



Pepwave Surf SOHO User Manual

Pepwave Product:

Surf SOHO

Pepwave Firmware 7

January 2017

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1 Introduction and Scope

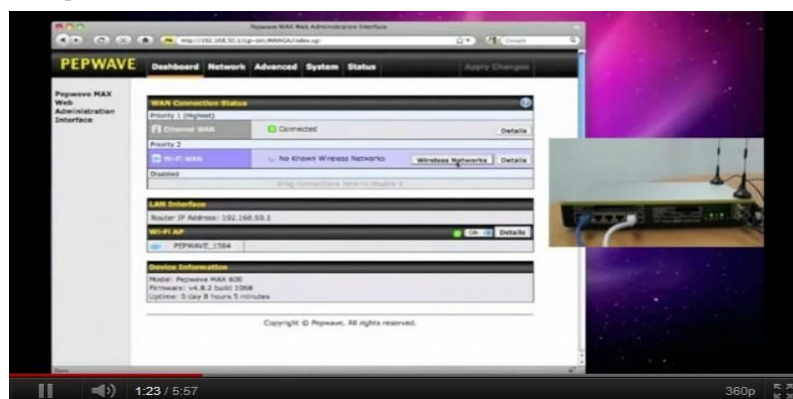
The Surf SOHO is a professional-grade router that is secure, reliable, and easy to use.

With the Surf SOHO, you can connect to the Internet using a USB cellular modem, Ethernet, or Wi-Fi. Hook the Surf SOHO up to Ethernet and Cellular connections, and it will automatically fail over from one to the other as needed. That way, you can stay connected even when a connection breaks

This manual covers setting up Surf SOHO router and provides an introduction to their features and usage.

Tips

Want to know more about Pepwave routers? Visit our [YouTube Channel](#) for a [video introduction](#)!



<http://youtu.be/UCkVQThLKO4>

2 Glossary

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

3G	3rd Generation standards for wireless communications
4G	4th Generation standards for wireless communications
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
EVDO	Evolution-Data Optimized
HSDPA	High-Speed Downlink Packet Access
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

3 Product Features

Pepwave routers enable all LAN users to share broadband Internet connections, and they provide advanced features to enhance Internet access. Our Surf SOHO routers support one Ethernet, one USB 4G LTE/3G WAN, and Wi-Fi as WAN for failover

It also includes three SMA dual-band antennas that allows better reliability, larger bandwidth, and increased wireless coverage.

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

3.1 Supported Network Features

3.1.1 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 pass through
- Intelligent Failover
- 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

3.1.2 LAN

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

3.1.3 VPN

- Site-to-Site VPN
- 256-bit AES Encryption
- Dynamic Routing
- Pre-shared key authentication
- PPTP/L2TP VPN server

3.1.4 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

3.1.5 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

3.1.6 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

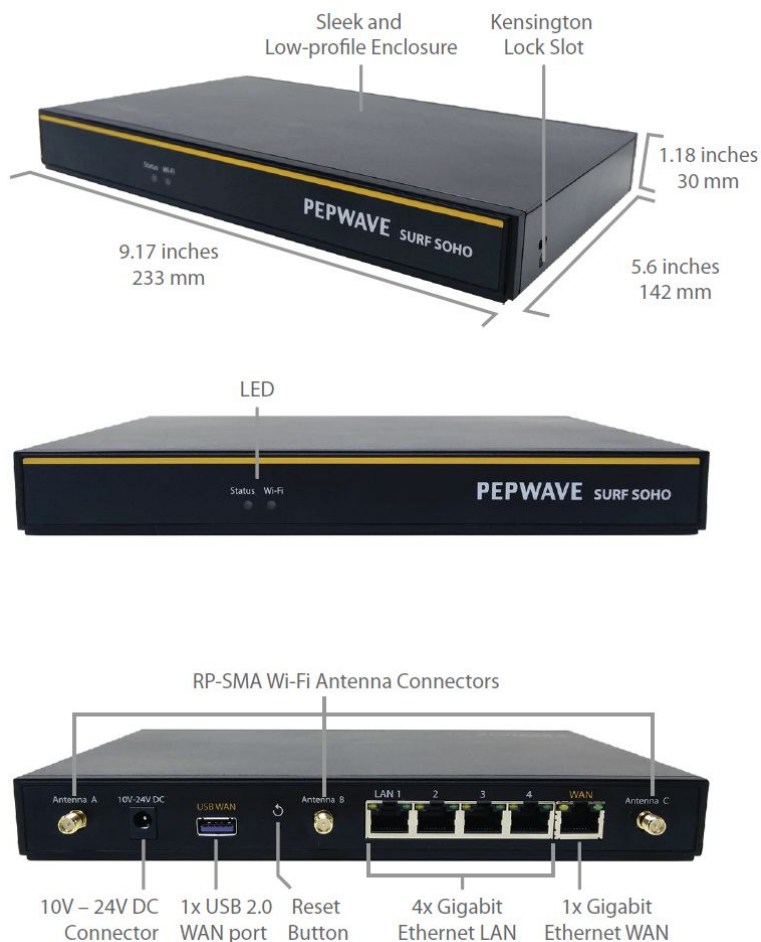
3.2 Other Supported Features

- User-friendly web-based administration interface
- HTTP and HTTPS support for web admin interface
- 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 for web admin
- Shared IP drop-in mode
- Authentication and accounting by RADIUS server for web admin
- Syslog
- SIP passthrough
- PPTP packet pass through
- Event log
- Active sessions
- Client list
- UPnP / NAT-PMP
- Real-time, hourly, daily, and monthly bandwidth usage reports and charts
- IPv6 support

4 Pepwave Surf SOHO Router Overview

4.1 Surf SOHO

4.1.1 Panel Appearance



Specifications

WAN Interface

1x 100/1000M Ethernet Port
1x USB 2.0 Interface
Wi-Fi as WAN

LAN Interface

4x 100/1000M Ethernet Ports
Simultaneous Dual-Band 11ac Wi-Fi AP

Wi-Fi AP Operating Frequency

2412 – 2472 MHz and
5180 - 5825 MHz

Wi-Fi Antenna	3x External Wi-Fi Antenna
Recommended Users	1-25
Router Throughput	120Mbps
Number of PPTP VPN Users	3
Number of PPTP VPN Users	2
Power Input	DC Jack: 10V – 24VDC AC Adapter: AC Input 100V – 240V, DC Output 12V, 1.5A
Power Consumption	26W (max) with USB WAN 22W (max) without USB WAN
Dimensions	9.17 x 5.6 x 1.18 inch 233 x 142 x 30 mm
Weight	0.86 pounds 388 grams
Operating Temperature	-14° – 113°F -10° – 45°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS
Warranty	1-Year Limited Warranty

4.1.2 LED Indicators

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

Wi-Fi and Status Indicators		
Wi-Fi	OFF	Disabled Intermittent

Status	Blinking	Enabled but no client connected
	ON	Client(s) connected to wireless network
	Continuous blinking	Transferring data to wireless network
	OFF	System initializing
	Red	Booting up or busy
	Green	Ready state

LAN and Ethernet WAN Ports

Green LED	ON	10 / 100 / 1000 Mbps
Orange LED	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port type	Auto MDI/MDI-X ports	

Wi-Fi Signal

Off	No connection
Signal strength	Wi-Fi signal strength (low, medium, and high)

5 Advanced Feature Summary

5.1 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.

5.2 USB Modem



For increased WAN diversity, plug in a USB LTE modem as backup. Peplink routers are compatible with over [200 modem types](#).

5.3 Built-In Remote User VPN Support



Use 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 full instructions on setting up L2TP with IPsec.](#)

6 Installation

The following section details connecting Pepwave routers to your network.

6.1 Preparation

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

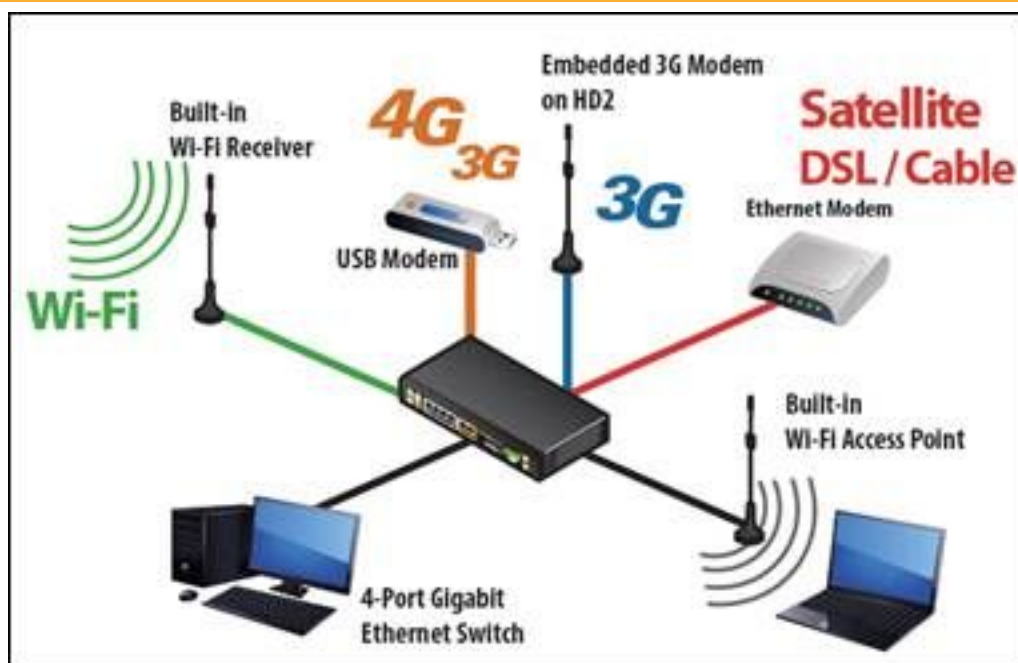
- At least one Internet/WAN access account and/or Wi-Fi access information
- Depending on network connection type(s), one or more of the following:
 - **Ethernet WAN:** A 10/100/1000BaseT UTP cable with RJ45 connector
 - **USB:** A USB modem
 - **Embedded modem:** A SIM card for GSM/HSPA service
 - **Wi-Fi WAN:** Wi-Fi antennas
 - **PC Card/Express Card WAN:** A PC Card/ExpressCard for the corresponding card slot
- A computer installed with the TCP/IP network protocol and a supported web browser. Supported browsers include Microsoft Internet Explorer 8.0 or above, Mozilla Firefox 10.0 or above, Apple Safari 5.1 or above, and Google Chrome 18 or above.

6.2 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 Pepwave router. Repeat with different cables for up to 4 computers to be connected.
2. With another Ethernet cable or a USB modem/Wi-Fi antenna/PC Card/Express Card, connect to one of the WAN ports on the Pepwave router. Repeat the same procedure for other WAN ports.
3. Connect the power adapter to the power connector on the rear panel of the Pepwave router, and then plug it into a power outlet.

The following figure schematically illustrates the resulting configuration:



6.3 Configuring the Network Environment

To ensure that the Pepwave 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.

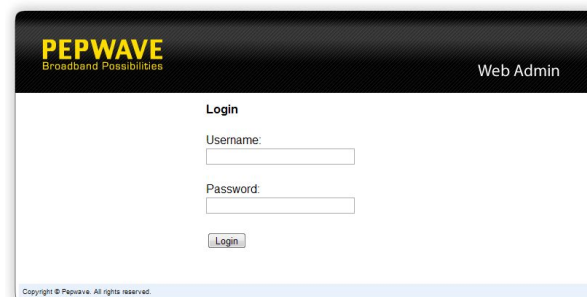
For advanced configuration, go to Section 9.2, Captive Portal.

7 Connecting to the Web Admin Interface

1. Start a web browser on a computer that is connected with the Pepwave 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 Pepwave routers.)



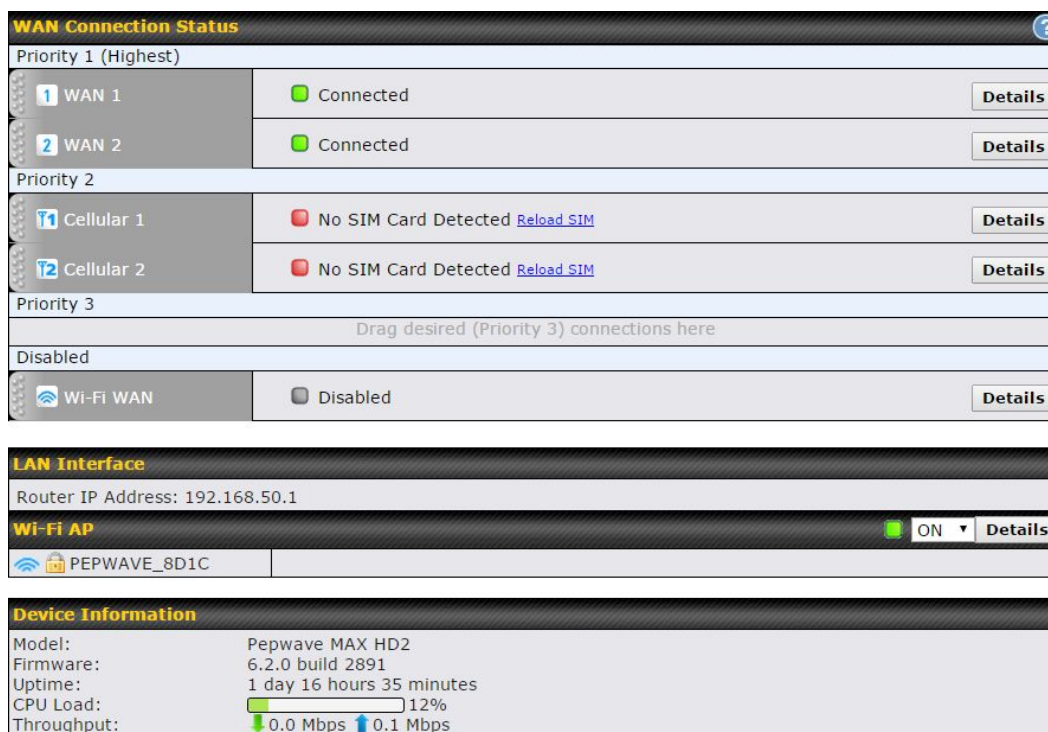
- Enter the following to access the web admin interface.

Username: admin

Password: admin

(This is the default username and password for Pepwave routers. The admin and read-only user passwords can be changed at **System>Admin Security**.)

- After successful login, the **Dashboard** will be displayed.



WAN Connection Status

Priority 1 (Highest)

1 WAN 1	Connected	Details
2 WAN 2	Connected	Details

Priority 2

1 Cellular 1	No SIM Card Detected Reload SIM	Details
2 Cellular 2	No SIM Card Detected Reload SIM	Details

Priority 3

Drag desired (Priority 3) connections here

Disabled

Wi-Fi WAN	Disabled	Details
-----------	----------	-------------------------

LAN Interface

Router IP Address: 192.168.50.1

Wi-Fi AP ON [Details](#)

PEPWAVE_8D1C

Device Information

Model:	Pepwave MAX HD2
Firmware:	6.2.0 build 2891
Uptime:	1 day 16 hours 35 minutes
CPU Load:	12%
Throughput:	0.0 Mbps ↑ 0.1 Mbps

The **Dashboard** shows current WAN, LAN, and Wi-Fi AP statuses. Here, you can change WAN connection priority and switch on/off the Wi-Fi AP.

Device Information displays details about the device, including model name, firmware version, and uptime.

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.

8 Configuring the LAN Interface(s)

8.1 Network Settings

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

LAN	VLAN	Network	
LAN	None	172.16.251.1/24	
VLAN1	1	2.2.2.2/24	
VLAN2	2	3.3.3.3/24	
New LAN			

This represents the LAN interfaces that are active on your router (including VLAN). A grey “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 grey “X”.

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

Clicking any of the existing LAN interfaces (or creating a new one) will result in the following

IP Settings 		
IP Address	<input type="text" value="192.168.50.1"/>	<input type="text" value="255.255.255.0 (/24)"/> ▼

IP Settings

IP Address

The IP address and subnet mask of the Pepwave router on the LAN.

Network Settings	
Name	<input type="text"/>
VLAN ID	<input type="text"/>
Inter-VLAN routing	<input checked="" type="checkbox"/>
Captive Portal	<input type="checkbox"/>



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.

DHCP Server Settings			
DHCP Server	<input checked="" type="checkbox"/>	Enable	
IP Range	<input type="text" value="192.168.50.10"/>	-	<input type="text" value="192.168.50.250"/>
Subnet Mask	<input type="text" value="255.255.255.0"/>	(/24)	
Lease Time	<input type="text" value="1"/>	Days	<input type="text" value="0"/> Hours <input type="text" value="0"/> Mins
DNS Servers	<input checked="" type="checkbox"/>	Assign DNS server automatically	
WINS Server	<input checked="" type="checkbox"/>	Assign WINS server	
	<input checked="" type="radio"/>	Built-in <input type="radio"/> External	
BOOTP	<input checked="" type="checkbox"/>	Server IP Address: <input type="text"/>	
		Boot File: <input type="text"/>	
		Server Name: <input type="text"/> (Optional)	
Extended DHCP Option	<input type="text"/>	Option	Value
		No Extended DHCP Option	
		<input type="button" value="Add"/>	
DHCP Reservation	<input type="text"/>	Name	MAC Address
			Static IP
			<input type="button" value="+"/>

DHCP Server Settings

DHCP Server	When this setting is enabled, the 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 Pepwave router's DHCP server can prevent IP address collision on the LAN.
--------------------	---

IP Range & Subnet Mask	These settings allocate a range of IP addresses that will be assigned to LAN computers by the Pepwave 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 the lease time, the assigned IP address will no longer be valid and renewal of the IP address assignment will be required.
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 Pepwave router's built-in DNS server address (i.e., LAN IP address) will be offered.
WINS Server	<p>This option allows you to optionally specify a Windows Internet Name Service (WINS) server. You may choose to use the built-in WINS server or external WINS servers.</p> <p>When this unit is connected using SpeedFusion™, other VPN peers can share this unit's built-in WINS server by entering this unit's LAN IP address in their DHCP WINS Server setting. Afterward, all PC clients in the VPN can resolve the NetBIOS names of other clients in remote peers. If you have enabled this option, a list of WINS clients will be displayed at Status>WINS Clients.</p>
BOOTP	Check this box to enable BOOTP on older networks that still require it.
Extended DHCP Option	<p>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 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.</p>
DHCP Reservation	<p>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.</p> <p>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 client information can be imported from the Client List, located at Status>Client List. For more details, please refer to Section 22.3.</p>

LAN Physical Settings	
Speed	Auto ▼

LAN Physical Settings

Speed

This is the port speed of the LAN interface. It should be set to the same speed as the connected device to avoid port negotiation problems. When a static speed is set, you may choose whether to advertise its speed to the peer device. **Auto** is selected by default. You can choose not to advertise the port speed if the port has difficulty negotiating with the peer device.



Static Route Settings			
Static Route	?	Destination Network	Subnet Mask
			255.255.255.0 (/24) ▼
		Gateway	+

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.

DNS Proxy Settings ?			
Enable		<input checked="" type="checkbox"/>	
DNS Caching	?	<input type="checkbox"/>	
Include Google Public DNS Servers	?	<input type="checkbox"/>	
Local DNS Records	?	Host Name	IP Address
DNS Resolvers	?	Connection	
		Current Status	
		<input type="checkbox"/> WAN 1	10.88.3.1
		<input type="checkbox"/> WAN 2	
		<input type="checkbox"/> Wi-Fi WAN	
		<input type="checkbox"/> Cellular 1	
		<input type="checkbox"/> Cellular 2	
		<input type="checkbox"/> USB	
		Connection	
		DNS Servers	
<input type="checkbox"/> LAN			
Preferred connections are shown with <input checked="" type="checkbox"/>			

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 Pepwave router, the corresponding IP address will be returned. Press  to create a new record. Press  to remove a record.
DNS Resolvers ^A	Check the box to enable the WINS server. A list of WINS clients will be displayed at Network>LAN>DNS Proxy Settings>DNS Resolvers . This field specifies which DNS resolvers will receive forwarded DNS requests. If no WAN/VPN/LAN DNS resolver is selected, all of the WAN's DNS resolvers will be selected. If a SpeedFusion™ peer is selected, you may enter the VPN peer's DNS resolver IP address(es). Queries will be forwarded to the selected connections' resolvers. If all of the selected connections are down, queries will be forwarded to all resolvers on healthy WAN connections.

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

To enable VLAN configuration, click the  button in the **IP Settings** section.



To add a new LAN, click the **New LAN** button. To change LAN settings, click the name of the LAN to change under the **LAN** heading.



The following settings are displayed when creating a new LAN or editing an existing LAN.

LAN**IP Settings**

IP Address

 255.255.255.0 (/24) ▼**IP Settings****IP Address &
Subnet Mask**

Enter the Pepwave router's IP address and subnet mask values to be used on the LAN.

Network Settings

Name

VLAN ID

Inter-VLAN routing



Captive Portal

**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.

DHCP Server Settings											
DHCP Server	 <input checked="" type="checkbox"/> Enable										
IP Range	<input type="text"/> - <input type="text"/> 255.255.255.0 (/24) ▼										
Lease Time	1 Days 0 Hours 0 Mins										
DNS Servers	<input checked="" type="checkbox"/> Assign DNS server automatically										
WINS Servers	<input type="checkbox"/> Assign WINS server										
BOOTP	<input type="checkbox"/>										
Extended DHCP Option	<table border="1"> <thead> <tr> <th>Option</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td colspan="2">No Extended DHCP Option</td> </tr> <tr> <td colspan="2" style="text-align: center;">Add</td> </tr> </tbody> </table>			Option	Value	No Extended DHCP Option		Add			
Option	Value										
No Extended DHCP Option											
Add											
DHCP Reservation	 <table border="1"> <thead> <tr> <th>Name</th> <th>MAC Address</th> <th>Static IP</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td style="text-align: center;">+</td> </tr> </tbody> </table>			Name	MAC Address	Static IP					+
Name	MAC Address	Static IP									
			+								

DHCP Server Settings

DHCP Server

When this setting is enabled, the Pepwave 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 Pepwave 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.

IP Range & Subnet Mask

These settings allocate a range of IP address that will be assigned to LAN computers by the Pepwave 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 Pepwave router's built-in DNS server address (i.e., LAN IP address) will be offered.

WINS Servers

This option allows you to specify the Windows Internet Name Service (WINS) server. You may choose to use the built-in WINS server or external WINS servers. When this unit is connected using SpeedFusion™, other VPN peers can share this unit's built-in WINS server by entering this unit's LAN IP address in their **DHCP WINS Servers** setting. Therefore, all PC clients in the VPN can resolve the NetBIOS names of other clients in remote peers. If you have enabled this option, a list of WINS clients will be displayed at **Status>WINS Clients**.

BOOTP

Check this box to enable BOOTP on older networks that still require it.

Extended DHCP



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


Option




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**.

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

DHCP Relay Settings	
DHCP Relay	 <input checked="" type="checkbox"/> Enable
DHCP Server IP Address	 DHCP Server 1: <input type="text"/> DHCP Server 2: <input type="text"/>
DHCP Option 82	 <input type="checkbox"/>

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

DCHP 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.

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

8.2 Port Settings

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

Port Settings					
Port Name	Enable	Speed	Advertise Speed	Port Type	VLAN
LAN Port 1	<input checked="" type="checkbox"/>	Auto ▼	<input checked="" type="checkbox"/>	Trunk ▼	Any ▼
LAN Port 2	<input checked="" type="checkbox"/>			Trunk ▼	Any ▼
LAN Port 3	<input checked="" type="checkbox"/>			Trunk ▼	Any ▼
LAN Port 4	<input checked="" type="checkbox"/>			Trunk ▼	Any ▼

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, can well as which VLAN each link belongs to, if any.

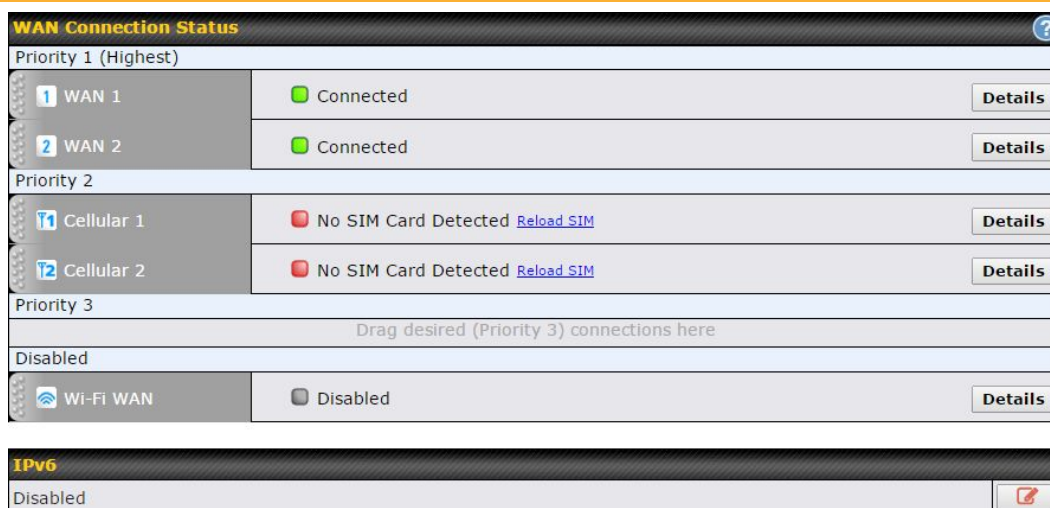
LAN Physical Settings

Speed

This is the port speed of the LAN interface. It should be set to the same speed as the connected device to avoid port negotiation problems. When a static speed is set, you may choose whether to advertise its speed to the peer device. **Auto** is selected by default. You can choose not to advertise the port speed if the port has difficulty negotiating with the peer device.

9 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 disable 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 **Details** 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.

9.1 Ethernet WAN

From **Network>WAN**, choose a WAN connection and then click **Details**.










WAN Port	
WAN Connection Name	WAN 1 Default
Schedule	Always on ▼
Connection Method	? DHCP ▼
Routing Mode	? <input checked="" type="radio"/> NAT
IP Address	10.10.12.49
Subnet Mask	255.255.0.0
Default Gateway	10.10.10.1
Uptime	1795 mins
Hostname (Optional)	<input type="text"/> <input type="checkbox"/> Use custom hostname
DNS Servers	<input checked="" type="checkbox"/> Obtain DNS server address automatically 10.10.10.1 <input type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/>

WAN Port (Section 1)

WAN Connection Name	Enter a name to represent this WAN connection.
Schedule	Click the drop-down menu to apply a time schedule to this interface
Connection Method	<p>There are three possible connection methods for Ethernet WAN:</p> <ul style="list-style-type: none">• DHCP• Static IP• PPPoE <p>The connection method and details are determined by, and can be obtained from, the ISP. See the following sections for details on each connection method.</p>
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 text.
IP Address/Subnet Mask/Default Gateway	Enter the WAN IP address and subnet mask, as well as the IP address of the default gateway, in these fields.

Hostname Enter a hostname for this WAN port if needed.

DNS Servers Select a DNS server for this port to use. This port can either be automatically selected or manually designated.

Standby State	 <input checked="" type="radio"/> Remain connected <input type="radio"/> Disconnect
Upstream Bandwidth	 1 <input type="text"/> Gbps ▼
Downstream Bandwidth	 1 <input type="text"/> Gbps ▼
Health Check Settings	
Health Check Method	 PING ▼
PING Hosts	 Host 1: <input type="text"/> 8.8.8.8 Host 2: <input type="text"/> <input type="checkbox"/> Use first two DNS servers as PING Hosts
Timeout	 5 ▼ second(s)
Health Check Interval	 5 ▼ second(s)
Health Check Retries	 3 ▼
Recovery Retries	 3 ▼

WAN Port (Section 2)

Standby State This setting specifies the standby state of the WAN connection. The available options are **Remain connected** and **Disconnect**. The default state is **Remain Connected**.

Upstream Bandwidth This setting specifies the data bandwidth in the outbound direction from the LAN through the WAN interface.

Downstream Bandwidth This setting specifies the data bandwidth in the inbound direction from the WAN interface to the LAN. This value is referenced as the default weight value when using the algorithm **Least Used** or the algorithm **Persistence (Auto)** in outbound policy with **Managed by Custom Rules** chosen..

Health Check Method This setting specifies the health check method for the WAN connection. The value of method can be configured as **Disabled**, **Ping**, **DNS Lookup**, or **HTTP**. The default method is **Disabled**. See **Section 10.4** for configuration details.

PING Hosts These fields are for specifying the target DNS servers where DNS lookups will be sent to for health check.

If the box 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 the connection healthiness. If the box is not checked, the field Host 1 must be filled and the field Host 2 is optional.

The connection is considered to be up if DNS responses are received from any one of the health

	check DNS servers, regardless of whether the result is positive or negative.
Timeout	If a health check test cannot be completed within the specified amount of time, the test will be treated as failed.
Health Check Interval	This is the number of consecutive check failures before treating a connection as down.
Health Check Retries	This is the number of consecutive check failures before treating a connection as down.
Recovery Retries	This is the number of responses required after a health check failure before treating a connection as up again.

Dynamic DNS Service Provider	<input type="text" value="Disabled"/>
Bandwidth Allowance Monitor	<input type="checkbox"/> Enable
Port Speed	<input type="text" value="Auto"/>
MTU	<input type="radio"/> Auto <input checked="" type="radio"/> Custom Value: <input type="text" value="1440"/> <input type="button" value="Default"/>




WAN Port (Section 3)

Dynamic DNS Service Provider	<p>This setting specifies the dynamic DNS service provider to be used for the WAN based on supported dynamic DNS service providers:</p> <ul style="list-style-type: none"> • changeip.com • dyndns.org • no-ip.org • tzo.com • DNS-O-Matic <p>Select Disabled to disable this feature. See Section 9.5 for configuration details.</p>
Bandwidth Allowance Monitor	<p>This option enables bandwidth usage monitoring on this WAN connection for each billing cycle. When this setting is not enabled, each month's bandwidth usage is tracked, but no action will be taken.</p>
Port Speed	<p>This setting specifies port speed and duplex configurations of the WAN port. By default, Auto is selected and the appropriate data speed is automatically detected by the Pepwave router. In the event of negotiation issues, the port speed can be manually specified. You can also choose whether</p>

or not to advertise the speed to the peer by selecting the **Advertise Speed** checkbox.

MTU

This setting specifies the maximum transmission unit. By default, MTU is set to **Custom 1440**. You may adjust the MTU value by editing the text field. Click **Default** to restore the default MTU value. Select **Auto** and the appropriate MTU value will be automatically detected. Auto-detection will run each time the WAN connection establishes.

MSS	 <input checked="" type="radio"/> Auto <input type="radio"/> Custom Value: <input type="text"/>
MAC Address Clone	 00 : 1A : 1A : 1A : 1A : 1A Default
VLAN	<input checked="" type="checkbox"/> VLAN ID: <input type="text"/>
Reply to ICMP PING	 <input checked="" type="radio"/> Yes <input type="radio"/> No
Additional Public IP Address	<div> <div>IP Address <input type="text"/></div> <div>Subnet Mask 255.255.255.0 (/24) ▼</div> </div> <div> <input type="button" value="↓"/> </div> <div> <input type="text"/> </div> <div> <input type="button" value="Delete"/> </div>

WAN Port (Section 4)

MSS

This setting should be configured based on the maximum payload size that the local system can handle. The MSS (maximum segment size) is computed from the MTU minus 40 bytes for TCP over IPv4. If MTU is set to **Auto**, the MSS will also be set automatically. By default, MSS is set to **Auto**.

MAC Address Clone

Some service providers (e.g., cable providers) identify the client's MAC address and require the client to always use the same MAC address to connect to the network. In such cases, change the WAN interface's MAC address to the original client PC's MAC address via this field. The default MAC address is a unique value assigned at the factory. In most cases, the default value is sufficient. Clicking **Default** restores the MAC address to the default value.

VLAN

Click the square if you wish to enable VLAN functionality and enable multiple broadcast domains. Once you enable VLAN, you will be able to enter a name for your network.

Reply to ICMP PING

If this field is disabled, the WAN connection will not respond to ICMP ping requests. By default, this is **enabled**.

Additional Public IP Address

The **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**.



IPv6

IPv6

IPv6 support can be enabled on one of the available Ethernet WAN ports. On this screen, you can choose which WAN will support IPv6. To enable IPv6 support on a WAN, the WAN router must respond to stateless address auto configuration advertisements and DHCPv6 requests. IPv6 clients on the LAN will acquire their IPv6, gateway, and DNS server addresses from it. The device will also acquire an IPv6 address for performing ping/traceroute checks and accepting web admin accesses. Note: This feature is only available on the Pepwave MAX 700, HD2, and HD2 IP67.

9.1.1 DHCP Connection

There are four possible connection methods:

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

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.).



Connection Method	 DHCP
Routing Mode	 NAT
IP Address	10.88.3.158
Subnet Mask	255.255.255.0
Default Gateway	10.88.3.253
Hostname (Optional)	<input type="text"/> <input type="checkbox"/> Use custom hostname
DNS Servers	<input checked="" type="checkbox"/> Obtain DNS server address automatically 10.88.3.1 <input type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/>

DHCP Connection 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	This information is obtained from the ISP automatically.
Hostname (Optional)	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	<p>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.</p> <p>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.)</p> <p>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.</p>

9.1.2 Static IP Connection

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



Connection Method	 Static IP ▾
Routing Mode	 <input checked="" type="radio"/> NAT
IP Address	10.88.3.158
Subnet Mask	255.255.255.0
Default Gateway	10.88.3.253
IP Address	<input type="text"/>
Subnet Mask	255.255.255.0 (/24) ▾
Default Gateway	<input type="text"/>
DNS Servers	<input checked="" type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/>

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.

9.1.3 PPPoE Connection

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



Connection Method	 PPPoE ▼
Routing Mode	 <input checked="" type="radio"/> NAT
IP Address	10.88.3.158
Subnet Mask	255.255.255.0
Default Gateway	10.88.3.253
PPPoE User Name	<input type="text"/>
PPPoE Password	<input type="password"/>
Confirm PPPoE Password	<input type="password"/>
Service Name (Optional)	<input type="text"/> Leave it blank unless it is provided by ISP
IP Address (Optional)	<input type="text"/> Leave it blank unless it is provided by ISP
DNS Servers	<input checked="" type="checkbox"/> Obtain DNS server address automatically 10.88.3.1 <input checked="" type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/>

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.
IP Address / Subnet Mask / Default Gateway	This information is obtained from the ISP automatically.
PPPoE User Name / 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.
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.

9.1.4 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.

Connection Method	 DHCP
Routing Mode	 <input checked="" type="radio"/> NAT
IP Address	10.88.3.158
Subnet Mask	255.255.255.0
Default Gateway	10.88.3.253
Hostname (Optional)	<input type="text"/> <input type="checkbox"/> Use custom hostname
DNS Servers	<input checked="" type="checkbox"/> Obtain DNS server address automatically 10.88.3.1 <input type="checkbox"/> Use the following DNS server address(es) DNS Server 1: <input type="text"/> DNS Server 2: <input type="text"/>

L2TP Settings

L2TP User Name / 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	<p>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.</p> <p>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.)</p> <p>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.</p>

Health Check Settings	
Health Check Method ?	DNS Lookup ▼
Health Check DNS Servers ?	Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as Health Check DNS Servers <input type="checkbox"/> Include public DNS servers
Timeout ?	5 ▼ second(s)
Health Check Interval ?	5 ▼ second(s)
Health Check Retries ?	3 ▼
Recovery Retries ?	3 ▼

Health Check Settings	
Heath Check Method	This setting allows you to specify the health check method for the cellular connection. Available options are Disabled , Ping , DNS Lookup , HTTP , and SmartCheck . The default method is DNS Lookup . See Section 10.4 for configuration details.
Timeout	If a health check test cannot be completed within the specified amount of time, the test will be treated as failed.
Health Check Interval	This is the time interval between each health check test.
Health Check Retries	This is the number of consecutive check failures before treating a connection as down.
Recovery Retries	This is the number of responses required after a health check failure before treating a connection as up again.

Dynamic DNS Settings	
Dynamic DNS Service Provider	Disabled ▼

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:

Service Provider

- changeip.com
- dyndns.org
- no-ip.org
- tzo.com
- DNS-O-Matic

Select **Disabled** to disable this feature. See **Section 9.5** for configuration details.


9.2 Wi-Fi WAN

To access Wi-Fi WAN settings, click **Network>WAN>Details**.

WAN Connection Settings	
WAN Connection Name	Wi-Fi WAN Default
Schedule	Always on ▼
Standby State	<input checked="" type="radio"/> Remain connected <input type="radio"/> Disconnected
MTU	<input type="radio"/> Auto <input checked="" type="radio"/> Custom Value: 1500 Default
Reply to ICMP PING	<input checked="" type="radio"/> Yes <input type="radio"/> No

Wi-Fi Connection Settings	
WAN Connection Name	Enter a name to represent this WAN connection.
Schedule	Click the drop-down menu to apply a time schedule to this interface.
Standby State	This setting specifies the state of the WAN connection while in standby. The available options are Remain Connected (hot standby) and Disconnect (cold standby).
MTU	This setting specifies the maximum transmission unit. By default, MTU is set to Custom 1440 . You may adjust the MTU value by editing the text field. Click Default to restore the default MTU value. Select Auto and the appropriate MTU value will be automatically detected. The auto-detection will run each time the WAN connection establishes
Reply to ICMP	If this setting is disabled, the WAN connection will not respond to ICMP ping requests. By default, this setting is enabled.

PING

Wi-Fi WAN Settings	
Channel Selection	<input checked="" type="radio"/> Auto <input type="radio"/> Custom
Roaming	<input type="checkbox"/>
Connect to Any Open Mode AP 	<input type="radio"/> Yes <input checked="" type="radio"/> No


Wi-Fi WAN Settings

Channel Selection

Determine whether the channel will be automatically selected. If you select custom, the following table will appear:



Scan Channels	
Scan Channels	<div> <input type="button" value="Clear"/> <input type="button" value="All"/> </div> <div> 2.4GHz: <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 6 <input checked="" type="checkbox"/> 7 <input checked="" type="checkbox"/> 8 <input checked="" type="checkbox"/> 9 <input checked="" type="checkbox"/> 10 <input checked="" type="checkbox"/> 11 </div>
<div> <input type="button" value="OK"/> <input type="button" value="Cancel"/> </div>	

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.

Bandwidth Allowance Monitor	
Bandwidth Allowance Monitor 	<input checked="" type="checkbox"/> Enable
Action 	Email notification is currently disabled. You can get notified when usage hits 75%/95% of monthly allowance by enabling Email Notification . <input checked="" type="checkbox"/> Disconnect when usage hits 100% of monthly allowance
Start Day	On <input type="text" value="1st"/> of each month at 00:00 midnight
Monthly Allowance	<input type="text"/> MB <input type="button" value="v"/>

Bandwidth Allowance Monitor

Action If **Error! Reference source not found.** 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.

Health Check Settings	
Health Check Method	? DNS Lookup ▼
Health Check DNS Servers	? Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as Health Check DNS Servers <input type="checkbox"/> Include public DNS servers
Timeout	? 5 ▼ second(s)
Health Check Interval	? 5 ▼ second(s)
Health Check Retries	? 3 ▼
Recovery Retries	? 3 ▼

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

Health Check Settings	
Health Check Method	? Disabled ▼ <small>Health Check disabled. Network problem cannot be detected.</small>

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

Health Check Method	 PING ▼
PING Hosts	 Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as PING Hosts

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

Health Check Method	 DNS Lookup ▼
Health Check DNS Servers	 Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as Health Check DNS Servers <input type="checkbox"/> Include public DNS servers

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

Health Check Method	 HTTP ▼
URL 1	 http:// <input type="text"/> Matching String: <input type="checkbox"/>
URL 2	 http:// <input type="text"/> Matching String: <input type="checkbox"/>

HTTP connections will be issued to test connectivity with configurable URLs and strings to match.

URL1

WAN Settings>WAN Edit>Health Check Settings>URL1

The URL will be retrieved when performing an HTTP health check. When **String to Match** is left blank, a health check will pass if the HTTP return code is between 200 and 299 (Note: HTTP redirection codes 301 or 302 are treated as failures). When **String to Match** is filled, a health check will pass if the HTTP return code is between 200 and 299 and if the HTTP response content contains the 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	 5 ▼ second(s)
Health Check Interval	 5 ▼ second(s)
Health Check Retries	 3 ▼
Recovery Retries	 3 ▼

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 Balance 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 Balance 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.

Dynamic DNS Settings	
Service Provider	DNS-O-Matic
Username	
Password	
Confirm Password	
Update All Hosts	<input type="checkbox"/>
Hosts / IDs	

Dynamic DNS Settings

Service Provider

This setting specifies the dynamic DNS service provider to be used for the WAN. Supported providers are:

- changeip.com
- dyndns.org
- no-ip.org
- tzo.com
- DNS-O-Matic

Select **Disabled** to disable this feature.

User ID / User / Email

This setting specifies the registered user name for the dynamic DNS service.

Password / Pass / TZO Key

This setting specifies the password for the dynamic DNS service.

Update All Hosts

Check this box to automatically update all hosts.

Hosts / Domain

This setting specifies a list of hostnames or domains to be associated with the public Internet IP address of the WAN connection.

Important Note

In order to use dynamic DNS services, appropriate hostname registration(s), as well as a valid account with a supported

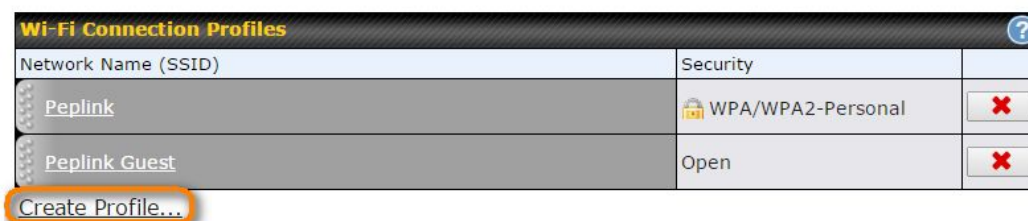
dynamic DNS service provider, are required.

A dynamic DNS update is performed whenever a WAN's IP address is changed, such as when an IP is changed after a DHCP IP refresh or reconnection.

Due to dynamic DNS service providers' policies, a dynamic DNS host expires automatically when the host record has not been not updated for a long time. Therefore, the Peplink Balance performs an update every 23 days, even if a WAN's IP address did not change.

9.2.1 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>WAN>Details>Create Profile...** to get started.



This will open a window similar to the one shown below:



Wi-Fi Connection Profile Settings

Type

Select whether the network will connect automatically or manually.

Network Name (SSID) Enter a name to represent this Wi-Fi connection.

This option allows you to select which security policy is used for this wireless network.
Available options:

- **Open**

Security	Open ▼
----------	--------

- **WEP**

Security	WEP ▼
Encryption Key	<input type="text"/> <input checked="" type="checkbox"/> Hide Characters

- **WPA/WPA2 – Personal**

Security	WPA/WPA2-Personal ▼
Shared Key	<input type="text"/> <input checked="" type="checkbox"/> Hide Characters

- **WPA/WPA2 – Enterprise**

Security	WPA/WPA2-Enterprise ▼
Login ID	<input type="text"/>
Password	<input type="text"/>
Confirm Password	<input type="text"/>
EAP Method	PEAP ▼
EAP Phase 2 Method	EAP/CHAP ▼
EAP outer authentication identity	<input checked="" type="radio"/> Anonymous <input type="radio"/> User Credentials <input type="radio"/> Other: <input type="text"/>

9.3 WAN Health Check

To ensure traffic is routed to healthy WAN connections only, the Pepwave 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>Details**.

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

Health Check Method	 Disabled
Health Check disabled. Network problem cannot be detected.	

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

Health Check Method	 PING
PING Hosts	 Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as PING Hosts

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

Health Check Method	 DNS Lookup
Health Check DNS Servers	 Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as Health Check DNS Servers <input type="checkbox"/> Include public DNS servers

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

Health Check Method	 HTTP
URL 1	 http:// <input type="text"/> Matching String: <input type="checkbox"/>
URL 2	 http:// <input type="text"/> Matching String: <input type="checkbox"/>

HTTP connections will be issued to test connectivity with configurable URLs and strings to match.

URL1





WAN Settings>WAN Edit>Health Check Settings>URL1

The URL will be retrieved when performing an HTTP health check. When **String to Match** is left blank, a health check will pass if the HTTP return code is between 200 and 299 (Note: HTTP redirection codes 301 or 302 are treated as failures). When **String to Match** is filled, a health check will pass if the HTTP return code is between 200 and 299 and if the HTTP response content contains the 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.

Timeout	 10 <input type="text"/> second(s)
Health Check Interval	 5 <input type="text"/> second(s)
Health Check Retries	 3 <input type="text"/>
Recovery Retries	 3 <input type="text"/>

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

This setting specifies the number of consecutive ping/DNS lookup timeouts after which the

Retries


Pepwave 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 Pepwave 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 Pepwave 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.**

9.4 Dynamic DNS Settings

Pepwave 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 Pepwave 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 Service Provider	<input type="text" value="changeip.com"/>
User ID	<input type="text"/>
Password	<input type="password"/>
Confirm Password	<input type="password"/>
Hosts	<input type="text"/>

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:

- changeip.com
- dyndns.org
- no-ip.org
- tzo.com
- 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.

Account Name / Email Address

This setting specifies the registered user name for the dynamic DNS service.

Password / TZO Key

This setting specifies the password for the dynamic DNS service.

Hosts / Domain

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 Pepwave router performs an update every 23 days, even if a WAN's IP address has not changed.

10 PepVPN

To configure PepVPN and SpeedFusion, navigate to **Advanced>PepVPN**

PepVPN



InControl management enabled. Settings can now be configured on [InControl](#).

Profile	Remote ID	Remote Address(es)	?
No VPN Connection Defined			
<input type="button" value="New Profile"/>			

Send All Traffic To	
No PepVPN profile selected	

Rules Drag and drop rows to change rule order						?
Service	Algorithm	Source	Destination	Protocol / Port		
HTTPS Persistence	Persistence (Src) (Auto)	Any	Any	TCP 443		
<input type="button" value="Add Rule"/>						

PepVPN Local ID			?
Local ID		SURF-SOHO-F385	

PepVPN Settings		?
Link Failure Detection Time	<input checked="" type="radio"/> Recommended (Approx. 15 secs) <input type="radio"/> Fast (Approx. 6 secs) <input type="radio"/> Faster (Approx. 2 secs) <input type="radio"/> Extreme (Under 1 sec) Shorter detection time incurs more health checks and higher bandwidth overhead	
<input type="button" value="Save"/>		

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>PepVPN** 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 Pepwave or Peplink device.

PepVPN Profile					
Name	<input type="text"/>				
Active	<input checked="" type="checkbox"/>				
Encryption	<input checked="" type="radio"/> 256-bit AES <input type="radio"/> OFF				
Authentication	<input checked="" type="radio"/> Remote ID / Pre-shared Key <input type="radio"/> X.509				
Remote ID / Pre-shared Key	<table border="1"> <thead> <tr> <th>Remote ID</th> <th>Pre-shared Key</th> </tr> </thead> <tbody> <tr> <td><input type="text"/></td> <td><input type="text"/></td> </tr> </tbody> </table>	Remote ID	Pre-shared Key	<input type="text"/>	<input type="text"/>
Remote ID	Pre-shared Key				
<input type="text"/>	<input type="text"/>				
NAT Mode	<input type="checkbox"/>				
Remote IP Address / Host Names (Optional)	<input type="text"/> <small>If this field is empty, this field on the remote unit must be filled</small>				
Cost	<input type="text" value="10"/>				
Data Port	<input checked="" type="radio"/> Auto <input type="radio"/> Custom <input type="text"/>				
Bandwidth Limit	<input type="checkbox"/>				
WAN Smoothing	<input type="text" value="Off"/>				
Use IP ToS	<input type="checkbox"/>				
Latency Difference Cutoff	<input type="text" value="500"/> ms				

Click the **Save** button to create and save a new VPN connection profile for making a VPN connection.

PepVPN 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 ().
Active	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 . 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 Balance'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.
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 Balance will initiate connection to each of the remote IP addresses until it succeeds in making a connection. If the field is empty, the Peplink Balance 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.
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.
Bandwidth Limit	Define maximum download and upload speed to each individual peer. This functionality requires the peer to use PepVPN version 4.0.0 or above.
Cost	Define path cost for this profile. OSPF will determine the best route through the network using the assigned cost. Default: 10

10.1 Outbound Policy Management

Pepwave 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>PepVPN**, depending on the model.

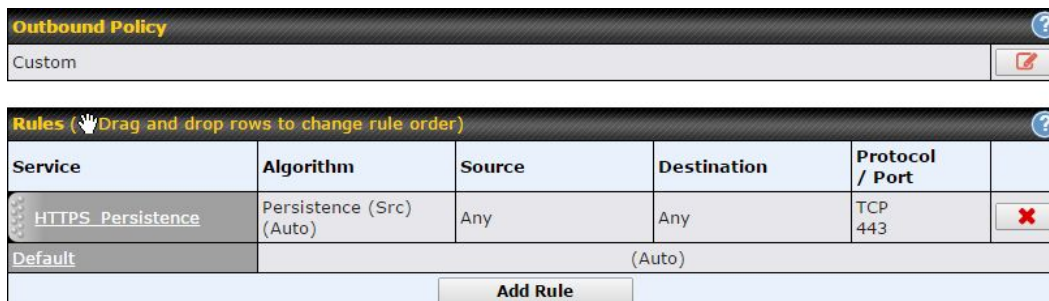


Service	Algorithm	Source	Destination	Protocol / Port
HTTPS Persistence	Persistence (Src) (Auto)	Any	Any	TCP 443
Default	(Auto)			

10.1.1 Outbound Policy

Outbound policies for managing and load balancing outbound traffic are located at

Network>Outbound Policy  or **Advanced>PepVPN>Outbound Policy**.



Service	Algorithm	Source	Destination	Protocol / Port
HTTPS Persistence	Persistence (Src) (Auto)	Any	Any	TCP 443
Default	(Auto)			

There are three main selections for the outbound traffic policy:

- High Application Compatibility
- Normal Application Compatibility
- Custom

Outbound Policy Settings

High Application Compatibility

Outbound traffic from a source LAN device is routed through the same WAN connection regardless of the destination Internet IP address and protocol. This option provides the highest application compatibility.

Normal Application Compatibility

Outbound traffic from a source LAN device to the same destination Internet IP address will be routed through the same WAN connection persistently, regardless of protocol. This option provides high compatibility to most applications, and users still benefit from WAN link load balancing when multiple Internet servers are accessed.

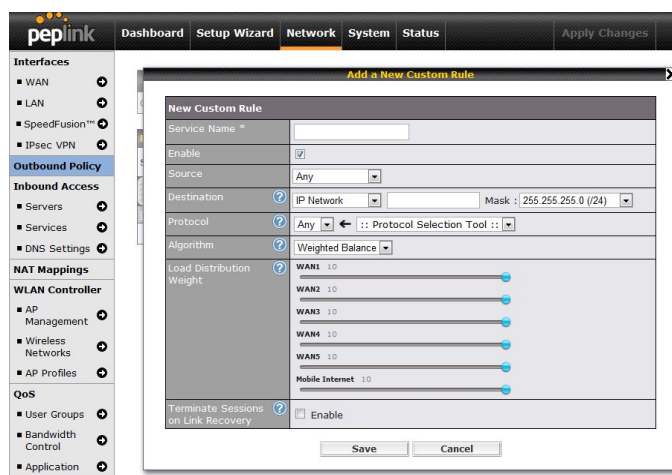
Custom

Outbound traffic behavior can be managed by defining rules in a custom rule table. A default rule can be defined for connections that cannot be matched with any of the rules.

The default policy is **Normal Application Compatibility**.


Tip

Want to know more about creating outbound rules? Visit our [YouTube Channel](#) for a video tutorial!



http://youtu.be/rKH4AS_bQnE

10.1.2 Custom Rules for Outbound Policy

Click  in the **Outbound Policy** form. Choose **Custom** and press the **Save** button.

Outbound Policy
?

Custom
✎

Rules ⏏ Drag and drop rows to change rule order
?

Service	Algorithm	Source	Destination	Protocol / Port	
HTTPS Persistence	Persistence (Src) (Auto)	Any	IP Network 192.168.50.0/24	TCP 443	✖
PepVPN Routes					
Default	(Auto)				
Add Rule					

Expert Mode
?

Enabled
✎

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.

Edit Default Custom Rule
✕

Default Rule ?
☒ Custom
☐ Auto

Algorithm ?
Weighted Balance ▼

Load Distribution Weight ?

WAN 1 10

WAN 2 10

Wi-Fi WAN 10

Cellular 1 10

Cellular 2 10

USB 10

Terminate Sessions on Link Recovery ?
☐ Enable

Save Cancel

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. Note that some Pepwave routers display this button at **Advanced>PepVPN>PepVPN Outbound Custom Rules**.

Add a New Custom Rule

Service Name *	<input type="text"/>		
Enable	<input checked="" type="checkbox"/> Always on ▾		
Source	Any ▾		
Destination	<input type="text"/> IP Network ▾ <input type="text"/> 255.255.255.0 (/24) ▾	Mask:	<input type="text"/>
Protocol	Any ▾ ◀ :: Protocol Selection Tool :: ▾		
Algorithm	Weighted Balance ▾		
Load Distribution Weight	<div>WAN 1 10 <input type="range"/></div> <div>WAN 2 10 <input type="range"/></div> <div>Wi-Fi WAN 10 <input type="range"/></div> <div>Cellular 1 10 <input type="range"/></div> <div>Cellular 2 10 <input type="range"/></div> <div>USB 10 <input type="range"/></div>		
Terminate Sessions on Link Recovery	<input type="checkbox"/> Enable		

Save
Cancel

New Custom Rule Settings

Service Name	This setting specifies the name of the outbound traffic rule.
Enable	<p>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 Pepwave router based on the other parameters of the rule. When Enable is unchecked, the rule does not take effect: the Pepwave router disregards the other parameters of the rule.</p> <p>Click the drop-down menu next to the checkbox to apply a time schedule to this custom rule.</p>
Source	This setting specifies the source IP address, IP network, or MAC address for traffic that matches the rule.
Destination	This setting specifies the destination IP address, IP network, or domain name for traffic that matches the rule.

Destination	Domain Name
Protocol	Any
Algorithm	IP Address
	IP Network
	Domain Name

If **Domain Name** is chosen and a domain name, such as *foobar.com*, is entered, any outgoing accesses to *foobar.com* and **foobar.com* will match this criterion. You may enter a wildcard (.) at the end of a domain name to match any host with a name having the domain name in the middle. If you enter *foobar.**, for example, *www.foobar.com*, *www.foobar.co.jp*, or *foobar.co.uk* will also match. Placing wildcards in any other position is not supported.

NOTE: if a server has one Internet IP address and multiple server names, and if one of the names is defined here, accesses to any one of the server names will also match this rule.

Protocol and Port

This setting specifies the IP protocol and port of traffic that matches this rule.

Algorithm

This setting specifies the behavior of the Pepwave router for the custom rule.

One of the following values can be selected (note that some Pepwave routers provide only some of these options):

- Weighted Balance
- Persistence
- Enforced
- Priority
- Overflow
- Least Used
- Lowest Latency

The upcoming sections detail the listed algorithms.

Terminate Sessions on Link 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 **Weighted**, **Persistence**, and **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.

11 Port Forwarding

Pepwave 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 Pepwave router. Inbound port forwarding rules can be defined at **Advanced>Port Forwarding**.

Service	IP Address(es)	Server	Protocol
No Services Defined			
Add Service			

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

Enable	<input checked="" type="radio"/> Yes <input type="radio"/> No																												
Service Name	<input type="text" value="Service_1"/>																												
IP Protocol	<input type="button" value="TCP"/> <input type="button" value="←"/> <input type="button" value=":: Protocol Selection Tool ::"/> <input type="button" value="▼"/>																												
Port	<input type="button" value="Any Port"/> <input type="button" value="▼"/>																												
Inbound IP Address(es) (Require at least one IP address)	<table> <tr> <th colspan="2">Connection / IP Address(es)</th><th>All</th><th>Clear</th></tr> <tr> <td><input checked="" type="checkbox"/> WAN 1</td><td><input checked="" type="checkbox"/> 10.88.3.158 (Interface IP)</td><td></td><td></td></tr> <tr> <td><input type="checkbox"/> WAN 2</td><td></td><td></td><td></td></tr> <tr> <td><input type="checkbox"/> Wi-Fi WAN</td><td></td><td></td><td></td></tr> <tr> <td><input type="checkbox"/> Cellular 1</td><td></td><td></td><td></td></tr> <tr> <td><input type="checkbox"/> Cellular 2</td><td></td><td></td><td></td></tr> <tr> <td><input type="checkbox"/> USB</td><td></td><td></td><td></td></tr> </table>	Connection / IP Address(es)		All	Clear	<input checked="" type="checkbox"/> WAN 1	<input checked="" type="checkbox"/> 10.88.3.158 (Interface IP)			<input type="checkbox"/> WAN 2				<input type="checkbox"/> Wi-Fi WAN				<input type="checkbox"/> Cellular 1				<input type="checkbox"/> Cellular 2				<input type="checkbox"/> USB			
Connection / IP Address(es)		All	Clear																										
<input checked="" type="checkbox"/> WAN 1	<input checked="" type="checkbox"/> 10.88.3.158 (Interface IP)																												
<input type="checkbox"/> WAN 2																													
<input type="checkbox"/> Wi-Fi WAN																													
<input type="checkbox"/> Cellular 1																													
<input type="checkbox"/> Cellular 2																													
<input type="checkbox"/> USB																													
Server IP Address	<input type="button" value="120.78.95.7"/>																												

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 Pepwave router based on the other parameters of the rule. When this setting is disabled, the inbound service does not take effect: the Pepwave 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.

IP 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 Pepwave 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

Port	<input type="button" value="Any Port"/> <input type="button" value="▼"/>
------	--

Any Port: all traffic that is received by the Pepwave 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.

Port	?	Single Port	Service Port: 80
------	---	-------------	------------------

Single Port: traffic that is received by the Pepwave 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	?	Port Range	Service Ports: 80 - 88
------	---	------------	------------------------

Port Range: traffic that is received by the Pepwave 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	?	Port Mapping	Service Port: 80	Map to Port: 88
------	---	--------------	------------------	-----------------

Port Mapping: traffic that is received by Pepwave 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.)

Port	?	Range Mapping	Service Ports: 80 - 88	Map to Ports: 88 - 96
------	---	---------------	------------------------	-----------------------

Range Mapping: traffic that is received by the Pepwave 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.

11.1 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.

UPnP / NAT-PMP Settings	
UPnP	<input checked="" type="checkbox"/> Enable
NAT-PMP	<input checked="" type="checkbox"/> Enable
<input type="button" value="Save"/>	

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

12 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**.

LAN Clients	Inbound Mappings	Outbound Mappings	
192.168.1.23	(WAN 1):10.88.3.158 (Interface IP)	Use Interface IP only	<input checked="" type="checkbox"/>
<input type="button" value="Add NAT Rule"/>			

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

LAN Client(s)	<input type="button" value="?"/> IP Address ▾												
Address	<input type="button" value="?"/> <input type="text"/>												
Inbound Mappings	<input type="button" value="?"/> Connection / Inbound IP Address(es) <table border="1"> <tbody> <tr><td><input type="checkbox"/> WAN 1</td></tr> <tr><td><input type="checkbox"/> WAN 2</td></tr> <tr><td><input type="checkbox"/> Wi-Fi WAN</td></tr> <tr><td><input type="checkbox"/> Cellular 1</td></tr> <tr><td><input type="checkbox"/> Cellular 2</td></tr> <tr><td><input type="checkbox"/> USB</td></tr> </tbody> </table>	<input type="checkbox"/> WAN 1	<input type="checkbox"/> WAN 2	<input type="checkbox"/> Wi-Fi WAN	<input type="checkbox"/> Cellular 1	<input type="checkbox"/> Cellular 2	<input type="checkbox"/> USB						
<input type="checkbox"/> WAN 1													
<input type="checkbox"/> WAN 2													
<input type="checkbox"/> Wi-Fi WAN													
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Outbound Mappings	<input type="button" value="?"/> Connection / Outbound IP Address <table border="1"> <tbody> <tr><td>WAN 1</td><td>10.88.3.158 (Interface IP) ▾</td></tr> <tr><td>WAN 2</td><td>Interface IP ▾</td></tr> <tr><td>Wi-Fi WAN</td><td>Interface IP ▾</td></tr> <tr><td>Cellular 1</td><td>Interface IP ▾</td></tr> <tr><td>Cellular 2</td><td>Interface IP ▾</td></tr> <tr><td>USB</td><td>Interface IP ▾</td></tr> </tbody> </table>	WAN 1	10.88.3.158 (Interface IP) ▾	WAN 2	Interface IP ▾	Wi-Fi WAN	Interface IP ▾	Cellular 1	Interface IP ▾	Cellular 2	Interface IP ▾	USB	Interface IP ▾
WAN 1	10.88.3.158 (Interface IP) ▾												
WAN 2	Interface IP ▾												
Wi-Fi WAN	Interface IP ▾												
Cellular 1	Interface IP ▾												
Cellular 2	Interface IP ▾												
USB	Interface IP ▾												

NAT Mapping Settings

LAN Client(s)	NAT mapping rules can be defined for a single LAN IP Address , an IP Range , or an IP Network .
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.
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.
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	<p>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.</p> <p>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.</p>
Outbound Mappings	<p>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).</p> <p>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.</p>

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

Important Note

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

13 QoS

13.1 Bandwidth Control

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 Manager members. By default, download and upload bandwidth limits are set to unlimited (set as **0**).

Individual Bandwidth Limit			
Enable	<input checked="" type="checkbox"/>		
User Bandwidth Limit:	Download	Upload	
	0 Mbps	0 Mbps	(0: unlimited)

13.2 Application

13.2.1 Application Prioritization


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

Application Prioritization	
<input checked="" type="radio"/>	Apply same settings to all users
<input type="radio"/>	Customize

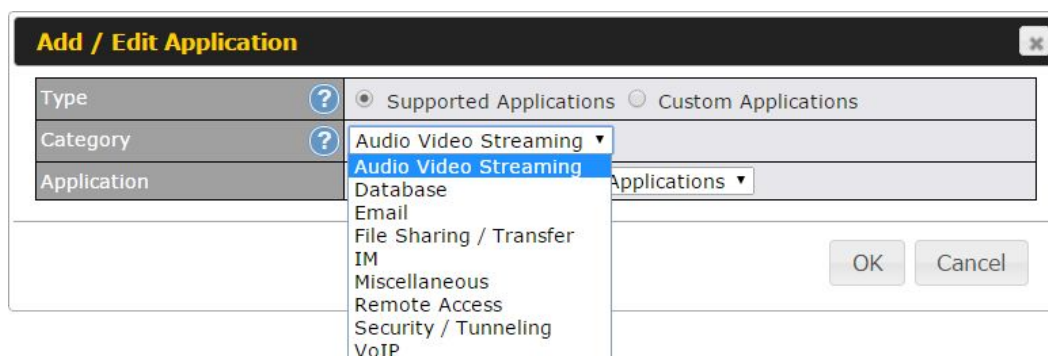
Three application priority levels can be set: **↑ High**, **— Normal**, and **↓ Low**. Pepwave routers can detect various application traffic types by inspecting the packet content. Select an application by choosing a supported application, or by defining a custom application manually. The priority preference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

Application	Priority			
	Manager	Staff	Guest	
All Supported Streaming Applications	↑ High	— Normal	↑ High	✖
All Email Protocols	↑ High	↑ High	↑ High	✖
MySQL	↑ High	— Normal	↓ Low	✖
SIP	↑ High	↓ Low	↓ Low	✖
Add				

13.2.2 Prioritization for Custom Applications

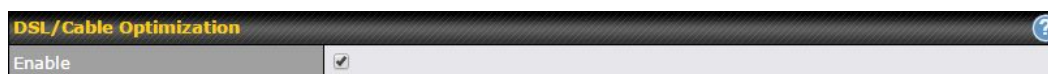
Click the **Add** button to define a custom application. Click the button  in the **Action** column to delete the custom application in the corresponding row.

When **Supported Applications** is selected, the Pepwave 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.



13.2.3 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 enabled.



14 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 Pepwave routers supports the selective filtering of data traffic in both

directions:

- Outbound (LAN to WAN)
- Inbound (WAN to LAN)

The firewall also supports the following functionality:

- Intrusion detection and DoS prevention
- Web blocking

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

Rule	Protocol	Source IP Port	Destination IP Port	Policy	
Default	Any	Any	Any	Allow	
Add Rule					

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

Rule	Protocol	WAN	Source IP Port	Destination IP Port	Policy	
Default	Any	Any	Any	Any	Allow	
Add Rule						

Apply Firewall Rules to PepVPN Traffic

Enabled

Intrusion Detection and DoS Prevention

Disabled

14.1 Outbound and Inbound Firewall Rules

14.1.1 Access Rules

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

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

Rule	Protocol	Source IP Port	Destination IP Port	Policy	
Default	Any	Any	Any	Allow	
Add Rule					

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

Add a New Outbound Firewall Rule

New Firewall Rule	
Rule Name	<input type="text"/>
Enable	<input checked="" type="checkbox"/> Always on
Protocol	Any <small>Protocol Selection Tool</small>
Source IP & Port	Any Address
Destination IP & Port	Any Address
Action	<input checked="" type="radio"/> Allow <input type="radio"/> Deny
Event Logging	<input type="checkbox"/> Enable

Save
Cancel

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

Inbound Firewall Rules <small>(Drag and drop rows to change rule order)</small>						
Rule	Protocol	WAN	Source IP Port	Destination IP Port	Policy	
Default	Any	Any	Any	Any	Allow	
Add Rule						

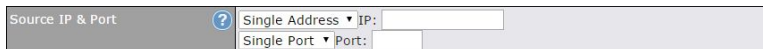
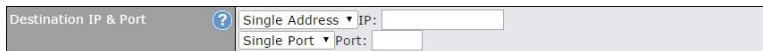
Click **Add Rule** to display the following screen:

Add a New Inbound Firewall Rule

New Firewall Rule	
Rule Name	<input type="text"/>
Enable	<input checked="" type="checkbox"/>
WAN Connection	Any
Protocol	Any <small>Protocol Selection Tool</small>
Source IP & Port	Any Address
Destination IP & Port	Any Address
Action	<input checked="" type="radio"/> Allow <input type="radio"/> Deny
Event Logging	<input type="checkbox"/> Enable

Save
Cancel

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 both outbound and inbound access.

Inbound / Outbound Firewall Settings	
Rule Name	This setting specifies a name for the firewall rule.
Enable	<p>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 Pepwave router based on the other parameters of the rule. If the box is not checked, the firewall rule does not take effect. The Pepwave router will disregard the other parameters of the rule.</p> <p>Click the dropdown menu next to the checkbox to place this firewall rule on a time schedule.</p>
WAN Connection (Inbound)	Select the WAN connection that this firewall rule should apply to.
Protocol	<p>This setting specifies the protocol to be matched. Via a drop-down menu, the following protocols can be specified:</p> <ul style="list-style-type: none"> • TCP • UDP • ICMP • IP <p>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.)</p> <p>After selecting an item from the Protocol Selection Tool drop-down menu, the protocol and port number remains manually modifiable.</p>
Source IP & Port	<p>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:</p>  <p>In addition, a single port, or a range of ports, can be specified for the Source IP & Port settings.</p>
Destination IP & Port	<p>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:</p>  <p>In addition, a single port, or a range of ports, can be specified for the Destination IP & Port settings.</p>

Action	<p>This setting specifies the action to be taken by the router upon encountering traffic that matches the both of the following:</p> <ul style="list-style-type: none"> • Source IP & port • Destination IP & port <p>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).</p>
Event Logging	<p>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:</p> <p>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</p> <ul style="list-style-type: none"> • 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.

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.

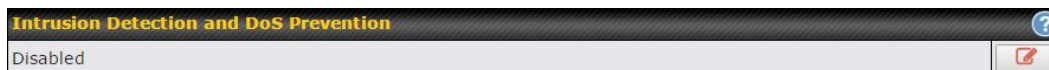
14.1.2 Apply Firewall Rules to PepVpn Traffic




When this option is enabled, Outbound Firewall Rules will be applied to PepVPN traffic. To turn on

this feature, click , check the **Enable** check box, and press the **Save** button.

14.1.3 Intrusion Detection and DoS Prevention



Pepwave 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 Pepwave 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

14.2 Content Blocking

Application Blocking

Please Select Application...

Web Blocking

Preset Category

☐ High
☐ Moderate
☐ Low
☒ Custom

☐ Abortion
☐ Alcohol
☐ Dating
☐ Entertainment
☐ Gambling
☐ Instant Messaging
☐ Lingerie
☐ Nudity
☐ Phishing
☐ Radio
☐ Search Engines
☐ Sports
☐ Update Sites
☐ Viruses
☐ Webmail

☐ Adware
☐ Anti-Spyware
☐ Drugs
☐ File Hosting
☐ Games
☐ Job Search/Employment
☐ Malware
☐ News/Media
☐ Pornography
☐ Remote Access
☐ Sexuality Education
☐ Spyware
☐ Vacation
☐ Weapons
☐ WebTV

☐ Aggressive
☐ Chatroom
☐ Ecommerce/Shopping
☐ P2P/File sharing
☐ Hacking
☐ Kids Time Wasting
☐ Manga/Anime/Webcomic
☐ Auctions
☐ Proxy/Anonymizer
☐ Ringtones
☐ Social Networking
☐ Tobacco
☐ Violence
☐ Weather

Customized Domains

cbs.com

Exempted Domains from Web Blocking

Exempted User Groups

Manager	<input type="checkbox"/> Exempt
Staff	<input type="checkbox"/> Exempt
Guest	<input type="checkbox"/> Exempt

Exempted Subnets

Network	Subnet Mask
	255.255.255.0 (/24)

URL Logging

Enable	<input type="checkbox"/>
Log Server Host	<div></div> <div>Port:</div> <div></div>

14.2.1 Application Blocking

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

<http://www.peplink.com>

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14.2.2 Web Blocking

Defines web site domain names to be blocked from LAN/PPTP/PepVPN 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 traffic. Secure web (HTTPS) traffic is not supported.

14.2.3 Exempted Subnets

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

14.2.4 URL Logging

Click **enable**, and then enter the ip address and port (if applicable) where your remote syslog server is located.

15 OSPF & RIPv2

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



The screenshot shows the configuration page for OSPF and RIPv2. It is divided into two main sections: OSPF and RIPv2.

OSPF Section:

- Router ID:** A field with two radio button options: "LAN IP Address" (selected) and "Custom:" followed by an empty text input box.
- Area and Interfaces Table:**

Area	Interfaces
0	PepVPN
- Add Button:** A button labeled "Add" is located at the bottom right of the table.

RIPv2 Section:

- Status:** A message box stating "No RIPv2 Defined." with a red icon in the bottom right corner.

OSPF

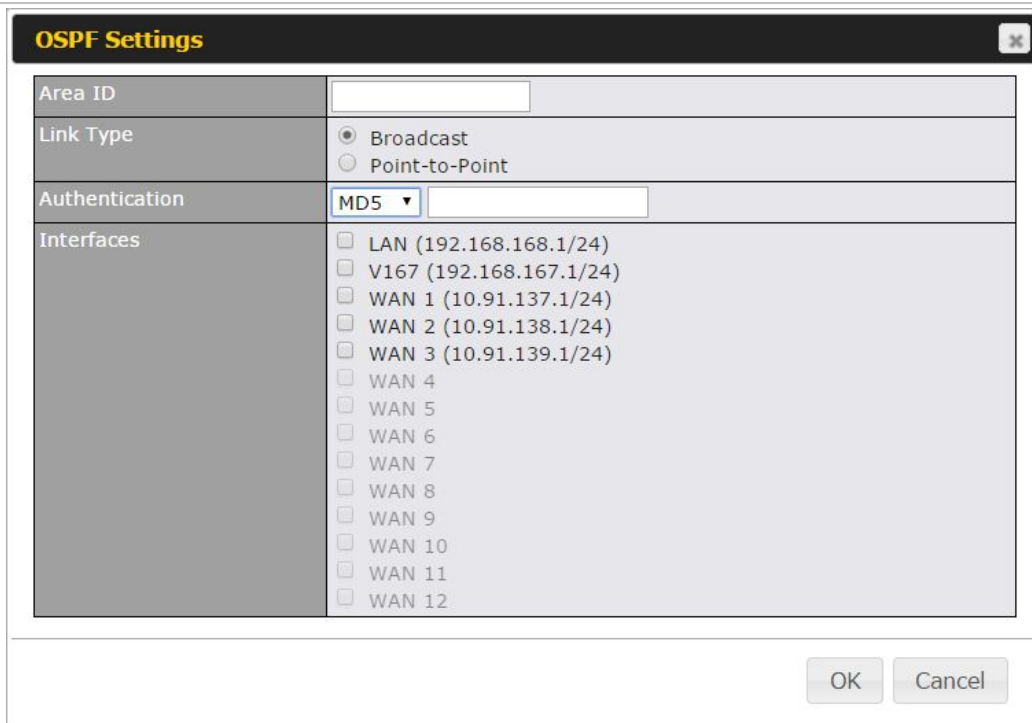
Router ID

This field determines the ID of the router. By default, this is specified as the LAN IP address. If you want to specify your own ID, enter it in the **Custom** field.

Area

This is an overview of the OSPFv2 areas you have defined. Click on the area name to configure it.

To set a new area, click **Add**. To delete an existing area, click  .



OSPF Settings

Area ID

Determine the name of your **Area ID** to apply to this group. Machines linked to this group will send and receive related OSPF packets, while unlinked machines will ignore it.

Link Type


Choose the network type that this area will use.

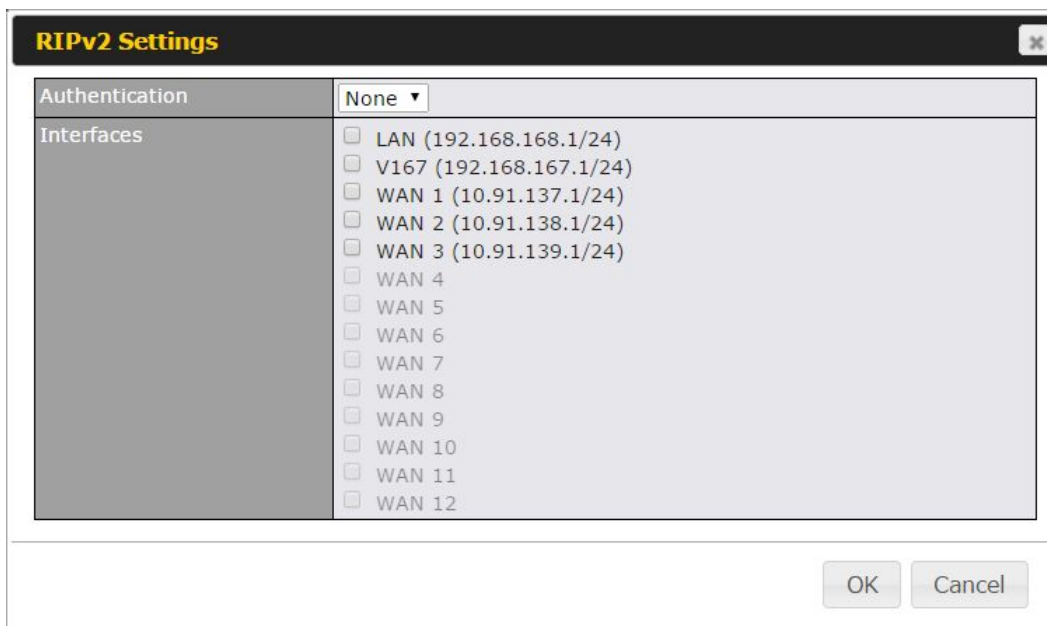
Authentication

Choose an authentication method, if one is used, from this drop-down menu. Available options are **MD5** and **Text**. Enter the authentication key next to the drop-down menu.

Interfaces

Determine which interfaces this area will use to listen to and deliver OSPF packets

To access RIPv2 settings, click .



The RIPv2 Settings dialog box has a title bar with the text "RIPv2 Settings" and a close button. It contains two main sections: "Authentication" and "Interfaces". The "Authentication" section has a drop-down menu currently set to "None". The "Interfaces" section is a list box containing the following items, each with a checkbox: LAN (192.168.168.1/24), V167 (192.168.167.1/24), WAN 1 (10.91.137.1/24), WAN 2 (10.91.138.1/24), WAN 3 (10.91.139.1/24), WAN 4, WAN 5, WAN 6, WAN 7, WAN 8, WAN 9, WAN 10, WAN 11, and WAN 12. At the bottom right of the dialog are "OK" and "Cancel" buttons.

RIPv2 Settings	
Authentication	Choose an authentication method, if one is used, from this drop-down menu. Available options are MD5 and Text . Enter the authentication key next to the drop-down menu.
Interfaces	Determine which interfaces this group will use to listen to and deliver RIPv2 packets.

16 Miscellaneous


16.1 Remote User Access

Networks routed by a Peplink Balance can be remotely accessed via L2TP with IPsec or PPTP. To configure this feature, navigate to **Network > Remote User Access**

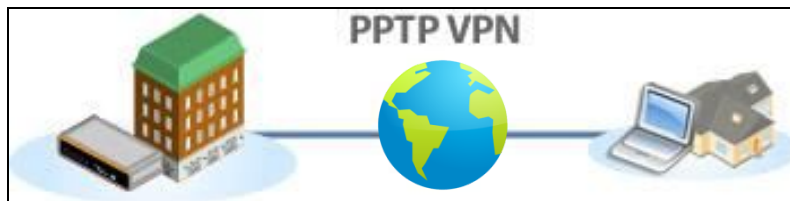
Remote User Access Settings										
Enable	<input checked="" type="checkbox"/>									
VPN Type	<input checked="" type="radio"/> L2TP with IPsec <input type="radio"/> PPTP <small>IPsec NAT-Traversal will be enabled to ensure compatibility for most of the devices</small>									
Preshared Key	<div>.....</div> <input checked="" type="checkbox"/> Hide Characters									
Listen On	<div> <div>?</div> <div> Connection / IP Address(es) <table border="1"> <tbody> <tr> <td><input checked="" type="checkbox"/> WAN1</td> <td><input checked="" type="checkbox"/> 10.10.12.47 (Interface IP)</td> </tr> <tr> <td><input checked="" type="checkbox"/> WAN2</td> <td><input checked="" type="checkbox"/> Interface IP</td> </tr> <tr> <td><input checked="" type="checkbox"/> WAN3</td> <td><input checked="" type="checkbox"/> Interface IP</td> </tr> <tr> <td><input checked="" type="checkbox"/> Mobile Internet</td> <td><input checked="" type="checkbox"/> Interface IP</td> </tr> </tbody> </table> </div> </div>	<input checked="" type="checkbox"/> WAN1	<input checked="" type="checkbox"/> 10.10.12.47 (Interface IP)	<input checked="" type="checkbox"/> WAN2	<input checked="" type="checkbox"/> Interface IP	<input checked="" type="checkbox"/> WAN3	<input checked="" type="checkbox"/> Interface IP	<input checked="" type="checkbox"/> Mobile Internet	<input checked="" type="checkbox"/> Interface IP	
<input checked="" type="checkbox"/> WAN1	<input checked="" type="checkbox"/> 10.10.12.47 (Interface IP)									
<input checked="" type="checkbox"/> WAN2	<input checked="" type="checkbox"/> Interface IP									
<input checked="" type="checkbox"/> WAN3	<input checked="" type="checkbox"/> Interface IP									
<input checked="" type="checkbox"/> Mobile Internet	<input checked="" type="checkbox"/> Interface IP									
User Accounts	<div>?</div> <table border="1"> <thead> <tr> <th>Username</th> <th>Password</th> <th></th> </tr> </thead> <tbody> <tr> <td>admin</td> <td>.....</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Username	Password		admin				
Username	Password									
admin									

Remote User Access Settings

Enable	Click the checkbox to enable Remote User Access.
VPN Type	Determine whether remote devices can connect to the Balance using L2TP with IPsec or PPTP. For greater security, we recommend you connect using L2TP with IPsec.
Preshared Key	Enter your pre-shared key in the text field. Please note that remote devices will need this preshared key to access the Balance.
Listen On	This setting is for specifying the WAN IP addresses where the PPTP server of the router should listen on.
User Accounts	This setting allows you to define the PPTP 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. Click the button X to delete the account in its corresponding row.

Click the  button to switch to enters user accounts by pasting the information in.CSV format.

16.2 PPTP Server



Pepwave routers feature a built-in PPTP server, which enables remote computers to conveniently and securely access the local network. PPTP server settings are located at **Advanced>Misc. Settings>PPTP Server**.

Check the box to enable PPTP server functionality. All connected PPTP sessions are displayed at **Status>Client List**.

PPTP Server		
Enable	<input checked="" type="checkbox"/>	
Listen On	<div>?</div> Connection / IP Address(es)	
	<input checked="" type="checkbox"/> WAN 1	<input checked="" type="checkbox"/> 10.88.3.158 (Interface IP)
	<input checked="" type="checkbox"/> WAN 2	<input checked="" type="checkbox"/> Interface IP
	<input checked="" type="checkbox"/> Wi-Fi WAN	<input checked="" type="checkbox"/> Interface IP
	<input checked="" type="checkbox"/> Cellular 1	<input checked="" type="checkbox"/> Interface IP
	<input checked="" type="checkbox"/> Cellular 2	<input checked="" type="checkbox"/> Interface IP
	<input checked="" type="checkbox"/> USB	<input checked="" type="checkbox"/> Interface IP
Authentication	<div>?</div> Local User Accounts ▼	
User Accounts	<div>?</div> Username	<div>?</div> Password

PPTP Server Settings

Listen On

This setting is for specifying the WAN connection(s) and IP address(es) that the PPTP server should listen on.

Authentication


This setting is for specifying the user database source for PPTP authentication. Three sources can be selected: **Local User Accounts**, **LDAP Server**, or **RADIUS Server**.

Local User Accounts - User accounts are stored in the Pepwave router locally. You can add/modify/delete accounts in the **User Accounts** table.



LDAP Server - Authenticate with an external LDAP server. This has been tested with Open LDAP servers where passwords are NTLM hashed. Active Directory is not supported. (You can choose to use RADIUS to authenticate with a Windows server.)

RADIUS Server - Authenticate with an external RADIUS server. This has been tested with Microsoft Windows Internet Authentication Service and FreeRADIUS servers where passwords are NTLM hashed or in plain text.

User Accounts

This setting allows you to define PPTP user accounts for authentication via local 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. Click  to delete the account in its corresponding row.

16.3 Certificate Manager

Certificate Manager		
VPN Certificate	 No Certificate	Assign
Web Admin SSL Certificate	 No Certificate	Assign
Captive Portal SSL Certificate	No Certificate	Assign

This section allows you to assign certificates for local VPN and web admin SSL. The local keys will not be transferred to another device by any means.

16.4 Service Forwarding

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


SMTP Forwarding Setup		
SMTP Forwarding	<input type="checkbox"/> Enable	
Web Proxy Forwarding Setup		
Web Proxy Forwarding	<input type="checkbox"/> Enable	
DNS Forwarding Setup		
Forward Outgoing DNS Requests to Local DNS Proxy	<input type="checkbox"/> Enable	
Custom Service Forwarding Setup		
Custom Service Forwarding	<input type="checkbox"/> Enable	

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	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

Forwarding	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.

16.4.1 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. Pepwave 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.



SMTP Forwarding Setup			
SMTP Forwarding		<input checked="" type="checkbox"/> Enable	
Connection	Enable Forwarding?	SMTP Server	SMTP Port
WAN 1	<input type="checkbox"/>		
WAN 2	<input type="checkbox"/>		
Wi-Fi WAN	<input type="checkbox"/>		
Cellular 1	<input type="checkbox"/>		
Cellular 2	<input type="checkbox"/>		
USB	<input type="checkbox"/>		

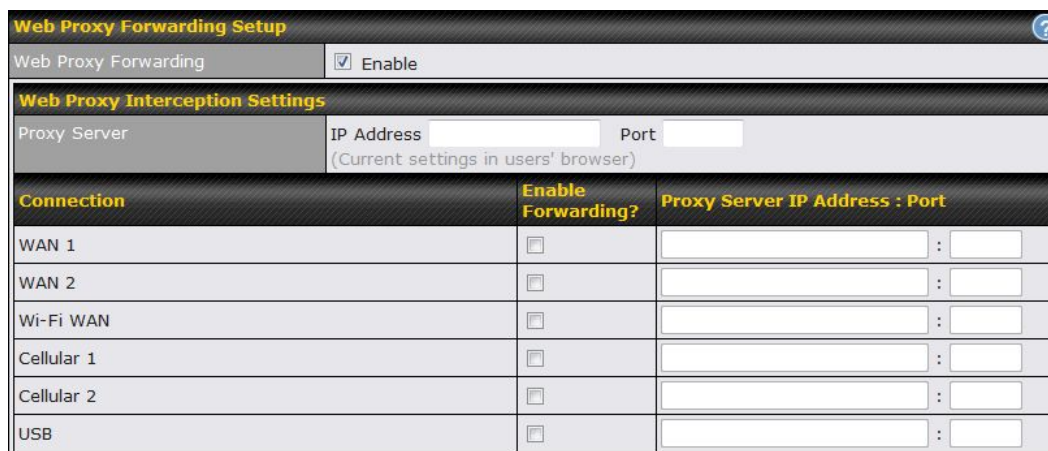
To enable the feature, select **Enable** under **SMTP Forwarding Setup**. Check **Enable Forwarding** for the WAN connection(s) that needs forwarding. Under **SMTP Server**, enter the ISP's email server hostname or IP address. Under **SMTP Port**, enter the TCP port number for each WAN.

The Pepwave 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**).

16.4.2 Web Proxy Forwarding



Web Proxy Forwarding Setup

Web Proxy Forwarding ☒ Enable

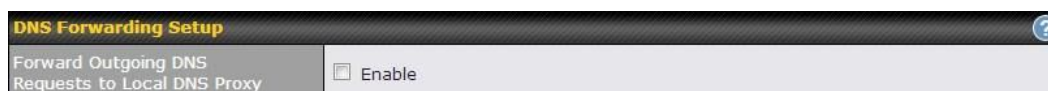
Web Proxy Interception Settings

Proxy Server IP Address Port
(Current settings in users' browser)

Connection	Enable Forwarding?	Proxy Server IP Address : Port
WAN 1	<input type="checkbox"/>	<input type="text"/> : <input type="text"/>
WAN 2	<input type="checkbox"/>	<input type="text"/> : <input type="text"/>
Wi-Fi WAN	<input type="checkbox"/>	<input type="text"/> : <input type="text"/>
Cellular 1	<input type="checkbox"/>	<input type="text"/> : <input type="text"/>
Cellular 2	<input type="checkbox"/>	<input type="text"/> : <input type="text"/>
USB	<input type="checkbox"/>	<input type="text"/> : <input type="text"/>

When this feature is enabled, the Pepwave 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.

16.4.3 DNS Forwarding

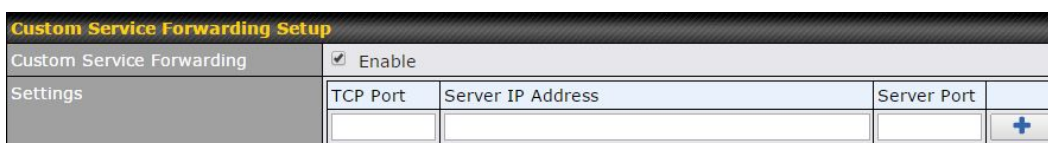


DNS Forwarding Setup

Forward Outgoing DNS Requests to Local DNS Proxy ☐ Enable

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

16.4.4 Custom Service Forwarding



Custom Service Forwarding Setup

Custom Service Forwarding ☒ Enable

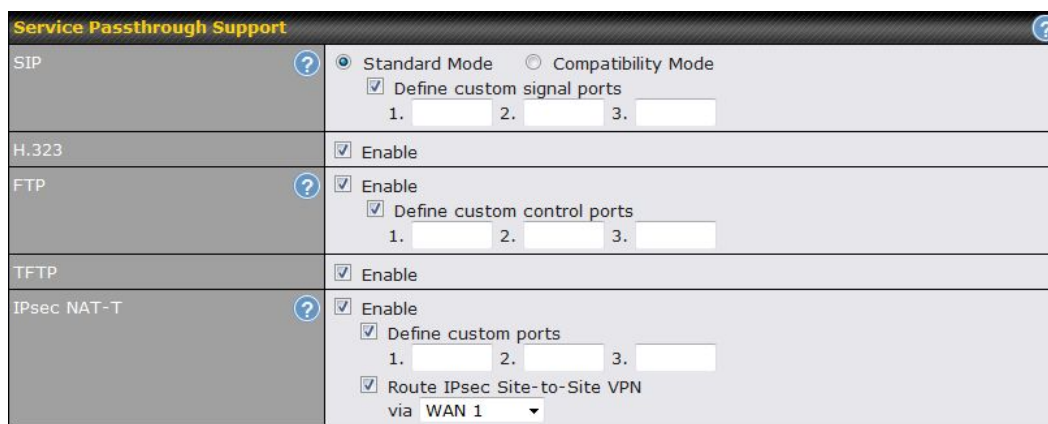
Settings	TCP Port	Server IP Address	Server Port	
	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="button" value="+"/>

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.

16.5 Service Passthrough

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



The screenshot shows the 'Service Passthrough Support' configuration page. It includes a title bar with a help icon. Below are several sections for different services:

- SIP**: Includes radio buttons for 'Standard Mode' (selected) and 'Compatibility Mode'. A checkbox 'Define custom signal ports' is checked, with three input fields for port numbers (1, 2, 3).
- H.323**: A checkbox 'Enable' is checked.
- FTP**: Includes a checkbox 'Enable' (checked), a checkbox 'Define custom control ports' (checked), and three input fields for port numbers (1, 2, 3).
- TFTP**: A checkbox 'Enable' is checked.
- IPsec NAT-T**: Includes a checkbox 'Enable' (checked), a checkbox 'Define custom ports' (checked) with three input fields, and a checkbox 'Route IPsec Site-to-Site VPN' (checked) with a dropdown menu set to 'WAN 1'.

At the bottom, a small note states: '(Registered trademarks are copyrighted by their respective owner)'.

Some Internet services need to be specially handled in a multi-WAN environment. Pepwave 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 Pepwave 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 Pepwave 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 Pepwave 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 Pepwave 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.

16.6 Sim Toolkit

Sim Toolkit option can be found at **Advanced>Settings>SIM Toolkit**.

SIM Status
No SIM information

17 AP

Use the controls on the AP tab to set the wireless SSID and AP settings.

17.1 Wireless SSID

Wireless network settings, including the name of the network (SSID) and security policy, can be defined and managed in this section.

PEPWAVE

Dashboard

Network

Advanced

AP

System

Status

Apply Changes


AP

Wireless SSID

Settings

SSID	Security Policy	MAC Address (BSSID)	
PEPWAVE_F385	WPA/WPA2 - Personal	00:1A:DD:13:28:28	<div></div>
<div>Add</div>			

Click **Add** to create a new network profile, or click the existing network profile to modify its settings.

SSID Settings 	
SSID	<input type="text"/>
Schedule	Always on ▾
VLAN ID	Untagged LAN ▾
Broadcast SSID	<input checked="" type="checkbox"/>
Data Rate	<input checked="" type="radio"/> Auto <input type="radio"/> Fixed
Multicast Filter	<input type="checkbox"/>
Multicast Rate	MCS0/6M ▾
IGMP Snooping	<input type="checkbox"/>
Layer 2 Isolation	<input type="checkbox"/>
Maximum number of clients	2.4 GHz: <input type="text" value="0"/> 5 GHz: <input type="text" value="0"/> (0: Unlimited)

SSID Settings	
SSID	This setting specifies the Router SSID that Wi-Fi clients will see when scanning.
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.
VLAN ID	Some service providers require the router to enable VLAN tagging for Internet traffic. If it is required by your service provider, you can enable this field and enter the VLAN ID that the provider requires.
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	Select Auto to allow your access point to set the data rate automatically, or select Fixed and choose a rate from the drop-down menu. Click the MCS Index link to display a reference table containing MCS and matching HT20 and HT40 values.
Multicast Filter	This setting enables the filtering of multicast network traffic to the wireless SSID.
Multicast Rate	This setting specifies the transmit rate to be used for sending multicast network traffic.
IGMP Snooping	To allow your access point to convert multicast traffic to unicast traffic for associated clients, select this option.
Layer 2 Isolation	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 upper communication layer(s). By default, the setting is disabled.

Maximum no of Clients

Enter the maximum number of clients that can simultaneously connect to your access point, or enter 0 to allow unlimited Wi-Fi clients.

Security Settings

Security Policy	WPA2 - Personal ▼
Encryption	AES:CCMP
Shared Key	<input type="text"/> <input checked="" type="checkbox"/> Hide Characters

Security Settings

Security Policy

This setting configures the wireless authentication and encryption methods. Available options are Open (No Encryption), WPA/WPA2 - Personal, WPA/WPA2 – Enterprise and Static WEP.

Access Control

Restricted Mode	None ▼
-----------------	--------

Access Control

Restricted Mode

The settings allow administrator to control access using Mac address filtering. Available options are None, Deny all except listed, Accept all except listed, and RADIUS MAC Authentication.

When WPA/WPA2 - Enterprise is configured, RADIUS-based 802.1 x authentication is enabled. Under this configuration, the Shared Key option should be disabled. When using this method, select the appropriate version using the V1/V2 controls. The security level of this method is known to be very high.

When WPA/WPA2- Personal is configured, a shared key is used for data encryption and authentication. When using this configuration, the Shared Key option should be enabled. Key length must be between eight and 63 characters (inclusive). The security level of this method is known to be high.

The configuration of Static WEP parameters enables pre-shared WEP key encryption. Authentication is not supported by this method. The security level of this method is known to be weak.

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.

17.2 Settings

Navigating to **AP>Settings** displays a screen similar to the one shown below:

Wi-Fi Radio Settings		
Operating Country	United States <input type="button" value="v"/>	
SSID	2.4GHz <input checked="" type="checkbox"/> 5GHz <input checked="" type="checkbox"/> Wi-Fi_AP	

Wi-Fi AP Settings <input style="float: right;" type="button" value="?"/>		
Protocol	802.11ng <input type="button" value="v"/>	802.11ac <input type="button" value="v"/>
Channel Width	20 MHz <input type="button" value="v"/>	80 MHz <input type="button" value="v"/>
Channel	1 (2.412 GHz) <input type="button" value="v"/>	Auto <input type="button" value="v"/> <input type="button" value="Edit"/> Channels: 36 40 44 48 52 56 60 64 100 104 108 112 116 120 124 128 149 153 157 161
Output Power	Max <input type="button" value="v"/> <input type="checkbox"/> Boost	Max <input type="button" value="v"/> <input type="checkbox"/> Boost
Maximum number of clients	0 (0: Unlimited)	
Client Signal Strength Threshold	0 -95 dBm (0: Unlimited)	
Beacon Rate	<input style="float: left;" type="button" value="?"/> 1 Mbps <input type="button" value="v"/>	
Beacon Interval	<input style="float: left;" type="button" value="?"/> 100 ms <input type="button" value="v"/>	
DTIM	<input style="float: left;" type="button" value="?"/> 1 <input type="button" value="Default"/>	
RTS Threshold	0 <input type="button" value="Default"/>	
Fragmentation Threshold	0 (0: Disable) <input type="button" value="Default"/>	
Distance / Time Converter	<input type="range"/> 4050 m Note: Input distance for recommended values	
Slot Time	<input style="float: left;" type="button" value="?"/> <input type="radio"/> Auto <input checked="" type="radio"/> Custom 9 <input type="button" value="μs"/> <input type="button" value="Default"/>	
ACK Timeout	<input style="float: left;" type="button" value="?"/> 48 <input type="button" value="μs"/> <input type="button" value="Default"/>	
Frame Aggregation	<input type="checkbox"/>	

Wi-Fi Radio Settings

Operating Country

This option sets the country whose regulations the Pepwave router follows.

Wi-Fi Antenna

Choose from the router's internal or optional external antennas, if so equipped.

Important Note

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

Wi-Fi AP Settings

Protocol

This option allows you to specify which client association requests will be accepted. By default, **802.11ng** is selected.

Channel Width

Auto (20/40 MHz) and **20 MHz** are available. The default setting is **Auto (20/40 MHz)**, which allows both widths to be used simultaneously.
Auto (80 MHz) and **(20/40 MHz)** are available. The default setting is **80 MHz**.

Channel

This option allows you to select which 802.11 RF channel will be used.

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.

Maximum number of clients

Enter the maximum number of clients that can simultaneously connect to the wireless network or enter 0 to allow an unlimited number of connections.

Client Signal Strength Threshold^A

This field determines that maximum signal strength each individual client will receive. The measurement unit is megawatts.

Beacon Rate^A

This option is for setting the transmit bit rate for sending a beacon. By default, **1Mbps** is selected.

Beacon Interval^A

This option is for setting the time interval between each beacon. By default, **100ms** is selected.

DTIM^A	This field allows you to set the frequency for the beacon to include a delivery traffic indication message. The interval is measured in milliseconds. The default value is set to 1 ms .
RTS Threshold	Set the minimum packet size for your access point 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 is for specifying the wait time before the Surf SOHO transmits a packet. By default, this field is set to 9 μs .
ACK Timeout^A	This field is for setting the wait time to receive an acknowledgement packet before performing a retransmission. By default, this field is set to 48 μs .
Frame Aggregation^A	This option allows you to enable frame aggregation to increase transmission throughput.

18 System Settings








The options on the System tab control login and security settings, firmware upgrades, SNMP settings, and other settings.


PEPWAVE		Dashboard	Network	Advanced	AP	System	Status	Apply Changes																																																																						
System <ul style="list-style-type: none"> Admin Security Firmware Time Schedule Email Notification Event Log SNMP InControl Configuration Feature Add-ons Reboot Tools <ul style="list-style-type: none"> Ping Traceroute Wake-on-LAN 																																																																														
Admin Settings <table border="1"> <tr> <td>Router Name</td> <td colspan="2">SURF-SOHO-F385</td> <td colspan="2">hostname: surf-soho-f385</td> </tr> <tr> <td colspan="5">This configuration is being managed by InControl.</td> </tr> <tr> <td>Admin User Name</td> <td colspan="4">admin</td> </tr> <tr> <td>Admin Password</td> <td colspan="4">••••••••</td> </tr> <tr> <td>Confirm Admin Password</td> <td colspan="4">••••••••</td> </tr> <tr> <td>Read-only User Name</td> <td colspan="4">user</td> </tr> <tr> <td>User Password</td> <td colspan="4"></td> </tr> <tr> <td>Confirm User Password</td> <td colspan="4"></td> </tr> <tr> <td>Web Session Timeout</td> <td>4</td> <td>Hours</td> <td>0</td> <td>Minutes</td> </tr> <tr> <td>Authentication by RADIUS</td> <td colspan="4"><input type="checkbox"/> Enable</td> </tr> <tr> <td>CLI SSH & Console</td> <td colspan="4"><input type="checkbox"/> Enable</td> </tr> <tr> <td>Security</td> <td colspan="4">HTTP</td> </tr> <tr> <td>Web Admin Port</td> <td>80</td> <td colspan="3">Default</td> </tr> <tr> <td>Web Admin Access</td> <td colspan="4">LAN Only</td> </tr> </table> <p style="text-align: center;">Save</p>									Router Name	SURF-SOHO-F385		hostname: surf-soho-f385		This configuration is being managed by InControl .					Admin User Name	admin				Admin Password	••••••••				Confirm Admin Password	••••••••				Read-only User Name	user				User Password					Confirm User Password					Web Session Timeout	4	Hours	0	Minutes	Authentication by RADIUS	<input type="checkbox"/> Enable				CLI SSH & Console	<input type="checkbox"/> Enable				Security	HTTP				Web Admin Port	80	Default			Web Admin Access	LAN Only			
Router Name	SURF-SOHO-F385		hostname: surf-soho-f385																																																																											
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Security	HTTP																																																																													
Web Admin Port	80	Default																																																																												
Web Admin Access	LAN Only																																																																													

18.1 Admin Security

The **Admin Security** section allows you to set up your access point's name, password, security settings, and other options

PEPWAVE		Dashboard	Network	Advanced	AP	System	Status	Apply Changes
System								
<ul style="list-style-type: none"> Admin Security Firmware Time Schedule Email Notification Event Log SNMP InControl Configuration Feature Add-ons Reboot 								
Tools								
<ul style="list-style-type: none"> Ping Traceroute Wake-on-LAN 								

Admin Settings	
Router Name	SURF-SOHO-F385 <small>hostname: surf-soho-f385</small>  This configuration is being managed by InControl .
Admin User Name	admin
Admin Password	••••••••
Confirm Admin Password	••••••••
Read-only User Name	user
User Password	
Confirm User Password	
Web Session Timeout	 4 Hours 0 Minutes
Authentication by RADIUS	 <input type="checkbox"/> Enable
CLI SSH & Console	 <input type="checkbox"/> Enable
Security	HTTP 
Web Admin Port	80 
Web Admin Access	LAN Only 

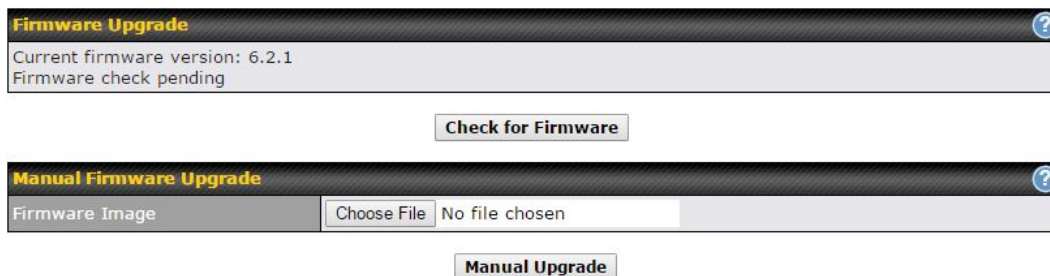


Admin Security	
Router Name	Enter a name to identify your Router .
Admin User Name	This field specifies the administrator username of the web admin. It is set as admin by default
Admin Password	This field allows you to specify a new administrator password. The default password is public
Confirm Admin 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
User Password	This field allows you to specify a new user password. Once the user password is set, the read-only user feature will be enabled

Confirm User Password	This field allows you to verify and confirm the new user password
Web Session Timeout	This field specifies the number of hours and minutes that a web session can remain idle before the Router terminates its access to the web admin interface. By default, it is set to 4 hours .
Authentication by RADIUS	With this box 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 external RADIUS server, local accounts will be enabled again for emergency access. Additional authentication options will be available once this box is checked
Auth Protocol	This specifies the authentication protocol used. Available options are MS-CHAP v2 and PAP.
Auth Server	This specifies the access address and port of the external RADIUS server.
Auth Server Secret	This field is for entering the secret key for accessing the RADIUS server.
Auth Timeout	This option specifies the time value for authentication timeout.
Accounting Server	This specifies the access address and port of the external accounting server.
Accounting Server Secret	This field is for entering the secret key for accessing the accounting server.
CLI SSH & Console	The CLI (command line interface) can be accessed via SSH. This field enables CLI support
Security	<p>This option is for specifying the protocol(s) through which the web admin interface can be accessed:</p> <ul style="list-style-type: none"> • HTTP • HTTPS • HTTP/HTTPS
Web Admin Port	This field is for specifying the port number on which the web admin interface can be accessed.
Web Admin Access	<p>This option is for specifying the network interfaces through which the web admin interface can be accessed:</p> <ul style="list-style-type: none"> • LAN only • LAN/WAN • If LAN/WAN is chosen, the WAN Connection Access Settings form will be displayed.

18.2 Firmware

Pepwave router firmware is upgradeable through the web admin interface. Firmware upgrade functionality is located at **System>Firmware**.



There are two ways to upgrade the unit. The first method is through an online download. The second method is to upload a firmware file manually.

To perform an online download, click on the **Check for Firmware** button. The Pepwave router will check online for new firmware. If new firmware is available, the Pepwave router will automatically download the firmware. The rest of the upgrade process will be automatically initiated.

You may also download a firmware image from the [Peplink website](http://www.peplink.com) and update the unit manually. To update using a firmware image, click **Choose File** to select the firmware file from the local computer, and then click **Manual Upgrade** to send the firmware to the Pepwave router. It will then automatically initiate the firmware upgrade process.

Please note that all Peplink devices can store two different firmware versions in two different partitions. A firmware upgrade will always replace the inactive partition. If you want to keep the inactive firmware, you can simply reboot your device with the inactive firmware and then perform the firmware upgrade.

Important Note

The firmware upgrade process may not necessarily preserve the previous configuration, and the behavior varies on a case-by-case basis. Consult the release notes for the particular firmware version before installing. Do not disconnect the power during firmware upgrade process. Do not attempt to upload a non-firmware file or a firmware file that is not supported by Peplink. Upgrading the Pepwave router with an invalid firmware file will damage the unit and may void the warranty.

Important Note

If the firmware is rolled back from 5.x to 4.x, the configurations will be lost.

18.3 Time

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



Time Settings	
Time Zone	(GMT+07:00) Krasnoyarsk <input type="checkbox"/> Show all
Time Server	0.peplink.pool.ntp.org Default

Save

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 Pepwave router's event log and e-mail notifications. Check Show all to show all time zone options.
Time Server	This setting specifies the NTP network time server to be utilized by the Pepwave router.

18.4 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**

Schedule			
Enabled			
Name	Time	Used by	
<u>Weekdays Only</u>	Weekdays only	-	
New Schedule			

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

Edit schedule profile

Schedule Settings

Enable	<input checked="" type="checkbox"/> The schedule function of those associated features will be lost if profile is disabled.
Name	Weekdays Only
Schedule	Weekdays only
Used by	You may go to supported feature settings page and set this profile as scheduler.

Schedule Map

	Midnight	4am	8am	Noon	4pm	8pm
Sunday	x	x	x	x	x	x
Monday	✓	✓	✓	✓	✓	✓
Tuesday	✓	✓	✓	✓	✓	✓
Wednesday	✓	✓	✓	✓	✓	✓
Thursday	✓	✓	✓	✓	✓	✓
Friday	✓	✓	✓	✓	✓	✓
Saturday	x	x	x	x	x	x

Save Cancel

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.

18.5 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 Setup	
Email Notification	<input checked="" type="checkbox"/> Enable
SMTP Server	smtp.mycompany.com <input checked="" type="checkbox"/> Require authentication
SSL Encryption	<input checked="" type="checkbox"/> (Note: any server certificate will be accepted)
SMTP Port	465 <input type="button" value="Default"/>
SMTP User Name	smtpuser
SMTP Password	•••••
Confirm SMTP Password	•••••
Sender's Email Address	admin@mycompany.com
Recipient's Email Address	system@mycompany.com staff@mycompany.com

Email Notification Settings

Email Notification	This setting specifies whether or not to enable email notification. If Enable is checked, the Pepwave 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 Pepwave 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 .
SSL Encryption	Check the box to enable SMTPS. When the box is checked, SMTP Port will be changed to 465 automatically.
SMTP Port	This field is for specifying the SMTP port number. By default, this is set to 25 ; when SSL Encryption is checked, the default port number will be set to 465 . You may customize the port number by editing this field. Click Default to restore the number to its default setting.
SMTP User Name / Password	This setting specifies the SMTP username and password while sending email. These options are shown only if Require authentication is checked in the SMTP Server setting.
Confirm SMTP Password	This field allows you to verify and confirm the new administrator password.
Sender's Email	This setting specifies the email address the Pepwave router will use to send reports.

Address

Recipient's Email Address This setting specifies the email address(es) to which the Pepwave 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:

Test Email Notification	
SMTP Server	smtp.mycompany.com
SMTP Port	465
SMTP UserName	smtpuser
Sender's Email Address	admin@mycompany.com
Recipient's Email Address	system@mycompany.com staff@mycompany.com

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

Test email sent. Email notification settings are not saved, it will be saved after clicked the 'Save' button.

Test Result

```
[INFO] Try email through connection #3
[<-] 220 ESMTP
[->] EHLO balance
[<-] 250-smtp Hello balance [210.210.210.210]
250-SIZE 100000000
250-8BITMIME
250-PIPELINING
250-AUTH PLAIN LOGIN
250-STARTTLS
250-ENHANCEDSTATUSNOTIFICATIONS
[<-] 250 OK
```


18.6 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**.

Send Events to Remote Syslog Server ?	
Remote Syslog	<input checked="" type="checkbox"/>
Remote Syslog Host	<input type="text"/>

Push Events to Mobile Devices ?	
Push Events	<input checked="" type="checkbox"/>

Save

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.
Push Events	<p>The Pepwave router can also send push notifications to mobile devices that have our Mobile Router Utility installed. Check the box to activate this feature.</p>  <p>For more information on the Router Utility, go to: www.peplink.com/products/router-utility</p>

18.7 SNMP

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

SNMP Settings	
SNMP Device Name	MAX_HD2_8D1C
SNMP Port	161 Default
SNMPv1	<input type="checkbox"/> Enable
SNMPv2c	<input type="checkbox"/> Enable
SNMPv3	<input type="checkbox"/> Enable
<input type="button" value="Save"/>	

Community Name	Allowed Source Network	Access Mode
No SNMPv1 / SNMPv2c Communities Defined		
<input type="button" value="Add SNMP Community"/>		

SNMPv3 User Name	Authentication / Privacy	Access Mode
No SNMPv3 Users Defined		
<input type="button" value="Add SNMP User"/>		

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

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

SNMP Community
✕

Community Name	My Company	
Allowed Network	192.168.1.25	/ 255.255.255.0 (/24) ▼

SNMP Community Settings

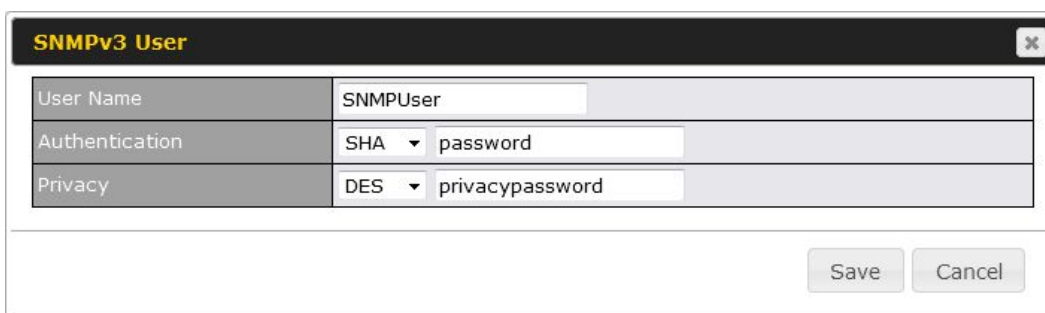
Community Name

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 username for SNMPv3, click **Add SNMP User** in the **SNMPv3 User Name** table, upon which the following screen is displayed:



The dialog box titled "SNMPv3 User" contains the following fields:

User Name	SNMPUser
Authentication	SHA password
Privacy	DES privacypassword

At the bottom right are "Save" and "Cancel" buttons.

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 username 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

This setting specifies via a drop-down menu one of the following valid authentication

Protocol	protocols: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • NONE • DES When DES is selected, an entry field will appear for the password.

18.8 InControl

InControl Management	
InControl Management	<input checked="" type="checkbox"/> Allow InControl Management
Privately Host InControl	<input checked="" type="checkbox"/>
InControl Host	<input type="text"/> <input type="text"/>

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

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

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

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

18.9 Configuration

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

Restore Configuration to Factory Settings
?

Restore Factory Settings

Download Active Configurations
?

Download

Upload Configurations
?

Configuration File
No file selected.

Upload

Upload Configurations from High Availability Pair
?

Configuration File
No file selected.

Upload

Configuration	
Restore Configuration to Factory Settings	The Restore Factory Settings button is to reset the configuration to factory default settings. After clicking the button, you will need to click the Apply Changes button on the top right corner to make the settings effective.
Download Active Configurations	Click Download to backup the current active settings.
Upload Configurations	To restore or change settings based on a configuration file, click Choose File to locate the configuration file on the local computer, and then click Upload . The new settings can then be applied by clicking the Apply Changes button on the page header, or you can cancel the procedure by pressing discard on the main page of the web admin interface.
Upload Configurations from High Availability Pair	In a high availability (HA) configuration, a Pepwave 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 Pepwave router so that it is different from the HA counterpart.

18.10 Feature Add-ons

Some Pepwave 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**.

A screenshot of the 'Feature Activation' section in a web interface. It has a dark header with the title 'Feature Activation' in yellow. Below the header is a table with two columns. The first column is labeled 'Activation Key' and has a grey background. The second column is a large, empty white text input field.

18.11 Reboot

This page provides a reboot button for restarting the system. For maximum reliability, the Pepwave 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.

A screenshot of the 'Reboot System' section in a web interface. It has a dark header with the title 'Reboot System' in yellow and a help icon (question mark in a blue circle) on the right. Below the header is a light blue box containing the text 'Select the firmware you want to use to start up this device:'. There are two radio button options: 'Firmware 1: 6.2.1 build 2977 (Running)' which is selected, and 'Firmware 2: 6.2.1b01 build 2949'. Below the options is a red 'Reboot' button.

19 Tools

19.1 Ping

The ping test tool sends pings through a specified 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:

Ping	
Connection	WAN 1 ▾
Destination	10.10.10.1
Packet Size	56
Number of times	Times 5 
<div>Start Stop</div>	

Results	Clear Log
PING 10.10.10.1 (10.10.10.1) from 10.88.3.158 56(84) bytes of data.	
64 bytes from 10.10.10.1: icmp_req=1 ttl=62 time=27.6 ms	
64 bytes from 10.10.10.1: icmp_req=2 ttl=62 time=26.5 ms	
64 bytes from 10.10.10.1: icmp_req=3 ttl=62 time=28.9 ms	
64 bytes from 10.10.10.1: icmp_req=4 ttl=62 time=28.3 ms	
64 bytes from 10.10.10.1: icmp_req=5 ttl=62 time=27.7 ms	

--- 10.10.10.1 ping statistics ---	
5 packets transmitted, 5 received, 0% packet loss, time 4005ms	
rtt min/avg/max/mdev = 26.516/27.855/28.933/0.814 ms	

Tip

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

19.2 Traceroute Test

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

[illegible]

Tip

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

19.3 Wake-on-LAN

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

Wake-on-LAN		
Wake-on-LAN Target	Surf_SOHO (00:90:90:90:90:90) ▼	Send

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

20 Status

20.1 Device


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

System Information	
Router Name	SURF-SOHO-2933
Model	Pepwave Surf SOHO MK3
Product Code	SUS-SOHO
Hardware Revision	1
Serial Number	2933-2933-2933
Firmware	7.0.0 build 1133
PepVPN Version	6.0.0
Modem Support Version	1020 (Modem Support List)
Host Name	surf-soho-2933
Uptime	14 days 20 hours
System Time	Wed Jan 25 03:17:55 UTC 2017
Diagnostic Report	Download
Remote Assistance	Turn on

System Information	
Router Name	This is the name specified in the Router Name field located at System>Admin Security .
Model	This shows the model name and number of this device.
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.
PepVPN Version	This shows the current PepVPN version.
Modem Support Version	This shows the modem support version. For a list of supported modems, click Modem Support List .
Hostname	The host name assigned to the Pepwave router appears here.

Uptime	This shows the length of time since the device has been rebooted.
System Time	This shows the current system time.
Diagnostic Report	The Download link is for exporting a diagnostic report file required for system investigation.
Remote Assistance	Click Turn on to enable remote assistance.

Interface	MAC Address
LAN	00:1A:DD:BD:54:40
WAN 1	00:1A:DD:BD:54:41
WAN 2	00:1A:DD:BD:54:42

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

Important Note

If you encounter issues and would like to contact the Pepwave Support Team (<http://www.pepwave.com/contact/>), please download the diagnostic report file and attach it along with a description of your issue.

In Firmware 5.1 or before, the diagnostic report file can be obtained at **System>Reboot**.

20.2 Active Sessions

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

Overview	Search
----------	--------

Session data captured within one minute. [Refresh](#)

Service	Inbound Sessions	Outbound Sessions
AIM/ICQ	0	1
Bittorrent	0	32
DNS	0	51
Flash	0	1
HTTPS	0	76
Jabber	0	5
MSN	0	11
NTP	0	4
QQ	0	1
Remote Desktop	0	3
SSH	0	12
SSL	0	64
XMPP	0	4
Yahoo	0	1

Interface	Inbound Sessions	Outbound Sessions
WAN 1	0	176
WAN 2	0	32
Wi-Fi WAN	0	51
Cellular 1	0	64
Cellular 2	0	0
USB	0	0

Top Clients

Client IP Address	Total Sessions
10.9.66.66	1069
10.9.98.144	147
10.9.2.18	63
10.9.66.14	56
10.9.2.26	33

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**.

Overview
Search

Session data captured within one minute. [Refresh](#)

IP / Subnet	Source or Destination ▾		255.255.255.255 (/32) ▾
Port	Source or Destination ▾		
Protocol / Service	TCP ▾		
Interface	<input type="checkbox"/> WAN 1 <input type="checkbox"/> WAN 2 <input type="checkbox"/> Wi-Fi WAN <input type="checkbox"/> Cellular 1 <input type="checkbox"/> Cellular 2 <input type="checkbox"/> USB <input type="checkbox"/> VPN		
Search			

Outbound

Protocol	Source IP	Destination IP	Service	Interface	Idle Time
No sessions					

Total searched results: 0

Inbound

Protocol	Source IP	Destination IP	Service	Interface	Idle Time
No sessions					

Total searched results: 0


Transit

Protocol	Source IP	Destination IP	Service	Interface	Idle Time
No sessions					

Total searched results: 0

This **Active Sessions** section displays the active inbound/outbound sessions of each WAN connection on the Pepwave 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.



20.3 Client List

The client list table is located at **Status>Client List**. It lists DHCP and online client IP addresses, names (retrieved from the DHCP reservation table or defined by users), current download and upload rate, and MAC address. Clients can be imported into the DHCP reservation table by clicking the  button on the right. You can update the record after import by going to **Network>LAN**.

Filter

☐ Online Clients Only
☐ DHCP Clients Only

Client List

IP Address ▲	Name	Download (kbps)	Upload (kbps)	MAC Address	Import
 192.168.1.100		0	0	00:50:50:50:50:50	

Scale: ☒ kbps ☐ Mbps

20.4 Event Log

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

Device Event Log	
Device Event Log <input checked="" type="checkbox"/> Auto Refresh	
Feb 17 04:43:26	System: Changes applied
Feb 16 10:27:01	System: Time synchronization successful
Feb 16 10:26:25	WAN: WAN 1 connected (10.88.3.158)
Feb 16 10:26:01	WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Priority 2 - Cellular 1, Cellular 2 / Disabled - Wi-Fi WAN)
Feb 16 10:25:40	System: Started up (6.2.0 build 2891)
Feb 16 10:17:27	System: Changes applied
Feb 16 10:17:00	System: Time synchronization successful
Feb 16 10:19:23	WAN: WAN 1 connected (10.88.3.158)
Feb 16 10:18:58	WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Priority 2 - Cellular 1, Cellular 2 / Disabled - Wi-Fi WAN)
Feb 16 10:18:37	System: Started up (6.2.0.201501210247-r12145 build)
End of log	
<input type="button" value="Clear Log"/>	

The log section displays a list of events that has taken place on the Pepwave router. Check **Auto Refresh** to refresh log entries automatically. Click the **Clear Log** button to clear the log.

20.5 Bandwidth

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

20.5.1 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 boot up.

Data transferred since installation (Sun Oct 10 05:56:02 PST 2010)

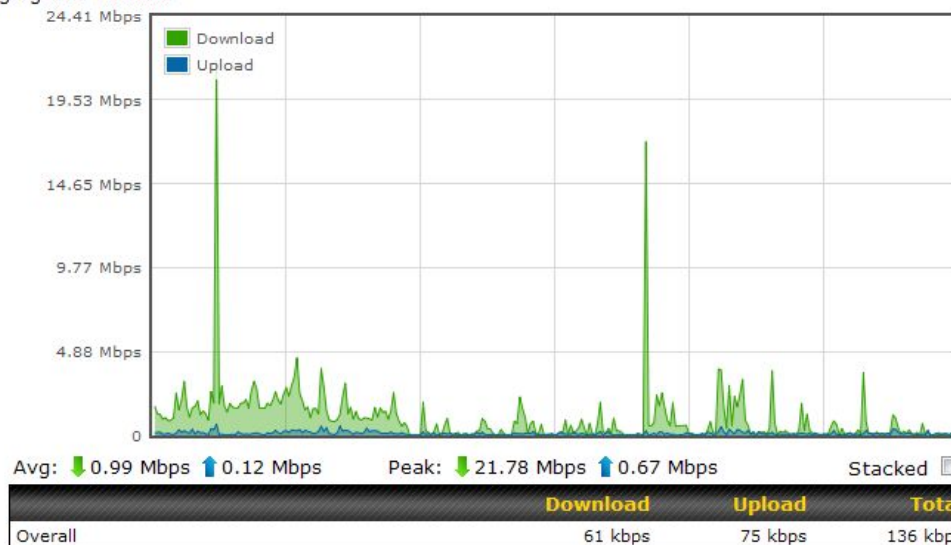
	Download	Upload	Total
All WAN Connections	216.68 GB	91.70 GB	308.38 GB

Data transferred since last reboot

[\[Hide Details \]](#)

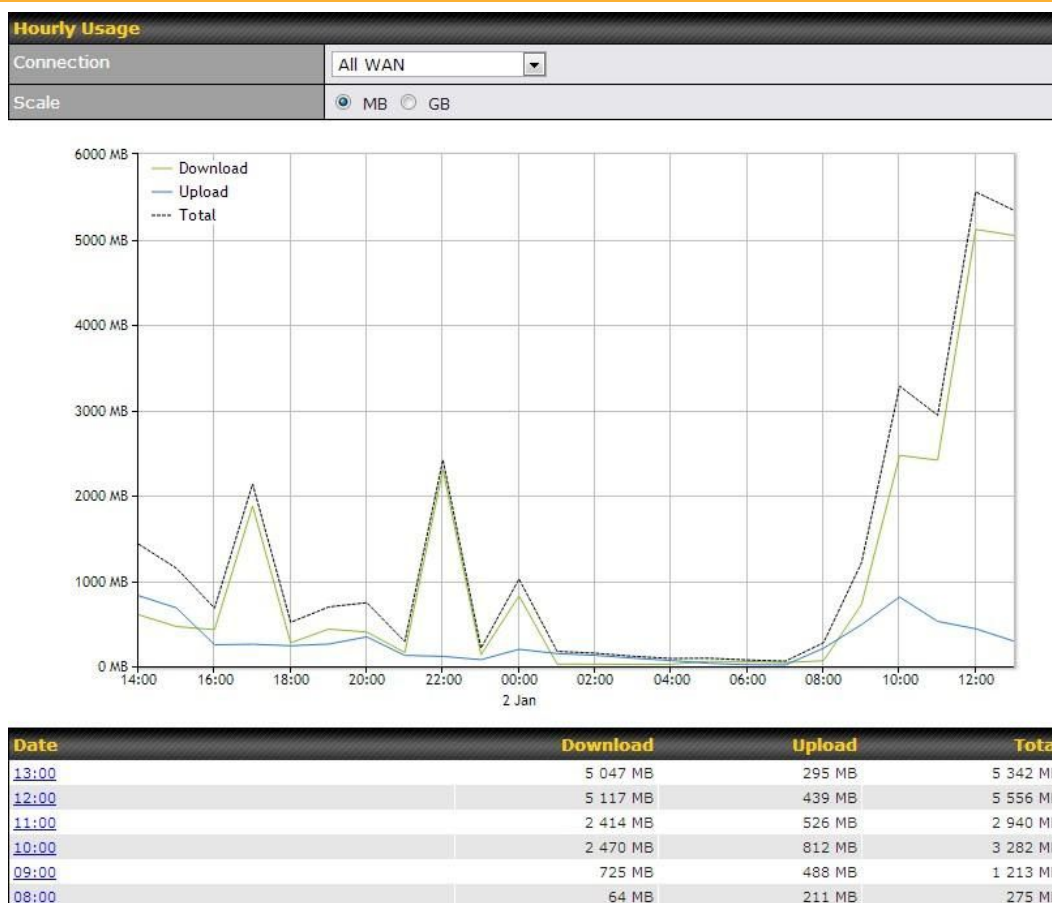
	Download	Upload	Total
All WAN Connections	0.74 GB	0.63 GB	1.37 GB
WAN1	0.67 GB	0.61 GB	1.28 GB
WAN2	0.07 GB	0.02 GB	0.09 GB

Aggregated Transfer



20.5.2 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.

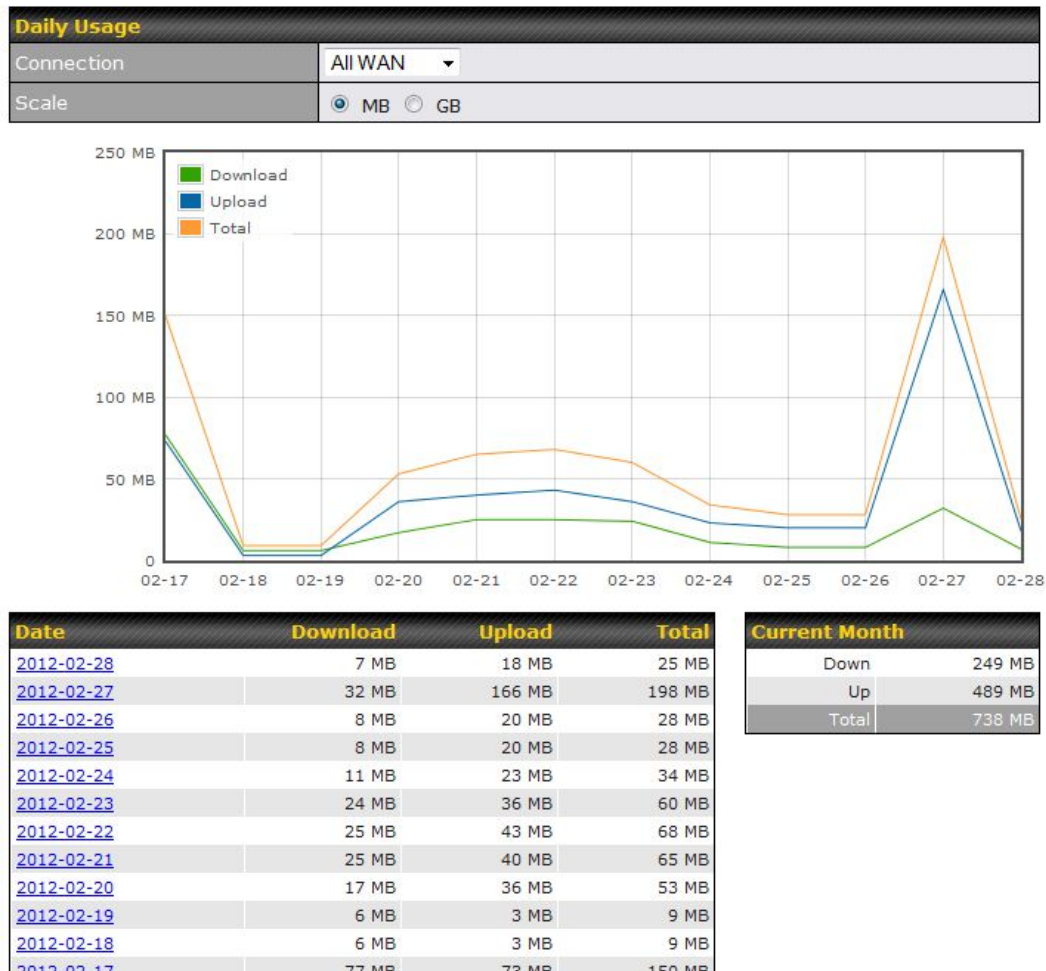


20.5.3 Daily

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.

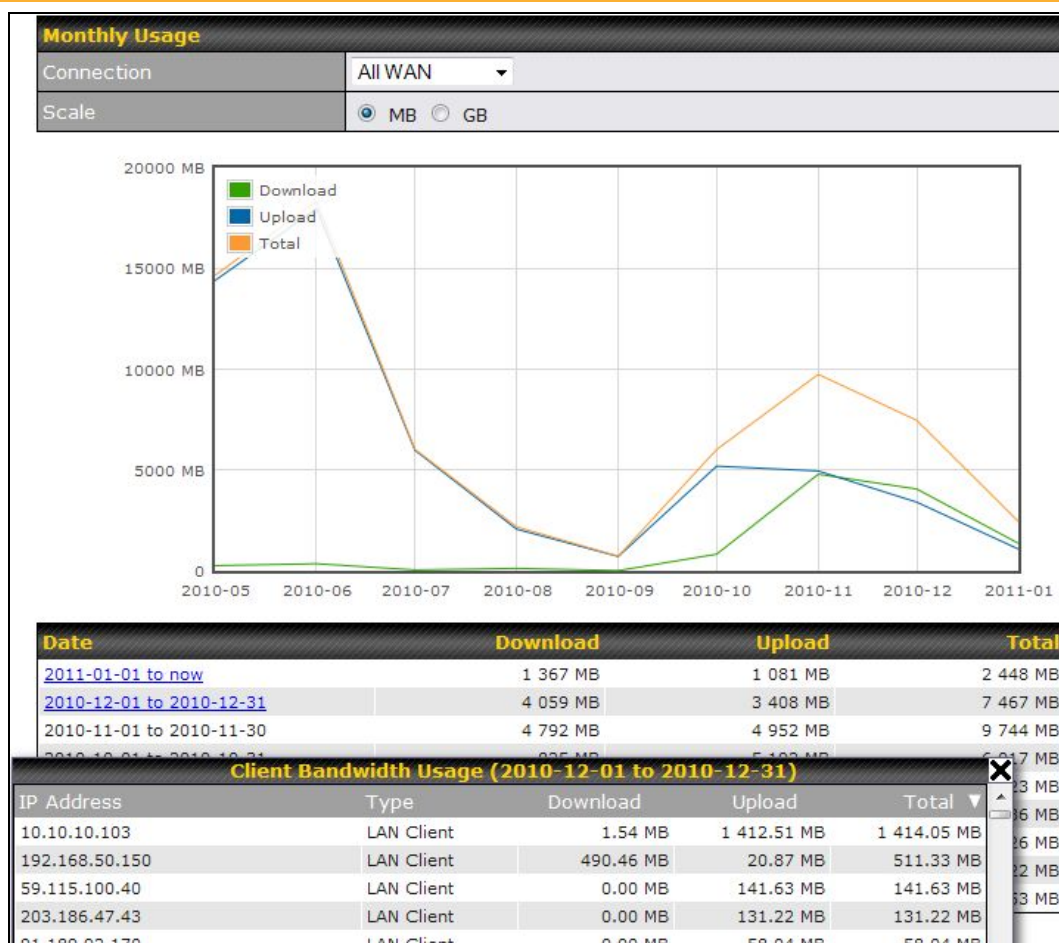
Click on a date to view the client bandwidth usage of that specific date. This feature is not available if you have selected to view the bandwidth usage of only a particular WAN connection. The scale of the graph can be set to display megabytes (**MB**) or gigabytes (**GB**).



20.5.4 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**).



Appendix A: Restoration of Factory Defaults

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

1. Locate the reset button on the front or back panel of the Pepwave router.
2. With a paper clip, press the reset button and hold it for at least 10 seconds, until the unit reboots itself.
3. After the Pepwave 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: Declaration

- **The device supports time division technology**
- **Federal Communication Commission Interference Statement**

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

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

- Consult the dealer or an experienced radio/TV technician for help.FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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

Operations in the 5.15-5.25GHz band are restricted to indoor usage only.

The availability of some specific channels and/or operational frequency bands are country dependent and are firmware programmed at the factory to match the intended destination.

- **CE Statement for Pepwave Routers**

Europe – EU Declaration of Conformity

This device complies with the essential requirements of the R&TTE Directive 1999/5/EC. The following test methods have been applied in order to prove presumption of conformity with the essential requirements of the R&TTE Directive 1999/5/EC:

❑ EN 60950-1: 2006 + A11 : 2009+A1 : 2010+ A12: 2011

Safety of Information Technology Equipment

❑ EN50385 : 2002 / Article 3(1)(a)

Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110MHz - 40 GHz) - General public

❑ EN 300 328 V1.7.1: 2006

Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

❑ EN 301 908-1 V5.2.1: 2011

Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 1: Harmonized EN for IMT-2000, introduction and common requirements, covering essential requirements of article 3.2 of the

R&TTE Directive

☐ EN 301 511 V9.0.2: 2003

Global System for Mobile communications (GSM); Harmonized standard for mobile stations in the GSM 900 and DCS 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)

☐ EN 301 489-1 V1.9.2: 2008

Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

☐ EN 301 489-7 V1.3.1: 2005

ElectroMagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment ad services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)

☐ EN 301 489-17 V2.2.1: 2012











Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment









☐ EN 301 489-24 V1.5.1: 2010

Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 24: Specific conditions for IMT-2000 CDMA Direct Spread (UTRA) for Mobile and portable (UE) radio and ancillary equipment



<input type="checkbox"/> Česky [Czech]	<i>[Jméno výrobce]</i> tímto prohlašuje, že tento <i>[typ zařízení]</i> je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
<input type="checkbox"/> Dansk	Undertegnede <i>[fabrikantens navn]</i> erklærer herved, at følgende udstyr <i>[udstyrets typebetegnelse]</i> overholder de væsentlige krav og øvrige relevante krav i direktiv

[Danish]	1999/5/EF.
 Deutsch [German]	Hiermit erklärt <i>[Name des Herstellers]</i> , dass sich das Gerät <i>[Gerätetyp]</i> in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
 Eesti [Estonian]	Käesolevaga kinnitab <i>[tootja nimi = name of manufacturer]</i> seadme <i>[seadme tüüp = type of equipment]</i> vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
 English	Hereby, <i>[name of manufacturer]</i> , declares that this <i>[type of equipment]</i> is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
 Español [Spanish]	Por medio de la presente <i>[nombre del fabricante]</i> declara que el <i>[clase de equipo]</i> cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
 Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ <i>[name of manufacturer]</i> ΔΗΛΩΝΕΙ ΟΤΙ <i>[type of equipment]</i> ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/EK.
 Français [French]	Par la présente <i>[nom du fabricant]</i> déclare que l'appareil <i>[type d'appareil]</i> est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
 Italiano [Italian]	Con la presente <i>[nome del costruttore]</i> dichiara che questo <i>[tipo di apparecchio]</i> è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
 Latviski [Latvian]	Ar šo <i>[name of manufacturer / izgatavotāja nosaukums]</i> deklarē, ka <i>[type of equipment / iekārtas tips]</i> atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
 Lietuvių [Lithuanian]	Šiuo <i>[manufacturer name]</i> deklaruoją, kad šis <i>[equipment type]</i> atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
	Hierbij verklaart <i>[naam van de fabrikant]</i> dat het toestel <i>[type van toestel]</i> in

Nederlands [Dutch]	overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
 Malti [Maltese]	Hawnhekk, <i>[isem tal-manifattur]</i> , jiddikjara li dan <i>[il-mudel tal-prodott]</i> jikkonforma mal-htigijiet essenzjali u ma provvedimenti oħrajn rilevanti li hemm fid-Dirrettiva 1999/5/EC.
 Magyar [Hungarian]	Alulírott, <i>[gyártó neve]</i> nyilatkozom, hogy a <i>[... típus]</i> megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.
 Polski [Polish]	Niniejszym <i>[nazwa producenta]</i> oświadczam, że <i>[nazwa wyrobu]</i> jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
 Português [Portuguese]	<i>[Nome do fabricante]</i> declara que este <i>[tipo de equipamento]</i> está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
 Slovensko [Slovenian]	<i>[Ime proizvajalca]</i> izjavlja, da je ta <i>[tip opreme]</i> v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
 Slovensky [Slovak]	<i>[Meno výrobcu]</i> týmto vyhlasuje, že <i>[typ zariadenia]</i> spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
 Suomi [Finnish]	<i>[Valmistaja = manufacturer]</i> vakuuttaa täten että <i>[type of equipment = laitteen tyyppimerkintä]</i> tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
 Svenska [Swedish]	Härmed intygar <i>[företag]</i> att denna <i>[utrustningstyp]</i> står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.