

Pepwave MAX and Surf User Manual

Pepwave Products:

MAX 700/HD2/HD2 IP67/HD2 mini/HD4/BR1/BR1 Slim/BR1 ENT/BR1 Pro LTE/BR1
IP55/BR2 IP55/On-The-Go/MAX HD2/HD4 with MediaFast/ Surf SOHO

Pepwave Firmware 6.2.1
July 2015

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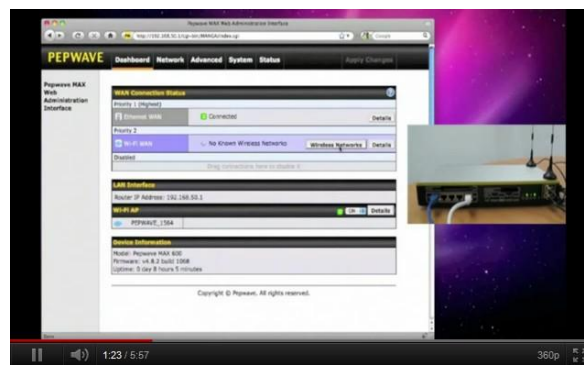
1 Introduction and Scope

Pepwave routers provide link aggregation and load balancing across multiple WAN connections, allowing a combination of technologies like 3G HSDPA, EVDO, 4G LTE, Wi-Fi, external WiMAX dongle, and satellite to be utilized to connect to the Internet.

This manual covers setting up Pepwave routers 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>

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2 Glossary

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

Term	Definition
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. 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
- Built-in HSPA and EVDO cellular modems
- USB mobile connection(s)
- Wi-Fi WAN connection
- Network address translation (NAT)/port address translation (PAT)
- Inbound and outbound NAT mapping
- IPsec NAT-T and PPTP packet passthrough
- MAC address clone and passthrough
- Customizable MTU and MSS values
- WAN connection health check
- Dynamic DNS (supported service providers: changeip.com, dyndns.org, no-ip.org, tzo.com and [DNS-O-Matic](http://DNS-O-Matic.com))
- 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

- PepVPN with SpeedFusion™
- PepVPN performance analyzer
- X.509 certificate support
- VPN load balancing and failover among selected WAN connections

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

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 Captive Portal

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

3.1.6 Outbound Policy

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

3.1.7 AP Controller

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

3.1.8 QoS

- Quality of service for different applications and custom protocols
- User group classification for different service levels
- Bandwidth usage control and monitoring on group- and user-level

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- 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
- Built-in WINS servers*
- Syslog
- SIP passthrough
- PPTP packet passthrough
- Event log
- Active sessions
- Client list
- WINS client list *
- UPnP / NAT-PMP
- Real-time, hourly, daily, and monthly bandwidth usage reports and charts
- IPv6 support
- Support USB tethering on Android 2.2+ phones

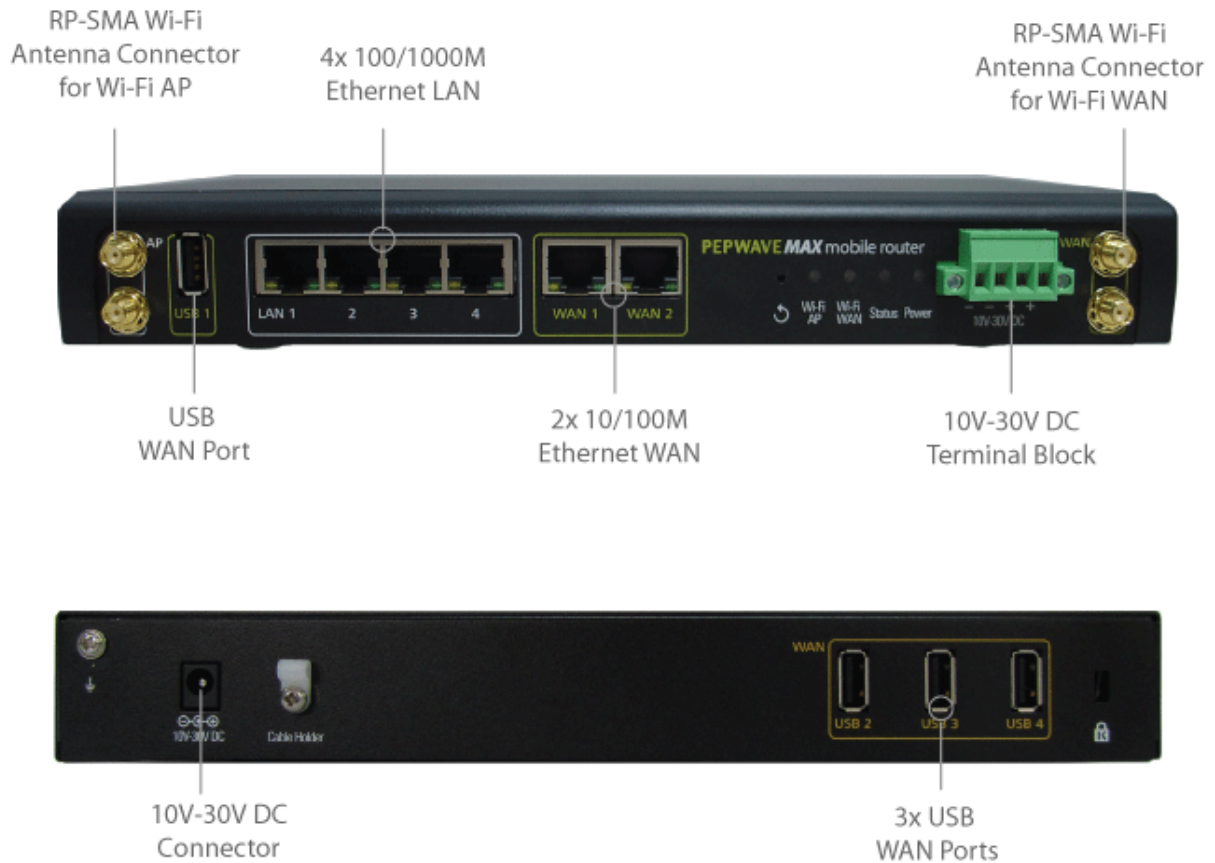
* Not supported on MAX Surf-On-The-Go, Surf SOHO, and BR1 variants

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4 Pepwave MAX Mobile Router Overview

4.1 MAX 700

4.1.1 Panel Appearance



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4.1.2 LED Indicators

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

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

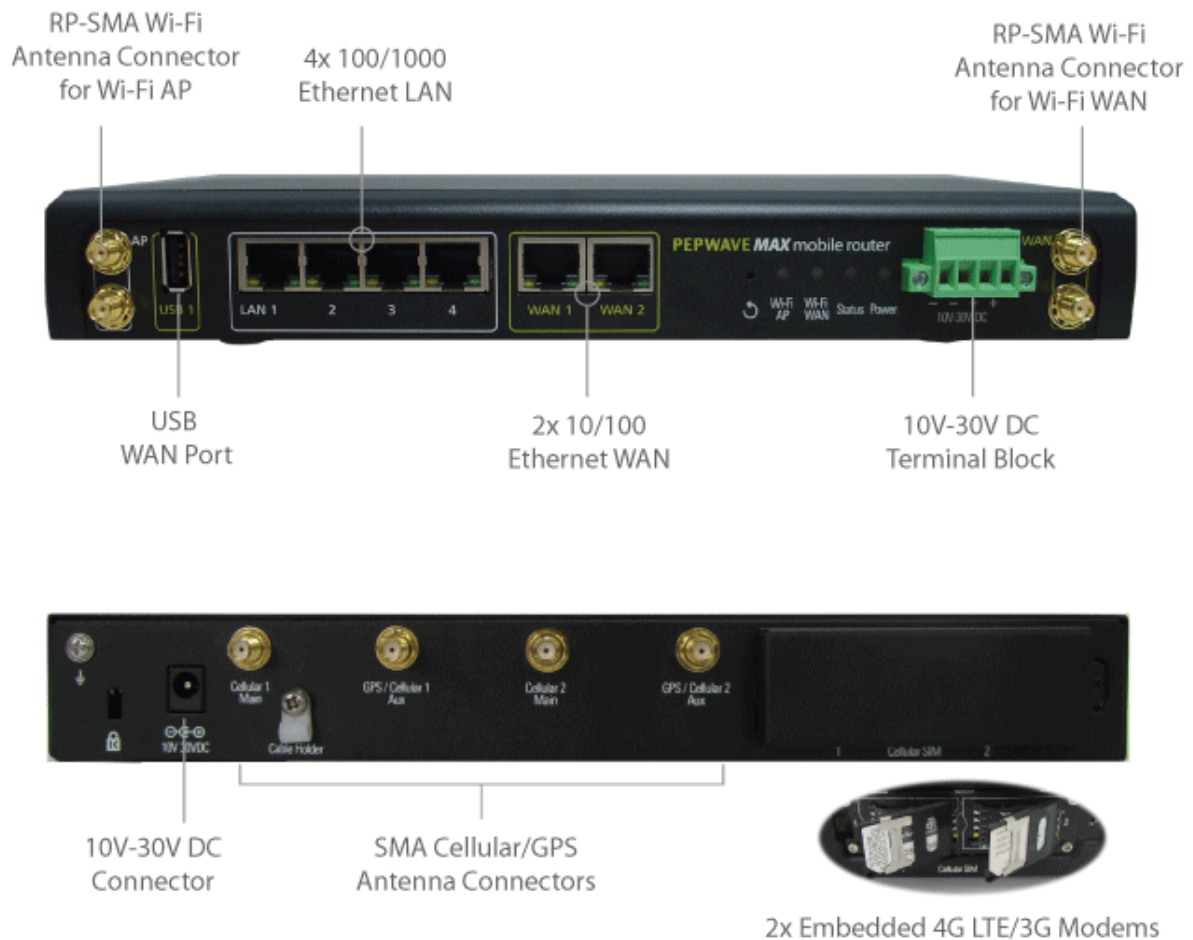
Wi-Fi AP and Wi-Fi WAN Indicators		
Wi-Fi WAN	OFF	Disconnected
	Blinking slowly	Connecting to network
	Blinking	Connected to network with traffic
	ON	Connected to network without traffic
Wi-Fi AP	OFF	Disabled
	Blinking slowly	Enabled but no client connected
	Blinking	Connected to network with traffic
	ON	Client(s) connected to wireless network

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

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4.2 MAX HD2

4.2.1 Panel Appearance



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4.2.2 LED Indicators

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

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

Wi-Fi AP and Wi-Fi WAN Indicators		
Wi-Fi WAN / Cellular 1 / Cellular 2	OFF	Disabled Intermittent
	Blinking slowly	Connecting to wireless network(s)
	Blinking	Connected to wireless network(s) with traffic
	ON	Connected to wireless network(s) without traffic

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

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4.3 MAX HD2 IP67

4.3.1 Panel Appearance



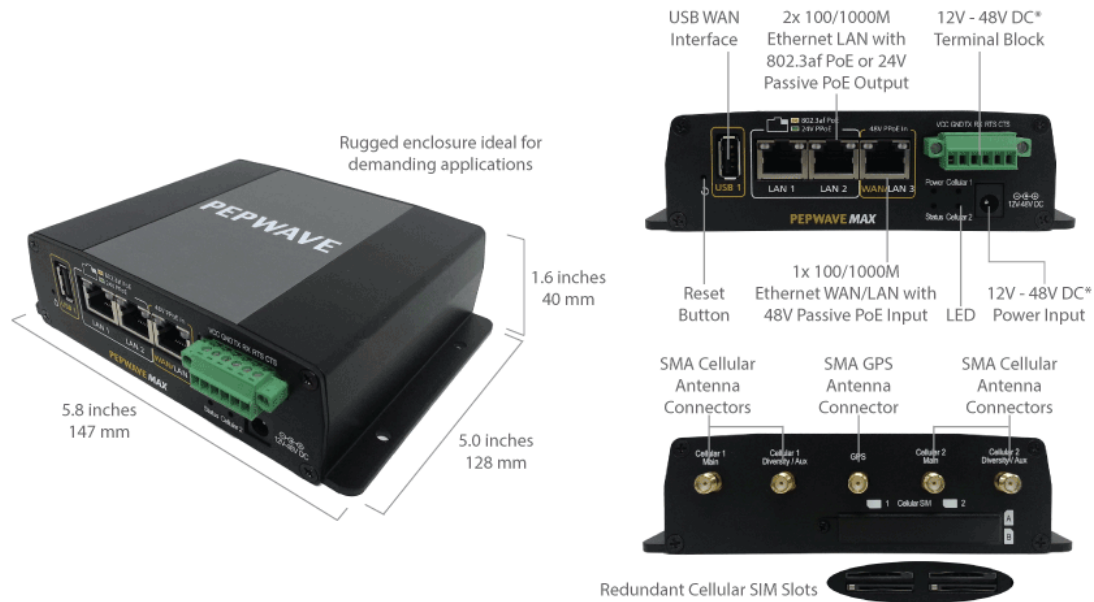
The statuses indicated by the front panel LEDs are as follows:

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

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4.4 MAX HD2 mini

4.4.1 Panel Appearance



* With 48V DC power, all 3 Ethernet ports can act as 802.3af PoE or 24V Passive PoE outputs

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4.4.2 LED Indicators

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

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

Cellular WAN Indicators		
Cellular 1 / Cellular 2	OFF	Disabled intermittent
	Blinking slowly	Connecting to wireless network(s)
	Blinking	Connected to wireless network(s) with traffic
	ON	Connected to wireless network(s) without traffic

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

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4.5 MAX HD4

4.5.1 Panel Appearance



4.5.2 LED Indicators

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

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

Wi-Fi AP and Wi-Fi WAN Indicators		
Wi-Fi WAN / Cellular 1 / Cellular 2	OFF	Disabled Intermittent
	Blinking slowly	Connecting to wireless network(s)
	Blinking	Connected to wireless network(s) with traffic
	ON	Connected to wireless network(s) without traffic

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

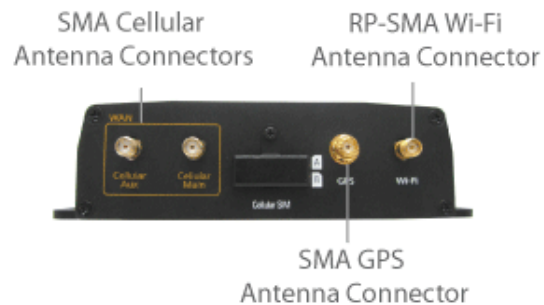
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4.6 MAX BR1

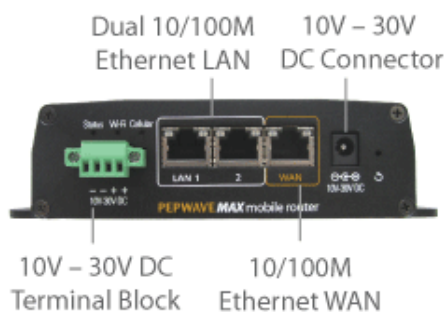
4.6.1 Panel Appearance



MAX-BR1-LTE Version



MAX-BR1 Version



4.6.2 LED Indicators

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

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

Wi-Fi Indicators		
Wi-Fi	OFF	Disabled intermittent
	Blinking slowly	Connecting to wireless network(s)
	Blinking	Connected to wireless network(s) with traffic
	ON	Connected to wireless network(s) without traffic

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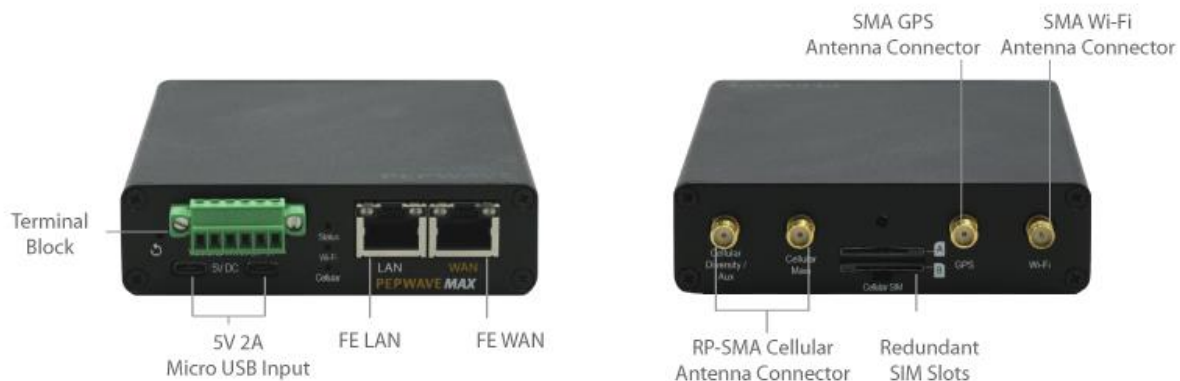
Cellular Indicators		
Cellular	OFF	Disabled or no SIM card inserted
	ON	Connecting or connected to network(s)

LAN and Ethernet WAN Ports		
Green LED	ON	100 Mbps
	OFF	10 Mbps
Orange LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	Port is not connected
Port Type	Auto MDI/MDI-X ports	

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4.7 MAX BR1 Slim

4.7.1 Panel Appearance



4.7.2 LED Indicators

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

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

Wi-Fi Indicators		
Wi-Fi	OFF	Disabled intermittent
	Blinking slowly	Connecting to wireless network(s)
	Blinking	Connected to wireless network(s) with traffic
	ON	Connected to wireless network(s) without traffic

Cellular Indicators		
Cellular	OFF	Disabled or no SIM card inserted
	ON	Connecting or connected to network(s)

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-

LAN and Ethernet WAN Ports		
Green LED	ON	100 Mbps
	OFF	10 Mbps
Orange LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	Port is not connected
Port Type	Auto MDI/MDI-X ports	

-

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4.8 MAX BR1 ENT

4.8.1 Panel Appearance



4.8.2 LED Indicators

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

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

Cellular Indicators		
Cellular	OFF	Disabled or no SIM card inserted
	ON	Connecting or connected to network(s)

LAN and Ethernet WAN Ports		
Green LED	ON	100 Mbps
	OFF	10 Mbps
Orange LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	Port is not connected
Port Type	Auto MDI/MDI-X ports	

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4.9 MAX BR1 Pro LTE

4.9.1 Panel Appearance



4.9.2 LED Indicators

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

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

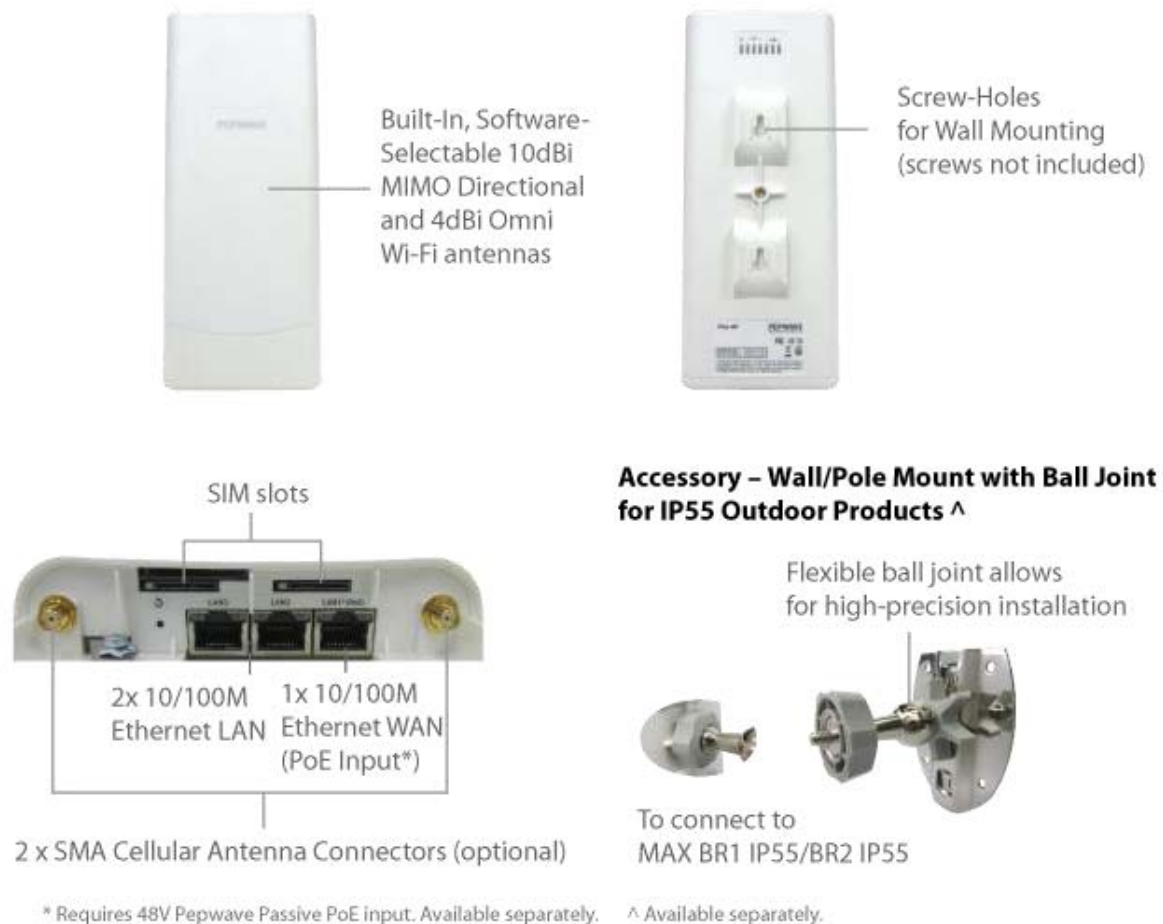
Cellular Indicators		
Cellular	OFF	Disabled or no SIM card inserted
	ON	Connecting or connected to network(s)

LAN and Ethernet WAN Ports		
Green LED	ON	100 Mbps
	OFF	10 Mbps
Orange LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	Port is not connected
Port Type	Auto MDI/MDI-X ports	

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4.10 MAX BR1/2 IP55

4.10.1 Panel Appearance



4.10.2 LED Indicators

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

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

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Wi-Fi Indicators		
Wi-Fi	OFF	Disabled Intermittent
	Blinking slowly	Connecting to wireless network(s)
	Blinking	Connected to wireless network(s) with traffic
	ON	Connected to wireless network(s) without traffic

Cellular Indicators		
Cellular	OFF	Disabled or no SIM card inserted
	ON	Connecting or connected to network(s)

LAN and Ethernet WAN Ports		
Green LED	ON	100 Mbps
	OFF	10 Mbps
Orange LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	Port is not connected
Port Type	Auto MDI/MDI-X ports	

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4.11 MAX On-The-Go

4.11.1 Panel Appearance



4.11.2 LED Indicators

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

Cellular Indicators		
WAN	OFF	Modem is not attached to the port
	Green	Modem is attached to the port

Wi-Fi Indicators		
Wi-Fi	OFF	Disconnected from AP
	Green	Connected to AP

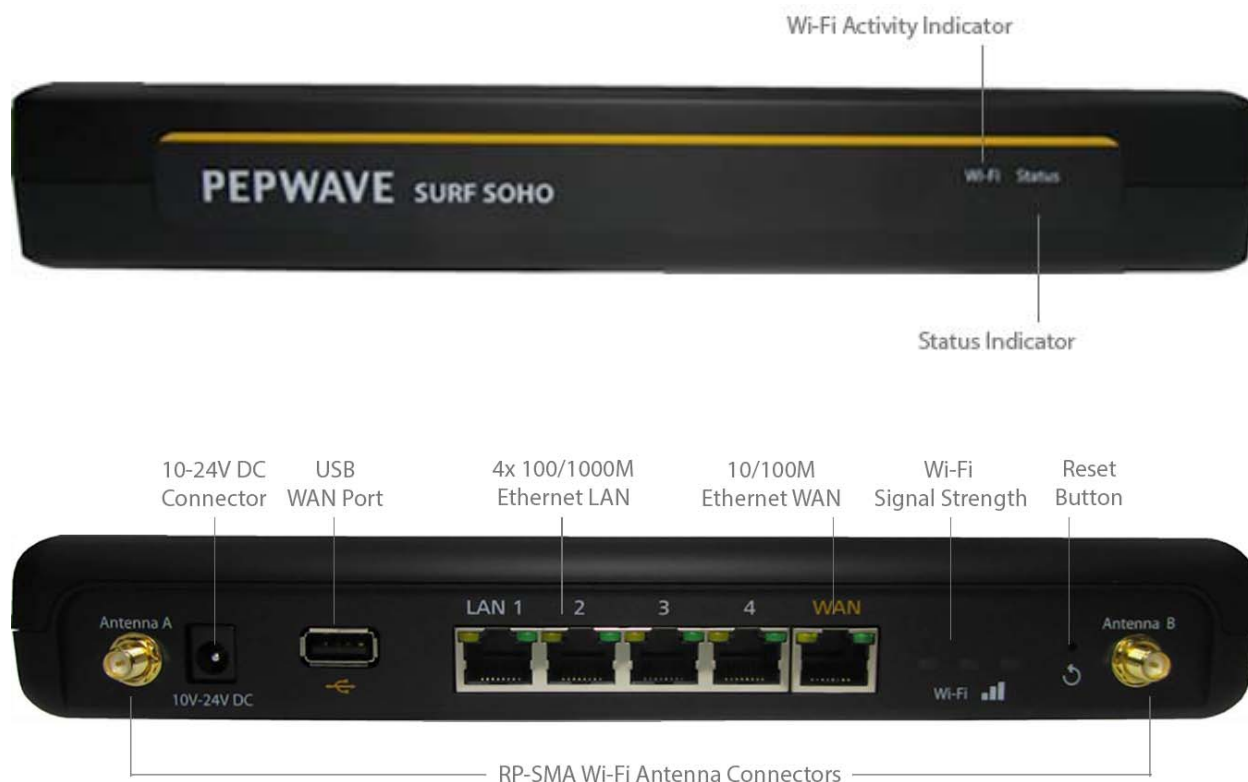
Status Indicators		
Status	OFF	System initializing
	Red	Booting up or busy
	Green	Ready

LAN and Ethernet WAN Ports		
Green LED	ON	100 Mbps
	OFF	10 Mbps
Orange LED	ON	Port is connected without traffic
	Blinking	Data is transferring
Port Type	Auto MDI/MDI-X ports	

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4.12 Surf SOHO

4.12.1 Panel Appearance



4.12.2 LED Indicators

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

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

LAN and Ethernet WAN Ports		
Green LED	ON	10 / 100 Mbps

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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 Installation

The following section details connecting Pepwave routers to your network.

5.1 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.

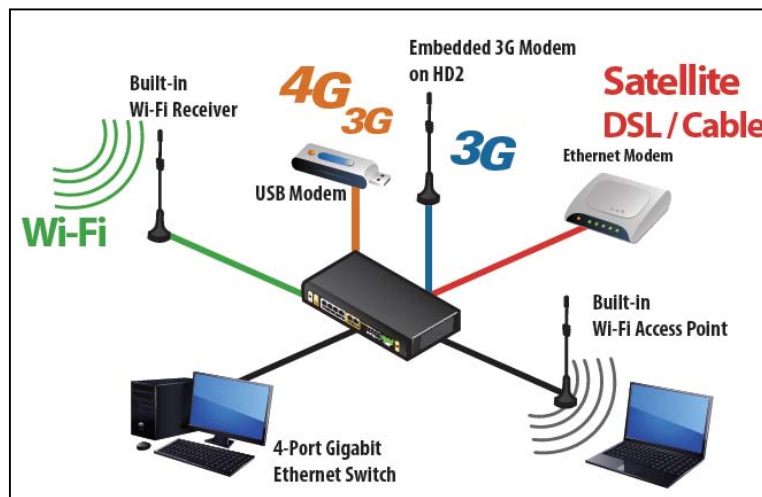
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5.2 Constructing the Network

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:



5.3 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 7, Connecting to the Web Admin Interface**.

For advanced configuration, go to **Section 8, Configuring the LAN Interface(s)**.

- WAN configuration

For basic configuration, refer to **Section 7, Connecting to the Web Admin Interface**.

For advanced configuration, go to **Section 8.2, Captive Portal**.

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6 Mounting the Unit

6.1 Wall Mount

The Pepwave MAX 700/HD2/On-The-Go can be wall mounted using screws. After adding the screw on the wall, slide the MAX in the screw hole socket as indicated below. Recommended screw specification: M3.5 x 20mm, head diameter 6mm, head thickness 2.4mm.

The Pepwave MAX BR1 requires four screws for wall mounting.

6.2 Car Mount

The Pepwave MAX700/HD2 can be mounted in a vehicle using the included mounting brackets. Place the mounting brackets by the two sides and screw them onto the device.



6.3 IP67 Installation Guide

Installation instructions for IP67 devices can be found here:
http://download.peplink.com/manual/IP67_Installation_Guide.pdf

7 Connecting to the Web Admin Interface

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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.)

3. 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**.)



4. 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. For further information on setting up these connections, please refer to **Sections 8** and **9**.

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

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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 Basic Settings

LAN interface settings are located at **Network>LAN>Basic Settings**.

IP Settings		
IP Address	192.168.50.1	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	
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.
Captive Portal	Check this box to turn on captive portals.

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Drop-In Mode Settings	
Enable	☒
WAN for Drop-In Mode	WAN 1 ▼
Share Drop-In IP	☒
Shared IP Address	255.255.255.0 (/24) ▼
WAN Default Gateway	 ☒ I have other host(s) on WAN segment Host IP Address(es) - ↓ Delete
WAN DNS Servers	DNS server 1: DNS server 2:
NOTE: The DHCP Server Settings will be overwritten. The following WAN 1 settings will be overwritten: Connection Method, MTU, Health Check, Additional Public IP, and Dynamic DNS Settings. The PPTP Server will be disabled. Tip: please review the DNS Forwarding setting under the Service Forwarding section.	

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Drop-in Mode Settings	
Enable	Drop-in mode eases the installation of Peplink routers on a live network between the existing firewall and router, such that no configuration changes are required on existing equipment. Check the box to enable the drop-in mode feature, if available on your model.
WAN for Drop-In Mode	Select the WAN port to be used for drop-in mode. If WAN 1 with LAN Bypass is selected, the high availability feature will be disabled automatically.
Share Drop-In IP^A	When this option is enabled, the passthrough IP address will be used to connect to WAN hosts (email notification, remote syslog, etc.). The Pepwave router will listen for this IP address when WAN hosts access services provided by the Pepwave router (web admin access from the WAN, DNS server requests, etc.). To connect to hosts on the LAN (email notification, remote syslog, etc.), the default gateway address will be used. The Pepwave router will listen for this IP address when LAN hosts access services provided by the Pepwave router (web admin access from the WAN, DNS proxy, etc.).
Shared IP Address^A	Access to this IP address will be passed through to the LAN port if this device is not serving the service being accessed. The shared IP address will be used in connecting to hosts on the WAN (email notification, remote syslog, etc.) The device will also listen on the IP address when hosts on the WAN access services served on this device (web admin access from the WAN, DNS server, etc.)
WAN Default Gateway	Enter the WAN router's IP address in this field. If there are more hosts in addition to the router on the WAN segment, check the I have other host(s) on WAN segment box and enter the IP address of the hosts that need to access LAN devices or be accessed by others.
WAN DNS Servers	Enter the selected WAN's corresponding DNS server IP addresses.

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

Layer 2 PepVPN Bridging	
PepVPN Profiles to Bridge	 Connection 1
Spanning Tree Protocol	☒
Override IP Address when bridge connected	 ☒ Do not override ☐ Static ☐ By DHCP ☐ As None

Layer 2 PepVPN Bridging	
PepVPN Profiles to Bridge	The remote network of the selected PepVPN profiles will be bridged with this local LAN, creating a Layer 2 PepVPN, they will be connected and operate like a single LAN, and any broadcast or multicast packets will be sent over the VPN.
Spanning Tree Protocol	Click the box will enable STP for this layer 2 profile bridge.
Override IP	Select "Do not override" if the LAN IP address and local DHCP server should remain unchanged after the Layer 2 PepVPN is up.

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Address when bridge connected

If you choose to override IP address when the VPN is connected, the device will not act as a router, and most Layer 3 routing functions will cease to work.

DHCP Server Settings									
DHCP Server		☒ Enable							
IP Range		192.168.50.10 - 192.168.50.250							
Subnet Mask		255.255.255.0 (/24)							
Lease Time		1 Days 0 Hours 0 Mins							
DNS Servers		☒ Assign DNS server automatically							
WINS Server		☒ Assign WINS server ☒ Built-in ☐ External							
BOOTP		☒ Server IP Address: Boot File: Server Name: (Optional)							
Extended DHCP Option		<table><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"> Add </td></tr></tbody></table>		Option	Value	No Extended DHCP Option		Add	
Option	Value								
No Extended DHCP Option									
Add									
DHCP Reservation		<table><thead><tr><th>Name</th><th>MAC Address</th><th>Static IP</th></tr></thead><tbody><tr><td></td><td></td><td></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 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

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**.

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**.

BOOTP

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

Extended DHCP Option

In addition to standard DHCP options (e.g., DNS server address, gateway address, subnet mask), you can specify the value of additional extended DHCP options, as defined in RFC 2132. With these extended options enabled, you can pass additional configuration information to LAN hosts.

To define an extended DHCP option, click the **Add** button, choose the option to define and

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DHCP Reservation

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.

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 client information can be imported from the **Client List**, located at **Status>Client List**. For more details, please refer to **Section 21.3**.

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	Gateway
			255.255.255.0 (/24)	

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.

WINS Server Settings	
Enable	☐

WINS Server Settings

Enable

Check the box to enable the WINS server. A list of WINS clients will be displayed at **Status>WINS Clients**.

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DNS Proxy Settings																				
Enable	☒																			
DNS Caching	☐																			
Include Google Public DNS Servers	☐																			
Local DNS Records	<table border="1"> <thead> <tr> <th>Host Name</th> <th>IP Address</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>+</td> </tr> </tbody> </table>		Host Name	IP Address				+												
Host Name	IP Address																			
		+																		
DNS Resolvers	<table border="1"> <thead> <tr> <th>Connection</th> <th>Current Status</th> </tr> </thead> <tbody> <tr> <td>☐ WAN 1</td> <td>10.88.3.1</td> </tr> <tr> <td>☐ WAN 2</td> <td></td> </tr> <tr> <td>☐ Wi-Fi WAN</td> <td></td> </tr> <tr> <td>☐ Cellular 1</td> <td></td> </tr> <tr> <td>☐ Cellular 2</td> <td></td> </tr> <tr> <td>☐ USB</td> <td></td> </tr> <tr> <th>Connection</th> <th>DNS Servers</th> </tr> <tr> <td>☐ LAN</td> <td></td> </tr> </tbody> </table>		Connection	Current Status	☐ WAN 1	10.88.3.1	☐ WAN 2		☐ Wi-Fi WAN		☐ Cellular 1		☐ Cellular 2		☐ USB		Connection	DNS Servers	☐ LAN	
Connection	Current Status																			
☐ WAN 1	10.88.3.1																			
☐ WAN 2																				
☐ Wi-Fi WAN																				
☐ Cellular 1																				
☐ Cellular 2																				
☐ USB																				
Connection	DNS Servers																			
☐ LAN																				
Preferred connections are shown with ☒																				

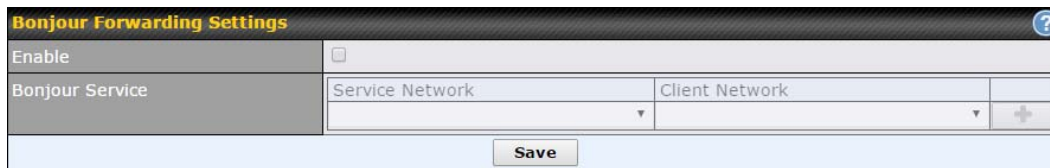
DNS Proxy Settings	
Enable	To enable the DNS proxy feature, check this box, and then set up the feature at Network>LAN>DNS Proxy Settings . A DNS proxy server can be enabled to serve DNS requests originating from LAN/PPTP/SpeedFusion™ peers. Requests are forwarded to the DNS servers/resolvers defined 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.

Finally, if needed, configure Bonjour forwarding, Apple's zero configuration networking

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protocol. Once VLAN configuration is complete, click **Save** to store your changes.



The screenshot shows a web interface titled "Bonjour Forwarding Settings" with a help icon. It contains two main sections: "Enable" with a checkbox, and "Bonjour Service" with two dropdown menus labeled "Service Network" and "Client Network", and a "+" button. A "Save" button is at the bottom.

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

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

IP Settings		
IP Address	192.168.50.1	255.255.255.0 (/24) ▼

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.

LAN	VLAN	Network	
Untagged LAN	None	192.168.50.1/24	
New LAN			

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.
Captive Portal	Check this box to turn on captive portals.

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DHCP Server Settings											
DHCP Server	☒ Enable										
IP Range	- 255.255.255.0 (/24) ▼										
Lease Time	1 Days 0 Hours 0 Mins										
DNS Servers	☒ Assign DNS server automatically										
WINS Servers	☐ Assign WINS server										
BOOTP	☐										
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 Option	In addition to standard DHCP options (e.g. DNS server address, gateway address, subnet mask), you can specify the value of additional extended DHCP options, as defined in RFC 2132. With these extended options enabled, you can pass additional configuration information to LAN hosts. To define an extended DHCP option, click the Add button, choose the option to define, and then enter its value. For values that are in IP address list format, you can enter one IP address per line in the provided text area input control. Each option can be defined once only.
DHCP Reservation	This setting reserves the assignment of fixed IP addresses for a list of computers on the LAN. The computers to be assigned fixed IP addresses on the LAN are identified by their MAC addresses. The fixed IP address assignment is displayed as a cross-reference list between the computers' names, MAC addresses, and fixed IP addresses. Name (an optional field) allows you to specify a name to represent the device. MAC addresses should be in the format of 00:AA:BB:CC:DD:EE. Press  to create a new record. Press  to remove a record. Reserved clients information can be imported from the Client List, located at Status>Client List. For more details, please refer to Section

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21.3.

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

DHCP Relay Settings	
DHCP Relay	 ☒ Enable
DHCP Server IP Address	 DHCP Server 1: DHCP Server 2:
DHCP Option 82	 ☐

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**, **WINS Server Settings**, and **DNS Proxy Settings** as noted above.

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8.2 Captive Portal

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

Captive Portal Settings	
Enable	☒ Untagged LAN
Hostname	captive-portal.peplink.com Default
Access Mode	☒ Open Access ☐ User Authentication
Access Quota	30 mins (0: Unlimited) 0 MB (0: Unlimited)
Quota Reset Time	☒ Daily at 00 :00 ☐ 1440 minutes after quota reached
Allowed Networks	Domain Name / IP Address +
Allowed Clients	MAC / IP Address +
Splash Page	☒ Built-in ☐ External, URL: http://

Captive Portal Settings																						
Enable	Check Enable and then, optionally, select the LANs/VLANs that will use the captive portal.																					
Hostname	To customize the portal's form submission and redirection URL, enter a new URL in this field. To reset the URL to factory settings, click Default .																					
Access Mode	Click Open Access to allow clients to freely access your router. Click User Authentication to force your clients to authenticate before accessing your router.																					
RADIUS Server	This authenticates your clients through a RADIUS server. After selecting this option, you will see the following fields: <table><tbody><tr><td>Authentication</td><td colspan="2">RADIUS Server</td></tr><tr><td>Auth Server</td><td> </td><td>Port 1812 Default</td></tr><tr><td>Auth Server Secret</td><td> </td><td>☒ Hide Characters</td></tr><tr><td>CoA-DM</td><td colspan="2">☐</td></tr><tr><td>Accounting Server</td><td> </td><td>Port 1813 Default</td></tr><tr><td>Accounting Server Secret</td><td> </td><td>☒ Hide Characters</td></tr><tr><td>Accounting Interim Interval</td><td> </td><td>seconds</td></tr></tbody></table> Fill in the necessary information to complete your connection to the server and enable authentication.	Authentication	RADIUS Server		Auth Server		Port 1812 Default	Auth Server Secret		☒ Hide Characters	CoA-DM	☐		Accounting Server		Port 1813 Default	Accounting Server Secret		☒ Hide Characters	Accounting Interim Interval		seconds
Authentication	RADIUS Server																					
Auth Server		Port 1812 Default																				
Auth Server Secret		☒ Hide Characters																				
CoA-DM	☐																					
Accounting Server		Port 1813 Default																				
Accounting Server Secret		☒ Hide Characters																				
Accounting Interim Interval		seconds																				
LDAP Server	This authenticates your clients through a LDAP server. Upon selecting this option, you will see the following fields: <table><tbody><tr><td>Authentication</td><td colspan="2">LDAP Server</td></tr><tr><td>LDAP Server</td><td> </td><td>Port 389 Default</td></tr><tr><td></td><td colspan="2">☐ Use DN/Password to bind to LDAP Server</td></tr><tr><td>Base DN</td><td colspan="2"> </td></tr><tr><td>Base Filter</td><td colspan="2"> </td></tr></tbody></table> Fill in the necessary information to complete your connection to the server and enable authentication.	Authentication	LDAP Server		LDAP Server		Port 389 Default		☐ Use DN/Password to bind to LDAP Server		Base DN			Base Filter								
Authentication	LDAP Server																					
LDAP Server		Port 389 Default																				
	☐ Use DN/Password to bind to LDAP Server																					
Base DN																						
Base Filter																						

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Access Quota	Set a time and data cap to each user's Internet usage.
Quota Reset Time	This menu determines how your usage quota resets. Setting it to Daily will reset it at a specified time every day. Setting a number of minutes after quota reached establish a timer for each user that begins after the quota has been reached.
Allowed Networks	To whitelist a network, enter the domain name / IP address here and click  . To delete an existing network from the list of allowed networks, click the  button next to the listing.
Splash Page	Here, you can choose between using the Pepwave router's built-in captive portal and redirecting clients to a URL you define.

The **Portal Customization** menu has two options:  and . Clicking  displays a pop-up previewing the captive portal that your clients will see. Clicking  displays the following menu:

Portal Customization

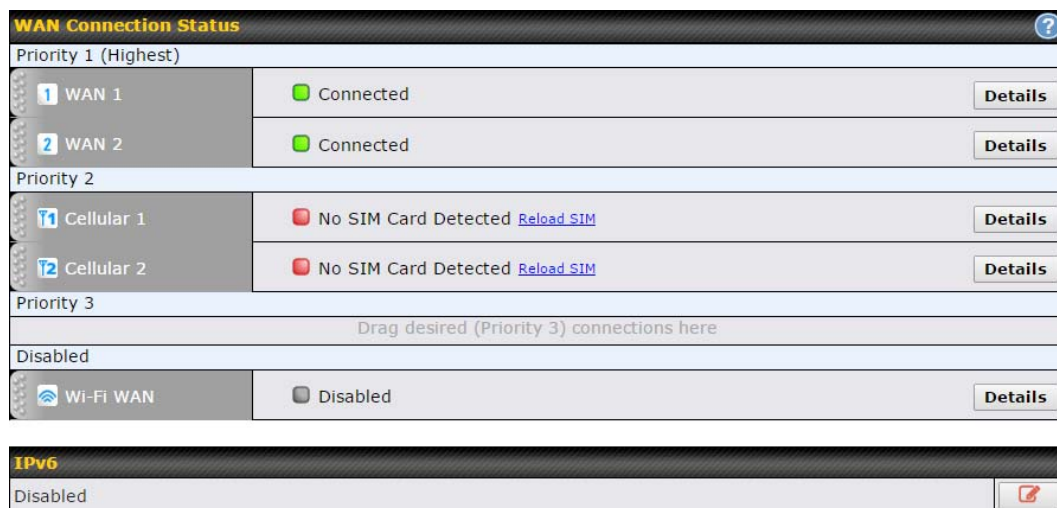
Logo Image	☒ No image [Use default Logo Image] ☐ Choose File No file chosen NOTE: Size max 512KB. Supported images types: JPEG, PNG and GIF.
Message	
Terms & Conditions	[Use default Terms & Conditions]
Custom Landing Page	☒ http://

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Portal Customization	
Logo Image	Click the Choose File button to select a logo to use for the built-in portal.
Message	If you have any additional messages for your users, enter them in this field.
Terms & Conditions	If you would like to use your own set of terms and conditions, please enter them here. If left empty, the built-in portal will display the default terms and conditions.
Custom Landing Page	Fill in this field to redirect clients to an external URL.

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 to 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.

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9.1 Ethernet WAN

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

WAN Port	
WAN Connection Name	WAN 1 Default
Connection Method	? DHCP
Routing Mode	? ☒ NAT ☐ IP Forwarding
IP Address	10.88.3.158
Subnet Mask	255.255.255.0
Default Gateway	10.88.3.253
Hostname (Optional)	 ☐ Use custom hostname
DNS Servers	☒ Obtain DNS server address automatically 10.88.3.1 ☐ Use the following DNS server address(es) DNS Server 1: DNS Server 2:

WAN Port (Section 1)	
WAN Connection Name	Enter a name to represent this WAN connection.
Connection Method	There are three possible connection methods for Ethernet WAN: • DHCP • Static IP • PPPoE 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.
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.

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Standby State	 ☒ Remain connected ☐ Disconnect
Upstream Bandwidth	 1 Gbps ▼
Downstream Bandwidth	 1 Gbps ▼
Health Check Settings	
Health Check Method	 PING ▼
PING Hosts	 Host 1: 8.8.8.8 Host 2: ☐ 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 (see Section 14.2).
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 9.4 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.

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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	Disabled
Bandwidth Allowance Monitor	☐ Enable
Port Speed	Auto
MTU	☐ Auto ☒ Custom Value: 1440 Default

WAN Port (Section 3)

Dynamic DNS Service Provider

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

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

Bandwidth Allowance Monitor

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.

Port Speed

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 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.

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MSS	☐ Auto ☐ Custom Value:
MAC Address Clone	☐ 00 : 1A : DD : BD : 54 : 41 Default
VLAN	☒ VLAN ID:
Reply to ICMP PING	☐ Yes ☐ No
Additional Public IP Address	IP Address Subnet Mask 255.255.255.0 (/24) ↓ Delete

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.

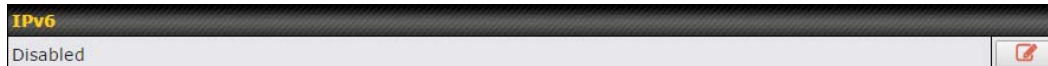
Reply to ICMP PING

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.

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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)	 ☐ Use custom hostname
DNS Servers	☒ Obtain DNS server address automatically 10.88.3.1 ☐ Use the following DNS server address(es) DNS Server 1: DNS Server 2:

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.

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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

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.

9.1.2 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	 ☒ NAT
IP Address	10.88.3.158
Subnet Mask	255.255.255.0
Default Gateway	10.88.3.253
IP Address	
Subnet Mask	255.255.255.0 (/24) ▾
Default Gateway	
DNS Servers	☒ Use the following DNS server address(es) DNS Server 1: DNS Server 2:

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.

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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	 ☒ NAT
IP Address	10.88.3.158
Subnet Mask	255.255.255.0
Default Gateway	10.88.3.253
PPPoE User Name	
PPPoE Password	
Confirm PPPoE Password	
Service Name (Optional)	 Leave it blank unless it is provided by ISP
IP Address (Optional)	 Leave it blank unless it is provided by ISP
DNS Servers	☒ Obtain DNS server address automatically 10.88.3.1 ☒ Use the following DNS server address(es) DNS Server 1: DNS Server 2:

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

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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	L2TP
Routing Mode	☒ NAT
IP Address	10.88.3.158
Subnet Mask	255.255.255.0
Default Gateway	10.88.3.253
L2TP User Name	
L2TP Password	
Confirm L2TP Password	
Server IP Address / Host	
Address Type	☒ Dynamic IP ☐ Static IP
DNS Servers	☒ Obtain DNS server address automatically 10.88.3.1 ☒ Use the following DNS server address(es) DNS Server 1: DNS Server 2:

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

Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) servers to be used when a DNS lookup is routed through this connection.

Selecting **Obtain DNS server address automatically** results in the DNS servers assigned by the PPPoE server to be used for outbound DNS lookups over the WAN connection. (The DNS servers are obtained along with the WAN IP address assigned from the PPPoE server.)

When **Use the following DNS server address(es)** is selected, you can enter custom DNS server addresses for this WAN connection into the **DNS server 1** and **DNS server 2** fields.

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9.2 Cellular WAN

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

To access cellular WAN settings, click **Network>WAN>Details**.
(Available on the Pepwave MAX BR1, HD2, and HD2 IP67 only)

Connection Details

Cellular 1 Status	
IMSI	(No SIM Card Detected)
MEID	A100001F7DC038 270113180708241208
ESN	8052FC8A
IMEI	356144040031862

Cellular Status	
IMSI	This is the International Mobile Subscriber Identity which uniquely identifies the SIM card. This is applicable to 3G modems only.
MEID	Some Pepwave routers support both HSPA and EV-DO. For Sprint or Verizon Wireless EV-DO users, a unique MEID identifier code (in hexadecimal format) is used by the carrier to associate the EV-DO device with the user. This information is presented in hex and decimal format.
ESN	This serves the same purpose as MEID HEX but uses an older format.
IMEI	This is the unique ID for identifying the modem in GSM/HSPA mode.

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WAN Connection Settings	
WAN Connection Name	Cellular 1 Default
Network Mode	☒ HSPA ☐ Sprint,EV-DO ☐ Verizon Wireless,EV-DO
Routing Mode	? ☒ NAT
DNS Servers	☒ Obtain DNS server address automatically ☐ Use the following DNS server address(es) DNS Server 1: DNS Server 2:

WAN Connection Settings	
WAN Connection Name	Enter a name to represent this WAN connection.
Network Mode	Users have to specify the network they are on accordingly.
Routing Mode	This option allows you to select the routing method to be used in routing IP frames via the WAN connection. The mode can be either NAT (network address translation) or IP Forwarding . Click the ? button to enable IP forwarding.
DNS Servers	Each ISP may provide a set of DNS servers for DNS lookups. This setting specifies the DNS (Domain Name System) servers to be used when a DNS lookup is routed through this connection. Selecting Obtain DNS server address automatically results in the DNS servers assigned by the PPPoE server to be used for outbound DNS lookups over the WAN connection. (The DNS servers are obtained along with the WAN IP address assigned from the PPPoE server.) When Use the following DNS server address(es) is selected, you can enter custom DNS server addresses for this WAN connection into the DNS server 1 and DNS server 2 fields.

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Cellular Settings	
Network Selection	 ☒ Auto ☐ Manual
3G/2G	 Auto
Authentication	Auto
Band Selection	☒ WCDMA / HSDPA / HSUPA / HSPA+ (800 MHz) ☒ WCDMA / HSDPA / HSUPA / HSPA+ (850 MHz) ☒ WCDMA / HSDPA / HSUPA / HSPA+ (900 MHz) ☒ WCDMA / HSDPA / HSUPA / HSPA+ (1700 MHz) ☒ WCDMA / HSDPA / HSUPA / HSPA+ (1900 MHz) ☒ WCDMA / HSDPA / HSUPA / HSPA+ (2100 MHz) ☒ GSM / GPRS / EDGE (850 MHz) ☒ GSM / GPRS / EDGE (900 MHz) ☒ GSM / GPRS / EDGE (1800 MHz) ☒ GSM / GPRS / EDGE (1900 MHz)
Data Roaming	☐
Operator Settings	☒ Auto ☐ Custom
APN	
Username	
Password	
SIM PIN (Optional)	
Bandwidth Allowance Monitor	 ☒ Enable
Action	 ☐ Disconnect when usage hits 100% Email notification is currently disabled. You can get notified when usage hits 75%/95% of monthly allowance by enabling Email Notification .
Start Day	On 1st of each month
Monthly Allowance	GB

Cellular Settings	
Network Selection	By default, the MAX router will automatically choose a network to connect to. If you wish to use only certain networks, click the  button beside the menu item.
3G/2G	This drop-down menu allows restricting cellular to particular band. Click the  button to enable the selection of specific bands.
Authentication	Choose from PAP Only or CHAP Only to use those authentication methods exclusively. Select Auto to automatically choose an authentication method.
Data Roaming	This checkbox enables data roaming on this particular SIM card. Please check your service provider's data roaming policy before proceeding.
Operator Settings	This setting applies to 3G/EDGE/GPRS modems only. It does not apply to EVDO/EVDO Rev. A modems. This allows you to configure the APN settings of your connection. If Auto is selected, the mobile operator should be detected automatically. The connected device will be configured and connection will be made automatically. If there is any difficulty in making connection, you may select Custom to enter your carrier's APN , Login , Password , and Dial Number settings manually. The correct values can be obtained from your carrier. The default

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and recommended setting is **Auto**.

APN / Login / Password / SIM PIN

When **Auto** is selected, the information in these fields will be filled automatically. Select **Custom** to customize these parameters. The parameter values are determined by and can be obtained from the ISP.

Bandwidth Allowance Monitor

Check the box Enable to enable bandwidth usage monitoring on this WAN connection for each billing cycle. When this option is not enabled, bandwidth usage of each month is still being tracked but no action will be taken.

Action

If email notification is enabled, you will be notified by email when usage hits 75% and 95% of the monthly allowance. If **Disconnect when usage hits 100% of monthly allowance** is checked, this WAN connection will be disconnected automatically when the usage hits the monthly allowance. It will not resume connection unless this option has been turned off or the usage has been reset when a new billing cycle starts.

Start Day

This option allows you to define which day of the month each billing cycle begins.

Monthly Allowance

This field is for defining the maximum bandwidth usage allowed for the WAN connection each month.

General Settings

Standby State	☒ Remain connected ☐ Disconnected
Idle Disconnect	☒ 3 minutes Time value is global. A change will affect all WAN profiles.

General Settings

Standby State

This option allows you to choose whether to remain connected or disconnected when this WAN connection is no longer in the highest priority and has entered the standby state. When **Remain connected** is chosen, bringing up this WAN connection to active makes it immediately available for use.

Idle Disconnect

When Internet traffic is not detected within the user-specified timeframe, the modem will automatically disconnect. Once the traffic is resumed by the LAN host, the connection will be re-activated.

Health Check Settings

Health Check Method	SmartCheck ▼
Timeout	5 ▼ second(s)
Health Check Interval	10 ▼ second(s)
Health Check Retries	3 ▼
Recovery Retries	3 ▼

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Health Check Settings

Health 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 9.4** 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 Service Provider

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

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

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9.3 Wi-Fi WAN

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

WAN Connection Settings	
WAN Connection Name	Wi-Fi WAN Default
Standby State	☒ Remain connected ☐ Disconnected
MTU	☐ Auto ☒ Custom Value: 1500 Default
Reply to ICMP PING	☒ Yes ☐ No

Wi-Fi Connection Settings	
WAN Connection Name	Enter a name to represent this WAN connection.
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 PING	If this setting is disabled, the WAN connection will not respond to ICMP ping requests. By default, this setting is enabled.

Wi-Fi WAN Settings	
Channel Selection	☒ Auto ☐ Custom
Roaming	☐
Connect to Any Open Mode AP	☐ Yes ☒ No

Wi-Fi WAN Settings	
	Determine whether the channel will be automatically selected. If you select custom, the following table will appear:
Channel Selection	Scan Channels Clear All 2.4GHz: ☒ 1 ☒ 2 ☒ 3 ☒ 4 ☒ 5 ☒ 6 ☒ 7 ☒ 8 ☒ 9 ☒ 10 ☒ 11 OK Cancel

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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	 ☒ Enable
Action	 Email notification is currently disabled. You can get notified when usage hits 75%/95% of monthly allowance by enabling Email Notification . ☒ Disconnect when usage hits 100% of monthly allowance
Start Day	On 1st of each month at 00:00 midnight
Monthly Allowance	MB

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: Host 2: ☒ Use first two DNS servers as Health Check DNS Servers ☐ 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**

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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 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: Host 2: ☒ 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: Host 2: ☒ Use first two DNS servers as Health Check DNS Servers ☐ 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

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Health Check Method	 HTTP
URL 1	 http:// Matching String: ☐
URL 2	 http:// Matching String: ☐

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.

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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	☐
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 /

This setting specifies the password for the dynamic DNS service.

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TZO Key

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

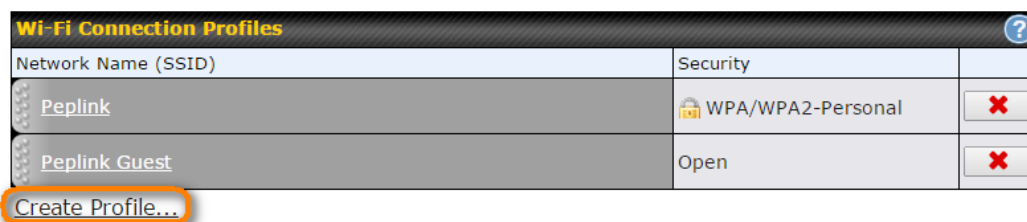
In order to use dynamic DNS services, appropriate hostname registration(s), as well as a valid account with a supported dynamic DNS service provider, are required.

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 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.

9.3.1 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:

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Create Wi-Fi Connection Profile

Wi-Fi Connection

Network Name (SSID)	
Security	Open ▾
IP Address	☒ Obtain an IP address automatically ☐ Static

OKCancel

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:

Security

- **Open**

Security	Open ▾
----------	--------

- **WEP**

Security	WEP ▾
Encryption Key	☒ Hide Characters

- **WPA/WPA2 – Personal**

Security	WPA/WPA2-Personal ▾
Shared Key	☒ Hide Characters

- **WPA/WPA2 – Enterprise**

Security	WPA/WPA2-Enterprise ▾
Login ID	
Password	
Confirm Password	
EAP Method	PEAP ▾
EAP Phase 2 Method	EAP/CHAP ▾
EAP outer authentication identity	☒ Anonymous ☐ User Credentials ☐ Other:

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9.4 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: Host 2: ☒ 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: Host 2: ☒ Use first two DNS servers as Health Check DNS Servers ☐ 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.

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Health Check Method: HTTP

Health Check Method		HTTP
URL 1		http:// Matching String: ☐
URL 2		http:// Matching String: ☐

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	second(s)
Health Check Interval		5	second(s)
Health Check Retries		3	
Recovery Retries		3	

Other Health Check Settings

Timeout

This setting specifies the timeout in seconds for ping/DNS lookup requests. The default timeout is **5 seconds**.

Health Check Interval

This setting specifies the time interval in seconds between ping or DNS lookup requests. The default health check interval is **5 seconds**.

Health Check Retries

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

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 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.

9.5 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	changeip.com
User ID	
Password	
Confirm Password	
Hosts	

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

Select **Disabled** to disable this feature.

Account Name /

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

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Email Address

**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 Advanced Wi-Fi Settings

Wi-Fi settings can be configured at **Advanced>Wi-Fi Settings** (or **AP>Settings** on some models). Note that menus displayed can vary by model.

Wi-Fi Radio Settings	
Operating Country	United States ▼

Wi-Fi Radio Settings

Operating Country

This drop-down menu specifies the national/regional regulations which the Wi-Fi radio should follow.

- If a North American region is selected, RF channels 1 to 11 will be available and the maximum transmission power will be 26 dBm (400 mW).
- If European region is selected, RF channels 1 to 13 will be available. The maximum transmission power will be 20 dBm (100 mW).

NOTE: Users are required to choose an option suitable to local laws and regulations.

Important Note

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

Wi-Fi AP Settings	
Protocol	802.11ng ▼
Channel	1 (2.412 GHz) ▼
Channel Width	Auto ▼
Output Power	Max ▼ ☐ Boost

Wi-Fi AP Settings

Protocol

This option allows you to specify whether 802.11b and/or 802.11g client association requests will be accepted. Available options are **802.11ng** and **802.11na**. By default, **802.11ng** is selected.

Channel

This option allows you to select which 802.11 RF channel will be utilized. **Channel 1 (2.412 GHz)** is selected by default.

Channel Width

Available options are **20 MHz**, **40 MHz**, and **Auto (20/40 MHz)**. Default is **Auto (20/40 MHz)**, which allows both widths to be used simultaneously.

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.

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

Beacon Rate		1Mbps ▾
Beacon Interval		100ms ▾
DTIM		1
Slot Time		9 μ s
ACK Timeout		48 μ s
Frame Aggregation		☒ Enable
Guard Interval		☐ Short ☒ Long

Wi-Fi AP Advanced Settings	
Beacon Rate ^A	This option is for setting the transmit bit rate for sending a beacon. By default, 1Mbps is selected.
Beacon Interval ^A	This option is for setting the time interval between each beacon. By default, 100ms is selected.
DTIM ^A	This field allows you to set the frequency for the beacon to include delivery traffic indication messages. The interval is measured in milliseconds. The default value is set to 1 ms .
Slot Time ^A	This field is for specifying the unit wait time before transmitting a packet. By default, this field is set to 9 μs .
ACK Timeout ^A	This field is for setting the wait time to receive an acknowledgement packet before performing a retransmission. By default, this field is set to 48 μs .
Frame Aggregation ^A	This option allows you to enable frame aggregation to increase transmission throughput.
Guard Interval ^A	This is where you opt for a short or long guard period interval for your transmissions.

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

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Wi-Fi WAN settings can be configured at **Advanced>Wi-Fi Settings** (or **Advanced>Wi-Fi WAN** on some models).

Wi-Fi WAN Settings	
Channel Width	20/40 MHz ▼
Bit Rate	Auto ▼
Output Power	Max ▼ ☐ Boost

Wi-Fi WAN Settings	
Channel Width	Available options are 20/40 MHz and 20 MHz . Default is 20/40 MHz , which allows both widths to be used simultaneously.
Bit Rate	This option allows you to select a specific bit rate for data transfer over the device's Wi-Fi network. By default, Auto is selected.
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. Note that selecting the Boost option may cause the MAX's radio output to exceed local regulatory limits.

11 MediaFast Configuration

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

11.1 Setting Up MediaFast Content Caching

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

Cache Control											
Domains / IP Addresses	☐ Cache all ☒ Whitelist ☐ Blacklist ted.com										
Content Type	☒ Video ☒ Audio ☒ Images ☒ OS / Application Updates										
Cache Lifetime Settings	<table border="1"><thead><tr><th>File Extension</th><th>Lifetime (days)</th><th></th></tr></thead><tbody><tr><td>jpg</td><td>30</td><td>✖</td></tr><tr><td></td><td></td><td>+</td></tr></tbody></table>		File Extension	Lifetime (days)		jpg	30	✖			+
File Extension	Lifetime (days)										
jpg	30	✖									
		+									

Cache Control Settings	
Domain	Choose to Cache on all domains , or enter domain names and then choose either Cache the specified domains only or Do not cache the specified domains .
Content Type	Check these boxes to cache the listed content types or leave boxes unchecked to disable caching for the listed types.
Cache Lifetime Settings	Enter a file extension, such as JPG or DOC. Then enter a lifetime in days to specify how long files with that extension will be cached. Add or delete entries using the controls on the right.

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11.2 Scheduling Content Prefetching

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

Prefetch Schedule								
Name	Status	Next Run Time	Last Run Time	Last Duration	Result	Last Download	Actions	
▶ Course Progress	Downloading	04-11 06:00	04-09 02:03	-		0 B		
▶ National Geog	Ready	04-11 00:00	04-09 00:00	00:01		4.98 kB		
▶ Syllabus	Downloading	04-11 06:00	04-09 06:00	-		0 B		
▶ Vimeo	Ready	04-11 00:00	04-09 02:03	00:01		115.91 kB		
▶ ted	Ready	04-11 00:00	04-09 00:00	00:01		62.26 kB		
New Schedule								
Tools								
Clear Web Cache Clear Statistics								

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

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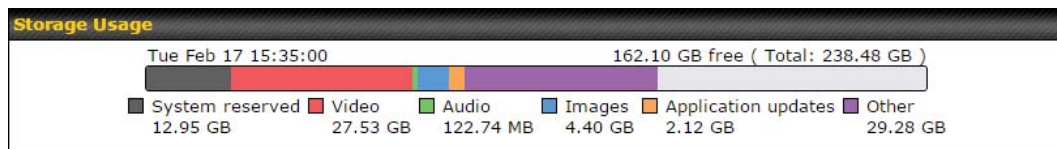
Clear Web Cache

To clear all cached content, click this button. Note that this action cannot be undone.

Clear Statistics To clear all prefetch and status page statistics, click this button.

11.3 Viewing MediaFast Statistics

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



Bandwidth Summary			
	Bandwidth Saved	Total Bandwidth	Accesses
Today	2.94 GB (68.9%)	4.27 GB	76374
Last week	1.32 GB (9.4%)	14.05 GB	138395
Last month	141.54 GB (36.5%)	388.00 GB	7.00 million
Last year	142.14 GB (36.0%)	394.40 GB	7.13 million

Bandwidth Details			
Period	Today 1 Week 1 Month 1 Year		
Order	Top Hit Top Usage Top Visited Top Missed		
	Bandwidth Saved	Total Bandwidth	Accesses
Web Domain			
apple.com	2.52 GB (92.0%)	2.74 GB	436
office.net	28.64 MB (98.0%)	29.23 MB	92
canonical.com	13.51 MB (100%)	13.51 MB	2
ubuntu.com	8.14 MB (25.0%)	32.60 MB	425
blogspot.com	3.13 MB (22.3%)	14.04 MB	115
nextmedia.com	2.85 MB (54.6%)	5.21 MB	326
File Category			
application	2.72 GB (82.8%)	3.28 GB	27752
image	144.71 MB (40.0%)	361.82 MB	14359
text	49.69 MB (11.6%)	429.80 MB	33252
video	36.57 MB (16.5%)	221.94 MB	914
font	2.27 MB (81.8%)	2.77 MB	75
Media Type			
octet-stream	2.52 GB (91.4%)	2.75 GB	695
png	105.31 MB (53.1%)	198.16 MB	3620
pkix-crl	99.57 MB (83.2%)	119.72 MB	93
zip	55.20 MB (50.3%)	109.82 MB	12
mp4	36.57 MB (25.3%)	144.70 MB	46
jpeg	34.56 MB (24.2%)	142.67 MB	4798
plain	30.27 MB (15.9%)	190.47 MB	7413

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12 Bandwidth Bonding SpeedFusion™ / PepVPN



Pepwave bandwidth bonding SpeedFusion™ functionality securely connects your Pepwave router to another Pepwave or Peplink device (Peplink Balance 210/310/380/580/710/1350 only). Data, voice, or video communications between these locations are kept confidential across the public Internet.

Bandwidth bonding SpeedFusion™ is specifically designed for multi-WAN environments. Pepwave routers can aggregate all WAN connections' bandwidth for routing SpeedFusion™ traffic. Unless all the WAN connections of one site are down, Pepwave routers can keep the VPN up and running.

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

12.1 PepVPN

To configure PepVPN and SpeedFusion, navigate to **Advanced>SpeedFusion™** or **Advanced>PepVPN**.

PepVPN with SpeedFusion™ 

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

Profile	Remote ID	Remote Address(es)	
FL Office	8345-5F7A-DE97		
New Profile			

Send All Traffic To

No PepVPN profile selected 

PepVPN

Local ID	 MAX_HD2_DEF1 
----------	--

Link Failure Detection

Link Failure Detection Time 

☒ Recommended (Approx. 15 secs)
☐ Fast (Approx. 6 secs)
☐ Faster (Approx. 2 secs)
☐ Extreme (Under 1 sec)
Shorter detection time incurs more health checks and higher bandwidth overhead

[Save](#)

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

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

All data can be routed over the VPN using the 256-bit AES encryption standard. To configure, navigate to **Advanced>SpeedFusion™** or **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. Note that available settings vary by model.

PepVPN Profile							
Name							
Active	☒						
SpeedFusion	Supported						
Encryption	☒ 256-bit AES ☐ OFF						
Authentication	☒ Remote ID / Pre-shared Key ☐ X.509						
Remote ID / Pre-shared Key	<table><tr><td>Remote ID</td><td>Pre-shared Key</td><td></td></tr><tr><td> </td><td> </td><td> + </td></tr></table>	Remote ID	Pre-shared Key				+
Remote ID	Pre-shared Key						
		+					
Allow shared Remote ID	☐						
NAT Mode	☐						
Remote IP Address / Host Names (Optional)	 If this field is empty, this field on the remote unit must be filled						
Data Port	☒ Default ☐ Custom						
Bandwidth Limit	☐						
WAN Smoothing	Normal ▼						

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

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

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	VPN connection, no encryption will be applied.
Authentication	Select from By Remote ID Only , Preshared Key , or X.509 to specify the method the Peplink Balance will use to authenticate peers. When selecting By Remote ID Only , be sure to enter a unique peer ID number in the Remote ID field.
Remote ID / Pre-shared Key	This optional field becomes available when Remote ID / Pre-shared Key is selected as the Peplink 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. Enter Remote IDs either by typing out each Remote ID and Pre-shared Key, or by pasting a CSV. If you wish to paste a CSV, click the  icon next to the "Remote ID / Preshared Key" setting.
Remote ID/Remote Certificate	These optional fields become available when X.509 is selected as the Peplink Balance's VPN authentication method, as explained above. To authenticate VPN connections using X.509 certificates, copy and paste certificate details into these fields. To get more information on a listed X.509 certificate, click the Show Details link below the field.
Allow Shared Remote ID	When this option is enabled, the router will allow multiple peers to run using the same remote ID.
NAT Mode	Check this box to allow the local DHCP server to assign an IP address to the remote peer. When NAT Mode is enabled, all remote traffic over the VPN will be tagged with the assigned IP address using network address translation.
Remote IP Address / Host Names (Optional)	If NAT Mode is not enabled, you can enter a remote peer's WAN IP address or hostname(s) here. If the remote uses more than one address, enter only one of them here. Multiple hostnames are allowed and can be separated by a space character or carriage return. Dynamic-DNS host names are also accepted. This field is optional. With this field filled, the Peplink 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.
WAN Smoothing^A	Select the degree to which WAN Smoothing will be implemented across your WAN links.

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

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To enable Layer 2 Bridging between PepVPN profiles, navigate to **Network>LAN>Basic Settings>*LAN Profile Name*** and refer to instructions in section 8.1

WAN Connection Priority ?					
	Priority	Direction	Connect to Remote	Cut-off latency (ms)	Suspension Time after Packet Loss (ms)
1. WAN 1	1 (Highest) ▼	Up/Down ▼	All ▼		
2. WAN 2	1 (Highest) ▼	Up/Down ▼	All ▼		
3. Wi-Fi WAN	1 (Highest) ▼	Up/Down ▼	All ▼		
4. Cellular 1	1 (Highest) ▼	Up/Down ▼	All ▼		
5. Cellular 2	1 (Highest) ▼	Up/Down ▼	All ▼		
6. USB	1 (Highest) ▼	Up/Down ▼	All ▼		

WAN Connection Priority

WAN Connection Priority

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

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

Send All Traffic To

No PepVPN profile selected



Send All Traffic To

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

Send All Traffic	
Send All Traffic To	☒ VPN Connection 2 ▼
	DNS Server
	135.36.14.0

You could also specify a DNS server to resolve incoming DNS requests.

Outbound Policy/PepVPN Outbound Custom Rules

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

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The image shows two screenshots from the Pepwave management interface. The top screenshot is the 'Outbound Policy' screen, which has a dropdown menu set to 'According to custom rules' and an edit icon. The bottom screenshot is the 'PepVPN Outbound Custom Rules' screen, which is a table with columns for Service, Algorithm, Source, Destination, and Protocol. The 'Source' field is set to '(Auto)'. There is an 'Add Rule' button at the bottom.

The image shows the 'PepVPN Local ID' configuration screen. It has a label 'Local ID' followed by a text input field containing 'MAX_HD2_8D1C'. There is a question mark icon to the left of the input field and an edit icon to the right.

PepVPN Local ID

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

The image shows the 'PepVPN Settings' configuration screen. It has a title bar with a question mark icon. The settings are as follows: 'Handshake Port' has radio buttons for 'Default' (selected) and 'Custom' with an adjacent input field; 'Backward Compatibility' has radio buttons for 'High (firmware 5.3+)' (selected) and 'Latest (firmware 6.2+)'; 'Link Failure Detection Time' has radio buttons for 'Recommended (Approx. 15 secs)' (selected), 'Fast (Approx. 6 secs)', 'Faster (Approx. 2 secs)', and 'Extreme (Under 1 sec)'. A note at the bottom states: 'Shorter detection time incurs more health checks and higher bandwidth overhead'.

PepVPN Settings

Handshake Port^A

To designate a custom handshake port (TCP), click the **custom** radio button and enter the port number you wish to designate.

Backward Compatibility

Determine the level of backward compatibility needed for PepVPN tunnels. The use of the **Latest** setting is recommended as it will improve the performance and resilience of SpeedFusion connections.

Link Failure Detection Time

The bonded VPN can detect routing failures on the path between two sites over each WAN connection. Failed WAN connections will not be used to route VPN traffic. Health check packets are sent to the remote unit to detect any failure. The more frequently checks are sent, the shorter the detection time, although more bandwidth will be consumed. When **Recommended** (default) is selected, a health check packet is sent every five seconds, and the expected detection time is 15 seconds. When **Fast** is selected, a health check packet is sent every three seconds, and the expected detection time is six seconds. When **Faster** is selected, a health check packet is sent every second, and the expected detection time is two seconds. When **Extreme** is selected, a health check packet is sent every 0.1 second, and the expected detection time is less than one second.

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

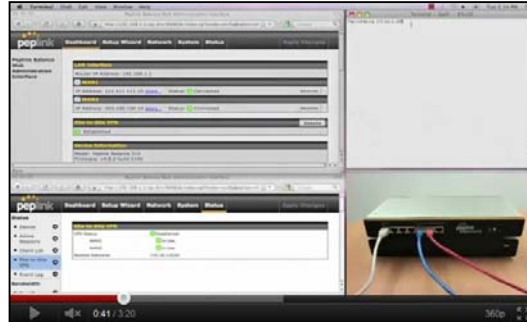
Important Note

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

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Tip

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



<http://youtu.be/TLQgdpPSY88>

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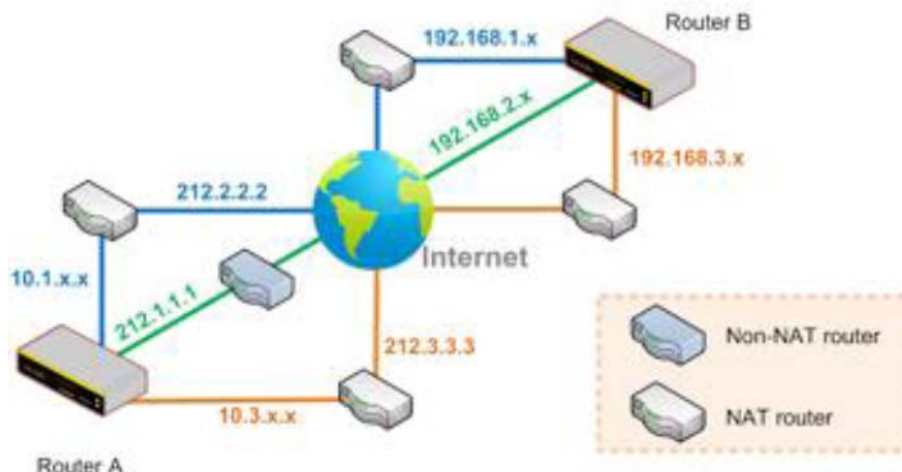
12.2 The Pepwave Router Behind a NAT Router

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

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

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

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



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

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12.3 SpeedFusion™ Status

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

SpeedFusion™		Status
FL Office		Established
NY Office		Established

After clicking the **Status** button at the top right corner of the SpeedFusion™ table, you will be forwarded to **Status>SpeedFusion™**, where you can view subnet and WAN connection information for each VPN peer. Please refer to **Section 21.6** for details.

IP Subnets Must Be Unique Among VPN Peers

The entire interconnected SpeedFusion™ network is a single non-NAT IP network. Avoid duplicating subnets in your sites to prevent connectivity problems when accessing those subnets.

13 IPsec VPN

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

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

13.1 IPsec VPN Settings

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

IPsec VPN Profiles	Remote Networks
No IPsec VPN Profile Defined.	
New Profile	

Pepwave MAX IPsec only supports network-to-network connection with Cisco, Juniper or Pepwave MAX devices.

A **NAT-Traversal** option and list of defined **IPsec VPN** profiles will be shown. **NAT-Traversal** should be enabled if your system is behind a NAT router. Click the **New Profile** button to create new IPsec VPN profiles that make VPN connections to remote Pepwave, Cisco, or Juniper routers via available WAN connections. To edit any of the profiles, click on its associated connection name in the leftmost column.

IPsec VPN Profile X