PEPWAVE
Broadband Possibilities

Pepwave MAX and Surf User Manual

Pepwave Products:
MAX 700/HD2/HD2 IP67/HD2 mini/HD4/Transit/BR1/BR1 Slim/BR1 ENT/BR1 Pro LTE/BR1 IP55/BR2 IP55/On-The-Go/MAX HD2/HD4 with MediaFast/Device Connector/ Surf SOHO

Pepwave Firmware 6.3
May 2016

COPYRIGHT & TRADEMARKS
Specifications are subject to change without notice. Copyright © 2016 Pepwave Ltd. All Rights Reserved. Pepwave and the Pepwave logo are trademarks of Pepwave Ltd. Other brands or products mentioned may be trademarks or registered trademarks of their respective owners.

Table of Contents

1 INTRODUCTION AND SCOPE 6

2 GLOSSARY 7

3 PRODUCT FEATURES 8

3.1 Supported Network Features 8
3.2 Other Supported Features 10

4 PEPWAVE MAX MOBILE ROUTER OVERVIEW 11

4.1 MAX 700 11
4.2 MAX HD2 13
4.3 MAX HD2 IP67 15
4.4 MAX HD2 mini 16
4.5 MAX Transit 18
4.6 MAX HD4 19
4.7 MAX BR1 20
4.8 MAX BR1 Slim 22
4.9 MAX BR1 ENT 24
4.10 MAX BR1 Pro LTE 25
4.11 MAX BR1/2 IP55 26
4.12 MAX On-The-Go 28
4.13 Surf SOHO 29

5 ADVANCED FEATURE SUMMARY 31

5.1 Drop-in Mode and LAN Bypass: Transparent Deployment 31
5.2 QoS: Clearer VoIP 31
5.3 Per-User Bandwidth Control 32
5.4 High Availability via VRRP 32
5.5 USB Modem and Android Tethering 33
5.6 Built-In Remote User VPN Support 33
5.7 SIM-card USSD support 34

6 INSTALLATION 35

6.1 Preparation 35
6.2 Constructing the Network 36
6.3 Configuring the Network Environment 37

7 MOUNTING THE UNIT 38

7.1 Wall Mount 38
7.2 Car Mount 38
7.3 IP67 Installation Guide 38

 Copyright @ 2016 Pepwave

8 CONNECTING TO THE WEB ADMIN INTERFACE 39

9 CONFIGURING THE LAN INTERFACE(S) 41

9.1 BASIC SETTINGS 41
9.2 CAPTIVE PORTAL 51

10 CONFIGURING THE WAN INTERFACE(S) 53

10.1 ETHERNET WAN 54
10.2 CELLULAR WAN 62
10.3 WI-FI WAN 67
10.4 WAN HEALTH CHECK 73
10.5 DYNAMIC DNS SETTINGS 75

11 ADVANCED WI-FI SETTINGS 78

12 MEDIAFAST CONFIGURATION 81

12.1 SETTING UP MEDIAFAST CONTENT CACHING 81
12.2 SCHEDULING CONTENT PREFETCHING 82
12.3 VIEWING MEDIAFAST STATISTICS 83

13 BANDWIDTH BONDING SPEEDFUSION™ / PEPVPN 85

13.1 PEPVPN 86
13.2 THE PEPWAVE ROUTER BEHIND A NAT ROUTER 92
13.3 SPEEDFUSION™ STATUS 93

14 IPSEC VPN 94

14.1 IPSEC VPN SETTINGS 94

15 OUTBOUND POLICY MANAGEMENT 98

15.1 OUTBOUND POLICY 98
15.2 CUSTOM RULES FOR OUTBOUND POLICY 99

16 INBOUND ACCESS 108

16.1 PORT FORWARDING SERVICE 108

17 NAT MAPPINGS 111

18 QOS 113

18.1 USER GROUPS 113
18.2 BANDWIDTH CONTROL 114
18.3 APPLICATION 114

19 FIREWALL 116

19.1 OUTBOUND AND INBOUND FIREWALL RULES 116
19.2 CONTENT BLOCKING 121
19.3 OSPF & RIPV2 122

 Copyright @ 2016 Pepwave

19.4 Remote User Access 124

MISCELLANEOUS SETTINGS 126

19.5 High Availability 126
19.6 PPTP Server 129
19.7 Certificate Manager 130
19.8 Service Forwarding 130
19.9 Service Passthrough 133
19.10 GPS Forwarding 134

20 AP CONTROLLER 135

20.1 Wireless SSID 135
20.2 Settings 139
20.3 Toolbox 143

21 SYSTEM SETTINGS 144

21.1 Admin Security 144
21.2 Firmware 148
21.3 Time 149
21.4 Schedule 149
21.5 Email Notification 150
21.6 Event Log 152
21.7 SNMP 154
21.8 InControl 156
21.9 Configuration 156
21.10 Feature Add-ons 158
21.11 Reboot 158
21.12 Ping 159
21.13 Traceroute Test 160
21.14 PepVPN Test 160
21.15 Wake-on-LAN 161
21.16 CLI (Command Line Interface Support) 161

22 STATUS 162

22.1 Device 162
22.2 Active Sessions 164
22.3 Client List 166
22.4 WINS Client 166
22.5 UPnP / NAT-PMP 167
22.6 SpeedFusion Status 167
22.7 Event Log 171
22.8 Bandwidth 171

APPENDIX A. RESTORATION OF FACTORY DEFAULTS 177

 Copyright @ 2016 Pepwave

APPENDIX B. CASE STUDIES 177

MPLS ALTERNATIVE 177
NETWORK TRAFFIC DISTRIBUTION 180
SINGAPORE NATIONAL DAY PARADE 2015 182
UNOLS (UNIVERSITY-NATIONAL OCEANOGRAPHIC LABORATORY SYSTEM) 184

APPENDIX C. PRODUCT DATASHEETS 191

 Copyright @ 2016 Pepwave

1 Introduction and Scope

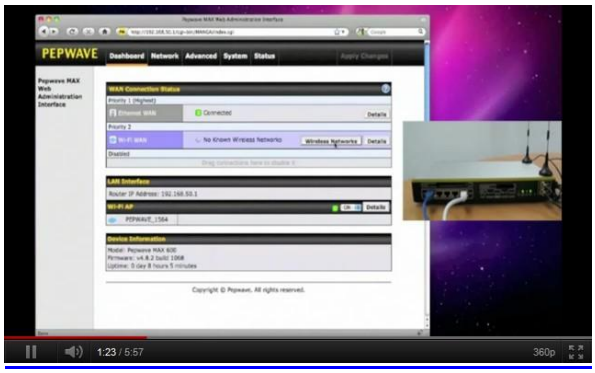
Pepwave routers provide link aggregation and load balancing across multiple WAN connections, allowing a combination of technologies like 3G HSDPA, EVDO, 4G LTE, Wi-Fi, external WiMAX dongle, and satellite to be utilized to connect to the Internet.

The MAX wireless SD-WAN router series has a wide range of products suitable for many different deployments and markets. Entry level SD-WAN models such as the MAX BR1 are suitable for SMEs or branch offices. High-capacity SD-WAN routers such as the MAX HD2 are suitable for larger organizations and head offices.

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

 Copyright @ 2016 Pepwave

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

 Copyright @ 2016 Pepwave

3 Product Features

Pepwave routers enable all LAN users to share broadband Internet connections, and they provide advanced features to enhance Internet access. Our Max BR wireless routers support multiple SIM cards. They can be configured to switch from using one SIM card to another SIM card according to different criteria, including wireless network reliability and data usage.

Our MAX HD series wireless routers are embedded with multiple 4G LTE modems, and allow simultaneous wireless Internet connections through multiple wireless networks. The wireless Internet connections can be bonded together using our SpeedFusion technology. This allows better reliability, larger bandwidth, and increased wireless coverage are comparing to use only one 4G LTE modem.

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)
- 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

 Copyright @ 2016 Pepwave

3.1.3 VPN

- PepVPN with SpeedFusion™
- PepVPN performance analyzer
- X.509 certificate support
- VPN load balancing and failover among selected WAN connections
- Bandwidth bonding and failover among selected WAN connections
- IPsec VPN for network-to-network connections (works with Cisco and Juniper 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

 Copyright @ 2016 Pepwave

- 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
- 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

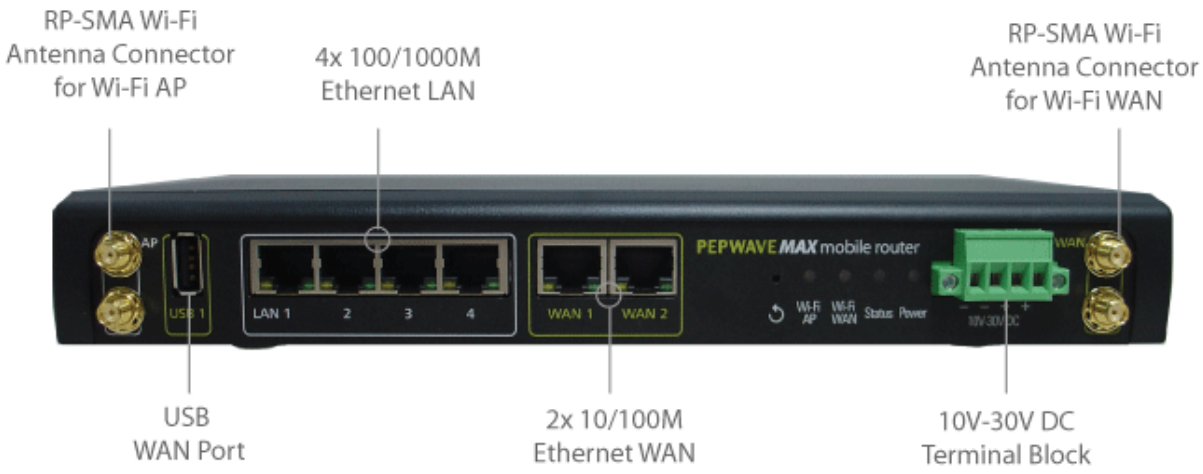
* Not supported on MAX Surf-On-The-Go, Surf SOHO, and BR1 variants

 Copyright @ 2016 Pepwave

4 Pepwave MAX Mobile Router Overview

4.1 MAX 700

4.1.1 Panel Appearance



 Copyright @ 2016 Pepwave

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

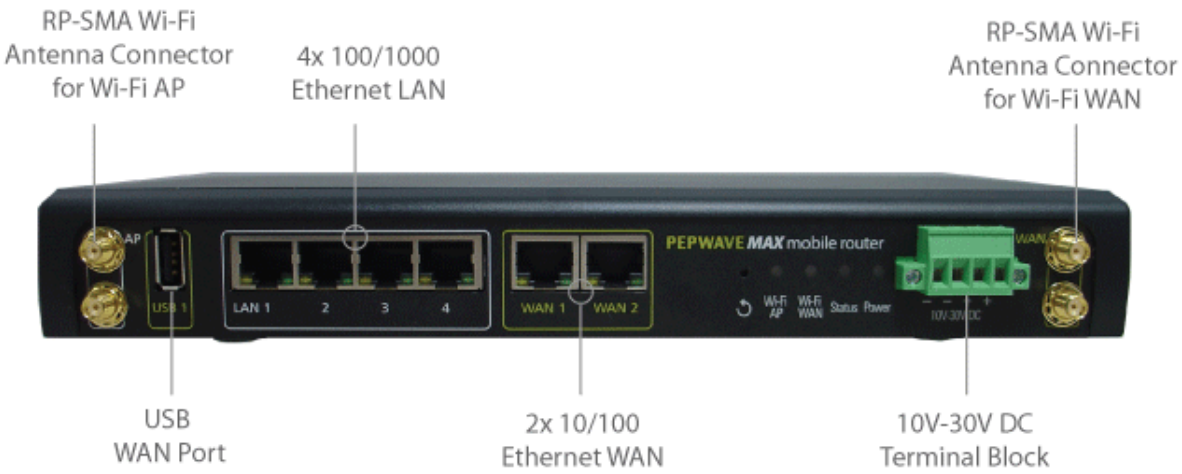
Wi-Fi AP and Wi-Fi WAN Indicators		
Wi-Fi WAN	OFF	Disconnected
	Blinking slowly	Connecting to network
	Blinking	Connected to network with traffic
	ON	Connected to network without traffic
Wi-Fi AP	OFF	Disabled
	Blinking slowly	Enabled but no client connected
	Blinking	Connected to network with traffic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

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

 Copyright @ 2016 Pepwave

4.2 MAX HD2

4.2.1 Panel Appearance



 Copyright @ 2016 Pepwave

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
Orange LED	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port Type	Auto MDI/MDI-X ports	

 Copyright @ 2016 Pepwave

4.3 MAX HD2 IP67

4.3.1 Panel Appearance

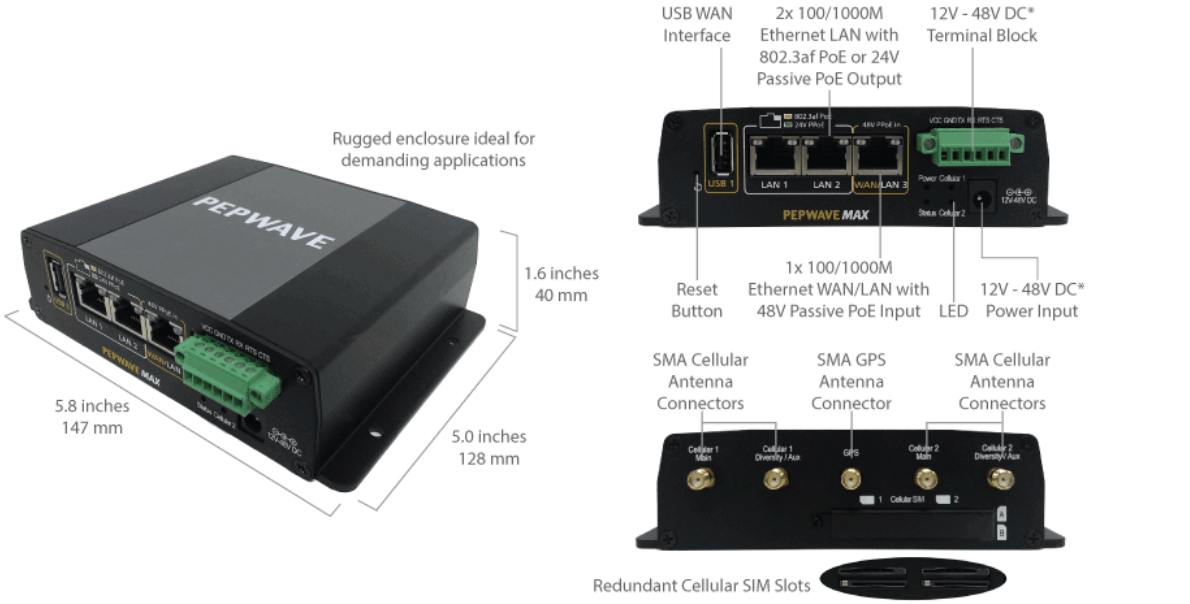
The statuses indicated by the front panel LEDs are as follows:

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

 Copyright @ 2016 Pepwave

4.4 MAX HD2 mini

4.4.1 Panel Appearance



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

 Copyright @ 2016 Pepwave

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
Orange LED	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port Type	Auto MDI/MDI-X ports	

 Copyright @ 2016 Pepwave

4.5 MAX Transit

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

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

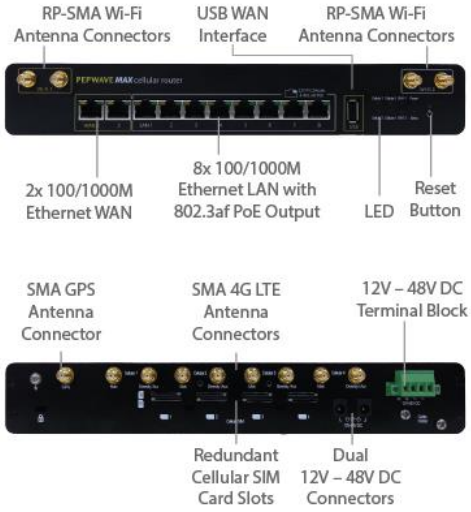
* For MAX-TST_DUO

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

 Copyright @ 2016 Pepwave

4.6 MAX HD4

4.6.1 Panel Appearance



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 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

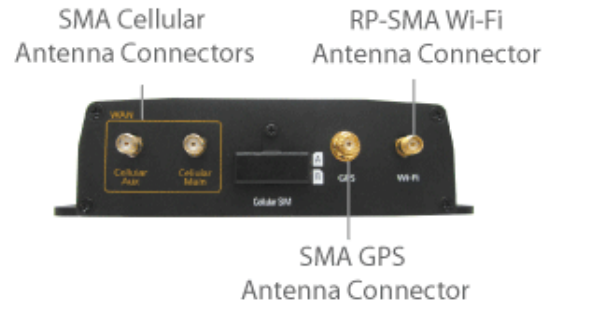
LAN and Ethernet WAN Ports		
Green LED	ON	10 / 100 / 1000 Mbps
Orange LED	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port Type	Auto MDI/MDI-X ports	

 Copyright @ 2016 Pepwave

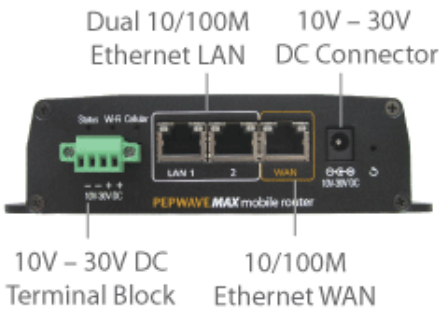
4.7 MAX BR1

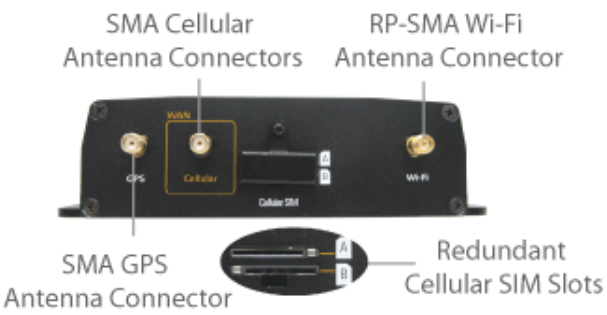
4.7.1 Panel Appearance

MAX-BR1-LTE Version



MAX-BR1 Version





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

 Copyright @ 2016 Pepwave

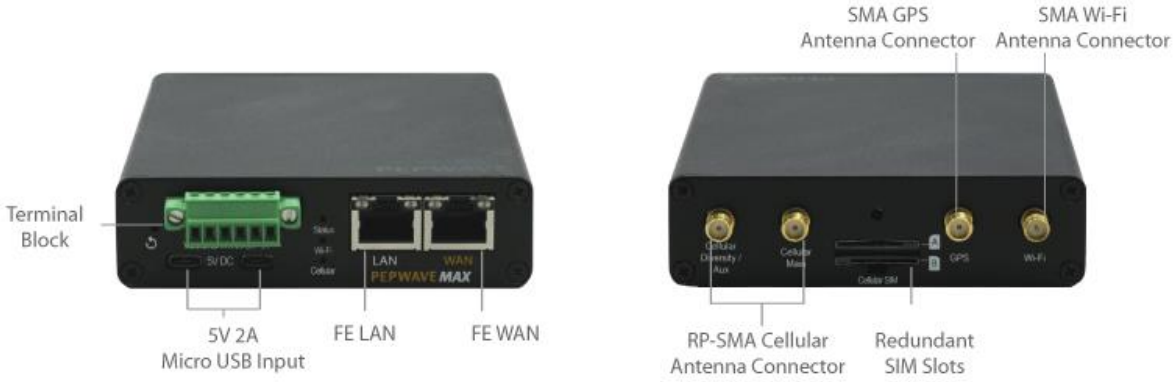
Cellular Indicators		
Cellular	OFF	Disabled or no SIM card inserted
	ON	Connecting or connected to network(s)

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	

 Copyright @ 2016 Pepwave

4.8 MAX BR1 Slim

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

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)

 Copyright @ 2016 Pepwave

-

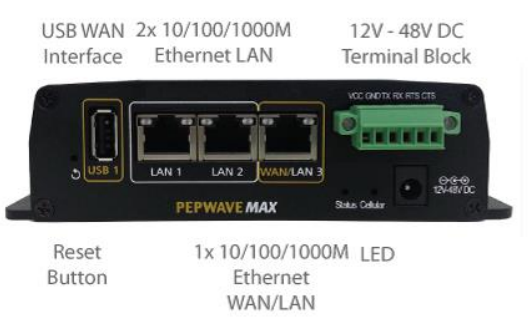
LAN and Ethernet WAN Ports		
Green LED	ON	100 Mbps
	OFF	10 Mbps
Orange LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	Port is not connected
Port Type	Auto MDI/MDI-X ports	

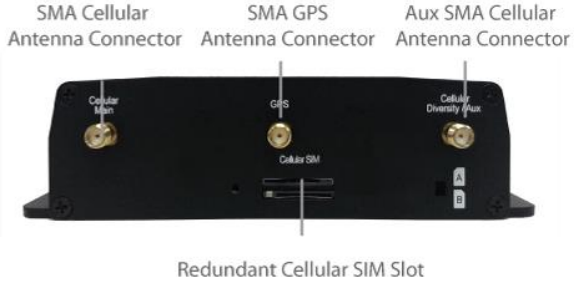
-

 Copyright @ 2016 Pepwave

4.9 MAX BR1 ENT

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

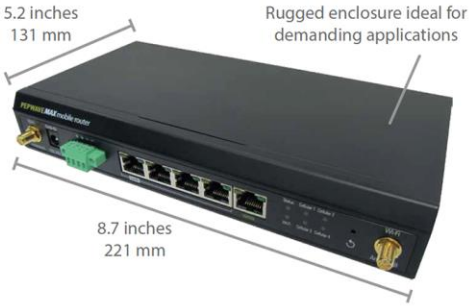
Cellular Indicators		
Cellular	OFF	Disabled or no SIM card inserted
	ON	Connecting or connected to network(s)

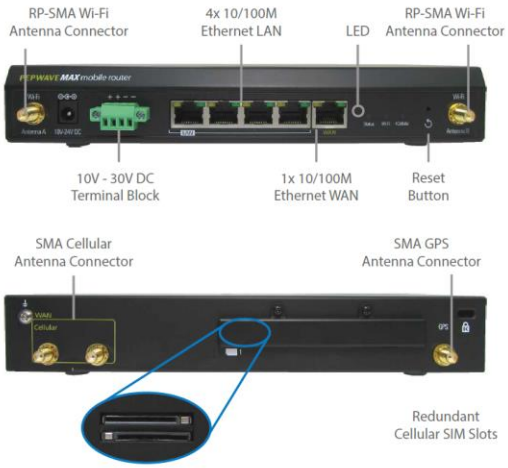
LAN and Ethernet WAN Ports		
Green LED	ON	100 Mbps
	OFF	10 Mbps
Orange LED	ON	Port is connected without traffic
	Blinking	Data is transferring
	OFF	Port is not connected
Port Type	Auto MDI/MDI-X ports	

 Copyright @ 2016 Pepwave

4.10 MAX BR1 Pro LTE

4.10.1 Panel Appearence





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

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	

 Copyright @ 2016 Pepwave

4.11 MAX BR1/2 IP55

4.11.1 Panel Appearance

4.11.2 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

 Copyright @ 2016 Pepwave

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	

 Copyright @ 2016 Pepwave

4.12 MAX On-The-Go

4.12.1 Panel Appearance

4.12.2 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

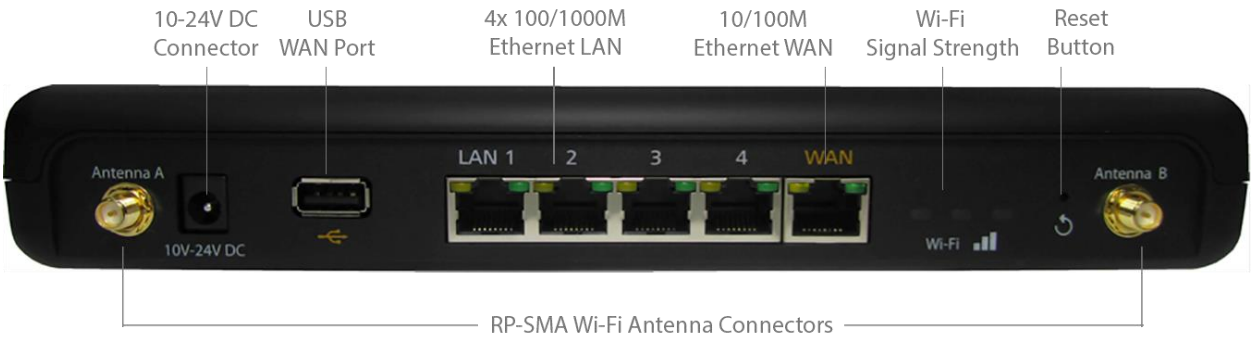
Status Indicators		
Status	OFF	System initializing
	Red	Booting up or busy
	Green	Ready

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	

 Copyright @ 2016 Pepwave

4.13 Surf SOHO

4.13.1 Panel Appearance



4.13.2 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

 Copyright @ 2016 Pepwave

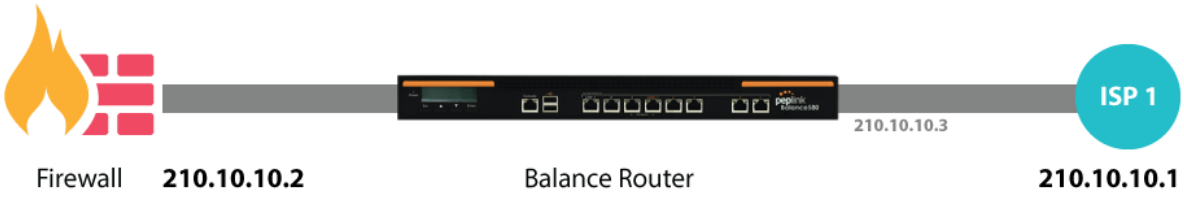
Orange LED	Blinking	Data is transferring
	OFF	No data is being transferred or port is not connected
Port type	Auto MDI/MDI-X ports	

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

 Copyright @ 2016 Pepwave

5 Advanced Feature Summary

5.1 Drop-in Mode and LAN Bypass: Transparent Deployment



As your organization grows, it needs more bandwidth. But modifying your network would require effort better spent elsewhere. In **Drop-in Mode**, you can conveniently install your Peplink router without making any changes to your network. And if the Peplink router loses power for any reason, **LAN Bypass** will safely and automatically bypass the Peplink router to resume your original network connection.

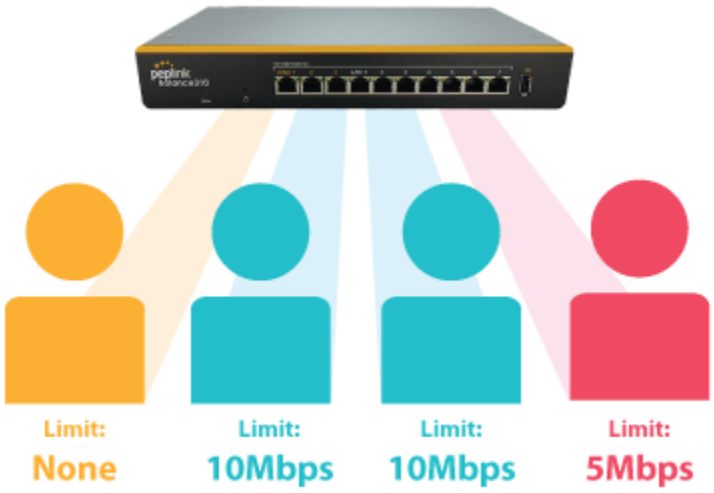
Compatible with: MAX 700, MAX HD2 (All variants), HD4 (All Variants)

5.2 QoS: Clearer VoIP

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

 Copyright @ 2016 Pepwave

5.3 Per-User Bandwidth Control



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

5.4 High Availability via VRRP

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

Compatible with: MAX 700, MAX HD2 (All variants), HD4 (All Variants)

 Copyright @ 2016 Pepwave

5.5 USB Modem and Android Tethering

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

Compatible with: MAX 700, HD2 (all variants except IP67), HD4 (All variants)

5.6 Built-In Remote User VPN Support

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

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

 Copyright @ 2016 Pepwave

5.7 SIM-card USSD support

Cellular-enabled routers can now use USSD to check their SIM card's balance, process pre-paid cards, and configure carrier-specific services.Click here for full instructions on using USSD.

 Copyright @ 2016 Pepwave

6 Installation

The following section details connecting Pepwave routers to your network.

6.1 Preparation

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

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

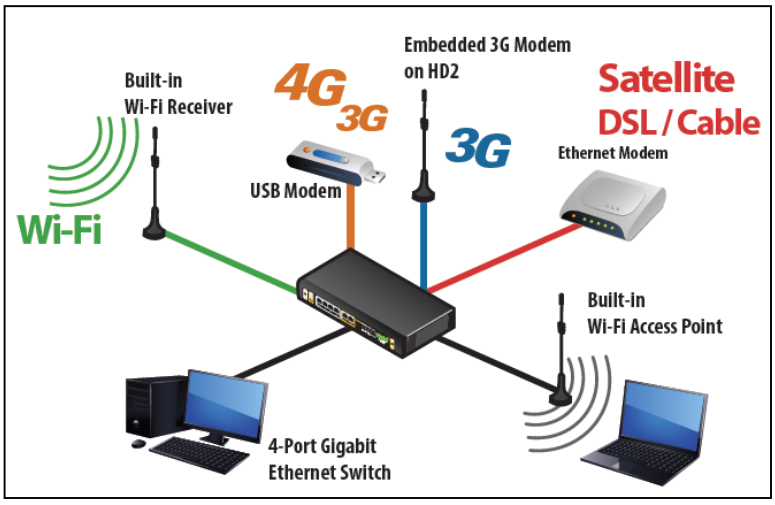
 Copyright @ 2016 Pepwave

6.2 Constructing the Network

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

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

The following figure schematically illustrates the resulting configuration:



 Copyright @ 2016 Pepwave

6.3 Configuring the Network Environment

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

- LAN configuration

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

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

- WAN configuration

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

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

 Copyright @ 2016 Pepwave

7 Mounting the Unit

7.1 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. Recommeneded screw specification: M3.5 x 20mm, head diameter 6mm, head thickness 2.4mm.

The Pepwave MAX BR1 requires four screws for wall mounting.

7.2 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.

7.3 IP67 Installation Guide

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

 Copyright @ 2016 Pepwave

8 Connecting to the Web Admin Interface

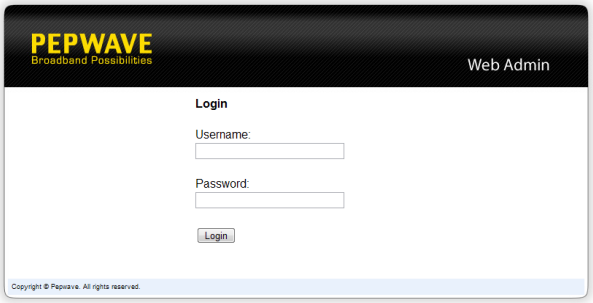
1. Start a web browser on a computer that is connected with the Pepwave router through the LAN.
2. To connect to the router's web admin interface, enter the following LAN IP address in the address field of the web browser:

   http://192.168.50.1

   (This is the default LAN IP address for Pepwave routers.)
3. Enter the following to access the web admin interface.

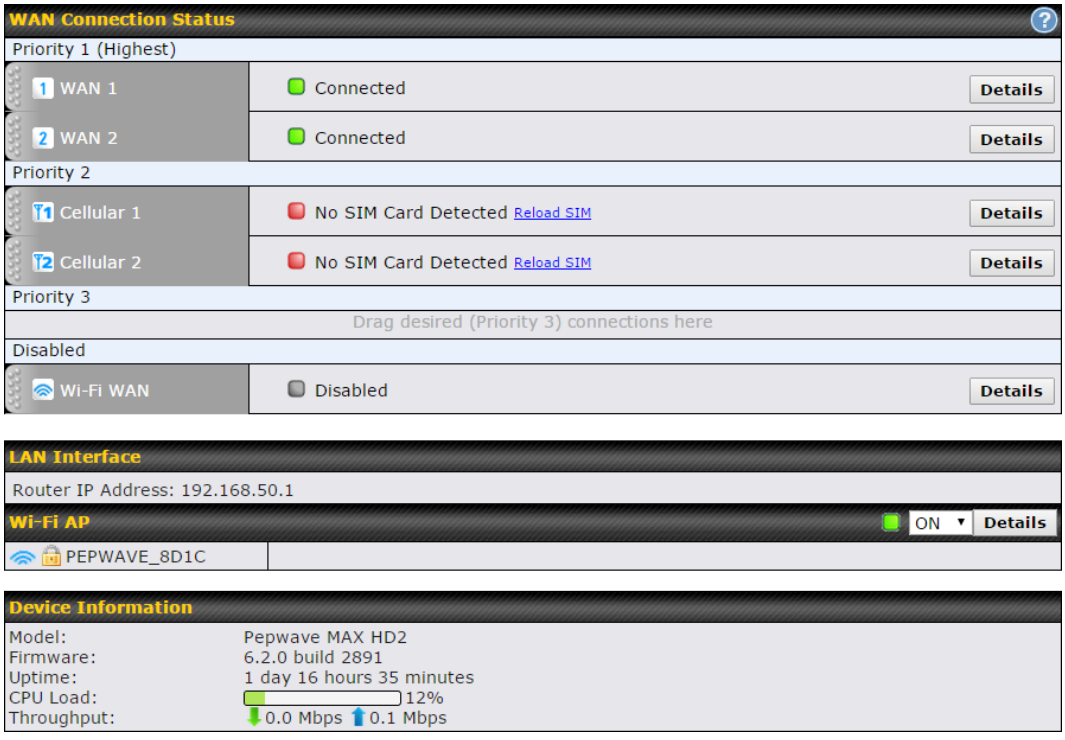
   Username: admin

   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.



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.**

 Copyright @ 2016 Pepwave

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

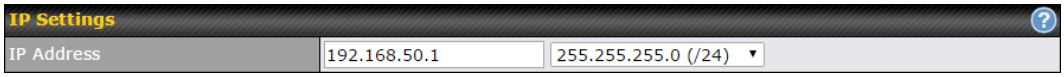
Important Note
Configuration changes (e.g. WAN, LAN, admin settings, etc.) will take effect only after clicking the **Save** button at the bottom of each page. The **Apply Changes** button causes the changes to be saved and applied.

 Copyright @ 2016 Pepwave

9 Configuring the LAN Interface(s)

9.1 Basic Settings

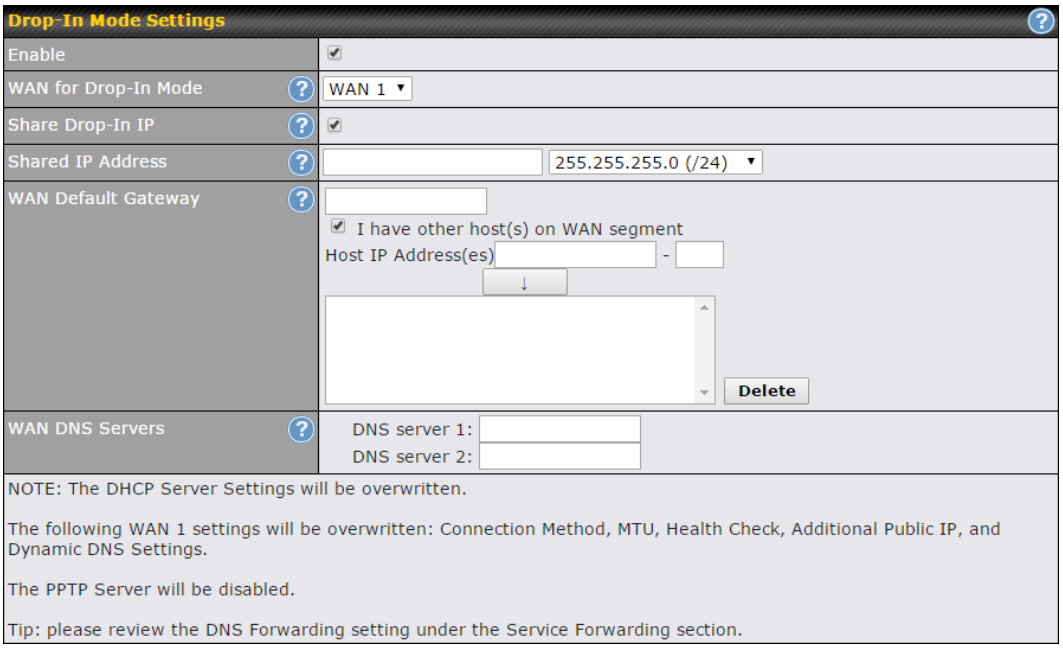
LAN interface settings are located at **Network>LAN>Basic Settings**.



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

Network Settings	
Name	Enter a name for the LAN.
VLAN ID	Enter a number for your VLAN.
Inter-VLAN routing	Check this box to enable routing between virtual LANs.
Captive Portal	Check this box to turn on captive portals.

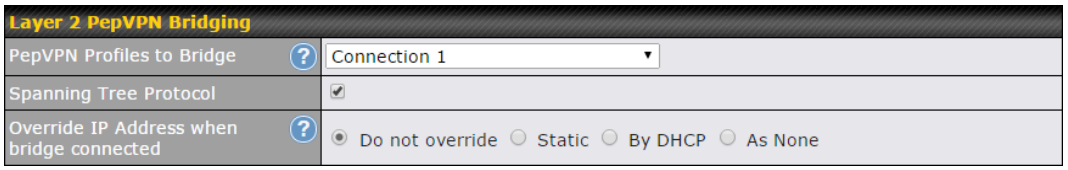
 Copyright @ 2016 Pepwave



 Copyright @ 2016 Pepwave

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.

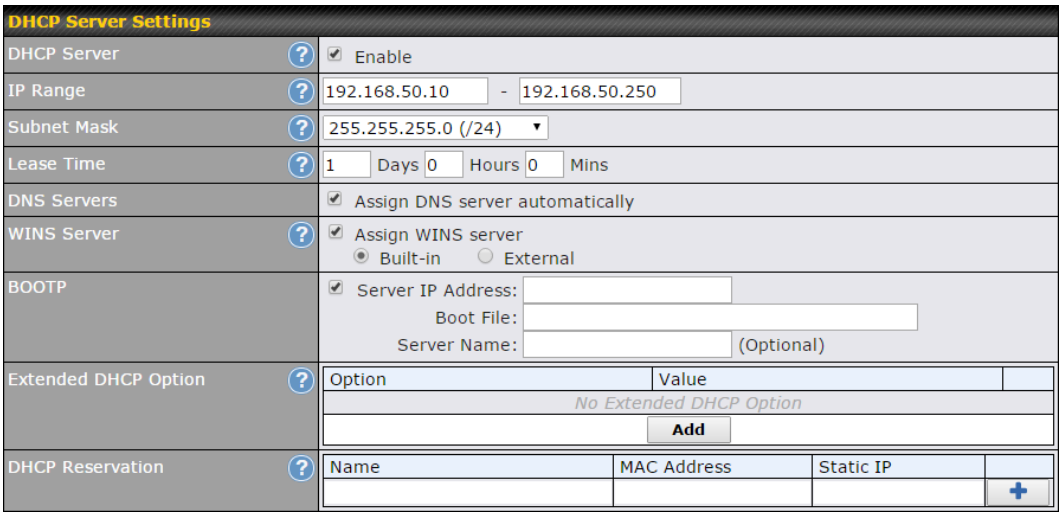
[A] - Advanced feature, please click the button on the top right-hand corner to activate.



Layer 2 PepVPN Bridging	
PepVPN Profiles to Bridge	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.

 Copyright @ 2016 Pepwave

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

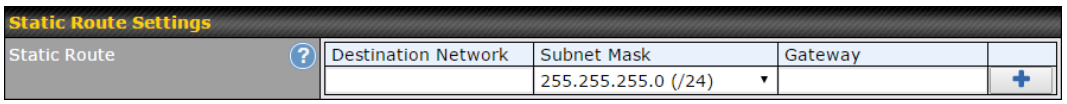
DHCP Server	When this setting is enabled, the DHCP server automatically assigns an IP address to each computer that is connected via LAN and configured to obtain an IP address via DHCP. The Pepwave router's DHCP server can prevent IP address collision on the LAN.
IP Range & Subnet Mask	These settings 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

 Copyright @ 2016 Pepwave

	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 client information can be imported from the **Client List**, located at **Status>Client List**. For more details, please refer to **Section 22.3.**

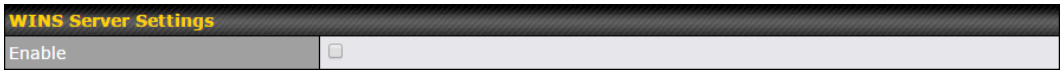
LAN Physical Settings

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

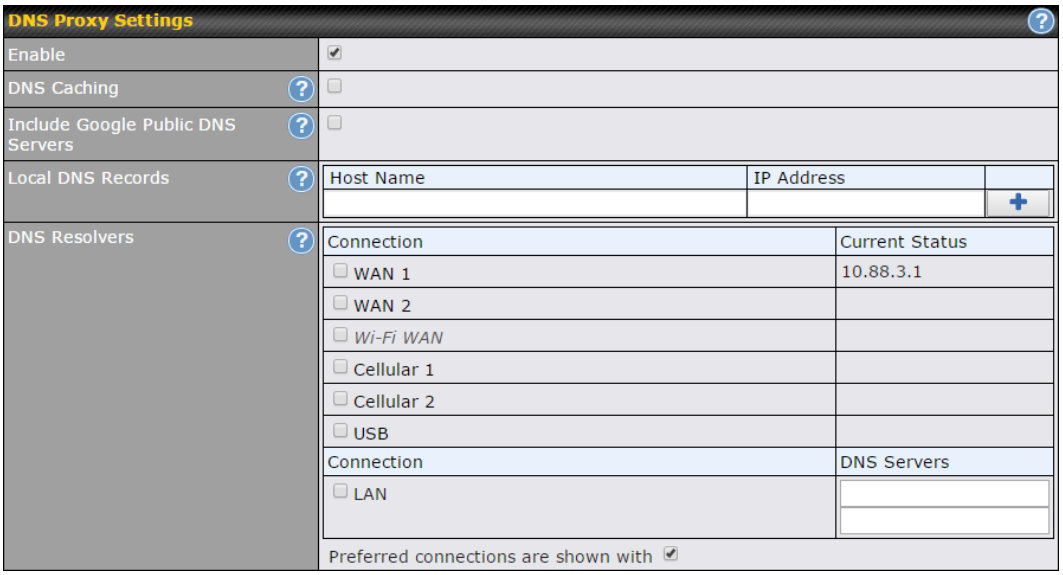
Static Route	This table is for defining static routing rules for the LAN segment. A static route consists of the network address, subnet mask, and gateway address. The address and subnet mask values are in *w.x.y.z* format. The local LAN subnet and subnets behind the LAN will be advertised to the VPN. 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	Check the box to enable the WINS server. A list of WINS clients will be displayed at **Status>WINS Clients**.

 Copyright @ 2016 Pepwave



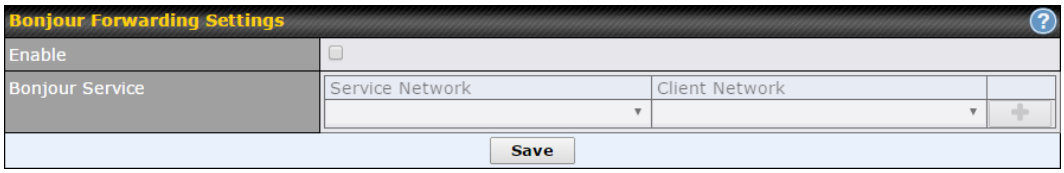
DNS Proxy Settings	
Enable	To enable the DNS proxy feature, check this box, and then set up the feature at **Network>LAN>DNS Proxy Settings**. A DNS proxy server can be enabled to serve DNS requests originating from LAN/PPTP/SpeedFusion™ peers. Requests are forwarded to the **DNS servers/resolvers**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

 Copyright @ 2016 Pepwave

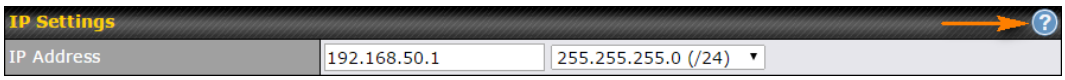
protocol. Once VLAN configuration is complete, click **Save** to store your changes.



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

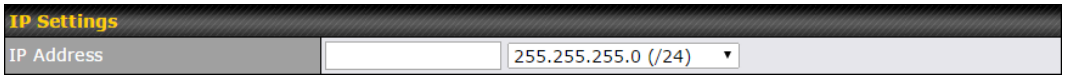
 Copyright @ 2016 Pepwave

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



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

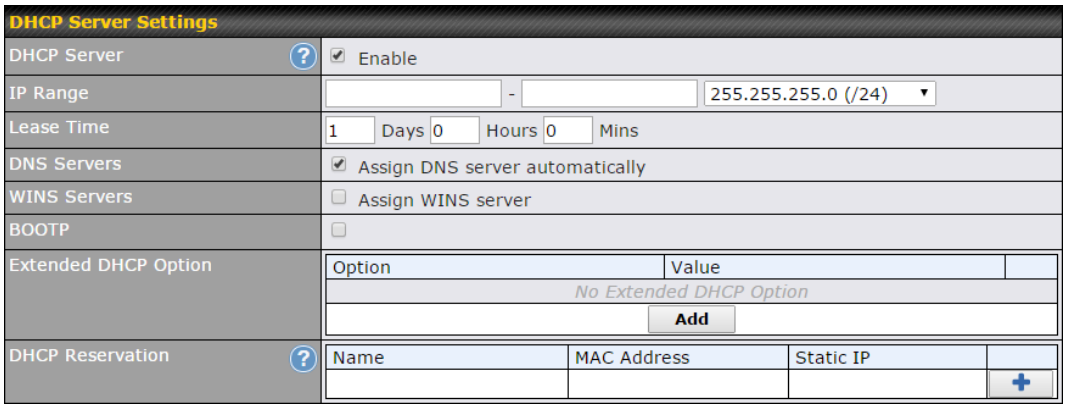
The following settings are displayed when creating a new LAN or editing an existing LAN.



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	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.

 Copyright @ 2016 Pepwave

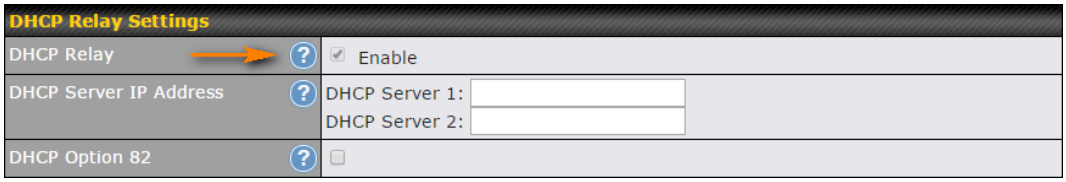


DHCP Server Settings	
DHCP Server	When this setting is enabled, the Pepwave router's DHCP server automatically assigns an IP address to each computer that is connected via LAN and configured to obtain an IP address via DHCP. The Pepwave router's DHCP server can prevent IP address collisions on the LAN. 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**

 Copyright @ 2016 Pepwave

22.3.

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



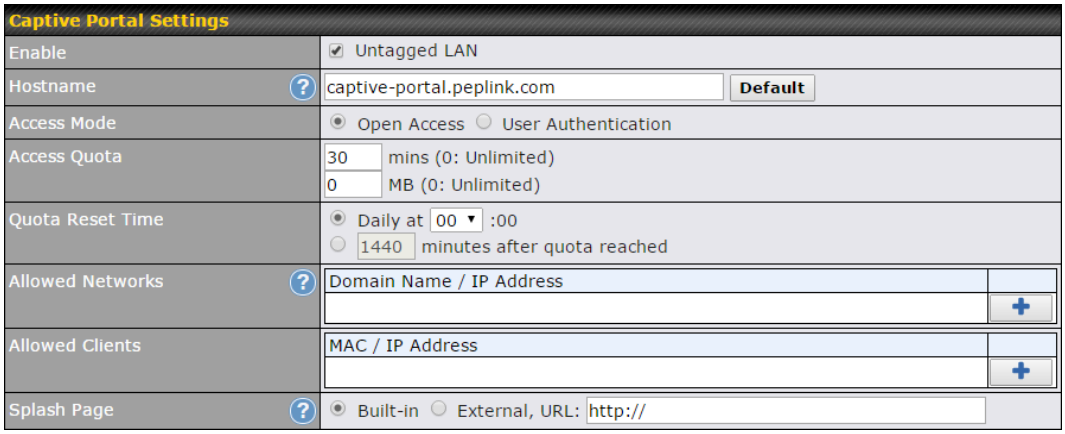
DHCP Relay Settings	
Enable	Check this box to turn on DHCP relay. Click the icon to disable DHCP relay.
DHCP Server IP Address	Enter the IP addresses of one or two DHCP servers in the provided fields. The DHCP servers entered here will receive relayed DHCP requests from the LAN. For active-passive DHCP server configurations, enter active and passive DHCP server relay IP addresses in **DHCP Server 1** and **DHCP Server 2.**
DHCP Option 82	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.

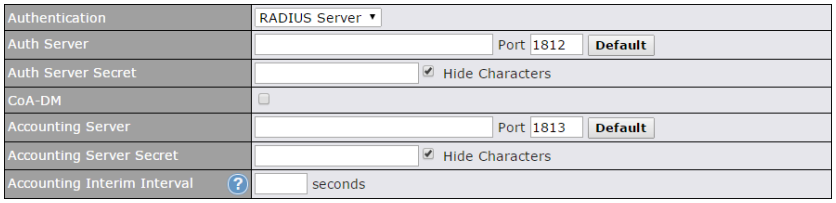
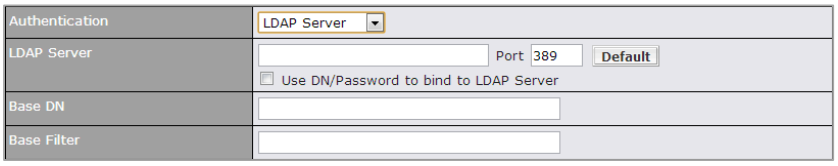
Once DHCP is set up, configure **LAN Physical Settings**, **Static Route Settings**, **WINS Server Settings**, and **DNS Proxy Settings** as noted above.

 Copyright @ 2016 Pepwave

9.2 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**.

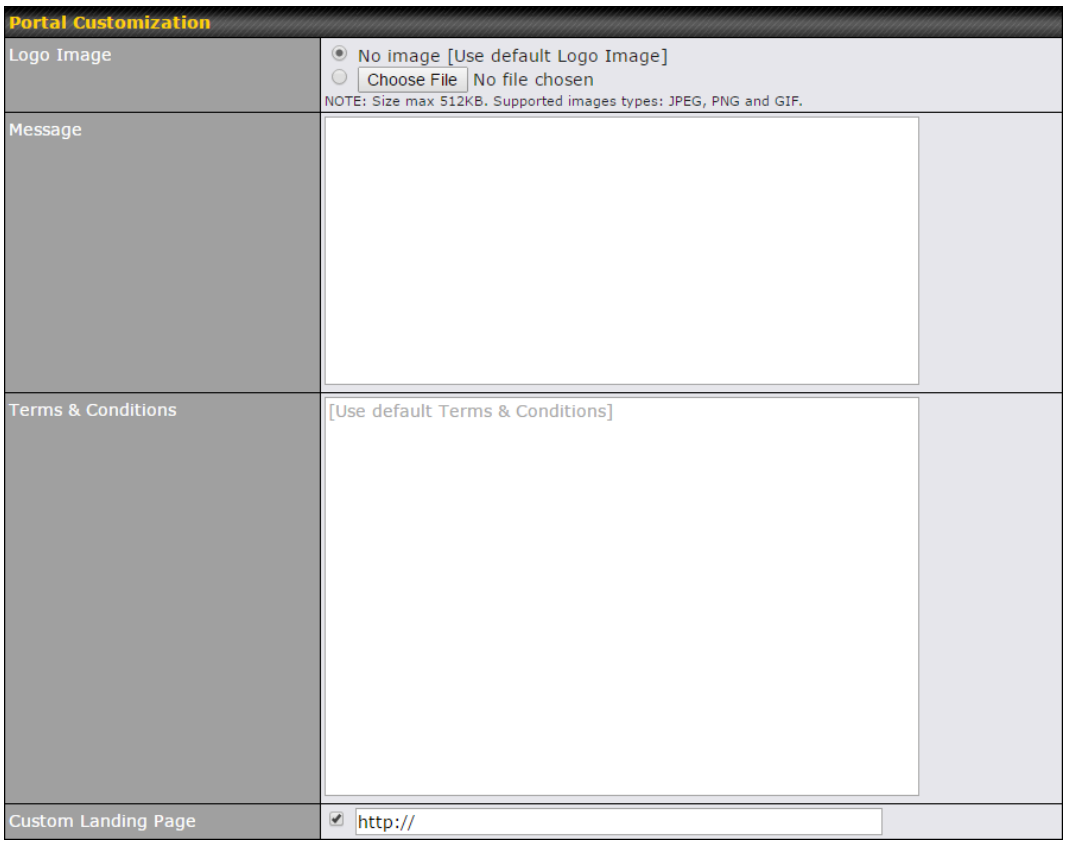


Captive Portal Settings	
Enable	Check **Enable** and then, optionally, select the LANs/VLANs that will use the captive portal.
Hostname	To customize the portal's form submission and redirection URL, enter a new URL in this field. To reset the URL to factory settings, click **Default**.
Access Mode	Click **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:  Fill in the necessary information to complete your connection to the server and enable authentication.
LDAP Server	This authenticates your clients through a LDAP server. Upon selecting this option, you will see the following fields:  Fill in the necessary information to complete your connection to the server and enable authentication.

 Copyright @ 2016 Pepwave

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:

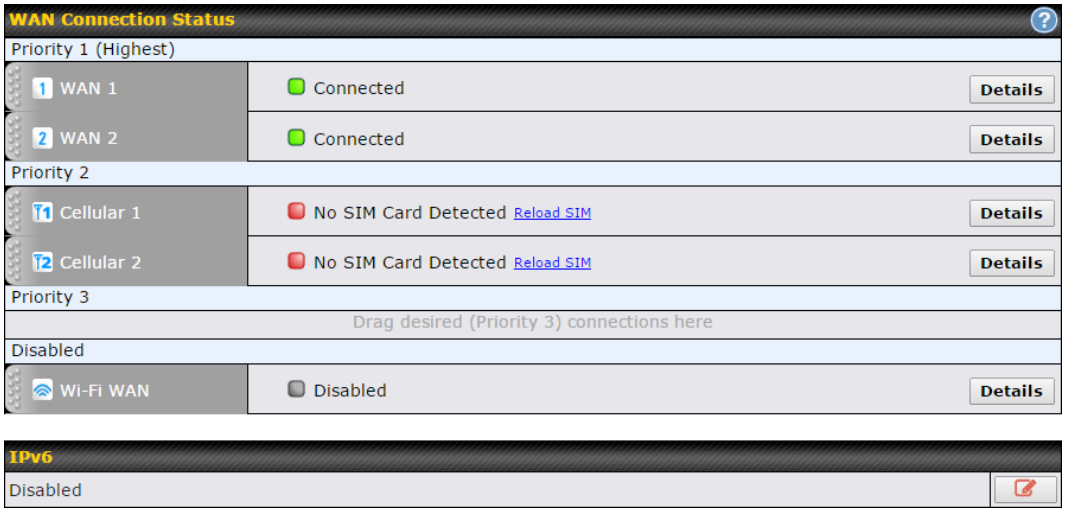


 Copyright @ 2016 Pepwave

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.

10 Configuring the WAN Interface(s)

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



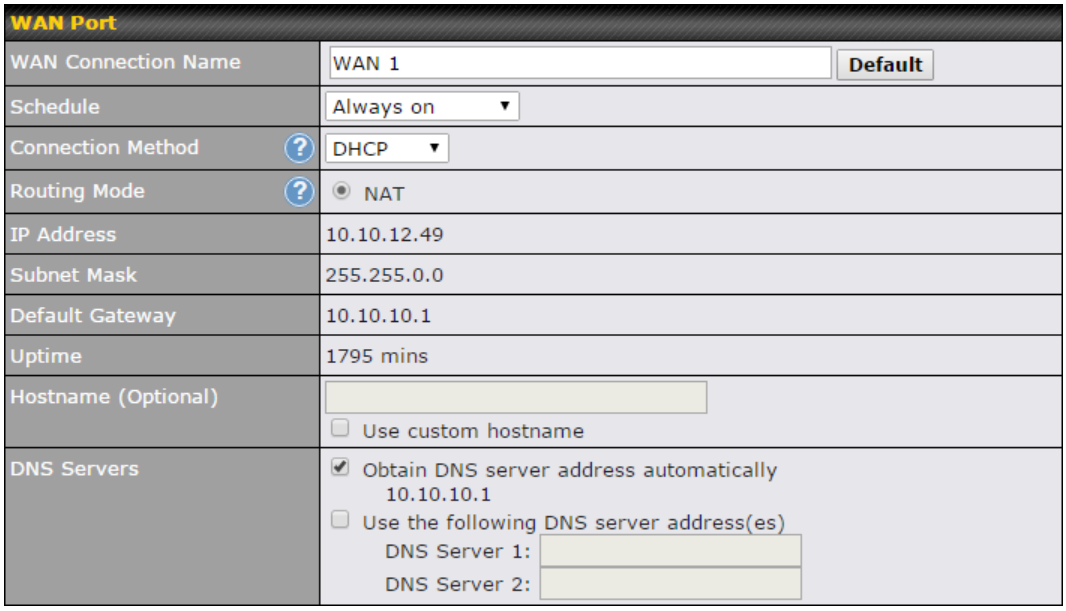
To disable a particular WAN connection, drag on the appropriate WAN by holding the left mouse button, move it the **Disabled** row, and drop it by releasing the mouse button. You can also set priorities on the **Dashboard**. Click the **Details** button in the corresponding row to modify the connection setting.

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

 Copyright @ 2016 Pepwave

10.1 Ethernet WAN

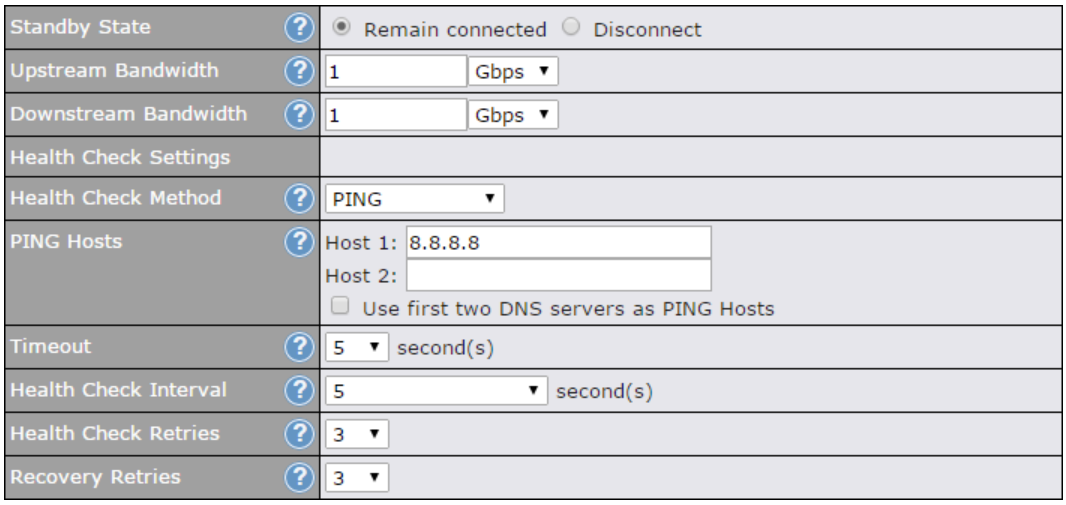
From **Network>WAN,** choose a WAN connection and then click **Details**.



WAN Port (Section 1)	
WAN Connection Name	Enter a name to represent this WAN connection.
Schedule	Click the drop-down menu to apply a time schedule to this interface
Connection Method	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.

 Copyright @ 2016 Pepwave

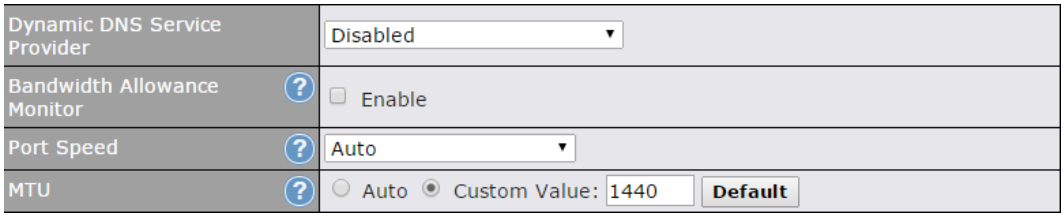
Hostname	Enter a hostname for this WAN port if needed.
DNS Servers	Select a DNS server for this port to use. This port can either be automatically selected or manually designated.



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 15.2**).
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 10.4** for configuration details.
PING Hosts	These fields are for specifying the target DNS servers where DNS lookups will be sent to for health check. If the box Use first two DNS servers as Health Check DNS Servers is checked, the first two DNS servers will be the DNS lookup targets for checking the connection healthiness. If the box is not checked, the field Host 1 must be filled and the field Host 2 is optional. The connection is considered to be up if DNS responses are received from any one of the

 Copyright @ 2016 Pepwave

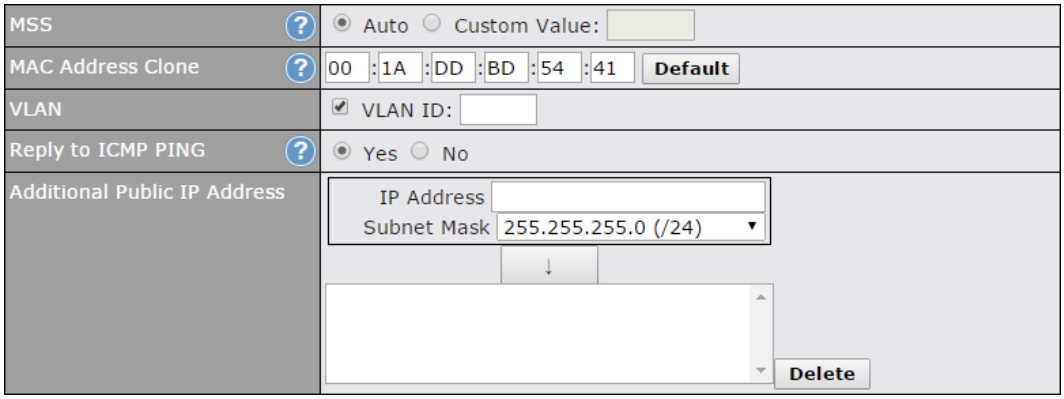
	health check DNS servers, regardless of whether the result is positive or negative.
Timeout	If a health check test cannot be completed within the specified amount of time, the test will be treated as failed.
Health Check Interval	This is the number of consecutive check failures before treating a connection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



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

 Copyright @ 2016 Pepwave

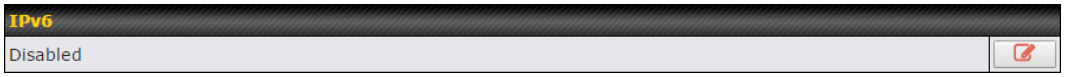
default MTU value. Select **Auto** and the appropriate MTU value will be automatically detected. Auto-detection will run each time the WAN connection establishes.



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.

 Copyright @ 2016 Pepwave



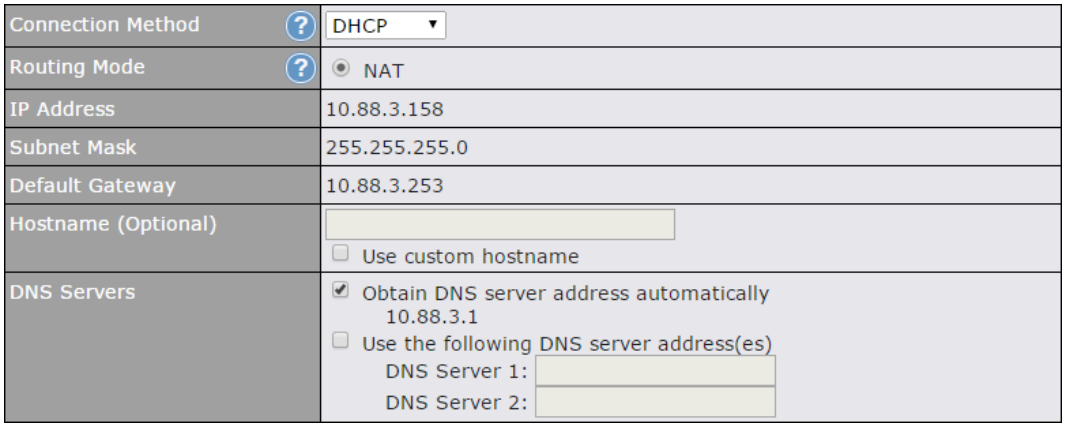
IPv6	
IPv6	IPv6 support can be enabled on one of the available Ethernet WAN ports. On this screen, you can choose which WAN will support IPv6. To enable IPv6 support on a WAN, the WAN router must respond to stateless address auto configuration advertisements and DHCPv6 requests. IPv6 clients on the LAN 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.

10.1.1 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.).



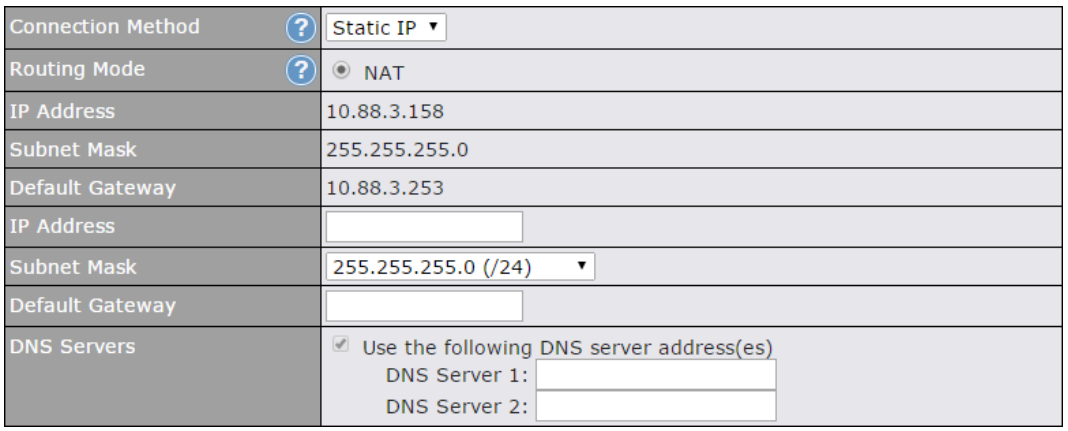
DHCP Connection Settings	
Routing Mode	NAT allows substituting the real address in a packet with a mapped address that is routable on the destination network. By clicking the help icon in this field, you can display the **IP Forwarding** option, if your network requires it.

 Copyright @ 2016 Pepwave

IP Address/ Subnet Mask/ Default Gateway	This information is obtained from the ISP automatically.
Hostname (Optional)	If your service provider's DHCP server requires you to supply a hostname value upon acquiring an IP address, you may enter the value here. If your service provider does not provide you with the value, you can safely bypass this option.
DNS Servers	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.

10.1.2 Static IP Connection

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



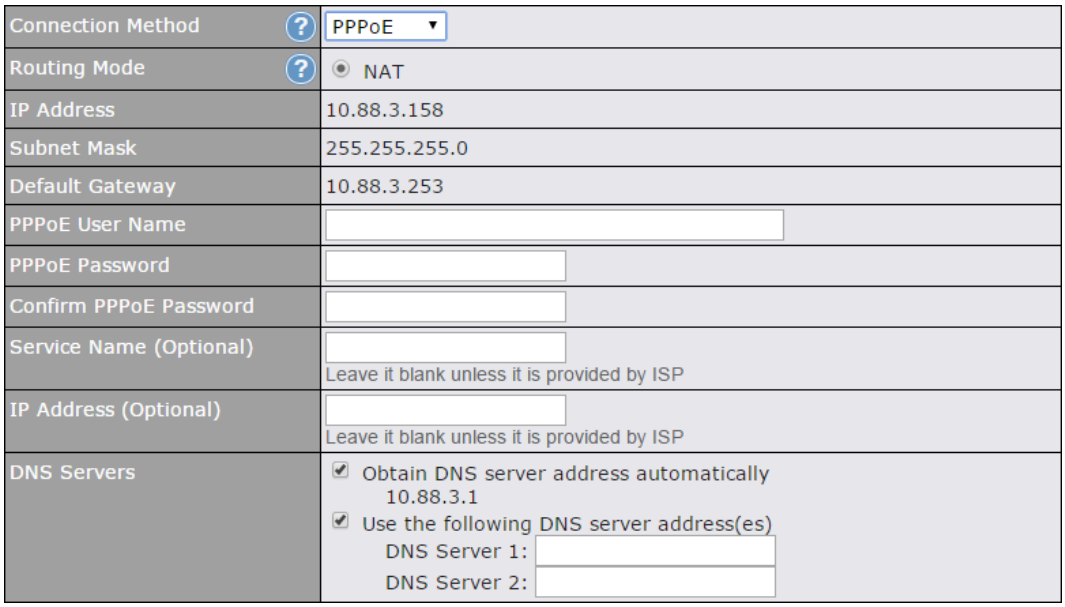
Static IP Settings	
Routing Mode	NAT allows substituting the real address in a packet with a mapped address that is routable on the destination network. By clicking the help icon in this field, you can display the **IP Forwarding** option, if your network requires it.
IP Address / Subnet Mask / Default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

 Copyright @ 2016 Pepwave

selected, you may enter custom DNS server addresses for this WAN connection into the **DNS Server 1** and **DNS Server 2** fields.

10.1.3 PPPoE Connection

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



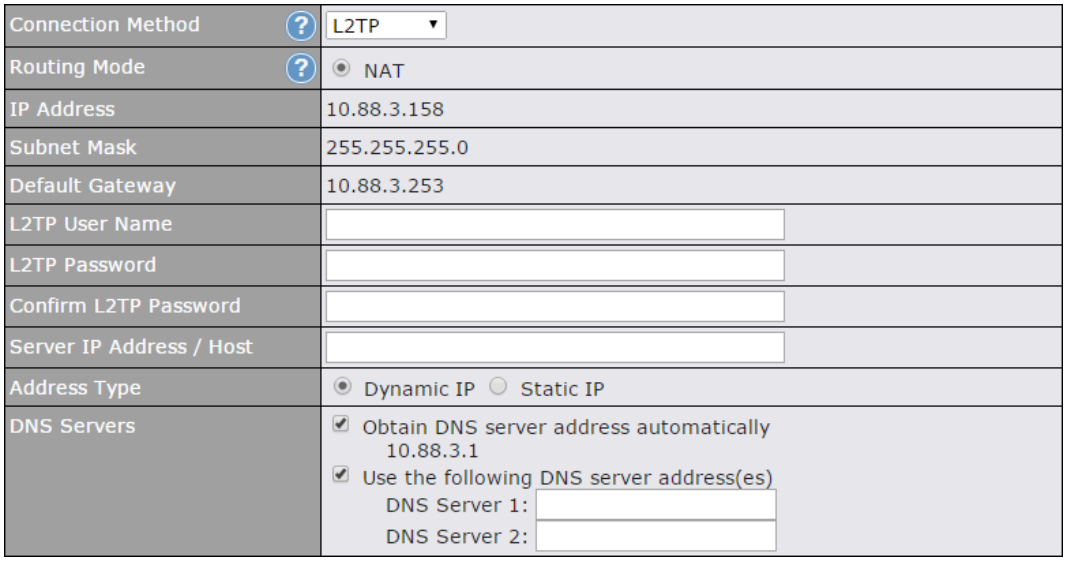
PPPoE Settings	
Routing Mode	NAT allows substituting the real address in a packet with a mapped address that is routable on the destination network. By clicking the help icon in this field, you can display the **IP Forwarding** option, if your network requires it.
IP Address / Subnet Mask / Default Gateway	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

 Copyright @ 2016 Pepwave

	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.

10.1.4 L2TP Connection

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

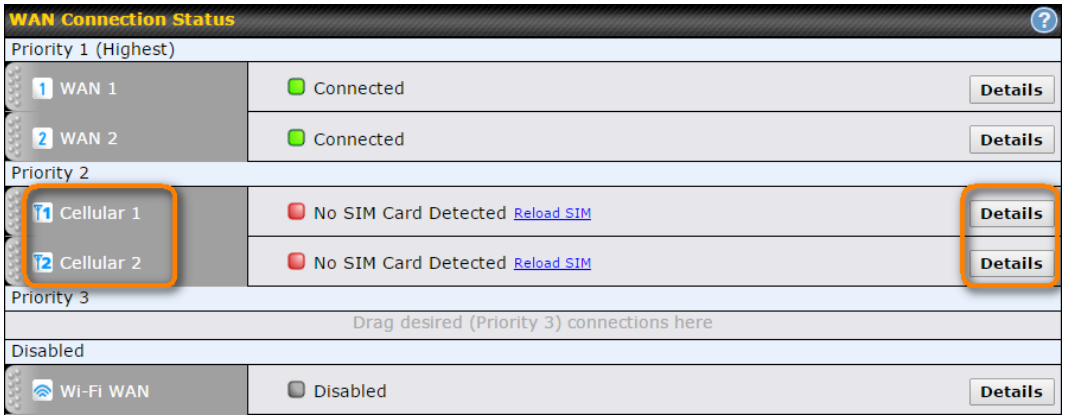


L2TP Settings	
L2TP User Name / Password	Enter the required information in these fields in order to connect via L2TP to your ISP. The parameter values are determined by and can be obtained from your ISP.
Confirm L2TP Password	Verify your password by entering it again in this field.
Server IP Address / 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.)

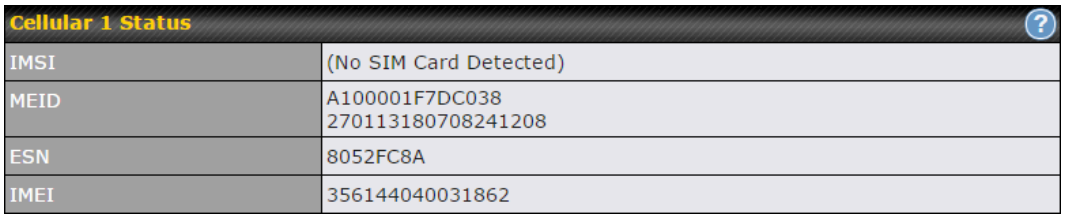
 Copyright @ 2016 Pepwave

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.

10.2 Cellular WAN

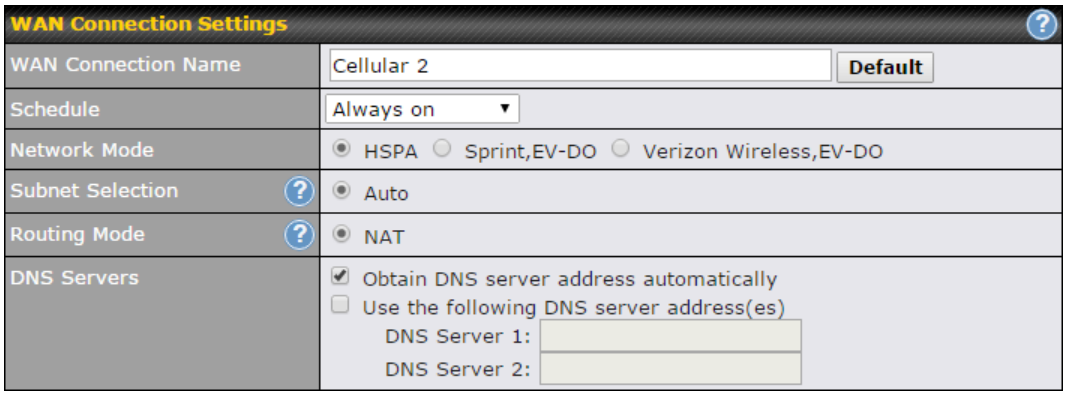


To access cellular WAN settings, click **Network>WAN>Details**.
(**Available on the Pepwave MAX BR1, HD2, and HD2 IP67 only)**



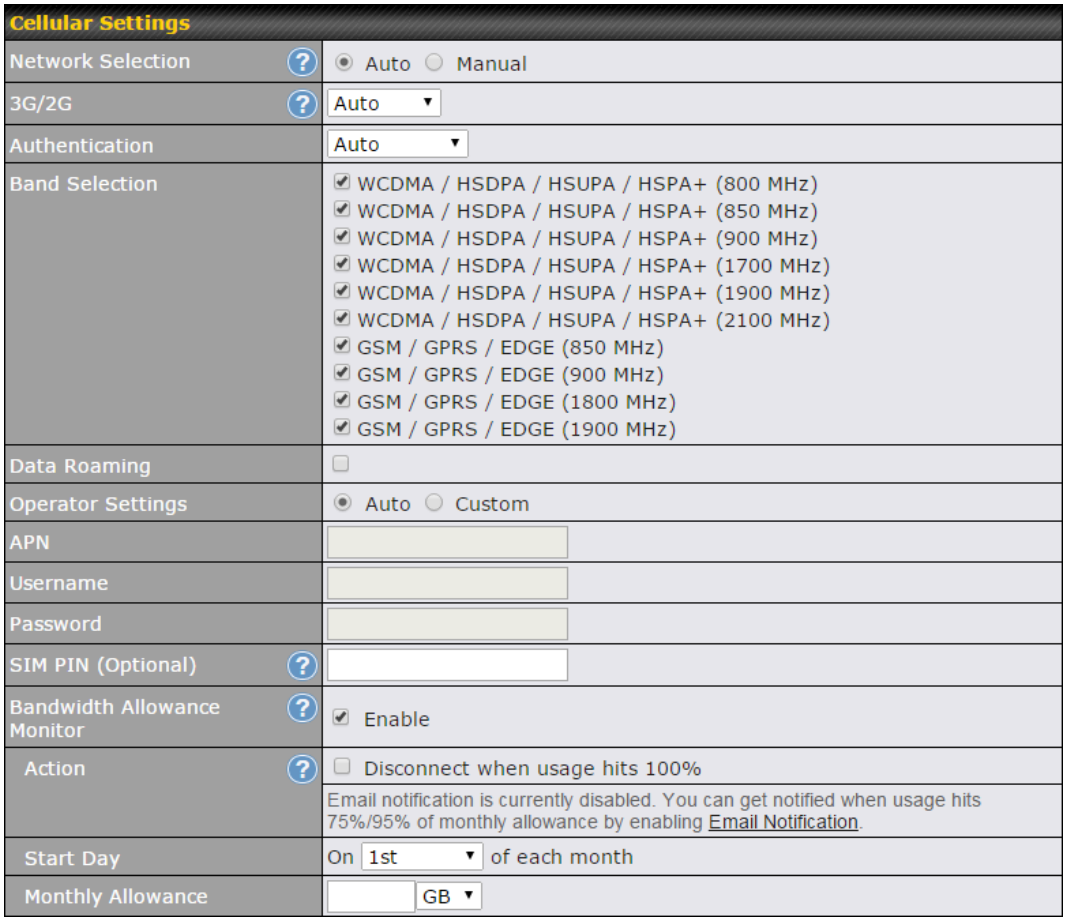
Cellular Status	
IMSI	This is the International Mobile Subscriber Identity which uniquely identifies the SIM card. This is applicable to 3G modems only.
MEID	Some Pepwave routers support both HSPA and EV-DO. For Sprint or Verizon Wireless EV-DO users, a unique MEID identifier code (in hexadecimal format) 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.

 Copyright @ 2016 Pepwave



WAN Connection Settings	
WAN Connection Name	Enter a name to represent this WAN connection.
Schedule	Click the drop-down menu to apply a time schedule to this interface if needed.
Network Mode	Users have to specify the network they are on accordingly.
Subnet Selection	Auto: The subnet mask will be set automatically. Force /31 Subnet: The subnet mask will be set as 255.255.255.254(/31), and the gateway IP address will be recalculated.
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.

 Copyright @ 2016 Pepwave

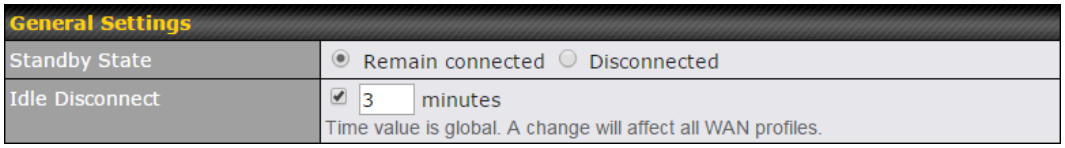


Cellular Settings	
Network Selection	Auto / Manual
3G/2G	Auto
Authentication	Auto
Band Selection	WCDMA / HSDPA / HSUPA / HSPA+ (800 MHz) WCDMA / HSDPA / HSUPA / HSPA+ (850 MHz) WCDMA / HSDPA / HSUPA / HSPA+ (900 MHz) WCDMA / HSDPA / HSUPA / HSPA+ (1700 MHz) WCDMA / HSDPA / HSUPA / HSPA+ (1900 MHz) WCDMA / 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.

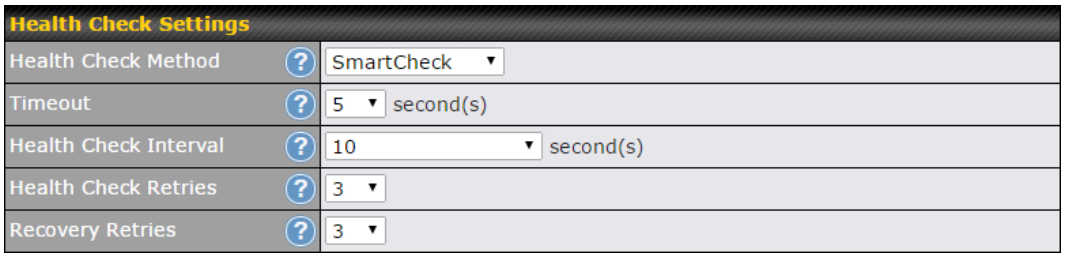
 Copyright @ 2016 Pepwave

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 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	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.

 Copyright @ 2016 Pepwave



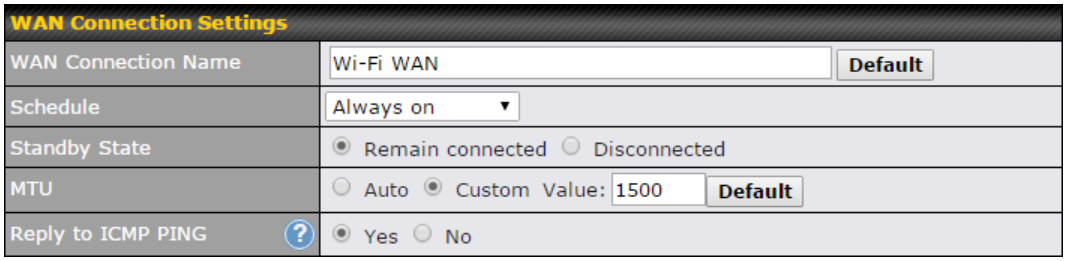
Health Check Settings	
Heath Check Method	This setting allows you to specify the health check method for the cellular connection. Available options are **Disabled, Ping, DNS Lookup, HTTP,** and **SmartCheck**. The default method is **DNS Lookup**. See **Section 10.4** for configuration details.
Timeout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

Dynamic DNS Settings	
Dynamic DNS Service Provider	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.

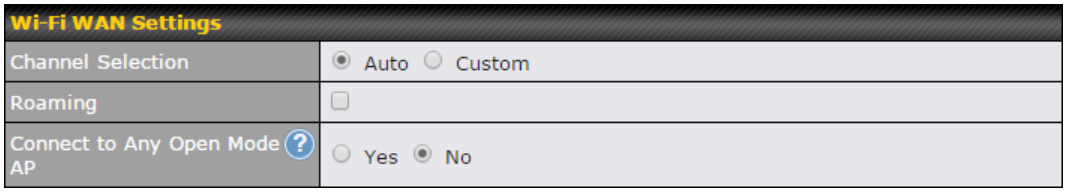
 Copyright @ 2016 Pepwave

10.3 Wi-Fi WAN

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

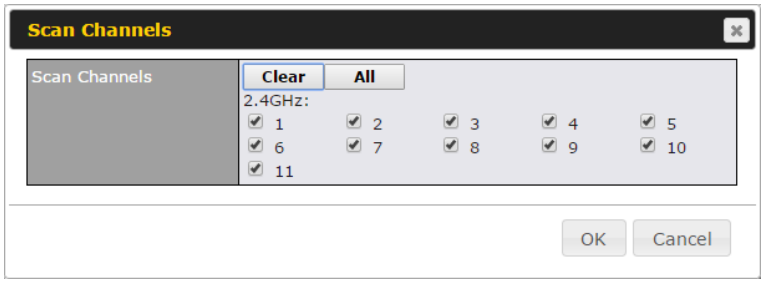


Wi-Fi Connection Settings	
WAN Connection Name	Enter a name to represent this WAN connection.
Schedule	Click the drop-down menu to apply a time schedule to this interface.
Standby State	This setting specifies the state of the WAN connection while in standby. The available options are **Remain Connected**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

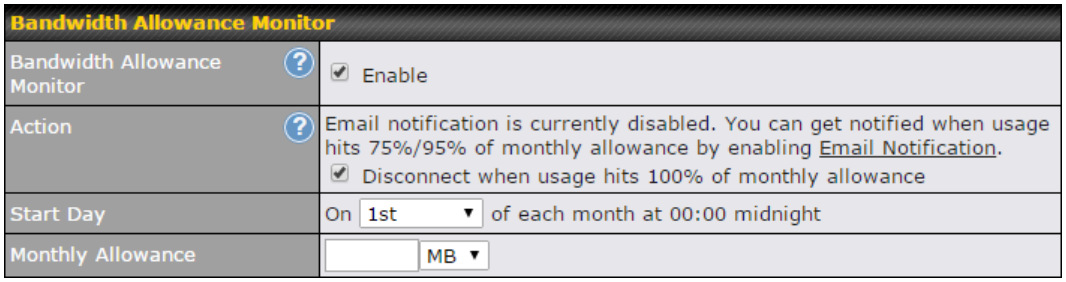


Wi-Fi WAN Settings	
Channel Selection	Determine whether the channel will be automatically selected. If you select custom, the following table will appear:

 Copyright @ 2016 Pepwave

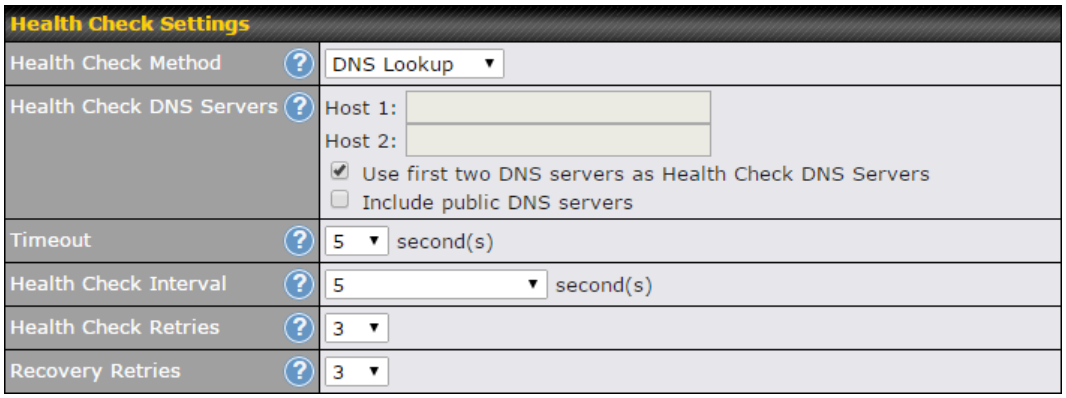


Roaming	Checking this box will enable Wi-Fi roaming. Click the icon for additional options.
Connect to Any Open Mode AP	This option is to specify whether the Wi-Fi WAN will connect to any open mode access points it finds.



Bandwidth Allowance Monitor	
Action	If **Error! Reference source not found.** is enabled, you will be notified by email hen 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.

 Copyright @ 2016 Pepwave

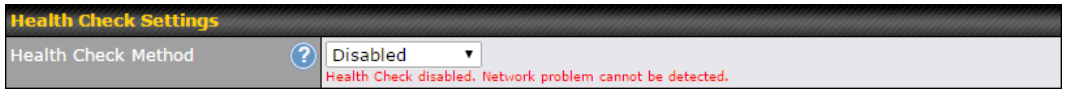


Health Check Settings

Method

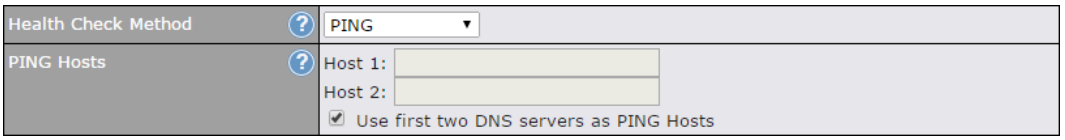
This setting specifies the health check method for the WAN connection. This value can be configured as **Disabled**, **PING**, **DNS Lookup**, or **HTTP**. The default method is **DNS Lookup**. For mobile Internet connections, the value of **Method** can be configured as **Disabled** or **SmartCheck**.

Health Check Disabled



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

Health Check Method: PING

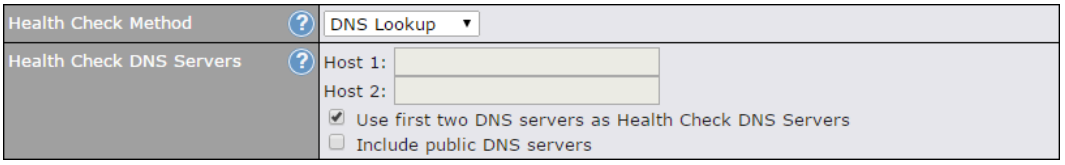


ICMP ping packets will be issued to test the connectivity with a configurable target IP address or hostname. A WAN connection is considered as up if ping responses are received from either one or both of the ping hosts.

PING Hosts

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

Health Check Method: DNS Lookup



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

 Copyright @ 2016 Pepwave

Health Check DNS Servers	This field allows you to specify two DNS hosts' IP addresses with which connectivity is to be tested via DNS Lookup. If **Use first two DNS servers as Health Check DNS Servers** is checked, the first two DNS servers will be the DNS lookup targets for checking a connection's health. If the box is not checked, **Host 1** must be filled, while a value for **Host 2** is optional. If **Include public DNS servers** is selected and no response is received from all specified DNS servers, DNS lookups will also be issued to some public DNS servers. A WAN connection will be treated as down only if there is also no response received from the public DNS servers. Connections will be considered as up if DNS responses are received from any one of the health check DNS servers, regardless of a positive or negative result. By default, the first two DNS servers of the WAN connection are used as the health check DNS servers.

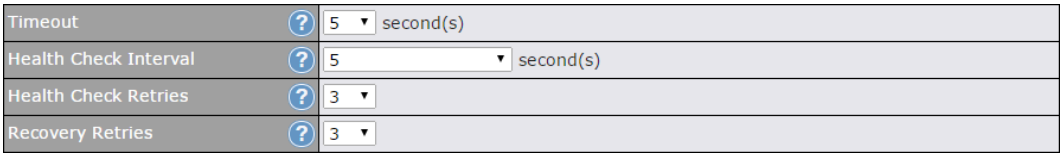
Health Check Method: HTTP

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

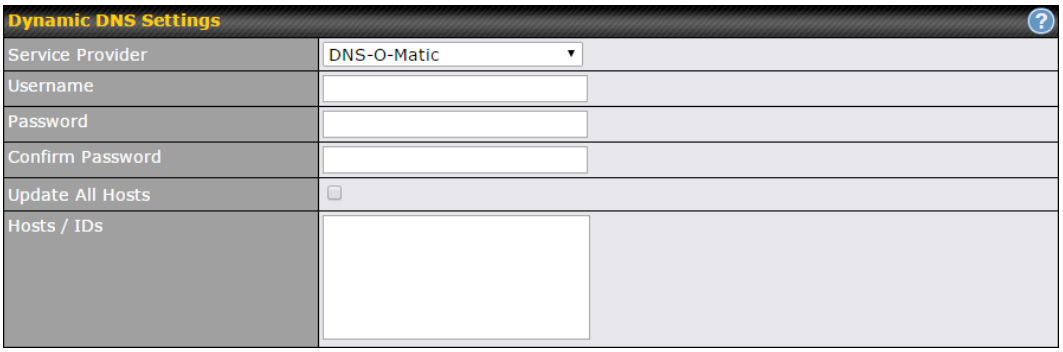
URL1	**WAN Settings>WAN Edit>Health Check Settings>URL1** The URL will be retrieved when performing an HTTP health check. When **String to Match** is left blank, a health check will pass if the HTTP return code is between 200 and 299 (Note: HTTP redirection codes 301 or 302 are treated as failures). 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.

 Copyright @ 2016 Pepwave

Other Health Check Settings



Timeout	This setting specifies the timeout in seconds for ping/DNS lookup requests. The default timeout is **5 seconds**.
Health Check Interval	This setting specifies the time interval in seconds between ping or DNS lookup requests. The default health check interval is **5 seconds**.
Health Check Retries	This setting specifies the number of consecutive ping/DNS lookup timeouts after which the Peplink 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	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.

 Copyright @ 2016 Pepwave

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

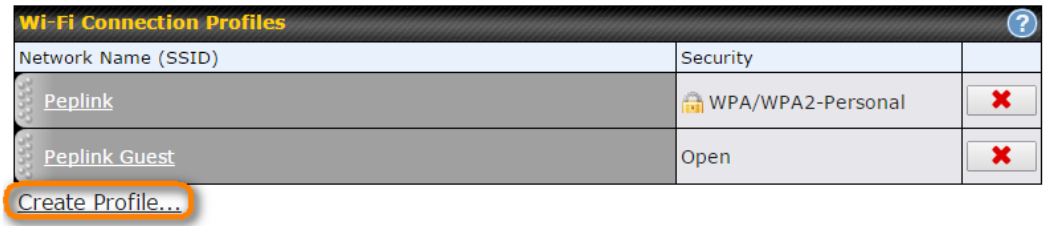
In order to use dynamic DNS services, appropriate hostname registration(s), as well as a valid account with a supported dynamic DNS service provider, are required.

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.

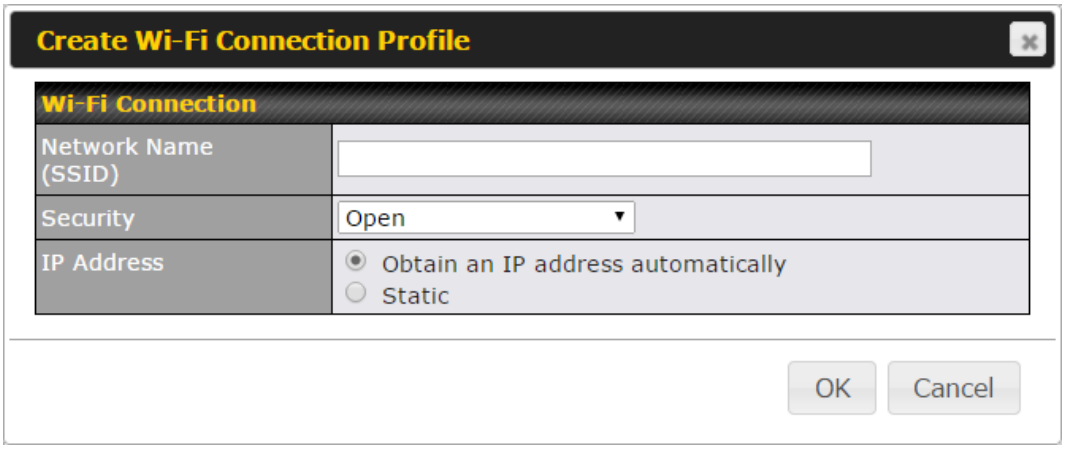
Due to dynamic DNS service providers' policies, a dynamic DNS host expires automatically when the host record has not been not updated for a long time. Therefore, the Peplink Balance performs an update every 23 days, even if a WAN's IP address did not change.

10.3.1 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:



 Copyright @ 2016 Pepwave

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.
Security	This option allows you to select which security policy is used for this wireless network. Available options: • **Open** • **WEP** • **WPA/WPA2 – Personal** • **WPA/WPA2 – Enterprise**

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:

10.4 WAN Health Check

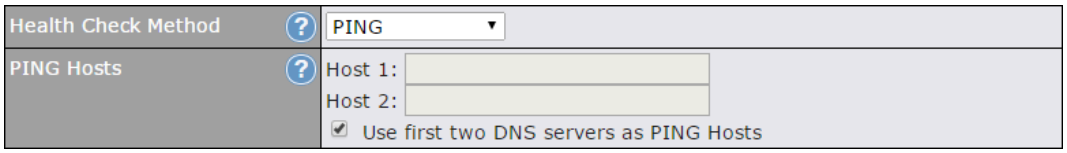
To ensure traffic is routed to healthy WAN connections only, the Pepwave router can periodically check the health of each WAN connection. The health check settings for each WAN connection can be independently configured via **Network>WAN>Details**.

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	

 Copyright @ 2016 Pepwave

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

Health Check Method: PING

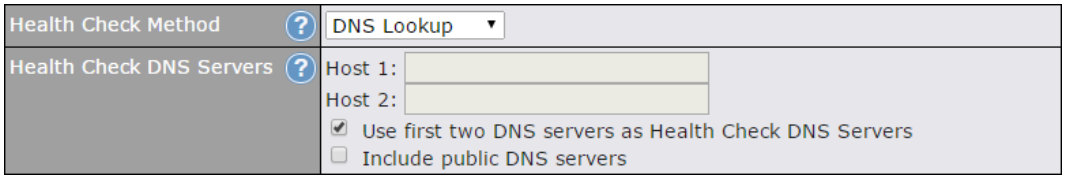


ICMP ping packets will be issued to test the connectivity with a configurable target IP address or hostname. A WAN connection is considered as up if ping responses are received from either one or both of the ping hosts.

PING Hosts

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

Health Check Method: DNS Lookup

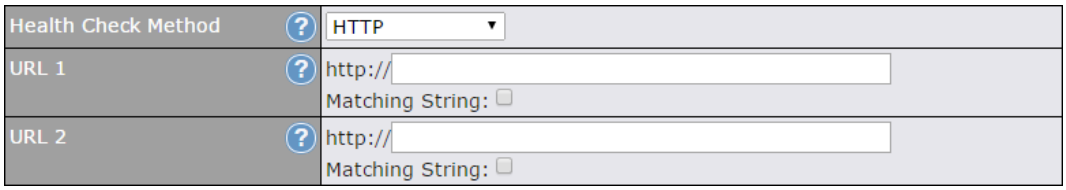


DNS lookups will be issued to test connectivity with target DNS servers. The connection will be treated as up if DNS responses are received from one or both of the servers, regardless of whether the result was positive or negative.

Health Check DNS Servers

This field allows you to specify two DNS hosts' IP addresses with which connectivity is to be tested via DNS lookup.
If **Use first two DNS servers as Health Check DNS Servers** is checked, the first two DNS servers will be the DNS lookup targets for checking a connection's health. If the box is not checked, **Host 1** must be filled, while a value for **Host 2** is optional.
If **Include public DNS servers** is selected and no response is received from all specified DNS servers, DNS lookups will also be issued to some public DNS servers. A WAN connection will be treated as down only if there is also no response received from the public DNS servers.
Connections will be considered as up if DNS responses are received from any one of the health check DNS servers, regardless of a positive or negative result. By default, the first two DNS servers of the WAN connection are used as the health check DNS servers.

Health Check Method: HTTP



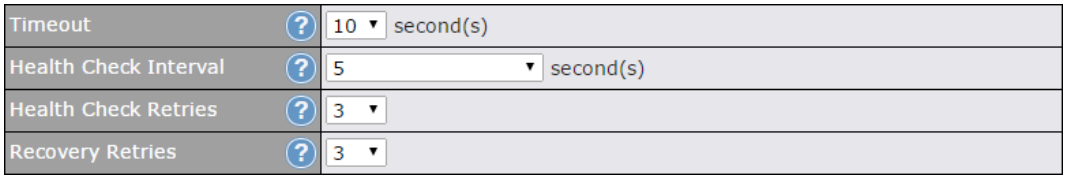
HTTP connections will be issued to test connectivity with configurable URLs and strings to match.

URL1

WAN Settings>WAN Edit>Health Check Settings>URL1
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

 Copyright @ 2016 Pepwave

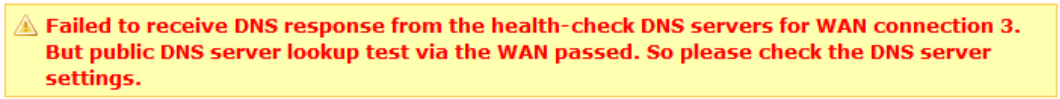
	filled, a health check will pass if the HTTP return code is between 200 and 299 and if the HTTP response content contains the string.
URL 2	**WAN Settings>WAN Edit>Health Check Settings>URL2** If **URL2** is also provided, a health check will pass if either one of the tests passed.



Other Health Check Settings	
Timeout	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:



10.5 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.

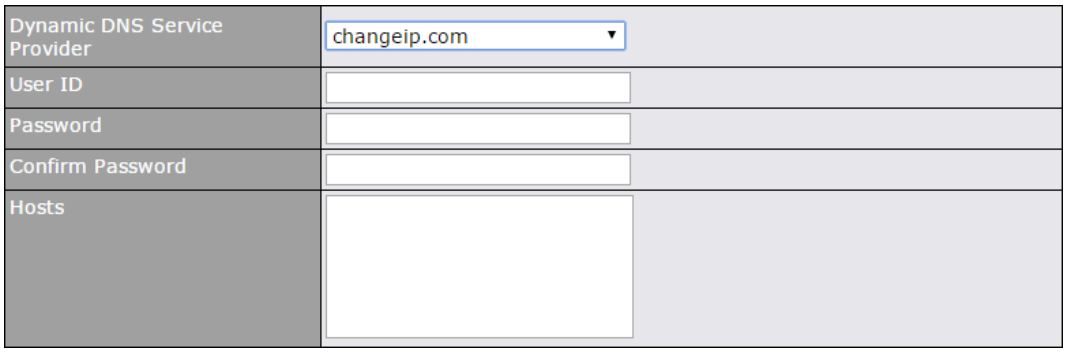
If the WAN connection's IP address is a reserved private IP address (i.e., behind a NAT

 Copyright @ 2016 Pepwave

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

Important Note
In order to use dynamic DNS services, appropriate host name registration(s) and a valid account with a supported dynamic DNS service provider are required. A dynamic DNS update is performed whenever a WAN's IP address changes (e.g., the IP is changed after a DHCP IP refresh, reconnection, etc.). Due to dynamic DNS service

 Copyright @ 2016 Pepwave

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.

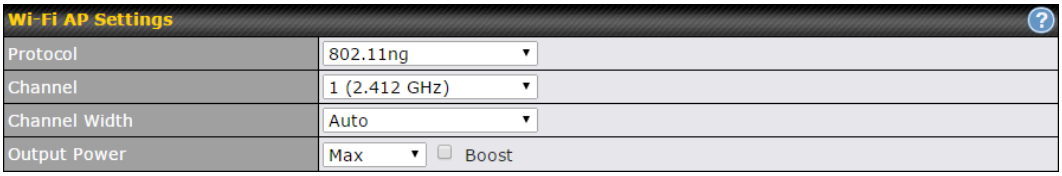
 Copyright @ 2016 Pepwave

11 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	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.

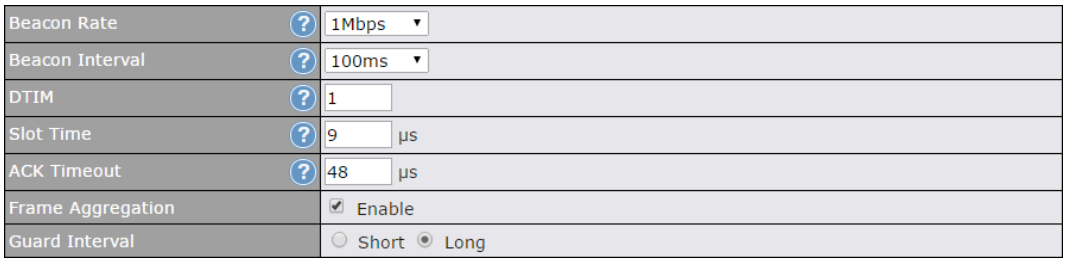
Important Note
Per FCC regulation, the country selection is not available on all models marketed in the US. All US models are fixed to US channels only.



Wi-Fi AP Settings	
Protocol	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.

 Copyright @ 2016 Pepwave

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**.

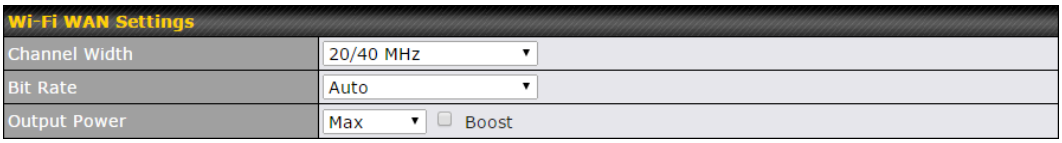


Wi-Fi AP Advanced Settings	
Beacon Rate [A]	This option is for setting the transmit bit rate for sending a beacon. By default, **1Mbps** is selected.
Beacon Interval [A]	This option is for setting the time interval between each beacon. By default, **100ms** is selected.
DTIM [A]	This field allows you 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.

 Copyright @ 2016 Pepwave

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



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.

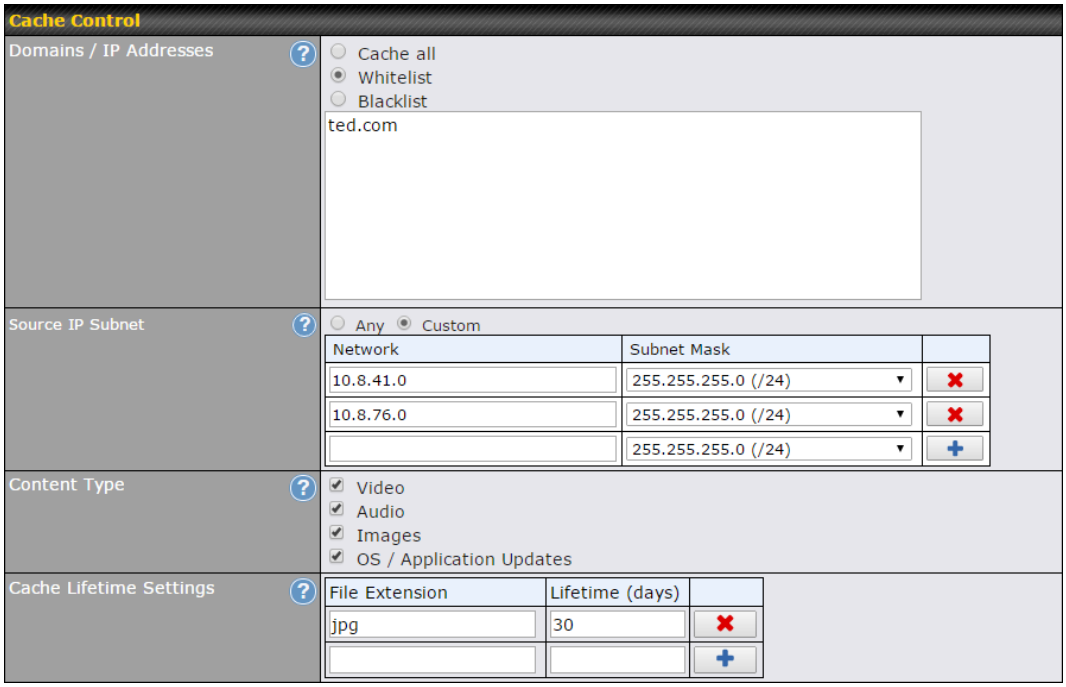
 Copyright @ 2016 Pepwave

12 MediaFast Configuration

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

12.1 Setting Up MediaFast Content Caching

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

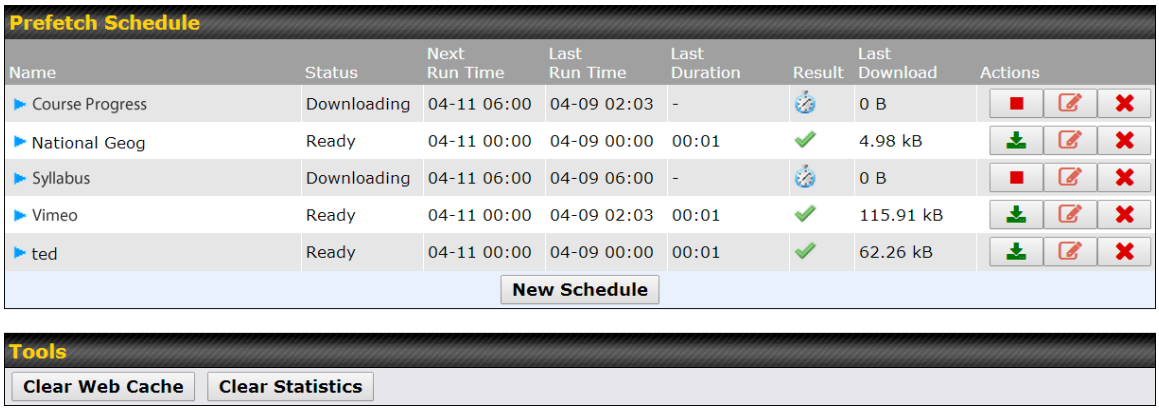


Cache Control Settings	
Domain	Choose to **Cache on all domains**, or enter domain names and then choose either **Cache the specified domains only** or **Do not cache the specified domains**.
Source IP Subnet	This setting allows caching to be applied to the user-specified IP subnets. If "Any" is selected, then caching will apply to all subnets.
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.

 Copyright @ 2016 Pepwave

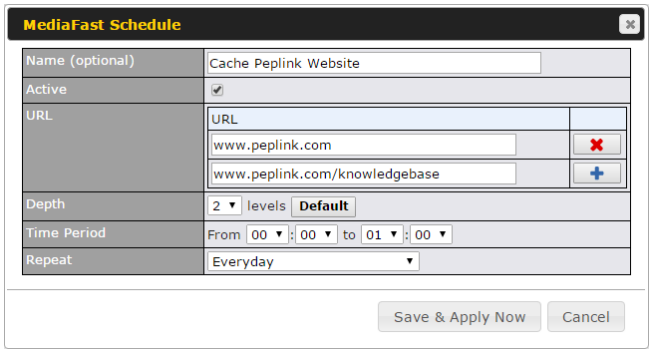
12.2 Scheduling Content Prefetching

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 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.

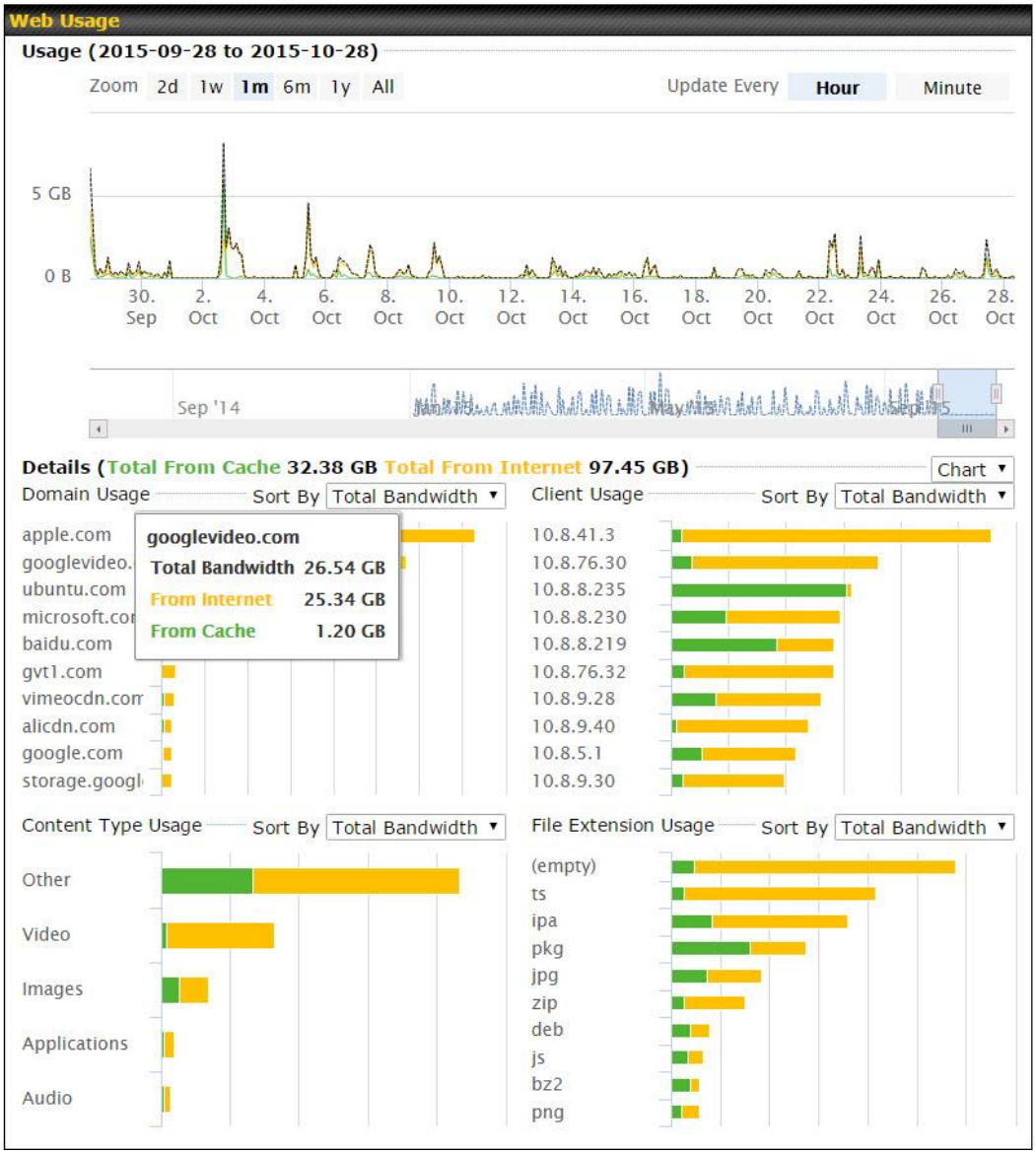
 Copyright @ 2016 Pepwave

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

12.3 Viewing MediaFast Statistics

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

 Copyright @ 2016 Pepwave



 Copyright @ 2016 Pepwave

13 Bandwidth Bonding SpeedFusion™ / PepVPN

Pepwave bandwidth bonding SpeedFusionTM is our patented technology that enables our SD-WAN routers to bond multiple Internet connections to increase site-to-site bandwidth and reliability. SpeedFusion functionality securely connects your 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. In case of failures and network congestion at one or more WANs, other WANs can be used to continue carrying the network traffic.

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

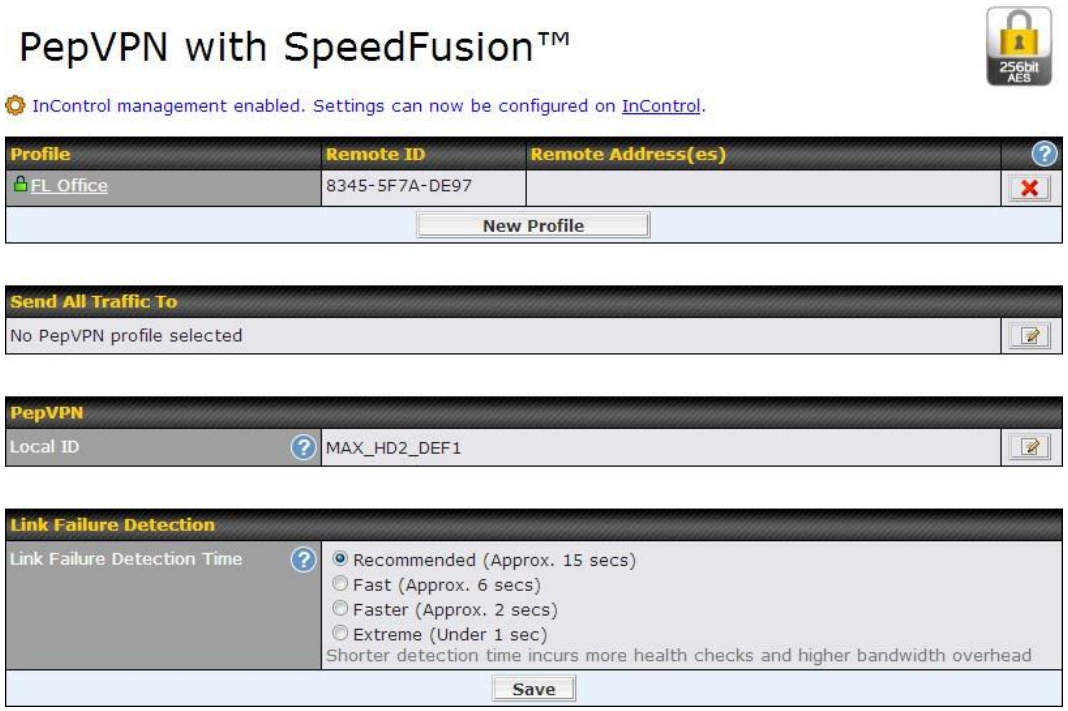
Pepwave routers can aggregate all WAN connections' bandwidth for routing SpeedFusion™ traffic. Unless all the WAN connections of one site are down, Pepwave routers can keep the VPN up and running.

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.

 Copyright @ 2016 Pepwave

13.1 PepVPN

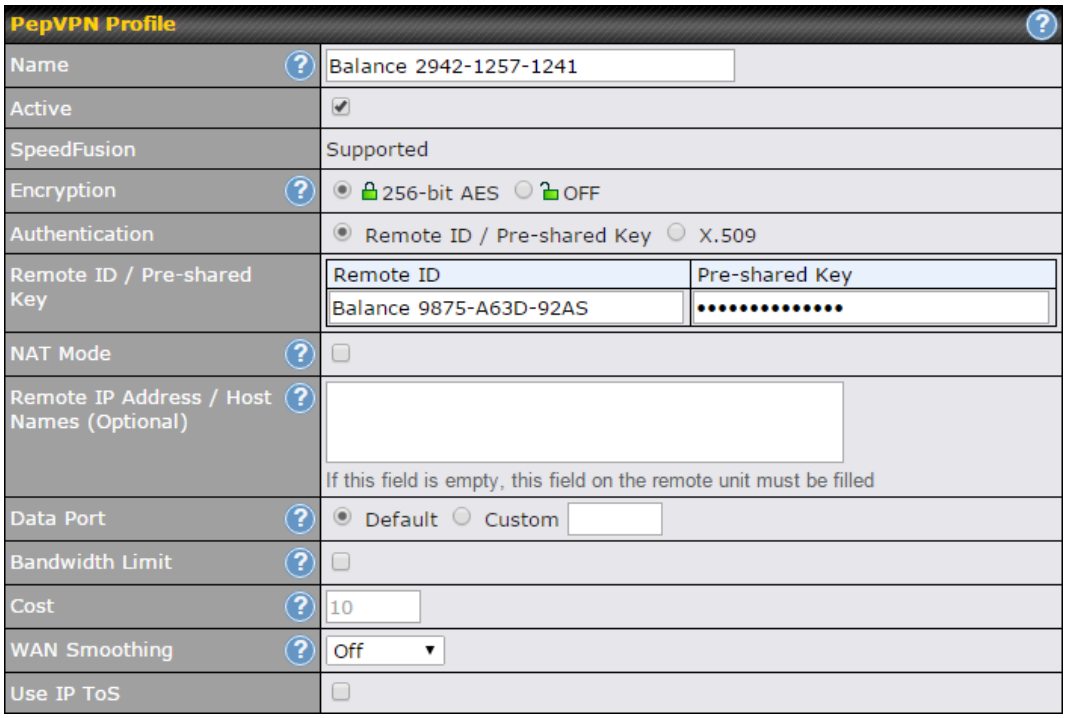
To configure PepVPN and SpeedFusion, navigate to **Advanced>SpeedFusion™** or **Advanced>PepVPN**.



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 acesss 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.

 Copyright @ 2016 Pepwave



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 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.

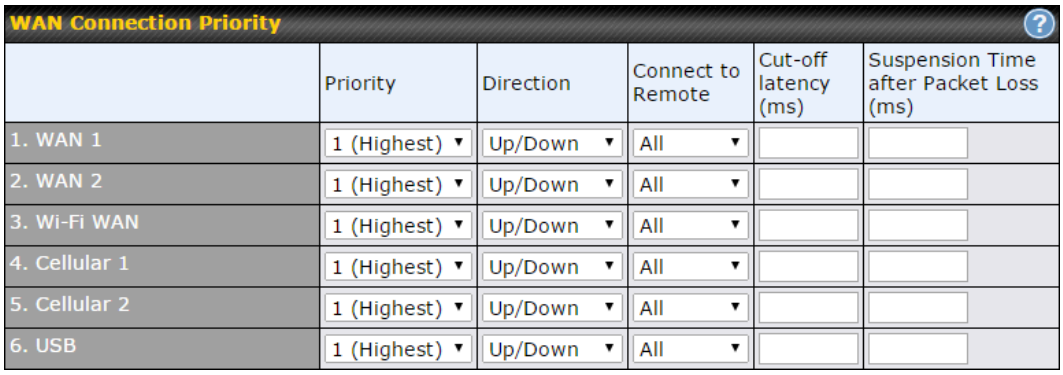
 Copyright @ 2016 Pepwave

	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.
Cost	Define path cost for this profile. OSPF will determine the best route through the network using the assigned cost. Default: 10
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.

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

 Copyright @ 2016 Pepwave



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.

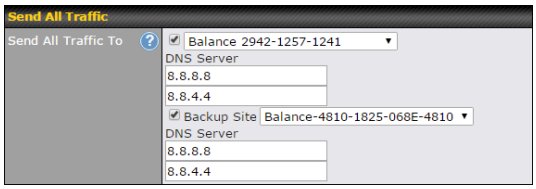
To enable asymmetric connections, connection mapping to remote WANs, cut-off latency, and packet loss suspension time, click the button.

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: Balance 2942-1257-1241

DNS Server: 8.8.8.8, 8.8.4.4

Backup Site: Balance-4810-1825-068E-4810

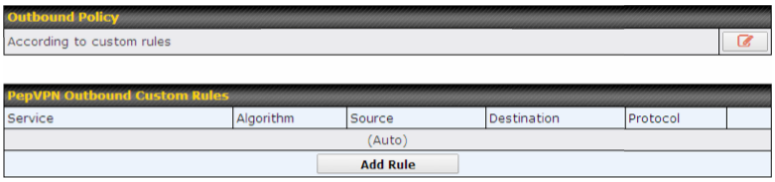
DNS Server: 8.8.8.8, 8.8.4.4

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

Outbound Policy/PepVPN Outbound Custom Rules

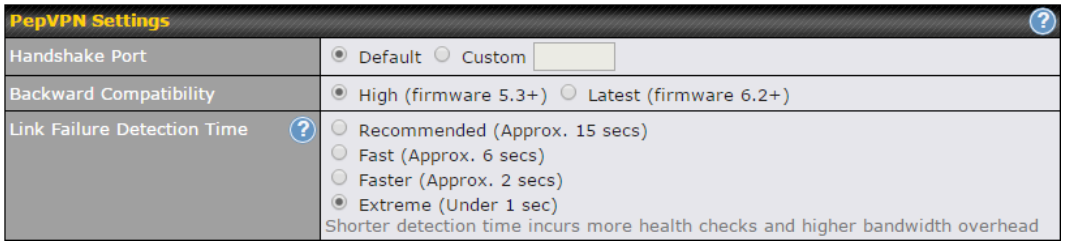
Some models allow you to set outbound policy and custom outbound rules from **Advanced>PepVPN**. See **Section 14** for more information on outbound policy settings.

 Copyright @ 2016 Pepwave



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**.



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.

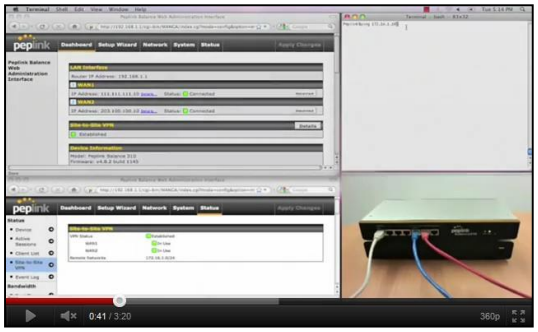
Important Note

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.

 Copyright @ 2016 Pepwave

Tip

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



http://youtu.be/TLQgdpPSY88

 Copyright @ 2016 Pepwave

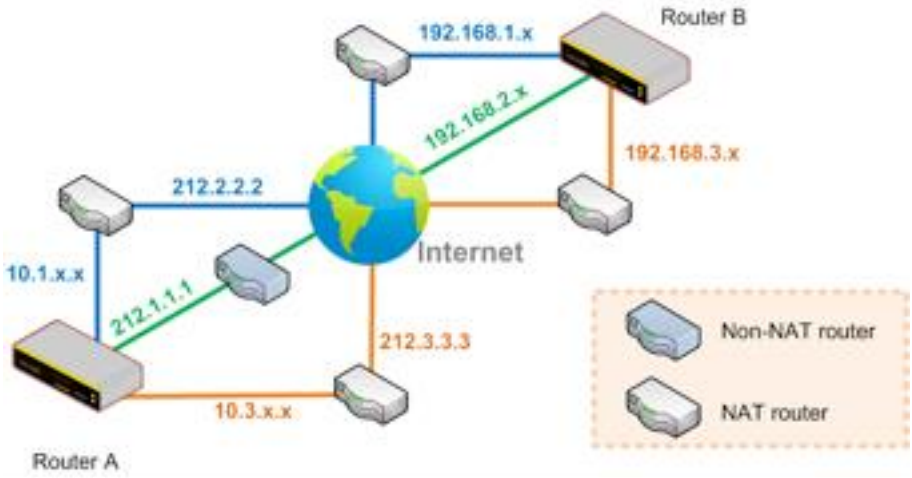
13.2 The Pepwave Router Behind a NAT Router

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.

 Copyright @ 2016 Pepwave

13.3 SpeedFusion™ Status

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

After clicking the **Status** button at the top right corner of the SpeedFusion™ table, you will be forwarded to **Status>SpeedFusion™**, where you can view subnet and WAN connection information for each VPN peer. Please refer to **Section 22.6** 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.

 Copyright @ 2016 Pepwave

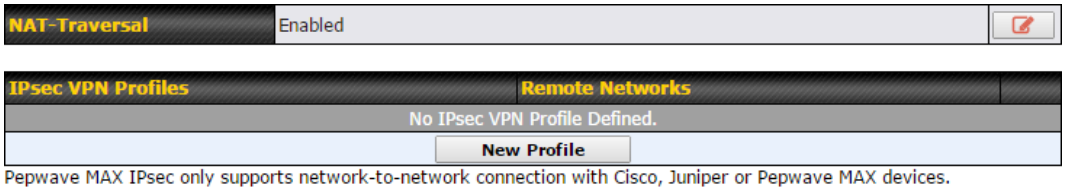
14 IPsec VPN

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.

14.1 IPsec VPN Settings

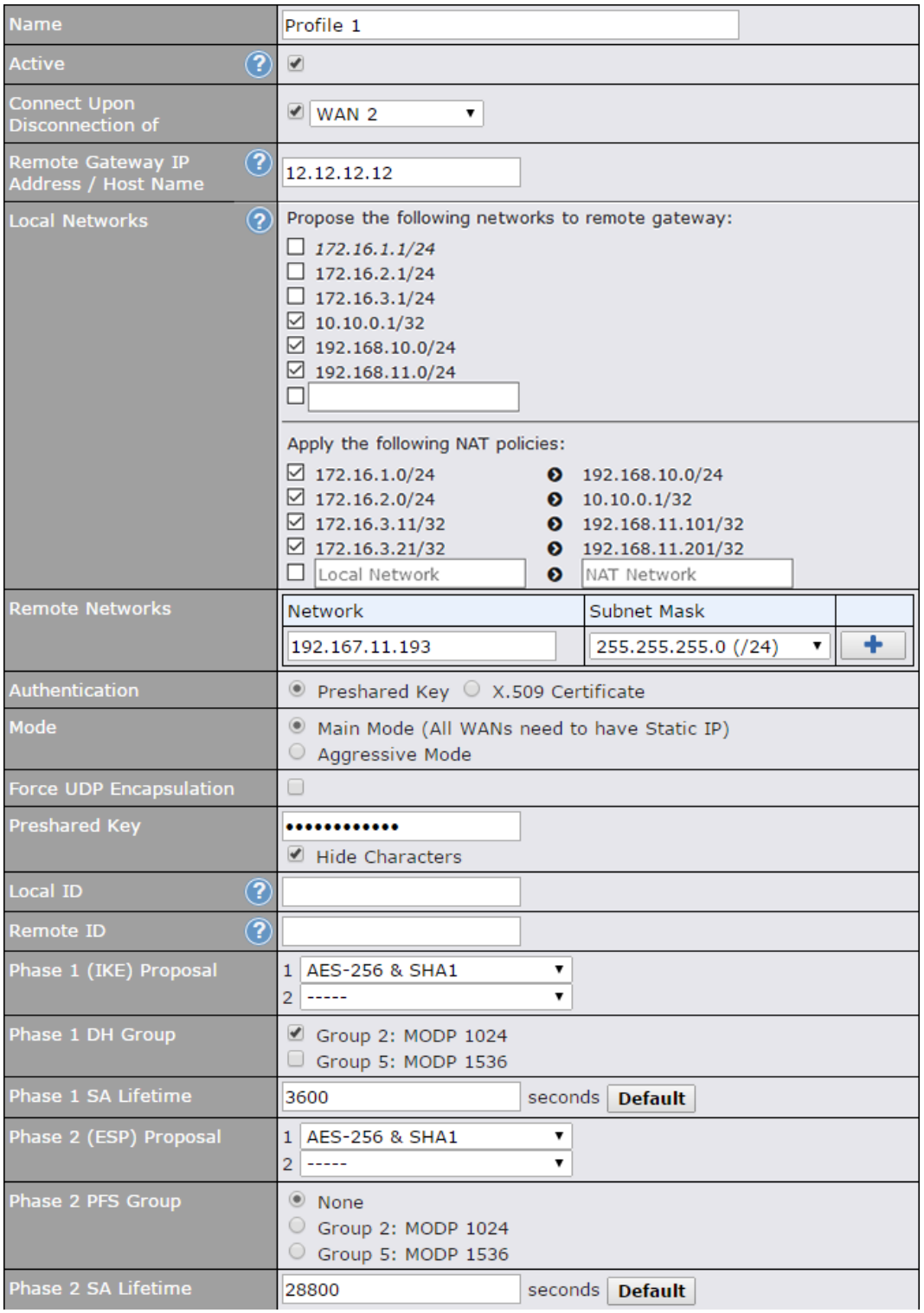
Many Pepwave products can make multiple IPsec VPN connections with Peplink, Pepwave, Cisco, and Juniper routers. Note that all LAN subnets and the subnets behind them must be unique. Otherwise, VPN members will not be able to access each other. All data can be routed over the VPN with a selection of 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.**



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.

 Copyright @ 2016 Pepwave



IPsec VPN Settings	
Name	This field is for specifying a local name to represent this connection profile.
Active	When this box is checked, this IPsec VPN connection profile will be enabled. Otherwise, it

 Copyright @ 2016 Pepwave

	will be disabled.
Connect Upon Disconnection of	Check this box and select a WAN to connect to this VPN automatically when the specified WAN is disconnected.
Remote Gateway IP Address / Host Name	Enter the remote peer's public IP address. For **Aggressive Mode**, this is optional.
Local Networks	Enter the local LAN subnets here. If you have defined static routes, they will be shown here. Using NAT, you can map a specific local network / IP address to another, and the packets received by remote gateway will appear to be coming from the mapped network / IP address. This allow you to establish IPsec connection to a remote site that has one or more subnets overlapped with local site. Two types of NAT policies can be defined: One-to-One NAT policy: if the defined subnet in Local Network and NAT Network has the same size, for example, policy "192.168.50.0/24 > 172.16.1.0/24" will translate the local IP address 192.168.50.10 to 172.16.1.10 and 192.168.50.20 to 172.16.1.20. This is a bidirectional mapping which means clients in remote site can initiate connection to the local clients using the mapped address too. Many-to-One NAT policy: if the defined NAT Network on the right hand side is an IP address (or having a network prefix /32), for example, policy "192.168.1.0/24 > 172.168.50.1/32" will translate all clients in 192.168.1.0/24 network to 172.168.50.1. This is a unidirectional mapping which means clients in remote site will not be able to initiate connection to the local clients.
Remote Networks	Enter the LAN and subnets that are located at the remote site here.
Authentication	To access your VPN, clients will need to authenticate by your choice of methods. Choose between the **Preshared Key** and **X.509 Certificate** methods of authentication.
Mode	Choose **Main Mode** if both IPsec peers use static IP addresses. Choose **Aggressive Mode** if one of the IPsec peers uses dynamic IP addresses.
Force UDP Encapsulation	For forced UDP encapsulation regardless of NAT-traversal, tick this checkbox.
Pre-shared Key	This defines the peer authentication pre-shared key used to authenticate this VPN connection. The connection will be up only if the pre-shared keys on each side match.
Remote Certificate (pem encoded)	Available only when **X.509 Certificat**e is chosen as the **Authentication** method, this field allows you to paste a valid X.509 certificate.
Local ID	In **Main Mode**, this field can be left blank. In **Aggressive Mode**, if **Remote Gateway IP Address** is filled on this end and the peer end, this field can be left blank. Otherwise, this

 Copyright @ 2016 Pepwave

	field is typically a U-FQDN.
Remote ID	In **Main Mode**, this field can be left blank. In **Aggressive Mode**, if **Remote Gateway IP Address** is filled on this end and the peer end, this field can be left blank. Otherwise, this field is typically a U-FQDN.
Phase 1 (IKE) Proposal	In **Main Mode**, this allows setting up to six encryption standards, in descending order of priority, to be used in initial connection key negotiations. In **Aggressive Mode**, only one selection is permitted.
Phase 1 DH Group	This is the Diffie-Hellman group used within IKE. This allows two parties to establish a shared secret over an insecure communications channel. The larger the group number, the higher the security. **Group 2**: **1024-bit** is the default value. **Group 5**: **1536-bit** is the alternative option.
Phase 1 SA Lifetime	This setting specifies the lifetime limit of this Phase 1 Security Association. By default, it is set at **3600** seconds.
Phase 2 (ESP) Proposal	In **Main Mode**, this allows setting up to six encryption standards, in descending order of priority, to be used for the IP data that is being transferred. In **Aggressive Mode**, only one selection is permitted.
Phase 2 PFS Group	Perfect forward secrecy (PFS) ensures that if a key was compromised, the attacker will be able to access only the data protected by that key. **None** - Do not request for PFS when initiating connection. However, since there is no valid reason to refuse PFS, the system will allow the connection to use PFS if requested by the remote peer. This is the default value. **Group 2**: 1024-bit Diffie-Hellman group. The larger the group number, the higher the security. **Group 5**: **1536-bit** is the third option.
Phase 2 SA Lifetime	This setting specifies the lifetime limit of this Phase 2 Security Association. By default, it is set at **28800** seconds.

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

 Copyright @ 2016 Pepwave

15 Outbound Policy Management

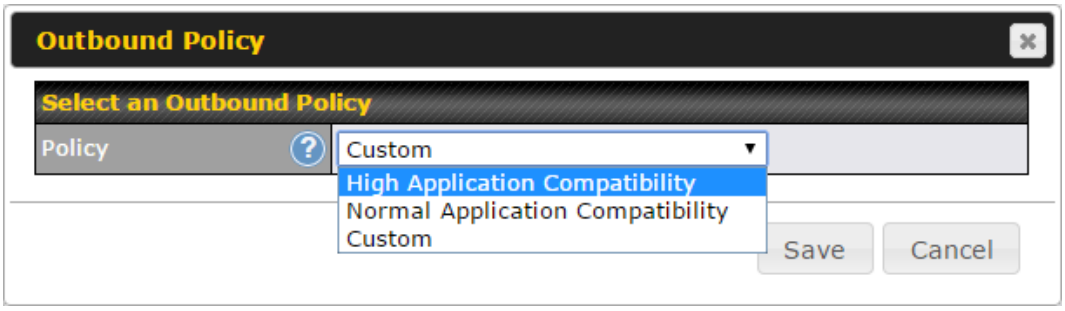
Pepwave routers can flexibly manage and load balance outbound traffic among WAN connections.

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

The settings for managing and load balancing outbound traffic are located at **Advanced>Outbound Policy** or **Advanced>PepVPN**, depending on the model.

15.1 Outbound Policy

Outbound policies for managing and load balancing outbound traffic are located at **Network>Outbound Policy>** or **Advanced>PepVPN>Outbound Policy.**



There are three main selections for the outbound traffic policy:

- High Application Compatibility
- Normal Application Compatibility
- Custom

Note that some Pepwave routers provide only the **Send All Traffic To** setting here. See **Section 12.1** for details.

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

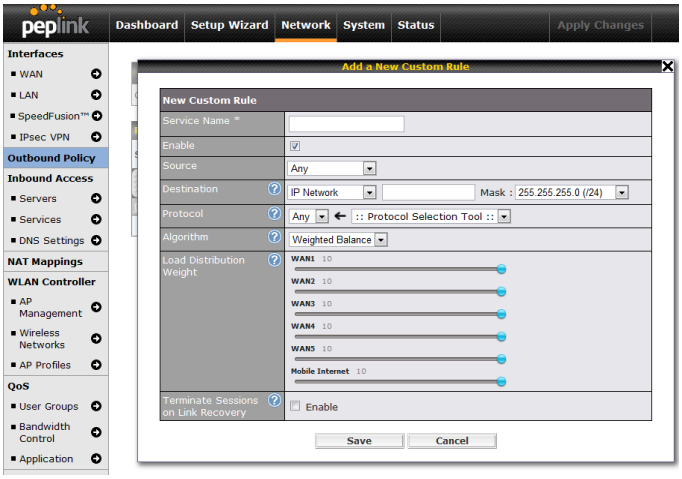
 Copyright @ 2016 Pepwave

Application Compatibility	highest application compatibility.
Normal Application Compatibility	Outbound traffic from a source LAN device to the same destination Internet IP address will be routed through the same WAN connection persistently, regardless of protocol. This option provides high compatibility to most applications, and users still benefit from WAN link load balancing when multiple Internet servers are accessed.
Custom	Outbound traffic behavior can be managed by defining rules in a custom rule table. A default rule can be defined for connections that cannot be matched with any of the rules.

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

Tip

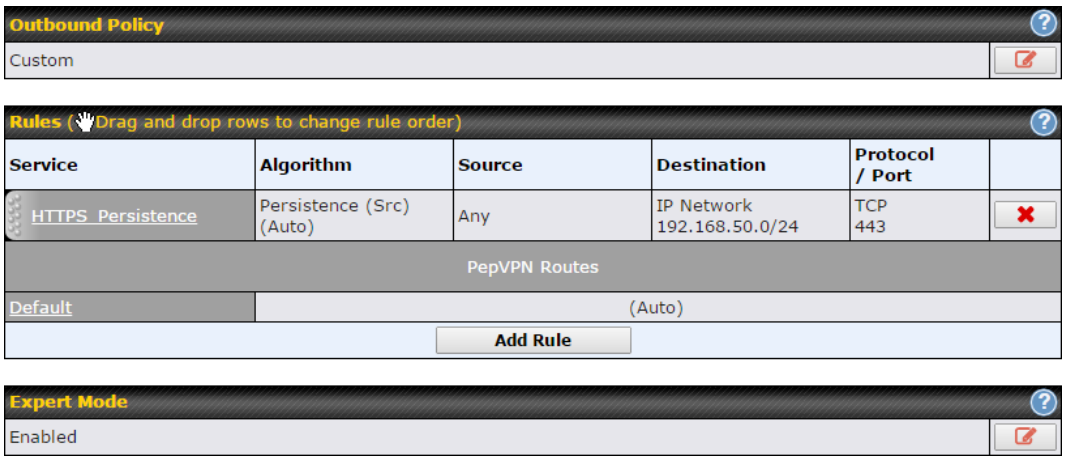
Want to know more about creating outbound rules? Visit our YouTube Channel for a video tutorial!



http://youtu.be/rKH4AS_bQnE

15.2 Custom Rules for Outbound Policy

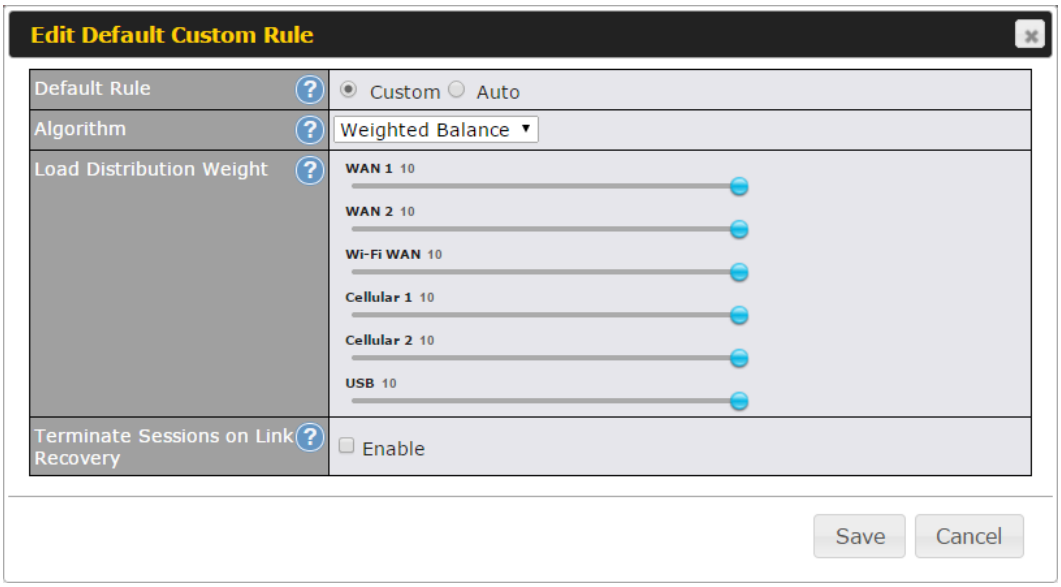
Click in the **Outbound Policy** form. Choose **Custom** and press the **Save** button.



 Copyright @ 2016 Pepwave

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

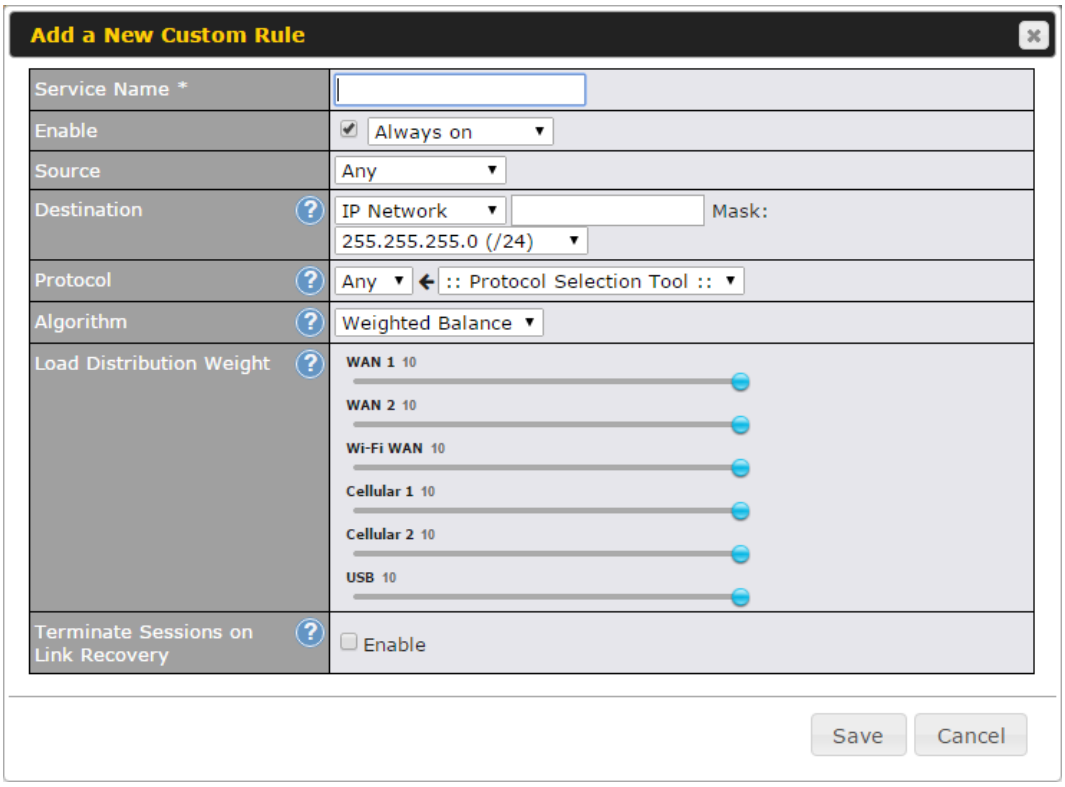
To rearrange the priority of outbound rules, drag and drop them into the desired sequence.

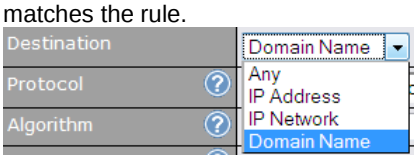


By default, **Auto** is selected as the **Default Rule**. You can select **Custom** to change the algorithm to be used. Please refer to the upcoming sections for the details on the available algorithms.

To create a custom rule, click **Add Rule** at the bottom of the table. Note that some Pepwave routers display this button at **Advanced>PepVPN>PepVPN Outbound Custom Rules**.

 Copyright @ 2016 Pepwave



New Custom Rule Settings	
Service Name	This setting specifies the name of the outbound traffic rule.
Enable	This setting specifies whether the outbound traffic rule takes effect. When **Enable** is checked, the rule takes effect: traffic is matched and actions are taken by the Pepwave router based on the other parameters of the rule. When **Enable** is unchecked, the rule does not take effect: the Pepwave router disregards the other parameters of the rule. Click the drop-down menu next to the checkbox to apply a time schedule to this custom rule.
Source	This setting specifies the source IP address, IP network, or MAC address for traffic that matches the rule.
Destination	This setting specifies the destination IP address, IP network, or domain name for traffic that matches the rule.  If **Domain Name** is chosen and a domain name, such as *foobar.com*, is entered, any outgoing accesses to *foobar.com* and **.foobar.com* will match this criterion. You may enter a wildcard (.*) at the end of a domain name to match any host with a name having the domain name in the middle. If you enter *foobar.*,* for example, *www.foobar.com*, *www.foobar.co.jp*, or *foobar.co.uk* will also match. Placing wildcards in any other position is not supported. NOTE: if a server has one Internet IP address and multiple server names, and if one of the names is defined here, accesses to any one of the server names will also match this rule.

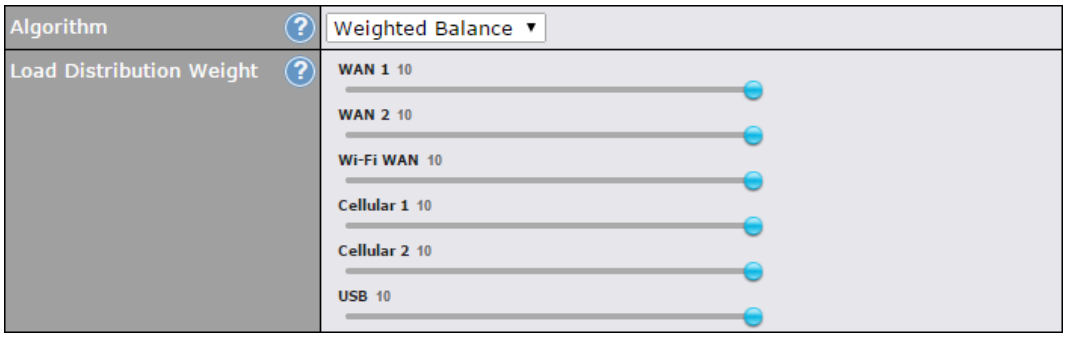
 Copyright @ 2016 Pepwave

Protocol and Port	This setting specifies the IP protocol and port of traffic that matches this rule.
Algorithm	This setting specifies the behavior of the Pepwave router for the custom rule. One of the following values can be selected (note that some Pepwave routers provide only some of these options): • Weighted Balance • Persistence • Enforced • Priority • Overflow • Least Used • Lowest Latency The upcoming sections detail the listed algorithms.
Terminate Sessions on Link Recovery	This setting specifies whether to terminate existing IP sessions on a less preferred WAN connection in the event that a more preferred WAN connection is recovered. This setting is applicable to the **Weighted, Persistence**, and **Priority** algorithms. By default, this setting is disabled. In this case, existing IP sessions will not be terminated or affected when any other WAN connection is recovered. When this setting is enabled, existing IP sessions may be terminated when another WAN connection is recovered, such that only the preferred healthy WAN connection(s) is used at any point in time.

 Copyright @ 2016 Pepwave

15.2.1 Algorithm: Weighted Balance

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



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

For example, with the following weight settings:

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

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

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

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

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

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

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

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

 Copyright @ 2016 Pepwave

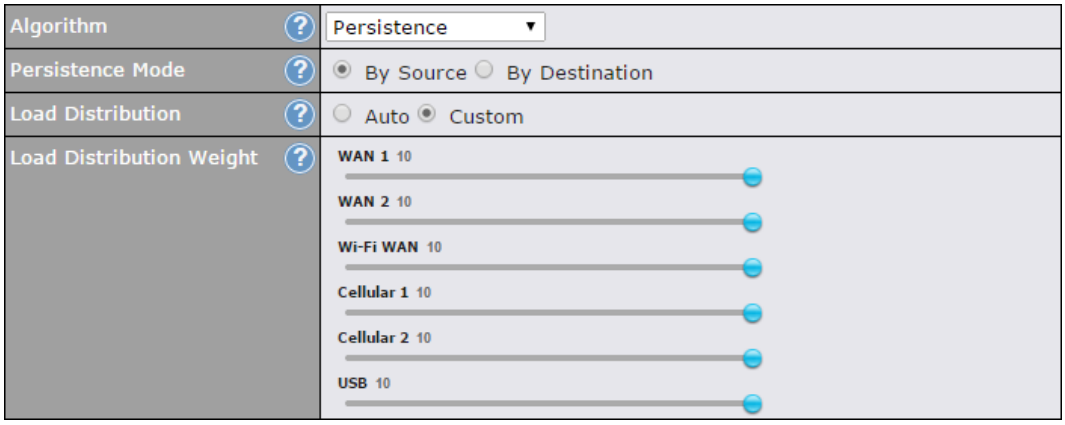
15.2.2 Algorithm: Persistence

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

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

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

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



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

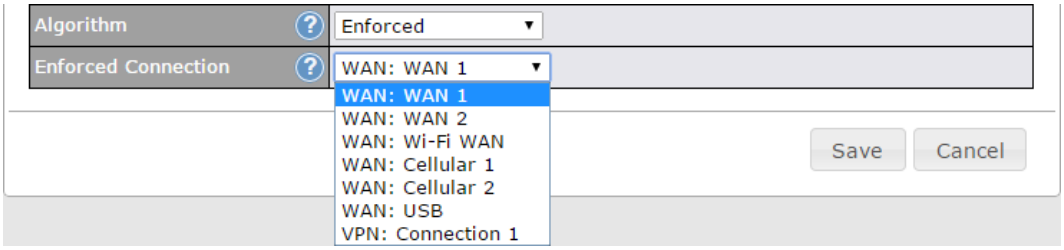
By Source:	The same WAN connection will be used for traffic matching the rule and originating from the same machine, regardless of its destination. This option will provide the highest level of application compatibility.
By Destination:	The same WAN connection will be used for traffic matching the rule,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

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

 Copyright @ 2016 Pepwave

15.2.3 Algorithm: Enforced

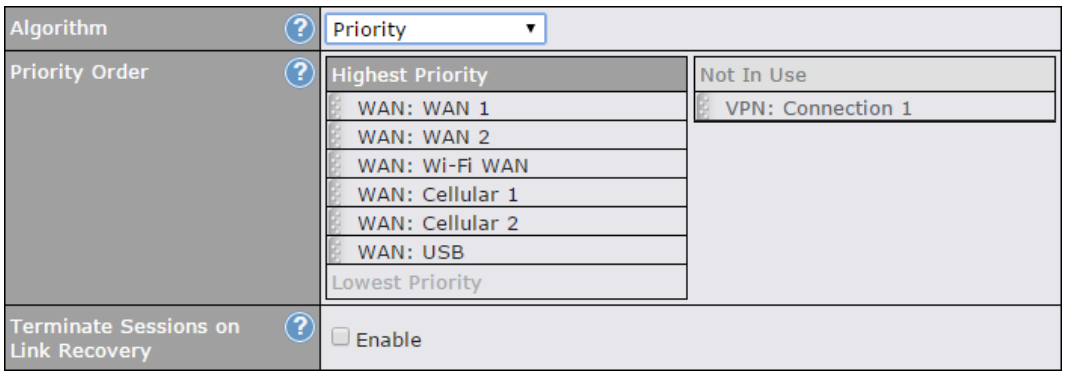
This setting specifies the WAN connection usage to be applied on the specified IP protocol and port. This setting is applicable only when **Algorithm** is set to **Enforced**.



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

15.2.4 Algorithm: Priority

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



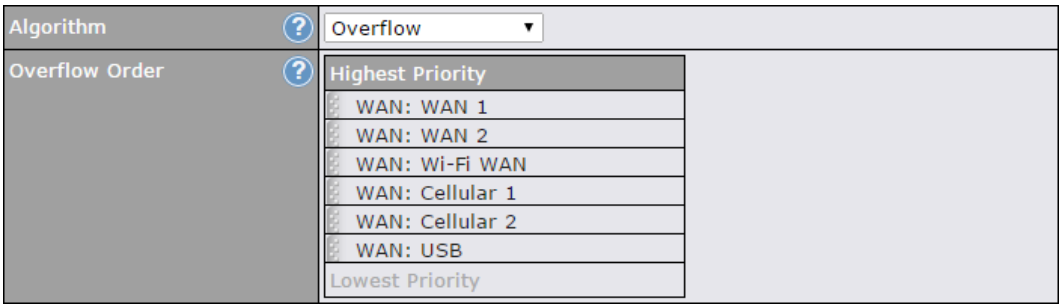
Starting from Firmware 5.2, outbound traffic can be prioritized to go through SpeedFusion™ connection(s). By default, VPN connections are not included in the priority list.

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

15.2.5 Algorithm: Overflow

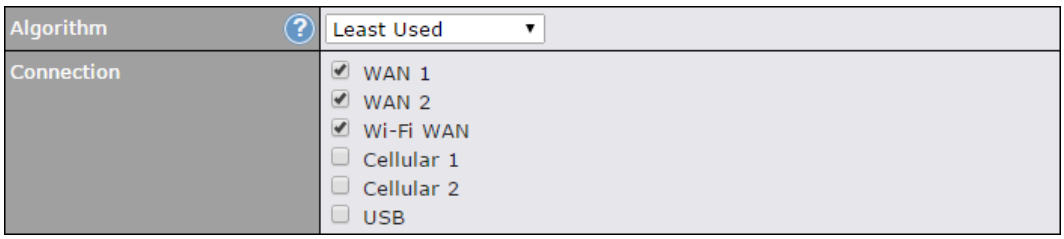
The traffic matching this rule will be routed through the healthy WAN connection that has the highest priority and is not in full load. When this connection gets saturated, new sessions will be routed to the next healthy WAN connection that is not in full load.

 Copyright @ 2016 Pepwave



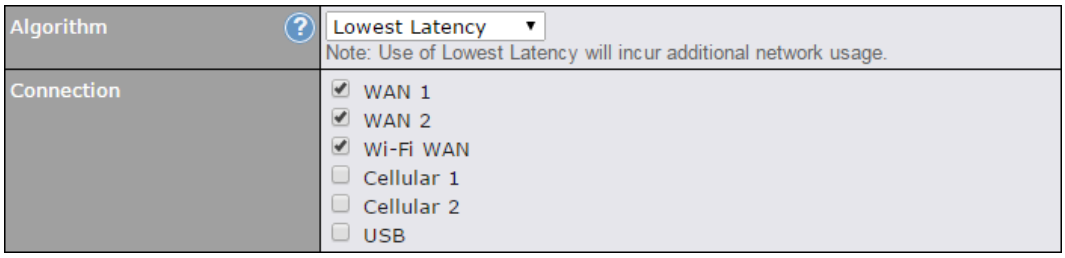
Drag and drop to specify the order of WAN connections to be used for routing traffic. Only the highest priority healthy connection that is not in full load will be used.

15.2.6 Algorithm: Least Used



The traffic matching this rule will be routed through the healthy WAN connection that is selected in **Connection** and has the most available download bandwidth. The available download bandwidth of a WAN connection is calculated from the total download bandwidth specified on the WAN settings page and the current download usage. The available bandwidth and WAN selection is determined every time an IP session is made.

15.2.7 Algorithm: Lowest Latency



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

Tip

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

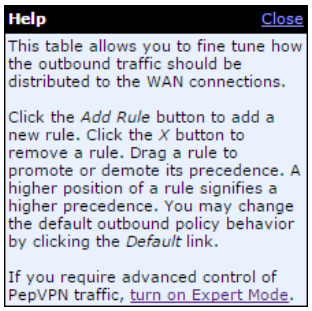
- All WAN connections are symmetric; or

 Copyright @ 2016 Pepwave

- A latency sensitive application must be routed through the lowest latency WAN, regardless of the WAN's available bandwidth.

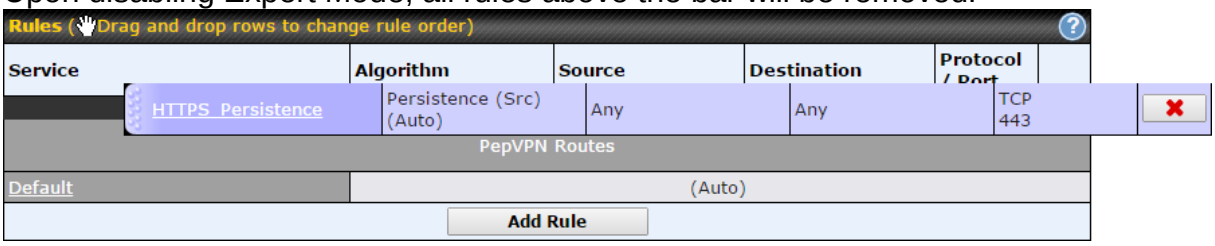
15.2.8 Expert Mode

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



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

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

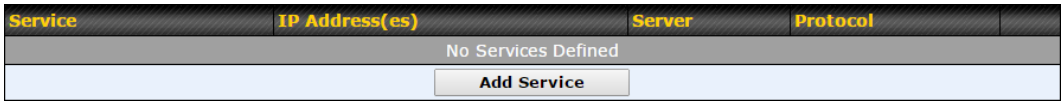


 Copyright @ 2016 Pepwave

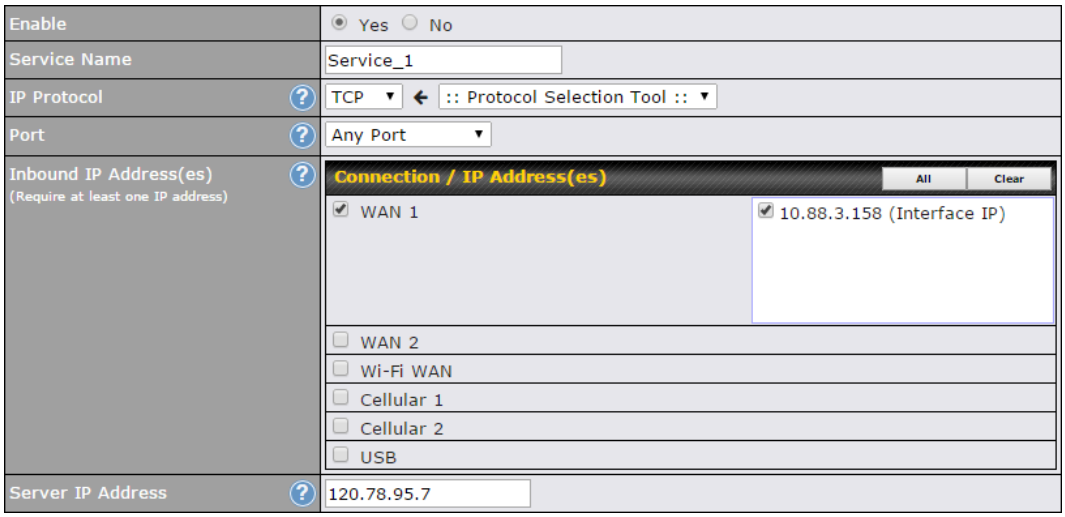
16 Inbound Access

16.1 Port Forwarding Service

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

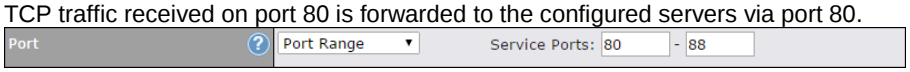
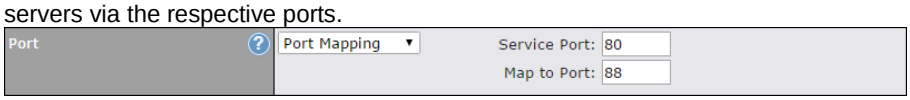
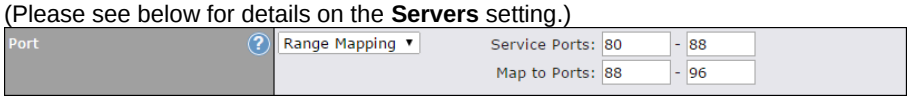


To define a new service, click **Add Service**.



Port Forwarding Settings	
Enable	This setting specifies whether the inbound service takes effect. When **Enable** is checked, the inbound service takes effect: traffic is matched and actions are taken by the Pepwave router based on the other parameters of the rule. When this setting is disabled, the inbound service does not take effect: the Pepwave router disregards the other parameters of the rule.
Service Name	This setting identifies the service to the system administrator. Valid values for this setting consist of only alphanumeric and underscore "_" characters.
IP Protocol	The **IP Protocol** setting, along with the **Port** setting, specifies the protocol of the service as TCP, UDP, ICMP, or IP. Traffic that is received by the Pepwave router via the specified protocol at the specified port(s) is forwarded to the LAN hosts specified by the **Servers** setting. Please see below for details on the **Port** and **Servers** settings. Alternatively, the **Protocol Selection Tool** drop-down menu can be used to automatically fill in the protocol and a single port number of common Internet services (e.g. HTTP, HTTPS, etc.). After selecting an item from the **Protocol Selection Tool** drop-down menu, the protocol and port number remain manually modifiable.

 Copyright @ 2016 Pepwave

Port	The **Port** setting specifies the port(s) that correspond to the service, and can be configured to behave in one of the following manners: **Any Port**, **Single Port**, **Port Range**, **Port Map**, and **Range Mapping** **Any Port**: all traffic that is received by the Pepwave router via the specified protocol is forwarded to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Any Port**, all TCP traffic is forwarded to the configured servers. **Single Port**: traffic that is received by the Pepwave router via the specified protocol at the specified port is forwarded via the same port to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Single Port** and **Service Port** 80, TCP traffic received on port 80 is forwarded to the configured servers via port 80.  **Port Range**: traffic that is received by the Pepwave router via the specified protocol at the specified port range is forwarded via the same respective ports to the LAN hosts specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Port Range** and **Service Ports** 80-88, TCP traffic received on ports 80 through 88 is forwarded to the configured servers via the respective ports.  **Port Mapping**: traffic that is received by Pepwave router via the specified protocol at the specified port is forwarded via a different port to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Port Mapping**, **Service Port** 80, and **Map to Port** 88, TCP traffic on port 80 is forwarded to the configured servers via port 88. (Please see below for details on the **Servers** setting.)  **Range Mapping**: traffic that is received by the Pepwave router via the specified protocol at the specified port range is forwarded via a different port to the servers specified by the **Servers** setting.
Inbound IP Address(es)	This setting specifies the WAN connections and Internet IP address(es) from which the service can be accessed.
Server IP Address	This setting specifies the LAN IP address of the server that handles the requests for the service.

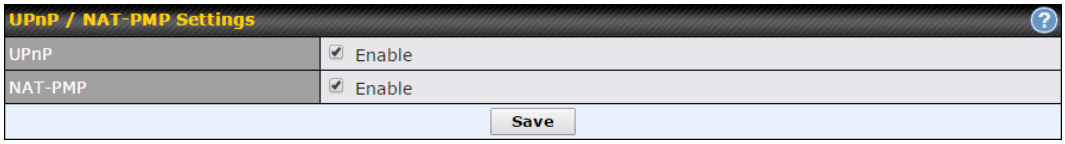
 Copyright @ 2016 Pepwave

16.1.1 UPnP / NAT-PMP Settings

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

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

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

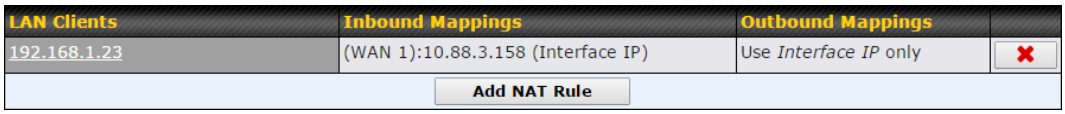


When the options are enabled, a table listing all the forwarded ports under these two protocols can be found at **Status>UPnP / NAT-PMP**.

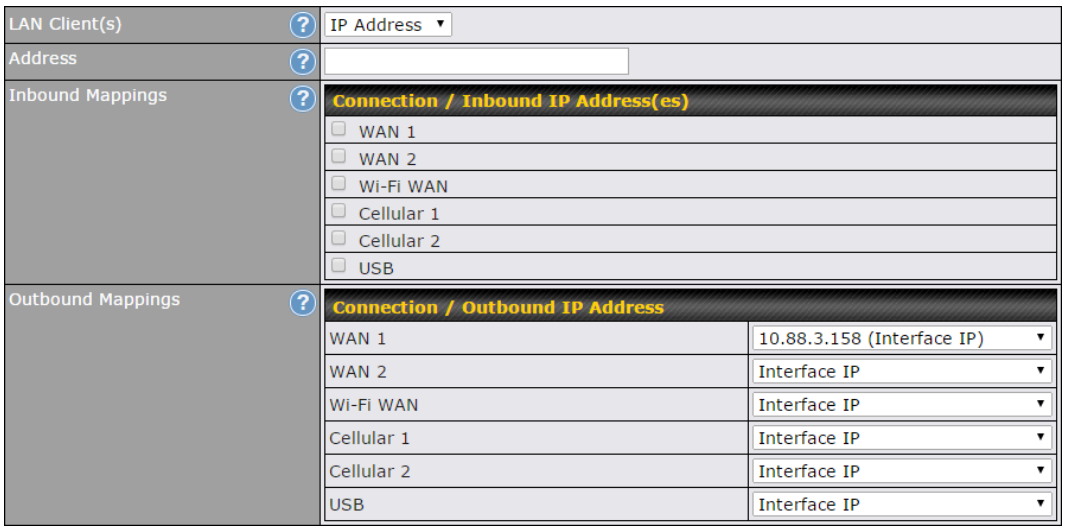
 Copyright @ 2016 Pepwave

17 NAT Mappings

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



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



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

 Copyright @ 2016 Pepwave

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

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

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

 Copyright @ 2016 Pepwave

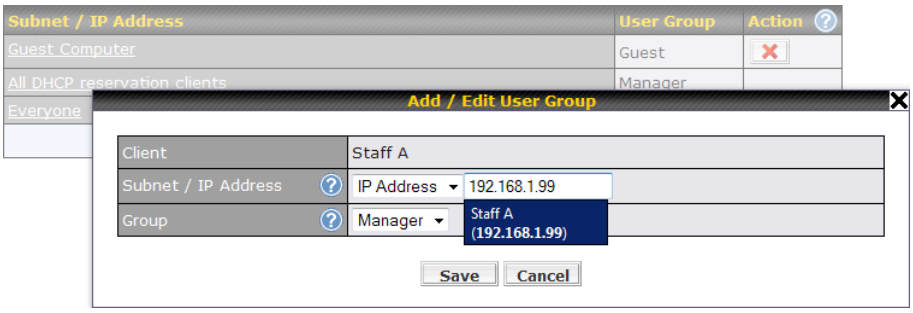
18 QoS

18.1 User Groups

LAN and PPTP clients can be categorized into three user groups: **Manager, Staff, and Guest**. This menu allows you to define rules and assign client IP addresses or subnets to a user group. You can apply different bandwidth and traffic prioritization policies on each user group in the **Bandwidth Control** and **Application** sections (note that the options available here vary by model).

The table is automatically sorted by rule precedence. The smaller and more specific subnets are put towards the top of the table and have higher precedence; larger and less specific subnets are placed towards the bottom.

Click the **Add** button to define clients and their user group. Click the button to remove the defined rule. Two default rules are pre-defined and put at the bottom. They are **All DHCP reservation clients** and **Everyone**, and they cannot be removed. The **All DHCP reservation client represents** the LAN clients defined in the DHCP Reservation table on the LAN settings page. **Everyone** represents all clients that are not defined in any rule above. Click on a rule to change its group.



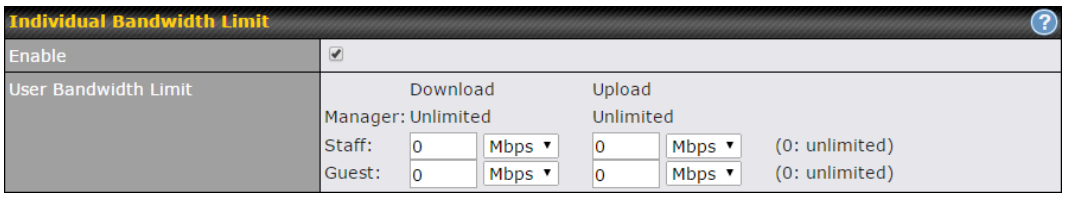
Add / Edit User Group	
Subnet / IP Address	From the drop-down menu, choose whether you are going to define the client(s) by an **IP Address** or a **Subnet**. If **IP Address** is selected, enter a name defined in DHCP reservation table or a LAN client's IP address. If **Subnet** is selected, enter a subnet address and specify its subnet mask.
Group	This field is to define which **User Group** the specified subnet / IP address belongs to.

Once users have been assigned to a user group, their internet traffic will be restricted by rules defined for that particular group. Please refer to the following two sections for details.

 Copyright @ 2016 Pepwave

18.2 Bandwidth Control

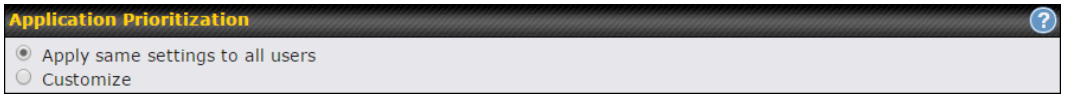
You can define a maximum download speed (over all WAN connections) and upload speed (for each WAN connection) that each individual Staff and Guest member can consume. No limit can be imposed on individual Manager members. By default, download and upload bandwidth limits are set to unlimited (set as **0**).



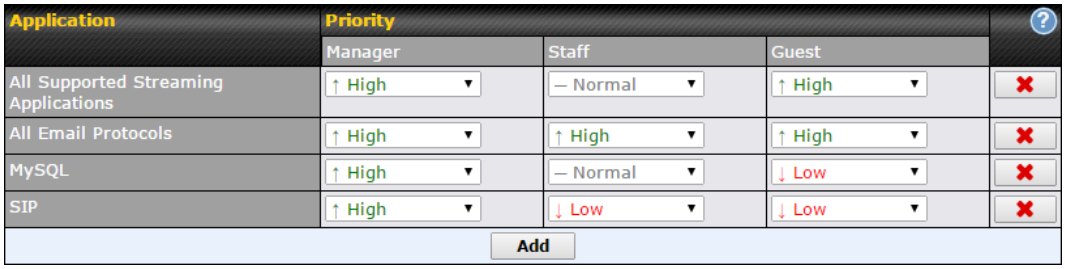
18.3 Application

18.3.1 Application Prioritization

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



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

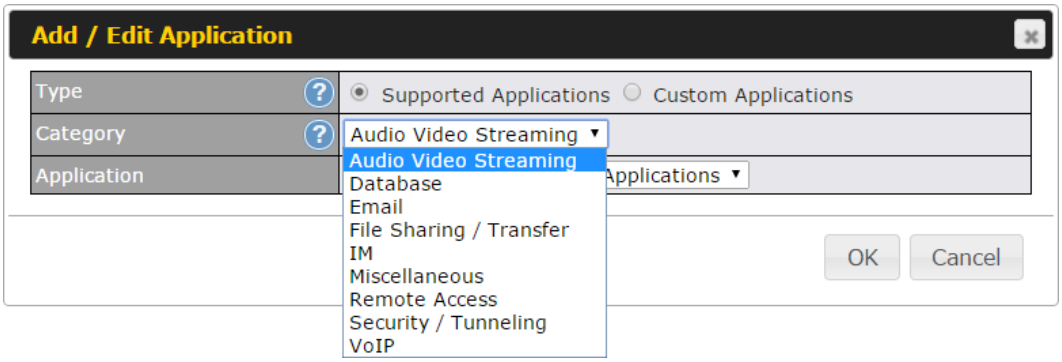


 Copyright @ 2016 Pepwave

18.3.2 Prioritization for Custom Applications

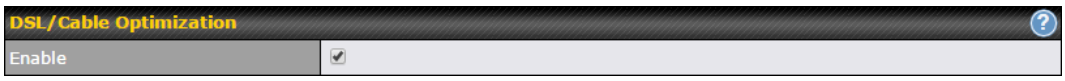
Click the **Add** button to define a custom application. Click the button ✖ in the **Action** column to delete the custom application in the corresponding row.

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



18.3.3 DSL/Cable Optimization

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



 Copyright @ 2016 Pepwave

19 Firewall

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

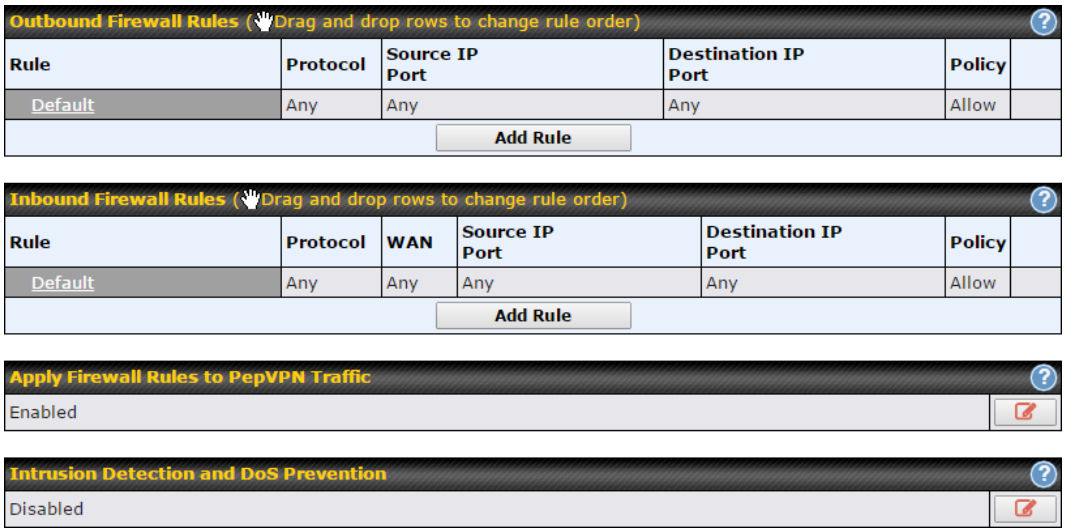
The firewall functionality of Pepwave routers supports the selective filtering of data traffic in both directions:

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

The firewall also supports the following functionality:

- Intrusion detection and DoS prevention
- Web blocking

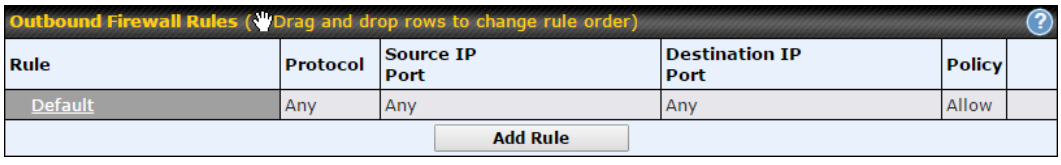
With SpeedFusion™ enabled, the firewall rules also apply to VPN tunneled traffic.



19.1 Outbound and Inbound Firewall Rules

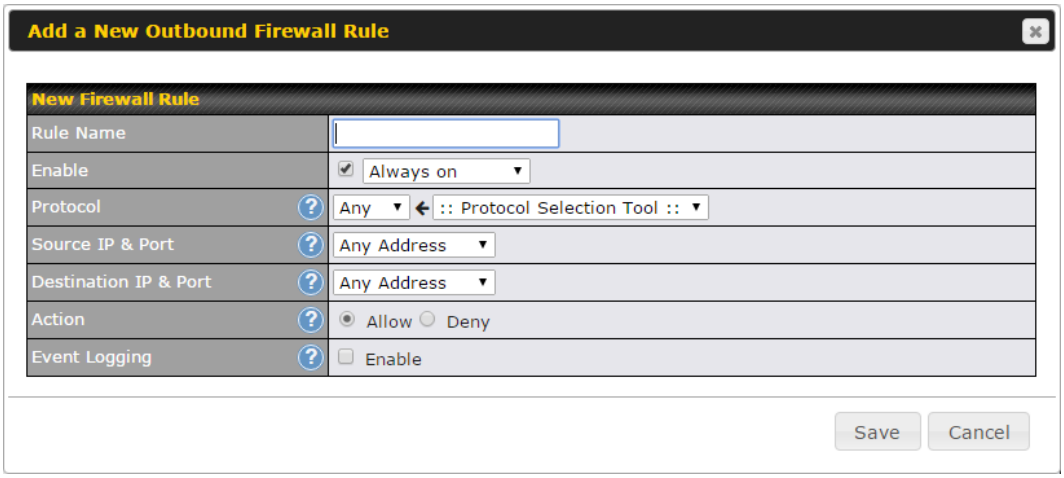
19.1.1 Access Rules

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



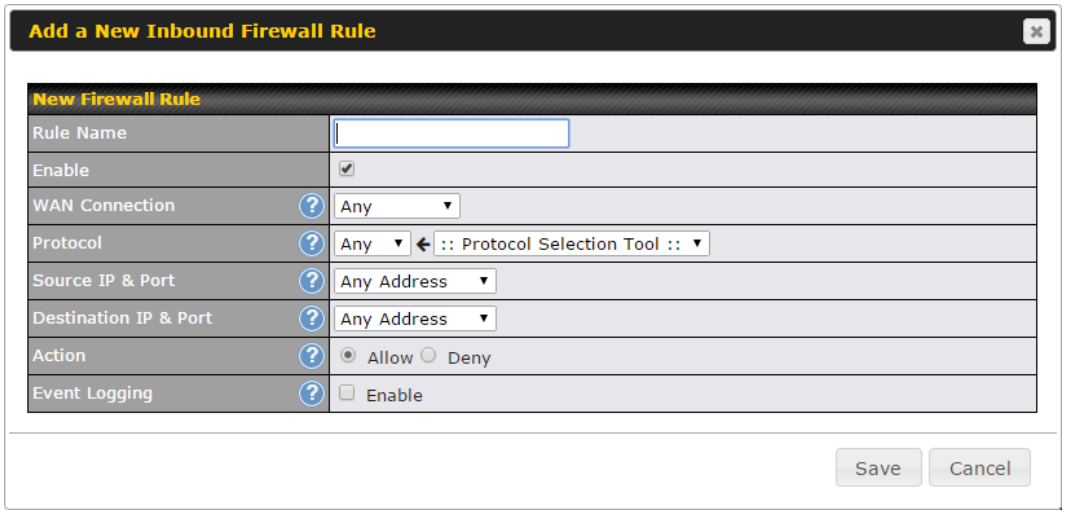
 Copyright @ 2016 Pepwave

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



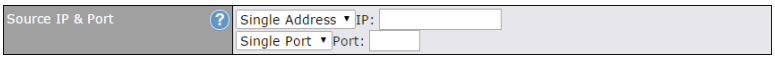
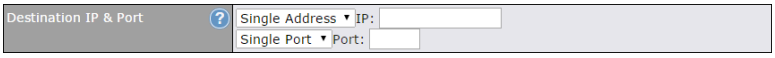
Inbound firewall settings are located at **Advanced>Firewall>Access Rules>Inbound Firewall Rules.**

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



Rules are matched from top to bottom. If a connection matches any one of the upper rules, the matching process will stop. If none of the rules match, the **Default** rule will be applied. By default, the **Default** rule is set as **Allow** for both outbound and inbound access.

 Copyright @ 2016 Pepwave

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

 Copyright @ 2016 Pepwave

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

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

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

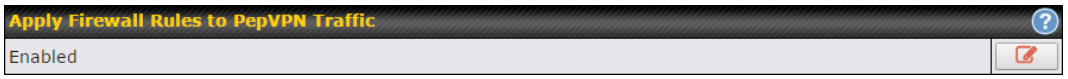
- Hold the left mouse button on the rule.
- Move it to the desired position.
- Drop it by releasing the mouse button.

Tip

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

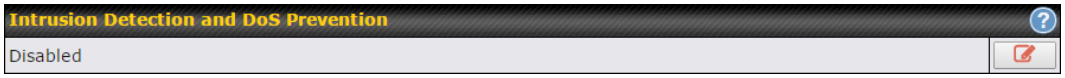
 Copyright @ 2016 Pepwave

19.1.2 Apply Firewall Rules to PepVpn Traffic



When this option is enabled, Outbound Firewall Rules will be applied to PepVPN traffic. To turn on this feature, click , check the **Enable** check box, and press the **Save** button.

19.1.3 Intrusion Detection and DoS Prevention



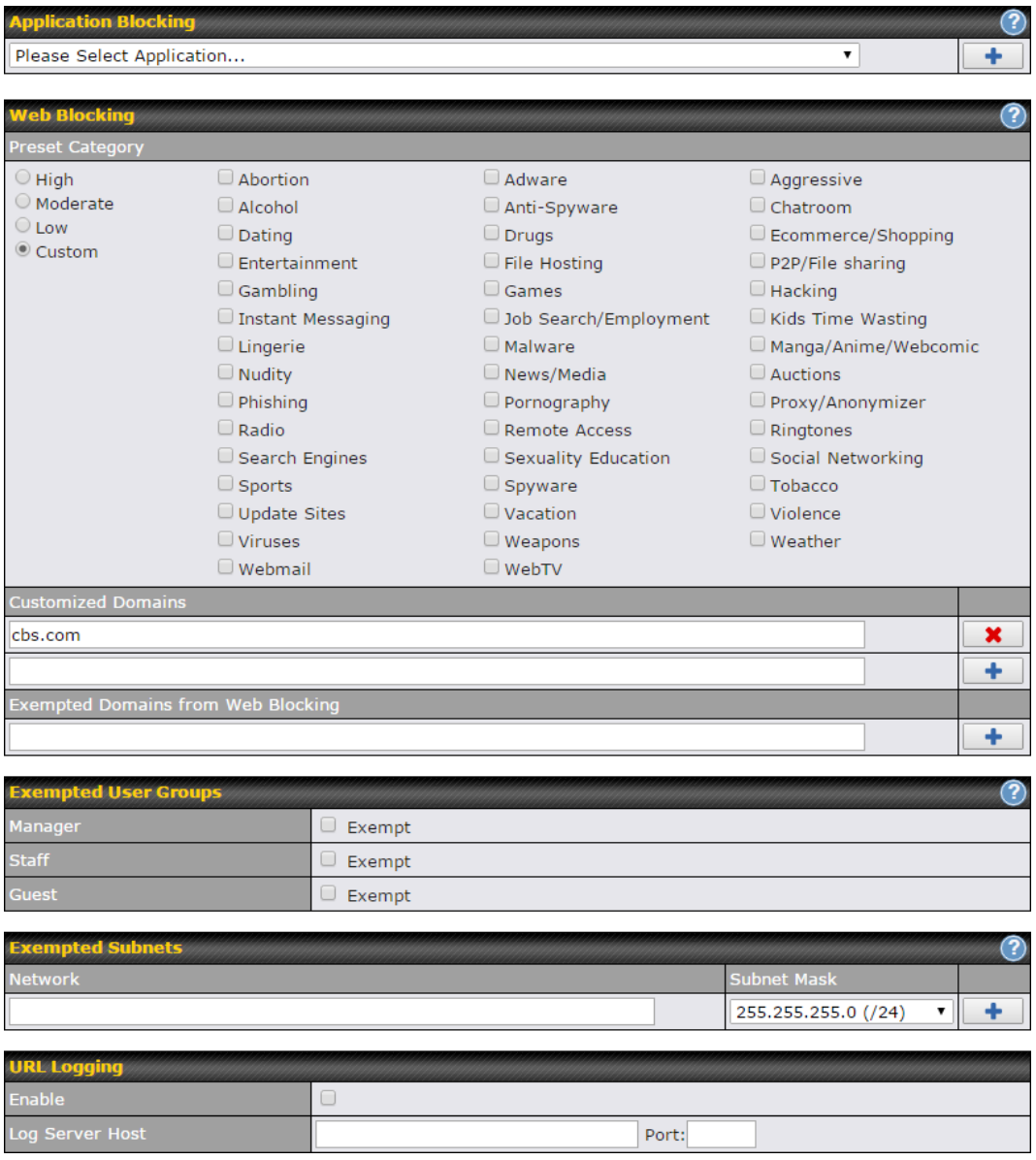
Pepwave routers can detect and prevent intrusions and denial-of-service (DoS) attacks from the Internet. To turn on this feature, click , check the **Enable** check box, and press the **Save** button.

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

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

 Copyright @ 2016 Pepwave

19.2 Content Blocking



19.2.1 Application Blocking

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

19.2.2 Web Blocking

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

 Copyright @ 2016 Pepwave

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

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

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

19.2.3 Customized Domains

Enter an appropriate website address, and the Peplink Balance will block and disallow LAN/PPTP/SpeedFusionTM peer clients to access these websites. Exceptions can be added using the instructions in Sections 20.1.3.2 and 20.1.3.3.
You may enter the wild card ".*" at the end of a domain name to block any web site with a host name having the domain name in the middle. For example, If you enter "foobar.*," then "www.foobar.com," "www.foobar.co.jp," or "foobar.co.uk" will be blocked. Placing the wild card in any other position is not supported.
The Peplink Balance will inspect and look for blocked domain names on all HTTP traffic. Secure web (HTTPS) traffic is not supported.

19.2.4 Exempted User Groups

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

19.2.5 Exempted Subnets

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

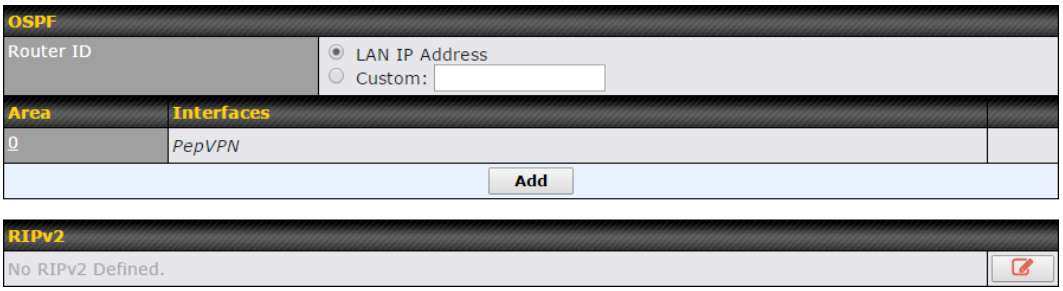
19.2.6 URL Logging

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

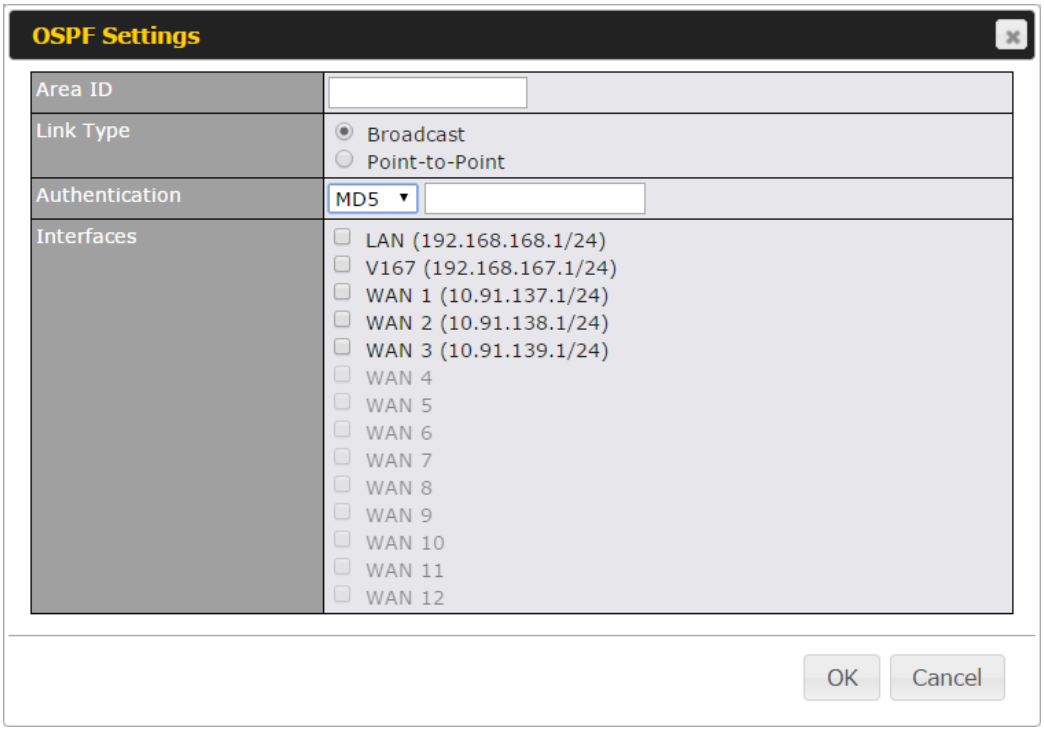
19.3 OSPF & RIPv2

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

 Copyright @ 2016 Pepwave



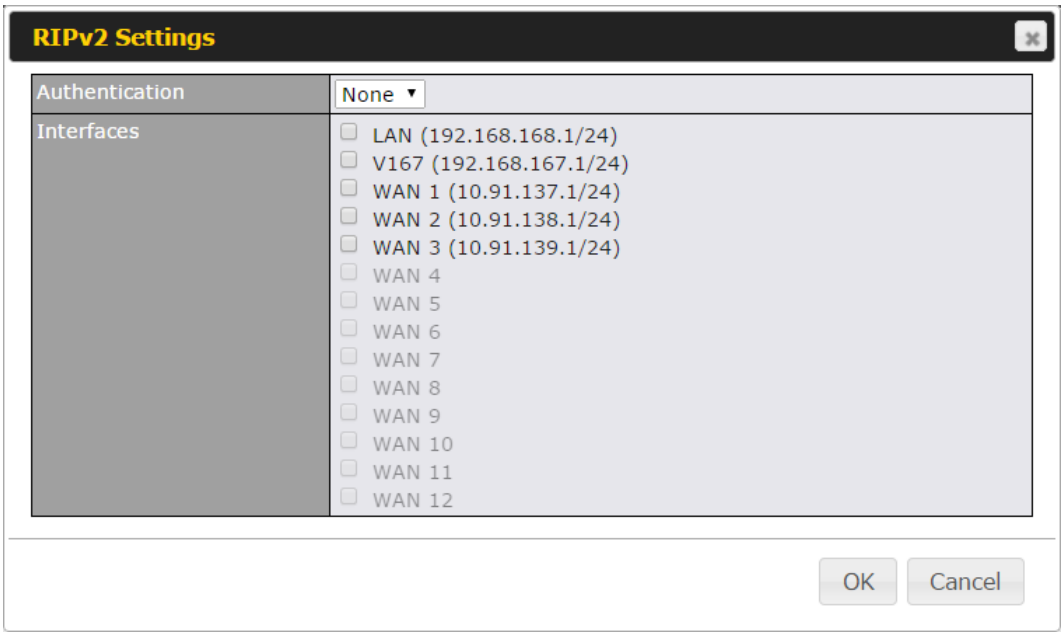
OSPF	
Router ID	This field determines the ID of the router. By default, this is specified as the LAN IP address. If you want to specify your own ID, enter it in the **Custom** field.
Area	This is an overview of the OSPFv2 areas you have defined. Click on the area name to configure it. To set a new area, click **Add**. To delete an existing area, click .



OSPF Settings	
Area ID	Determine the name of your **Area ID** to apply to this group. Machines linked to this group will send and receive related OSPF packets, while unlinked machines will ignore it.
Link Type	Choose the network type that this area will use.
Authentication	Choose an authentication method, if one is used, from this drop-down menu. Available options are **MD5** and **Text**. Enter the authentication key next to the drop-down menu.
Interfaces	Determine which interfaces this area will use to listen to and deliver OSPF packets

 Copyright @ 2016 Pepwave

To access RIPv2 settings, click .

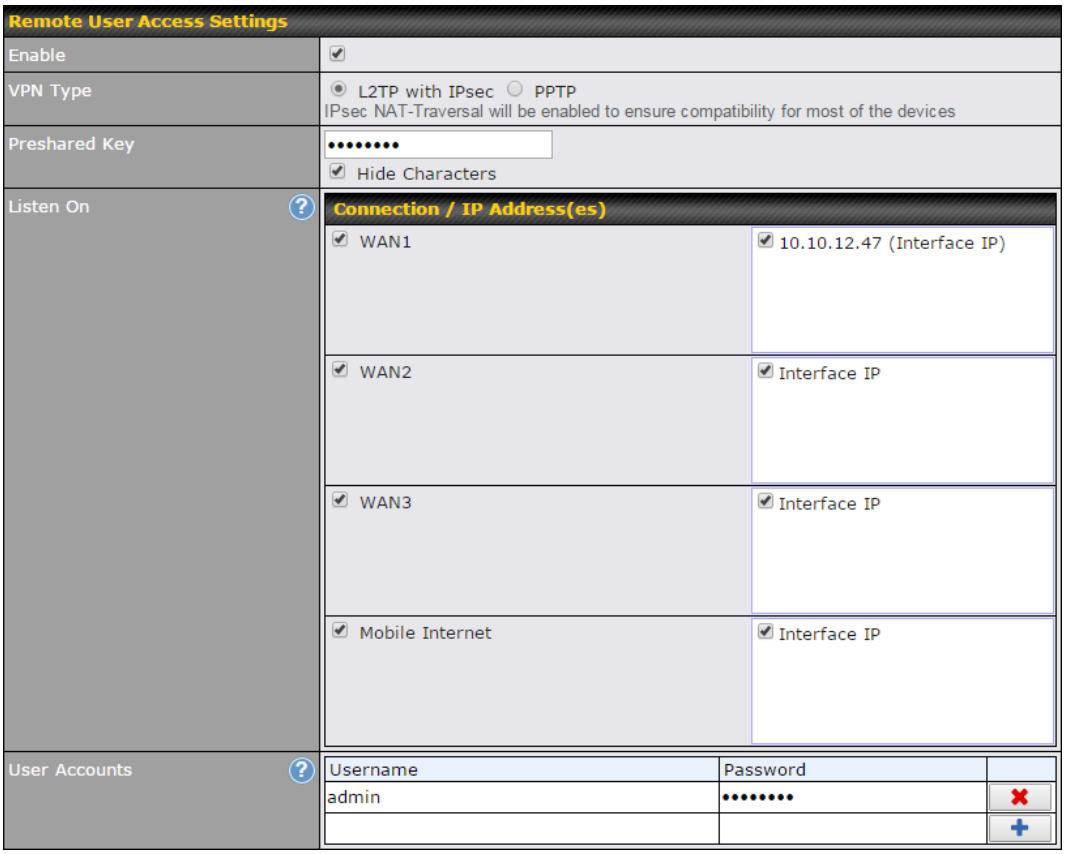


RIPv2 Settings	
Authentication	Choose an authentication method, if one is used, from this drop-down menu. Available options are **MD5** and **Text**. Enter the authentication key next to the drop-down menu.
Interfaces	Determine which interfaces this group will use to listen to and deliver RIPv2 packets.

19.4 Remote User Access

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

 Copyright @ 2016 Pepwave



Remote User Access Settings	
Enable	Click the checkbox to enable Remote User Access.
VPN Type	Determine whether remote devices can connect to the Balance using L2TP with IPsec or PPTP. For greater security, we recommend you connect using L2TP with IPsec.
Preshared Key	Enter your preshared key in the text field. Please note that remote devices will need this preshared key to access the Balance.
Listen On	This setting is for specifying the WAN IP addresses where the PPTP server of the router should listen on.
User Accounts	This setting allows you to define the PPTP User Accounts. Click Add to input username and password to create an account. After adding the user accounts, you can click on a username to edit the account password. Click the button X to delete the account in its corresponding row. Click the button to switch to enters user accounts by pasting the information in.CSV format.

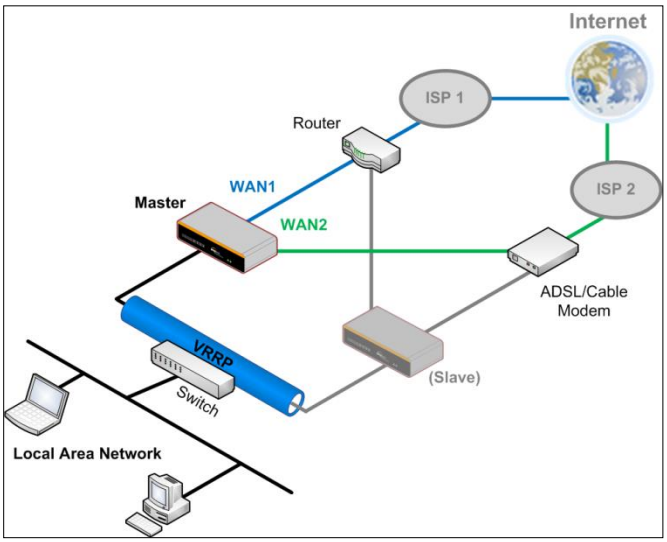
 Copyright @ 2016 Pepwave

Miscellaneous Settings

The miscellaneous settings include configuration for high availability, PPTP server, service forwarding, and service passthrough.

19.5 High Availability

Many Pepwave routers support high availability (HA) configurations via an open standard virtual router redundancy protocol (VRRP, RFC 3768). In an HA configuration, two Pepwave routers provide redundancy and failover in a master-slave arrangement. In the event that the master unit is down, the slave unit becomes active. High availability will be disabled automatically where there is a drop-in connection configured on a LAN bypass port.



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

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

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

 Copyright @ 2016 Pepwave

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

Interface for Master Router

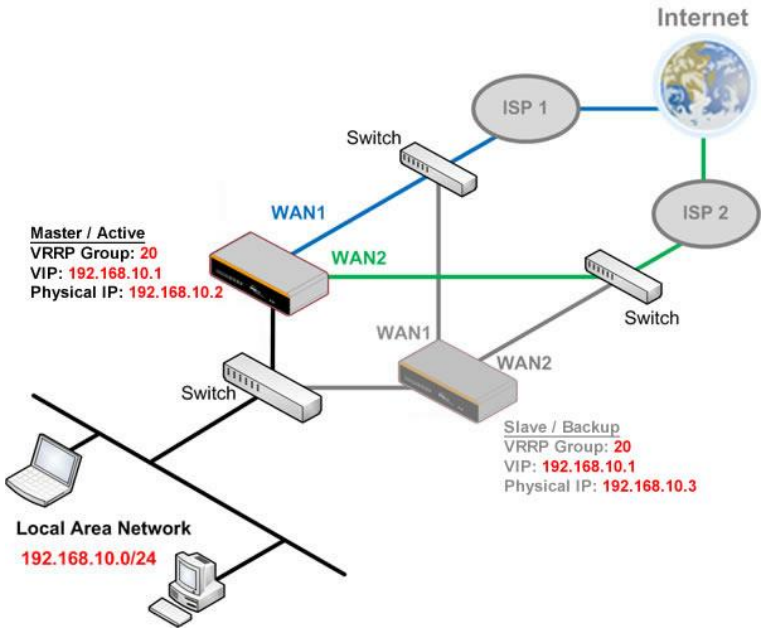
Interface for Slave Router

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

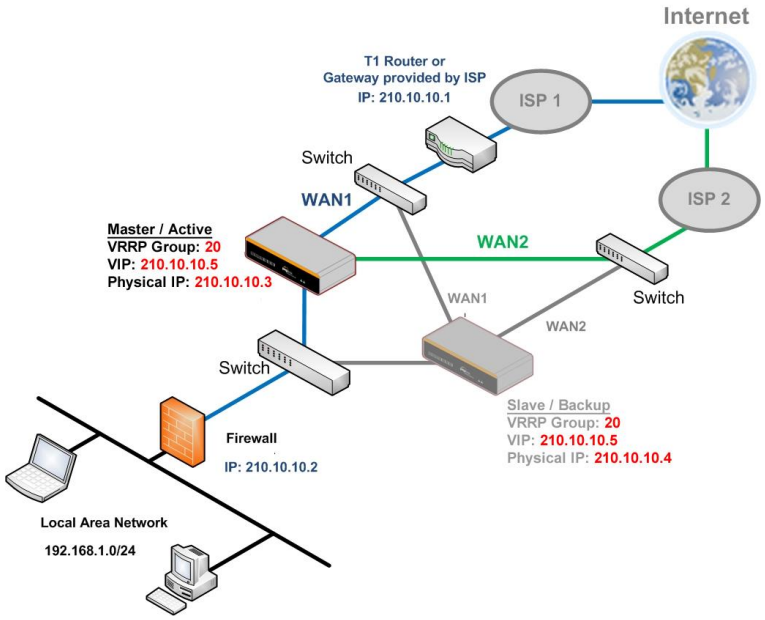
 Copyright @ 2016 Pepwave

Important Note

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



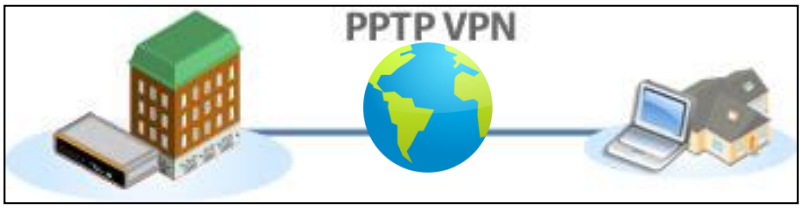
In drop-in mode, no other configuration needs to be set.



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

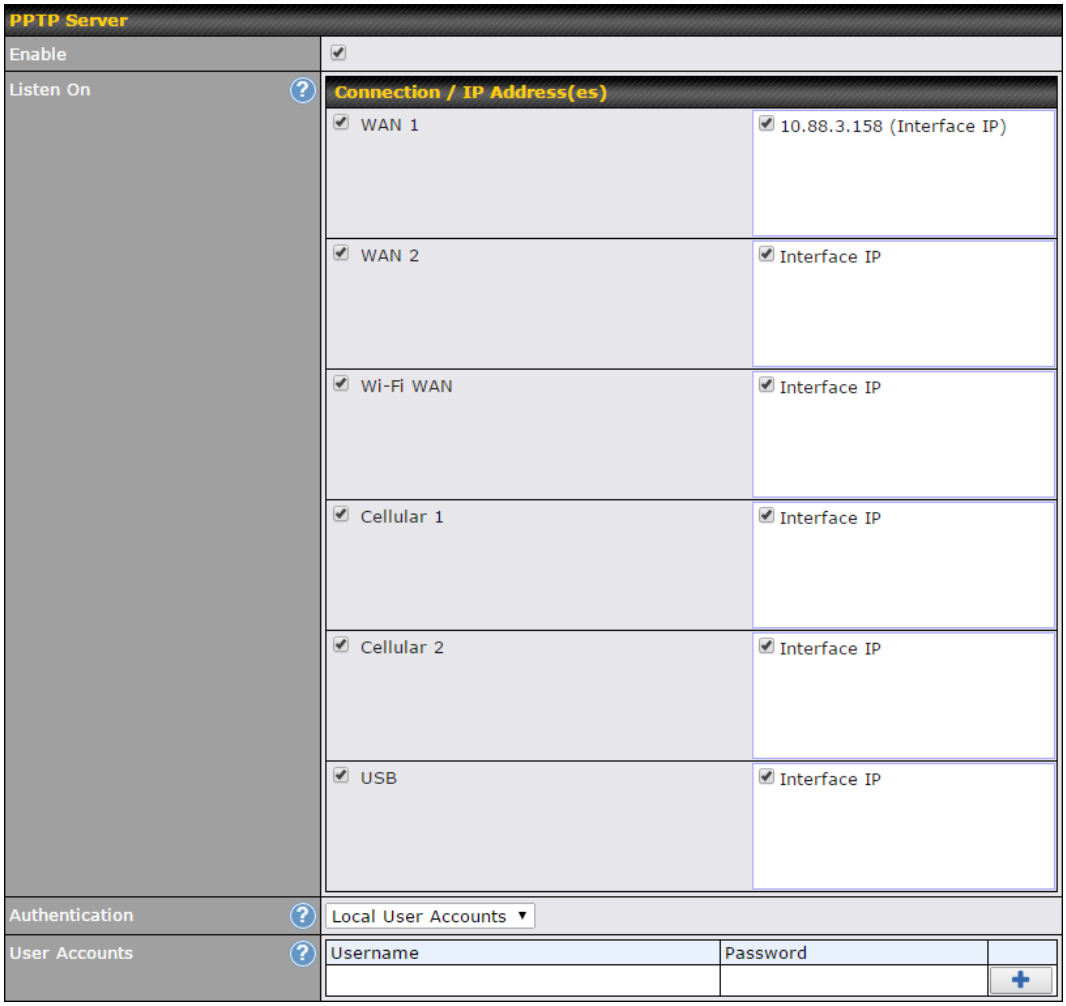
 Copyright @ 2016 Pepwave

19.6 PPTP Server



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

Check the box to enable PPTP server functionality. All connected PPTP sessions are displayed at **Status>Client List**. Please refer to **Section 22.3** for details. Note that available options vary by model.



 Copyright @ 2016 Pepwave

PPTP Server Settings	
Listen On	This setting is for specifying the WAN connection(s) and IP address(es) that the PPTP server should listen on.
Authentication	This setting is for specifying the user database source for PPTP authentication. Three sources can be selected: **Local User Accounts, LDAP Server,** or **RADIUS Server**. **Local User Accounts** - User accounts are stored in the Pepwave router locally. You can add/modify/delete accounts in the **User Accounts** table. **LDAP Server** - Authenticate with an external LDAP server. This has been tested with Open LDAP servers where passwords are NTLM hashed. Active Directory is not supported. (You can choose to use RADIUS to authenticate with a Windows server.) **RADIUS Server** - Authenticate with an external RADIUS server. This has been tested with Microsoft Windows Internet Authentication Service and FreeRADIUS servers where passwords are NTLM hashed or in plain text.
User Accounts	This setting allows you to define PPTP user accounts for authentication via local user accounts. Click **Add** to input username and password to create an account. After adding the user accounts, you can click on a username to edit the account password. Click ✖ to delete the account in its corresponding row.

19.7 Certificate Manager

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

19.8 Service Forwarding

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

Service Forwarding	
SMTP Forwarding	When this option is enabled, all outgoing SMTP connections destined for any host at TCP port 25 will be intercepted. These connections will be redirected to a specified SMTP server and port number. SMTP server settings for each WAN can be specified

 Copyright @ 2016 Pepwave

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

19.8.1 SMTP Forwarding

Some ISPs require their users to send e-mails via the ISP's SMTP server. All outgoing SMTP connections are blocked except those connecting to the ISP's. Pepwave routers support intercepting and redirecting all outgoing SMTP connections (destined for TCP port 25) via a WAN connection to the WAN's corresponding SMTP server.

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

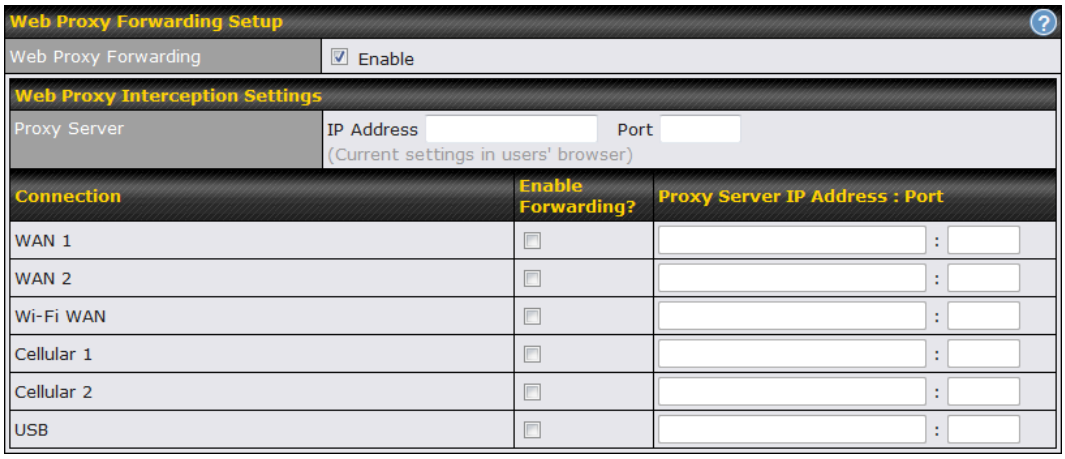
The Pepwave router will intercept SMTP connections. Choose a WAN port according to the outbound policy, and then forward the connection to the SMTP server if the chosen WAN has enabled forwarding. If the forwarding is disabled for a WAN connection, SMTP connections for the WAN will be simply be forwarded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

Note
If you want to route all SMTP connections only to particular WAN connection(s), you should create a custom rule

 Copyright @ 2016 Pepwave

in outbound policy (see **Section 14.2**).

19.8.2 Web Proxy Forwarding

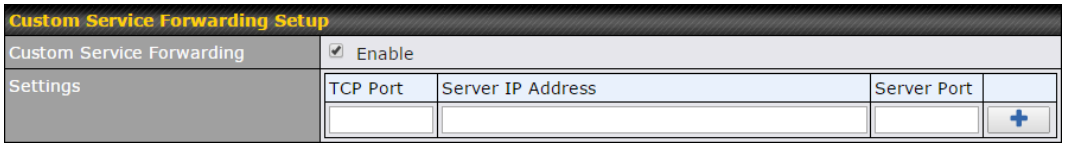


When this feature is enabled, the Pepwave router will intercept all outgoing connections destined for the proxy server specified in **Web Proxy Interception Settings**, choose a WAN connection with reference to the outbound policy, and then forward them to the specified web proxy server and port number.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

19.8.3 DNS Forwarding

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

19.8.4 Custom Service Forwarding

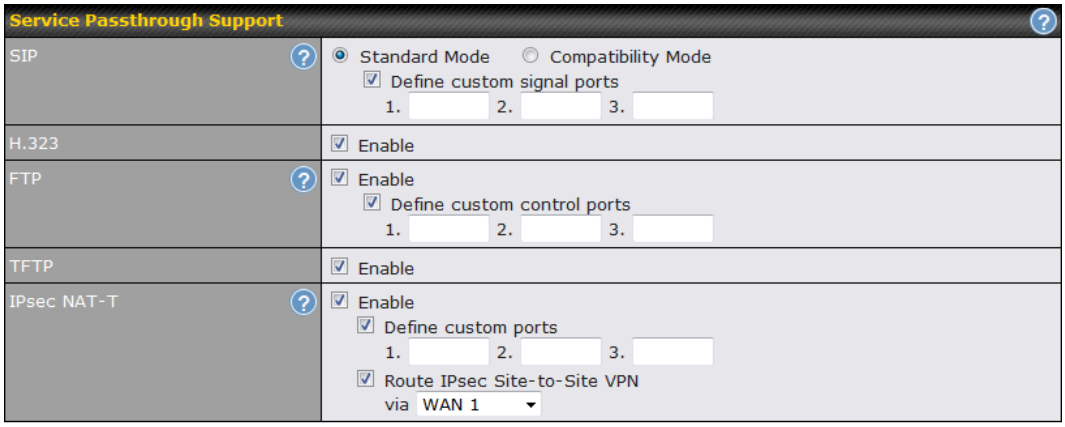


After clicking the **enable** checkbox, enter your TCP port for traffic heading to the router, and then specify the IP Address and Port of the server you wish to forward to the service to.

 Copyright @ 2016 Pepwave

19.9 Service Passthrough

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



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

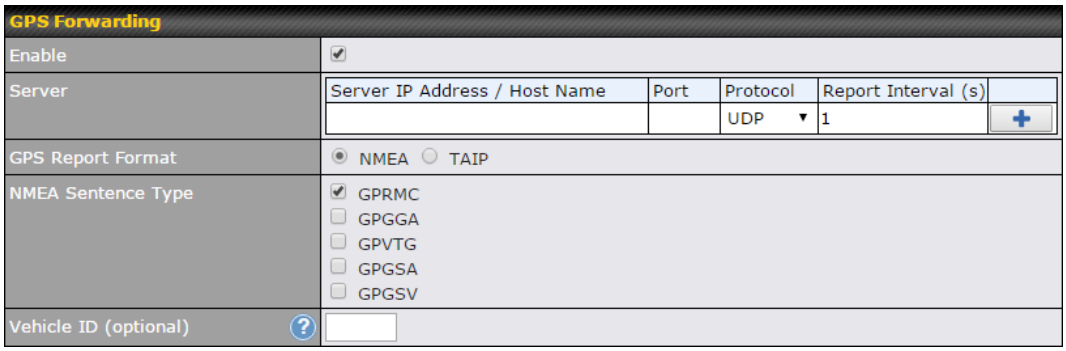
Service Passthrough Support	
SIP	Session initiation protocol, aka SIP, is a voice-over-IP protocol. The Pepwave router can act as a SIP application layer gateway (ALG) which binds connections for the same SIP session to the same WAN connection and translate IP address in the SIP packets correctly in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

 Copyright @ 2016 Pepwave

to route the traffic to.

19.10 GPS Forwarding

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



GPS Forwarding	
Enable	Check this box to turn on GPS forwarding.
Server	Enter the name/IP address of the server that will receive GPS data. Also specify a port number, protocol (**UDP** or **TCP**), and a report interval of between 1 and 10 seconds. Click + to save these settings.
GPS Report Format	Choose from NMEA or TAIP format for sending GPS reports.
NMEA Sentence Type	If you've chosen to send GPS reports in NMEA format, select one or more sentence types for sending the data (**GPRMC**, **GPGGA**, **GPVTG**, **GPGSA**, and **GPGSV**).
Vehicle ID	The vehicle ID will be appended in the last field of the NMEA sentence. Note that the NMEA sentence will become customized and non-standard.
TAIP Sentence Type/TAIP ID (optional)	If you've chosen to send GPS reports in TAIP format, select one or more sentence types for sending the data (**PV—Position / Velocity Solution** and **CP—Compact Velocity Solution**). You can also optionally include an ID number in the **TAIP ID** field.

 Copyright @ 2016 Pepwave

20 AP Controller

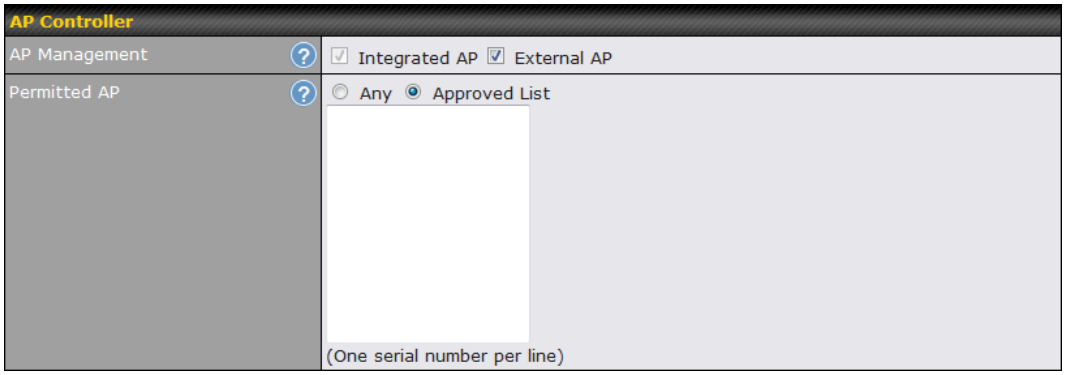
The AP controller acts as a centralized controller of Pepwave AP devices. With this feature, users can customize and manage multiple APs from a single Pepwave router interface.

Special Note
Each Pepwave router can control a limited number of routers without additional cost. To manage more, a Full Edition license is required. Please contact your Authorized Reseller or the Peplink Sales Team for more information and pricing details.

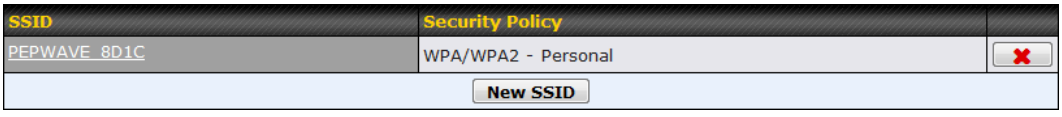
To configure, navigate to the **AP** tab.

20.1 Wireless SSID

This menu is the first one that appears after clicking the **AP** tab. This screen can also be reached by clicking **AP>Wireless SSID**. Note the appearance of this screen varies by model.

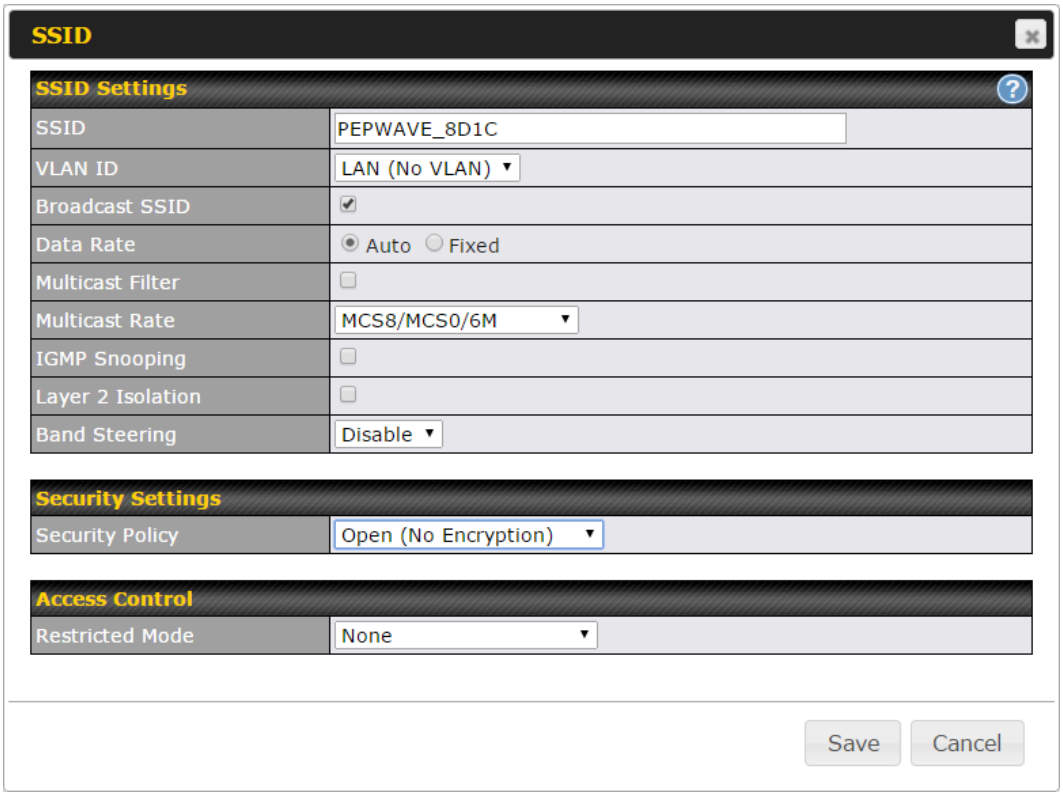


AP Controller	
AP Management	The AP controller for managing Pepwave APs can be enabled by checking this box. When this option is enabled, the AP controller will wait for management connections originating from APs over the LAN on TCP and UDP port 11753. It will also wait for captive portal connections on TCP port 443. An extended DHCP option, **CAPWAP Access Controller addresses** (field 138), will be added to the DHCP server. A local DNS record, **AP Controller**, will be added to the local DNS proxy.
Permitted AP	Access points to manage can be specified here. If **Any** is selected, the AP controller will manage any AP that reports to it. If **Approved List** is selected, only APs with serial numbers listed in the provided text box will be managed.



 Copyright @ 2016 Pepwave

Current SSID information appears in the **SSID** section. To edit an existing SSID, click its name in the list. To add a new SSID, click **Add**. Note that the following settings vary by model.

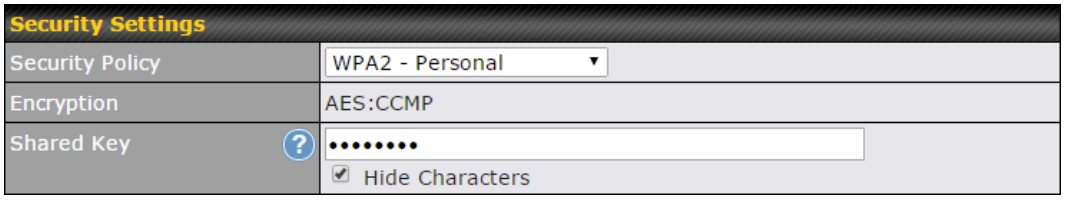


SSID Settings	
SSID	This setting specifies the SSID of the virtual AP to be scanned by Wi-Fi clients.
Enable	Select **Yes** to enable the virtual AP.
VLAN ID	This setting specifies the VLAN ID to be tagged on all outgoing packets generated from this wireless network (i.e., packets that travel from the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

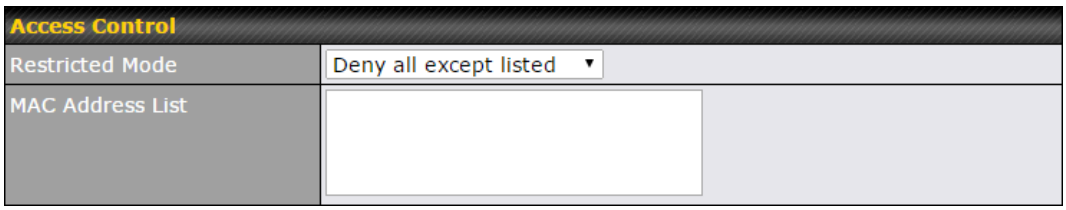
 Copyright @ 2016 Pepwave

Multicast Rate[A]	This setting specifies the transmit rate to be used for sending multicast network traffic. The selected **Protocol** and **Channel Bonding** settings will affect the rate options and values available here.
IGMP Snooping [A]	To allow the Pepwave router to listen to internet group management protocol (IGMP) network traffic, select this option.
DHCP Option 82 [A]	If you use a distributed DHCP server/relay environment, you can enable this option to provide additional information on the manner in which clients are physically connected to the network.
Network Priority (QoS) [A]	Select from **Gold**, **Silver**, and **Bronze** to control the QoS priority of this wireless network's traffic.
Layer 2 Isolation [A]	**Layer 2** refers to the second layer in the ISO Open System Interconnect model. When this option is enabled, clients on the same VLAN, SSID, or subnet are isolated to that VLAN, SSID, or subnet, which can enhance security. Traffic is passed to upper communication layer(s). By default, the setting is disabled.
Band Steering [A]	Band steering allows the Pepwave router to steer AP clients from the 2.4GHz band to the 5GHz band for better usage of bandwidth. To make steering mandatory, select **Enforce**. To cause the Pepwave router to preferentially choose steering, select **Prefer**. The default for this setting is **Disable**.

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



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



Access Control	
Restricted Mode	The settings allow administrator to control access using MAC address filtering. Available options are **None**, **Deny all except listed**, **Accept all except listed**, and **RADIUS MAC Authentication**. When **WPA/WPA2 - Enterprise** is configured, RADIUS-based 802.1 x authentication is enabled. Under this configuration, the **Shared Key** option should be disabled. When using

 Copyright @ 2016 Pepwave

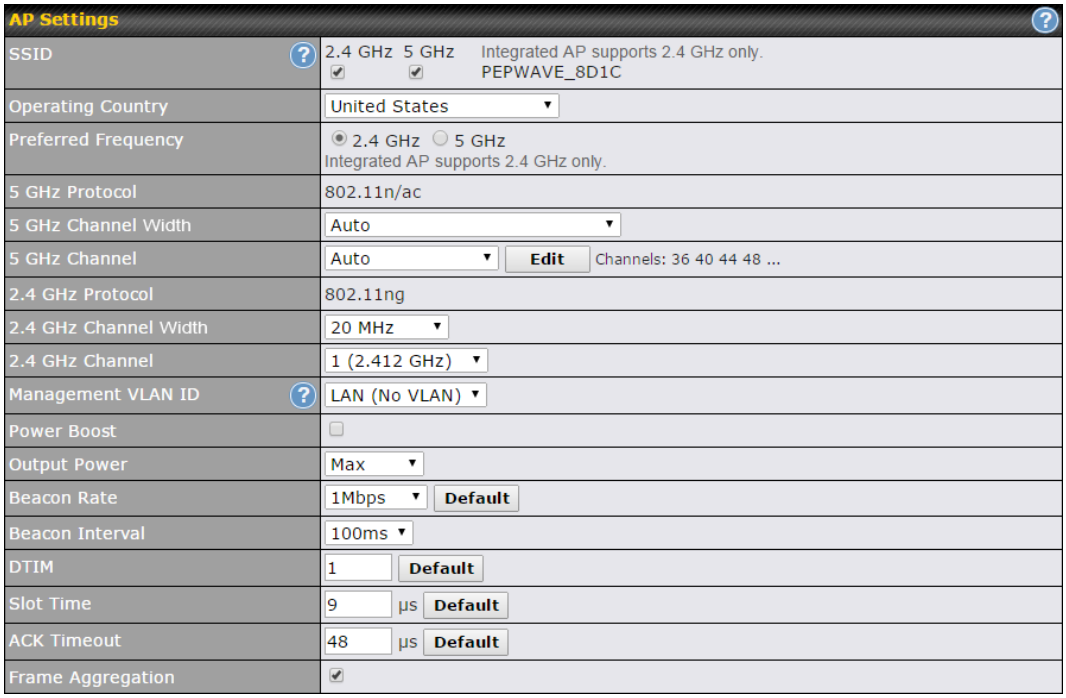
	this method, select the appropriate version using the **V1**/**V2** controls. The security level of this method is known to be very high. When **WPA/WPA2- Personal** is configured, a shared key is used for data encryption and authentication. When using this configuration, the **Shared Key** option should be enabled. Key length must be between eight and 63 characters (inclusive). The security level of this method is known to be high. The configuration of **Static WEP** parameters enables pre-shared WEP key encryption. Authentication is not supported by this method. The security level of this method is known to be weak.
MAC Address List	Connection coming from the MAC addresses in this list will be either denied or accepted based the option selected in the previous field.

RADIUS Server Settings	
Host	Enter the IP address of the primary RADIUS server and, if applicable, the secondary RADIUS server.
Secret	Enter the RADIUS shared secret for the primary server and, if applicable, the secondary RADIUS server.
Authentication Port	In field, enter the UDP authentication port(s) used by your RADIUS server(s) or click the **Default** button to enter **1812**.
Accounting Port	In field, enter the UDP accounting port(s) used by your RADIUS server(s) or click the **Default** button to enter **1813**.

 Copyright @ 2016 Pepwave

20.2 Settings

On many Pepwave models, the AP settings screen (**AP>Settings**) looks similar to the example below:



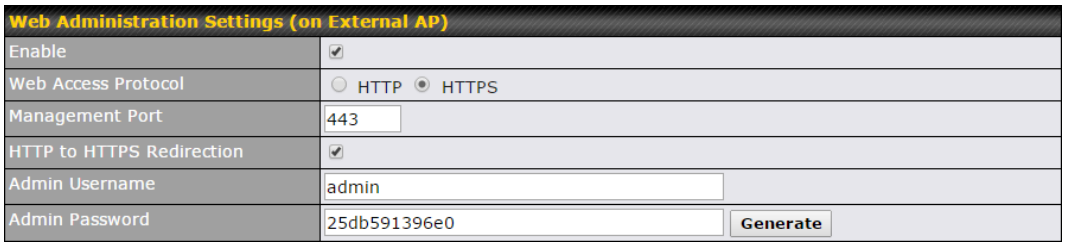
AP Settings	
SSID	These buttons specify which wireless networks will use this AP profile. You can also select the frequencies at which each network will transmit. Please note that the Pepwave router does not detect whether the AP is capable of transmitting at both frequencies. Instructions to transmit at unsupported frequencies will be ignored by the AP.
Operating Country	This drop-down menu specifies the national/regional regulations which the AP should follow. • If a North American region is selected, RF channels 1 to 11 will be available and the maximum transmission power will be 26 dBm (400 mW). • If European region is selected, RF channels 1 to 13 will be available. The maximum transmission power will be 20 dBm (100 mW). NOTE: Users are required to choose an option suitable to local laws and regulations. Per FCC regulation, the country selection is not available on all models marketed in US. All US models are fixed to US channels only.
Preferred Frequency	These buttons determine the frequency at which access points will attempt to broadcast. This feature will only work for APs that can transmit at both 2.4GHz and 5GHz frequencies.
5 GHz Protocol	This section displays the 5 GHz protocols your APs are using.
5GHz Channel Width	There are three options: **20 MHz**, **20/40 MHz**, and **40 MHz**. With this feature enabled, the Wi-Fi system can use two channels at once. Using two channels improves the

 Copyright @ 2016 Pepwave

	performance of the Wi-Fi connection.
5 GHz Channel	This drop-down menu selects the 5 GHz 802.11 channel to be utilized. If **Auto** is set, the system will perform channel scanning based on the scheduled time set and choose the most suitable channel automatically.
2.4 GHz Protocol	This section displays the 2.4GHz protocols your APs are using.
2.4 GHz Channel Width	There are three options: **20 MHz**, **20/40 MHz**, and **40 MHz**. With this feature enabled, the Wi-Fi system can use two channels at once. Using two channels improves the performance of the Wi-Fi connection.
2.4 GHz Channel	This drop-down menu selects the 802.11 channel to be utilized. Available options are from 1 to 11 and from 1 to 13 for the North America region and Europe region, respectively. (Channel 14 is only available when the country is selected as Japan with protocol 802.11b.) If **Auto** is set, the system will perform channel scanning based on the scheduled time set and choose the most suitable channel automatically.
Management VLAN ID	This field specifies the VLAN ID to tag to management traffic, such as AP to AP controller communication traffic. The value is **0** by default, meaning that no VLAN tagging will be applied. NOTE: change this value with caution as alterations may result in loss of connection to the AP controller.
Power Boost[A]	With this option enabled, the AP under this profile will transmit using additional power. Please note that using this option with several APs in close proximity will lead to increased interference.
Output Power[A]	This drop-down menu determines the power at which the AP under this profile will broadcast. When fixed settings are selected, the AP will broadcast at the specified power level, regardless of context. When **Dynamic** settings are selected, the AP will adjust its power level based on its surrounding APs in order to maximize performance. The **Dynamic: Auto** setting will set the AP to do this automatically. Otherwise, the **Dynamic: Manual** setting will set the AP to dynamically adjust only of instructed to do so. If you have set **Dynamic:Manual**, you can go to **AP>Toolbox>Auto Power Adj.** to give your AP further instructions.
Beacon Rate[A]	This drop-down menu provides the option to send beacons in different transmit bit rates. The bit rates are **1Mbps**, **2Mbps**, **5.5Mbps**, **6Mbps**, and **11Mbps**.
Beacon Interval[A]	This drop-down menu provides the option to set the time between each beacon send. Available options are **100ms**, **250ms**, and **500ms**.
DTIM[A]	This field provides the option to set the frequency for beacon to include delivery traffic indication messages (DTIM). The interval unit is measured in milliseconds.
Slot Time[A]	This field provides the option to modify the unit wait time before it transmits. The default value is **9µs**.
ACK Timeout[A]	This field provides the option to set the wait time to receive acknowledgement packet before doing retransmission. The default value is **48µs**.
Frame Aggregation[A]	With this feature enabled, throughput will be increased by sending two or more data frames in a single transmission.

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

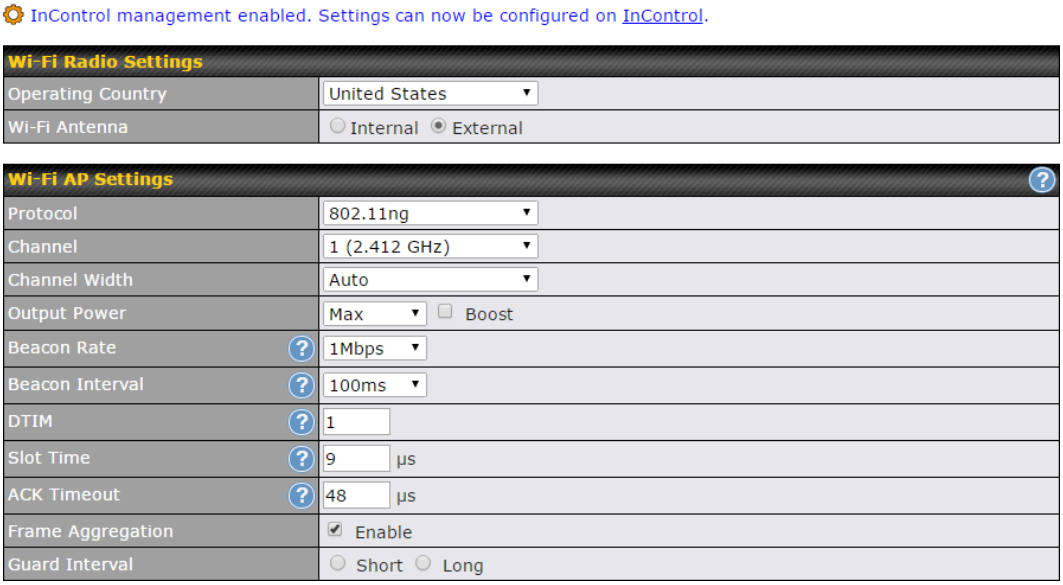
 Copyright @ 2016 Pepwave



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

 Copyright @ 2016 Pepwave

Navigating to **AP>Settings** on some Pepwave models displays a screen similar to the one shown below:



Wi-Fi Radio Settings

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

Important Note

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

Wi-Fi AP Settings

Protocol	This option allows you to specify whether 802.11b and/or 802.11g client association requests will be accepted. Available options are **802.11ng** and **802.11na**. By default, **802.11ng** is selected.
Channel	This option allows you to select which 802.11 RF channel will be used. **Channel 1 (2.412 GHz)** is selected by default.
Channel Width	**Auto (20/40 MHz)** and **20 MHz** are available. The default setting is **Auto (20/40 MHz),** which allows both widths to be used simultaneously.
Output Power	This option is for specifying the transmission output power for the Wi-Fi AP. There are 4 relative power levels available – **Max**, **High**, **Mid**, and **Low**. The actual output power will be bound by the regulatory limits of the selected country.
Beacon Rate[A]	This option is for setting the transmit bit rate for sending a beacon. By default, **1Mbps** is

 Copyright @ 2016 Pepwave

	selected.
Beacon Interval[A]	This option is for setting the time interval between each beacon. By default, **100ms** is selected.
DTIM[A]	This field allows you to set the frequency for the beacon to include a delivery traffic indication message. The interval is measured in milliseconds. The default value is set to **1 ms**.
Slot Time[A]	This field is for specifying the wait time before the Surf SOHO transmits a packet. By default, this field is set to **9 µs**.
ACK Timeout[A]	This field is for setting the wait time to receive an acknowledgement packet before performing a retransmission. By default, this field is set to **48 µs**.
Frame Aggregation[A]	This option allows you to enable frame aggregation to increase transmission throughput.
Guard Interval[A]	This setting allows choosing 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.

20.3 Toolbox

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

Firmware Packs

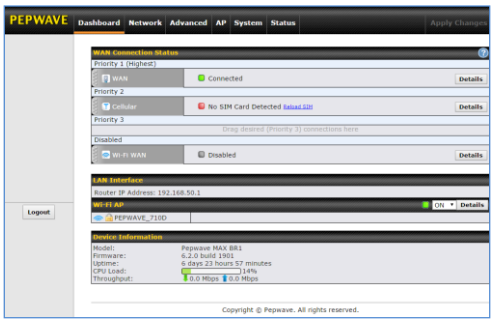
Here, you can manage the firmware of your AP. Clicking on will result in information regarding each firmware pack. To receive new firmware packs, you can click **Check for Updates** to download new packs, or you can click **Manual Upload** to manually upload a firmware pack. Click **Default** to define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

 Copyright @ 2016 Pepwave

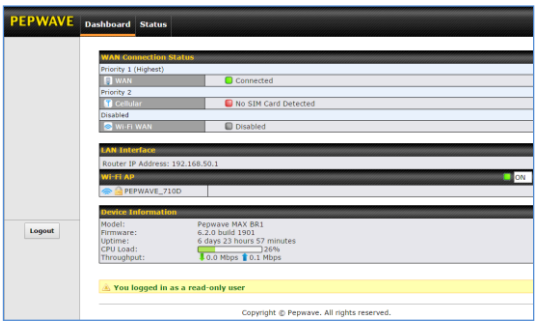
21 System Settings

21.1 Admin Security

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



Admin account UI



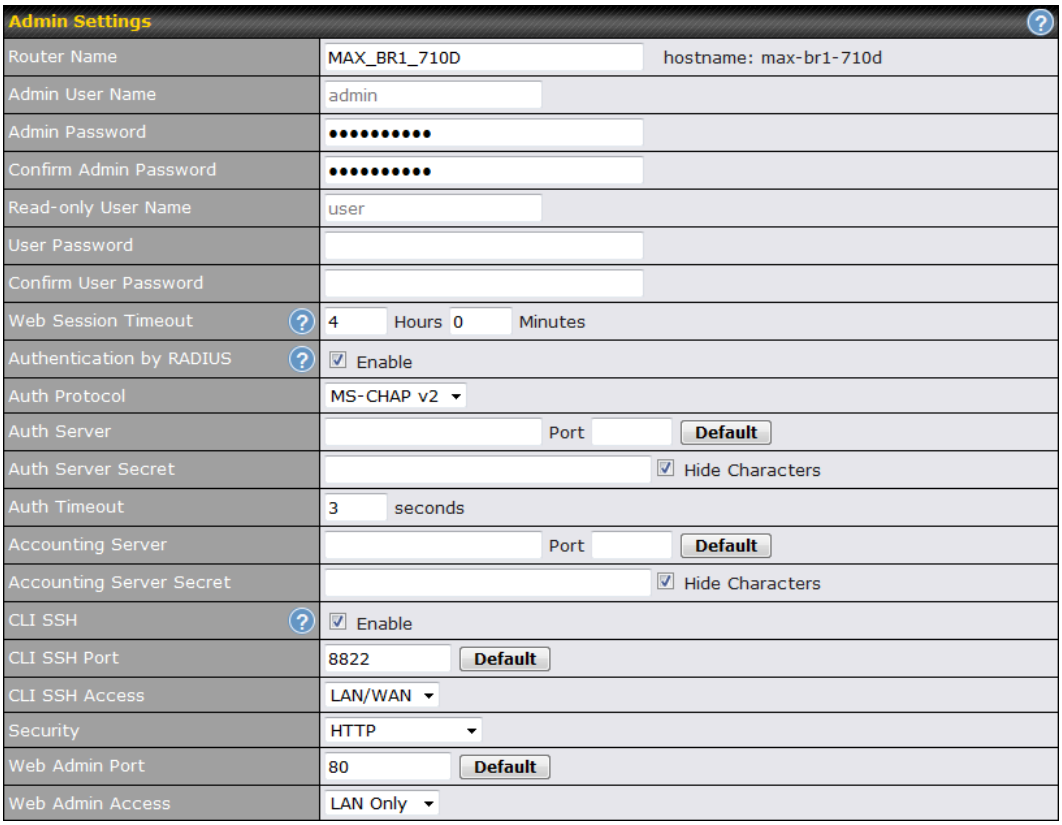
User account UI

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

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

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

 Copyright @ 2016 Pepwave

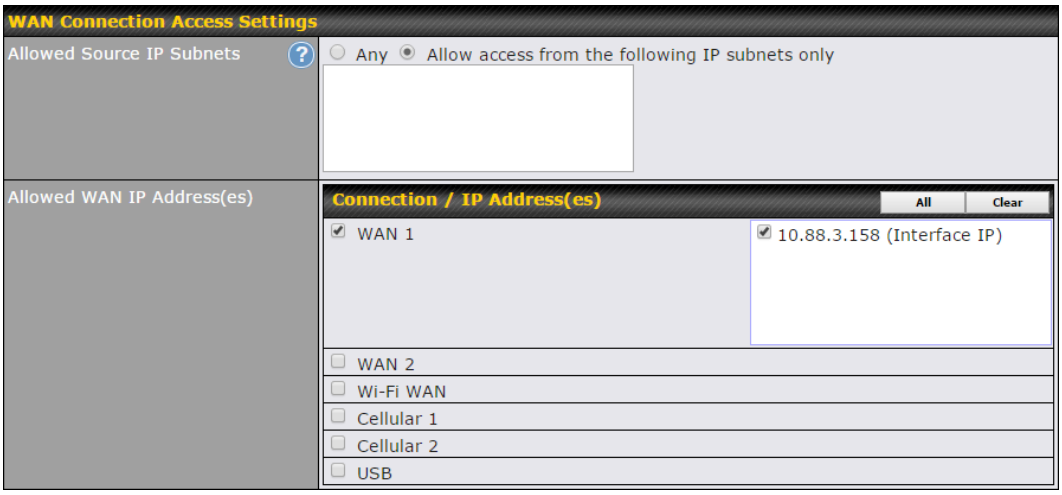


Admin Settings	
Router Name	This field allows you to define a name for this Pepwave router. By default, **Router Name** is set as **MAX_XXXX** or **Surf_SOHO_XXXX**, where *XXXX* refers to the last 4 digits of the unit's serial number.
Admin User Name	**Admin User Name** is set as *admin* by default, but can be changed, if desired.
Admin Password	This field allows you to specify a new administrator password.
Confirm Admin Password	This field allows you to verify and confirm the new administrator password.
Read-only User Name	**Read-only User Name** is set as *user* by default, but can be changed, if desired.
User Password	This field allows you to specify a new user password. Once the user password is set, the read-only user feature will be enabled.
Confirm User Password	This field allows you to verify and confirm the new user password.
Web Session Timeout	This field specifies the number of hours and minutes that a web session can remain idle before the Pepwave router terminates its access to the web admin interface. By default, it is set to **4 hours**.

 Copyright @ 2016 Pepwave

Authentication by RADIUS	With this box is checked, the web admin will authenticate using an external RADIUS server. Authenticated users are treated as either "admin" with full read-write permission or “user” with read-only access. Local admin and user accounts will be disabled. When the device is not able to communicate with the external RADIUS server, local accounts will be enabled again for emergency access. Additional authentication options will be available once this box is checked.
Auth Protocol	This specifies the authentication protocol used. Available options are **MS-CHAP v2** and **PAP**.
Auth Server	This specifies the access address and port of the external RADIUS server.
Auth Server Secret	This field is for entering the secret key for accessing the RADIUS server.
Auth Timeout	This option specifies the time value for authentication timeout.
Accounting Server	This specifies the access address and port of the external accounting server.
Accounting Server Secret	This field is for entering the secret key for accessing the accounting server.
Network Connection	This option is for specifying the network connection to be used for authentication. Users can choose from LAN, WAN, and VPN connections.
CLI SSH	The CLI (command line interface) can be accessed via SSH. This field enables CLI support. For additional information regarding CLI, please refer to **Section 21.16**.
CLI SSH Port	This field determines the port on which clients can access CLI SSH.
CLI SSH Access	This menu allows you to choose between granting access to LAN and WAN clients, or to LAN clients only.
Security	This option is for specifying the protocol(s) through which the web admin interface can be accessed: • HTTP • HTTPS • HTTP/HTTPS
Web Admin Port	This field is for specifying the port number on which the web admin interface can be accessed.
Web Admin Access	This option is for specifying the network interfaces through which the web admin interface can be accessed: • LAN only • LAN/WAN If LAN/WAN is chosen, the **WAN Connection Access Settings** form will be displayed.

 Copyright @ 2016 Pepwave



WAN Connection Access Settings

Allowed Source IP Subnets

This field allows you to restrict web admin access only from defined IP subnets.

- **Any** - Allow web admin accesses to be from anywhere, without IP address restriction.
- **Allow access from the following IP subnets only** - Restrict web admin access only from the defined IP subnets. When this is chosen, a text input area will be displayed beneath:

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

To define multiple subnets, separate each IP subnet one in a line. For example:

- 192.168.0.0/24
- 10.8.0.0/16

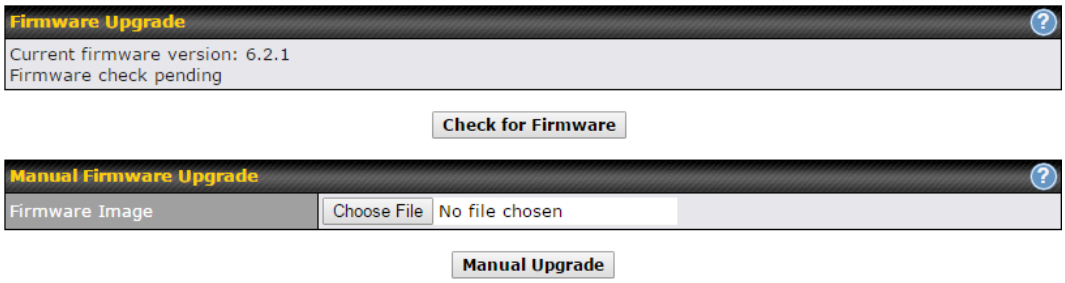
Allowed WAN IP Address(es)

This is to choose which WAN IP address(es) the web server should listen on.

 Copyright @ 2016 Pepwave

21.2 Firmware

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



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

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

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

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

Important Note

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

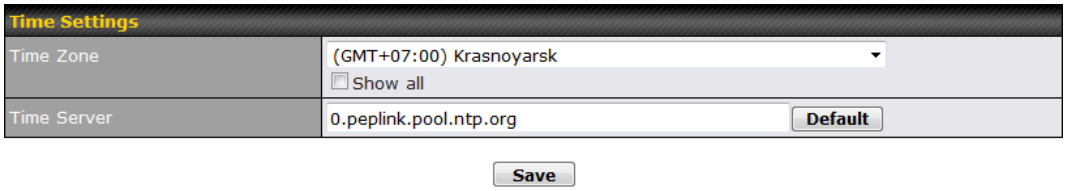
Important Note

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

 Copyright @ 2016 Pepwave

21.3 Time

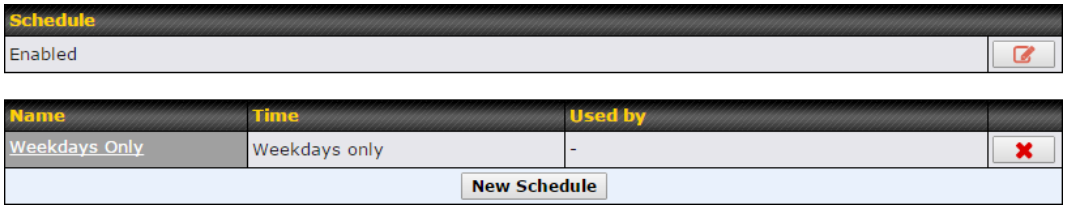
Time Settings enables the system clock of the Pepwave router to be synchronized with a specified time server. Time settings are located at **System>Time**.



Time Settings	
Time Zone	This specifies the time zone (along with the corresponding Daylight Savings Time scheme). The **Time Zone** value affects the time stamps in the Pepwave router's event log and e-mail notifications. Check **Show all** to show all time zone options.
Time Server	This setting specifies the NTP network time server to be utilized by the Pepwave router.

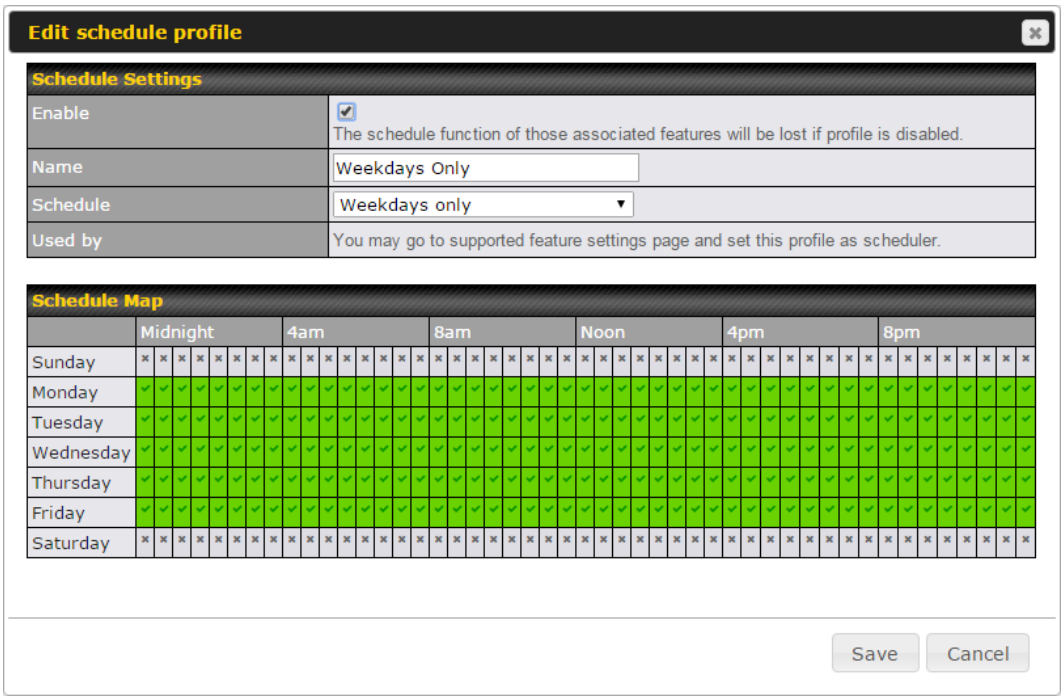
21.4 Schedule

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



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

 Copyright @ 2016 Pepwave

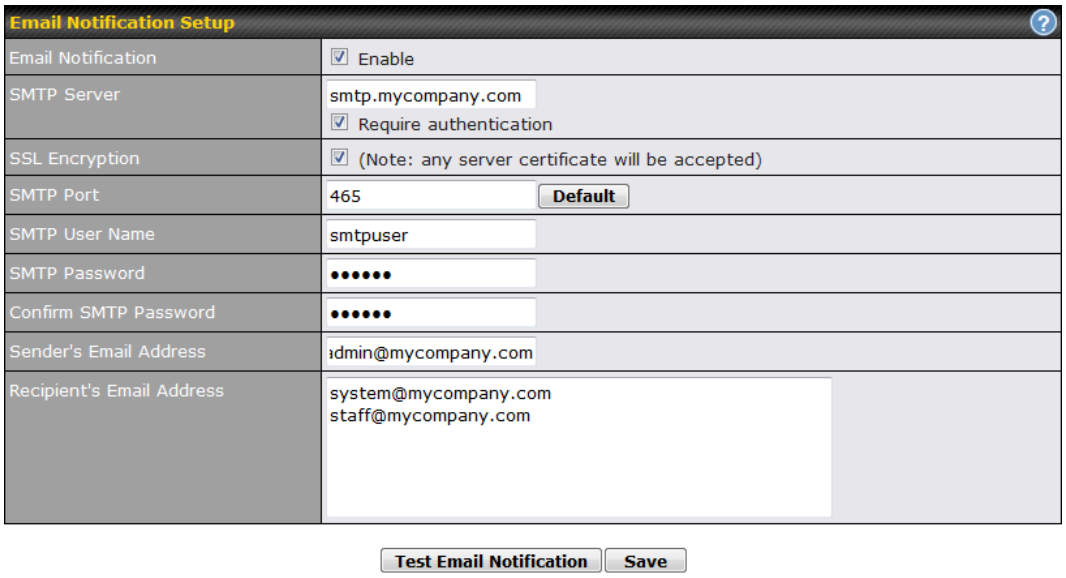


Edit Schedule Profile	
Enabling	Click this checkbox to enable this schedule profile. Note that if this is disabled, then any associated features will also have their scheduling disabled.
Name	Enter your desired name for this particular schedule profile.
Schedule	Click the drop-down menu to choose pre-defined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

21.5 Email Notification

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

 Copyright @ 2016 Pepwave

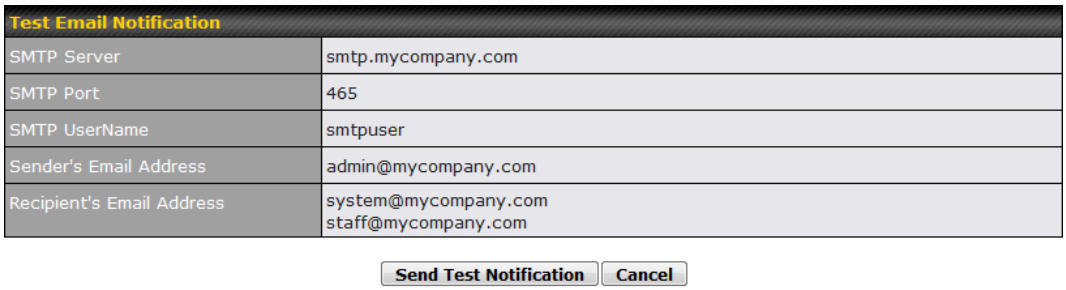


Email Notification Settings	
Email Notification	This setting specifies whether or not to enable email notification. If **Enable** is checked, the Pepwave router will send email messages to system administrators when the WAN status changes or when new firmware is available. If **Enable** is not checked, email notification is disabled and the Pepwave router will not send email messages.
SMTP Server	This setting specifies the SMTP server to be used for sending email. If the server requires authentication, check **Require authentication**.
SSL Encryption	Check the box to enable SMTPS. When the box is checked, **SMTP Port** will be changed to **465** automatically.
SMTP Port	This field is for specifying the SMTP port number. By default, this is set to **25**; when **SSL Encryption** is checked, the default port number will be set to **465**. You may customize the port number by editing this field. Click **Default** to restore the number to its default setting.
SMTP User Name / Password	This setting specifies the SMTP username and password while sending email. These options are shown only if **Require authentication** is checked in the **SMTP Server** setting.
Confirm SMTP Password	This field allows you to verify and confirm the new administrator password.
Sender's Email Address	This setting specifies the email address the Pepwave router will use to send reports.
Recipient's Email Address	This setting specifies the email address(es) to which the Pepwave router will send email notifications. For multiple recipients, separate each email addresses using the enter key.

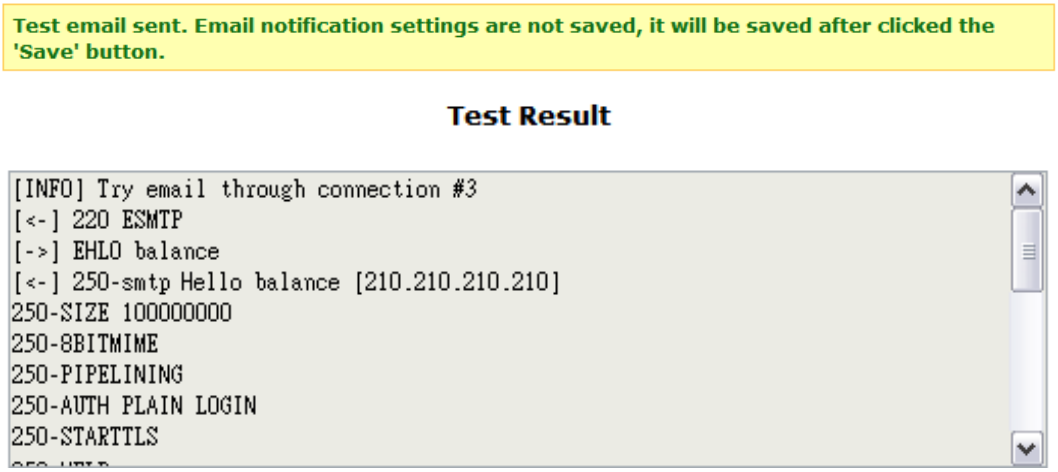
After you have finished setting up email notifications, you can click the **Test Email Notification** button to test the settings before saving. After **Test Email Notification** is

 Copyright @ 2016 Pepwave

clicked, you will see this screen to confirm the settings:

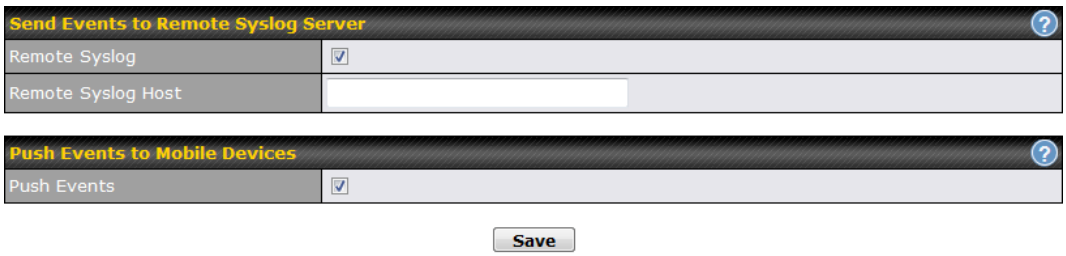


Click **Send Test Notification** to confirm. In a few seconds, you will see a message with detailed test results.



21.6 Event Log

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



Event Log Settings	
Remote Syslog	This setting specifies whether or not to log events at the specified remote syslog server.
Remote Syslog Host	This setting specifies the IP address or hostname of the remote syslog server.

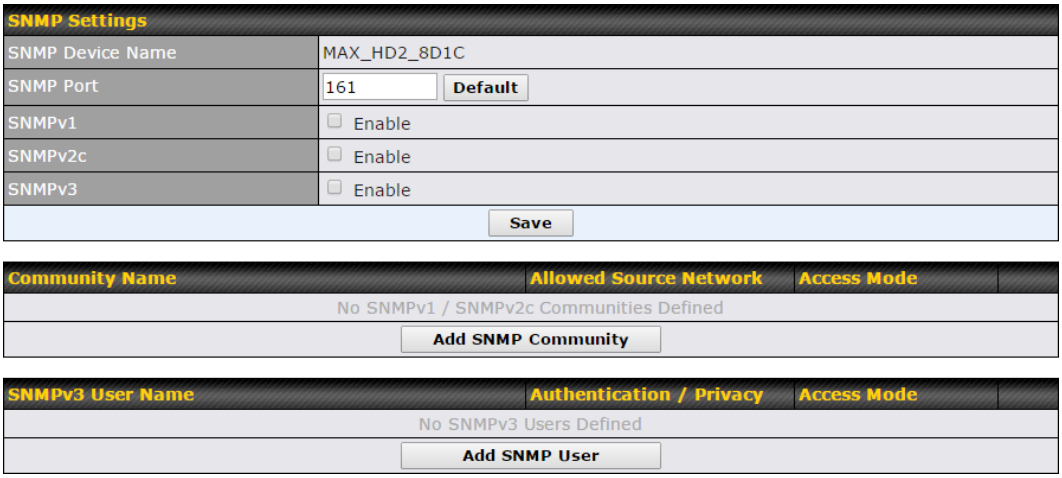
 Copyright @ 2016 Pepwave

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

 Copyright @ 2016 Pepwave

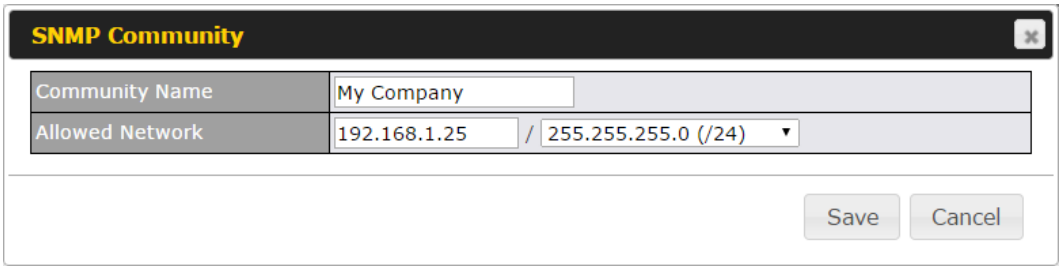
21.7 SNMP

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



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

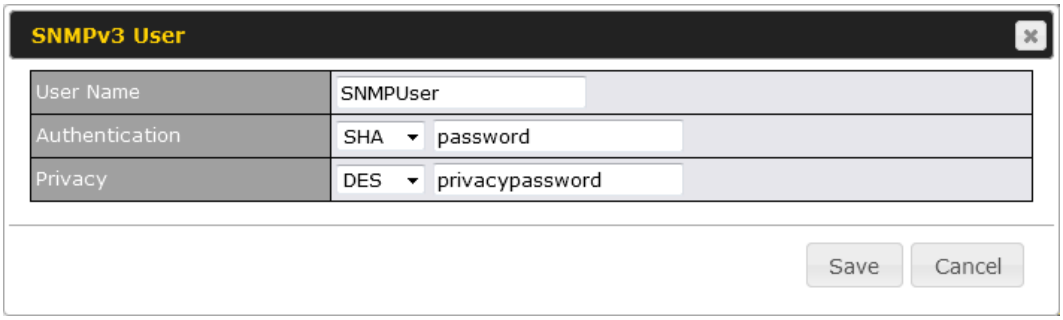
To add a community for either SNMPv1 or SNMPv2, click the **Add SNMP Community** button in the **Community Name** table, upon which the following screen is displayed:



 Copyright @ 2016 Pepwave

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

To define a user name for SNMPv3, click **Add SNMP User** in the **SNMPv3 User Name**

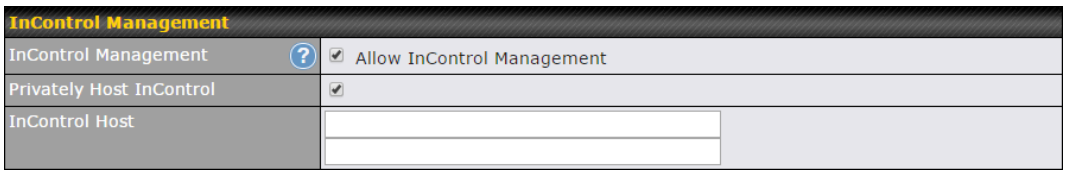


table, upon which the following screen is displayed:

SNMPv3 User Settings	
User Name	This setting specifies a user name to be used in SNMPv3.
Authentication Protocol	This setting specifies via a drop-down menu one of the following valid authentication protocols: • NONE • MD5 • SHA When MD5 or SHA is selected, an entry field will appear for the password.
Privacy Protocol	This setting specifies via a drop-down menu one of the following valid privacy protocols: • NONE • DES When DES is selected, an entry field will appear for the password.

 Copyright @ 2016 Pepwave

21.8 InControl



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

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

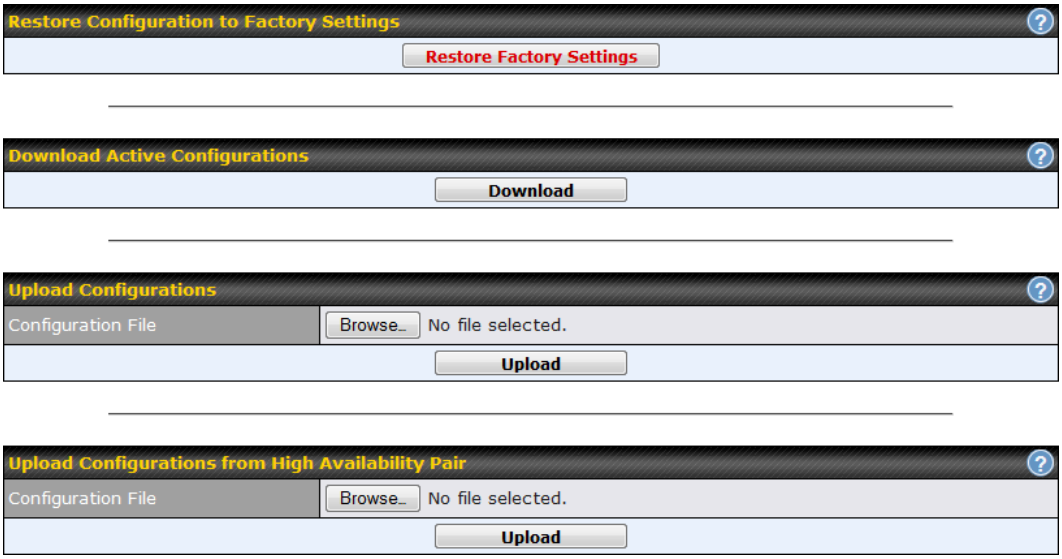
Alternately, you could also privately host InControl. Simply check the box beside the "Privately Host InControl" open, and enter the IP Address of your InControl Host.

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

21.9 Configuration

 Copyright @ 2016 Pepwave

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



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

 Copyright @ 2016 Pepwave

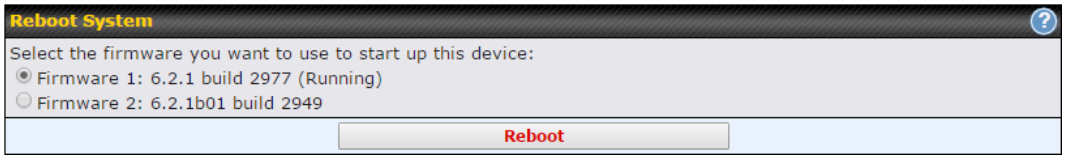
21.10 Feature Add-ons

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

21.11 Reboot

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

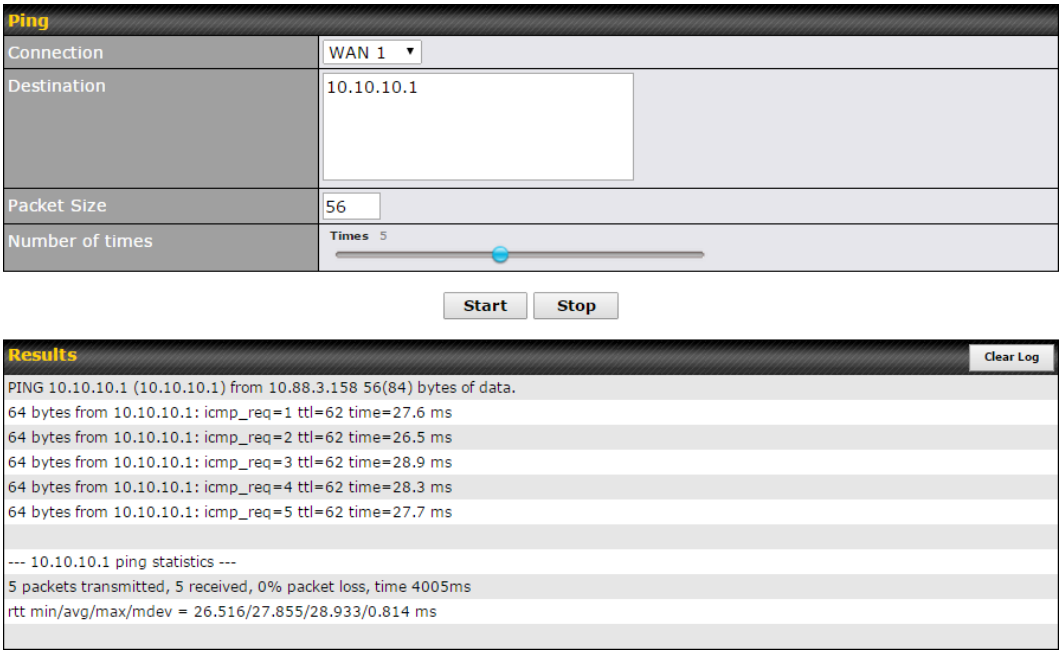
Please note that a firmware upgrade will always replace the inactive firmware partition.



 Copyright @ 2016 Pepwave

21.12 Ping

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



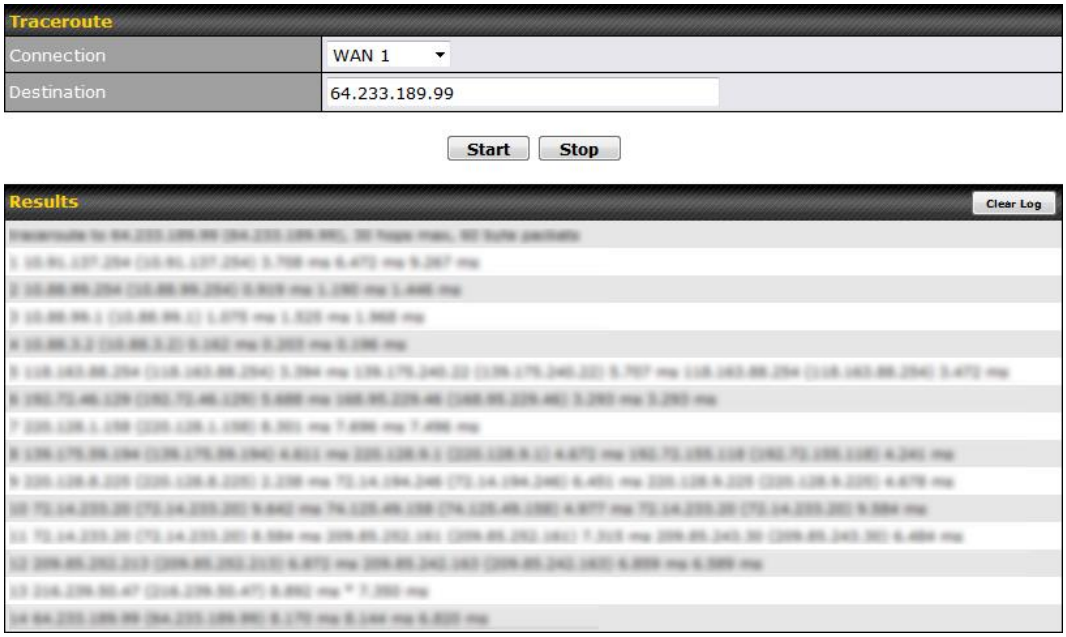
Tip

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

 Copyright @ 2016 Pepwave

21.13 Traceroute Test

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

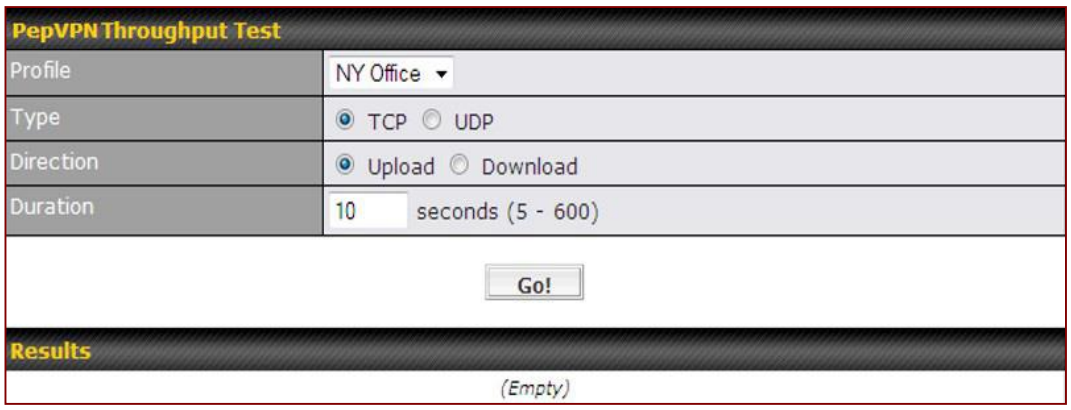


Tip

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

21.14 PepVPN Test

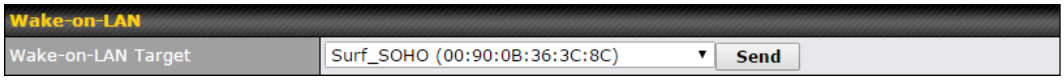
The **PepVPN Test** tool can help to test the throughput between different VPN peers. You can define the **Test Type**, **Direction**, and **Duration** of the test, and press **Go!** to perform the throughput test. The VPN test utility is located at **System>Tools>PepVPN Test**, illustrated as follows:



 Copyright @ 2016 Pepwave

21.15 Wake-on-LAN

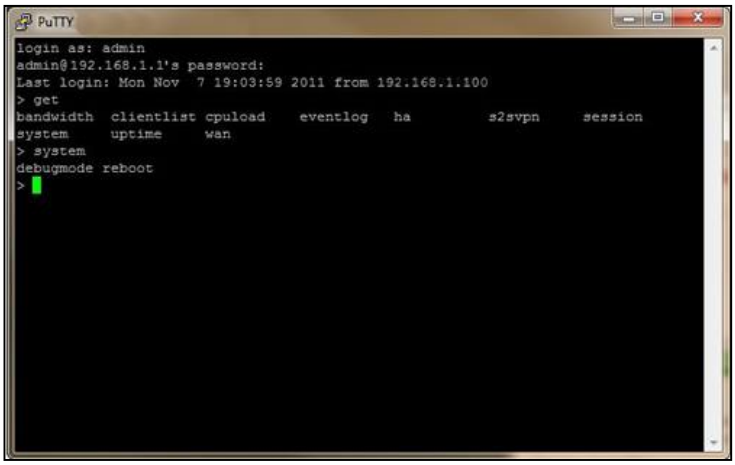
Peplink routers can send special “magic packets” to any client specified from the Web UI. To access this feature, navigate to **System > Tools > Wake-on-LAN**



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

21.16 CLI (Command Line Interface Support)

The CLI (command line interface) can be accessed via SSH. This field enables CLI support. The below settings specify which TCP port and which interface(s) should accept remote SSH CLI access. The user name and password used for remote SSH CLI access are the same as those used for web admin access.



 Copyright @ 2016 Pepwave

22 Status

22.1 Device

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

System Information	
Router Name	MAX_HD2_8D1C
Model	Pepwave MAX HD2
Hardware Revision	2
Serial Number	2830-A48A-8D1C
Firmware	6.2.0 build 2891
PepVPN Version	4.0.0
Modem Support Version	1017 (Modem Support List)
Host Name	max-hd2-8d1c
Uptime	7 days 50 minutes
System Time	Mon Feb 23 11:14:13 WET 2015
Diagnostic Report	Download
Remote Assistance	Turn on

System Information	
Router Name	This is the name specified in the **Router Name** field located at **System>Admin Security**.
Model	This shows the model name and number of this device.
Product Code	If your model uses a product code, it will appear here.
Hardware Revision	This shows the hardware version of this device.
Serial Number	This shows the serial number of this device.
Firmware	This shows the firmware version this device is currently running.
PepVPN Version	This shows the current PepVPN version.
Modem Support Version	This shows the modem support version. For a list of supported modems, click **Modem Support List**.
Host Name	The host name assigned to the Pepwave router appears here.
Uptime	This shows the length of time since the device has been rebooted.
System Time	This shows the current system time.
Diagnostic Report	The **Download** link is for exporting a diagnostic report file required for system investigation.

 Copyright @ 2016 Pepwave

Remote Assistance	Click **Turn on** to enable remote assistance.

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

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

Important Note

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

22.1.1 GPS Data

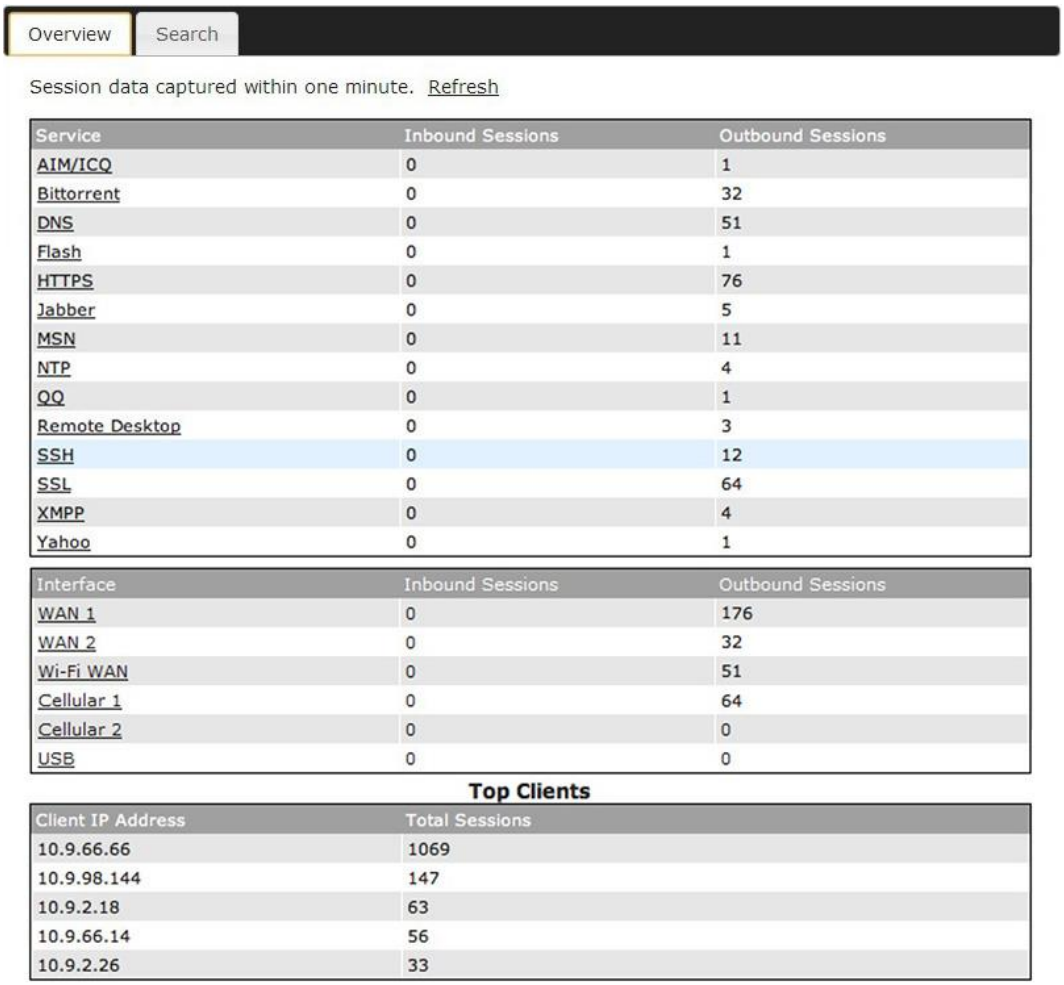
The MAX HD2 and HD2 IP67 automatically store up to seven days of GPS location data in GPS eXchange format (GPX). To review this data using third-party applications, click **Status>Device** and then download your GPX file.

The Pepwave MAX BR1, HD2, and HD2 IP67 export real-time location data in NMEA format through the LAN IP address at TCP port 60660. It is accessible from the LAN or over a SpeedFusion connection. To access the data via a virtual serial port, install a virtual serial port driver. Visit http://www.peplink.com/index.php?view=faq&id=294 to download the driver.

 Copyright @ 2016 Pepwave

22.2 Active Sessions

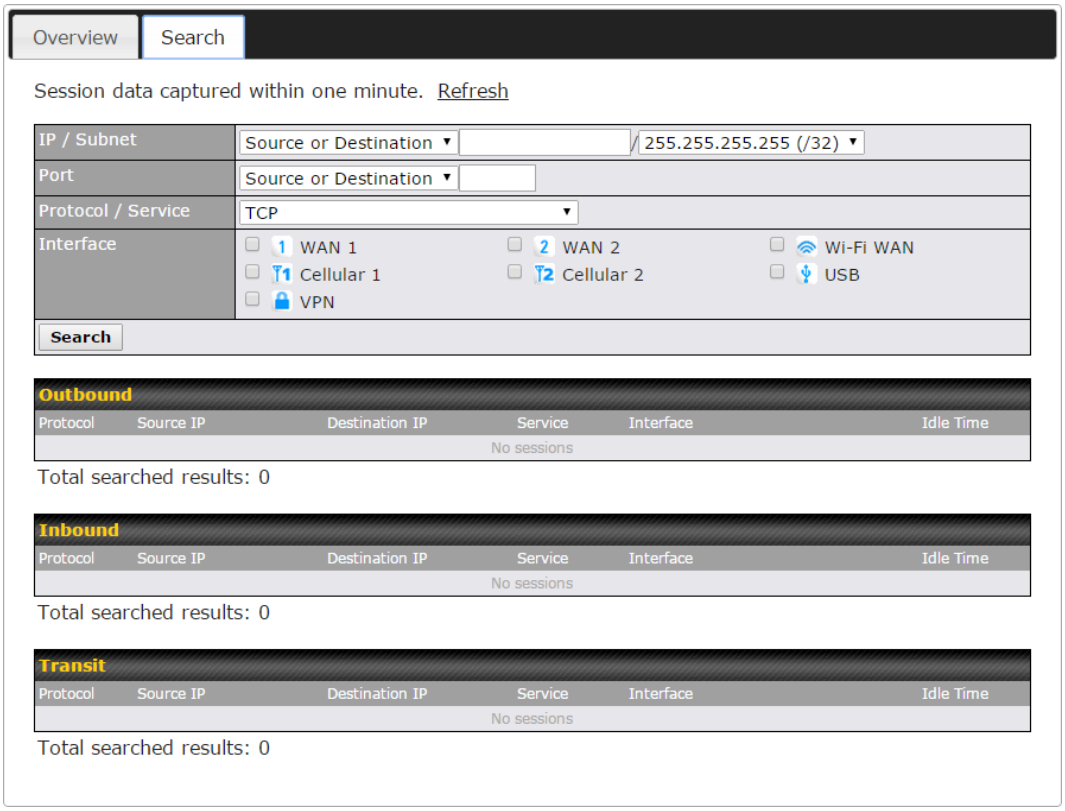
Information on active sessions can be found at **Status>Active Sessions>Overview.**



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

 Copyright @ 2016 Pepwave

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



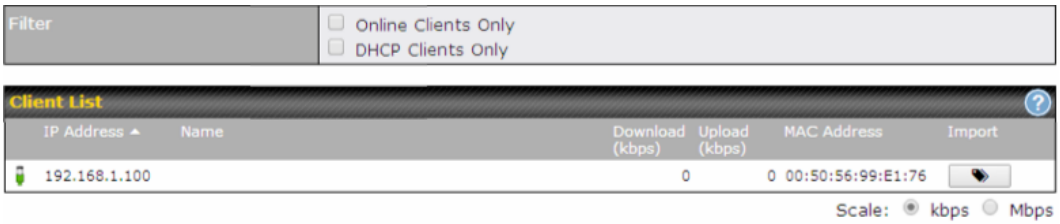
This **Active Sessions** section displays the active inbound/outbound sessions of each WAN connection on the Pepwave router. A filter is available to sort active session information. Enter a keyword in the field or check one of the WAN connection boxes for filtering.

 Copyright @ 2016 Pepwave

22.3 Client List

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

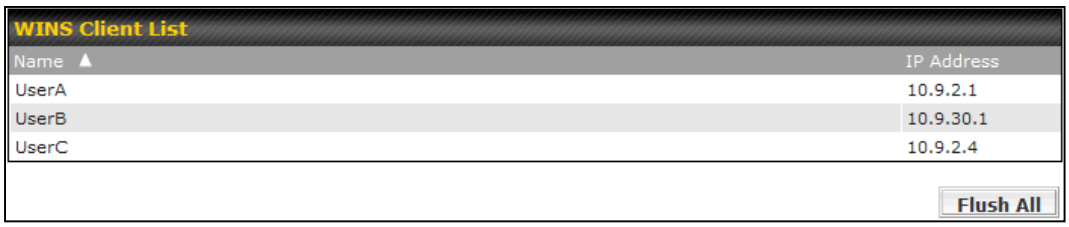
Clients can be imported into the DHCP reservation table by clicking the button on the right. You can update the record after import by going to **Network>LAN**.



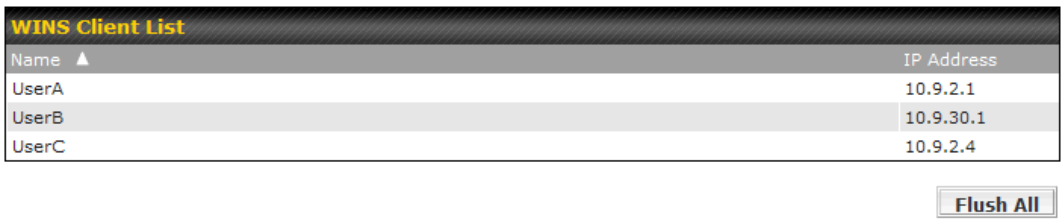
If the PPTP server (see **Section 19.2),** SpeedFusion™ (see **Section 12.1**), or AP controller (see **Section 20**) is enabled, you may see the corresponding connection name listed in the **Name** field.

22.4 WINS Client

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



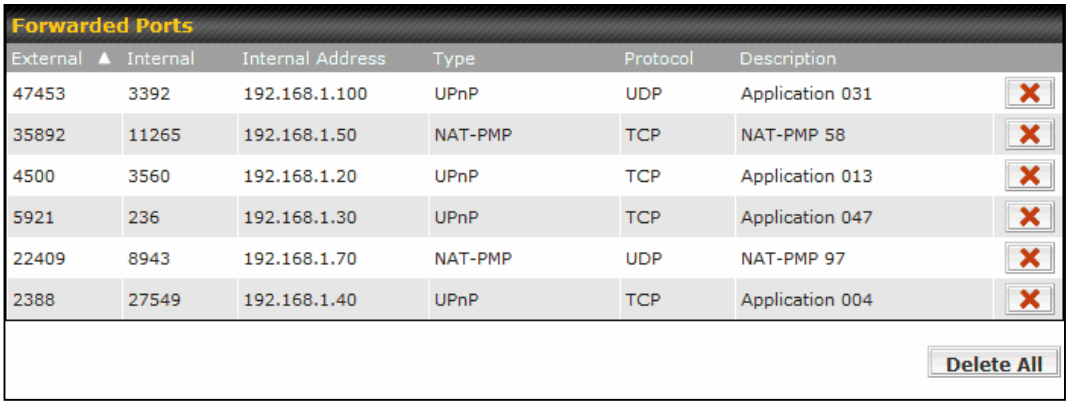
The WINS client table lists the IP addresses and names of WINS clients. This option will only be available when you have enabled the WINS server (navigation: **Network>Interfaces>LAN**). The names of clients retrieved will be automatically matched into the Client List (see previous section). Click **Flush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



 Copyright @ 2016 Pepwave

22.5 UPnP / NAT-PMP

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



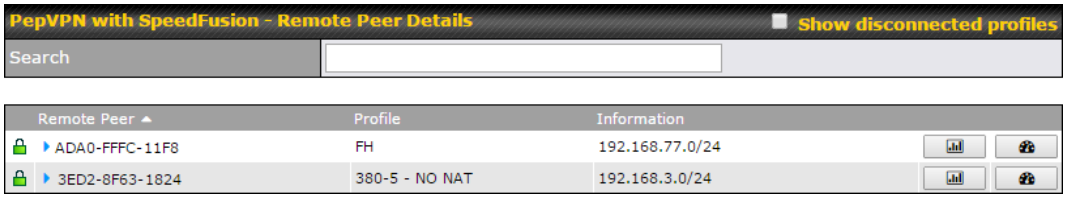
Click to delete a single UPnP / NAT-PMP record in its corresponding row. To delete all records, click **Delete All** on the right-hand side below the table.

Important Note

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

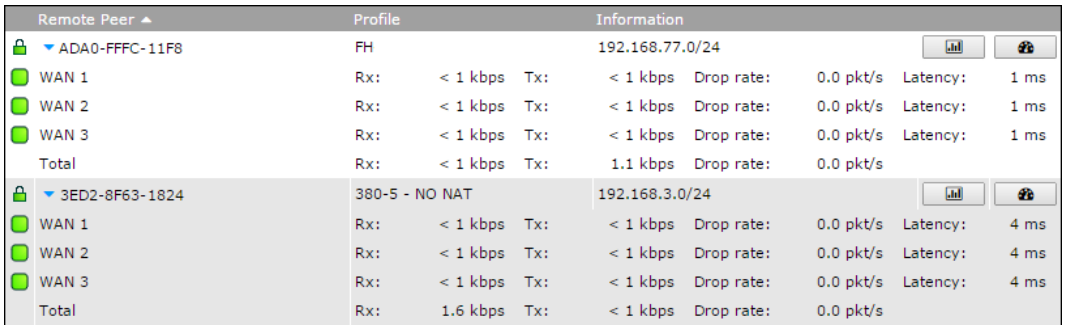
22.6 SpeedFusion Status

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



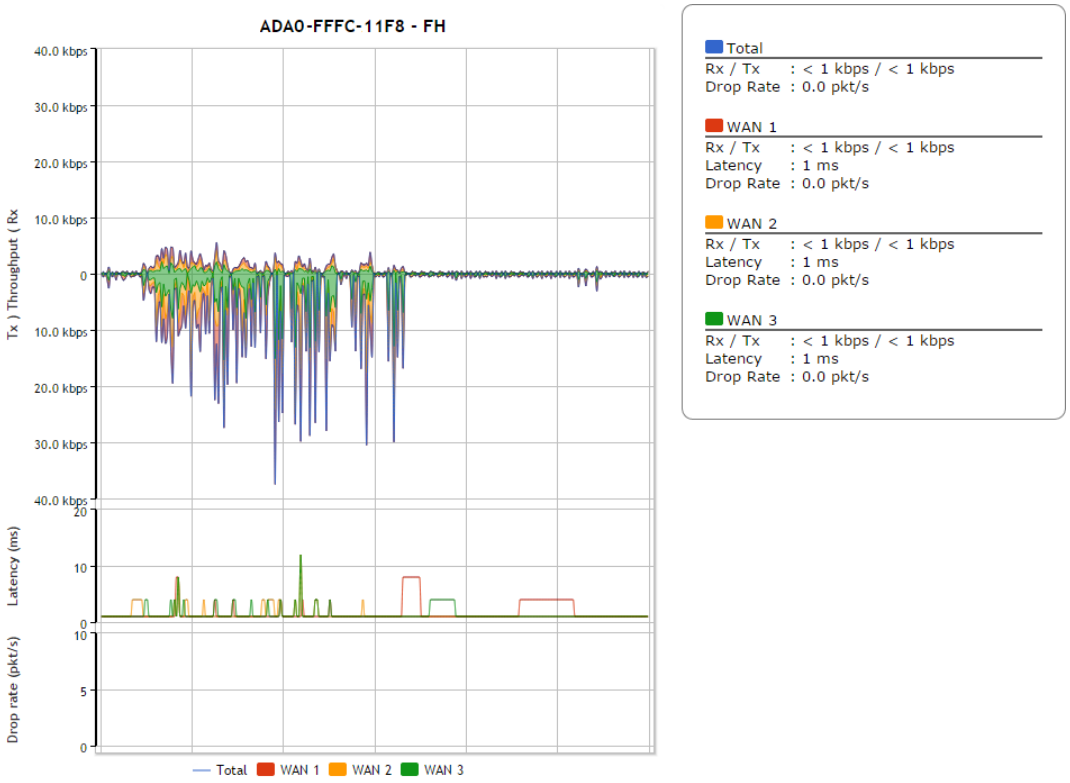
Click on the corresponding peer name to explore the WAN connection(s) status and subnet information of each VPN peer.

 Copyright @ 2016 Pepwave



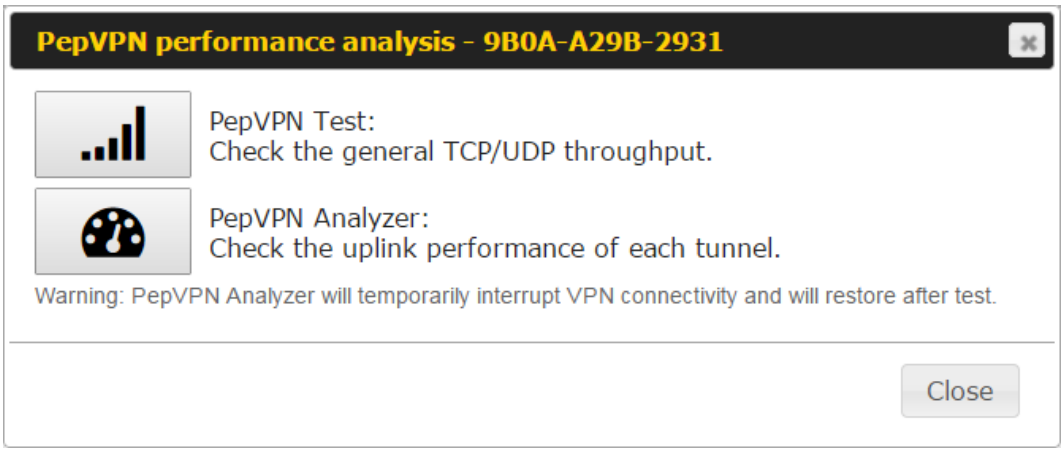
Remote Peer	Profile	Information
ADA0-FFFC-11F8	FH	192.168.77.0/24
WAN 1	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 1 ms
WAN 2	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 1 ms
WAN 3	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 1 ms
Total	Rx: < 1 kbps Tx: 1.1 kbps	Drop rate: 0.0 pkt/s
3ED2-8F63-1824	380-5 - NO NAT	192.168.3.0/24
WAN 1	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 4 ms
WAN 2	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 4 ms
WAN 3	Rx: < 1 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s Latency: 4 ms
Total	Rx: 1.6 kbps Tx: < 1 kbps	Drop rate: 0.0 pkt/s

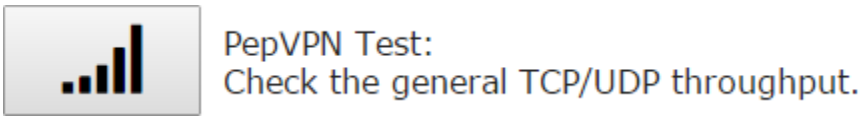
Click the button for a chart displaying real-time throughput, latency, and drop-rate information for each WAN connection.



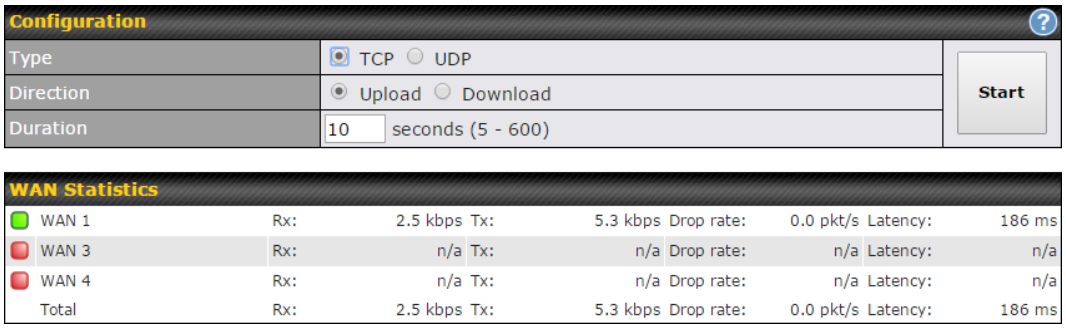
When pressing the button, the following menu will appear:

 Copyright @ 2016 Pepwave

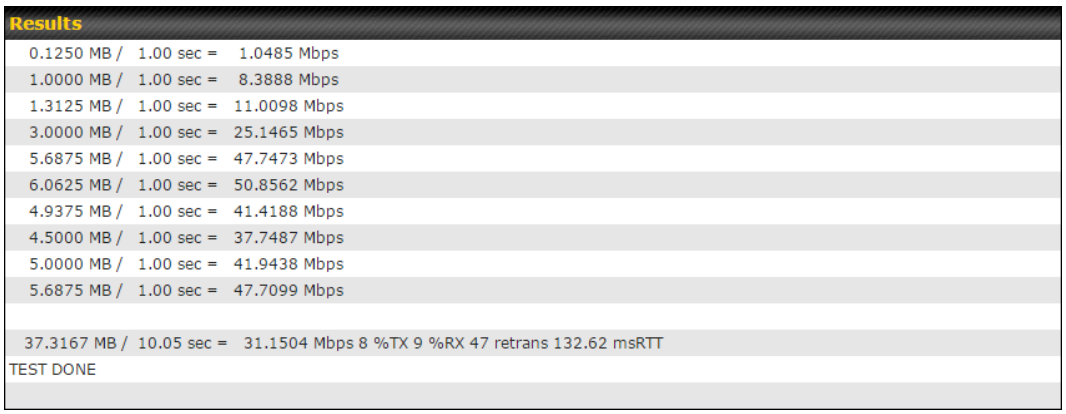




After clicking the icon, the following menu appears:



Select the L2 protocol (TCP/UDP), direction, and duration and click the **Start** button to begin the general throughput test.



 Copyright @ 2016 Pepwave

PepVPN Analyzer:
Check the uplink performance of each tunnel.

The bandwidth bonding feature of PepVPN occurs when multiple WAN lines from one end merge with multiple WAN lines from the other end. For this to happen, each WAN line needs to form a connection with all the WAN lines on the opposite end. The function of the PepVPN analyzer is to report the throughput, packet loss, and latency of all possible combinations of connections. **Please note that the PepVPN Analyzer will temporarily interrupt VPN connectivity and will restore after test.**

After clicking the icon, the analyzer will require several minutes to perform its analysis depending the number of WAN links in the SpeedFusion™ Tunnel. Once the test the complete, the report will appear:

Results

Estimated time: 150 s
Time remaining: 0 s

100%

Local WAN1 > Remote WAN3	Local WAN1 > Remote WAN4	Local WAN1 > Remote WAN5	Local WAN1 > Remote WAN6	Tx Avg. (Mbps)	Tx Max. (Mbps)	Packet loss (%)	RTT (ms)
O				5.87	16.95	0.76	420.51
	O			20.72	26.39	1.59	29.89
		O		30.10	43.69	2.24	29.61
			O	45.01	55.93	2.16	28.24
O	O			24.87	33.56	0.86	49.86
O		O		19.30	31.28	0.01	49.78
	O	O		18.59	30.41	2.08	39.78
O	O	O		20.56	34.60	0.00	38.11
O			O	36.70	59.16	2.64	42.06
	O		O	19.98	30.40	4.40	38.01
O	O		O	31.63	42.99	0.72	37.99
		O	O	36.88	55.78	2.60	33.89
O		O	O	38.30	47.89	0.01	29.98
	O	O	O	33.21	55.23	2.69	30.48
O	O	O	O	30.02	46.66	3.77	28.68

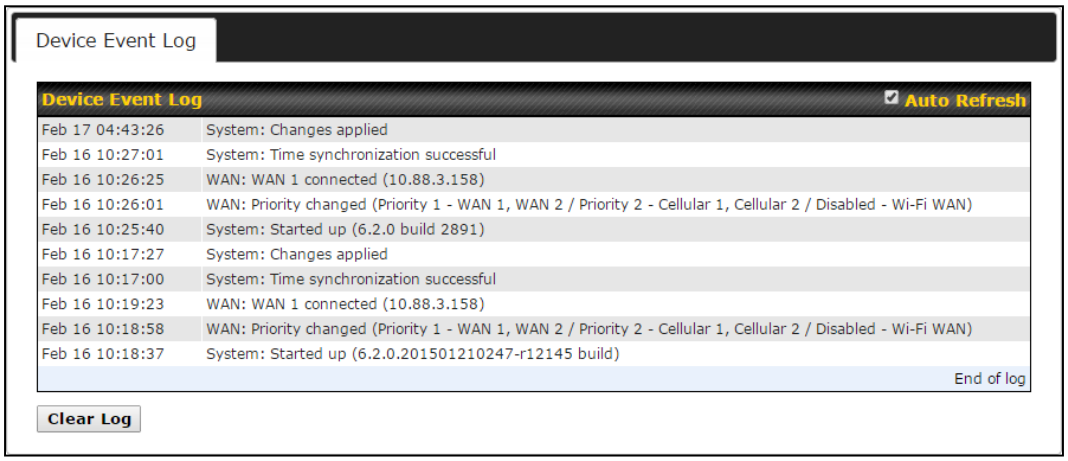
"O" indicates that specific WAN / Tunnel is active for that particular test.

"Tx Avg." is the averaged throughput across the full 10 seconds time, while "Tx Max." is the averaged throughput of the fastest 30% of time.

 Copyright @ 2016 Pepwave

22.7 Event Log

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



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

22.8 Bandwidth

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

 Copyright @ 2016 Pepwave

22.8.1 Real-Time

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

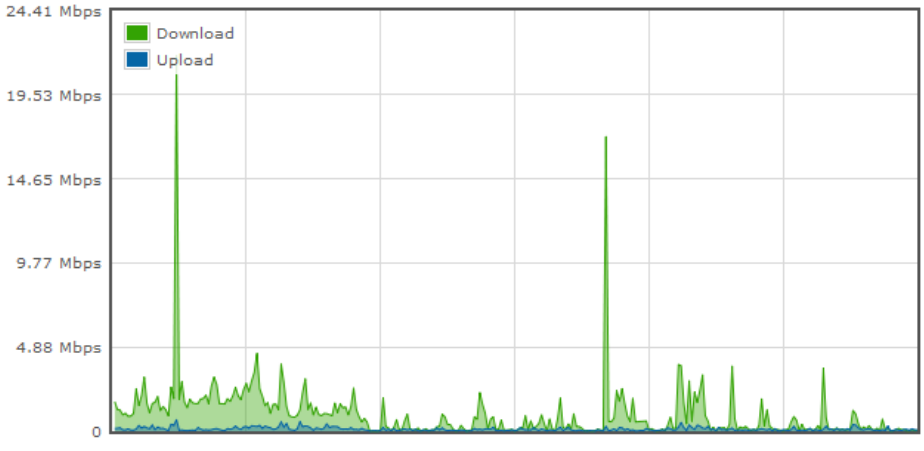
Data transferred since installation (Sun Oct 10 05:56:02 PST 2010)

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

Data transferred since last reboot [Hide Details]

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

Aggregated Transfer



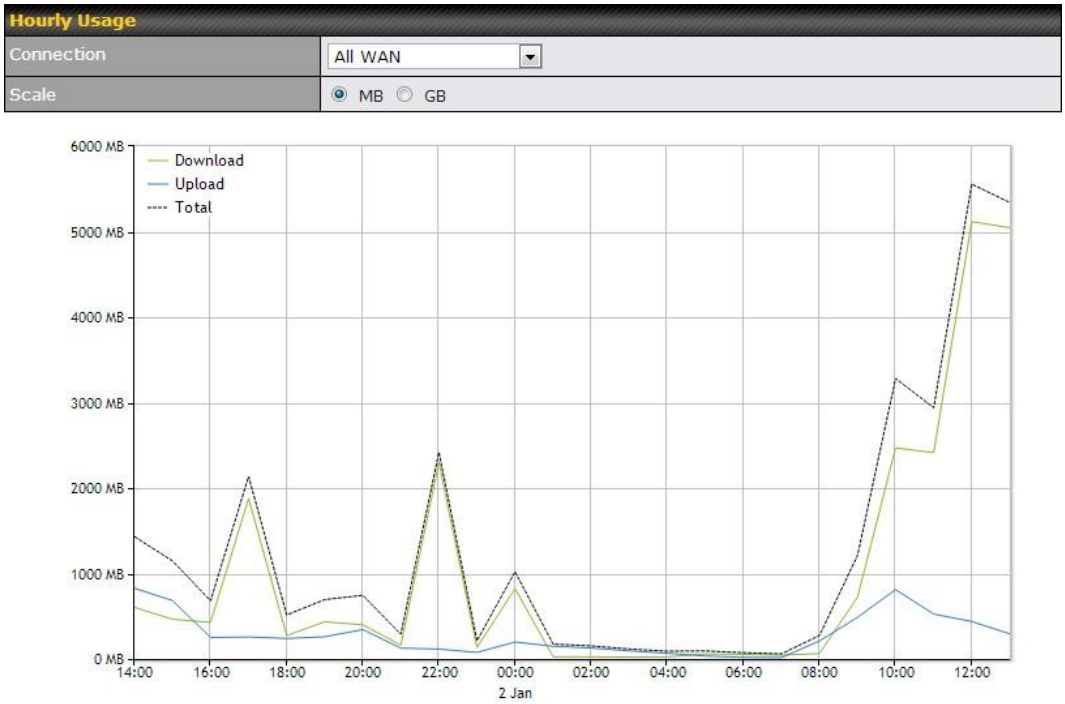
Avg: 0.99 Mbps 0.12 Mbps Peak: 21.78 Mbps 0.67 Mbps Stacked

	Download	Upload	Total
Overall	61 kbps	75 kbps	136 kbps

 Copyright @ 2016 Pepwave

22.8.2 Hourly

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



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

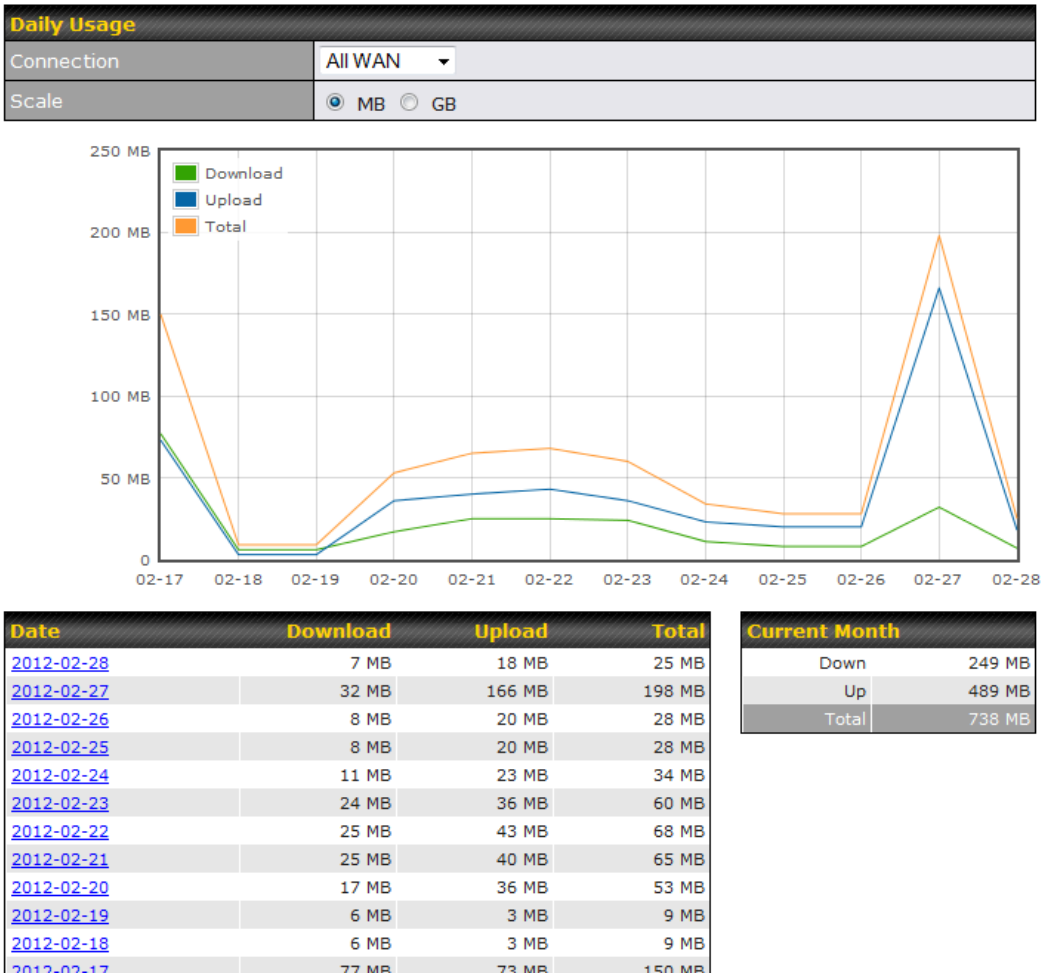
22.8.3 Daily

 Copyright @ 2016 Pepwave

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

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

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



Date	Download	Upload	Total
2012-02-28	7 MB	18 MB	25 MB
2012-02-27	32 MB	166 MB	198 MB
2012-02-26	8 MB	20 MB	28 MB
2012-02-25	8 MB	20 MB	28 MB
2012-02-24	11 MB	23 MB	34 MB
2012-02-23	24 MB	36 MB	60 MB
2012-02-22	25 MB	43 MB	68 MB
2012-02-21	25 MB	40 MB	65 MB
2012-02-20	17 MB	36 MB	53 MB
2012-02-19	6 MB	3 MB	9 MB
2012-02-18	6 MB	3 MB	9 MB
2012-02-17	77 MB	73 MB	150 MB

Current Month	
Down	249 MB
Up	489 MB
Total	738 MB

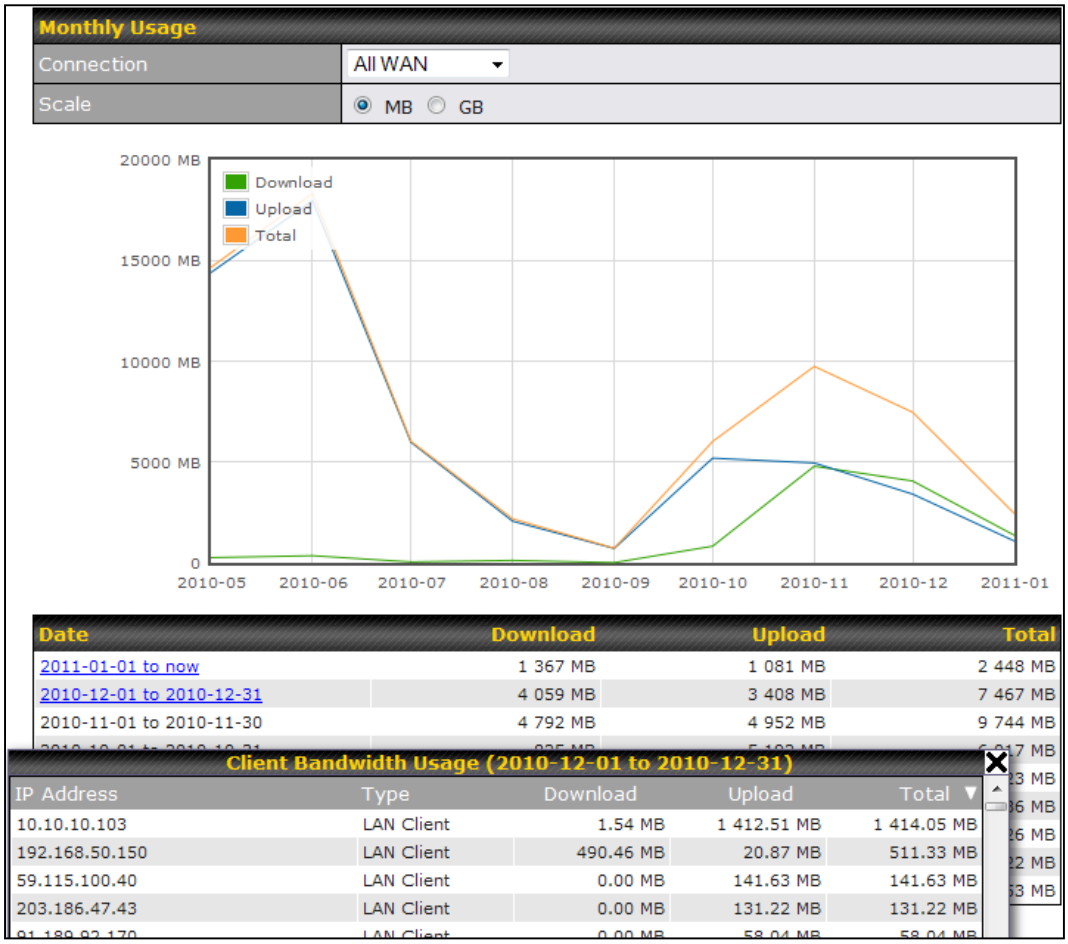
All WAN Daily Bandwidth Usage

 Copyright @ 2016 Pepwave

22.8.4 Monthly

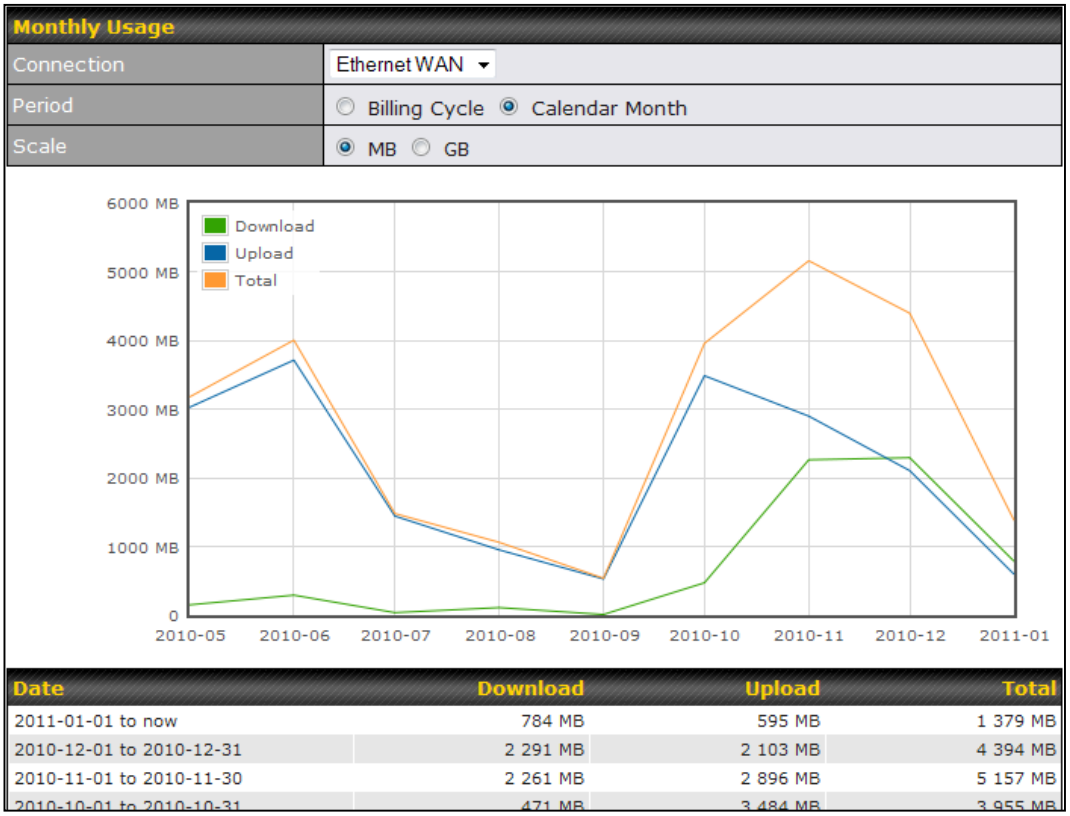
This page shows the monthly bandwidth usage for each WAN connection. If you have enabled the **Bandwidth Monitoring** feature, you can check the usage of each particular connection and view the information by **Billing Cycle** or by **Calendar Month**.

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



All WAN Monthly Bandwidth Usage

 Copyright @ 2016 Pepwave



Date	Download	Upload	Total
2011-01-01 to now	784 MB	595 MB	1 379 MB
2010-12-01 to 2010-12-31	2 291 MB	2 103 MB	4 394 MB
2010-11-01 to 2010-11-30	2 261 MB	2 896 MB	5 157 MB
2010-10-01 to 2010-10-31	471 MB	3 484 MB	3 955 MB

Ethernet WAN Monthly Bandwidth Usage

Tip

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

 Copyright @ 2016 Pepwave

Appendix A. Restoration of Factory Defaults

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

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

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

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

Appendix B. Case Studies

MPLS Alternative

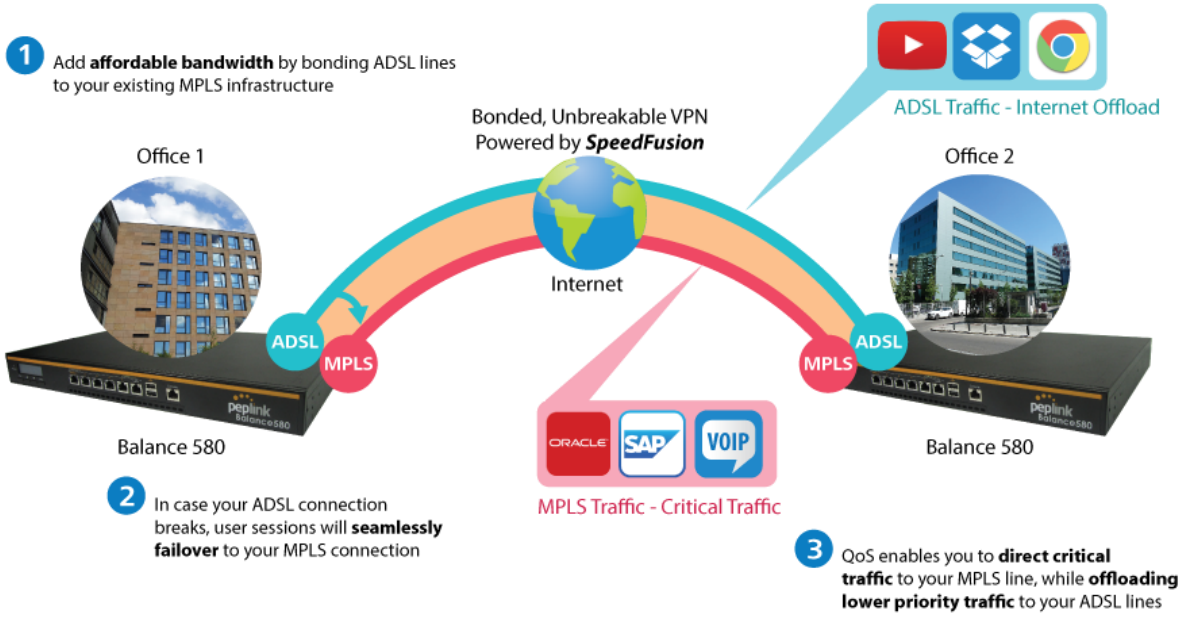
Our SpeedFusion enabled routers can be used to bond multiple low-cost/commodity Internet connections to replace an expensive managed business Internet connection, private leased line, MPLS, and frame relay without sacrificing reliability and availability.

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

Our MAX HD4 routers are capable of connecting to four different wireless networks simultaneously.

 Copyright @ 2016 Pepwave

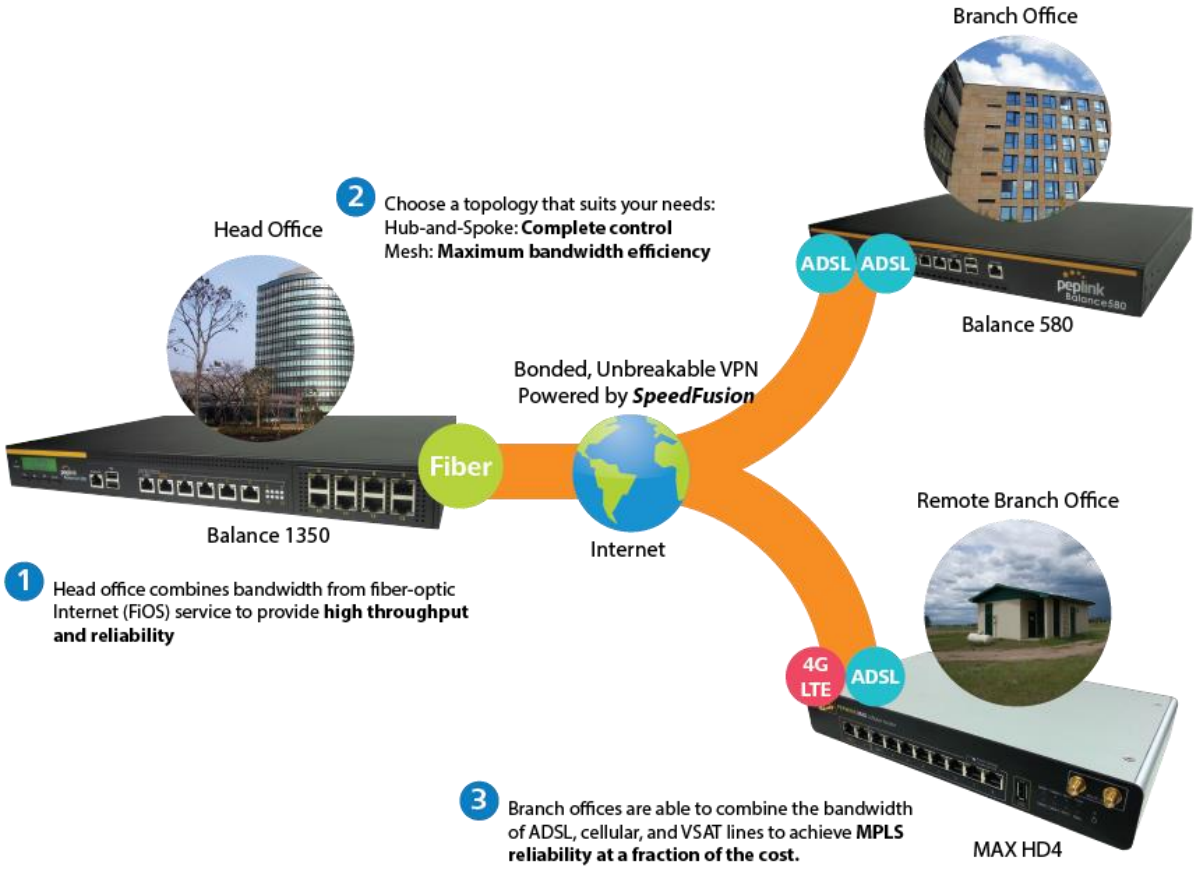
Option 1: MPLS Supplement



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

 Copyright @ 2016 Pepwave

Option 2: MPLS Alternative

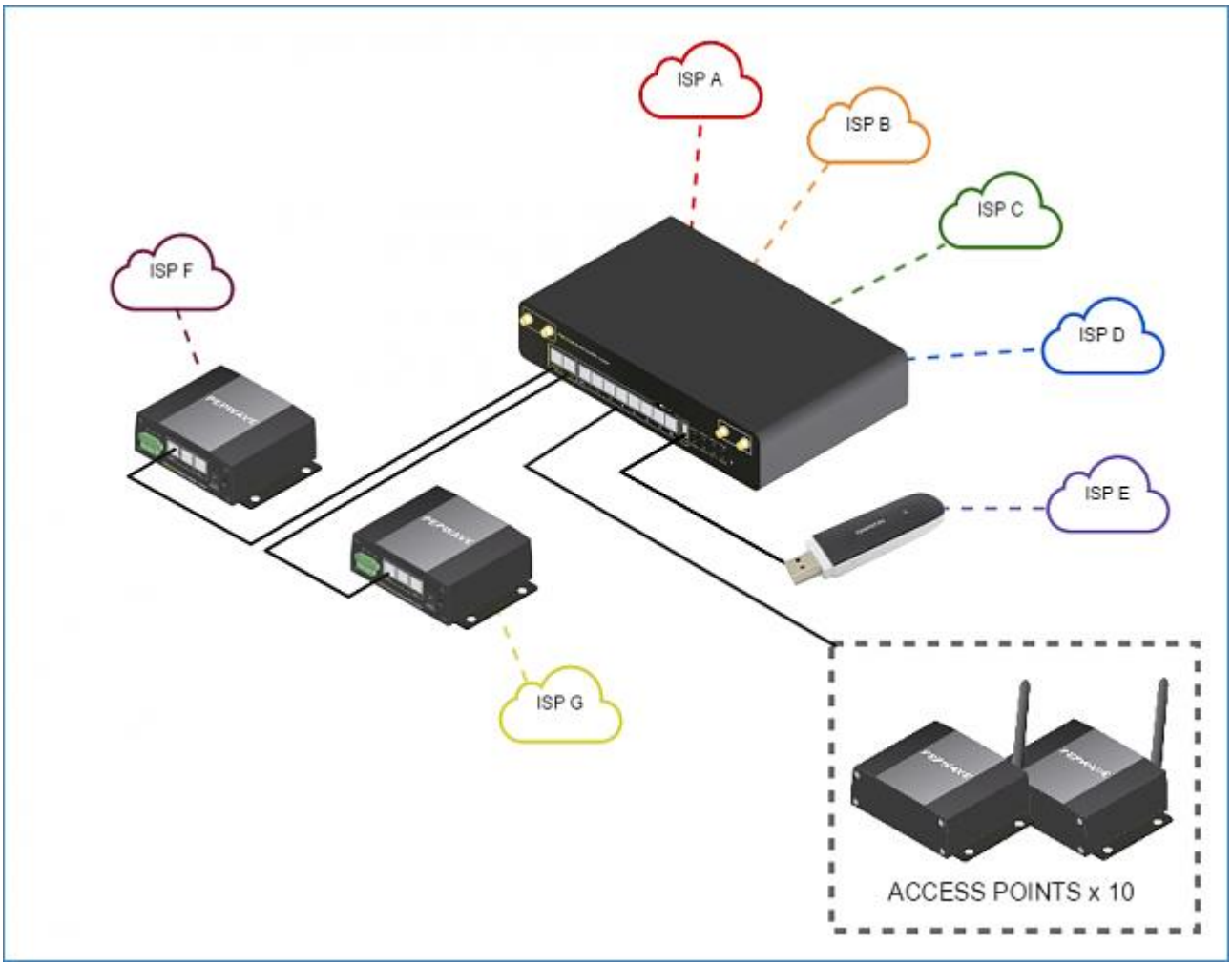


Achieve faster speeds and greater reliability while paying only 20% of MPLS costs by connecting multiple ADSL, 3G, and 4G LTE links. Choose a topology that suits your requirements: a hub-and-spoke topology maximizes control over your network, while a meshed topology can reduce your bandwidth overhead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

 Copyright @ 2016 Pepwave

Network Traffic Distribution

How to distribute network traffic with 7 x LTE Cellular WANs simultaneously using a HD4



Overview

Picture a coach full of some of the world's finest developers, programmers, hackers and technologists used as transportation between the company car park and corporate headquarters. Or perhaps a temporary office deployed rapidly for disaster recovery or whilst waiting for fixed line connectivity to be installed.

Requirement:

- As much bandwidth as possible to share between bandwidth hungry users and their applications.
- The ability to use multiple cellular carriers, dependant on coverage (particularly if installed in a moving vehicle) and bandwidth allowance.

 Copyright @ 2016 Pepwave

- Intelligent load balancing across all available connections and automatic WAN health/availability detection.

- In the case of a rapid site deployment - complete wireless network coverage of the building.

Solution Design:

- A HD4 is installed as the local internet gateway. It has 4 active LTE cellular internet connections to the internet built in, and supports dual SIMs per connection (in an Active/Passive configuration for coverage or bandwidth allowance purposes).

- The HD4 has two BR1 LTE routers connected on its wired WAN ports. These also have an active cellular internet connection (with the same dual sim support as above).

- The HD4 also has a USB LTE cellular Dongle attached to provide another internet connection.

- Connected to the LAN of the HD4 are up to 10 Peplink Wi-Fi access points. 8 APs can be directly connected to the HD4 using the 8 physical LAN ports, any more are connected using an additional switch (not shown above).

- The HD4 acts as a AP Controller for the attached APs, providing centralised Wi-Fi configuration, firmware and security management.

Future Expansion:

- The HD4 supports up to 8 SIM cards (with 4 actively used at any one time), the BR1s support two SIM cards each (with one actively used by each BR1). The additional SIMs can be added to take advantage of cellular data promotions, or to provide the highest number

Additional Options / Considerations

- A Captive Portal can be deployed on the HD4 to allocate a bandwidth allowance per connected client to control bandwidth consumption

- External DNS providers (such as OpenDNS) can be used to restrict internet access destinations, blocking video streaming sites, OS update services and other high bandwidth activities.

- QoS can be applied to prioritise key applications (such as VoIP)

- SpeedFusion VPN and WAN Smoothing might be configured to provide a secure, high quality unbreakable VPN connection to corporate applications and resources improving staff productivity.

 Copyright @ 2016 Pepwave

- Using a SpeedFusion VPN connection to the vehicle, wall boards and bulkhead mounted displays can show the vehicle location (using the HD4's inbuilt GPS) and other important corporate announcements pushed to the vehicle displays from a central corporate server.

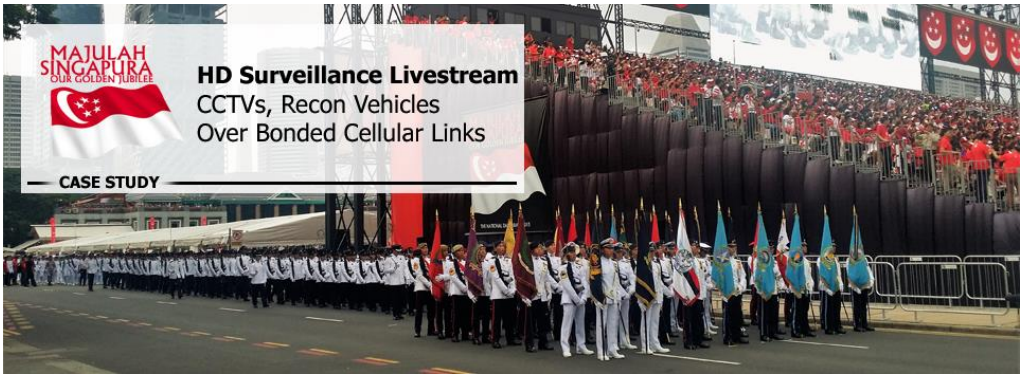
Devices Deployed: MAX HD4, BR1, AP One Series

Singapore National Day Parade 2015

Client: Singapore National Day Parade

Challenges:

- Security
- Bandwidth
- Connectivity
- Portability



Solution:

- MAX BR1 ENT
- MAX BR1 Slim
- MAX HD2
- MAX HD4
- Balance 2500
- SpeedFusion

August, 2015. Singapore held their largest ever National Day Parade to commemorate their 50th year of independence. The main display of the event – Singapore's Mobile Column comprised of more than 150 military vehicles and covered a distance of 20 KM along the Greater Marina Bay area.

This raised a multitude of security challenges and chief amongst which, was public safety. Road traffic, spectator safety, Mobile Column status, these were just a few of a long list of things that required real-time surveillance. This real-time data was to be fed constantly to the Core Command Group and various public safety agencies, so having rapidly deployable networks with huge amounts of bandwidth and top-notch reliability was of paramount importance.

The plan was to deploy a combination of HD pan tilt zoom (PTZ) CCTVs on high rise rooftops and roadside in the hundreds. But even with these super zoom-capable cameras, blind spots and blocked line of sights were inevitable. This was where the Mobile Rider

 Copyright @ 2016 Pepwave

came in. An electronic self-balancing scooter fitted with 4 HD cameras, 4G/LTE Peplink BR1 Slim router and batteries to last for 6 hours covered the grounds that the fixed-locations CCTVs could not.

To enable their high definition monitoring and streaming throughout the parade stretch, the Event Committee appointed Peplink Partner iT-DnS PTE Ltd., who has a solid track record in rapidly deployable networking solutions for event surveillance, as well as years of experience in managing public safety monitoring for past National Day Parades. iT-DnS decided to deploy a Balance 2500 in order to achieve a SpeedFusion bonded network with 2Gbps of throughput. Scattered throughout the stretch was an assortment of surveillance cameras fitted with MAX BR1 ENTs and BR1 Slims. Public safety agencies that had access to the monitoring feed connected via MAX HD2s and HD4s. As for the Mobile Rider solution, the MAX BR1 Slim with its low power requirements and USB port allows it to run for 6 hours continuously with a 10,000mAh portable battery pack.

The Core Command Group was able to stream real time HD footage that allowed them to make decisions and respond to immediate threats. Multiple agencies also had simultaneous access to the feed elsewhere to monitor other safety and strategic concerns. Due to the on-ground effectiveness of the Mobile Rider vehicle, the number of surveillance cameras deployed were reduced by more than half, saving the organizers at least 50% in cost.

“Love it! The MAX series and SpeedFusion provided the flexibility and stability like we’ve never seen before!” -Melvin Lee, Operation Director. iT-DnS PTE Ltd.

 Copyright @ 2016 Pepwave

UNOLS (University-National Oceanographic Laboratory System)

"R/V Roger Revelle. A US Navy-owned research vessel operated by Scripps Institution of Oceanography as part of the wider UNOLS (University-National Oceanographic Laboratory System) fleet. We replaced our $10,000+ Cisco router with a Peplink Balance 580 to load balance now three satellite connections (a proprietary system developed in-house, and two commercial systems from C-Bird and Inmarsat), and (if available) shore-based network connection and/or a 3g/4g cellular network. The 580 also administers several AP-One's deployed across the vessel.

We require a robust, and reliable internet link to shore in order for scientists onboard to conduct successful oceanographic research (downloading weather maps, downloading live data from equipment deployed in the ocean, live satellite imagery, outsourcing data processing at shore, outreach programs, etc...).

[Photo taken by me, in Keelung Harbor, Taiwan Oct 2014; as we're in between science deployments in and around the South China Sea. Notice the Seatel radome up on top using our propreitary HiSeasNet C-Band Satellite Internet System, and the smaller radome off the port side above the bridge, which is the Inmarsat FleetBroadBand system.]"

Daniel Yang – UNOLS

 Copyright @ 2016 Pepwave

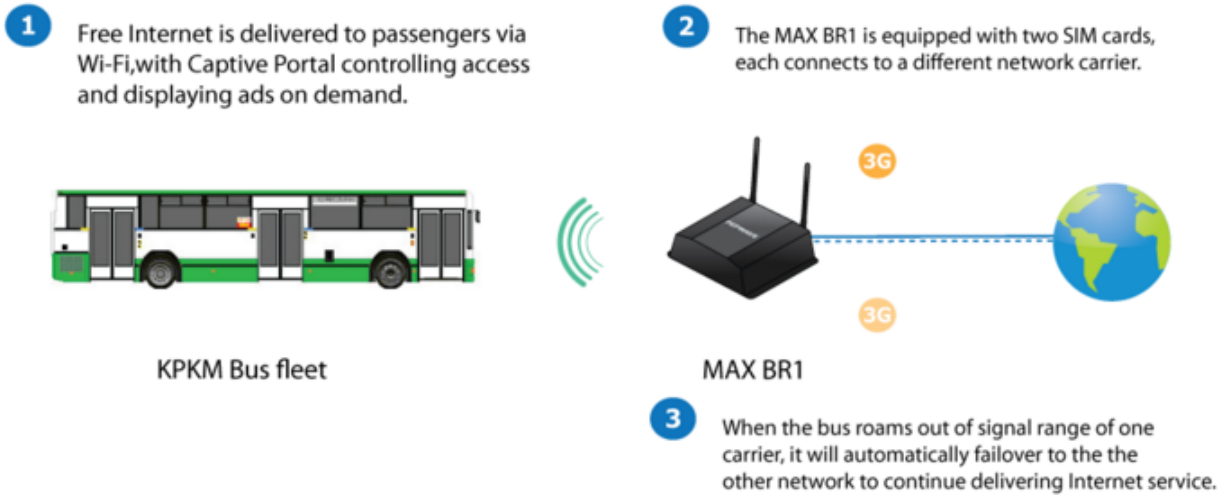
KPKM Pioneers Bus Wi-Fi With Successful Peplink Deployment

The Municipal Enterprise of Public Transport, Ltd (KPKM), a privatized public bus company in Poland, had been looking for a way to differentiate itself and stand out from the competition. KPKM decided to do something that had never been attempted before: offering free Wi-Fi Internet to their passengers. With ACO Solutions' assistance, KPKM conducted lengthy trials and determined Peplink to be the best-performing solution. The ensuing installation for the entire fleet took just two weeks to complete, and KPKM gained more than just the ability to offer free Wi-Fi Internet.

Requirements

- Offer quality Wi-Fi Internet to all bus passengers, for free
- A system that can simultaneously handle Internet access from all on-board passengers
- Display advanced Captive Portals with information for passengers or advertising.
- Integrated fleet management system, with the ability to export the collected data.

 Copyright @ 2016 Pepwave



Solution

- Pepwave MAX BR1
- InControl 2 Fleet Management
- Unbreakable Internet

Benefits

- InControl 2's flexibility enabled the implementation of ACO Solutions' advertising system designed to bring in revenue and sustain the free Internet
- InControl 2's powerful API makes it possible for a third party systems to interface with Peplink devices. KPKM is able to collect user statistics and improve scheduling efficiency with the data
- Passengers enjoy stable, free Wi-Fi Internet
- The entire fleet's real-time location now available from InControl 2's fleet tracking and management
- Highly durable, operating between five and 122 degrees Fahrenheit, without issue
- System has laid the groundwork for future expansion, such as CCTV, bus tracking via mobile apps for users, and display of bus location on timetables
- Successfully set an example and provided proof of concept for the rest of the public transport sector in Poland

 Copyright @ 2016 Pepwave

- Declaration

1. **The device supports time division technology**

2. **Federal Communication Commission Interference Statement**

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

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

- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

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

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

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

IMPORTANT NOTE
FCC Radiation Exposure Statement (for MAX700/ HD2/ HD2 IP67/ BR1)
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

 Copyright @ 2016 Pepwave

FCC Radiation Exposure Statement (for MAX On-The-Go)

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

1. 20cm minimum when the product is operated alone without co-transmitting with a plug-in 3G USB dongle device.
2. 65cm minimum when the product is operated with a plug-in 3G USB device which has maximum of 7W ERP output power.
3. For co-transmission scenario which is not covered above, please consult the RF technician or device supplier.

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

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

3. CE Statement for Pepwave Routers

Europe – EU Declaration of Conformity

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

- EN 60950-1: 2006 + A11 : 2009+A1 : 2010+ A12: 2011
  Safety of Information Technology Equipment

- EN50385 : 2002 / Article 3(1)(a)
  Product standard to demonstrate the compliance of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the reference levels related to human exposure to radio frequency electromagnetic fields (110MHz - 40 GHz) - General public

  EN 300 328 V1.7.1: 2006
  Electromagnetic compatibility and Radio spectrum Matters (ERM); Wideband Transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using spread spectrum modulation techniques; Harmonized EN covering essential requirements under article 3.2 of the R&TTE Directive

- EN 301 908-1 V5.2.1: 2011
  Electromagnetic compatibility and Radio spectrum Matters (ERM); Base Stations (BS), Repeaters and User Equipment (UE) for IMT-2000 Third-Generation cellular networks; Part 1: Harmonized EN for IMT-2000, introduction and common

 Copyright @ 2016 Pepwave

requirements, covering essential requirements of article 3.2 of the R&TTE Directive

- EN 301 511 V9.0.2: 2003
  Global System for Mobile communications (GSM); Harmonized standard for mobile stations in the GSM 900 and DCS 1800 bands covering essential requirements under article 3.2 of the R&TTE directive (1999/5/EC)

- EN 301 489-1 V1.9.2: 2008
  Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements

- EN 301 489-7 V1.3.1: 2005
  ElectroMagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment ad services; Part 7: Specific conditions for mobile and portable radio and ancillary equipment of digital cellular radio telecommunications systems (GSM and DCS)

- EN 301 489-17 V2.2.1: 2012
  Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for 2,4 GHz wideband transmission systems and 5 GHz high performance RLAN equipment

- EN 301 489-24 V1.5.1: 2010
  Electromagnetic compatibility and Radio Spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 24: Specific conditions for IMT-2000 CDMA Direct Spread (UTRA) for Mobile and portable (UE) radio and ancillary equipment

CE 0081

cs Česky [Czech]	*[Jméno výrobce]* tímto prohlašuje, že tento *[typ zařízení]* je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.
da Dansk [Danish]	Undertegnede *[fabrikantens navn]* erklærer herved, at følgende udstyr *[udstyrets typebetegnelse]* overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.
de Deutsch [German]	Hiermit erklärt *[Name des Herstellers]*, dass sich das Gerät *[Gerätetyp]* in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 1999/5/EG befindet.
et Eesti [Estonian]	Käesolevaga kinnitab *[tootja nimi = name of manufacturer]* seadme *[seadme tüüp = type of equipment]* vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.
en English	Hereby, *[name of manufacturer]*, declares that this *[type of equipment]* is in

 Copyright @ 2016 Pepwave

	compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.
es Español [Spanish]	Por medio de la presente *[nombre del fabricante]* declara que el *[clase de equipo]* cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.
el Ελληνική [Greek]	ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ *[name of manufacturer]* ΔΗΛΩΝΕΙ ΟΤΙ *[type of equipment]* ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1999/5/ΕΚ.
fr Français [French]	Par la présente *[nom du fabricant]* déclare que l'appareil *[type d'appareil]* est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.
it Italiano [Italian]	Con la presente *[nome del costruttore]* dichiara che questo *[tipo di apparecchio]* è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.
Latviski [Latvian]	Ar šo *[name of manufacturer / izgatavotāja nosaukums]* deklarē, ka *[type of equipment / iekārtas tips]* atbilst Direktīvas 1999/5/EK būtiskajām prasībām un citiem ar to saistītajiem noteikumiem.
Lietuvių [Lithuanian]	Šiuo *[manufacturer name]* deklaruoja, kad šis *[equipment type]* atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.
nl Nederlands [Dutch]	Hierbij verklaart *[naam van de fabrikant]* dat het toestel *[type van toestel]* in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG.
mt Malti [Maltese]	Hawnhekk, *[isem tal-manifattur]*, jiddikjara li dan *[il-mudel tal-prodott]* jikkonforma mal-ħtiġijiet essenzjali u ma provvedimenti oħrajn relevanti li hemm fid-Dirrettiva 1999/5/EC.
hu Magyar [Hungarian]	Alulírott, *[gyártó neve]* nyilatkozom, hogy a *[... típus]*megfelel a vonatkozó alapvetõ követelményeknek és az 1999/5/EC irányelv egyéb elõírásainak.
pl Polski [Polish]	Niniejszym *[nazwa producenta]* oświadcza, że *[nazwa wyrobu]* jest zgodny z zasadniczymi wymogami oraz pozostałymi stosownymi postanowieniami Dyrektywy 1999/5/EC.
pt Português [Portuguese]	*[Nome do fabricante]* declara que este *[tipo de equipamento]* está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.
sl Slovensko [Slovenian]	*[Ime proizvajalca]* izjavlja, da je ta *[tip opreme]* v skladu z bistvenimi zahtevami in ostalimi relevantnimi določili direktive 1999/5/ES.
Slovensky [Slovak]	*[Meno výrobcu]* týmto vyhlasuje, že *[typ zariadenia]*spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.
fi Suomi [Finnish]	*[Valmistaja = manufacturer]* vakuuttaa täten että *[type of equipment = laitteen tyyppimerkintä]* tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen.
sv Svenska [Swedish]	Härmed intygar *[företag]* att denna *[utrustningstyp]* står I överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

 Copyright @ 2016 Pepwave

Appendix C. Product Datasheets

 Copyright @ 2016 Pepwave

PEPWAVE
Broadband Possibilities

MAX BR1/BR2 IP55

IP55 Outdoor 4G LTE/3G Router

Water-proof

Dust protected

MIMO Directional

MIMO OMNI

Waterproof IP55 Enclosure

Deploy the BR1 IP55 with confidence in harsh indoor and outdoor environments. Its waterproof IP55 metal enclosure stands up to dust, vibration, and inclement weather, making it a great choice for industrial, emergency, and other heavy-duty applications.

Embedded MIMO & Omni Antennas

Configure your antenna on the fly. The BR1 IP55's built-in MIMO directional and Omni antennas are software selectable, so it's easy to optimize antenna performance at any time.

Built-in PoE & 3-Port Switch

Cut down on cabling and simplify deployments. The BR1 IP55 includes a built-in 3-port LAN switch to reduce clutter and the need for extra equipment. It also offers 802.3af PoE input and output, so one wire is all you need for both connectivity and power you can share with security cameras and other devices.

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
USB 4G/3G Modem Support
Support for Dynamic DNS services
WAN Port Convertible into LAN Port

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Per-Port VLAN Support

Load Balancing*
Intelligent Failover
Session Persistence
Per-Service Load Distribution
Multiple Algorithms

Complete VPN Solution
PepVPN/SpeedFusion Hot Failover/
SpeedFusion Bandwidth Bonding*
- Site-to-Site VPN
- Bandwidth Aggregation*
- Hot Failover
- 256-bit AES Encryption
- Pre-shared Key Authentication
- Dynamic Routing
- X.509 Certificate Support*

IPsec VPN (Network-to-Network)
- X.509 Certificate Support*

Advanced QoS
Individual Bandwidth Limit
Application Prioritization
- SIP, HTTPS, VPN QoS
- Custom Application QoS

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP

Captive Portal Support*
Support for Wired and Wireless LAN Clients
Support for RADIUS Authentication
Time and Usage Quotas on Open Access Mode
Built-in Customizable Splash Page

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklist

Device Management
Web Administrative Interface
Command Line Interface
InControl Cloud Management
Email Notification
Active Client & Session Lists
Bandwidth Usage Statistics
Syslog Service
SNMP v1, v2c and v3

*Available on selected models.

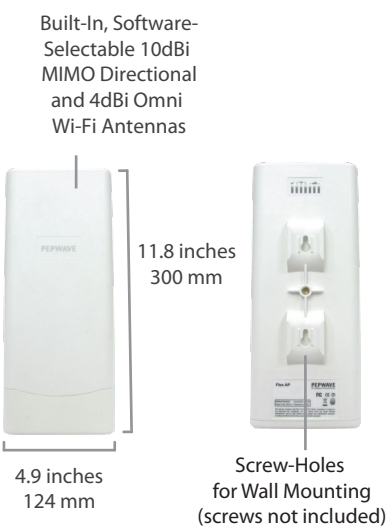
Works With

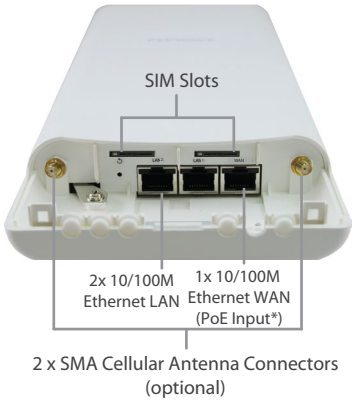
verizon at&t T··Mobile·

And worldwide 4G LTE/3G carriers

Specifications

	MAX BR1 IP55	MAX BR2 IP55
WAN Interface	1x GE 1x Embedded Outdoor LTE Modem	1x GE 2x Embedded Outdoor 3G Modem
LAN Interface	2x GE	
Wi-Fi Interface	802.11b/g/n 300 Mbps Wi-Fi WAN and/or AP	
Router Throughput	100Mbps	
Recommended Users	1-60	
Cellular Antenna Connector	Built-In, Switchable 2dBi Cellular Antenna and 2x SMA Cellular Antenna Connectors	
Power Input	Pepwave Passive PoE: 12V – 48V DC (48V Pepwave Passive PoE Input is Needed for 802.3af or Pepwave Passive PoE Output)#	
Power Output	Up To Two 802.3af or 48V Pepwave Passive PoE Outputs #	
Power Consumption	16W (max.)	
Dimensions	5.8 x 5.0 x 1.6 inches 147 x 128 x 40 mm	
Weight	0.96 pound 435 grams	
Operating Temperature	-40° – 149°F -40° – 65°C	
Humidity	15% – 95% (non-condensing)	
Certifications	FCC, CE, RoHS RF Port Lightning Immunity: ITU-T K.20 (+/- 1.5 kV)	
Warranty	1-Year Limited Warranty	





Requires 48V Pepwave Passive PoE input. Available separately.

Ordering Info

	Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)	VPN Functionality
4G LTE	MAX-BR1-LTE-US-IP55	Verizon /AT&T/T-Mobile	1	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800	PepVPN
	MAX-BR1-LTE-E-IP55	Europe/International	1	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900	PepVPN
3G	MAX-BR1-AE-IP55	Worldwide	1	-	WCDMA/HSDPA/HSUPA/HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 EDGE/GPRS/GSM: B2/1900, B3/1800, B5/850, B8/900	PepVPN
	MAX-BR2-AE-IP55	Worldwide	2	-	WCDMA/HSDPA/HSUPA/HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 EDGE/GPRS/GSM: B2/1900, B3/1800, B5/850, B8/900	PepVPN , and optional SpeedFusion Bonding
	MAX-BR2-AE-SF-IP55	Worldwide	2	-	WCDMA/HSDPA/HSUPA/HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 EDGE/GPRS/GSM: B2/1900, B3/1800, B5/850, B8/900	SpeedFusion Bonding

Add-on Feature

Product Code	Product Name	Description
ACW-109	PoE Kit for IP55 Outdoor Products	Include 48V Pepwave Passive PoE Injector and PoE license. Enable 802.3af/48V Pepwave Passive PoE output.
ACW-510	Ball Joint Mount for IP55 Outdoor Products	Wall/pole mount with flexible ball-joint for high-precision installation.

©Pepwave. All rights reserved.

MAX BR1 cellular router

Industrial-Grade 4G LTE/3G Router

PEPWAVE
Broadband Possibilities

Automatic Failover 4G LTE Router.

The BR1 offers redundant SIM slots with automatic switching, DC or terminal block power capability, advanced GPS fleet tracking, and remote management, all packed into a durable metal enclosure. It is also Verizon XLTE certified.

Works With

verizon Sprint at&t T-Mobile

And worldwide 4G LTE/3G carriers

Redundant SIM Slots for Multiple Carriers.

Redundant SIM slots with automatic switching for reliable network. You can set the BR1 to automatically switch SIM cards when you're in danger of exceeding a data cap. It also allows you travel across borders without changing SIM cards manually.

Fleet Tracking and Management

With built-in GPS fleet tracking and InControl cloud-based management, you can keep tabs on location and manage your mobile network from any Internet-connected device.

Customize Captive Portal

Branding your captive portal is as easy as uploading your logo and terms & conditions. You can easily set bandwidth allowance and access duration per user or manage access using RADIUS.

SpeedFusion Hot Failover

SpeedFusion technology powers MAX BR1 for seamless failover.

Terminal Block for Secure Power Supply

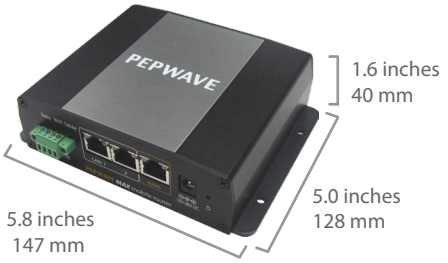
MAX BR1 is equipped with a terminal block for secure power installation in vehicles and other locations.

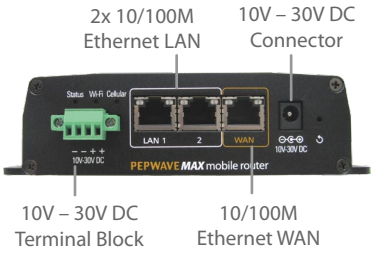
Certified Toughness

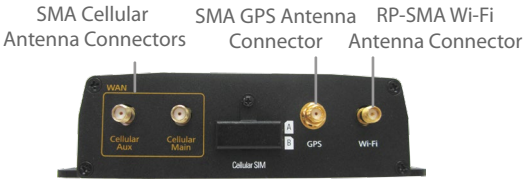
In addition to rugged metal enclosure, BR1 has certifications on:
Shock and vibration resistance
(EN 61373:1999, IEC 61373:1999)
Railway applications (EN 50155)
Electromagnetic Compatibility (EN 61000)

Specifications

	MAX BR1
WAN Interface	1x FE Embedded LTE/3G Modem with Redundant SIM Slot
LAN Interface	2x FE
Wi-Fi Interface	802.11b/g/n 300 Mbps Wi-Fi WAN and/or AP
Router Throughput	100Mbps
Recommended Users	1-60
Cellular and GPS Antenna Connector	2x SMA Antenna Connectors 1x SMA GPS Antenna Connector 1x Wi-Fi Connector
Power Input	DC Jack/Terminal Block: 12V – 48V DC
Power Consumption	16W (max.)
Dimensions	5.8 x 5.0 x 1.6 inches 147 x 128 x 40 mm
Weight	0.96 pound 435 grams
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS, E-Mark RF Port Lightning Immunity: ITU-T K.20 (+/- 1.5 kV) EN 61373:1999 IEC 61373:1999 : Shock and Vibration Resistance EN 50155: Railway Applications EN 61000: Electromagnetic Compatibility
Warranty	1-Year Limited Warranty







Ordering Information

	Product Code	Carrier/Region	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
4G LTE	MAX-BR1-LTE-US-T	Verizon/Sprint AT&T/T-Mobile	1	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-BR1-LTE-E-T	Europe/International	1	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900
	MAX-BR1-LTE-TD-T	China	1	TDD LTE: B38/2600, B39,/1900, B40/2300, B41/2500 FDD LTE: B1/2100, B3/1800	TD-SCDMA: B34/2000, B39/1900 UMTS: Band 1/2100 EVDO/CDMA: BC0/800
	MAX-BR1-LTE-SC-T	Scandinavia	1	FDD LTE: B3/1800, B7/2600, B20/800, B31/450	-

Add-on Feature

Product Code	Product Name	Description
MAX-BR1-ADV	Advanced Feature Pack	Package includes a software license key for Advanced Car-Fi Roaming; and SpeedFusion and IPsec X.509 Certificate Support

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
Support for Dynamic DNS services
WAN Port Convertible into LAN Port

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Per-Port VLAN Support

Security
Stateful Firewall
DoS Prevention
Web Blocking
Wef Filtering Blacklist

Load Balancing
Intelligent Failover
Session Persistence
Per-Service Load Distribution
Multiple Algorithms

Advanced QoS
Individual Bandwidth Limit
Application Prioritization
SIP, HTTPS, VPN QoS
Custom Application QoS

Complete VPN Solution
PepVPN/SpeedFusion Hot Failover
Site-to-Site VPN
Hot Failover
256-bit AES Encryption
Pre-shared Key Authentication
Dynamic Routing
X.509 Certificate Support*
IPsec VPN (Network-to-Network)
X.509 Certificate Support*

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP

Captive Portal Support
Support for Wired and Wireless LAN Clients
Support for RADIUS Authentication
Time and Usage Quotas on Open Access Mode
Built-in Customizable Splash Page

Global Positioning System
Integrated GPS
Device Location Map
Location Tracking Data with InControl 2
Fleet Management with InControl 2

*Available as optional feature.

©Pepwave. All rights reserved.

MAX BR1 ENT

Enterprise Grade Router with LTE Failover

PEPWAVE
Broadband Possibilities

LTE Highspeed Broadband Router

The BR1 ENT delivers blazing 200Mbps router throughput with automatic failover to LTE and comes without Wi-Fi, making it an ideal choice for deployments that demand high performance, and outstanding reliability. It is also Verizon XLTE certified.

Works With

verizon Sprint at&t T-Mobile

And worldwide 4G LTE/3G carriers

Highspeed Broadband with LTE backup

Stay online when connections fail with instant automatic failover. Connect a high-speed primary line and a backup LTE connection, and the BR1 ENT will seamlessly switch between wired and cellular links as needed to keep your connection stable and fast.

SpeedFusion™
Bonding Technology

SpeedFusion Hot Failover.

MAX BR automatically re-establishes your IPsec VPN connection on lower priority link when your primary WAN fails. Your VPN stays up, and you stay seamlessly connected.

Meet Strict Security Compliance

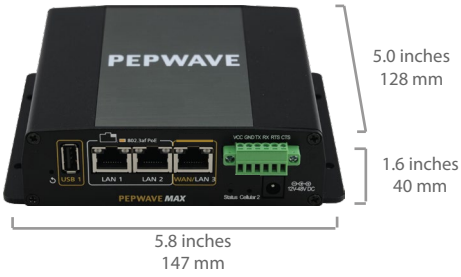
Got a strict no-Wi-Fi security policy? Configured without Wi-Fi, the BR1 ENT is a great choice for deployments with compliance requirements.

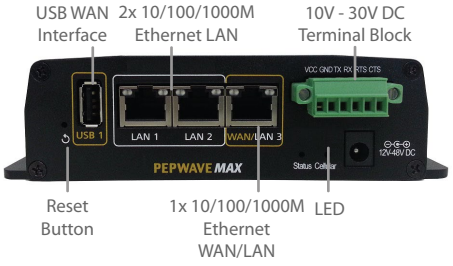
Certified for Tough Deployment

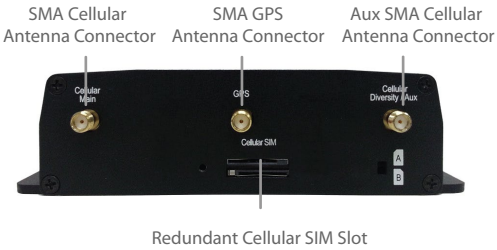
In addition to rugged metal enclosure, BR1 ENT has certifications on:
Shock and vibration resistance (EN 61373:1999 IEC 61373:1999)
RF Port Lightning Immunity (ITU-T K.20 (+/- 1.5 kV))
Railway Applications (EN 50155)
Electromagnetic Compatibility (EN 61000)

Specifications

	MAX BR1 ENT
WAN Interface	1x USB Interface 1x GE Embedded LTE Modem with Redundant SIM Slot
LAN Interface	2x GE
Router Throughput	200Mbps
Recommended Users	25-150
Cellular and GPS Antenna Connector	2x SMA Antenna Connectors 1x SMA GPS Antenna Connector (2x 2dBi Indoor 4G LTE Antennas Included)
Power Input	DC Jack/Terminal Block: 12V – 48V DC
Power Consumption	12W (max.)
Dimensions	5.8 x 5.0 x 1.6 inches 147 x 128 x 40 mm
Weight	0.96 pound 435 grams
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS, E-Mark RF Port Lightning Immunity: ITU-T K.20 (+/- 1.5 kV) EN 61373:1999 IEC 61373:1999 : Shock and Vibration Resistance: EN 50155: Railway Applications EN 61000: Electromagnetic Compatibility
Warranty	1-Year Limited Warranty







Product Ordering Information

	Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
4G LTE	MAX-BR1-ENT-LTE-US-T	Verizon/Sprint /AT&T/T-Mobile	1	4G LTE: B2/1900, B4/AWS (XLTE) , B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-BR1-ENT-LTE-E-T	4G LTE/HSPA+	1	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900
	MAX-BR1-ENT-LTE-SC-T	Scandinavia	1	FDD LTE: B3/1800, B7/2600, B20/800, B31/450	-

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
Support for Dynamic DNS services
WAN Port Convertible into LAN Port

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Per-Port VLAN Support

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklist

Complete VPN Solution
PepVPN / SpeedFusion Hot Failover
- Site-to-Site VPN
- Hot Failover
- 256-bit AES Encryption
- Pre-shared Key Authentication
- Dynamic Routing

IPsec VPN (Network-to-Network)

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP

Advanced QoS
User Groups
- Individual Bandwidth Limit

Application Prioritization
- SIP, HTTPS, VPN QoS
- Custom Application QoS

Device Management
Web Administrative Interface
Command Line Interface
InControl 2 Cloud Managment
Router Utility Mobile App
Email Notification
Active Client & Session Lists
Bandwidth Usage Statistics
Web Reporting Services
Syslog Service
SNMP v1, v2c and v3

Global Positioning System
Integrated GPS
Device Location Map
Location Tracking Data
Fleet Management with InControl 2

Package Content
MAX BR1 ENT
12V2A Power Supply
1x GPS Antenna
2x 2dBi 4G LTE Antennas

^ Feature is available as an upgrade

PEPWAVE
Broadband Possibilities

©Pepwave. All rights reserved.

MAX BR1 Pro

Enterprise Grade Router with LTE Failover

PEPWAVE
Broadband Possibilities

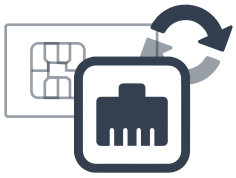
Works With

verizon Sprint at&t T-Mobile

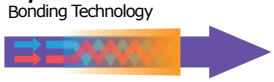
And worldwide 4G LTE/3G carriers

Cellular Branch Networking Router

The MAX BR1 Pro comes with 4-port LAN switch and automatic failover, making it an ideal choice for deployments that demand outstanding reliability and flexibility.



SpeedFusion™
Bonding Technology

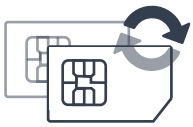


Broadband with LTE backup

Stay online when connections fail with instant automatic failover. Connect a high-speed primary line and a backup LTE connection, the BR1 Pro will seamlessly switch between wired and cellular links as needed to keep your connection stable and fast.

SpeedFusion Hot Failover.

MAX BR automatically re-establishes your IPsec VPN connection on lower priority link when your primary WAN fails. Your VPN stays up, and you stay seamlessly connected.



Redundant SIM Slots for Multiple Carriers

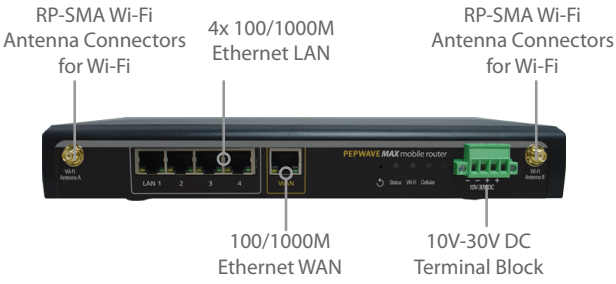
Redundant SIM slots with automatic switching for reliable network. You can set the MAX BR1 Pro to automatically switch SIM cards when you're in danger of data overage, or allows you travel across borders without changing SIM cards manually.

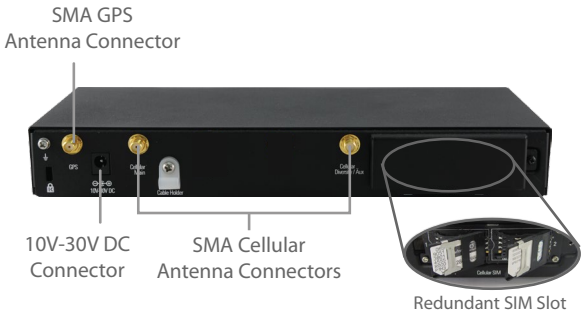
4-port GE LAN Switch

The four-port GE LAN switch allows the BR1 Pro to be dropped into any network transparently, without needs for extra cabling. Perfect for Branch Networking.

Specifications

	MAX BR1 Pro
WAN Interface	1x GE 1x Embedded LTE Modem with Redundant SIM Slot
LAN Interface	4x GE
Wi-Fi Interface	802.11a/n or b/g/n 300Mbps
Router Throughput	100Mbps
Recommended Users	1-60
Antenna Connector	2x Indoor 4G LTE Antenna Connector 2x RP-SMA Wi-Fi Connectors 1x SMA GPS Antenna Connector
Power Input	DC Jack/Terminal Block: DC 10V - 30V, 3A
Power Consumption	25W (max.)
Dimensions	1.6 x 10.2 x 5.6 inches 40 x 260 x 143 mm
Weight	2.65 pounds 1.2 kg
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS
Warranty	1-Year Limited Warranty





Product Ordering Information

Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
MAX-BR1-PRO-LTE-US-T	Verizon/Sprint/ AT&T/T-Mobile	1	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700,B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
MAX-BR1-PRO-LTE-E-T	Europe/International	1	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
Support for Dynamic DNS services
WAN Port Convertible into LAN Port

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklist

Complete VPN Solution
PepVPN / SpeedFusion Hot Failover
  Site-to-Site VPN
  Hot Failover
  256-bit AES Encryption
  Pre-shared Key Authentication
  Dynamic Routing
IPsec VPN (Network-to-Network)

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP

Advanced QoS
User Groups
  Individual Bandwidth Limit
Application Prioritization
  SIP, HTTPS, VPN QoS
  Custom Application QoS

Device Management
Web Administrative Interface
Command Line Interface
InControl 2 Cloud Managment
Router Utility Mobile App
Email Notification
Active Client & Session Lists
Bandwidth Usage Statistics
Web Reporting Services
Syslog Service
SNMP v1, v2c and v3

Global Positioning System
Integrated GPS
Device Location Map
Location Tracking Data
Fleet Management with InControl 2

Package Content
MAX BR1 Pro
12V3A Power Supply
2x 5dBi Wi-Fi Antennas
2x 2dBi 4G LTE Antennas
1x GPS Antenna

PEPWAVE
Broadband Possibilities

©Pepwave. All rights reserved.

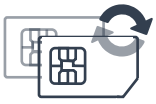
MAX BR1 Slim

Portable and Rugged 4G LTE Router

PEPWAVE
Broadband Possibilities

The MAX BR1 Slim is compact (1.1 x 3.8 x 4.8 inches) and tough enough to install just about anywhere, and it offers advanced features such as GPS fleet tracking, remote management, and USB or terminal block power capability.

Works With
verizon Sprint at&t T-Mobile
And worldwide 4G LTE/3G carriers



Redundant SIM Slot for Multiple Carriers

Redundant SIM slot with automatic switching for reliable network. You can also set the MAX BR1 Slim to automatically switch SIM cards when you're in danger of exceeding a data cap. It also allows you travel across borders without changing SIM cards manually.

2x 5V Micro USB Ports

Dual Micro USB Power Input

Connect one of the two built-in 5V micro USB ports to a 10000mAh power bank for up to 7 hours of operation. Running low on power? Connect a second power bank before disconnecting the first for uninterrupted networking.

SpeedFusion

SpeedFusion Hot Failover.

The MAX BR1 Slim automatically re-establishes your SpeedFusion VPN connection on lower priority link when your primary WAN fails. Your VPN stays up, and you stay seamlessly connected.

Fleet Tracking and Management

Track and manage your fleet from anywhere. With built-in GPS and InControl 2 cloud-based management, you can keep tabs on location and manage your mobile network from any Internet-connected device.

Customize Captive Portal

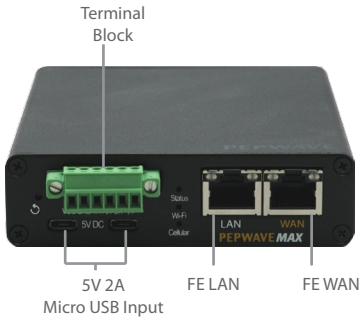
Branding your captive portal is as easy as uploading your logo and terms & conditions. You can easily set bandwidth allowance and access duration per user or manage access using RADIUS or LDAP servers.

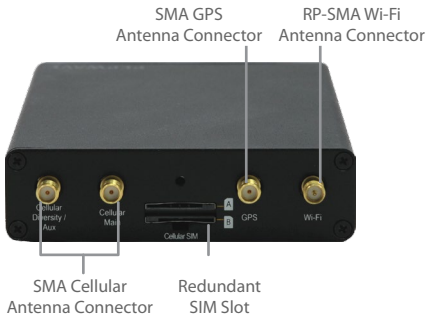
Ultra-Portable LTE Connectivity

The MAX BR1 Slim gives you full-featured LTE Connectivity in a package that measures just 1.1 x 3.8 x 4.8 inches. Its rugged metal enclosure stands up to moisture, dust, and vibration. It gives you and your devices, such as surveillance camera, LTE connectivity anywhere.

Specifications

	MAX BR1 Slim
WAN Interface	1x FE Embedded LTE Modem with Redundant SIM Slot
LAN Interface	1x FE
Wi-Fi Interface	802.11b/g/n 150Mbps Wi-Fi WAN or AP
Router Throughput	100Mbps
Recommended Users	1-60
Cellular and GPS Antenna Connector	2x RP-SMA Cellular Antenna Connector 1x SMA GPS Antenna Connector 1x SMA Wi-Fi Antenna Connector
Power Input	Micro USB 5V 2A/Terminal Block: 12V – 48V DC
Power Consumption	10W (max.)
Dimensions	1.1 x 3.8 x 4.8 inches 27 x 97 x 120 mm
Weight	0.8 pound 350 grams
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS, E-Mark EN 61373:1999 IEC 61373:1999 : Shock and Vibration Resistance EN 50155: Railway Applications EN 61000: Electromagnetic Compatibility
Warranty	1-Year Limited Warranty





Product Ordering Information

Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
MAX-BR1-SLIM-LTE-US-T	Verizon/Sprint/ AT&T/T-Mobile	1	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700,B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
MAX-BR1-SLIM-LTE-E-T	Europe/International	1	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900

Feature Add-On	Feature Pack	Description
Product Code	Advanced Feature Pack	Package includes a software license key for Advanced Car-Fi Roaming; and SpeedFusion and IPsec X.509 Certifi cate Support
MAX-BR1-ADV		

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
Support for Dynamic DNS services
WAN Port Convertible into LAN Port

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Port-Based VLAN

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklists

Complete VPN Solution
PepVPN / SpeedFusion Hot Failover
- Site-to-Site VPN
- Hot Failover
- 256-bit AES Encryption
- Pre-shared Key Authentication
- Dynamic Routing
- X.509 Certificate Support^

IPsec VPN (Network-to-Network)

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP
Advanced QoS
Individual Bandwidth Limit
Application Prioritization
- SIP, HTTPS, VPN QoS
- Custom Application QoS

Device Management
Web Administrative Interface
Command Line Interface
InControl 2 Cloud Managment
Router Utility Mobile App
Email Notification
Active Client & Session Lists
Bandwidth Usage Statistics
Web Reporting Services
Syslog Service
SNMP v1, v2c and v3

Global Positioning System
Integrated GPS
Device Location Map
Location Tracking Data
Fleet Management with InControl 2

Package Content
MAX BR1 Slim
1x 5dBi Wi-Fi Antenna
1x GPS Antenna
2x 2dBi 4G LTE Antennas

^ Feature is available as an upgrade

PEPWAVE
Broadband Possibilities

www.pepwave.com
©Pepwave. All rights reserved.

MAX HD2

Dual 4G LTE Mobile Router

PEPWAVE
Broadband Possibilities

Dual 4G LTE Mobile Router

The HD2 gives you blazing fast connectivity on the road with dual embedded cellular modems and SpeedFusion bandwidth bonding, plus a built-in 4-port GE switch to reduce clutter in your mobile deployments. It is also Verizon XLTE certified.

Works With

verizon Sprint at&t T··Mobile·

And worldwide 4G LTE/3G carriers

Dual Cellular for Multiple Carriers

Dual SIM slots allow you to use the same or different cellular providers for bandwidth bonding or eliminating blind spots.

Fleet Tracking and Management

With built-in GPS fleet tracking and InControl cloud-based management, you can keep tabs on location and manage your mobile network from any Internet-connected device.

Terminal Block for Secure Power Supply

The MAX HD2 is equipped with a terminal block for secure installation in vehicles and other locations.

SpeedFusion™
Bonding Technology

SpeedFusion Bandwidth Bonding and Seamless Failover

SpeedFusion bandwidth bonding technology bonds all connected bandwidth into a single superfast stream, using the same or different cellular providers.

Customize Captive Portal

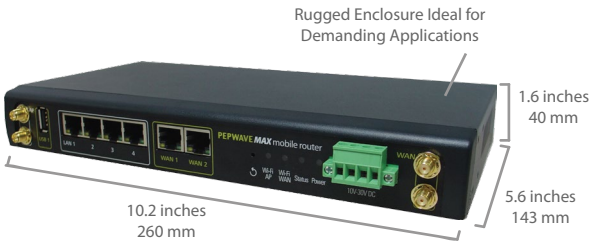
Branding your captive portal is as easy as uploading your logo and terms & conditions. You can easily set bandwidth allowance and access duration per user or manage access using RADIUS.

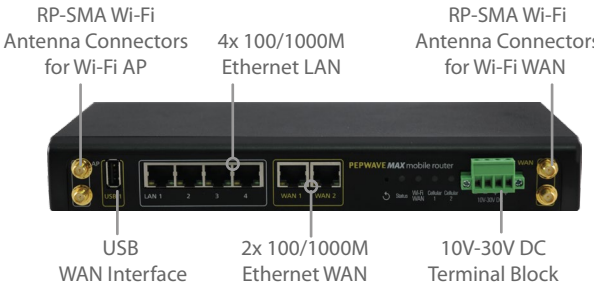
Certified Toughness

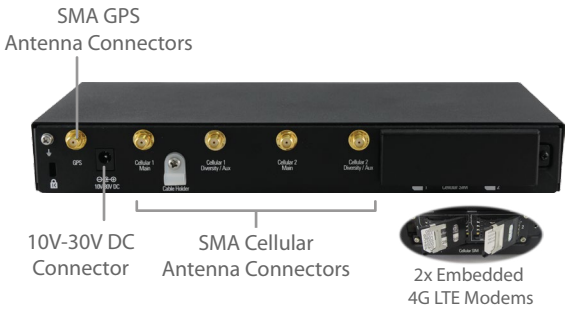
In addition to rugged metal enclosure, HD2 has certifications on:
Shock and vibration resistance (EN 61373:2010)
RF Port Lightning Immunity (ITU-T K.20 (+/- 1.5 kV))
Railway Applications (EN 50155)
Electromagnetic Compatibility (EN 61000)

Specifications

	MAX HD2
WAN Interface	1x USB Interface 2x GE 2x Embedded LTE Modems
LAN Interface	4x GE
Wi-Fi Interface	802.11b/g/n 300 Mbps Wi-Fi WAN and/or AP
Router Throughput	100Mbps
Recommended Users	25-150
Cellular and GPS Antenna Connector	4x SMA Antenna Connectors 1x SMA GPS Antenna Connector 4x 5dBi Wi-Fi Antennas
Power Input	DC Jack/Terminal Block: 10V - 30V, 3A
Power Consumption	25W (max.)
Dimensions	1.6 x 10.2 x 5.6 inches 40 x 260 x 143 mm
Weight	2.65 pounds 1.2 kg
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS, E-Mark RF Port Lightning Immunity: ITU-T K.20 (+/- 1.5 kV) Shock and Vibration Resistance: EN 61373:2010 Railway Applications: EN 50155 Electromagnetic Compatibility: EN 61000
Warranty	1-Year Limited Warranty







Ordering Information

	Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
4G LTE	MAX-HD2-LTE-US-T	Verizon/Sprint/AT&T/T-Mobile	2	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD2-LTE-UE-T	Cellular 1: Europe/International Cellular 2: Verizon/Sprint /AT&T/T-Mobile	2	Cellular 1 4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800 Cellular 2 4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	Cellular 1 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 Cellular 2 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD2-LTE-E-T	Europe/International	2	4G LTE B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
USB 4G/3G Modem Support
Support for Dynamic DNS services

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Per-Port VLAN Support

Captive Portal Support
Support for Wired and Wireless LAN Clients
Support for RADIUS Authentication
Time and Usage Quotas on Open Access Mode
Built-in Customizable Splash Page

Advanced QoS
User Groups
  Bandwidth Reservation
  Individual Bandwidth Limit
Application Prioritization
  SIP, HTTPS, VPN QoS
  Custom Application QoS

Load Balancing
Intelligent Failover
Session Persistence
Per-Service Load Distribution
Multiple Algorithms

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklist

Complete VPN Solution
PepVPN/ SpeedFusion Bandwidth Bonding
  Site-to-Site VPN
  Bandwidth Bonding
  Hot Failover
  256-bit AES Encryption
  Pre-shared Key Authentication
  Dynamic Routing
IPsec VPN (Network-to-Network)

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP

Device Management
Web Administrative Interface
Command Line Interface
InControl Cloud Management
Email Notification
Active Client & Session Lists
Bandwidth Usage Statistics
Syslog Service
SNMP v1, v2c and v3

Package Content
MAX HD2
12V3A Power Supply
4x 5dBi Wi-Fi Antennas
1x GPS Active Antenna
4x 2dBi 4G LTE Antennas
1 Pair of Mounting Brackets

PEPWAVE
Broadband Possibilities

www.pepwave.com
©Pepwave. All rights reserved.

MAX HD2 IP67

Dual 4G LTE Outdoor Mobile Router

PEPWAVE
Broadband Possibilities

Works With

verizon Sprint at&t T··Mobile·

And worldwide 4G LTE/3G carriers

The HD2 IP67 offers dual embedded cellular modems and PoE support, all encased in a shock and vibration certified, waterproof enclosure that's more than a match for almost any environment.

SpeedFusion™
Bonding Technology

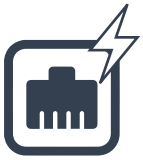
Dual Cellular and Redundant SIM slots for Multiple Carrier.

The HD2 IP67 includes two built-in outdoor 4G LTE/3G modems and two Redundant SIM slots. It allows you to use the same or different cellular providers for bandwidth bonding or eliminating blind spots.
List of supported 4G LTE carriers at: peplink.com/lte-networks/

SpeedFusion Bandwidth Bonding and Seamless Failover.

SpeedFusion bandwidth bonding technology bonds all connected bandwidth into a single superfast stream, using the same or different cellular providers.

Water-proof | Dust protected | Lightning Immunity | Shock and Vibration



Super-Duty IP67 Enclosure. Shock and Vibration Certified.

Its waterproof IP67 metal enclosure stands up to dust, vibration, and inclement weather.And, it is certified shock and vibration resistant, making it a great choice for construction, drilling, and other heavy-duty applications.

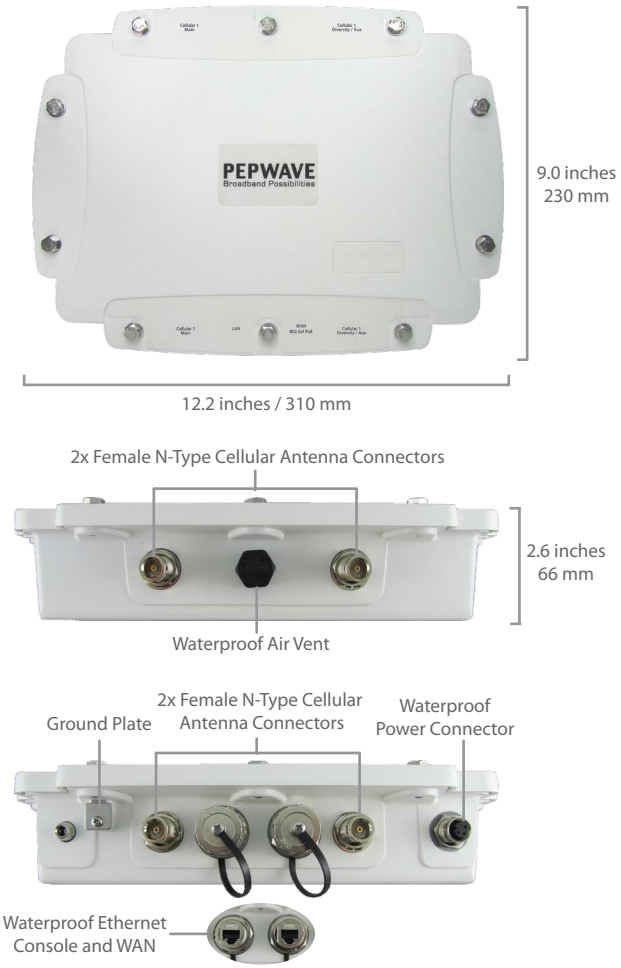
Optional PoE Input.

Cut down on cabling and simplify deployments. The HD2 IP67 supports 802.3af PoE input, so one wire is all you need for both connectivity and power. 802.af PoE Injector is available separately.

Specifications

MAX HD2 IP67	
WAN Interface	1x 10/100/1000M Ethernet Port 2x Embedded LTE Modem with Redundant SIM Slot
LAN Interface	1x 10/100/1000M Ethernet Ports
Router Throughput	100Mbps
Recommended Users	25-150
Cellular Antenna Connector	4x Female N-Type Cellular Antenna Connectors
Power Input	Power over Ethernet 802.3at# DC: 12V – 48V DC
Power Consumption	25W (max.)
Dimensions	9.0 x 12.2 x 2.6 inches 230 x 310 x 66 mm
Weight	5.84 pounds 2.65 kg
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS RF Port Lightning Immunity: ITU-T K.20 (+/- 1.5 kV) Shock and Vibration Resistance: EN 61373:1999 IEC 61373:1999
Warranty	1-Year Limited Warranty

#PoE Injector is available separately.



	Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
4G LTE	MAX-HD2-M-LTE-US-IP67	Verizon/Sprint /AT&T/T-Mobile	2	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	WCDMA/HSDPA/HSUPA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD2-M-LTE-UE-IP67	Cellular 1: Europe/International Cellular 2: Verizon/Sprint /AT&T/T-Mobile	2	Cellular 1 4G LTE : B1/2100, B3/1800, B7/2600, B8/900, B20/800 Cellular 2 4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	Cellular 1 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 Cellular 2 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD2-M-LTE-E-IP67	Europe/International	2	4G LTE : B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSDPA/HSUPA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900

PoE Injector

Product Code	Description
ACW-107	Includes 1x 802.3af/at PoE Injector

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
IPv6 Support
Support for Dynamic DNS services

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Per-Port VLAN Support

Load Balancing
Intelligent Failover
Session Persistence
Per-Service Load Distribution
Multiple Algorithms

Complete VPN Solution
PepVPN/SpeedFusion Hot Failover/
SpeedFusion Bandwidth Bonding
- Site-to-Site VPN
- Bandwidth Aggregation
- Hot Failover
- 256-bit AES Encryption
- Pre-shared Key Authentication
- Dynamic Routing
- X.509 Certificate Support

IPsec VPN (Network-to-Network)
- X.509 Certificate Support

Advanced QoS
User Groups
- Bandwidth Reservation
- Individual Bandwidth Limit

Application Prioritization
- By User Groups
- SIP, HTTPS, VPN QoS
- Custom Application QoS

AP Controller
AP Controller Support
Wi-Fi Usage Statistics

Captive Portal Support
Support for Wired and Wireless LAN Clients
Support for RADIUS Authentication
Support for LDAP Authentication
Time and Usage Quotas on Open Access Mode
Built-in Customizable Splash Page

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP
WINS Server
VRRP HA support

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklist

Device Management
Web Administrative Interface
Command Line Interface
InControl Cloud Management
Email Notification
Active Client & Session Lists
Bandwidth Usage Statistics
Syslog Service
SNMP v1, v2c and v3

Package Content
MAX HD2 IP67
Waterproof Power Connector Kit
2x Waterproof Ethernet Connector Kit
Mounting Kit

PEPWAVE
Broadband Possibilities

www.pepwave.com
©Pepwave. All rights reserved.

MAX HD2 Mini

Mission Critical 4G LTE Bandwidth Bonding Router

PEPWAVE
Broadband Possibilities

Compact Dual 4G LTE Mobile Router

The HD2 Mini packs big features, such as dual embedded cellular, SpeedFusion bandwidth bonding, and PoE, into a tough, compact enclosure that stands up to life on the go.

Works With
verizon Sprint at&t T-Mobile
And worldwide 4G LTE/3G carriers

Dual Cellular and Redundant SIM Slots

Dual Cellular and Redundant SIM slots allow you to use the same or different cellular providers for bandwidth bonding, data overage protection or eliminating blind spots.

Fleet Tracking and Management

With built-in GPS fleet tracking and InControl cloud-based management, you can keep tabs on location and manage your mobile network from any Internet-connected device.

Meet Strict Security Compliance

Got a strict no-Wi-Fi security policy? Configured without Wi-Fi, the BR1 ENT is a great choice for deployments with compliance requirements.

SpeedFusion™ Bonding Technology

SpeedFusion Bandwidth Bonding and Seamless Failover

SpeedFusion bandwidth bonding technology bonds all connected bandwidth into a single superfast stream, using the same or different cellular providers.

Customize Captive Portal

Branding your captive portal is as easy as uploading your logo and terms & conditions. You can easily set bandwidth allowance and access duration per user or manage access using RADIUS.

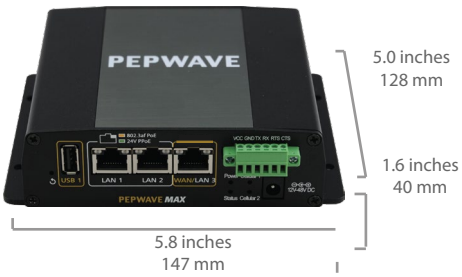
Certified Toughness

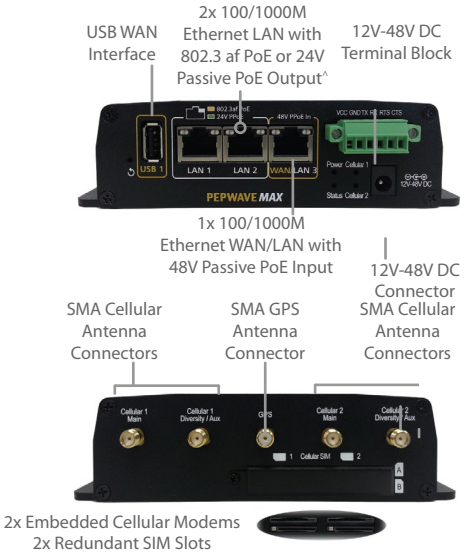
In addition to rugged metal enclosure, HD2 Mini has certifications on:
RF Port Lightning Immunity:
ITU-T K.20 (+/- 1.5 kV)
Shock and vibration resistance (EN 61373:1999, IEC 61373:1999)
Railway applications (EN 50155)
Electromagnetic Compatibility (EN 61000)

Specifications

	MAX HD2 Mini
WAN Interface	1x USB Interface 1x GE 2x Embedded LTE Modems with Redundant SIM Slots
LAN Interface	2x GE
Router Throughput	200Mbps
Recommended Users	25-150
Cellular and GPS Antenna Connector	4x SMA Antenna Connectors 1x SMA GPS Antenna Connector
Power Input	DC Jack/Terminal Block: 12V – 48V 2A
Power Output	Up To Three 802.3af/24V Pepwave Passive PoE Outputs#
Power Consumption	15W (max.)
Dimensions	1.6 x 5.8 x 5 inches 40 x 147 x 128 mm
Weight	0.96 pounds 0.5 kg
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS, E-Mark RF Port Lightning Immunity: ITU-T K.20 (+/- 1.5 kV) EN 61373:1999 IEC 61373:1999 : Shock and Vibration Resistance: EN 50155: Railway Applications EN 61000: Electromagnetic Compatibility
Warranty	1-Year Limited Warranty

#PoE Kit is available separately.





Ordering Information

	Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
4G LTE	MAX-HD2-MINI-LTE-US-T	Verizon/Sprint/AT&T/T-Mobile	2	4G LTE: B2/1900, B4/AWS (XLTE) , B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD2-MINI-LTE-UE-T	Cellular 1: Europe/International Cellular 2: Verizon/Sprint /AT&T/T-Mobile	2	Cellular 1 4G LTE : B1/2100, B3/1800, B7/2600, B8/900, B20/800 Cellular 2 4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	Cellular 1 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 Cellular 2 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD2-MINI-LTE-E-T	Europe/International	2	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900

Add-on Feature

Product Code	Product Name	Description
ACW-609	PoE Activation Kit	Includes 1x 48V Power Supply Enables 802.3af PoE Output Ports (PoE License automatically applied after kit purchase)

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
USB 4G/3G Modem Support
Support for Dynamic DNS services
WAN Port Convertible into LAN Port

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Per-Port VLAN Support

Advanced QoS
Individual Bandwidth Limit
Application Prioritization
- SIP, HTTPS, VPN QoS
- Custom Application QoS

Load Balancing
Intelligent Failover
Session Persistence
Per-Service Load Distribution
Multiple Algorithms

Complete VPN Solution
PepVPN/SpeedFusion Hot Failover
- Site-to-Site VPN
- Bandwidth Aggregation
- Hot Failover
- 256-bit AES Encryption
- Pre-shared Key Authentication
- Dynamic Routing

IPsec VPN (Network-to-Network)

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklist

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP

Captive Portal Support
Support for Wired LAN Clients
Support for RADIUS Authentication
Time and Usage Quotas on Open Access Mode
Built-in Customizable Splash Page

Device Management
Web Administrative Interface
Command Line Interface
InControl Cloud Management
Email Notification
Active Client & Session Lists
Bandwidth Usage Statistics
Syslog Service
SNMP v1, v2c and v3

Package Content
MAX HD2 Mini
12V2A Power Supply
1x GPS Active Antenna
4x 2dBi 4G LTE Antennas

©Pepwave. All rights reserved.

MAX HD2/4 with MediaFast

Dual/Quad 4G LTE Content Caching Router

PEPWAVE
Broadband Possibilities

Quad 4G LTE Content Caching Router

The MAX HD2 and HD4 with MediaFast team up embedded cellular modems and other great features of the HD Series with our MediaFast content caching, which lets you store content for later playback anywhere, regardless of connectivity.

Works with:

iTunes U iOS Updates TED.com and more...

Dual/Quad Embedded Cellular Modems

The MAX with MediaFast includes up to four built-in 4G LTE modems. It allows you to use the same or different cellular providers for bandwidth bonding, data overage protection or eliminating blind spots.

Fleet Tracking and Management

With built-in GPS fleet tracking and InControl 2 cloud-based management, you can keep tabs on location and manage your mobile network from any Internet-connected device.

Mobile Content Caching

Deliver endless content without consuming endless bandwidth. The MediaFast Editions of the HD2 and HD4 let you download content once and play it back without limit, even in locations where connectivity is spotty or absent.

SpeedFusion™
Bonding Technology

SpeedFusion Bandwidth Bonding and Seamless Failover

SpeedFusion bandwidth bonding technology bonds all connected bandwidth into a single superfast stream, using the same or different cellular providers.

Customize Captive Portal

Branding your captive portal is as easy as uploading your logo and terms & conditions. You can easily set bandwidth allowance and access duration per user or manage access using RADIUS.

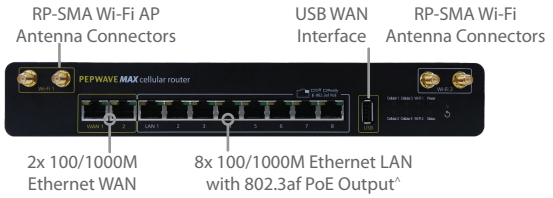
Certified Toughness

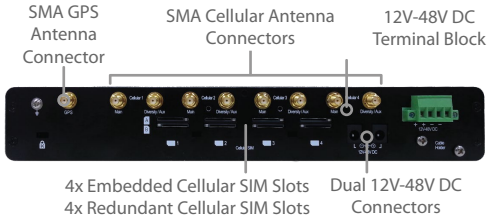
In addition to rugged metal enclosure, HD4 has certifications on:
Shock and vibration resistance
(EN 61373:1999, IEC 61373:1999)
Railway applications (EN 50155)
Electromagnetic Compatibility (EN 61000)

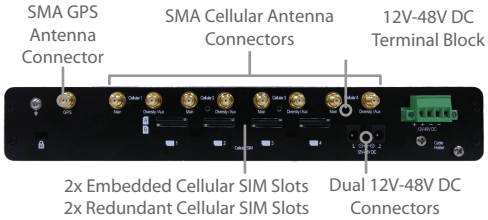
Specifications

	MAX HD2 with MediaFast	MAX HD4 with MediaFast
WAN Interface	2x Embedded LTE Modems with Redundant SIM Slots 1x USB Interface 2x GE	4x Embedded LTE Modems with Redundant SIM Slots 1x USB Interface 2x GE
LAN Interface	8x GE	
Wi-Fi Interface	802.11a/b/g/n 300Mbps 2x2 MIMO Wi-Fi WAN and/or AP Simultaneous Dual-Band AP	
Disk Drive	120GB SSD	
Cache Throughput	150Mbps	
Router Throughput	80Mbps	
Recommended Users	25-150	50-500
Cellular and GPS Antenna Connector	8x SMA Antenna Connectors 1x SMA GPS Antenna Connector 4x Dual Band Wi-Fi Antennas	
Power Input	DC Jack/Terminal Block: 12V - 48V, 4A	
Power Output	Up to Eight 802.3af PoE Outputs#	
Power Consumption	38W (max.)	
Dimensions	1.9 x 11.5 x 6.9 inches 50 x 292 x 177 mm	
Weight	4.20 pounds 1.9 kg	
Operating Temperature	-40° – 149°F -40° – 65°C	
Humidity	15% – 95% (non-condensing)	
Certifications	FCC, CE, RoHS, E-Mark EN 61373:1999 IEC 61373:1999 : Shock and Vibration Resistance: EN 50155: Railway Applications EN 61000: Electromagnetic Compatibility	
Warranty	1-Year Limited Warranty	

#PoE Kit is available separately.







Ordering Information

MAX HD2 with MediaFast

	Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
4G LTE	MAX-HD2-MFA-LTE-US-T	Verizon/AT&T/T-Mobile	4	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD2-MFA-LTE-UE-T	Cellular 1: Europe/International Cellular 2: Verizon/AT&T/T-Mobile	2	Cellular 1 4G LTE : B1/2100, B3/1800, B7/2600, B8/900, B20/800 Cellular 2 4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	Cellular 1 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 Cellular 2 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD2-MFA-LTE-E-T	Europe/International	4	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900

MAX HD4 with MediaFast

	Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
4G LTE	MAX-HD4-MFA-LTE-US-T	Verizon/AT&T/T-Mobile	4	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD4-MFA-LTE-UE-T	Cellular 1 & 2: Europe/International Cellular 3 & 4: Verizon/AT&T/T-Mobile	4	Cellular 1 & 2 4G LTE : B1/2100, B3/1800, B7/2600, B8/900, B20/800 Cellular 3 & 4 4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	Cellular 1 & 2 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 Cellular 3 & 4 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD4-MFA-LTE-E-T	Europe/International	4	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900

PoE Activation Kit

Product Code	Description
ACW-609	Includes 1x 48V Power Supply and PoE License. Enables 4x 802.3af PoE Output Ports Requires 2x ACW-609 to enable all PoE ports

Works With

verizon at&t T··Mobile·

And worldwide 4G LTE/3G carriers

*Specifications vary across different models. For the most updated specifications, please refer to our website.

©Pepwave. All rights reserved.

MAX HD4

Quad 4G LTE Mobile Router

PEPWAVE
Broadband Possibilities

Works With

verizon at&t T-Mobile

And worldwide 4G LTE/3G carriers

Quad 4G LTE Mobile Router

The MAX HD4 delivers outstanding performance from all your connections with the help of SpeedFusion bandwidth bonding and intelligent load balancing.

Quad Embedded Cellular and Redundant SIM Slots

Quad Cellular Modems and Redundant SIM slots allow you to use up to four different cellular providers for bandwidth bonding, data overage protection or eliminating blind spots.

Fleet Tracking and Management

With built-in GPS fleet tracking and InControl 2 cloud-based management, you can keep tabs on location and manage your mobile network from any Internet-connected device.

Terminal Block for Secure Power Supply

The MAX HD4 is equipped with a terminal block for secure installation in vehicles and other locations.

SpeedFusion™
Bonding Technology

SpeedFusion Bandwidth Bonding and Seamless Failover

SpeedFusion bandwidth bonding technology bonds all connected bandwidth into a single superfast stream, using the same or different cellular providers.

Customize Captive Portal

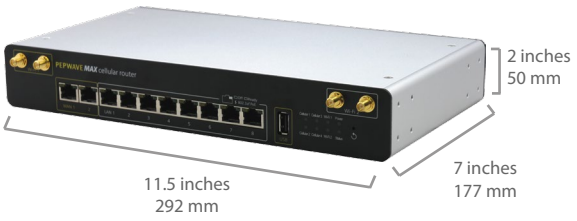
Branding your captive portal is as easy as uploading your logo and terms & conditions. You can easily set bandwidth allowance and access duration per user or manage access using RADIUS server.

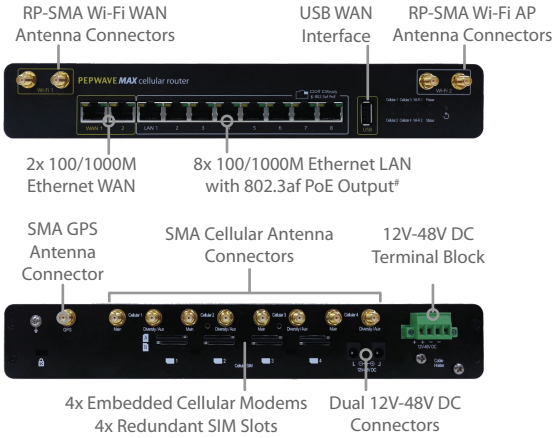
Certified Toughness

In addition to rugged metal enclosure, the MAX HD4 has certifications on:
Shock and vibration resistance
(EN 61373:1999, IEC 61373:1999)
Railway applications (EN 50155)
Electromagnetic Compatibility (EN 61000)

Specifications

	MAX HD4
WAN Interface	1x USB Interface 2x GE 4x Embedded LTE Modems with Redundant SIM Slots
LAN Interface	8x GE
Wi-Fi Interface	802.11a/b/g/n 300Mbps 2x2 MIMO Wi-Fi WAN and/or AP
Router Throughput	300Mbps
Recommended Users	50-500
Cellular and GPS Antenna Connector	8x SMA Antenna Connectors 1x SMA GPS Antenna Connector 4x RP-SMA Wi-Fi Antenna Connectors
Power Input	DC Jack/Terminal Block: 12V - 48V, 4A
Power Output	Up to Eight 802.3af PoE Outputs#
Power Consumption	38W (max.)
Dimensions	2.0 x 11.5 x 7.0 inches 50 x 292 x 177 mm
Weight	4.20 pounds 1.9 kg
Operating Temperature	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)
Certifications	FCC, CE, RoHS, E-Mark Shock and Vibration Resistance: EN 61373:1999 IEC 61373:1999 Railway Applications: EN 50155 Electromagnetic Compatibility: EN 61000
Warranty	1-Year Limited Warranty





#PoE Activation Kit is available separately.

Ordering Information

	Product Code	Carrier	Embedded Modem	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
4G LTE	MAX-HD4-LTE-US-T	Verizon/AT&T/T-Mobile	4	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD4-LTE-UE-T	Cellular 1 & 2: Europe/International Cellular 3 & 4: Verizon/AT&T/T-Mobile	4	Cellular 1 & 2 4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800 Cellular 3 & 4 4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	Cellular 1 & 2 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900 Cellular 3 & 4 WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
	MAX-HD4-LTE-E-T	Europe/International	4	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900

MAX HD4 - PoE Activation Kit

Product Code	Description
ACW-609	Includes 1x 48V Power Supply and PoE License. Enables 4x 802.3af PoE Output Ports Requires 2x ACW-609 to enable all PoE ports

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
USB 4G/3G Modem Support
IPv6 Support
Support for Dynamic DNS services

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Per-Port VLAN Support

Global Positioning System
Integrated GPS
Device Location Map
Location Tracking Data
GPS eXchange Format (GPX)
Fleet Management with InControl 2

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP
WINS Server
VRRP HA support

Load Balancing
Intelligent Failover
Session Persistence
Per-Service Load Distribution
Multiple Algorithms

Captive Portal Support
Wired & Wireless LAN Client Support
Support for RADIUS Authentication
Time and Usage Quotas on Open Access Mode
Built-in Customizable Splash Page

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklist

Complete VPN Solution
PepVPN/SpeedFusion Hot Failover
/SpeedFusion Bandwidth Bonding
Site-to-Site VPN
Bandwidth Bonding
Hot Failover
256-bit AES Encryption
Pre-shared Key Authentication
Dynamic Routing
X.509 Certificate Support
PPTP VPN Server
RADIUS, LDAP Authentication
IPsec VPN (Network-to-Network)
X.509 Certificate Support

AP Controller
AP Controller Support
Wi-Fi Usage Statistics

Device Management
Web Administrative Interface
Command Line Interface
InControl Cloud Management
Email Notification
Active Client & Session Lists
Bandwidth Usage Statistics
Syslog Service
SNMP v1, v2c and v3

Package Content
MAX HD4
12V4A Power Supply
4x Dual Band Wi-Fi Antennas
1x GPS Active Antenna
8x 2dBi 4G LTE Antennas
1 Pair of Mounting Brackets

PEPWAVE
Broadband Possibilities

www.pepwave.com
©Pepwave. All rights reserved.

MAX On-The-Go/700

PEPWAVE
Broadband Possibilities

Secure and Fast Internet or VPN Connections Anywhere You Work.

MAX 700

Turbocharged Mobile Access. Anytime. Everywhere.

The Pepwave MAX On-The-Go/700 bonds the bandwidth four 4G LTE/3G USB modems using SpeedFusion™ technology to deliver secure and fast Internet or VPN connections anywhere. You can even create your own hotspot or boost your bandwidth with available Wi-Fi connections using built-in 802.11n networking, making the MAX On-The-Go/700 the ultimate mobile connectivity solution.

Works With

verizon at&t Sprint T··Mobile· LTE

See a list of supported modems at peplink.com/modem

SpeedFusion™
Bonding Technology

SpeedFusion Bandwidth Bonding and Seamless Failover

SpeedFusion bandwidth bonding technology bonds all connected bandwidth into a single superfast stream, using the same or different cellular providers.

Unparalleled Modem Compatibility

Supports 250+ USB cellular modems from more than 100 carriers. You can plug in and start surfing instantly. But if not, just connect your modem and turn on Remote Assistance – our engineers will get right to work on adding support for your modem.

Fleet Tracking and Management

With built-in GPS fleet tracking and InControl 2 cloud-based management, you can keep tabs on location and manage your mobile network from any Internet-connected device.

Customize Captive Portal

Branding your captive portal is as easy as uploading your logo and terms & conditions. You can easily set bandwidth allowance and access duration per user or manage access using RADIUS.

Certified Toughness

In addition to rugged metal enclosure, MAX 700 has certifications on:
Shock and vibration resistance
(EN 61373:1999, IEC 61373:1999)
Railway applications (EN 50155)
Electromagnetic Compatibility (EN 61000)

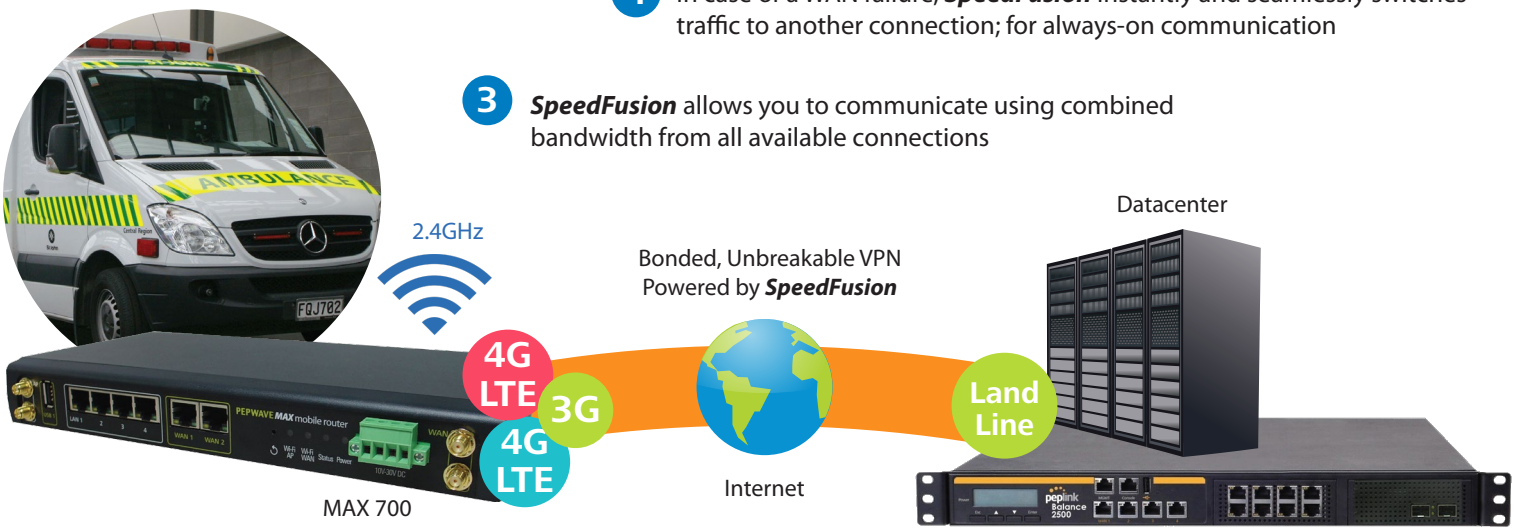
Application

First Responders – Unbreakable VPN for Mission-Critical Emergency Communication

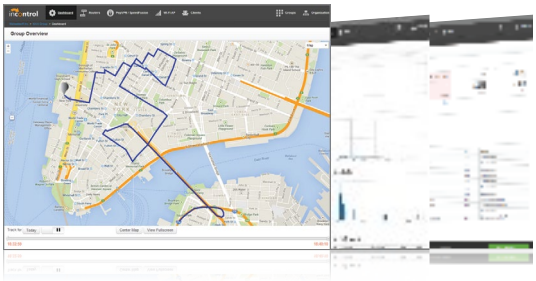
2 Unbreakable VPN powers uninterrupted communication and resource access

4 In case of a WAN failure, ***SpeedFusion*** instantly and seamlessly switches traffic to another connection; for always-on communication

3 ***SpeedFusion*** allows you to communicate using combined bandwidth from all available connections



1 ***SpeedFusion*** creates an ***unbreakable, high-bandwidth connection*** using multiple USB 4G LTE/3G modems from different carriers

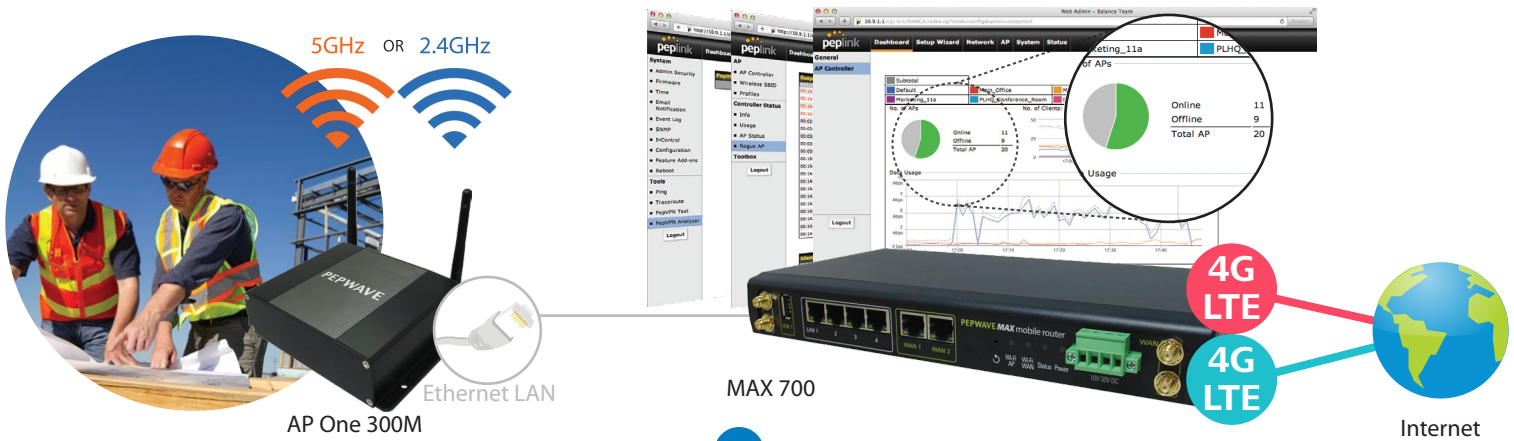


InControl²
Setup. Manage. Report.

5 InControl 2 provides complete cloud-based device management, monitoring, and reporting.

SMBs – Landline Alternative for Construction Site and Remote/Temporary Workstation

3 With MAX 700's built-in AP Controller, you can extend your Wi-Fi coverage with AP One, configure and get detailed access point usage reports anytime, right from your MAX 700



1 In areas where landline is not feasible, you can connect to multiple 4G LTE/3G with MAX 700 for ultra-fast and ultra-reliabile Internet connectivity

The AP One is available in a variety of configurations. Whether you need Wi-Fi in a single conference room or across a large outdoor area, there's an AP One model built for the job. Visit peplink.com/ap-one for details.

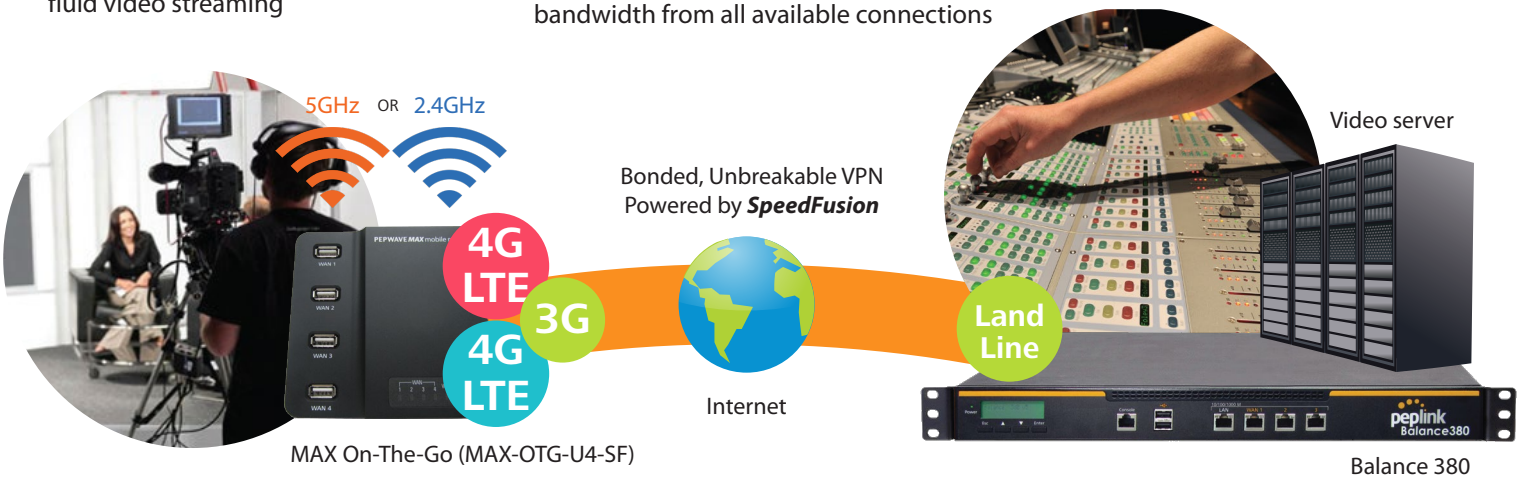
2 State-of-the-art load balancing and failover for unparalleled uptime

Broadcasting and Media – Blazing Fast Video Broadcast on Multiple 4G LTE/3G Links

4 In case of a WAN failure, ***SpeedFusion*** instantly and seamlessly switches traffic to another connection; for ultra-reliable video streaming

2 Unbreakable VPN delivers fast and fluid video streaming

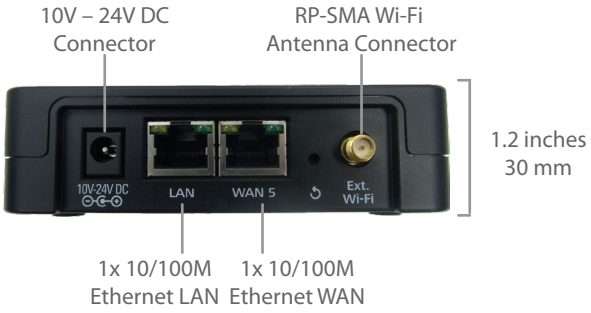
3 ***SpeedFusion*** allows you to transfer video using bandwidth from all available connections



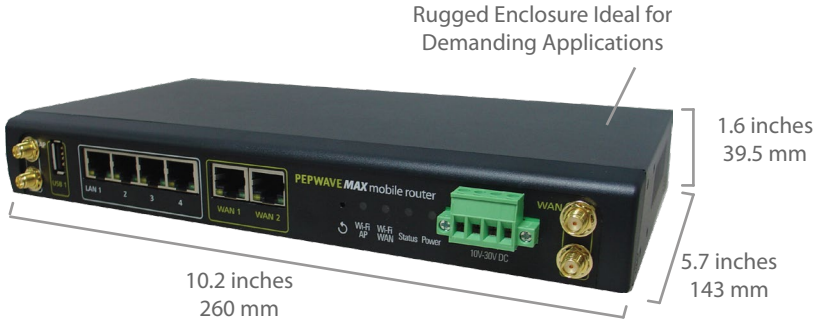
1 ***SpeedFusion*** creates an ***unbreakable, high-bandwidth connection*** using multiple USB 4G LTE/3G modems from different carriers

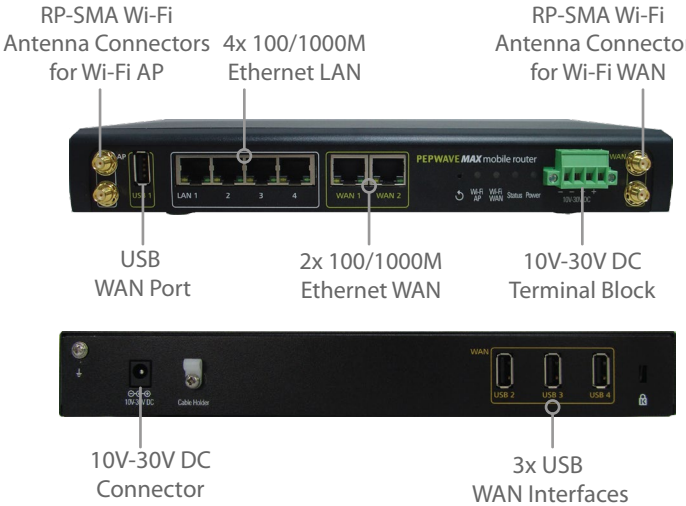
Hardware

MAX On-The-Go



MAX 700





Specifications

	MAX On-The-Go	MAX 700
WAN Interface	4x USB Interfaces 1x 10/100M Ethernet Port	4x USB Interfaces 2x 100/1000M Ethernet Ports
LAN Interface	1x 10/100M Ethernet Port	4x 100/1000M Ethernet Ports
Wi-Fi Interface	1x 802.11a/n or b/g/n 150Mbps Wi-Fi WAN and/or AP	802.11a/b/g/n 300Mbps Wi-Fi WAN 802.11a/b/g/n/ac 866Mbps Wi-Fi AP
Wi-Fi AP Operating Frequency	2412 – 2472 MHz or 5180 - 5825 MHz	2412 – 2472 MHz
Simultaneous Dual-Band Wi-Fi AP	○	●
Router Throughput	100Mbps	200Mbps
Recommended Users	1-25	25-150
PepVPN	●	●
SpeedFusion Hot Failover	●	●
SpeedFusion Bandwidth Bonding	●	●
Number of PepVPN/SpeedFusion Peers	2	2
PepVPN/SpeedFusion Throughput (no encryption)	40Mbps	100Mbps
PepVPN/SpeedFusion Throughput (256-bit AES)	20Mbps	60Mbps
Wi-Fi Antenna	Integrated 1dBi Omni Antenna Switchable to RP-SMA Connector for External Wi-Fi Antenna	4x RP-SMA Connectors
Enclosure	Low-Profile, All-Purpose	Indoor Metal
Dimension	1.2 x 4.3 x 4.3 inches 30 x 110 x 110 mm	1.6 x 10.2 x 5.7 inches 39.5 x 260 x 143 mm
Weight	0.43 pounds 195 grams	2.65 pounds 1.2 kg
Power Input	Device: 10V – 24V DC AC Adapter: AC Input 100V – 240V, DC Output 12V, 2A	Device: 10V – 30V DC, 3A AC Adapter: AC Input 100V – 240V / DC Output 12V Terminal Block: 10V – 30V DC, 3A
Power Consumption	20W (max.)	28W (max.)
Power Output	○	Up to four 802.3af PoE Outputs*
Operating Temperature	-14° – 149°F -10° – 65°C	-40° – 149°F -40° – 65°C
Humidity	15% – 95% (non-condensing)	
Certifications	FCC, CE, RoHS	
RF Port Lighting Immunity: ITU-T K.20 (+/- 1.5 kV)	○	●
Shock and Vibration Resistance: EN 61373:1999 IEC 61373:1999	○	●
Warranty	1-Year Limited Warranty	

*PoE Activation Kit is available separately.

Features

WAN
Support for PPPoE, Static IP, DHCP
WAN Link Health Check
Bandwidth Allowance Monitor
USB 4G/3G Modem Support
IPv6 Support*
Support for Dynamic DNS services
WAN Port Convertible into LAN Port*

LAN
DHCP Server for LAN Clients
Extended DHCP Options
DHCP Reservation
DNS Proxy for LAN Clients
VLAN on LAN Support
Per-Port VLAN Support

AP Controller*
AP Controller Support
Wi-Fi Usage Statistics

Load Balancing*
Intelligent Failover
Session Persistence
Per-Service Load Distribution
Multiple Algorithms

Complete VPN Solution
PepVPN/SpeedFusion Hot Failover*/
SpeedFusion Bandwidth Bonding*
- Site-to-Site VPN
- Bandwidth Aggregation*
- Hot Failover*
- 256-bit AES Encryption
- Pre-shared Key Authentication
- Dynamic Routing
- X.509 Certificate Support*

IPsec VPN (Network-to-Network)
- X.509 Certificate Support*

Advanced QoS
User Groups
- Bandwidth Reservation*
- Individual Bandwidth Limit*

Application Prioritization
- By User Groups*
- SIP, HTTPS, VPN QoS
- Custom Application QoS

Captive Portal Support*
Support for Wired and Wireless LAN Clients
Support for RADIUS Authentication
Support for LDAP Authentication*
Time and Usage Quotas on Open Access Mode
Built-in Customizable Splash Page

Certification
FCC, CE, RoHS
Shock and Vibration Resistance*
RF Port Lightning Immunity*

Networking
NAT and IP Forwarding
Static Routes
Port Forwarding
Many to One, One to One NAT
NAT Pool
SIP ALG, H.323 ALG
UPnP, NAT-PMP
WINS Server*
VRRP HA support*

Security
Stateful Firewall
DoS Prevention
Web Blocking
Web Filtering Blacklists

*Available on selected models.

Product Ordering Information

MAX On-The-Go

Product Code	Description
MAX-OTG-U4	Quad-USB 4G LTE/3G router. Supports PepVPN and quad-WAN load balancing & failover. Upgradable to MAX-OTG-SF with license key.
MAX-OTG-U4-SF	Quad-USB 4G LTE/3G router. Supports PepVPN, SpeedFusion HotFailover, SpeedFusion WAN Smoothing and quad-WAN load balancing & failover.

MAX 700

Product Code	Description
MAS-GN2-R	Quad-USB 4G LTE/3G router. Supports 200+ USB 4G LTE / 3G modems from mobile carriers including Verizon, AT&T, T-Mobile, Sprint, and worldwide carrier. Supports PepVPN, SpeedFusion HotFailover, SpeedFusion Bandwidth Bonding and quad-WAN load balancing & failover.

PEPWAVE
Broadband Possibilities

www.pepwave.com
©Pepwave. All rights reserved.

MAX Transit

Multi-LTE Router for Transportation Wi-Fi

PEPWAVE
Broadband Possibilities

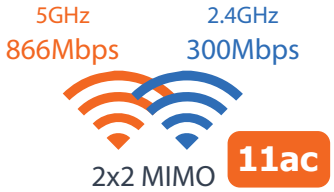
Works With

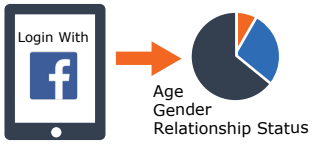
verizon Sprint at&t T··Mobile·

And worldwide 4G LTE/3G carriers

Built for Transportation Deployments

With a compact form factor, simultaneous dual-band 11ac Wi-Fi, the MAX Transit is ready to deliver fast, reliable Wi-Fi to your passengers.





Dual Embedded Cellular* and Redundant SIM Slots

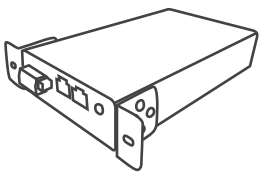
Up to two cellular modems and redundant SIM slots allow you to use up to four different cellular providers for bandwidth bonding, data overage protection or eliminating blind spots.

Simultaneous Dual-Band Wi-Fi

Reduce Wi-Fi congestion and interference. Simultaneous dual-band Wi-Fi gives you two independent networks that also work together, maximizing the throughput that your passengers can enjoy.

Captive Portal with Social Wi-Fi

The MAX Transit comes with a customizable captive portal what allows passengers to login with Facebook. As they login, you can use InControl 2 to see insightful reports on user demographics.



External Captive Portal for Advertising Servers

The MAX Transit also supports external captive portals, enabling you to connect to an advertising server. That way, your Wi-Fi hotspots can become a source of revenue.

Install it Anywhere

With mounting ears that can be installed from many angles and optional DIN rail mounts, the MAX Transit is ready to fit into just about any space you have available.

Certified Toughness

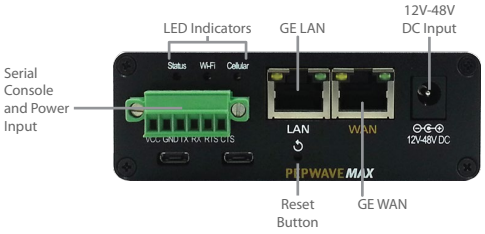
In addition to rugged metal enclosure, the MAX Transit has certifications on:
Shock and vibration resistance
(EN 61373:1999, IEC 61373:1999)
Railway applications (EN 50155)
Electromagnetic Compatibility (EN 61000)
eMark (ref: E13*10R00*10R05*13664*00)

*Applies only to the MAX-TST-DUO

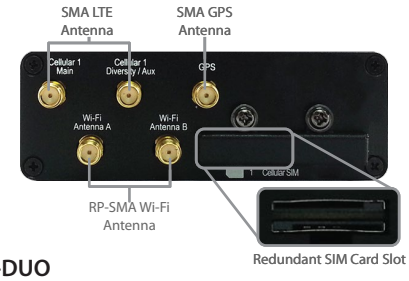
Specifications

	MAX-TST	MAX-TST-DUO
Cellular WAN Interfaces	Single LTE Modem	Dual LTE Modems
SpeedFusion Hot Failover	●	●
SpeedFusion WAN Smoothing	○	○^
SpeedFusion Bandwidth Bonding	○	○^
WAN Interface	1x GE+	
LAN Interface	1x GE	
Load Balancing/Failover	●	
Recommended Users	25-150	
Router Throughput	200Mbps	
SpeedFusion Throughput (No Encryption)	100Mbps	
SpeedFusion Throughput (256-bit AES)	60Mbps	
Wi-Fi Standard	802.11ac/a/b/g/n 2x2 MIMO	
2.4GHz / 5GHz	300Mbps / 866Mbps	
Simultaneous Dual-Band Wi-Fi AP	●	
Antenna Connectors	2x SMA Cellular*, 1x SMA GPS, 2x RP-SMA Wi-Fi	
Power Input	Device: 12V – 48V DC AC Adapter: AC Input 100V – 240V / DC Output 12V Terminal Block: 12V – 48V DC	
Power Consumption	18W (max.)	
Dimensions	7.3 x 3.8 x 1.3 inches 185 x 97 x 33.5 mm (L x W x H)	
Weight	1.3 pounds 590 grams	
Operating Temperature	-40° – 149°F -40° – 65°C	
Humidity	15% – 95% (non-condensing)	
Warranty	1-Year Limited Warranty	

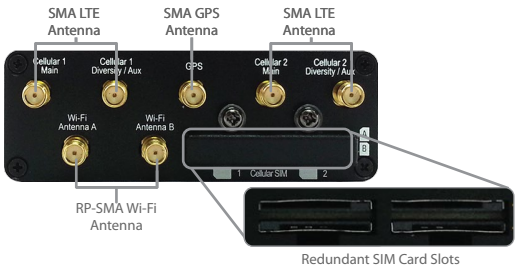
+ The WAN port can act as a LAN port if needed. ^ Available as a license add-on.
* the MAX-TST-DUO has 4x SMA cellular antenna connectors.



MAX-TST



MAX-TST-DUO



Product Ordering Information

Product Code	Carrier	Embedded Modem(s)	4G Bands/Frequencies (MHz)	3G Bands/Frequencies (MHz)
MAX-TST-US-T	Verizon/Sprint /AT&T/T-Mobile	1	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/190	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
MAX-TST-E-T	Europe/International	1	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900
MAX-TST-DUO-US-T	Verizon/Sprint /AT&T/T-Mobile	2	4G LTE: B2/1900, B4/AWS (XLTE), B5/850, B13/700, B17/700, B25/1900	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B4/AWS, B5/850, B8/900 EV-DO Rev.A: BC0/800, BC1/1900, BC10/800
MAX-TST-DUO-E-T	Europe/International	2	4G LTE: B1/2100, B3/1800, B7/2600, B8/900, B20/800	WCDMA/HSPA+/DC-HSPA+: B1/2100, B2/1900, B5/850, B6/800, B8/900
Add-On License				
MAX-TST-DUO-LC-SF	SpeedFusion License for MAX-TST-DUO		Enables SpeedFusion Bandwidth Bonding and WAN Smoothing for MAX-TST-DUO	

PEPWAVE
Broadband Possibilities

www.pepwave.com

©Pepwave. All rights reserved

PEPWAVE

Broadband Possibilities

www.pepwave.com

Contact Us:

Sales
http://www.pepwave.com/contact/sales/

Support
http://www.pepwave.com/contact/

Business Development and Partnerships
http://www.pepwave.com/partners/channel-