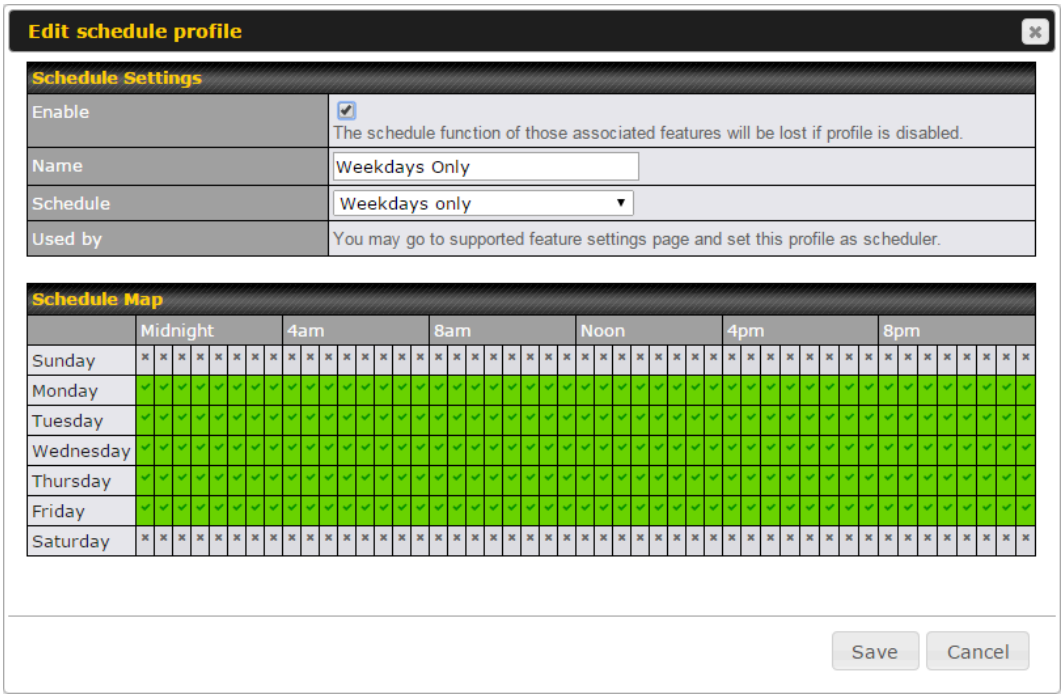
Time Settings	
Time Zone	This specifies the time zone (along with the corresponding Daylight Savings Time scheme). The **Time Zone** value affects the time stamps in the Peplink router's event log and e-mail notifications. Check **Show all** to show all time zone options.
Time Sync	This field allows to select your time sync mode, the available options are: • Time Server • GPS • GPS with Time Server as fallback
Time Server	This setting specifies the NTP network time server to be utilized by the router. **NOTE:** Multiple NTP servers can be added starting from firmware version 8.5.3.
Time Server Source Network Address	This setting is to specific which VLAN network will be used for NTP traffic.

28.4 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**



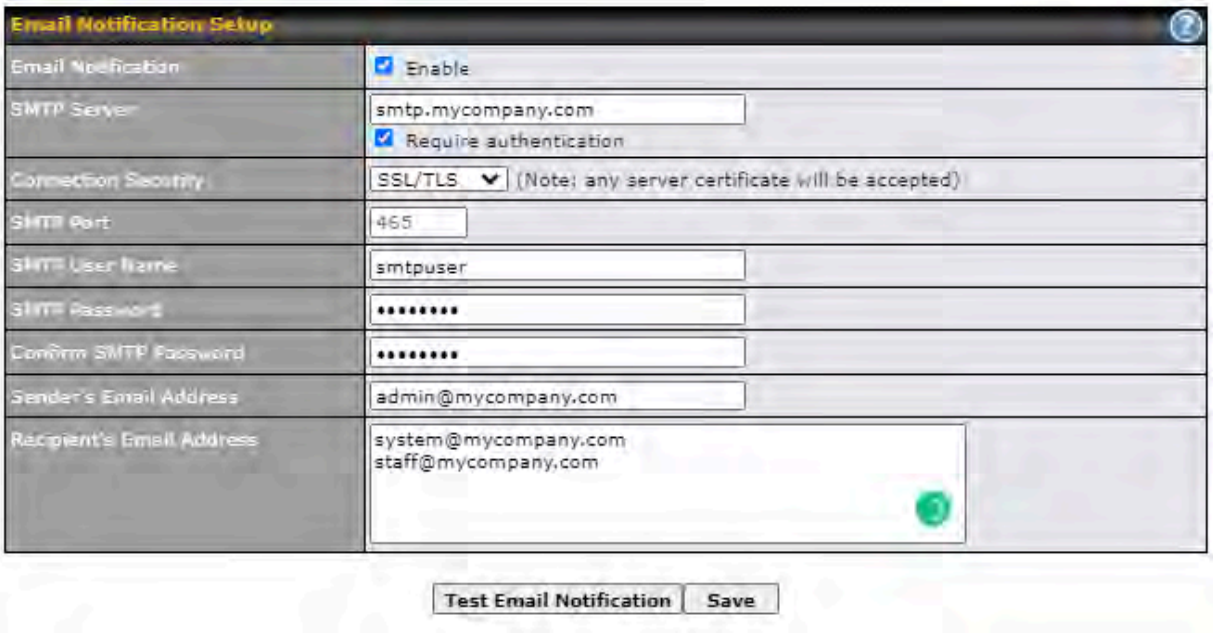
Enable scheduling, and then click on your schedule name or on the **New Schedule** button to begin.



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.

28.5 Email Notification

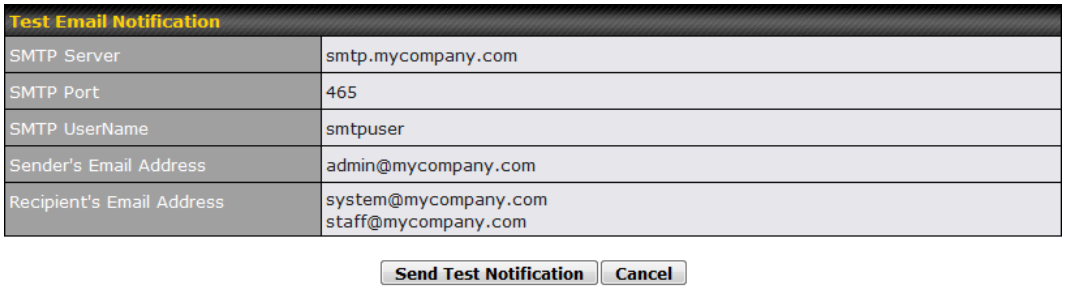
Email notification functionality provides a system administrator with up-to-date information on network status. The settings for configuring email notifications are found at **System>Email Notification**.



Email Notification Settings	
Email Notification	This setting specifies whether or not to enable email notification. If **Enable** is checked, the Peplink router 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 router 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**.
Connection Security	This setting specifies via a drop-down menu one of the following valid Connection Security: ● None ● STARTTLS ● SSL/TLS
SMTP Port	This field is for specifying the SMTP port number. By default, this is set to **25**. If Connection Security is selected "**STARTTLS**", the default port number will be set to **587**. If Connection Security is selected "**SSL/TLS**", the default port number will be set to **465**. You may customize the port number by editing this field.
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 the Peplink router will use to send reports.
Recipient's Email Address	This setting specifies the email address(es) to which the Peplink router will send email notifications. For multiple recipients, separate each email addresses using the enter key.

After you have finished 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.

Test email sent.
(NOTE: Settings are not saved. To confirm the update, click 'Save' button.)

Email Notification Setup	
Email Notification	☑ Enable
SMTP Server	[redacted] ☑ Require authentication
Connection Security	SSL/TLS (Note: any server certificate will be accepted)
SMTP Port	465
SMTP User Name	[redacted]
SMTP Password	••••••••••••••••
Confirm SMTP Password	••••••••••••••••
Sender's Email Address	[redacted]
Recipient's Email Address	[redacted]

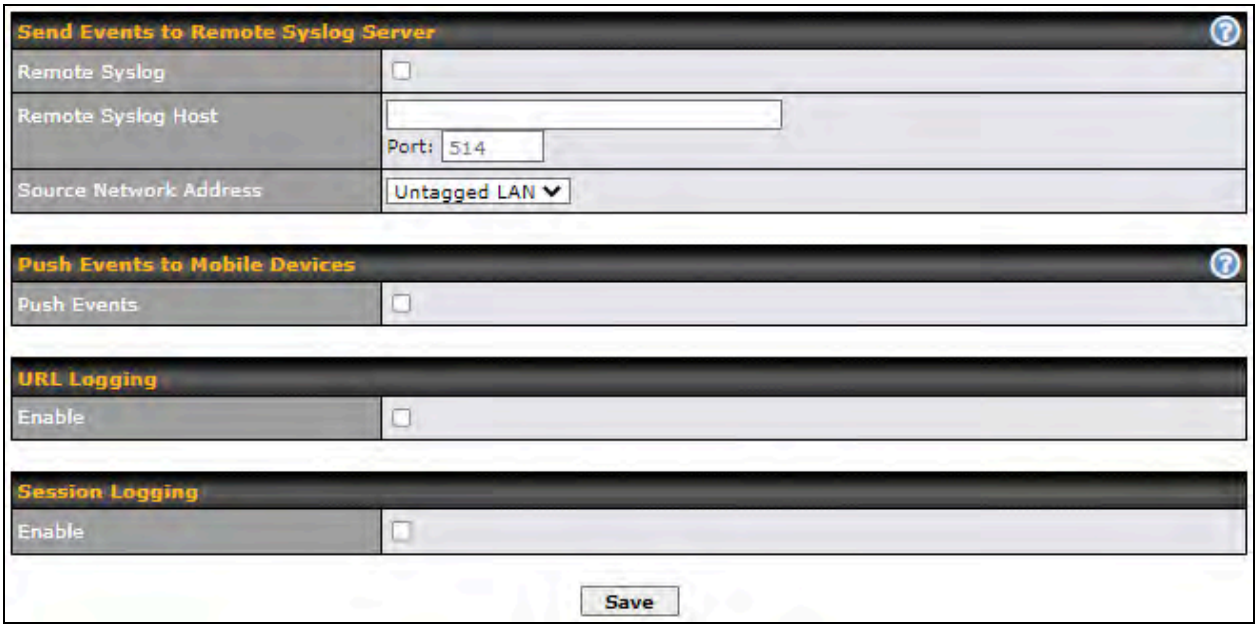
Test Email Notification | Save

Test Result

```
[INFO] Try email through auto detected connection
[INFO] SMTP through SSL connected
[<-] 220 smtp.gmail.com ESMTP h11sm3907691pjg.46 - gsmtp
[->] EHLO balance.peplink.com
[<-] 250-smtp.gmail.com at your service, [14.192.209.255]
[<-] 250-SIZE 35882577
[<-] 250-8BITMIME
[<-] 250-AUTH LOGIN PLAIN XOAUTH2 PLAIN-CLIENTTOKEN OAUTHBEARER XOAUTH
[<-] 250-ENHANCEDSTATUSCODES
[<-] 250-PIPELINING
[<-] 250-CHUNKING
[<-] 250 SMTPUTF8
[->] AUTH PLAIN AGdwc2dhbjk0QGdtYWlsLmNvbQBwdnJ6bWF6cGhtYXJpanpp
```

28.6 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**.

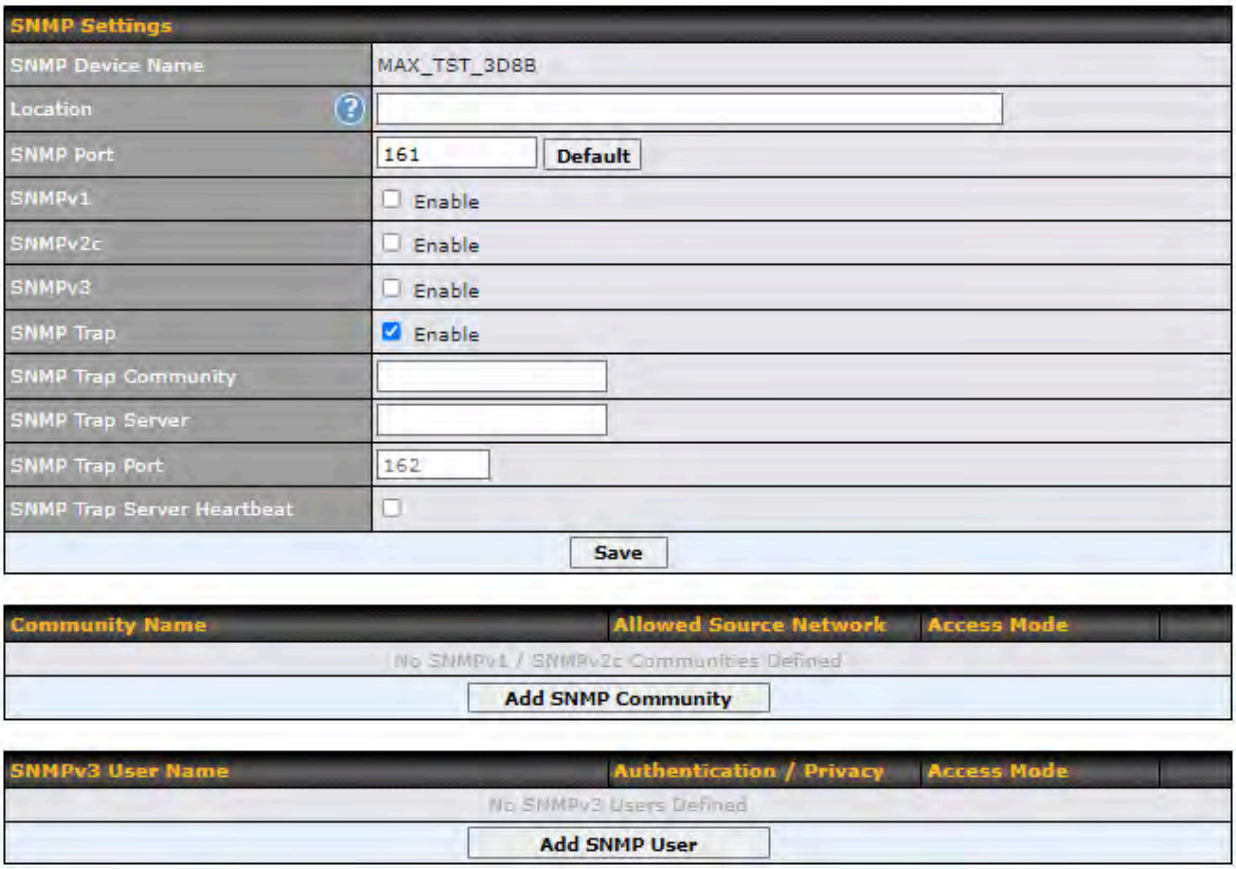


Event Log Settings	
Remote Syslog	This setting specifies whether or not to log events at the specified remote syslog server.
Remote Syslog Host	This setting specifies the IP address or hostname of the remote syslog server.
Source Network Address	Via drop-down list, you may choose the LAN interface for Event Log, URL Logging, Sessions Logging and RADIUS.
Push Events	The Peplink router can also send push notifications to mobile devices that have our Mobile Router Utility installed. Check the box to activate this feature.
URL Logging	This setting is to enable event logging at the specified log server.
URL Logging Host	This setting specifies the IP address or hostname of the URL log server.

Session Logging	This setting is to enable event logging at the specified log server.
Session Logging Host	This setting specifies the IP address or hostname of the Session log server.
	For more information on the Router Utility, go to: www.peplink.com/products/router-utility

28.7 SNMP

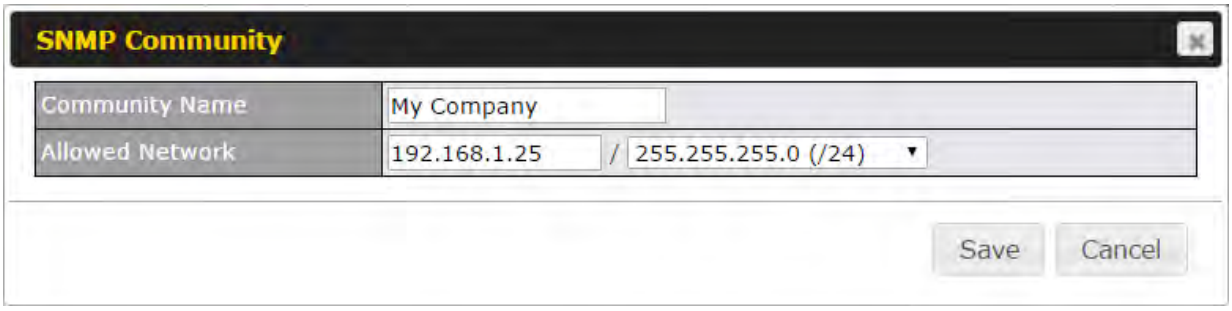
SNMP or simple network management protocol is an open standard that can be used to collect information about the Peplink router. SNMP configuration is located at **System > SNMP**.



SNMP Settings	
SNMP Device	This field shows the router name defined at **System > Admin Security**.

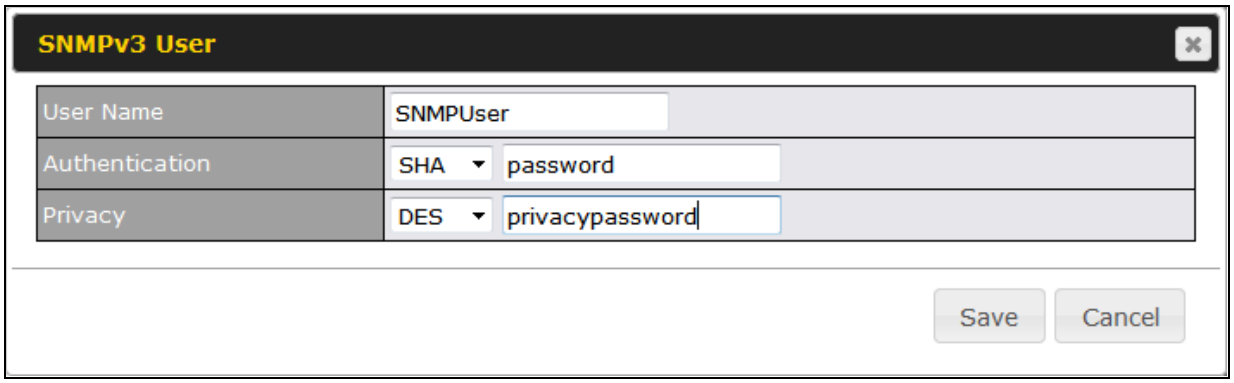
Name	
SNMP Port	This option specifies the port which SNMP will use. The default port is **161**.
SNMPv1	This option allows you to enable SNMP version 1.
SNMPv2	This option allows you to enable SNMP version 2.
SNMPv3	This option allows you to enable SNMP version 3.
SNMP Trap	This option allows you to enable SNMP Trap. If enabled, the following entry fields will appear.
SNMP Trap Community	This setting specifies the SNMP Trap community name.
SNMP Trap Server	Enter the IP address of the SNMP Trap server.
SNMP Trap Port	This option specifies the port which the SNMP Trap server will use. The default port is **162**.
SNMP Trap Server Heartbeat	This option allows you to enable and configure the heartbeat interval for the SNMP Trap server.

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:



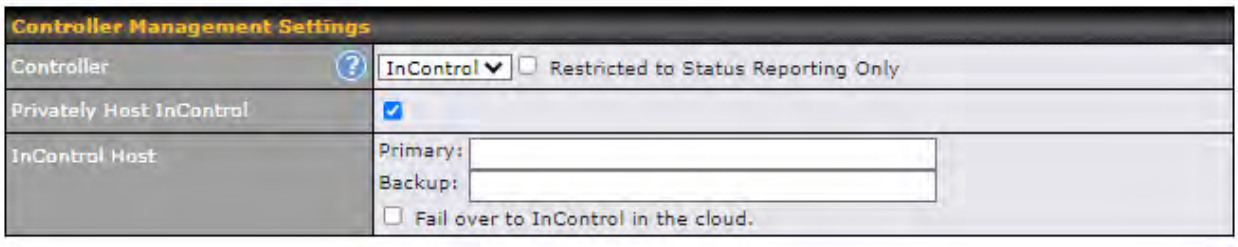
SNMP Community Settings	
Community Name	This setting specifies the SNMP community name.
Allowed Source Subnet Address	This setting specifies a subnet from which access to the SNMP server is allowed. Enter subnet address here (e.g., *192.168.1.0*) and select the appropriate subnet mask.

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: • NONE • MD5 • SHA 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: • NONE • DES When DES is selected, an entry field will appear for the password.

28.8 InControl



InControl is a cloud-based service which allows you to manage all of your Peplink 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.

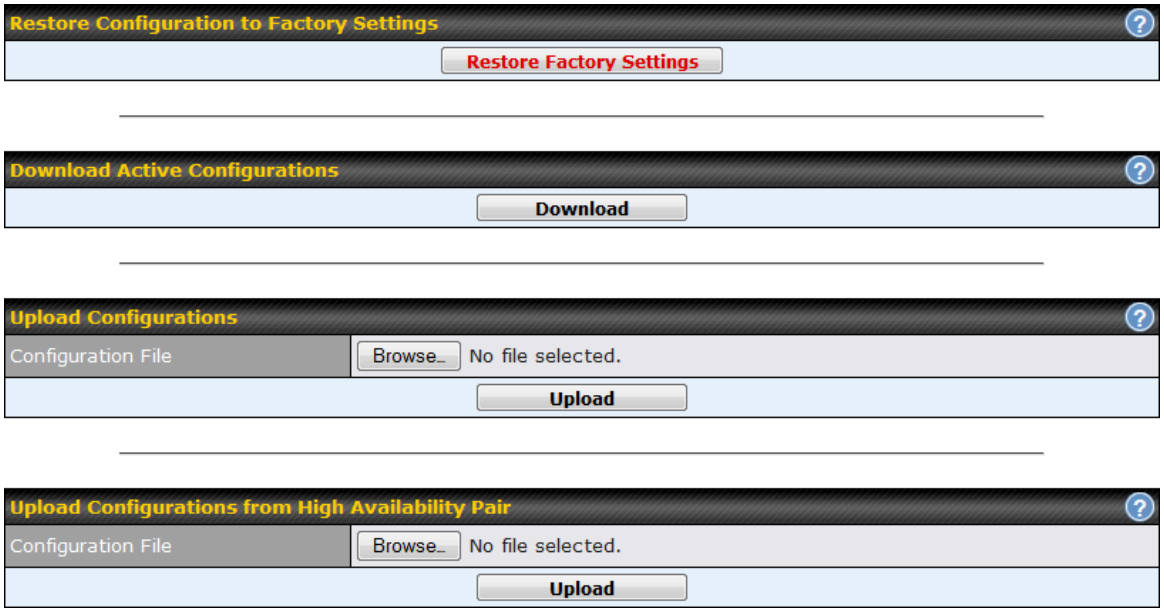
When this check box is checked, the device's status information will be sent to the Peplink InControl system. This device's usage data and configuration will be sent to the system if you enable the features in the system.

Alternatively, you can also privately host InControl. Simply check the “Privately Host InControl” box and enter the IP Address of your InControl Host. If you have multiple hosts, you may enter the primary and backup IP addresses for the InControl Host and tick the “Fail over to InControl in the cloud” box. The device will connect to either the primary InControl Host or the secondary/backup ICA/IC2.

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.

28.9 Configuration

Backing up Peplink router settings immediately after successful completion of initial setup is strongly recommended. The functionality to download and upload Peplink router settings is found at **System > Configuration**. Note that available options vary by model.



Configuration	
Restore	The **Restore Factory Settings** button is to reset the configuration to factory

Configuration to Factory Settings	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, a Peplink router 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 router so that it is different from the HA counterpart.

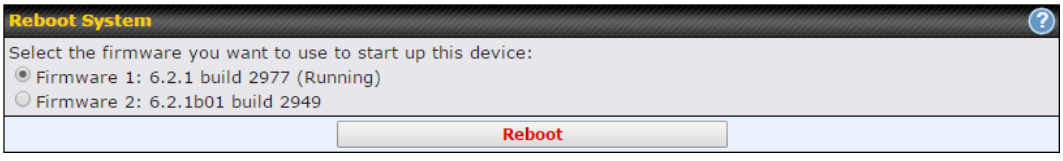
28.10 Feature Add-ons

Some Peplink routers 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**.

28.11 Reboot

This page provides a reboot button for restarting the system. For maximum reliability, the Peplink router can equip with two copies of firmware. 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.

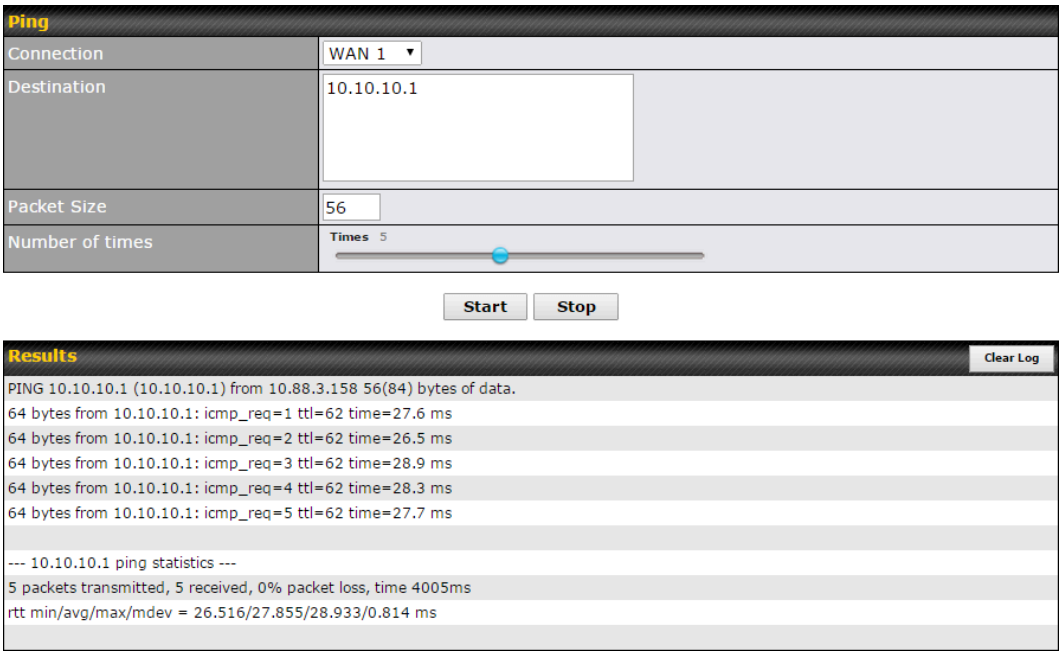
Please note that a firmware upgrade will always replace the inactive firmware partition.



29 Tools

29.1 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:

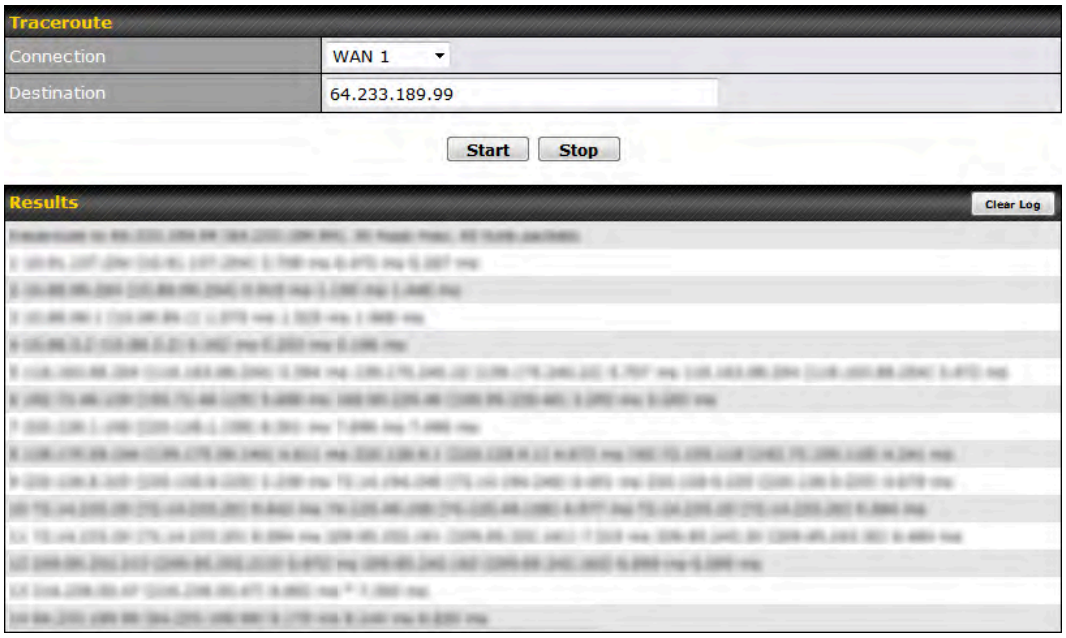


Tip

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

29.2 Traceroute Test

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**.

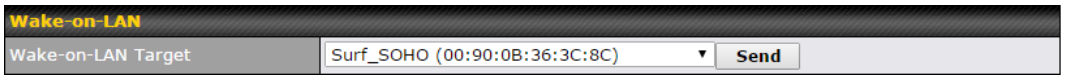


Tip

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

29.3 Wake-on-LAN

Pepwane 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**

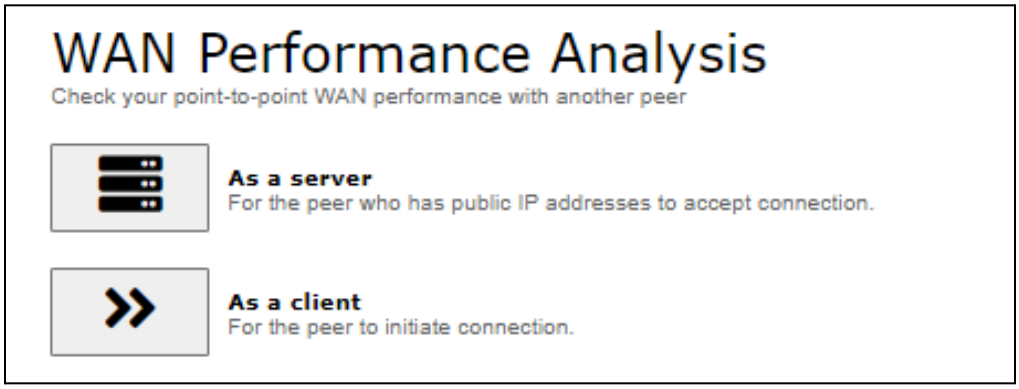


Select a client from the drop-down list and click **Send** to send a “magic packet”

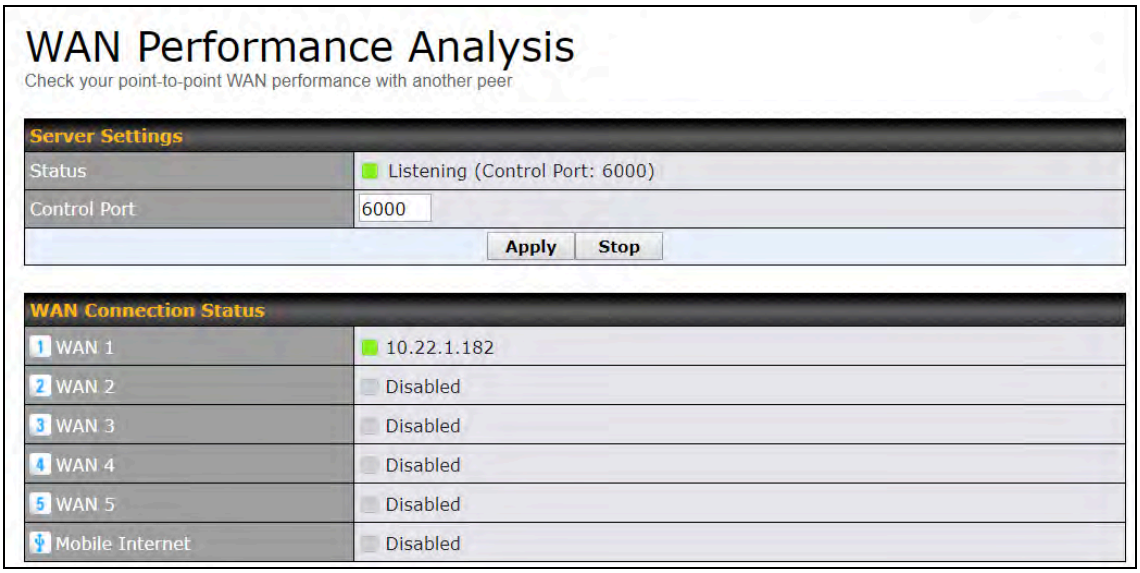
29.4 WAN Analysis

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

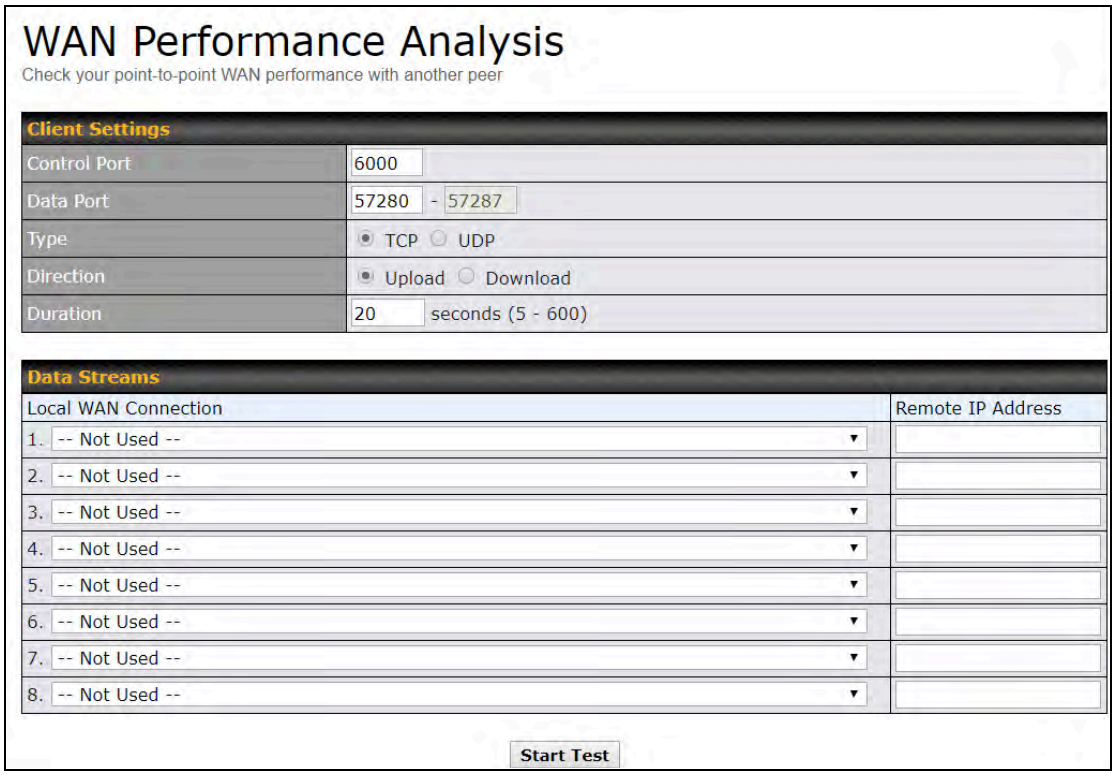
You can set a device up as a **Server** or a **Client**. One device must be set up as a server to run the speed tests and the server must have a public IP address.



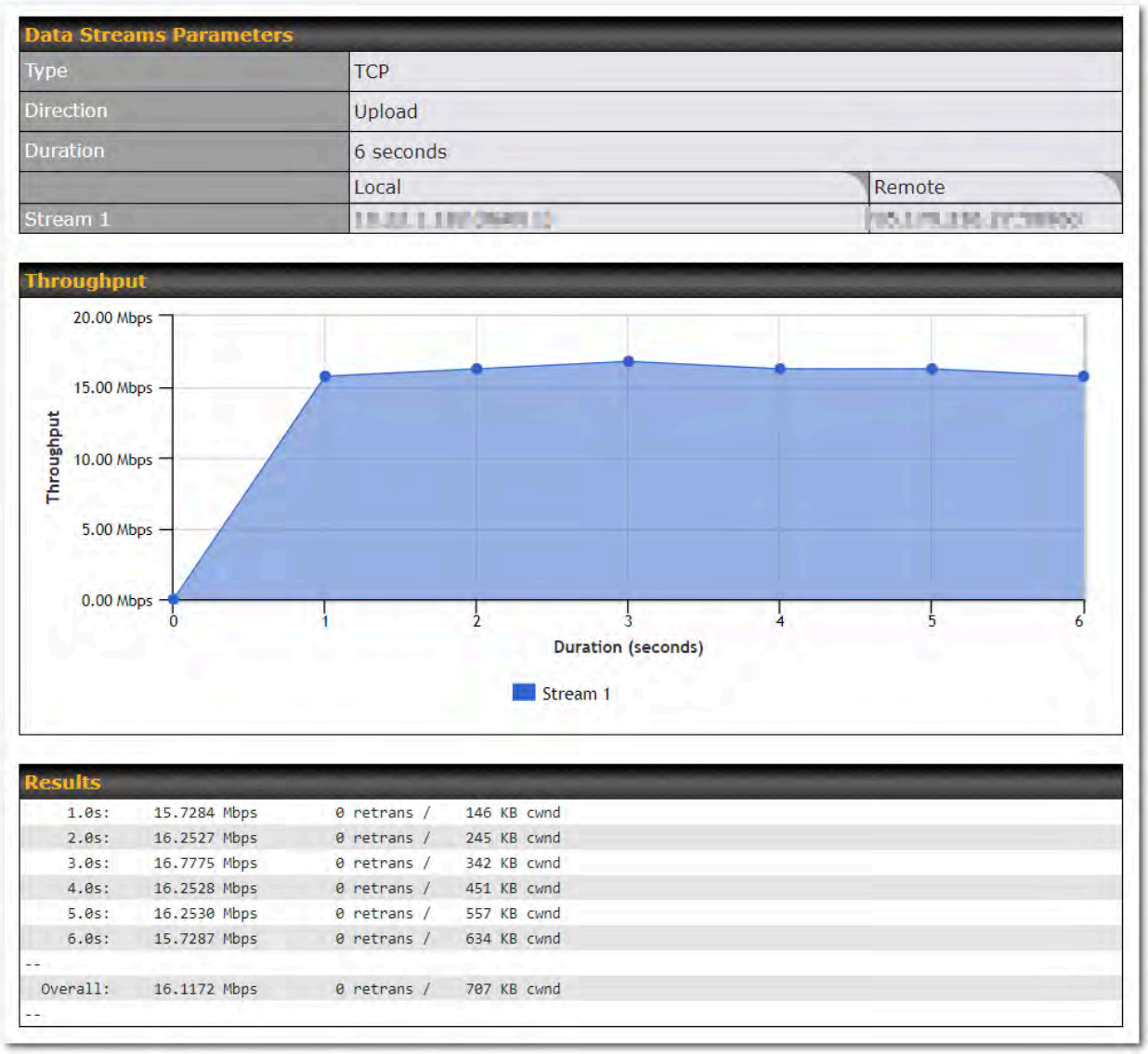
The default port is 6000 and can be changed if required. The IP address of the WAN interface will be shown in the **WAN Connection Status** section.



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**.

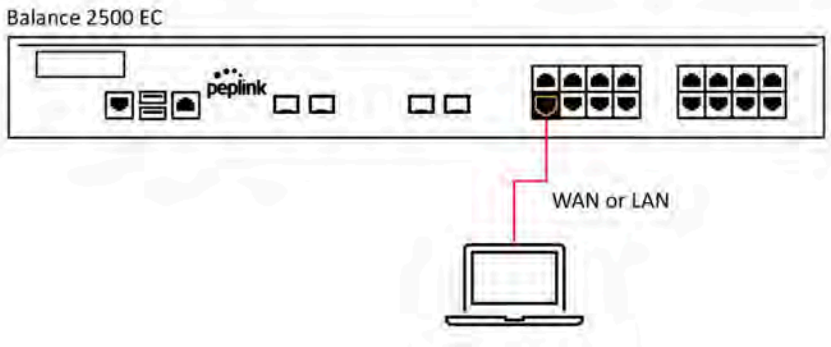


The test can be run again once it's complete by clicking the **Start** button or you can click **Close** and change the parameters for the test.

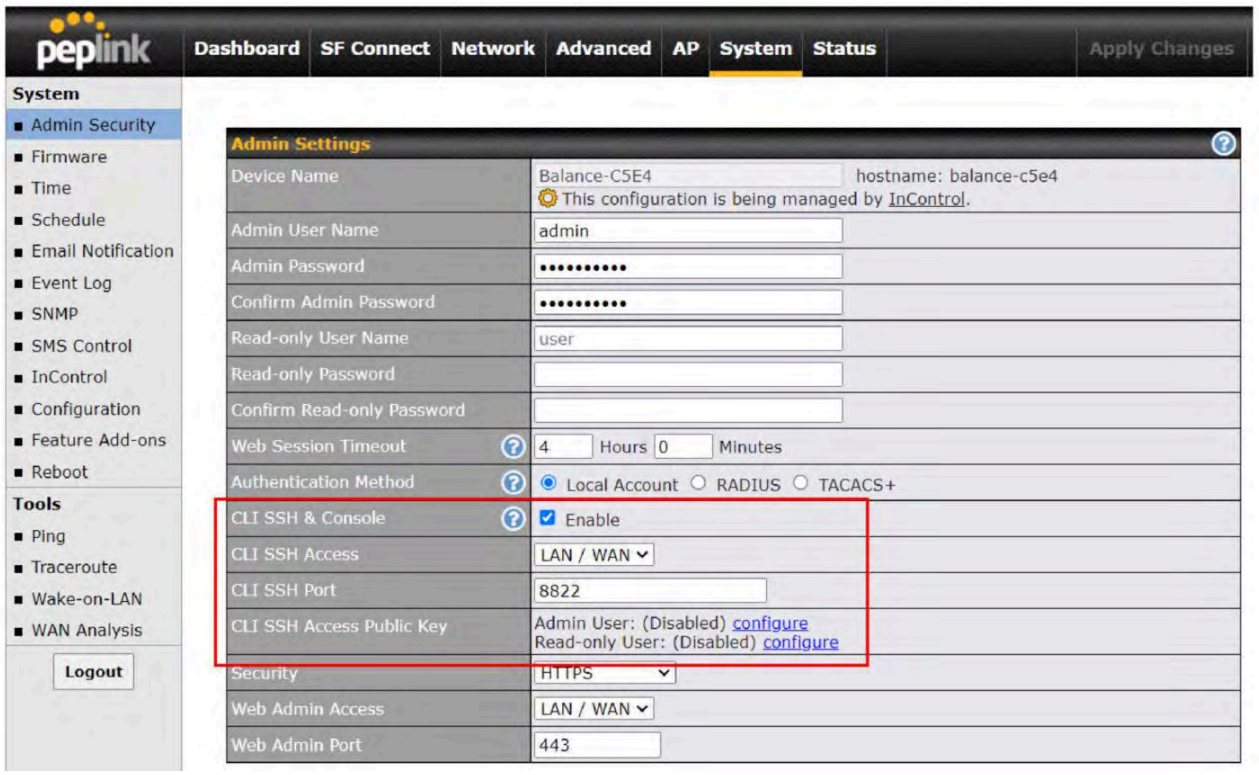
29.5 CLI (Command Line Support)

The CLI (Command Line Interface) can be accessed via SSH. You can use it to get device statistics and basic operations.

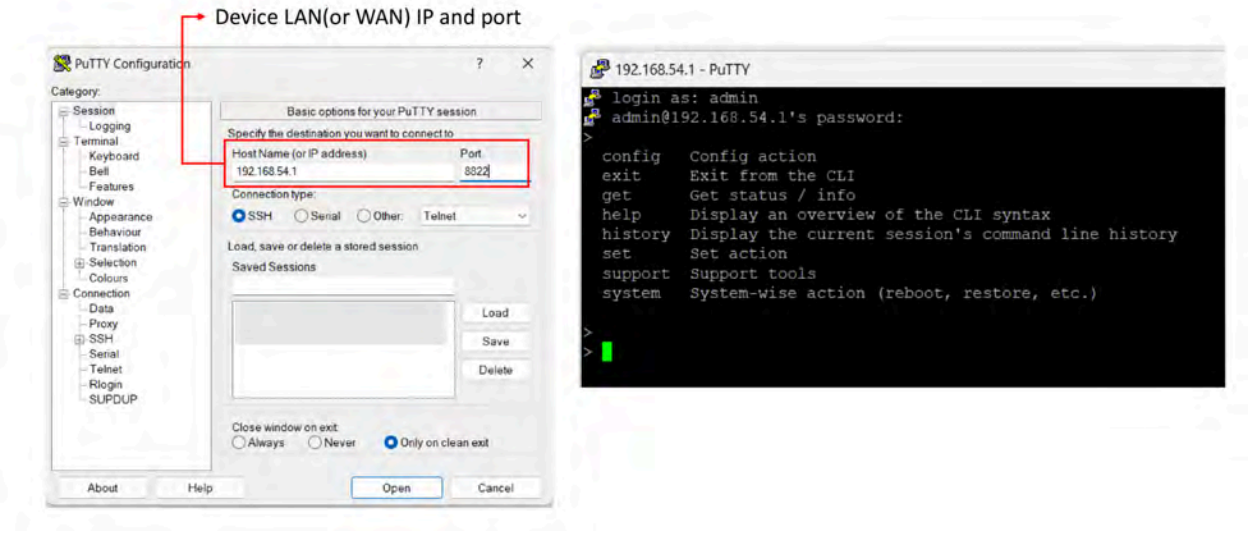
CLI Connect Method:



CLI (System > Admin Security):



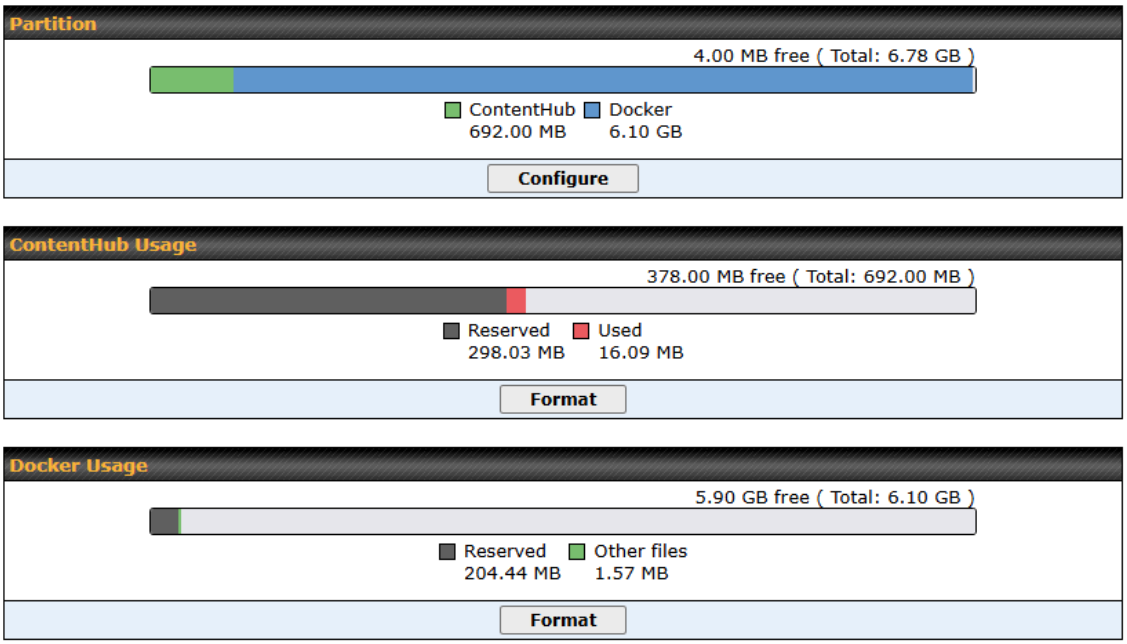
CLI:



Visit **this link** for full command set.

29.6 Storage Manager

*This page is only available on device with Edge computing features. Kindly refer the link below to further check if the device is able to support edge computing.
https://www.peplink.com/compare/routers/

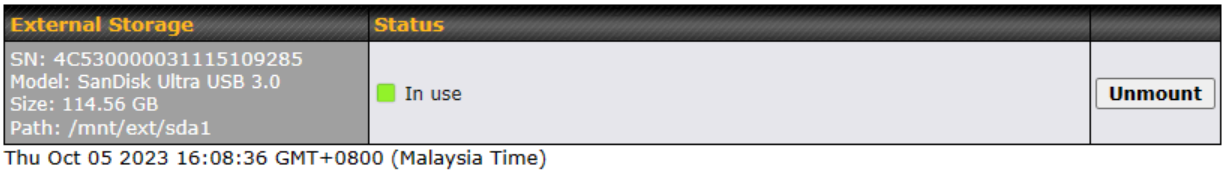


This page allow user to configure or format partition of internal storage for MediaFast / ContentHub / Docker Usage.

29.7 External Storage

(inlcuded in B One user manual - https://manual.peplink.com/peplink-b-one-series-user-manual/#4245)

*This page is only available on device with “External Storage via USB Port”. Kindly refer the link below to further check if the device is able to support External Storage and enable edge computing (Docker).
https://www.peplink.com/compare/routers/



This page allow user to manage their USB storage that connected to the device.

29.8 Package Manager

*This page is only available on device with Edge computing features. Kindly refer the link below to further check if the device is able to support edge computing.
https://www.peplink.com/compare/routers/

This page allow users to manage supported framework that is needed for ContentHub. For more information on how to upload content to the Content Hub, kindly refer (MAX - Chapter 18, Balance - Chapter 12 > Edge Computing).

30 Status

30.1 Device

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

System Information	
Device Name	
Model	Pepwave MAX HD4 MBX
Product Code	MAX-HD4-MBX-LTEA-K
Hardware Revision	2
Serial Number	2936
Firmware	8.5.3 build 6126
SpeedFusion VPN Version	9.2.4
Modem Support Version	1026 (Modem Support List)
InControl Managed Configuration	AP, LAN
Host Name	mbx
Care Plan	PrimeCare(Venus) (Expiry date: Jan 01, 2026, GMT+8) (Refresh)
Uptime	5 minutes
System Time	Wed, Sep 3, 2025, 3:21:32 PM GMT+8
Diagnostic Report	Download
Remote Assistance	Connection will expire after 2025-09-05 07:00

MAC Address	
LAN	
WAN 1	
WAN 2	
WAN 3	
SpeedFusion NAT Mode	

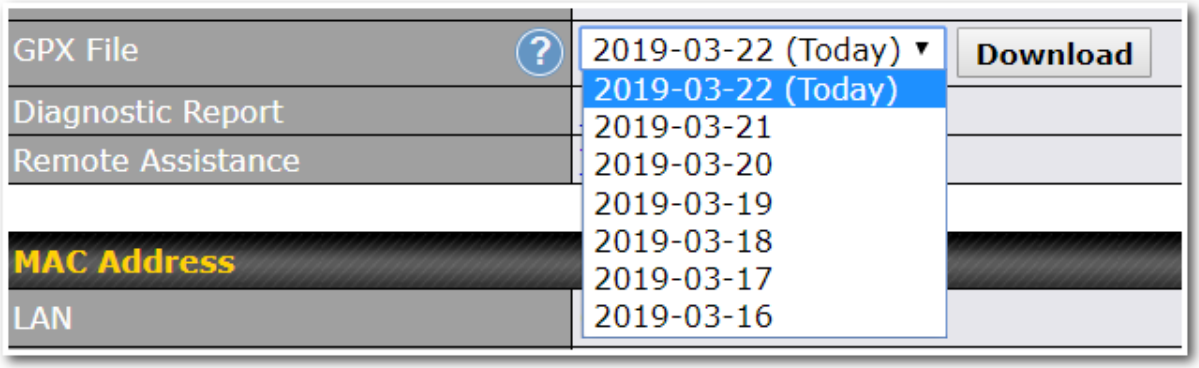
System Information	
Device Name	This is the name specified in the **Device Name** field located at **System > Admin Security**.
Model	This shows the model name and number of this device.
Product Code	If your model uses a product code, it will appear here.

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.
Care Plan	Display care plan status and expiry date. Note: Refresh button to manually refresh the PrimeCare license. User who has disabled InControl management may click [Refresh] option to check the PrimeCare license status after a renewal.
SpeedFusion VPN Version	This shows the current SpeedFusion VPN version.
InControl Managed Configuration	InControl Managed Configurations (firmware, VLAN, Captive Portal, etcetera)
Host Name	The host name assigned to the Peplink router appears here.
Uptime	This shows the length of time since the device has been rebooted.
System Time	This shows the current system time.
OpenVPN Client Profile	Link to download OpenVpn Client profile when this is enabled in Remote User Access
Diagnostic Report	The **Download** link is for exporting a diagnostic report file required for system investigation.
Remote Assistance	This option is to **Turn on** remote assistance with the time duration.

The second table shows the MAC address of each LAN/WAN interface connected. To view your device's End User License Agreement (EULA), click Legal.

status

30.2 GPS Data

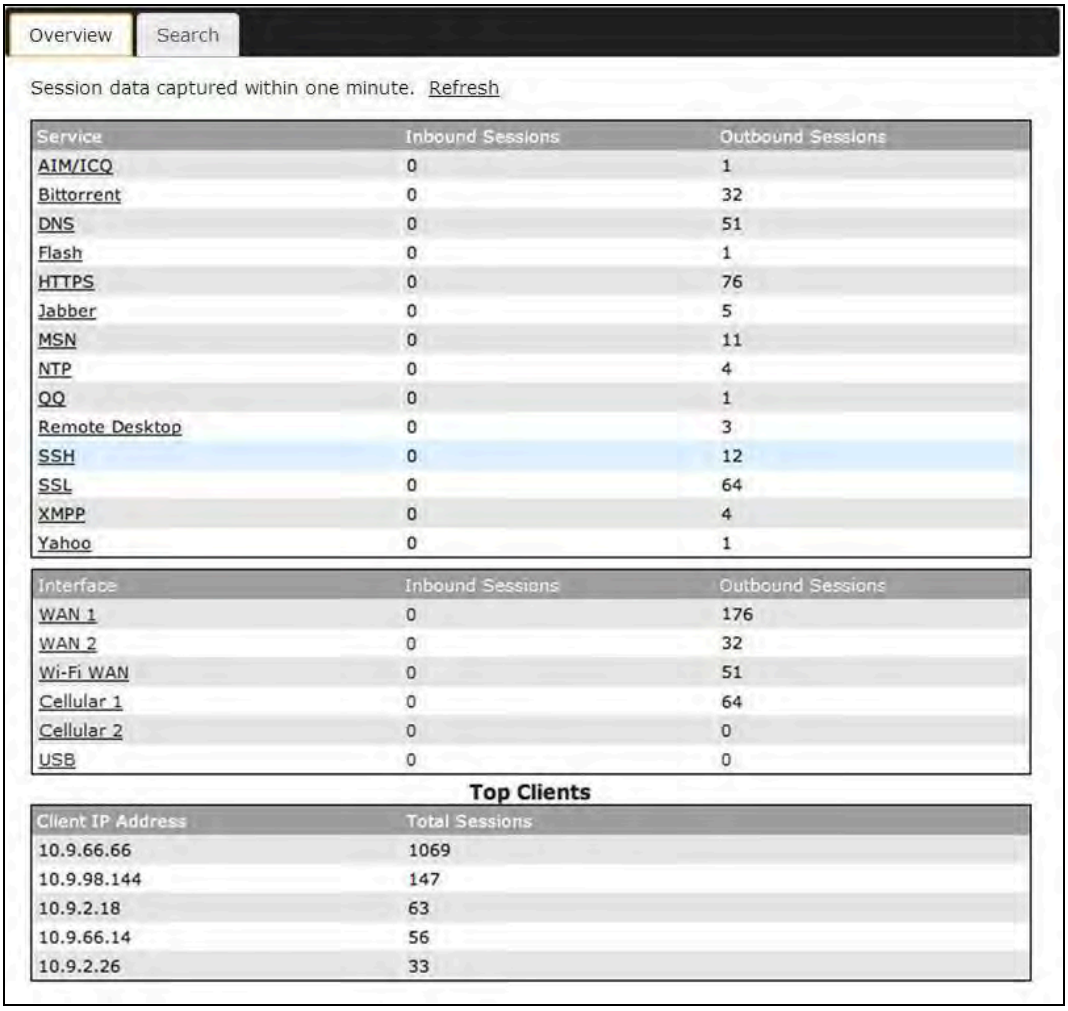


GPS enabled models automatically store up to seven days of GPS location data in GPS eXchange format (GPX). To review this data using third-party applications, click **Status > Device** and then download your GPX file.

The Peplink GPS enabled devices export real-time location data in NMEA format through the LAN IP address at TCP port 60660. It is accessible from the LAN or over a SpeedFusion connection. To access the data via a virtual serial port, install a virtual serial port driver. Visit http://www.peplink.com/index.php?view=faq&id=294 to download the driver.

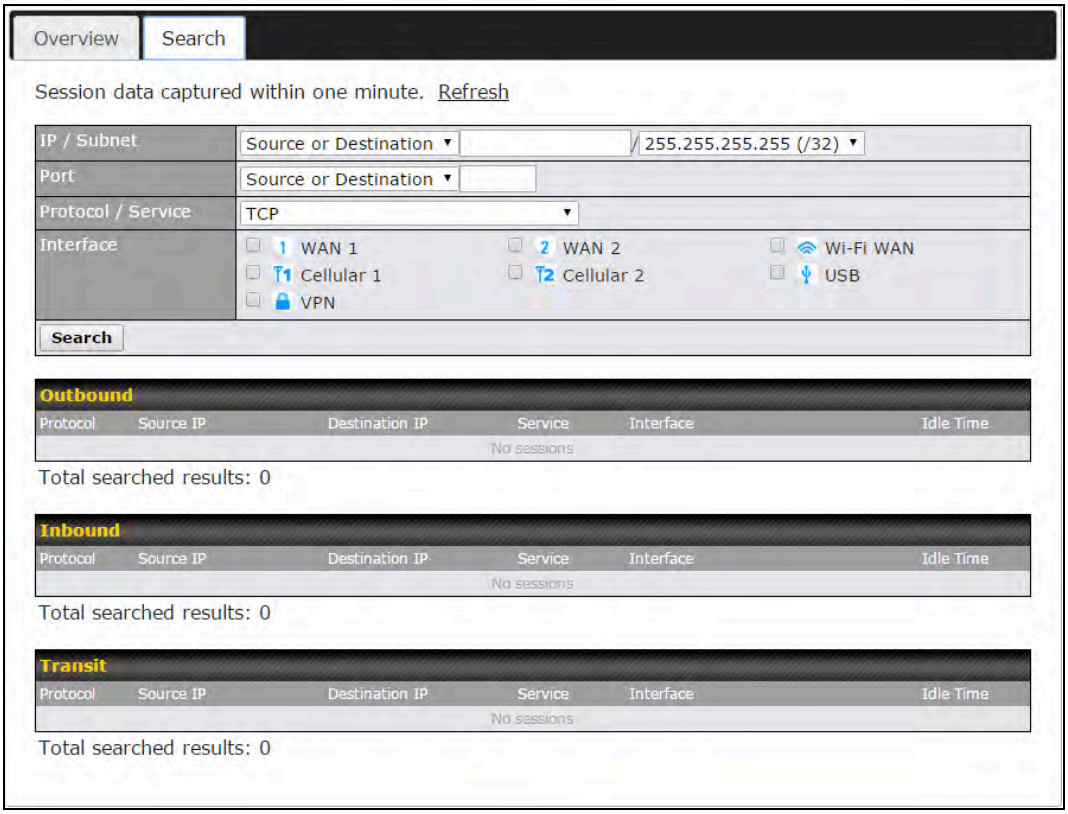
30.3 Active Sessions

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. In addition, you can see which clients are initiating the most sessions.

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**.

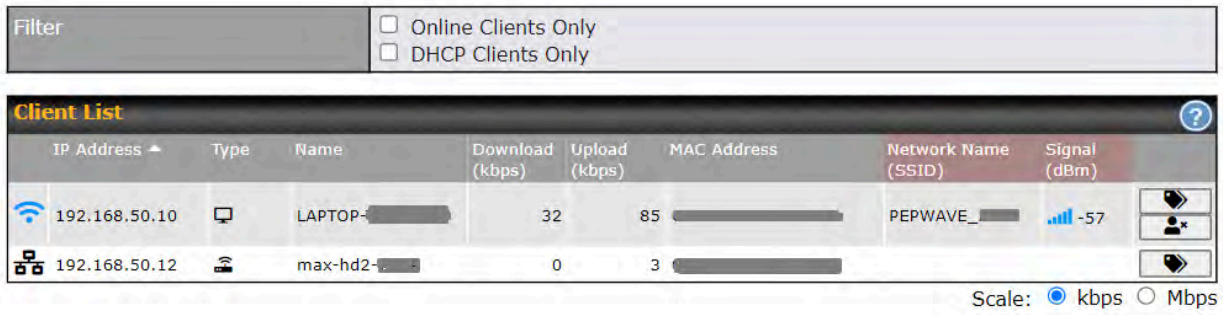


This **Active Sessions** section displays the active inbound/outbound sessions of each WAN connection on the Peplink router. A filter is available to sort active session information. Enter a keyword in the field or check one of the WAN connection boxes for filtering.

30.4 Client List

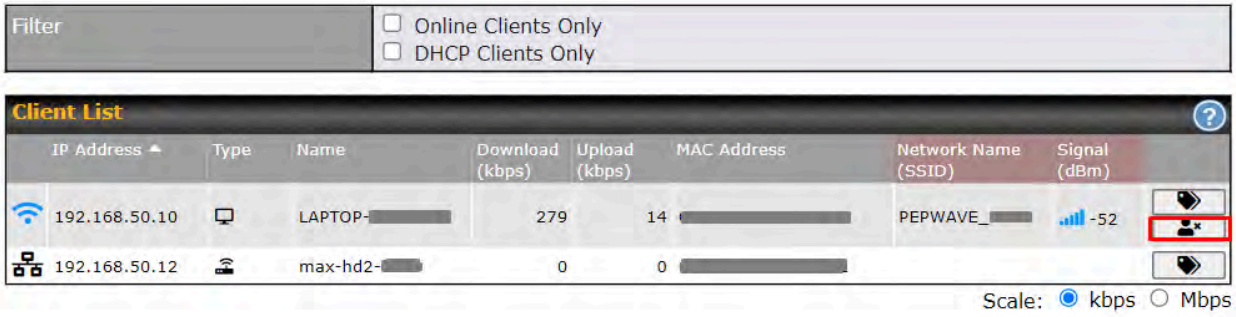
The client list table is located at **Status > Client List**. It lists DHCP and online client IP addresses, names (retrieved from the DHCP reservation table or defined by users), current download and upload rate, and MAC address.

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

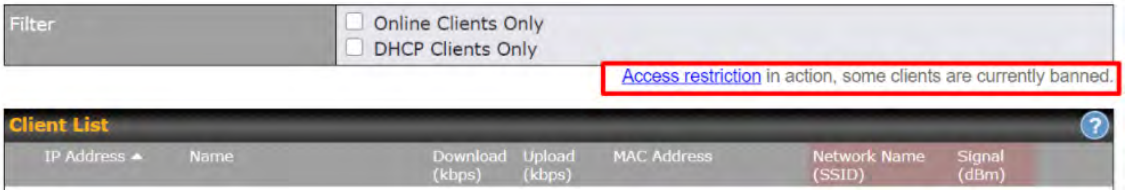


If the PPTP server (see **Section 19.2),** SpeedFusion™ (see **Section 12.1**), or AP controller (see **Section 20**) is enabled, you may see the corresponding connection name listed in the **Name** field.

In the client list table, there is a “Ban Client” feature which is used to disconnect the Wi-Fi and Remote User Access clients by clicking the button on the right.



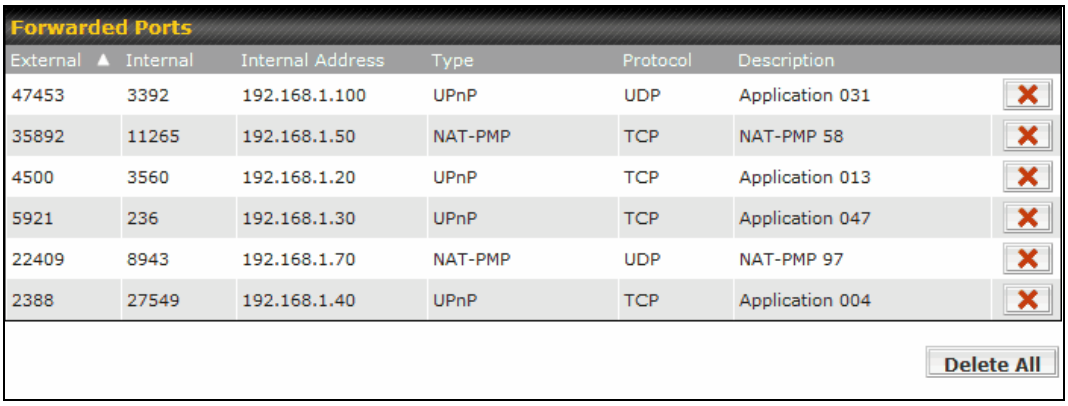
There is a blocklist on the same page after you banned the Wi-Fi or Remote User Access clients.



You may also unblock the Wi-Fi or Remote User Access clients when the client devices need to reconnect the network by clicking  the button on the right.

30.5 UPnP / NAT-PMP

The table that shows the forwarded ports under UPnP and NAT-PMP protocols is located at **Status > UPnP/NAT-PMP**. This section appears only if you have enabled UPnP / NAT-PMP as mentioned in **Section 16.1.1**.



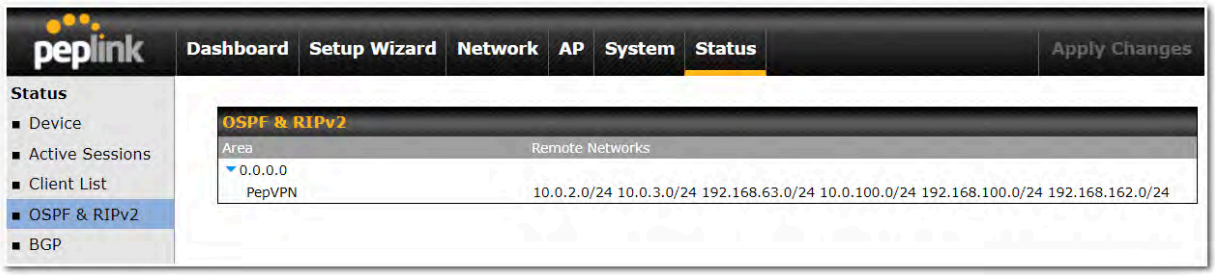
Click  to delete a single UPnP / NAT-PMP record in its corresponding row. To delete all records, click **Delete All** on the right-hand side below the table.

Important Note

UPnP / NAT-PMP records will be deleted immediately after clicking the button  or **Delete All,** without the need to click **Save** or **Confirm**.

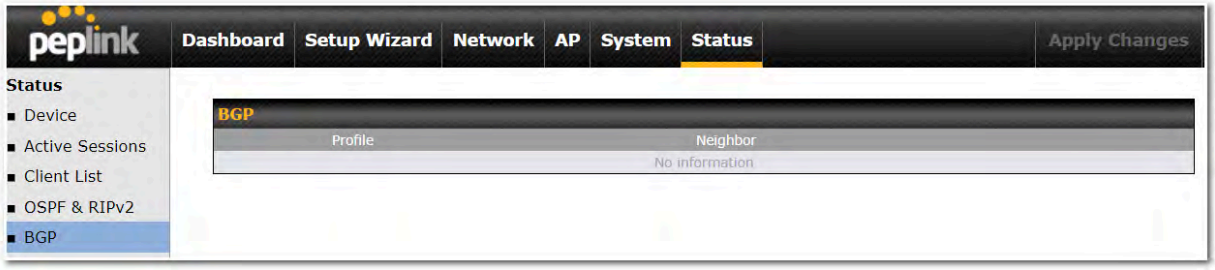
30.6 OSPF & RIPv2

The table shows status of OSPF and RIPv2.



30.7 BGP

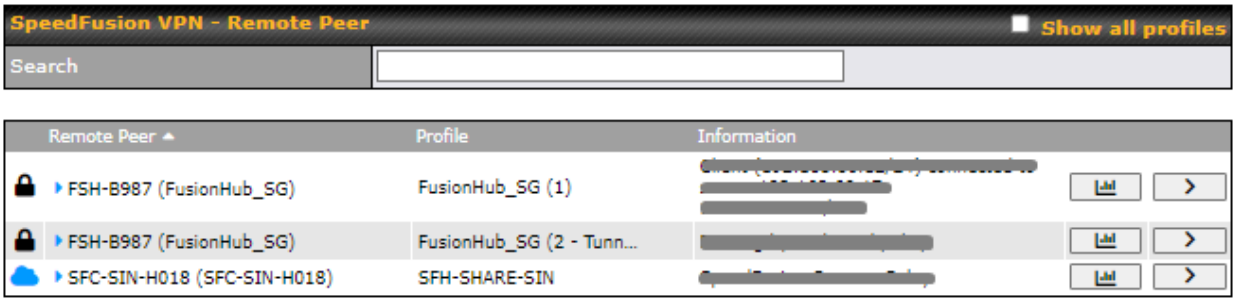
The table shows status of BGP



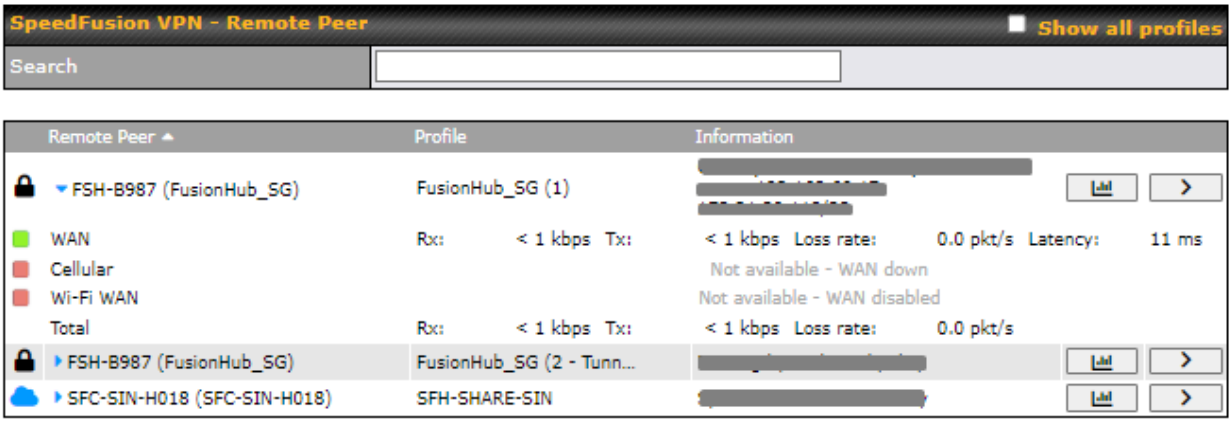
30.8 SpeedFusion VPN

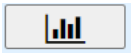
Current SpeedFusion VPN status information is located at **Status > SpeedFusion VPN**.

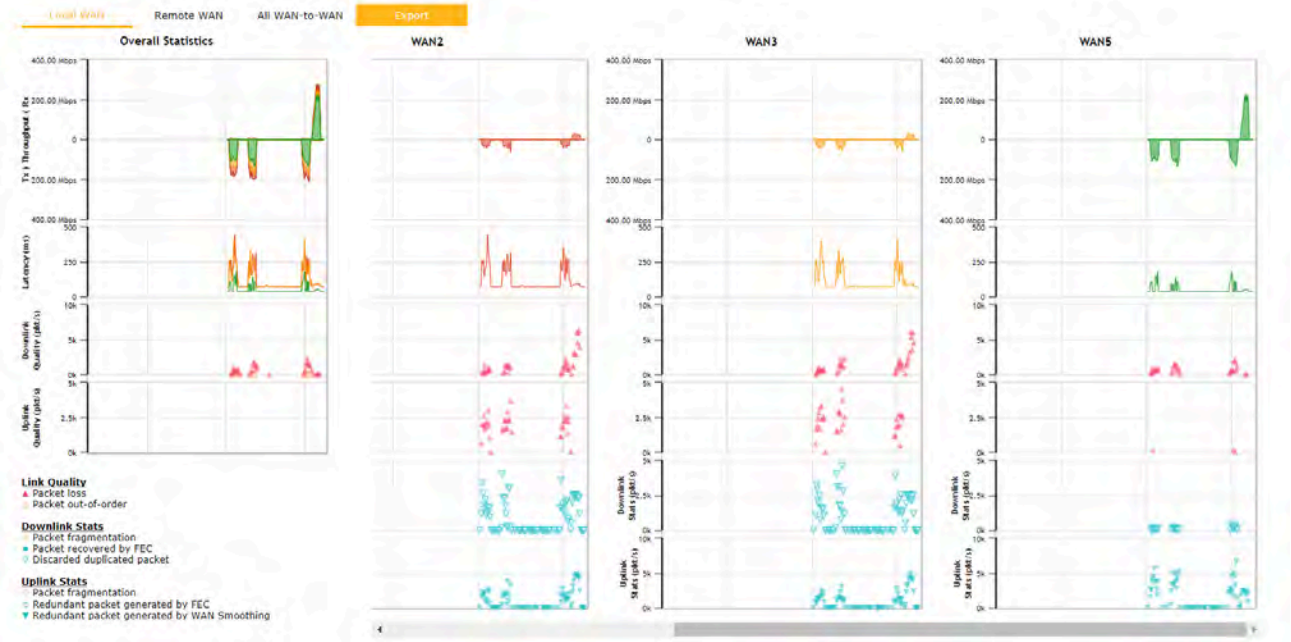
Details about SpeedFusion VPN connection peers appears as below:



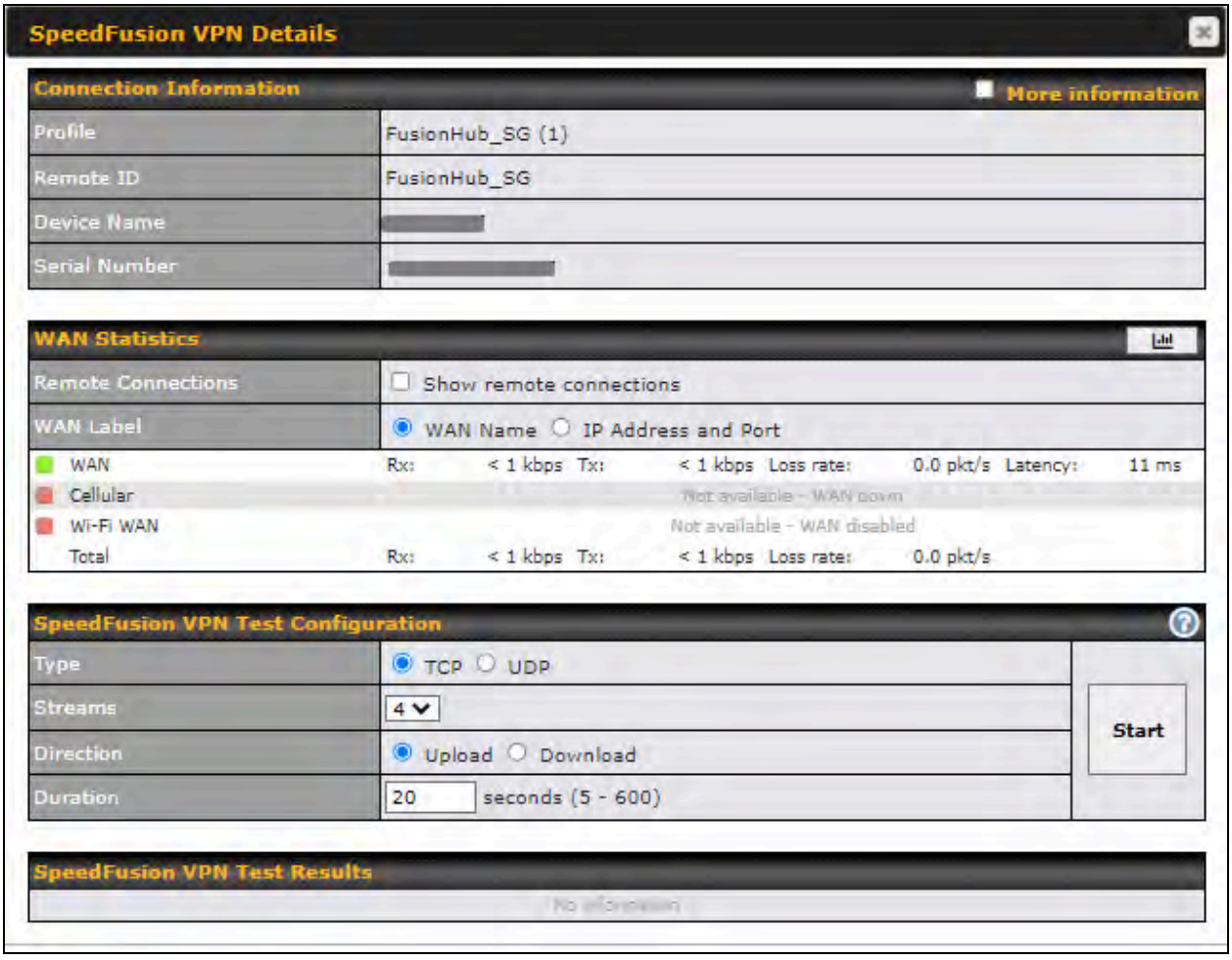
Click on the corresponding peer name to explore the WAN connection(s) status and subnet information of each VPN peer.



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



When pressing the  button, the following menu will appear:

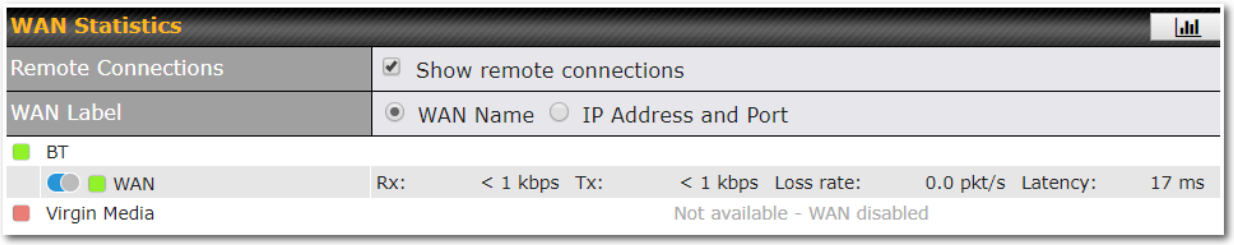


The **connection information** shows the details of the selected SpeedFusion VPN profile, consisting of the Profile name, **Router ID**, **Router Name** and **Serial Number** of the remote router
Advanced features for the SpeedFusion VPN profile will also be shown when the **More Information** checkbox is selected.

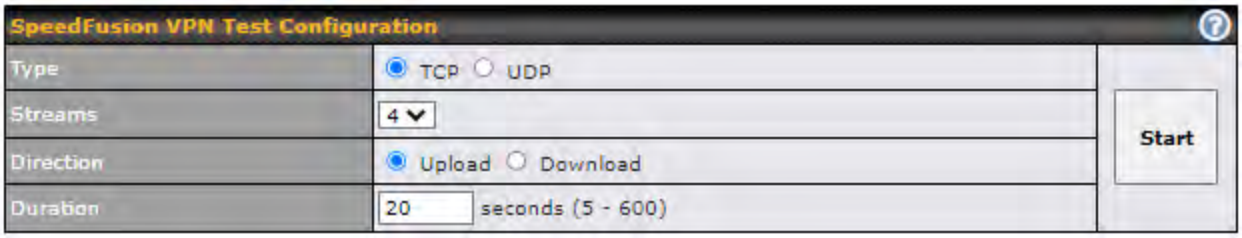
The **WAN statistics** show information about the local and remote WAN connections (when **show Remote connections**) is selected.
The available details are **WAN Name, IP address** and **port** used for the Speedfusion connection. **Rx and Tx rates, Loss rate and Latency**.

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 SpeedFusion VPN's speed between two locations to see if there is interference or network congestion between certain WAN connections.



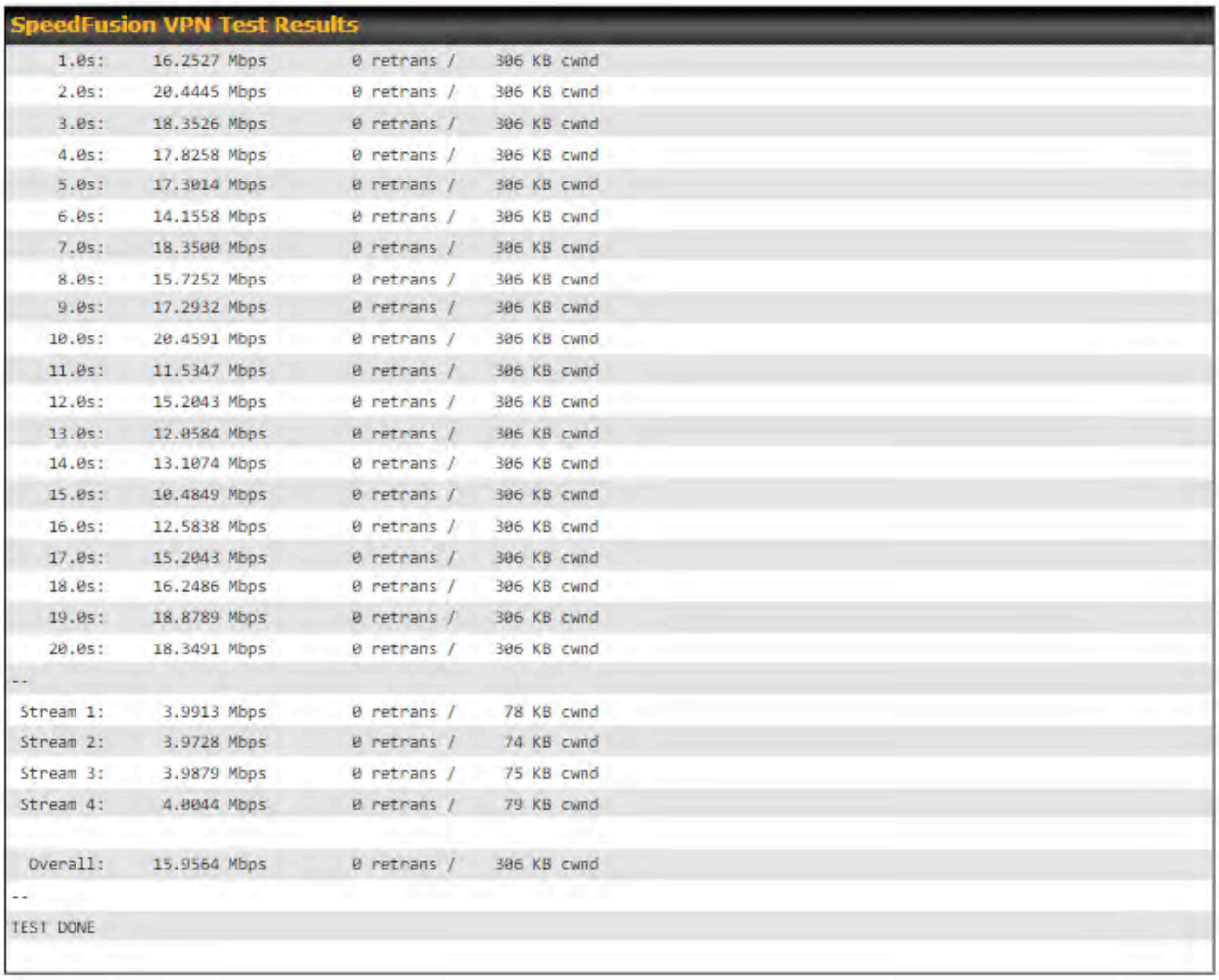
The SpeedFusion VPN test configuration allows us to configure and perform thorough tests. This is usually done after the initial installation of the routers and in case there are problems with aggregation.



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.

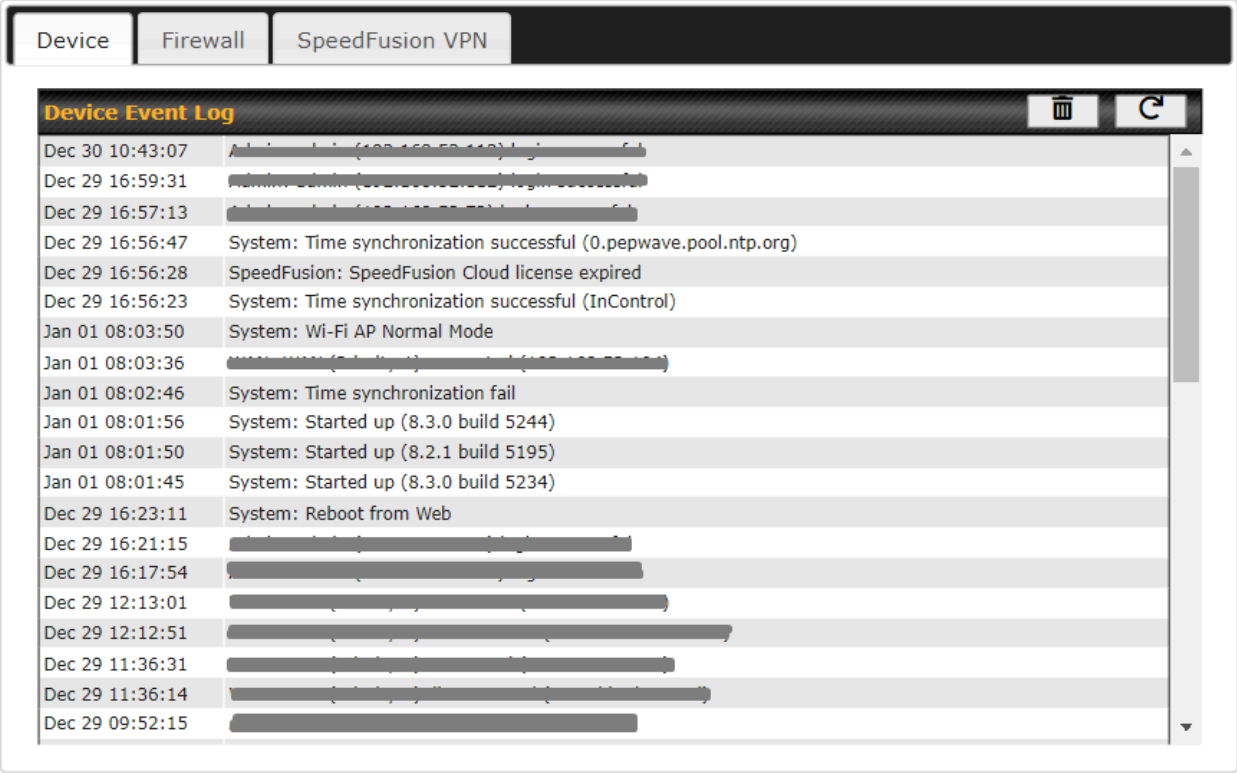


Peplink also published a whitepaper about Speedfusion which can be downloaded from the following url:
http://download.peplink.com/resources/whitepaper-speedfusion-and-best-practices-2019.pdf

30.9 Event Log

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

30.9.1 Device Event Log

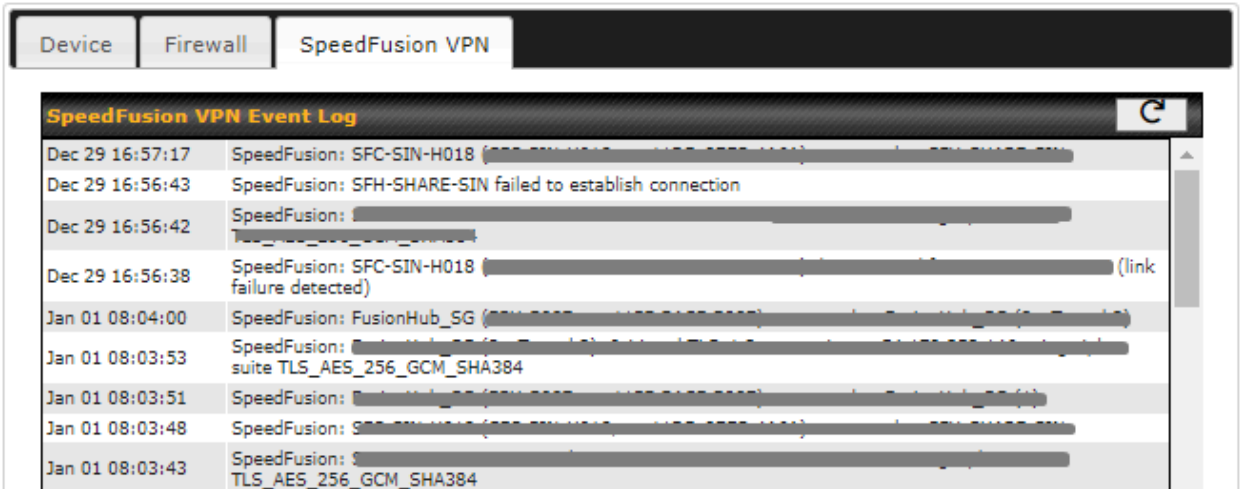


The log section displays a list of events that has taken place on the Peplink router. Click the  to refresh log entries automatically. Click the  button to clear the log.

30.9.2 Firewall Event log

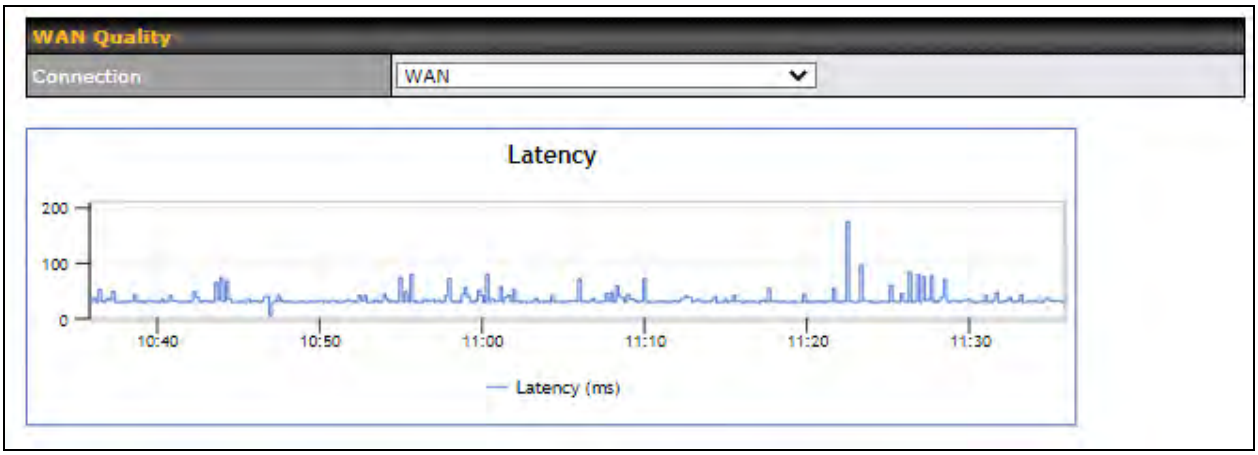
This section displays a list of events that have taken place within a firewall. Click the  button and the log will be refreshed.

30.9.3 SpeedFusion VPN Event log



This section displays a list of events that have taken place within a SpeedFusion VPN connection. Click the  button and the log will be refreshed.

31 WAN Quality



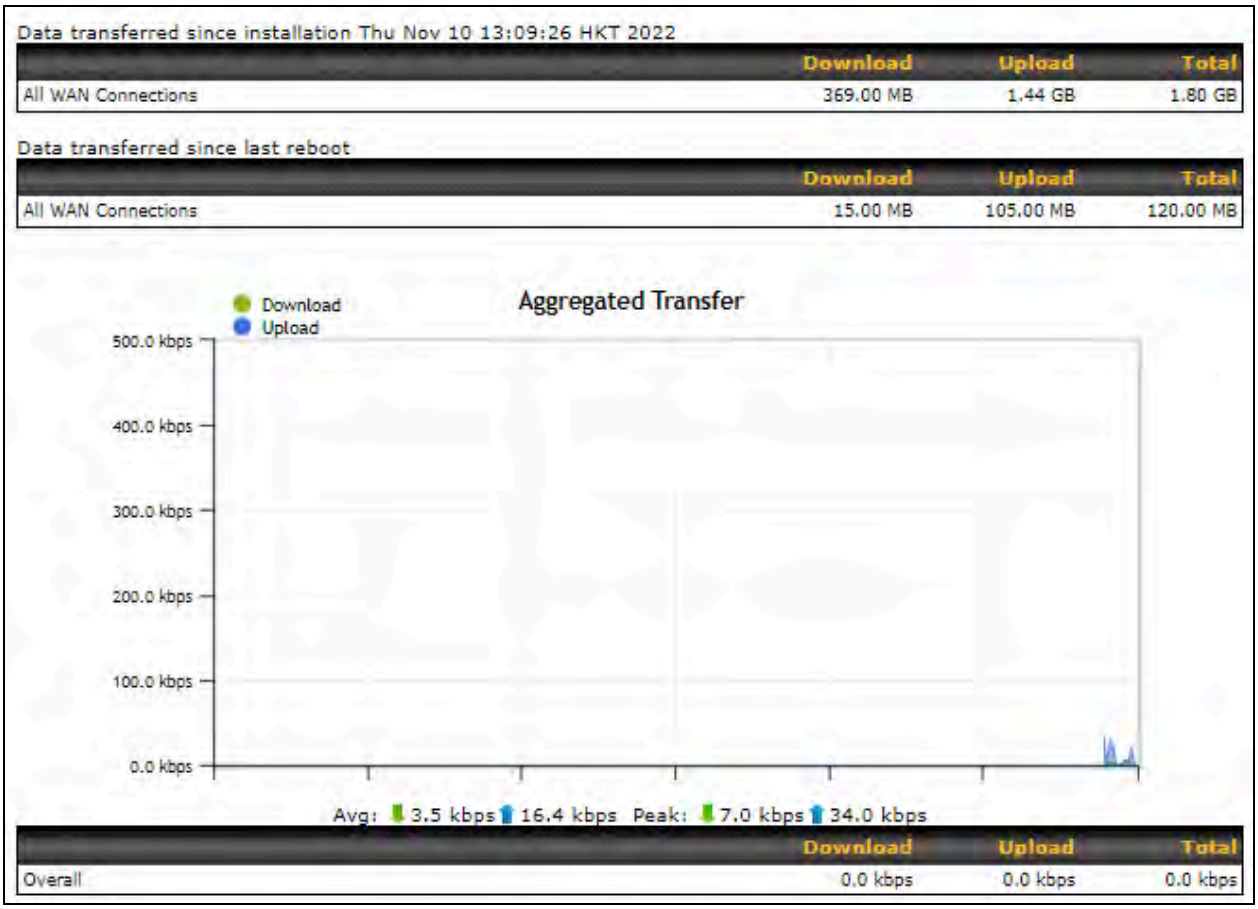
The **Status > WAN Quality** allow to show detailed information about each connected WAN connection.

32 Usage Reports

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

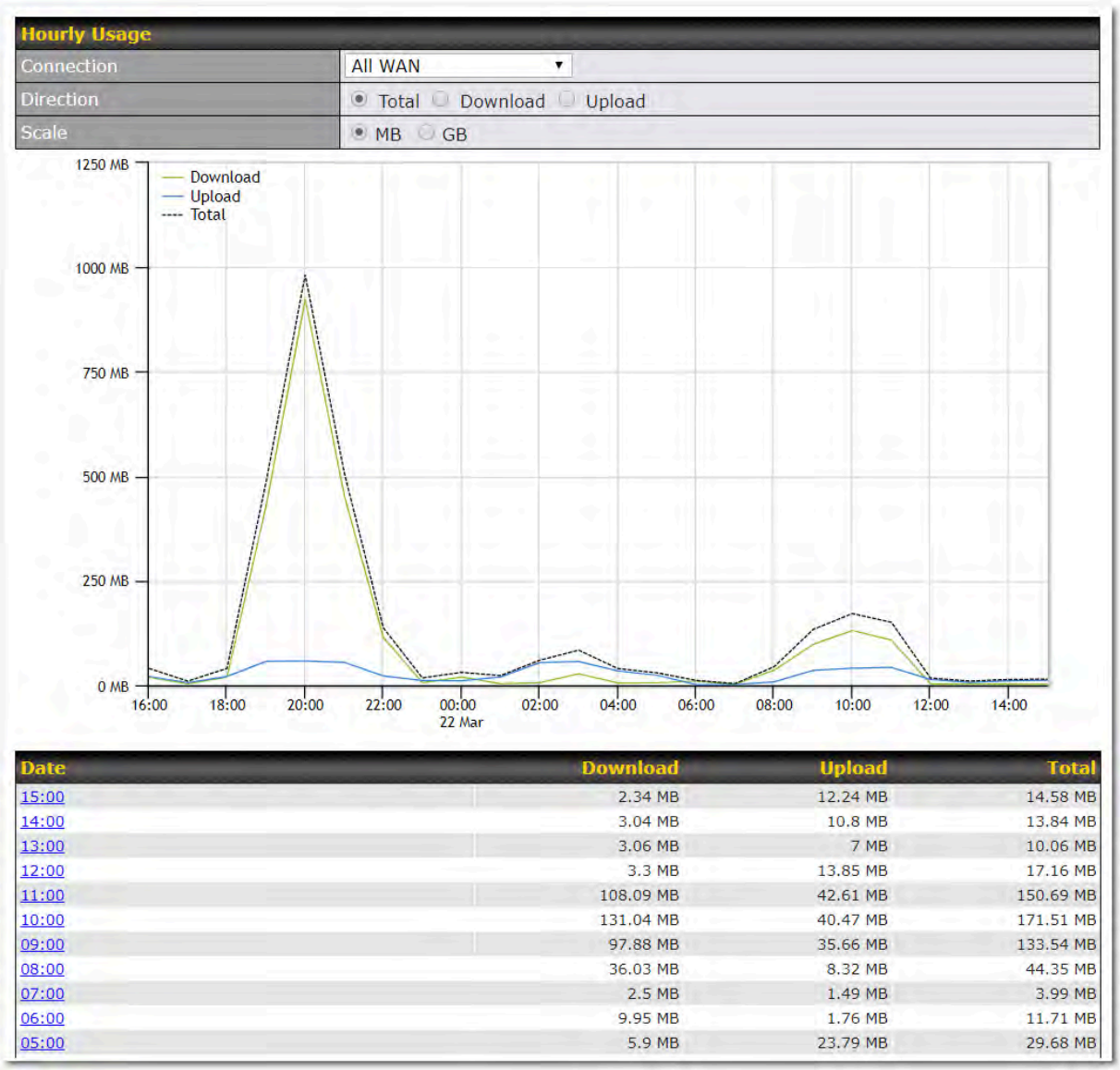
32.1 Real-Time

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.



32.2 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
15:00	2.34 MB	12.24 MB	14.58 MB
14:00	3.04 MB	10.8 MB	13.84 MB
13:00	3.06 MB	7 MB	10.06 MB
12:00	3.3 MB	13.85 MB	17.16 MB
11:00	108.09 MB	42.61 MB	150.69 MB
10:00	131.04 MB	40.47 MB	171.51 MB
09:00	97.88 MB	35.66 MB	133.54 MB
08:00	36.03 MB	8.32 MB	44.35 MB
07:00	2.5 MB	1.49 MB	3.99 MB
06:00	9.95 MB	1.76 MB	11.71 MB
05:00	5.9 MB	23.79 MB	29.68 MB

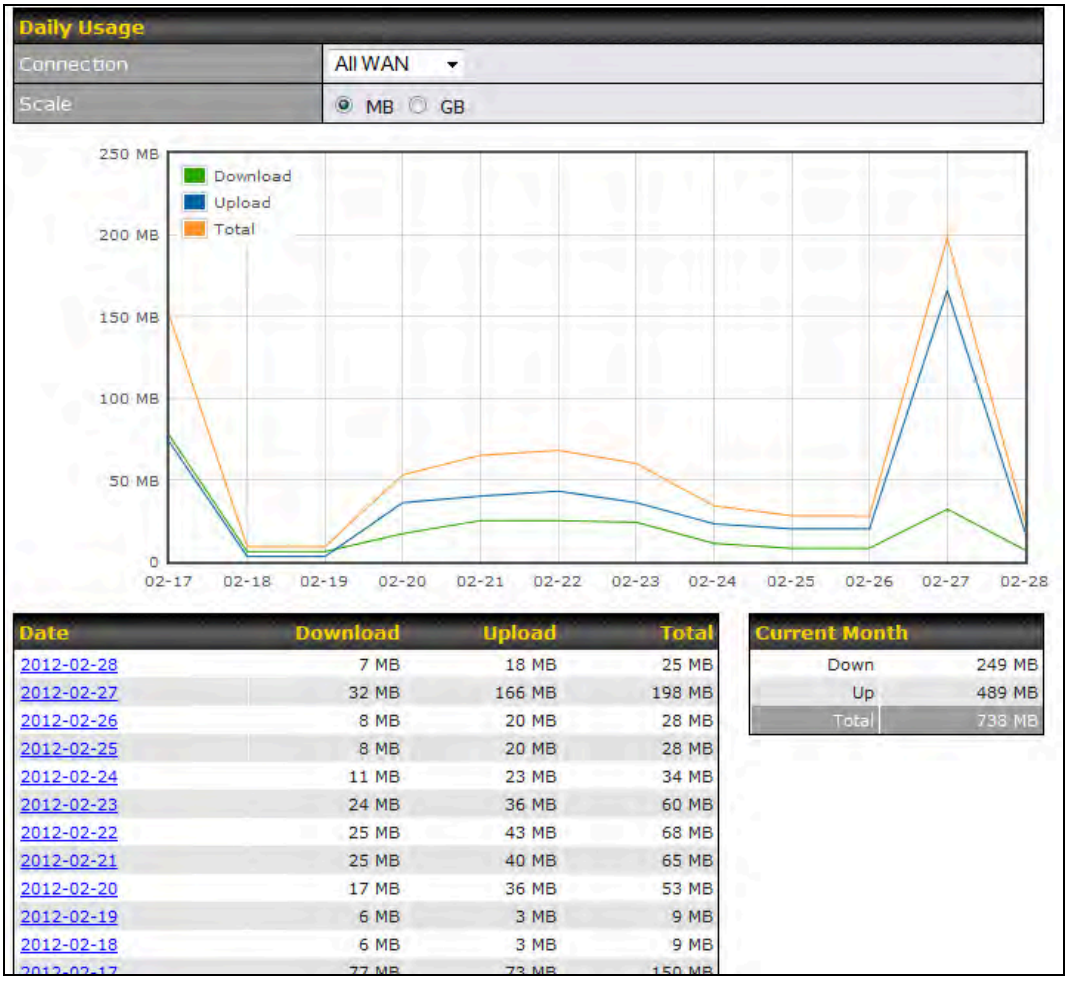
32.3 Daily

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**,** 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**).



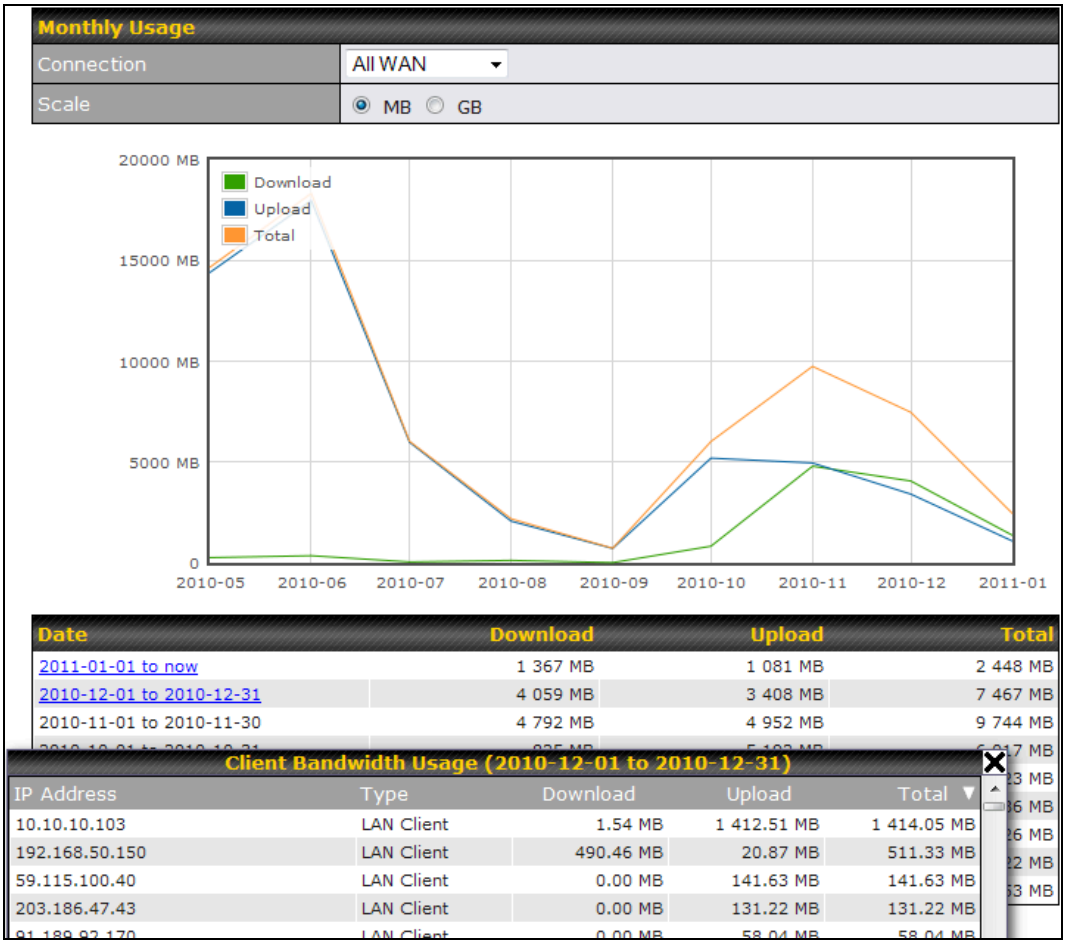
All WAN Daily Bandwidth Usage

32.4 Monthly

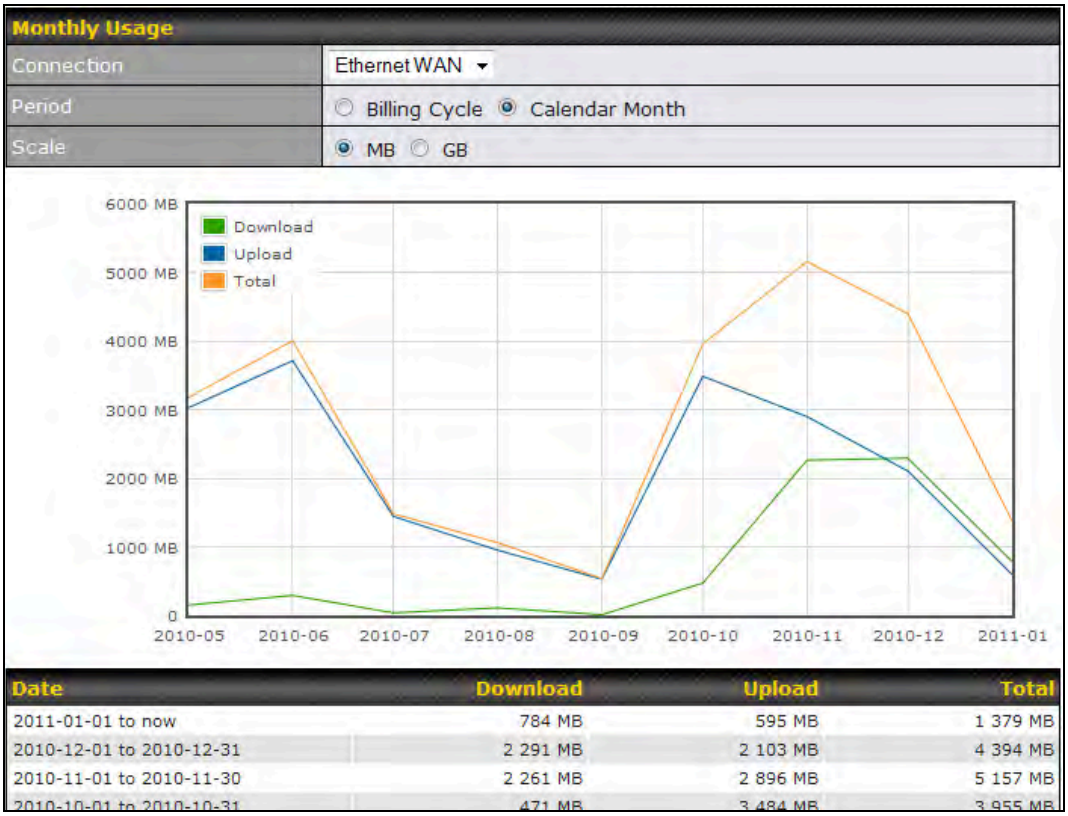
This page shows the monthly bandwidth usage for each WAN connection. If you have enabled the **Bandwidth Monitoring** feature, you can check the usage of each particular connection and

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**).



All WAN Monthly Bandwidth Usage



Ethernet WAN Monthly Bandwidth Usage

Tip

By default, the scale of data size is in **MB**. 1GB equals 1024MB.

Appendix A: Restoration of Factory Defaults

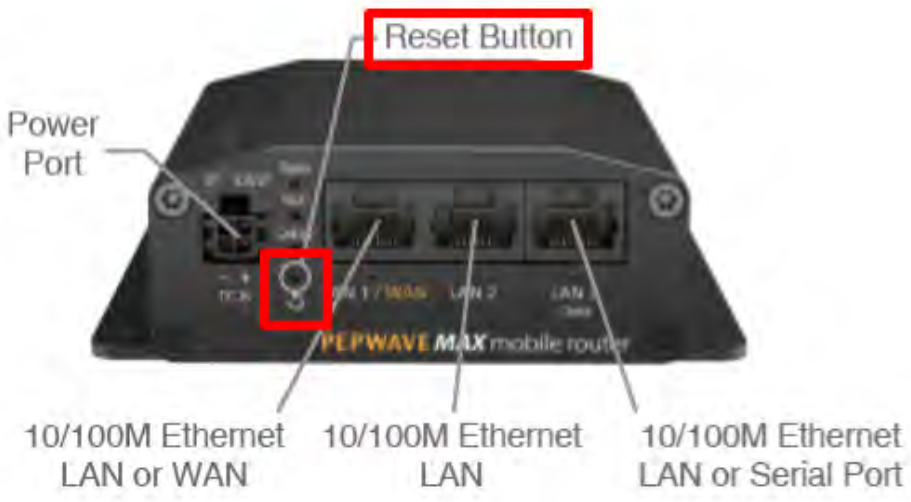
To restore the factory default settings on a Peplink router, follow the steps below:

1. Locate the reset button on the front or back panel of the Peplink router.
2. With a paperclip, press and keep the reset button pressed.

Hold for approximately 10 seconds for factory reset (Note: The LED status light shows in RED, until the status light off and release the button)

After the Peplink router finishes rebooting, the factory default settings will be restored.

Important Note
All previous configurations and bandwidth usage data will be lost after restoring factory default settings. Regular backup of configuration settings is strongly recommended.



Appendix B: Overview of ports used by Peplink SD-WAN routers and other Peplink services

Default Port Number	Usage	Service	Inbound/Outbound	Default Status
UDP 5246	Data flow	InControl	Outbound	Enabled
TCP 443	HTTPS service	InControl	Outbound	Enabled
TCP 5246	Optional, used when TCP 443 is not responding	InControl	Outbound	Enabled
TCP 5246	Remote Web Admin	InControl Virtual Appliance	Outbound	Enabled
TCP 4500	VPN Data (TCP Mode)	SpeedFusion VPN / SpeedFusion	Inbound / Outbound*	Disabled
TCP 32015	VPN handshake	SpeedFusion VPN / SpeedFusion	Inbound / Outbound*	Disabled
UDP 4500	VPN Data	SpeedFusion VPN / SpeedFusion	Inbound / Outbound*	Disabled
UDP 32015º	VPN Data (alternative)	SpeedFusion VPN / SpeedFusion	Inbound / Outbound*	Disabled
TCP/UDP 4500+N-1^	VPN Sub-Tunnels Data	SpeedFusion VPN / SpeedFusion	Inbound / Outbound*	Disabled
UDP 32015+N-1^	VPN Sub-Tunnels Data (alternative)	SpeedFusion VPN / SpeedFusion	Inbound / Outbound*	Disabled
UDP 4500	VPN Data	IPsec	Inbound / Outbound*	Disabled
UDP 500	VPN initiation	IPsec	Inbound / Outbound*	Disabled
UDP 500	L2TP	Remote User Access	Inbound	Disabled
UDP 1701	L2TP	Remote User Access	Inbound	Disabled
UDP 4500	L2TP	Remote User Access	Inbound	Disabled
UDP 1194	OpenVPN	Remote User Access	Inbound	Disabled
IP 47	PPTP (GRE)	Remote User Access	Inbound	Disabled
TCP 2222	Remote Assistance Direct connection	Peplink Troubleshooting Assistance	Outbound	Enabled
TCP 80	HTTP traffic	Web Admin	Inbound	Enabled

		Interface access		
TCP 443	HTTPS traffic	Web Admin Interface access (secure)	Inbound	Enabled
TCP 8822	SSH	SSH	Inbound	Disabled
UDP 161	SNMP Get	SNMP monitoring	Inbound	Disabled
UDP 162	SNMP Trap	SNMP monitoring	Outbound	Disabled
TCP, UDP 1812	Radius Authentication	Radius	Outbound	Disabled
TCP, UDP 1813	Radius Accounting	Radius	Outbound	Disabled
UDP 123	Network Time Protocol	NTP	Inbound Outbound	Disabled Enabled
TCP 60660	Real-time location data in NMEA format	GPS	Inbound	Disabled

Disclaimer:

- By default, only TCP 32015 and UDP 4500 are needed for SpeedFusion VPN / SpeedFusion.
- Inbound / Outbound* - Inbound = For Server mode; Outbound = For Client mode
- UDP 32015º - If IPsec VPN or L2TP/IPsec RUA is enabled, the UDP 4500 is occupied, so SpeedFusion VPN / SpeedFusion will automatically switch to UPD 32015 as VPN data port .
- UDP 32015+N-1^ / TCP/UDP 4500+N-1^ - When using Sub-Tunnels, multiple ports are in use (1 for each Sub-Tunnel profile).
- The default UDP data ports used when using (N number of Sub-Tunnel profiles) are: 4500…4500+N-1, or (when port 4500 is in use by IPsec or L2TP/IPsec) 32015… 32015+N-1".

Appendix C: Declaration

Federal Communication Commission Interference Statement

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 it is not installed and used in accordance with the instruction manual, it 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.
Any changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.
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.

Radiation Exposure Statement
This equipment complies with FCC RF 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.

Professional Installation Instruction
This product must be installed only by personnel who have completed Peplink training and obtained Peplink certification. The general user shall not attempt to install or change the settings