BODi rS BD007 and BD004 Series
Bandwidth-on-Demand Internet with Reliability and Survivability

User Manual

BD007

BD004

This is a Class A device and is not intended for use in a residential environment.

IMPORTANT

Important—The compliance information in this document is pending and subject to change.

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Part Number: **07MBD007_BD004-UM, Rev. A**
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The information in this document is subject to change without notice. Patton Electronics assumes no liability for errors that may appear in this document.

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Important Information

To use virtual private network (VPN) and/or AES/DES/3DES encryption capabilities with the BODi rS, you may need to purchase additional licenses, hardware, software, network connection, and/or service. Contact sales@patton.com or +1 (301) 975-1000 for assistance.

Warranty Information

Patton Electronics warrants all BODi rS components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of the shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If the product fails to perform as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall Patton Electronics be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. Patton Electronics specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

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About this guide

This guide describes BODi rS BD007 and BD004 hardware, installation and basic configuration.

Audience

This guide is intended for the following users:

- Operators
- Installers
- Maintenance technicians

Structure

This guide contains the following chapters and appendices:

- Chapter 1 on page 17 provides information about BODi rS features and capabilities
- Chapter 2 on page 23 provides information about connecting BODi rS hardware interfaces
- Chapter 3 on page 30 provides information about configuring LAN and WAN settings
- Chapter 4 on page 54 provides information about setting up WiFi on BODi rS
- Chapter 5 on page 59 provides information about configuring WAN Bonding
- Chapter 6 on page 66 provides information about managing outbound traffic to the WAN
- Chapter 7 on page 75 provides information about setting up port forwarding and NAT mappings
- Chapter 8 on page 82 provides information about configuring Quality of Service (QoS) settings
- Chapter 9 on page 86 provides information about setting up the firewall for BODi rS
- Chapter 10 on page 91 provides information about configuring the PPTP server and service forwarding
- Chapter 11 on page 97 provides information about managing general BODi rS system settings
- Chapter 12 on page 112 provides information about managing BODi rS status settings
- Chapter 13 on page 119 provides information on contacting Patton technical support for assistance
- Appendix A on page 122 provides compliance information for BODi rS
- Appendix B on page 124 provides specifications for BODi rS
- Appendix C on page 128 provides a glossary of technical terms used in this guide

For best results, read the contents of this guide *before* you install BODi rS BD007 or BD004.

Precautions

Notes, cautions, and warnings, which have the following meanings, are used throughout this guide to help you become aware of potential problems. ***Warnings*** are intended to prevent safety hazards that could result in personal injury. ***Cautions*** are intended to prevent situations that could result in property damage or impaired functioning.

Note A note presents additional information or interesting sidelights.

IMPORTANT

The alert symbol and IMPORTANT heading calls attention to important information.

CAUTION

The alert symbol and CAUTION heading indicate a potential hazard. Strictly follow the instructions to avoid property damage.

CAUTION

The shock hazard symbol and CAUTION heading indicate a potential electric shock hazard. Strictly follow the instructions to avoid property damage caused by electric shock.

WARNING

The alert symbol and WARNING heading indicate a potential safety hazard. Strictly follow the warning instructions to avoid personal injury.

WARNING

The shock hazard symbol and WARNING heading indicate a potential electric shock hazard. Strictly follow the warning instructions to avoid injury caused by electric shock.

Safety when working with electricity

WARNING

- Do not open the device when the power cord is connected. For systems without a power switch and without an external power adapter, line voltages are present within the device when the power cord is connected.
- For devices with an external power adapter, the power adapter shall be a listed *Limited Power Source.* The main outlet that is utilized to power the device shall be within 10 feet (3 meters) of the device, shall be easily accessible, and protected by a circuit breaker in compliance with local regulatory requirements.
- For AC powered devices, ensure that the power cable used meets all applicable standards for the country in which it is to be installed.
- For AC powered devices, which have 3 conductor power plugs (L1, L2 & GND or Hot, Neutral & Safety/Protective Ground), the wall outlet (or socket) must have an earth ground.
- For DC powered devices, ensure that the interconnecting cables are rated for proper voltage, current, anticipated temperature, flammability, and mechanical serviceability.
- WAN, LAN & PSTN ports (connections) may have hazardous voltages present regardless of whether the device is powered ON or OFF. PSTN relates to interfaces such as telephone lines, FXS, FXO, DSL, xDSL, T1, E1, ISDN, Voice, etc. These are known as “hazardous network voltages” and to avoid electric shock use caution when working near these ports. When disconnecting cables for these ports, detach the far end connection first.
- Do not work on the device or connect or disconnect cables during periods of lightning activity

WARNING

This device contains no user serviceable parts. This device can only be repaired by qualified service personnel.

In accordance with the requirements of council directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE), ensure that at end-of-life you separate this product from other waste and scrap and deliver to the WEEE collection system in your country for recycling.

CAUTION

Always follow ESD prevention procedures when removing and replacing cards.

Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground.

To properly guard against ESD damage and shocks, the wrist strap and cord must operate effectively. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

General observations

- Clean the case with a soft slightly moist anti-static cloth
- Place the unit on a flat surface and ensure free air circulation
- Avoid exposing the unit to direct sunlight and other heat sources
- Protect the unit from moisture, vapors, and corrosive liquids

Typographical conventions used in this document

This section describes the typographical conventions and terms used in this guide.

General conventions

The procedures described in this manual use the following text conventions:

Table 1. General conventions

Convention	Meaning
Garamond blue type	Indicates a cross-reference hyperlink that points to a figure, graphic, table, or section heading. Clicking on the hyperlink jumps you to the reference. When you have finished reviewing the reference, click on the **Go to Previous View** button ◀ in the Adobe® Acrobat® Reader toolbar to return to your starting point.
Futura bold type	Commands and keywords are in **boldface** font.
Futura bold-italic type	Parts of commands, which are related to elements already named by the user, are in ***boldface italic*** font.
Italicized Futura type	Variables for which you supply values are in *italic* font
Futura type	Indicates the names of fields or windows.
Garamond bold type	Indicates the names of command buttons that execute an action.
< >	Angle brackets indicate function and keyboard keys, such as <SHIFT>, <CTRL>, <C>, and so on.
[ ]	Elements in square brackets are optional.
{a | b | c}	Alternative but required keywords are grouped in braces ({ }) and are separated by vertical bars (|)
`screen`	Terminal sessions and information the system displays are in `screen font.`
node	The leading IP address or nodename of a BODi rS is substituted with ***node*** in ***boldfac italic*** font.
SN	The leading **SN** on a command line represents the nodename of the BODi rS
#	An hash sign at the beginning of a line indicates a comment line.

Chapter 1 General Information

Chapter contents

BODi rS Overview

Patton's BODi rS BD007 and BD004 (see Figure 1) are small, light and full featured. Unique bonding, load balancing and failover technology ensures bandwidth robustness and network survivability. All this combined with IPSec VPNs and WiFi mesh capability makes BODi rS the ideal fixed or mobile solution for secure, seamless network connectivity and backup.

BODi rS provides link aggregation and load balancing across seven WAN connections, allowing a combination of technologies like 3G/4G, HSPA, LTE. EVDO, Wi-Fi, external WiMAX dongle, and Satellite to be utilized to connect to the internet.

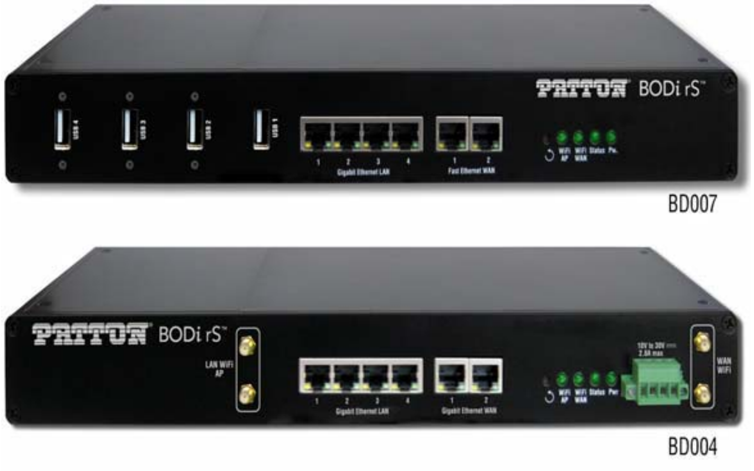


Figure 1. BODi rS BD007 and BD004

Network Features

BODi rS includes the following key features:

- **WAN**
  - – Ethernet WAN Connection in Full/Half Duplex
  - – USB WAN connections
  - – 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 and tzo.com)
- **LAN**
  - – Wi-Fi AP

  - Ethernet LAN ports
  - DHCP server on LAN
  - Static routing rules
- **VPN**
  - Secure Site-to-Site VPN
  - VPN load balancing and failover among selected WAN connections
  - Site-to-Site VPN bandwidth bonding
  - Ability to route internet traffic to a remote VPN peer
  - Optional pre-shared key setting
  - Site-to-Site VPN Throughput, Ping and Traceroute Test
  - PPTP server
  - PPTP and IPsec passthrough
- **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 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
- **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 optimization

- **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
  - 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, Daily and Monthly Bandwidth Usage reports and charts

BODi rS Panels

BD007 Front Panel

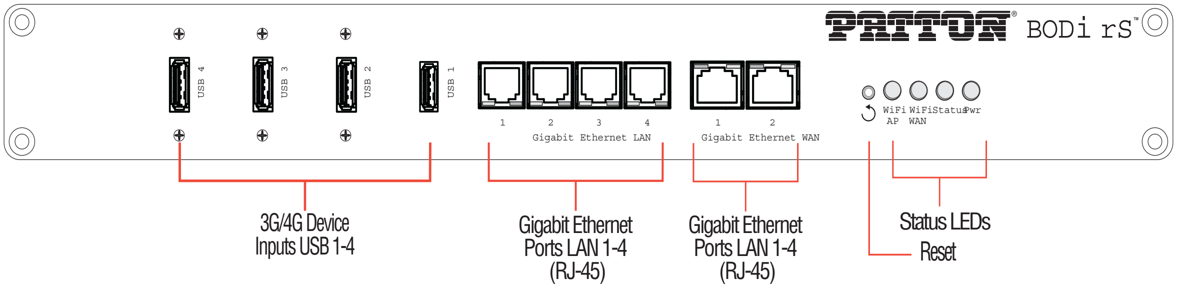


Figure 2. BODi rS BD007 front panel connectors

Table 2. BODi rS BD007 LEDs

LED	Indication	Description
Wi-Fi AP	OFF Blinking ON Continuous Blinking	Disabled Enabled, but no client is associated Client(s) associated to the wireless network Transferring data to wireless network
Wi-Fi WAN	OFF Blinking ON Continuous Blinking	Disabled Attempting to connect Connnected to wireless network(s) without traffic Transferring data
Status	OFF Red Green	System initializing Booting up or busy Ready state
Power	OFF ON	System is not connected to a power source System has a power connection
LAN/WAN (Green LED)	OFF ON	10/100 Mbps 1000 Mbps
LAN/WAN (Yellow LED)	Solid Blinking OFF	Port is connected without traffic Transferring data Port is not connected

BD007 Rear Panel

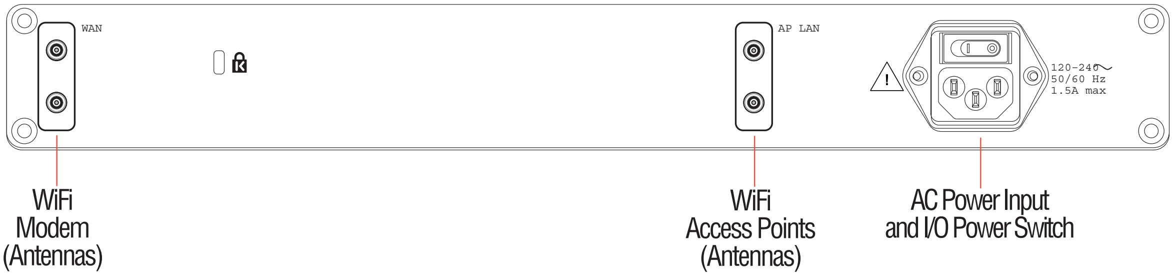

WAN
AP LAN
120-240~
50/60 Hz
1.5A max
WiFi Modem (Antennas)
WiFi Access Points (Antennas)
AC Power Input and I/O Power Switch

Figure 3. BODi rS BD007 rear panel connectors

BODi rS Panels

BD004 Front Panel

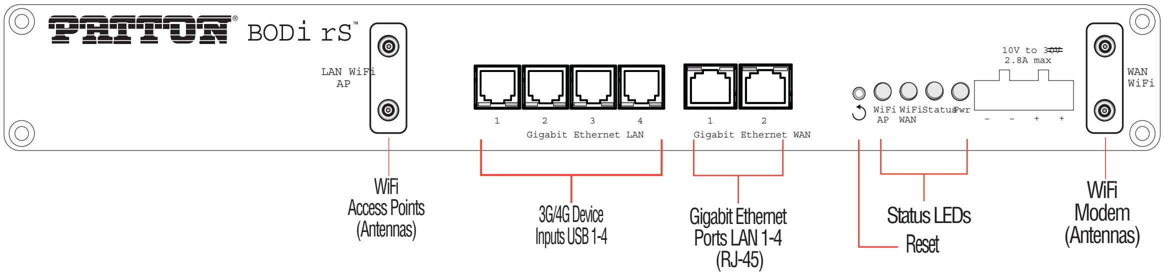


Figure 4. BODi rS BD004 front panel connectors

Table 3. BODi rS BD004 LEDs

LED	Indication	Description
Wi-Fi AP	OFF	Disabled
	Blinking	Enabled, but no client is associated
	ON	Client(s) associated to the wireless network
	Continuous Blinking	Transferring data to wireless network
Wi-Fi WAN	OFF	Disabled
	Blinking	Attempting to connect
	ON	Connnected to wireless network(s) without traffic
	Continuous Blinking	Transferring data
Status	OFF	System initializing
	Red	Booting up or busy
	Green	Ready state
Power	OFF	System is not connected to a power source
	ON	System has a power connection
LAN/WAN (Green LED)	OFF	10/100 Mbps
	ON	1000 Mbps
LAN/WAN (Yellow LED)	Solid	Port is connected without traffic
	Blinking	Transferring data
	OFF	Port is not connected

BD004 Rear Panel

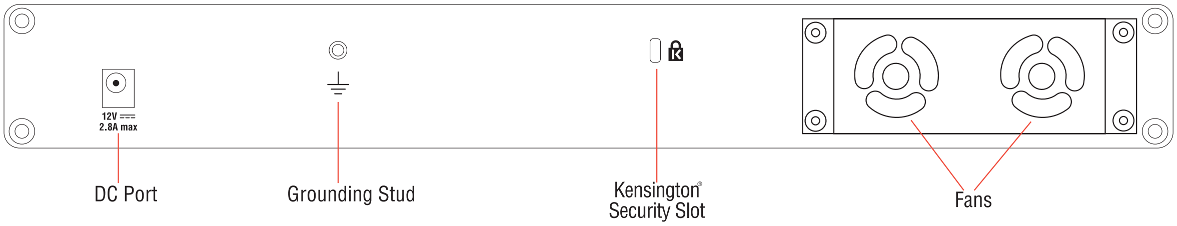


Figure 5. BODi rS BD004 rear panel connectors

Chapter 2 Installing BODi rS

Chapter contents

Planning the Installation

Please refer to the Quick Start Guides for BD007 and BD004 for each model's specific installation instructions.
Before installing BODi rS, gather the following information and materials:

- At least one internet/WAN access account and/or Wi-Fi access information
- Network connections:
  - **Ethernet WAN:** A 10/100/1000BaseT UTP cable with RJ45 connector
  - **USB:** A USB modem
  - **Wi-Fi WAN:** A Wi-Fi antenna
- A computer with TCP/IP network protocol and a web browser installed. Supported browsers include Microsoft Internet Explorer 7.0 or above, Mozilla Firefox 3.0 or above, Apple Safari 3.1.1 or above, and Google Chrome 2.0 or above.

Setting Up the Network

Constructing the Network

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

Figure 6 illustrates the network configuration:

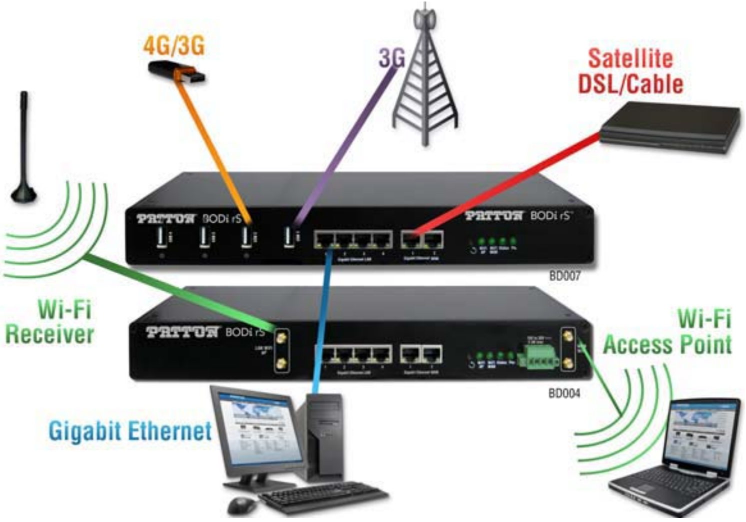


Figure 6. BODi rS Network Connections

Configuring the Network Environment

To ensure that BODi rS works properly in the LAN environment and can access the internet via the WAN connections, refer to the following setup procedures:

- To physically connect the LAN and WAN interfaces, refer to "Connecting BODi rS Interfaces" on page 27.
- To initially configure the LAN and WAN interfaces refer to "Connecting to the Web Admin Interface" on page 28.
- To configure advanced settings for the LAN and WAN interfaces, refer to Chapter 3, "Configuring the LAN Interface" on page 31.

Mounting BODi rS

Rack Mount

BODi rS can be mounted in a rack using the attachable rack mount ears (see Figure 7). Align the rack mount ears with the three holes on each side of the device. Place screws through the mounting holes and secure to the device. Place the device in a rack and secure using the open slots on the rack mount ears.

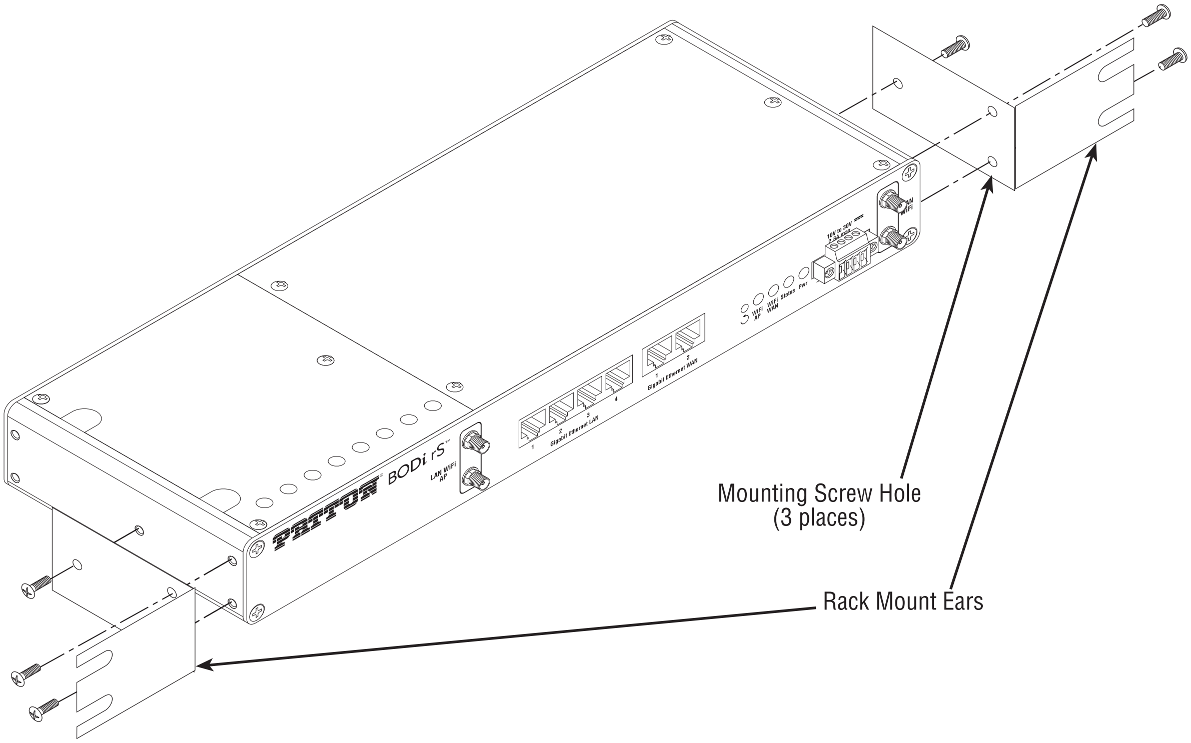


Figure 7. Mounting BODi rS in a rack

Car Mount for BD004 only

BODi rS BD004 can be mounted on a flat surface using the included car mounting plates. Place each car mount according the label's direction, and screw it onto the device. After mounting each plate on the sides of the device, screw the plate onto the flat surface.

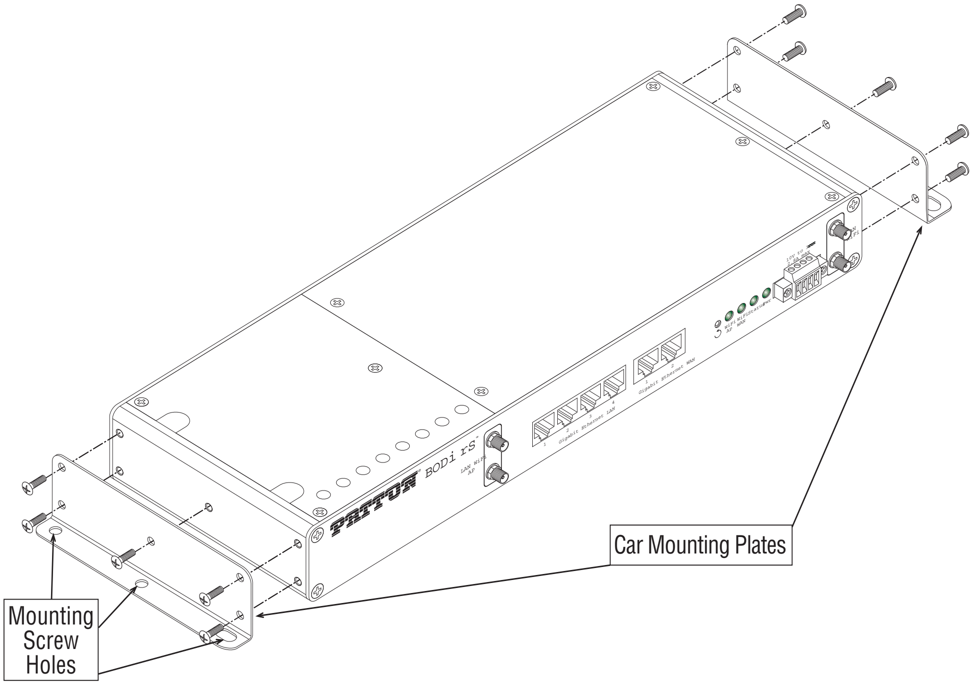


Figure 8. Mounting BODi rS in a car

Connecting BODi rS Interfaces

Connecting the Ethernet Interfaces

BODi rS includes four LAN Gigabit Ethernet ports and two Gigabit Ethernet WAN ports on the rear panel. Use a straight-through or cross-over Ethernet cable to connect the Ethernet RJ-45 ports.

Refer to Chapter 3, "Configuring LAN & WAN Interfaces" on page 30 for information about configuring the LAN and WAN interfaces via the Web Admin interface.

Connecting the Wi-Fi Interfaces

BODi rS provides four Wi-Fi antenna connectors on the rear panel– two connectors provide interfaces to connect wireless LAN Access Points (AP LAN), and two connectors provide interfaces to connect the wireless WAN. Use a SMA cable to connect the female SMA antenna ports.

Refer to Chapter 3, "Configuring LAN & WAN Interfaces" on page 30 for information about configuring the AP LAN and WAN wireless interfaces via the Web Admin interface.

Connecting the USB Interfaces

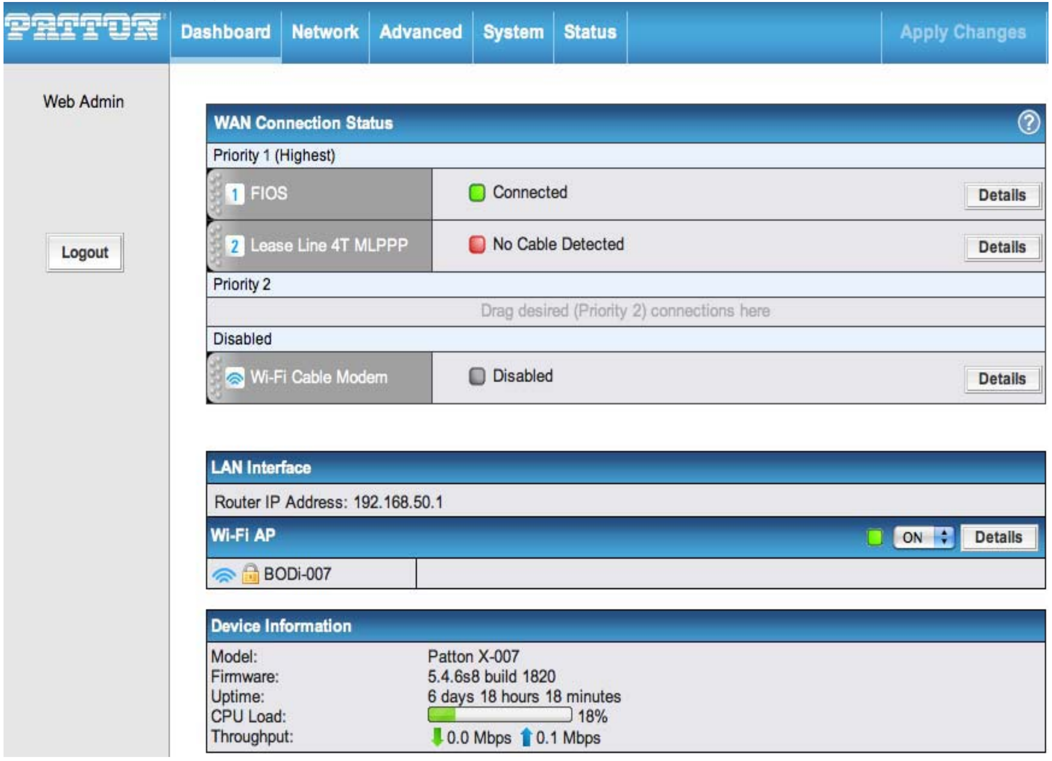
BODi rS provides four USB 2.0 ports on the front panel. You can use the USB ports to connect cellular modems.

Refer to Chapter 3, "Configuring LAN & WAN Interfaces" on page 30 for information about configuring USB WAN interfaces via the Web Admin interface.

Connecting to the Web Admin Interface

After physically connecting the LAN, use the Web Admin interface to configure BODi rS interfaces. To login to the Web Admin Interface:

1. Start a web browser on a computer that is connected to BODi rS through the LAN port.
2. Enter the following default LAN IP address in the address field of the web browser: **http://192.168.50.1**
3. Enter the username *admin* and password *admin* to login to the Web Admin Interface. This is the default Username and Password of BODi rS. (You may change the Admin and Read-only User Password by clicking on **System** > **Admin Security** in the Web Admin Interface).
4. After successfully logging in, the **Dashboard** of the Web Admin Interface displays:



WAN Connection Status

Priority 1 (Highest)

1 FIOS	🟩 Connected	Details
2 Lease Line 4T MLPPP	🟥 No Cable Detected	Details

Priority 2

Drag desired (Priority 2) connections here

Disabled

Wi-Fi Cable Modem	▢ Disabled	Details

LAN Interface

Router IP Address: 192.168.50.1

Wi-Fi AP 🟩 ON Details

BODi-007

Device Information

Model:	Patton X-007
Firmware:	5.4.6s8 build 1820
Uptime:	6 days 18 hours 18 minutes
CPU Load:	18%
Throughput:	0.0 Mbps 0.1 Mbps

Figure 9. Web Admin Interface home page

The Web Admin Interface **Dashboard** shows the current WAN, LAN, Wi-Fi AP settings and statuses. The **Dashboard** enables you to change the priority of the WAN connections and switch theWi-Fi AP connections off or on. For more information about configuring these connections, refer to Chapter 3, "Configuring LAN & WAN Interfaces" on page 30.

The **Device Information** section shows the details about BODi rS system, including the Firmware version and system uptime. For more information about viewing system status information, refer to Chapter 12, "Managing Status Settings" on page 112.

Note Configuration changes will only take effect after clicking the **Save** button at the bottom of each page. The **Apply Changes** button causes the changes to be saved and applied.

Restoring Factory Default Settings

To restore the factory default settings on BODi rS units, follow the steps below:

1. Locate the reset button on the front panel of BODi rS BD007 or BD004.

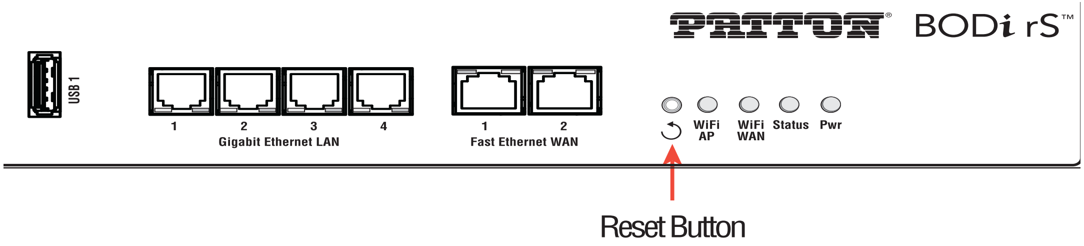


Figure 10. BODi rS BD007 and BD004 front panel reset button

2. With a paper clip, press the reset button and hold it for at least 10 seconds until the unit reboots itself.

After BODi rS finishes rebooting, it will operate with the factory default settings.

IMPORTANT

After restoring the factory default configuration, BODi rS permanently removes all previous configurations and bandwidth usage data.

Patton strongly recommends performing backups of configuration settings on a regular basis.

Chapter 3 **Configuring LAN & WAN Interfaces**

Chapter contents

Introduction

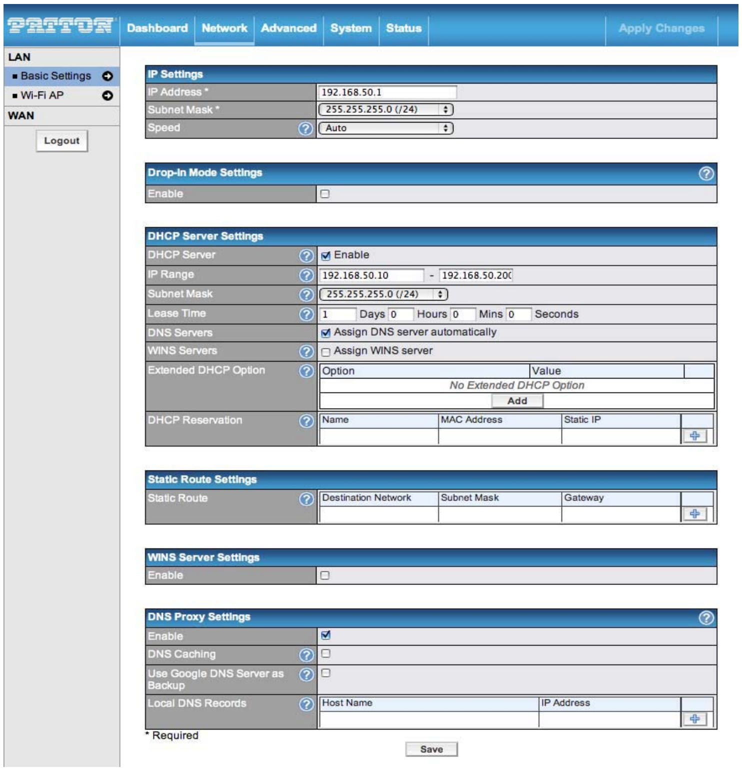
This chapter describes setting up Ethernet access through the physical LAN and WAN ports, and USB and Wi-Fi interfaces. For information about setting up the LAN interface, see "Configuring the LAN Interface" on page 31. For information about setting up the WAN interface, see "Configuring the WAN Interface" on page 38.

Configuring the LAN Interface

This section describes configuring the basic settings and Wi-Fi AP settings for the LAN using BODi rS Web Admin Interface.

Basic Settings

To configure basic settings for the LAN, click on **Network > LAN > Basic Settings** in the Web Interface.



IP Settings

IP Address *	192.168.50.1
Subnet Mask *	255.255.255.0 (/24)
Speed	Auto

Drop-In Mode Settings

Enable	□

DHCP Server Settings

DHCP Server	☑ Enable
IP Range	192.168.50.10 - 192.168.50.20(
Subnet Mask	255.255.255.0 (/24)
Lease Time	1 Days 0 Hours 0 Mins 0 Seconds
DNS Servers	☑ Assign DNS server automatically
WINS Servers	□ Assign WINS server
Extended DHCP Option	Option / Value *No Extended DHCP Option* Add
DHCP Reservation	Name / MAC Address / Static IP

Static Route Settings

Static Route	Destination Network / Subnet Mask / Gateway

WINS Server Settings

Enable	□

DNS Proxy Settings

Enable	☑
DNS Caching	□
Use Google DNS Server as Backup	□
Local DNS Records	Host Name / IP Address

* Required

Save

Figure 11. Network > LAN > Basic Settings

The following sections provide information for configuring the LAN on the **Basic Settings** configuraration page:

- "IP Settings" on page 32
- "DHCP Server Settings" on page 32
- "Static Route Settings" on page 33
- "WINS Server Settings" on page 33
- "DNS Proxy Settings" on page 34

IP Settings

Table 4. LAN: IP Settings

Field	Description
IP Address	The IP address for the Ethernet LAN management port
Subnet Mask	The subnet mask for the Ethernet LAN management port
Speed	The speed of the Ethernet LAN management port By default, **Auto** is selected and the appropriate data speed is automatically detected by BODi rS. In the event of negotiation issues, the port speed can be manually specified to circumvent the issues. You can also choose whether or not to advertise the speed to the peer by selecting the **Advertise Speed** checkbox.

DHCP Server Settings

Table 5. LAN: DHCP Server Settings

Field	Description
DHCP Server	When enabled, the DHCP server automatically assigns an IP address to each computer that is connected via the LAN and configured to obtain an IP address via DHCP. The DHCP server can prevent IP address collision on LAN.
IP Range & Subnet Mask	Allocates a range of IP addresses that the DHCP Server will assign to LAN computers
Lease Time	Specifies the length of time that 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 the renewal of the IP address assignment will be required.
DNS Servers	Allows manual input of DNS server addresses to be offered to the DHCP clients. If the **Assign DNS server automatically** option is selected, BODi rS's built-in DNS server address (i.e. LAN IP address) will be offered.
WINS Server	Specifies the Windows Internet Name Service (WINS) server. You may choose to use the Built-in WINS server or External WINS servers. When Site-to-Site VPN is connected, 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 enabled, you can view a list of WINS clients by clicking **Status > WINS Clients**.
Extended DHCP Option	Specifies the value of additional Extended DHCP Options defined in RFC 2132 (in addition to standard DHCP options like. DNS server address, gateway address, and subnet mask). In this case, you can pass additional configuration information to LAN hosts. To define an Extended DHCP Option, click the **Add** button, choose the option that you want to define and enter its value. For values that are in IP address list format, you can enter one IP address per line in the provided text field. You may only define each option one time.

Table 5. LAN: DHCP Server Settings

Field	Description
DHCP Reservation	Reserves the assignment of fixed IP addresses for a list of computers on the LAN. The MAC addresses identify the computers that will be assigned fixed IP addresses on the LAN. The fixed IP address assignment is displayed as a cross-reference list between the computers' Name, MAC addresses and fixed IP addresses. The field Name (an optional field) is used to define a name to represent the device. MAC addresses should be in the format of 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 on the **Status > Client List** configuration page. For more details, refer to Chapter 12, "Managing Status Settings" on page 112.

Static Route Settings

Table 6. LAN: Static Route Settings

Field	Description
Static Route	Defines 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 the format of **w.x.y.z**. 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

Table 7. LAN: WINS Server Settings

Field	Description
Enable	Check the box to enable the WINS Server. A list of WINS clients display on the **Status > WINS Clients** configuration page.

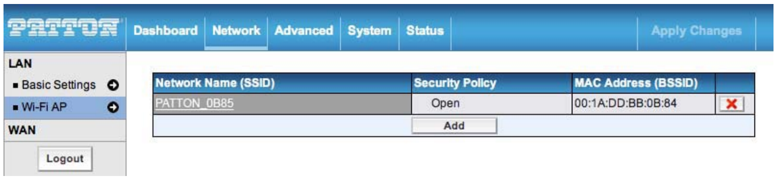
DNS Proxy Settings

Table 8. LAN: DNS Proxy Settings

Field	Description
Enable	Check the box to enable the DNS Proxy feature.
DNS Caching	Enables DNS caching on the built-in DNS proxy server. When enabled, queried DNS replies will be cached until the records’ Time To Live (TTL) limit has been reached. This feature can help improve the DNS lookup time. However, it cannot return the most updated result for frequently updated DNS records. Default = **Disabled**.
Use Google DNS Server as Backup	Check the box to enable the Google DNS feature, and BODi rS will automatically use the Google DNS Server as a backup DNS server. The DNS proxy server will forward DNS requests to Google's Public DNS Servers in case all of the WAN connections' DNS servers become unavailable. Default = **Disabled**.
Local DNS Records	Defines custom local DNS records. A static local DNS record consists of a Host Name and an IP Address. When looking up the Host Name from the LAN to LAN IP of BODi rS, the corresponding IP Address will be returned. Press ➕ to create a new record. Press ✖ to remove a record.

Wi-Fi AP Settings

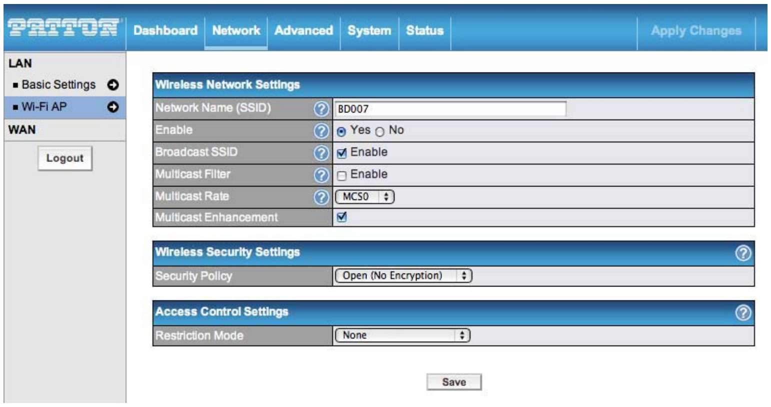
To configure wireless Access Point settings, click on **Network** > **LAN** > **Wi-Fi AP** in the Web Admin Interface. Wi-Fi AP may be switched on or off using the Web Admin Interface **Dashboard**.



Network Name (SSID)	Security Policy	MAC Address (BSSID)	
PATTON_0B85	Open	00:1A:DD:BB:0B:84	✗

Figure 12. Network > LAN > Wi-Fi AP

The following sections provide information for configuring the LAN on the **Wi-Fi AP** configuraration page. Click the **Add** button on the Wi-Fi AP page to create a new Service Set Identifier (SSID).



Wireless Network Settings	
Network Name (SSID)	BD007
Enable	● Yes ○ No
Broadcast SSID	☑ Enable
Multicast Filter	□ Enable
Multicast Rate	MCS0
Multicast Enhancement	☑

Wireless Security Settings	
Security Policy	Open (No Encryption)

Access Control Settings	
Restriction Mode	None

Figure 13. Network > LAN > Wi-Fi AP > Add

Refer to the following sections for information about configuring a new Wi-FI Access Point:

- "Wireless Network Settings" on page 36
- "Wireless Security Settings" on page 36
- "Access Control Settings" on page 37

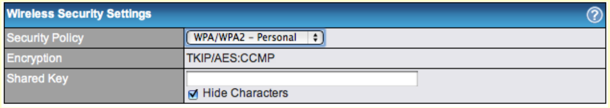
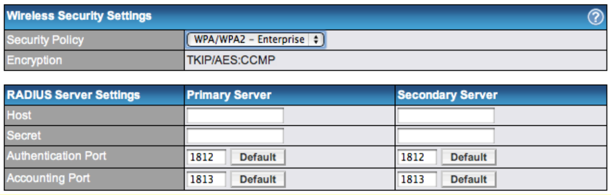
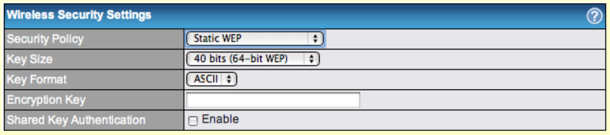
Wireless Network Settings

Table 9. LAN: Wi-Fi AP Network Settings

Field	Description
Network Name (SSID)	Specifies a unique name to represent the virtual AP scanned by Wi-Fi clients
Enable	Select **Yes** to enable the virtual AP. Click **No** to disable the virtual AP. Default = **Enabled**.
Broadcast SSID	When **Enabled**, Wi-Fi clients can scan for this SSID. Default = **Enabled**.
Multicast Filter	When **Enabled**, multicast network traffic to the wireless SSID is filtered. Default = **Disabled**.
Multicast Rate	Specifies the rate at which multicast packets are transmitted by the access point on your wireless network. Multicast packets are used to send a single message to a set of recipients in a defined group. Examples include: Teleconferencing, videoconferencing, and group email. Specifying a high multicast rate may improve performance of multicast features. Default= **1Mbps**

Wireless Security Settings

Table 10. LAN: Wi-Fi AP Security Settings

Field	Description
Security Policy	Specifies the security policy used for this wireless network. Available options: • **Open:** No Encryption • **WPA/WPA2 – Personal:** Wi-Fi Protected Access for Home/Small Business Use Requires a specified Shared Key  Wireless Security Settings Security Policy: WPA/WPA2 – Personal Encryption: TKIP/AES:CCMP Shared Key: ☑ Hide Characters • **WPA/WPA2 – Enterprise:** Wi-Fi Protected Access for Commercial Use Requires specified RADIUS Server settings  Wireless Security Settings Security Policy: WPA/WPA2 – Enterprise Encryption: TKIP/AES:CCMP RADIUS Server Settings — Primary Server — Secondary Server Host Secret Authentication Port: 1812 Default — 1812 Default Accounting Port: 1813 Default — 1813 Default • **Static WEP:** Wired Equivalent Privacy (WEP) Requires a specified Key Size, Key Format, and Encryption Key  Wireless Security Settings Security Policy: Static WEP Key Size: 40 bits (64-bit WEP) Key Format: ASCII Encryption Key Shared Key Authentication: □ Enable

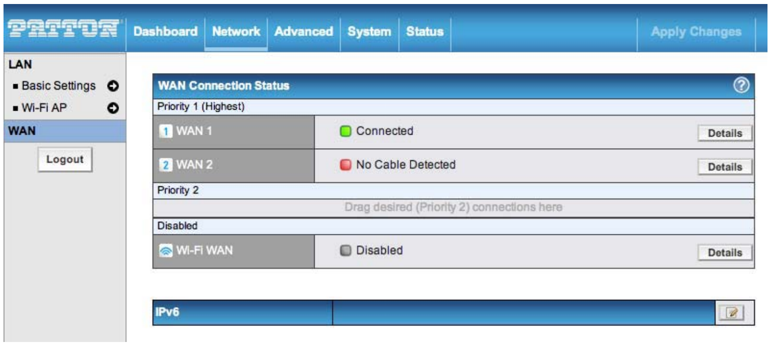
Access Control Settings

Table 11. LAN: Wi-Fi AP Access Control Settings

Field	Description
Restriction Mode	Enables access control through MAC address filtering. Available options: None, Deny all except listed, or Accept all except listed

Configuring the WAN Interface

This section describes managing the WAN settings using the BODi rS Web Admin Interface. From the **Dashboard**, click on **Network > WAN** to reach the main WAN configuration page.



WAN Connection Status

Priority 1 (Highest)

WAN 1 — Connected

WAN 2 — No Cable Detected

Priority 2

Drag desired (Priority 2) connections here

Disabled

Wi-Fi WAN — Disabled

Figure 14. Network > WAN

To reorder the priority list for different WANs, click on the desired WAN listing, hold the left mouse button and drag it to the desired priority level in the list (the first one would be the highest priority, the second one would be lower priority, etc...). Release the mouse button after moving the WAN listing.

To disable a particular WAN connection, click on the desired WAN listing, hold the left mouse button and drag it to the **DISABLED** row. Release the mouse button after moving the WAN listing.

You can also manage priority settings through the **Dashboard** (refer to "Connecting to the Web Admin Interface" on page 28 for information).

Click the **Details** button in the corresponding row of the WAN connection to modify the connection settings.

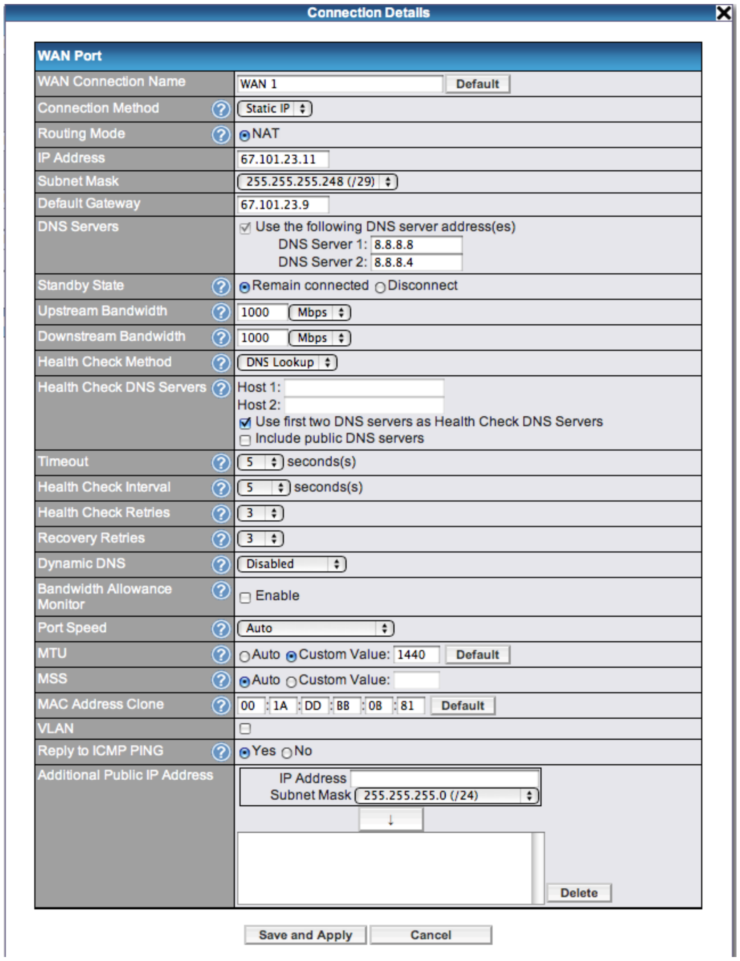
Note Connection Details will be changed and effective immediately after clicking the **Save and Apply** button.

Refer to the following sections for configuring specific WAN settings:

- Ethernet WAN basic settings (see "Ethernet WAN Settings" on page 39)
- USB Devices (see "USB Interface Settings" on page 46)
- Wireless WAN (see "Wi-Fi WAN Settings" on page 48)
- WAN Status Monitoring (see "WAN Health Check" on page 51)
- Bandwidth Monitoring (see "Bandwidth Allowance Monitor" on page 53)

Ethernet WAN Settings

To configure Ethernet WAN settings, click on **Network > WAN** in the Web Admin Interface. Then, click on the **Details** button in the **Ethernet WAN** row of the **WAN Connection Status** table. The **Ethernet WAN** configuration page displays.



WAN Port	
WAN Connection Name	WAN 1
Connection Method	Static IP
Routing Mode	● NAT
IP Address	67.101.23.11
Subnet Mask	255.255.255.248 (/29)
Default Gateway	67.101.23.9
DNS Servers	☑ Use the following DNS server address(es) DNS Server 1: 8.8.8.8 DNS Server 2: 8.8.8.4
Standby State	● Remain connected ○ Disconnect
Upstream Bandwidth	1000 Mbps
Downstream Bandwidth	1000 Mbps
Health Check Method	DNS Lookup
Health Check DNS Servers	Host 1: Host 2: ☑ Use first two DNS servers as Health Check DNS Servers □ Include public DNS servers
Timeout	5 seconds(s)
Health Check Interval	5 seconds(s)
Health Check Retries	3
Recovery Retries	3
Dynamic DNS	Disabled
Bandwidth Allowance Monitor	□ Enable
Port Speed	Auto
MTU	○ Auto ● Custom Value: 1440
MSS	● Auto ○ Custom Value:
MAC Address Clone	00 : 1A : DD : BB : 0B : 81
VLAN	□
Reply to ICMP PING	● Yes ○ No
Additional Public IP Address	IP Address Subnet Mask 255.255.255.0 (/24) ↓

Figure 15. Network > WAN > Ethernet WAN Settings

The following sections provide information for configuring the Ethernet WAN:

- "General Ethernet WAN Settings" on page 40
- "DHCP Settings" on page 42
- "Static IP Settings" on page 43
- "PPPoE Settings" on page 44
- "Dynamic DNS Settings" on page 45

General Ethernet WAN Settings

Table 12. WAN: General Ethernet WAN Settings

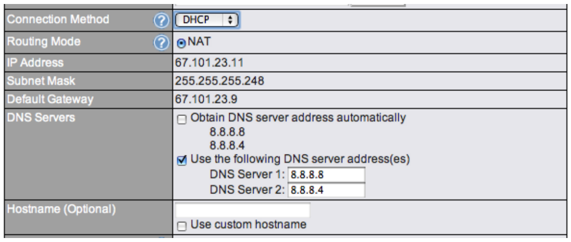
Field	Description
WAN Connection Name	Defines a unique name to represent the WAN connection
Connection Method	Available connection methods for Ethernet WAN: • DHCP: See "DHCP Settings" on page 42 • Static IP: "Static IP Settings" on page 43 • PPPoE: "PPPoE Settings" on page 44
Standby State	Specifies the state of the WAN connection. Available options include **Remain connected** and **Disconnect**. Default = **Remain Connected**
Upstream Bandwidth	Specifies the data bandwidth in the outbound traffic from the WAN interface.
Downstream Bandwidth	Specifies the data bandwidth in the inbound direction to the WAN interface. This value is referenced as the default weight value when using the custom rule default (**Auto**), the algorithm **Least Used**, or the algorithm **Persistence (Auto)** in Outbound Policy with **Managed by Custom Rules** chosen (see "Creating Custom Rules for the Outbound Policy" on page 68).
Health Check Method	Specifies the health check method for the WAN connection (see "WAN Health Check" on page 51). Available methods include **Ping**, **DNS Lookup**, or **Disabled**. Default = **Disabled**
Dynamic DNS	Specifies the dynamic DNS service provider to use for the WAN based on supported dynamic DNS service providers: • hangeip.com • dyndns.org • no-ip.org • zo.com Select **Disabled** to disable this feature. (See "Dynamic DNS Settings" on page 45 for more information).
Bandwidth Allowance Monitor	Enables bandwidth usage monitoring on this WAN connection for each billing cycle. When disabled, bandwidth usage for each month is still being tracked but no action will be taken (see "Bandwidth Allowance Monitor" on page 53).

Table 12. WAN: General Ethernet WAN Settings

Field	Description
Port Speed	Specifies the speed and duplex configurations of the WAN Port. By default, **Auto** is selected and BODi rS automatically detects the appropriate data speed. In the event of negotiation issues, the port speed can be manually specified to circumvent the issues. You can also choose whether or not to advertise the speed to the peer by selecting the **Advertise Speed** checkbox.
MTU	Specifies the Maximum Transmission Unit. Default = **Custom 1440** You may adjust the MTU value by editing the text field. Click **Default** to restore the default MTU value. Select **Auto** and BODi rS will automatically detect the appropriate MTU value. The auto-detection will run each time the WAN connection establishes.
MSS	Configures 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. Default = **Auto**
MAC Address Clone	Specifies the MAC address. 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 these cases, use the **MAC Address Clone** field to change the WAN's MAC address to the original client PC's MAC address. The default MAC Address is a unique value assigned at the factory. In most cases, the default value is sufficient. Click the **Default** button to restore the MAC Address to the default value.
Reply to ICMP Ping	When disabled, the WAN connection will not respond to ICMP PING requests. Default = **Enabled**
Additional Public IP Address	When there are more than one IP addresses assigned to the WAN connection, the **IP Address List** represents the list of fixed internet IP addresses assigned by the ISP. 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**.

DHCP Settings

The DHCP connection method is suitable if the ISP provides an IP address automatically by DHCP (e.g. via Satellite Modem, WiMAX Modem, Cable, Metro Ethernet, etc.).



Connection Method	DHCP
Routing Mode	● NAT
IP Address	67.101.23.11
Subnet Mask	255.255.255.248
Default Gateway	67.101.23.9
DNS Servers	□ Obtain DNS server address automatically 8.8.8.8 8.8.8.4 ☑ Use the following DNS server address(es) DNS Server 1: 8.8.8.8 DNS Server 2: 8.8.8.4
Hostname (Optional)	□ Use custom hostname

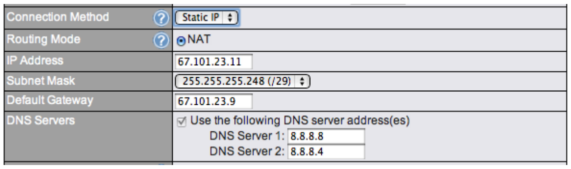
Figure 16. Network > WAN > Ethernet WAN Settings > DHCP Connection

Table 13. WAN: DHCP Settings

Field	Description
IP Address	BODi rS obtains this information from the ISP automatically.
Subnet Mask	BODi rS obtains this information from the ISP automatically.
Default Gateway	BODi rS obtains this information from the ISP automatically.
DNS Servers	Specifies the DNS (Domain Name System) Servers to be used when a DNS lookup is routed through this connection. Each ISP may provide a set of DNS servers for DNS lookups. Selecting **Obtain DNS server address automatically** allows the WAN DHCP Server to assign the DNS Servers 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.
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 in the **Hostname** field. If your service provider does not provide you with the value, you can safely bypass this option.

Static IP Settings

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



Connection Method	Static IP
Routing Mode	● NAT
IP Address	67.101.23.11
Subnet Mask	255.255.255.248 (/29)
Default Gateway	67.101.23.9
DNS Servers	☑ Use the following DNS server address(es) DNS Server 1: 8.8.8.8 DNS Server 2: 8.8.8.4

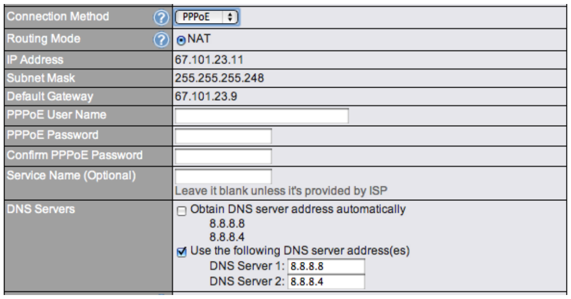
Figure 17. Network > WAN > Ethernet WAN Settings > Static IP Connection

Table 14. WAN: Static IP Settings

Field	Description
IP Address	Specifies a fixed IP address to connect to the internet. The ISP typically provides this information.
Subnet Mask	Specifies the subnet mask for the IP address. The ISP typically provides this information.
Default Gateway	Specifies the default gateway to connect to the internet. The ISP typically provides this information.
DNS Servers	Specifies the DNS (Domain Name System) Servers to be used when a DNS lookup is routed through this connection. Each ISP may provide a set of DNS servers for DNS lookups. You may enter the DNS server addresses provided by the ISP into the **DNS server 1** and **DNS server 2** fields. If no address is entered, this link will not be used for DNS lookups.

PPPoE Settings

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



Connection Method	PPPoE
Routing Mode	● NAT
IP Address	67.101.23.11
Subnet Mask	255.255.255.248
Default Gateway	67.101.23.9
PPPoE User Name	
PPPoE Password	
Confirm PPPoE Password	
Service Name (Optional)	Leave it blank unless it's provided by ISP
DNS Servers	□ Obtain DNS server address automatically 8.8.8.8 8.8.8.4 ☑ Use the following DNS server address(es) DNS Server 1: 8.8.8.8 DNS Server 2: 8.8.8.4

Figure 18. Network > WAN > Ethernet WAN Settings > PPPoE Connection

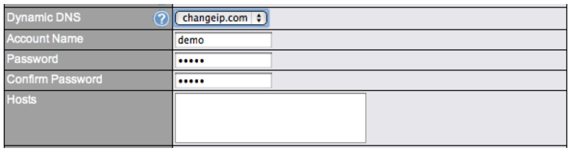
Table 15. WAN: PPPoE Settings

Field	Description
IP Address	BODi rS obtains this information from the ISP automatically.
Subnet Mask	BODi rS obtains this information from the ISP automatically.
Default Gateway	BODi rS obtains this information from the ISP automatically.
PPPoE Username / Password	Enter the username and password to connect to the ISP via the PPPoE server. The ISP typically provides this information.
Confirm PPPoE Password	Enter the password again for verification.
Service Name	Specifies the Service Name. The ISP typically provides this information. **Note:** Leave this field blank unless it is provided by your ISP.
DNS Servers	Specifies the DNS (Domain Name System) Servers to be used when a DNS lookup is routed through this connection. Each ISP may provide a set of DNS servers for DNS lookups. Selecting **Obtain DNS server address automatically** allows the PPPoE Server to assign the DNS Servers 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 may enter custom DNS server addresses for this WAN connection into the **DNS server 1** and **DNS server 2** fields.

Dynamic DNS Settings

BODi rS provides the functionality to register 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 hostname.

When the IP address is changed or 23 days have passed without a link reconnection, BODi rS will connect to the dynamic DNS service provider to perform an IP address update within the provider's records.



Dynamic DNS	changeip.com
Account Name	demo
Password	•••••
Confirm Password	•••••
Hosts	

Figure 19. Network > WAN > Ethernet WAN Settings > Dynamic DNS

Table 16. WAN: Dynamic DNS Settings

Field	Description
Dynamic DNS	Specifies the dynamic DNS service provider to be used for the WAN based on supported dynamic DNS service providers: • hangeip.com • dyndns.org • no-ip.org • zo.com Select **Disabled** to disable this feature.
Account Name	Specifies the registered username for the dynamic DNS service
Password	Specifies the password for the dynamic DNS service
Hosts	Specifies a list of hostnames or domains to be associated with the WAN connection's public internet IP address. You may use the Enter key to add more than one host.

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 changes (e.g. IP is changed after a DHCP IP refresh, reconnection, etc...).
Due to dynamic DNS service providers' policy, a dynamic DNS host will automatically expire if the host record has not been updated for a long time. BODi rS performs an update every 23 days even if a WAN's IP address has not changed.

USB Interface Settings

To configure the USB device settings, click on **Network > WAN** in the Web Admin Interface. Then, click on the **Details** button in the **USB** row of the **WAN Connection Status** table. Table 17 describes the settings for configuring a USB device.

Table 17. WAN: USB Settings

Field	Description
SIM Card IMSI	Displays the International Mobile Subscriber Identity which uniquely identifies the SIM card. This is applicable to 3G modems only.
Carrier	Displays the name of the carrier that issues the SIM card (for 3G) or the modem (for EVDO)
Country / Region	Displays the country/region of the carrier that issues the EVDO modem
Signal Strength	Displays the signal strength of the connection
IP Address	BODi rS obtains this information from the carrier automatically.
DNS Servers	Specifies the currently effective DNS (Domain Name System) Servers when a DNS lookup is routed through this connection. Each carrier may provide a set of DNS servers for DNS lookups. BODi rS obtains this information from the carrier automatically, or you may enter the DNS server entries manually.
WAN Connection Name	Defines a unique name to represent the WAN connection
Standby State	Select whether to keep the connection or disconnect the link when this WAN connection is no longer the highest priority and has entered the standby state. When **Remain connected** is enabled, the WAN connection will be available immediately when it is active.
Operator Settings	*Applies to 3G / EDGE / GPRS modem only. It does not apply to EVDO / EVDO Rev. A modem. Configures the APN settings of the WAN connection. Select **Auto** to detect the mobile operator automatically. The operator will automatically configure and connect the device. If there is any difficulty in making connection, select **Custom** to enter the carrier's PN, Login, Password, and Dial Number settings manually. You may obtain this information from your carrier. Default/Recommended Setting = **Auto**
APN / Login / Password / Dial Number / SIM PIN	Select **Auto** to automatically provide the information for these fields. Select **Custom** to manually enter these parameters. You may obtain this information from your ISP.
Health Check Settings	Specifies the health check method for the WAN connection (see "WAN Health Check" on page 51). Available options include **SmartCheck** or **Disabled**. Default = **SmartCheck**

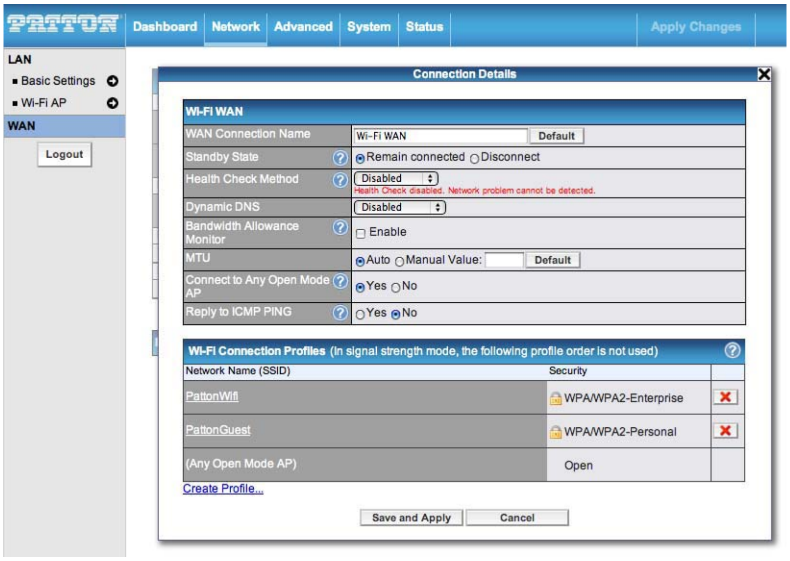
Table 17. WAN: USB Settings

Field	Description
Bandwidth Allowance Monitor	Enables bandwidth usage monitoring on this WAN connection for each billing cycle. When disabled, bandwidth usage for each month is still being tracked but no action will be taken (see "Bandwidth Allowance Monitor" on page 53).
Modem Specific Settings	The Modem Specific Settings may or may not be available depending on the model of the connected device.
Network Type	Specifies the preference for using the 4G, 3G and/or 2G networks. 4G networks include WiMAX; 3G networks include HSPA / UMTS; 2G networks include EDGE / GPRS. Select **3G only** or **2G only** to use the HSPA / UMTS or EDGE / GPRS network, respectively. If the chosen network is not available, no other network will be used regardless of its availability. The modem connection will remain offline. Select **3G preferred** or **2G preferred** to use the chosen network when it is available. If the chosen network is not available, the other network will be used where available. Default = **3G preferred** (The example above uses a Huawei 3G modem).
GSM Frequency Band	Specifies which GSM frequency band to use. Select **GSM1900** for use in the United States, Canada, and many other countries in the Americas. Select **GSM900 / GSM1800 / GSM2100** for use in Europe, Middle East, Africa, Asia, Oceania, and Brazil. Select **All Bands** to automatically use the appropriate frequency band. Default = **All Bands**
WiMAX Settings	This setting is associated with the detected WiMAX modem. BODi rS supports 3G/4G USB modems. Enter the associated Login ID and Password in the WiMAX field.

Note For a list of supported modems for the BODi rs, visit http://www.patton.com/products/usb_modems.asp

Wi-Fi WAN Settings

To configure Wi-Fi WAN settings, click on **Network > WAN** in the Web Admin Interface. Then, click on the **Details** button in the **Wi-Fi WAN** row of the **WAN Connection Status** table. The **Wi-Fi WAN** configuration page displays.



Wi-Fi WAN	
WAN Connection Name	Wi-Fi WAN
Standby State	● Remain connected ○ Disconnect
Health Check Method	Disabled Health Check disabled. Network problem cannot be detected.
Dynamic DNS	Disabled
Bandwidth Allowance Monitor	□ Enable
MTU	● Auto ○ Manual Value:
Connect to Any Open Mode AP	● Yes ○ No
Reply to ICMP PING	○ Yes ● No

Wi-Fi Connection Profiles (In signal strength mode, the following profile order is not used)

Network Name (SSID)	Security
PattonWifi	WPA/WPA2-Enterprise
PattonGuest	WPA/WPA2-Personal
(Any Open Mode AP)	Open

Create Profile...

Figure 20. Network > WAN > Wi-Fi WAN Settings

The following sections provide information for configuring the Wi-Fi WAN:

- "General Wi-Fi WAN Settings" on page 48
- "Create Wi-Fi Connection Profile" on page 50

General Wi-Fi WAN Settings

Table 18. WAN: General Wi-Fi WAN Settings

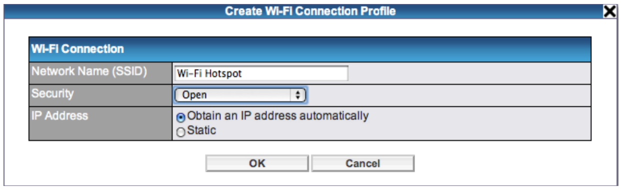
Field	Description
Network Name (SSID)	Displays the Wi-Fi connection broadcast name from the access point
MAC Address (BSSID)	Displays the MAC address of the device at the Wi-Fi access point
Signal Strength	Displays the signal strength of the Wi-Fi connection
IP Address	BODi rS obtains this information from the Wi-Fi AP automatically.
Subnet Mask	BODi rS obtains this information from the Wi-Fi AP automatically.
Default Gateway	BODi rS obtains this information from the Wi-Fi AP automatically.
DNS Servers	BODi rS obtains this information from the Wi-Fi AP automatically.
WAN Connection Name	Defines a unique name to represent the WAN connection
Standby State	Specifies the state of the WAN connection when it is in standby mode. Available options include **Remain connected** (hot standby) and **Disconnect** (cold standby).

Table 18. WAN: General Wi-Fi WAN Settings

Field	Description
Health Check Method	Specifies the health check method for the WAN connection (see "WAN Health Check" on page 51). Available methods include **Ping**, **DNS Lookup**, or **Disabled**. Default = **Disabled**
Bandwidth Allowance Monitor	Enables bandwidth usage monitoring on this WAN connection for each billing cycle. When disabled, bandwidth usage for each month is still being tracked but no action will be taken (see "Bandwidth Allowance Monitor" on page 53).
Wi-Fi Association Mode	Specifies the Wi-Fi access point selection criteria during association. Select the **Stronger Signal Strength** option to use an access point that matches one of the listed Wi-Fi Connection Profiles and has the strongest received signal (regardless of its profile priority). Select the **Profile Priority** option to use the access point that matches one of the listed of Wi-Fi Connection Profiles and has the highest priority level. Default = **Stronger Signal Strength**
Connect to Any Open Mode AP	Specifies whether the Wi-Fi WAN will connect to any open mode access point. Default = **Disabled**
Reply to ICMP Ping	When disabled, the WAN connection will not respond to ICMP PING requests. Default = **Enabled**

Create Wi-Fi Connection Profile

You can manually create a profile to use for a specific Wi-Fi connection. It is useful for creating a profile for connecting to hidden-SSID access points. To configure Wi-Fi Connection Profiles, click on the **Create Profile** link under the **Wi-Fi Connection Profiles** table. The Wi-Fi Connection Profile configuration page displays.



Wi-Fi Connection	
Network Name (SSID)	Wi-Fi Hotspot
Security	Open
IP Address	● Obtain an IP address automatically ○ Static

Figure 21. Network > WAN > Wi-Fi WAN Settings > Wi-Fi Connection Profile

Table 19. WAN: Create Wi-Fi Connection Profile

Field	Description
Network Name (SSID)	Defines a name to represent the specific Wi-Fi connection
Security	Specifies the security policy to use with the wireless network. Available options: • **Open:** No Encryption • **WEP:** Wired Equivalent Privacy (WEP) Requires a specified Key Size, Key Format, and Encryption Key • **WPA/WPA2 – Personal:** Wi-Fi Protected Access for Home and Small Business Use; Requires a specified Shared Key • **WPA/WPA2 – Enterprise:** Wi-Fi Protected Access for Commercial Use Requires specified RADIUS Server settings

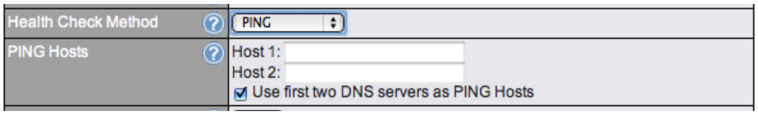
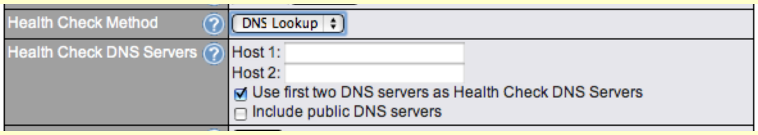
WAN Health Check

To ensure that traffic is routed only to healthy WAN connections, BODi rS provides the functionality to periodically check the health of each WAN connection. The Health Check settings for each WAN connection can be independently configured. To configure WAN Health Check settings, click on **Network** > **WAN** in the Web Admin Interface. Then, click on the **Details** button in the row of the desired WAN connection in the **WAN Connection Status** table. The configuration page for that WAN connection displays, which includes the **Health Check** options.

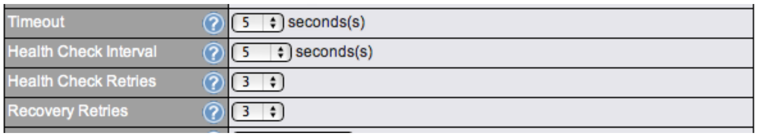
Health Check Methods

The **Health Check** drop-down menu specifies the health check method for the WAN connection. Available methods include **Disabled**, **Ping**, or **DNS Lookup**. The default value is **DNS Lookup**.

Table 20. WAN: Health Check Methods

Method	Description
Disabled	Select the **Disabled** option so that the WAN connection will always be considered as "up". The connection will not be treated as down in the event of IP routing errors.
Ping	 Health Check Method: PING PING Hosts: Host 1: Host 2: ☑ Use first two DNS servers as PING Hosts Select the **Ping** method to issue ICMP PING packets to test the connectivity of a target IP address or hostname. A WAN connection is considered "up" if PING responses are received from either one or both of the PING Hosts. The **Ping Hosts** field specifies the IP addresses or hostnames to test with the ICMP PING method for connectivity. If you select the **Use first two DNS servers as Ping Hosts** box, the target PING Host will be the first DNS server for the corresponding WAN connection.
DNS Lookup	 Health Check Method: DNS Lookup Health Check DNS Servers: Host 1: Host 2: ☑ Use first two DNS servers as Health Check DNS Servers □ Include public DNS servers Select the **DNS Lookup** method to test the connectivity with target DNS servers. The connection will be treated as "up" if DNS responses are received from either one or both of the servers, regardless of whether the result was positive or negative. The **Health Check DNS Servers** field allows you to specify two DNS hosts' IP address with which connectivity is to be tested via DNS Lookup. If you select the **Use first two DNS servers as Health Check DNS Servers** box, the first two DNS servers will be the DNS lookup targets for checking a connection's health. If the box is not checked, field Host 1 must be filled and field Host 2 is optional. If you select the **Include public DNS servers** box 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 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.

Additional Health Check Settings



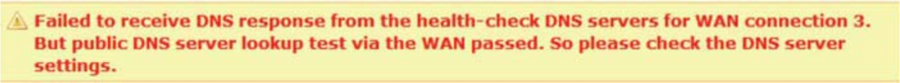
Timeout	5 seconds(s)
Health Check Interval	5 seconds(s)
Health Check Retries	3
Recovery Retries	3

Figure 22. Network > WAN > Details > Other Health Check Settings

Table 21. WAN: Other Health Check Settings

Method	Description
Timeout	Specifies the timeout, in seconds, for ping/DNS lookup requests. Default = **5 seconds**
Health Check Interval	Specifies the time interval, in seconds, between ping or DNS lookup requests. Default = **5 seconds**
Health Check Retries	Specifies the number of consecutive ping/DNS lookup timeouts to try before BODi rS marks the corresponding WAN connection as "down". Default = **3 retries** For example, with the default Health Retries setting of 3, after 3 consecutive timeouts, the corresponding WAN connection will be treated as "down".
Recovery Retries	Specifies the number of consecutive successful ping/DNS lookup responses that must be received before BODi rS considers a previously down WAN connection to be "up" again. Default = **3 retries** For example, a WAN connection that is treated as "down" will be considered to be up again after receiving 3 consecutive successful ping/DNS lookup responses.

Note When the health check method is set to **DNS Lookup** and the corresponding health checks fail, BODi rS will automatically perform DNS lookups on some public DNS servers. If the tests are successful, the WAN may not be considered as "down"; however, the target DNS server may malfunction. If a malfunction occurs, the following warning displays on the main page:

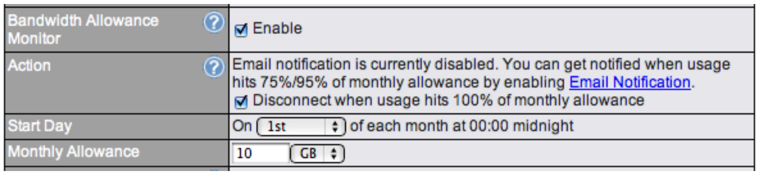


Failed to receive DNS response from the health-check DNS servers for WAN connection 3. But public DNS server lookup test via the WAN passed. So please check the DNS server settings.

Bandwidth Allowance Monitor

The Bandwidth Allowance Monitor feature tracks network usage for BODi rS. The Bandwidth Allowance settings for each WAN connection can be independently configured.

To configure the Bandwidth Allowance Monitor, click on **Network > WAN** in the Web Admin Interface. Then, click on the **Details** button in the row of the desired WAN connection in the **WAN Connection Status** table. The configuration page for that WAN connection displays, which includes the **Bandwidth Allowance Monitor** option. Select the box to enable and configure Bandwidth Allowance settings.



Bandwidth Allowance Monitor	☑ Enable
Action	Email notification is currently disabled. You can get notified when usage hits 75%/95% of monthly allowance by enabling Email Notification. ☑ Disconnect when usage hits 100% of monthly allowance
Start Day	On 1st of each month at 00:00 midnight
Monthly Allowance	10 GB

Figure 23. Network > WAN > Details > Bandwidth Allowance Monitor

Table 22. WAN: Bandwidth Allowance Monitor

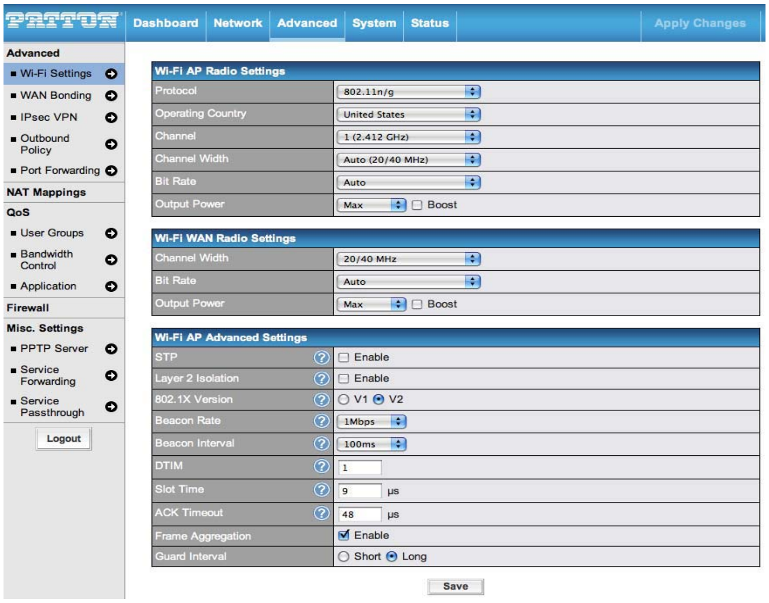
Method	Description
Action	Enable the **Email Notification** feature to be notified through email when network usage hits 75% and 95% of the monthly allowance. Select the **Disconnect when usage hits 100% of monthly allowance** box to automatically disconnect this WAN service when the usage hits the monthly 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	Defines which day in the month each billing cycle begins
Monthly Allowance	Defines the maximum bandwidth usage allowed for the WAN connection each month

Chapter 4 Configuring Wi-Fi Settings

Chapter contents

Introduction

This chapter describes setting up advanced Wi-Fi settings for WAN connections. To configure advanced Wi-Fi settings for BODi rS, click on **Advanced > Wi-Fi Settings** in the Web Admin Interface. The **Wi-Fi Settings** configuration page displays:



Wi-Fi AP Radio Settings	
Protocol	802.11n/g
Operating Country	United States
Channel	1 (2.412 GHz)
Channel Width	Auto (20/40 MHz)
Bit Rate	Auto
Output Power	Max ☐ Boost

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

Wi-Fi AP Advanced Settings	
STP	☐ Enable
Layer 2 Isolation	☐ Enable
802.1X Version	○ V1 ● V2
Beacon Rate	1Mbps
Beacon Interval	100ms
DTIM	1
Slot Time	9 µs
ACK Timeout	48 µs
Frame Aggregation	☑ Enable
Guard Interval	○ Short ● Long

Figure 24. Advanced > Wi-Fi Settings

Configuring Wi-Fi Settings

This section describes the following settings for managing Wi-Fi interfaces using BODi rS Web Admin Interface:

- Wi-Fi AP Radio Settings (see "Wi-Fi AP Radio Settings" on page 56)
- Wi-Fi WAN Radio Settings (see "Wi-Fi WAN Radio Settings" on page 56)
- Wi-Fi AP Advanced Settings (see "Wi-Fi AP Advanced Settings" on page 57)

Wi-Fi AP Radio Settings

Table 23. Wi-Fi: AP Radio Settings

Field	Description
Protocol	Specifies whether to accept 802.11b and/or 802.11g client association requests. Available options include **802.11b/g**, **802.11b Only** and **802.11g Only**. Default = **802.11b/g**
Operating Country	Specifies which country regulations to follow
Channel	Specifies which 802.11 RF channel to use Default = **Channel 1 (2.412 GHz)**
Output Power	Specifies the transmission output power for the Wi-Fi AP Default = **23 dBm (200mW)** or **20 dBm (100 mW)**, depending on the selected **Operating Country**

Wi-Fi WAN Radio Settings

Table 24. Wi-Fi: WAN Radio Settings

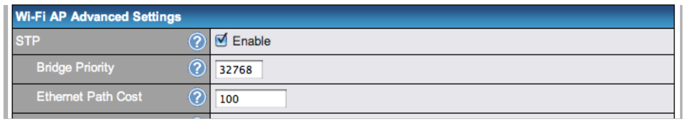
Field	Description
Output Power	Specifies the transmission output power for the Wi-Fi WAN Default = **23 dBm (200 mW)** or **20 dBm (100 mW)**, depending on the selected **Operating Country**

Wi-Fi AP Advanced Settings

Table 25. Wi-Fi: AP Advanced Settings

Field	Description
STP	Select this option to enable the **Spanning Tree Protocol** to prevent path redundancy (refer to "Spanning Tree Protocol (STP) Settings" on page 58). Default = **Disabled**
Layer 2 Communication	When **Enabled**, clients on the network are allowed to communicate with each other directly, and traffic will not be passed to any uplink equipment. When **Disabled**, clients on the network are not allowed to communicate with each other directly. Traffic will be passed to uplink equipments/uplink routers before communication can be established among clients. Default = **Enabled**
802.1X Version	Specifies the version of the 802.1X Extensible Authentication Protocol over LAN (EAPOL). Select **V1** to allow both V1 and V2 clients to associate with this Wi-Fi AP. Select **V2** to only allow V2 clients to associate with this Wi-Fi AP. Most wireless clients support V2. In case there are stations that do not support V2, select the V1 option. Default = **V2**
Beacon Rate	Sets the transmit bit rate for sending a beacon Default = **1 Mbps**
Beacon Interval	Sets the time interval between each beacon Default = **100 milliseconds**
DTIM	Sets the frequency for the beacon to include a Delivery Traffic Indication Message (DTIM). The interval is measured in milliseconds. Default = **1 millisecond**
RTS Threshold	Sets the minimum packet size for the unit to send a Request To Send (RTS) frame using the Request To Send/Clear To Send (RTS/CTS) handshake. Default = **0 (Disabled)**
Slot Time	Specifies the unit wait time before transmitting a packet Default = **9 µs**
ACK Timeout	Specifies the wait time to receive an acknowledgement packet before re-transmitting Default = **48 µs**
Channel Bonding	Determines the channel width for the AP Select **20** to turn off channel bonding and set the channel width to 20 MHz. Select **20/40** to allow the AP to automatically choose the channel width between 20 and 40 MHz. Select **40** to enforce channel bonding and set the channel width to 40 MHz.
Frame Aggregation	Enables frame aggregation to increase transmission throughput
Guard Interval	Specifies a short or long guard period interval for transmissions

Spanning Tree Protocol (STP) Settings



Wi-Fi AP Advanced Settings

STP ☑ Enable

Bridge Priority 32768

Ethernet Path Cost 100

Figure 25. Advanced > Wi-Fi Settings > STP

Table 26. Wi-Fi: STP Settings

Field	Description
STP	Select this option to enable the **Spanning Tree Protocol** to prevent path redundancy (Default = **Disabled**)
Bridge Priority	Specifies the priority level for determining the root switch Default = **32768**
Ethernet Path Cost	Specifies the preference to provide the best path from the switch to the root switch Default = **100**

Chapter 5 **Configuring WAN Bonding**

Chapter contents

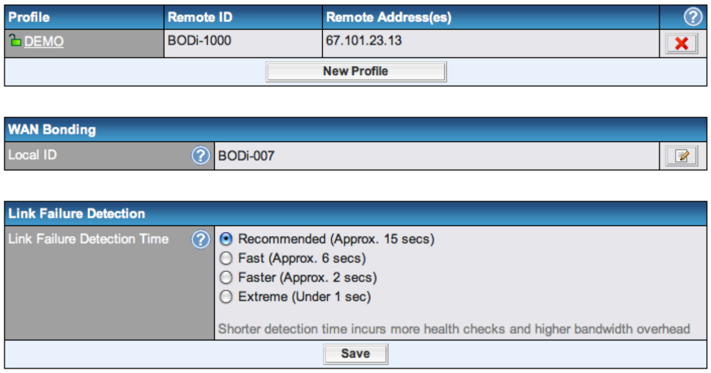
Introduction

This chapter describes setting up and managing the WAN Bonding functionality for BODi rS. The WAN Bonding functionality securely connects BODi rS in a different branch to another BODi rS. The data, voice or video communications between these locations are kept confidential across the public internet.

The WAN Bonding for BODi rS is specifically designed for a multi-WAN enviroment. BODi rS can aggregate the bandwidth for all WAN connections to route Site-to-Site VPN traffic. Unless all of the WAN connections of one site are down, BODi rS can still keep the VPN up and running. With VPN Bandwidth Bonding, 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.

> **Note** You can define firewall rules to control access within the VPN network. Outbound traffic can be redirected to VPN tunnels with custom outbound policies (see Chapter 6, "Managing Outbound Traffic to the WAN" on page 66).

To configure Site-to-Site VPN options for BODi rS, click on **Advanced > WAN Bonding** in the Web Admin Interface. **BODi rS WAN Bonding** configuration page displays:



Profile	Remote ID	Remote Address(es)	?
DEMO	BODi-1000	67.101.23.13	✗

New Profile

WAN Bonding	
Local ID ?	BODi-007

Link Failure Detection	
Link Failure Detection Time ?	● Recommended (Approx. 15 secs) ○ Fast (Approx. 6 secs) ○ Faster (Approx. 2 secs) ○ Extreme (Under 1 sec) Shorter detection time incurs more health checks and higher bandwidth overhead

Save

Figure 26. Advanced > WAN Bonding

Refer to the following sections for details about configuring and managing Site-to-Site VPN connections:

- "Configuring a WAN Bonding VPN Profile" on page 60
- "Managing Link Failure Detection Settings" on page 63
- "Configuring a NAT Router Behind BODi rS for VPN Connections" on page 64
- "Viewing the VPN Status" on page 65

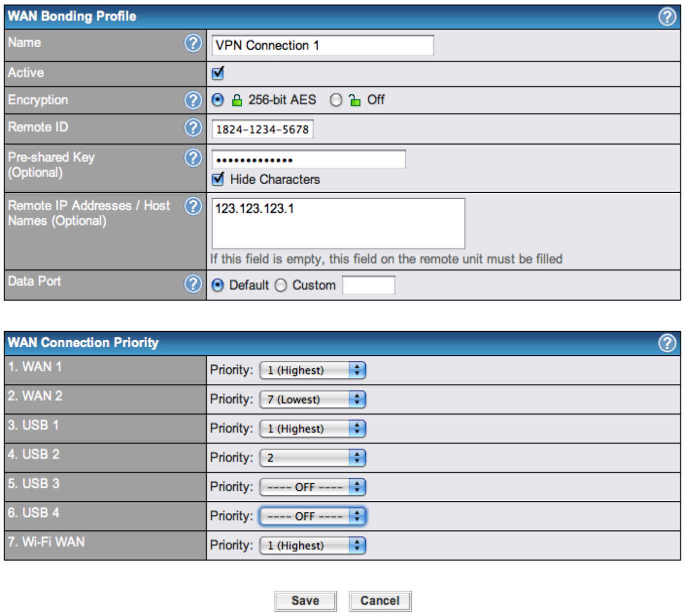
Configuring a WAN Bonding VPN Profile

BODi rS supports making two Site-to-Site VPN connections with a remote BODi rS unit. The local LAN subnet and subnets behind the LAN (defined in the "Static Route Settings" on page 33) will be advertised to the VPN. All VPN members (branch offices and headquarters) will be able to route to the local subnets.

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

All data can be routed over the VPN with 256-bit AES encryption standard.

To configure a new WAN Bonding connection, click on **Advanced > Site-to-Site VPN** in the Web Admin Interface, and click the **New Profile** button to create a new VPN profile. The **VPN Profile** configuration page displays:



WAN Bonding Profile	
Name	VPN Connection 1
Active	☑
Encryption	● 256-bit AES ○ Off
Remote ID	1824-1234-5678
Pre-shared Key (Optional)	•••••••••••••• ☑ Hide Characters
Remote IP Addresses / Host Names (Optional)	123.123.123.1 If this field is empty, this field on the remote unit must be filled
Data Port	● Default ○ Custom

WAN Connection Priority	
1. WAN 1	Priority: 1 (Highest)
2. WAN 2	Priority: 7 (Lowest)
3. USB 1	Priority: 1 (Highest)
4. USB 2	Priority: 2
5. USB 3	Priority: ---- OFF ----
6. USB 4	Priority: ---- OFF ----
7. Wi-Fi WAN	Priority: 1 (Highest)

Figure 27. Advanced > Site-to-Site VPN> Add VPN Connection

This section describes the following settings for creating a new VPN profile:

- VPN Settings (see “VPN Settings” on page 62)
- WAN Connection Priority Settings (see “WAN Connection Priority Settings” on page 62)

VPN Settings

Table 27. WAN Bonding: New VPN Connection Settings

Field	Description
Active	Check this box to enable the VPN connection.
Encryption	By default, VPN traffic is encrypted with 256-bit AES standard. If the Off option is selected on both sides of a VPN connection, no encryption will be applied.
Remote I.D.	BODi rS only establishes a VPN connection with a remote peer that has a serial number specified in this **Peer Serial Number** field. If the remote peer is in a high availability setup, select the **Remote client is set up in high availability mode** option, and enter the second unit's serial number into the second text box.
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 thepre-shared key. The connection will be up only if the pre-shared keys on each side match.
Peer IP Addresses / Host Names	(Optional) Enter the remote peer's WAN IP address(es) or host name(s) in the **Peer IP Addresses** field. Enter one IP address or host name per line. BODi rS also accepts Dynamic-DNS host names. When you provide the peer details, BODi rS will initiate a connection to each of the remote IP addresses until they connect successfully. If the field is empty, BODi rS will wait for a connection from the remote peer. Therefore, at least one side of the two VPN peers has to have this peer field filled. Otherwise, a VPN connection cannot be established.

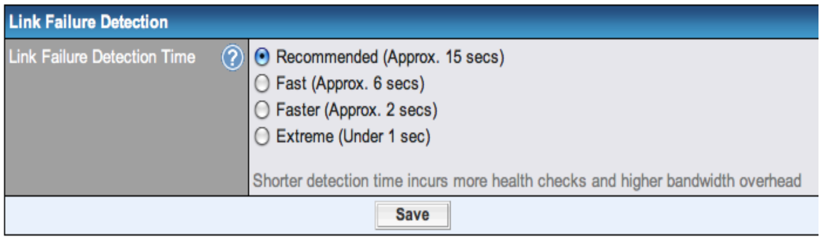
WAN Connection Priority Settings

Table 28. WAN Bonding: WAN Connection Priority Settings

Field	Description
WAN Connection Priority	You can specify the priority level of the WAN connections used for making VPN connections. WAN connections set to **OFF** will never be used. Only available WAN connections with the highest priority will be utilized.

Managing Link Failure Detection Settings

To configure Link Failure Detection settings for BODi rS, click on **Advanced** > **WAN Bonding** in the Web Admin Interface. **BODi rS WAN Bonding** configuration page displays, including the **Link Failure Detection** section:



Link Failure Detection

Link Failure Detection Time

● Recommended (Approx. 15 secs)
○ Fast (Approx. 6 secs)
○ Faster (Approx. 2 secs)
○ Extreme (Under 1 sec)

Shorter detection time incurs more health checks and higher bandwidth overhead

Figure 28. Advanced > WAN Bonding > Link Failure Detection

WAN Bonding 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 peer to detect any failure. Checking the status more frequently leads to a shorter detection time, but higher bandwidth overhead will be consumed.

Table 29. WAN Bonding: Link Failure Detection

Link Failure Detection Time	Description
Recommended[a]	Select the **Recommended** option to send a health check packet every 5 seconds. The expected detection time is 15 seconds.
Fast	Select the **Fast** option to send a health check packet every 3 seconds. The expected detection time is 6 seconds.
Faster	Select the **Faster** option to send a health check packet every 1 second. The expected detection time is 2 seconds.
Extreme	Select the **Extreme** option to send a health check packet every 0.1 second. The expected detection time is under 1 second.

[a] **Recommended** is the default setting for the Link Failure Detection Time.

Note BODi rS WAN Bonding feature uses TCP and UDP port 32015 for establishing VPN connections. If you have a firewall in front of the devices, you will need to add firewall rules for these ports and protocols that will allow inbound and outbound traffic to pass through the firewall.

Configuring a NAT Router Behind BODi rS for VPN Connections

BODi rS supports establishing Site-to-Site VPN over WAN connections that are behind a NAT (Network Address Translation) router. In order for a WAN connection behind a NAT router to accept VPN connections, you can configure the NAT router in front of the WAN connection to forward to TCP port 32015.

If one or more WAN connections on **Router A** can accept VPN connections (by means of port forwarding or not) while none of the WAN connections on the peer **Router B** can, you should put all public IP addresses or host names of the **Router A** in the **Router B** on **Router B**. Leave the **Peer IP Addresses / Host Names** field on **Router A** empty. With these settings in place, BODi rS can set up a site-to-site VPN connection and all WAN connections on both sides can be used.

For example, see Figure 29 below:

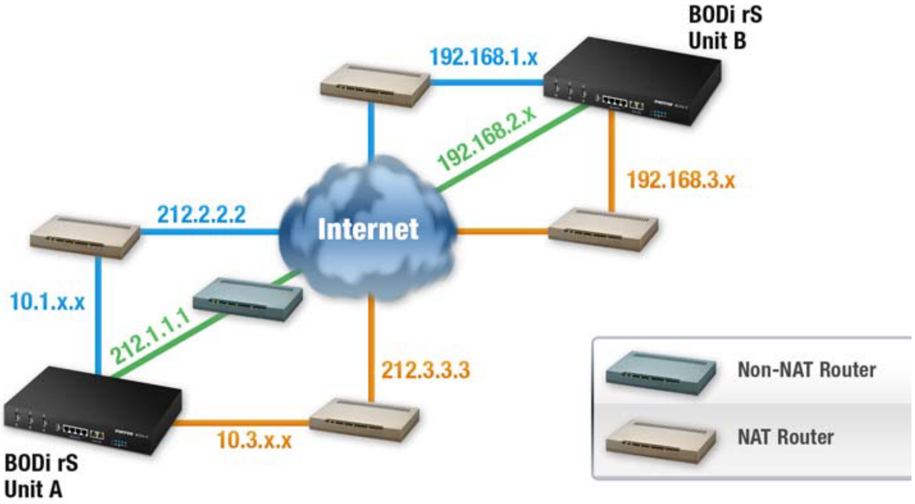


Figure 29. BODi rS Behind a NAT Router Application

One of the WAN connections of **Router A** is not using NAT (*212.1.1.1*). The rest of the WAN connections on **Router A** and all of the WAN connections on **Router B** are using NAT. In this case, the **Peer IP Addresses / Host Names** field in **Router B** should be filled with all of the **Router A**'s host names 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 of **Router A** should forward inbound traffic through TCP port 32015 to **Router A** so that all of the WAN connections can be utilized to establish the VPN connection.

Viewing the VPN Status

To view the status of VPN connections, click on the **Dashboard** in the Web Admin Interface. The **WAN Bonding** section shows the connection status of each connection profile. To view more details about a VPN connection status, click the **Details** button in the top-right hand corner of the **WAN Bonding** table. The **Status > WAN Bonding** page displays that provides the subnet and WAN connection information of each VPN peer.

Refer to "Viewing Site-to-Site VPN Connection Details" on page 115 for more information.

Note **IP Subnets must be unique among VPN peers.**
The entire inter-connected Site-to-Site VPN network is one single non-NAT IP network. No two subnets in two sites can be duplicated. Otherwise, BODi rS will experience connectivity problems in accessing those subnets.

Chapter 6 Managing Outbound Traffic to the WAN

Chapter contents

Introduction

BODi rS provides the functionality to flexibly manage and balance the load of outbound traffic among the WAN connections. To manage outbound traffic and load balancing, click on **Advanced > Outbound Policy** in the Web Admin Interface.

Note The **Outbound Policy** is only applied when more than one WAN connection is active.

Selecting the Outbound Policy

BODi rS provides three policy options for managing outbound traffic: High Application Compatibility, Normal Application Combatibility (Default), and Custom Rules.

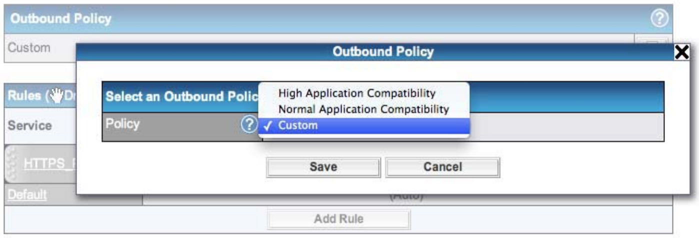

Policy: ✓ Custom

Figure 30. Advanced > Outbound Policy > Select Policy

Table 30. Outbound Policy: Options

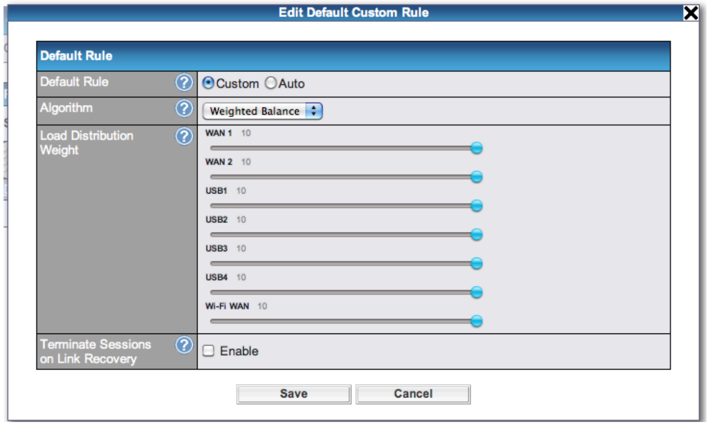
Field	Description
High Application Compatibility	Select this policy to route outbound traffic from a source LAN device through the same WAN connection, regardless of the destination IP address and protocol. This option provides the highest application compatibility.
Normal Application Compatibility[a]	Select this policy to persistently route outbound traffic from a source LAN device to the same destination IP address via the same WAN connection, regardless of the 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	Select this policy to manually define custom rules to manage outbound traffic behavior. Rules can be defined in a custom rule table. A default rule can be defined for connections that cannot be matched with any one of the rules.

[a] The default policy is **Normal Application Compatibility**.

Creating Custom Rules for the Outbound Policy

To configure custom rules for the outbound policy, click on the **Pencil icon** in the Outbound Policy window. Select the **Custom** option in the drop-down menu, then press **Save**. The **Custom Rules** section displays.

Click on the **Default** rule listing at the bottom of the table. You may edit this rule to change the device's default method of controlling outbound traffic for all connections, as long as it does not match any of the rules above it in the table. Drag and drop a row to rearrange the preferred priority level of an outbound rule:

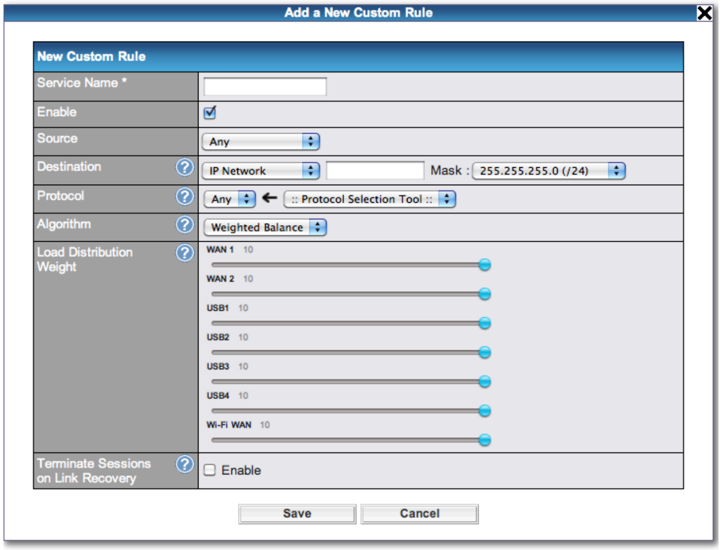


Edit Default Custom Rule

Default Rule	
Default Rule	● Custom ○ Auto
Algorithm	Weighted Balance
Load Distribution Weight	WAN 1 10 WAN 2 10 USB1 10 USB2 10 USB3 10 USB4 10 Wi-Fi WAN 10
Terminate Sessions on Link Recovery	□ Enable

Figure 31. Outbound Policy > Edit Default Custom Rule

By default, **Auto** is the selected setting for the **Default Rule**. Click on **Custom** to change the **Algorithm** used to define the rule. To create a custom rule, click **Add Rule** at the bottom of the table. The **Add a New Custom Rule** window displays:



Add a New Custom Rule

New Custom Rule	
Service Name *	
Enable	☑
Source	Any
Destination	IP Network Mask : 255.255.255.0 (/24)
Protocol	Any ← :: Protocol Selection Tool ::
Algorithm	Weighted Balance
Load Distribution Weight	WAN 1 10 WAN 2 10 USB1 10 USB2 10 USB3 10 USB4 10 Wi-Fi WAN 10
Terminate Sessions on Link Recovery	□ Enable

Figure 32. Outbound Policy > Add New Custom Rule

New Custom Rule Settings

Table 31. Outbound Policy: Custom Rule Settings

Field	Description
Service Name	Specifies the name of the custom rule
Enable	Specifies whether the outbound traffic rule takes effect. Click **Yes** to enable the outbound traffic rule. When enabled, BODi rS matches traffic and takes action based on the other parameters of the rule. Click **No** to disable the outbound traffic rule. When disabled, BODi rS disregards the other parameters of the rule.
Source	Specifies the source IP Address, IP Network or MAC Address for outbound traffic that matches the rule
Destination	Specifies the destination IP Address or IP Network for outbound traffic that matches the rule
Protocol and Port	Specifies the IP Protocol and Port of outbound traffic that matches this rule. Click the drop-down menu for the **Protocol Selection Tool** to choose a common protocol.
Algorithm	Specifies the behavior of BODi rS for the custom rule. Available options: • **Weighted Balance** (see "Algorithm: Weighted Balance" on page 70) • **Persistence** (see "Algorithm: Persistence" on page 71) • **Enforced** (see "Algorithm: Enforced" on page 72) • **Priority** (see "Algorithm: Priority" on page 72) • **Overflow** (see "Algorithm: Overflow" on page 72) • **Least Used** (see "Algorithm: Least Used" on page 73) • **Lowest Latency** (see "Algorithm: Lowest Latency" on page 73)
Terminate Sessions on Link Recovery	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 only applies to the **Weighted Balance**, **Persistence**, and **Priority** options. By default, this option is disabled. When disabled, all existing IP sessions will not be terminated or affected when any other WAN connection is recovered. When enabled, existing IP sessions may be terminated when another WAN connection is recovered, so that only the preferred healthy WAN connection(s) are used at any point in time.

Algorithm: Weighted Balance

The Weighted Balance algorithm specifies the ratio of WAN connection usage to be applied on the specified IP Protocol and Port. These settings only apply when the Algorithm is set to **Weighted Balance** (shown in Figure 32 on page 68).

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 the weight for each WAN.

For example, the weight settings in the bulleted list have these results:

- **Ethernet WAN:** 10
- **USB1:** 10
- **USB2:** 0
- **Wi-Fi WAN:** 5

The total weight is 25 = (10 + 0 + 0 + 10 + 0 + 5)

Matching traffic distributed to Ethernet WAN is 40% = (10 / 25) x 100%

Matching traffic distributed to USB1 is 40% = (10 / 25) x 100%

Matching traffic distributed to USB2 is 0% = (0 / 25) x 100%

Matching traffic distributed to Wi-Fi WAN is 20% = (5 / 25) x 100%

Algorithm: Persistence

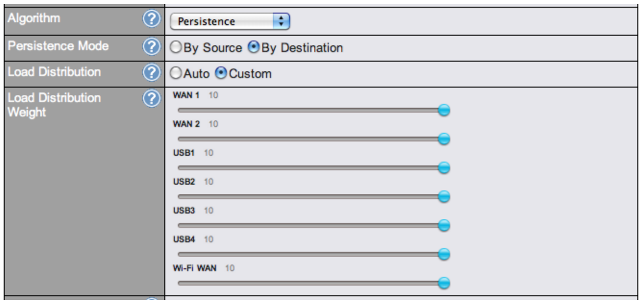
The Persistence algorithm provides solutions to fix undesirable link load distribution for internet services.

For example, many e-banking and other secure websites, for security reasons, terminate the session when the client computer's internet IP address changes during the 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.

BODi rS can be configured to distribute data traffic across multiple WAN connections. Also, the internet IP depends on the WAN connections where communication actually takes place. As a result, a LAN client computer behind BODi rS may communicate using multiple internet IP addresses. For example, a LAN client computer behind an BODi rS with three WAN connections may communicate on the internet using three different IP addresses.

When using the **Persistence** algorithm with BODi rS, 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 with the other end using one IP address to eliminate the issues.



Algorithm	Persistence
Persistence Mode	○ By Source ● By Destination
Load Distribution	○ Auto ● Custom
Load Distribution Weight	WAN 1 10 WAN 2 10 USB1 10 USB2 10 USB3 10 USB4 10 Wi-Fi WAN 10

Figure 33. Outbound Policy > Custom Rule > Persistence

The **Persistence** algorithm provides two options: **By Source** or **By Destination**.

Table 32. Persistence Algorithm: Persistence Mode Options

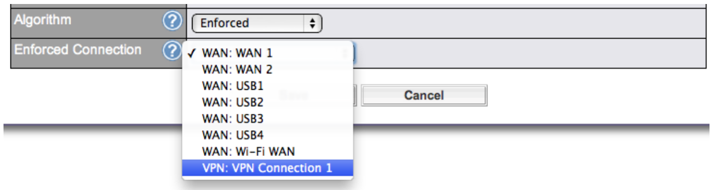
Mode	Description
By Source[a]	The same WAN connection will be used for traffic matching the rule and originating from the same machine regardless of its destination. This option will provide the highest level of application compatibility.
By Destination	The same WAN connection will be used for traffic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

[a] Default Persistence Mode

When there are multiple client requests, they can be distributed (persistently) to WAN connections with a weight. Select **Auto** for the **Load Distribution** setting to automatically adjust weights according to each WAN's Downstream Bandwidth specified in the WAN settings page (see "Configuring the WAN Interface" on page 38). Alternatively, select **Custom** to manually set the weight of each WAN using the sliders.

Algorithm: Enforced

The Enforced algorithm specifies the WAN connection usage to be applied on the specified IP Protocol and Port. These settings only apply when the Algorithm is set to **Enforced**:



Algorithm: Enforced

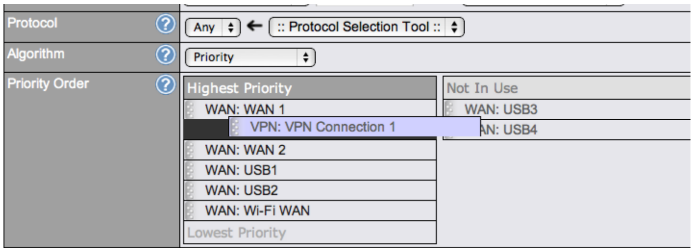
Enforced Connection: WAN: WAN 1

Figure 34. Outbound Policy > Custom Rule > Enforced

Matching traffic will be routed through the specified WAN connection regardless of the connection's health check status. Outbound traffic can be enforced to go through a specified Site-to-Site VPN connection.

Algorithm: Priority

The Priority algorithm specifies the priority of the WAN connections to be utilized 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.



Protocol: Any ← :: Protocol Selection Tool ::

Algorithm: Priority

Priority Order:

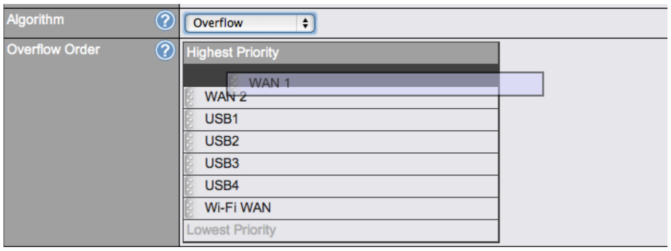
Highest Priority	Not In Use
WAN: WAN 1	WAN: USB3
VPN: VPN Connection 1	WAN: USB4
WAN: WAN 2	
WAN: USB1	
WAN: USB2	
WAN: Wi-Fi WAN	
Lowest Priority	

Figure 35. Outbound Policy > Custom Rule > Priority

Outbound traffic can be prioritized to go through a specified Site-to-Site VPN connection. You may configure multiple distribution rules to accommodate different kinds of services.

Algorithm: Overflow

The Overflow algorithm manages traffic by routing through the healthy WAN connection that has the highest priority and is not fully loaded. When this connection gets saturated, new sessions will be routed to the next healthy WAN connection that is available.



Algorithm: Overflow

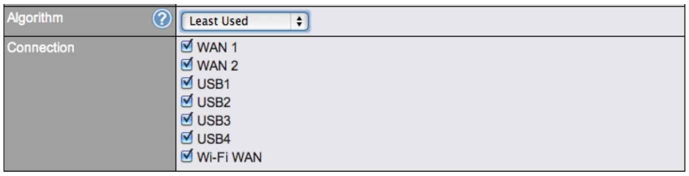
Overflow Order:

Highest Priority
WAN 1
WAN 2
USB1
USB2
USB3
USB4
Wi-Fi WAN
Lowest Priority

Figure 36. Outbound Policy > Custom Rule > Overflow

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 utilized.

Algorithm: Least Used

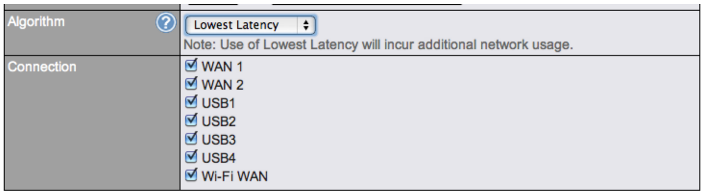


Algorithm	Least Used
Connection	☑ WAN 1 ☑ WAN 2 ☑ USB1 ☑ USB2 ☑ USB3 ☑ USB4 ☑ Wi-Fi WAN

Figure 37. Outbound Policy > Custom Rule > Least Used

The Least Used algorithm manages traffic by routing through the healthy WAN connection that is selected in the **Connection** field and has the most available downstream bandwidth. The available downstream bandwidth of a WAN connection is calculated from the total downstream bandwidth specified in the WAN settings page and the current downstream usage. The available bandwidth and WAN selection is determined every time an IP session is made.

Algorithm: Lowest Latency



Algorithm	Lowest Latency Note: Use of Lowest Latency will incur additional network usage.
Connection	☑ WAN 1 ☑ WAN 2 ☑ USB1 ☑ USB2 ☑ USB3 ☑ USB4 ☑ Wi-Fi WAN

Figure 38. Outbound Policy > Custom Rule > Lowest Latency

The Lowest Latency algorithm manages traffic by routing through the healthy WAN connection that is selected in the **Connection** field 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.

The round trip time of a "6M down / 640k up" link can be higher than that of a "2M down / 2M up" link. This occurs because the overall round trip time is lengthened by its lower upstream bandwidth, despite the higher downlink speed. This algorithm is ideal for the following two scenarios:

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

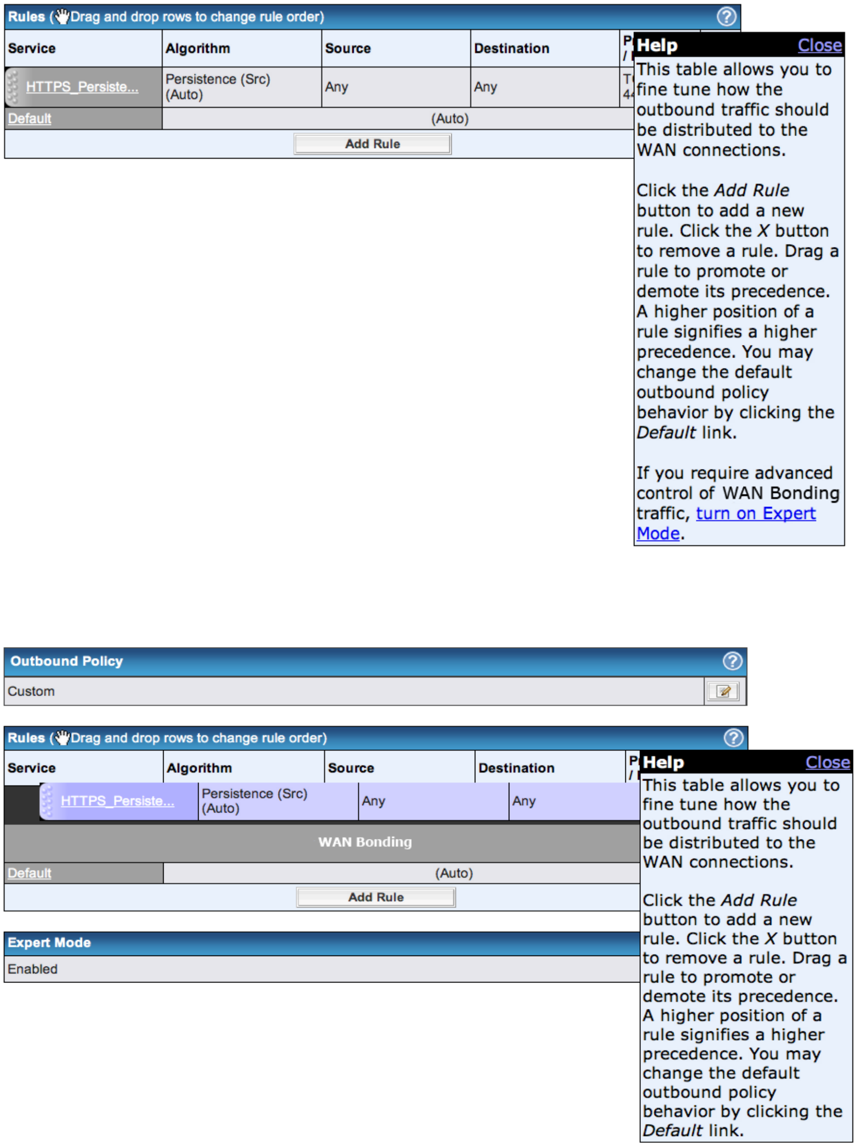
Expert Mode Settings

The **Expert Mode** is available for advanced users to configure custom rules. Click the **?** Help circle at the top of the **Custom Rules** window, and click the link to **turn on Expert Mode**.

Under Expert Mode, a special rule - "**Site-to-Site VPN Routes**" is available in the Custom Rules table. This option represents all Site-to-Site VPN routes learned from remote VPN peers. By default, this bar is on the top of all custom rules. That means traffic for remote VPN subnets will be routed to its corresponding VPN peer.

You can create custom **Priority** or **Enforced** rules and move them above the bar to override the Site-to-Site VPN Routes.

When disabled, all of the rules above the **Expert Mode** bar will be deleted.



Rules (Drag and drop rows to change rule order)

Service	Algorithm	Source	Destination
HTTPS_Persiste...	Persistence (Src) (Auto)	Any	Any
Default	(Auto)		

Help Close

This table allows you to fine tune how the outbound traffic should be distributed to the WAN connections.

Click the *Add Rule* button to add a new rule. Click the *X* button to remove a rule. Drag a rule to promote or demote its precedence. A higher position of a rule signifies a higher precedence. You may change the default outbound policy behavior by clicking the *Default* link.

If you require advanced control of WAN Bonding traffic, turn on Expert Mode.

Outbound Policy

Custom

Rules (Drag and drop rows to change rule order)

Service	Algorithm	Source	Destination
HTTPS_Persiste...	Persistence (Src) (Auto)	Any	Any
WAN Bonding			
Default	(Auto)		

Expert Mode

Enabled

Help Close

This table allows you to fine tune how the outbound traffic should be distributed to the WAN connections.

Click the *Add Rule* button to add a new rule. Click the *X* button to remove a rule. Drag a rule to promote or demote its precedence. A higher position of a rule signifies a higher precedence. You may change the default outbound policy behavior by clicking the *Default* link.

Figure 39. Outbound Policy > Custom Rule > Expert Mode

Chapter 7 Configuring Port Forwarding & NAT

Chapter contents

Introduction

This chapter describes setting up port forwarding services and NAT mappings. For information about setting up port forwarding, see “Configuring Port Forwarding” on page 76. For information about setting up NAT mappings, see “Configuring NAT Mappings” on page 80.

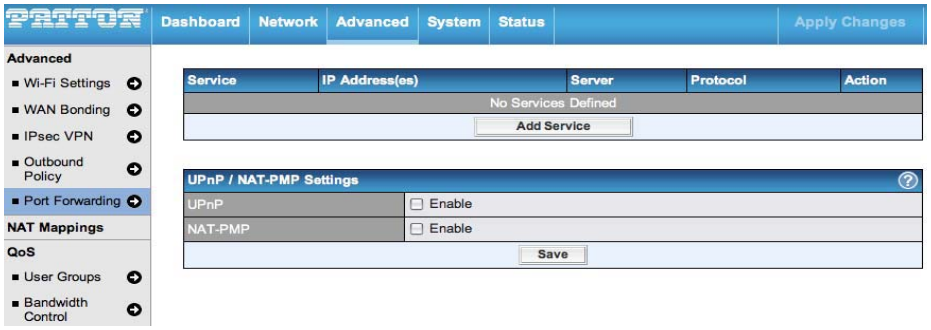
Configuring Port Forwarding

This section describes the following settings for managing port forwarding features using BODi rS Web Admin Interface: port forwarding service settings (see “Port Forwarding Service Settings” on page 76) and Universal Plug and Play (UPnP) and NAT Port Mapping Protocol (PMP) settings (see “UPnP/NAT-PMP Settings” on page 79).

Port Forwarding Service Settings

BODi rS can act as a firewall that blocks all inbound access from the internet by default. By using the port forwarding, internet users can access the servers behind BODi rS.

To configure inbound port forwarding rules, click on **Advanced > Port Forwarding** in the Web Admin Interface.



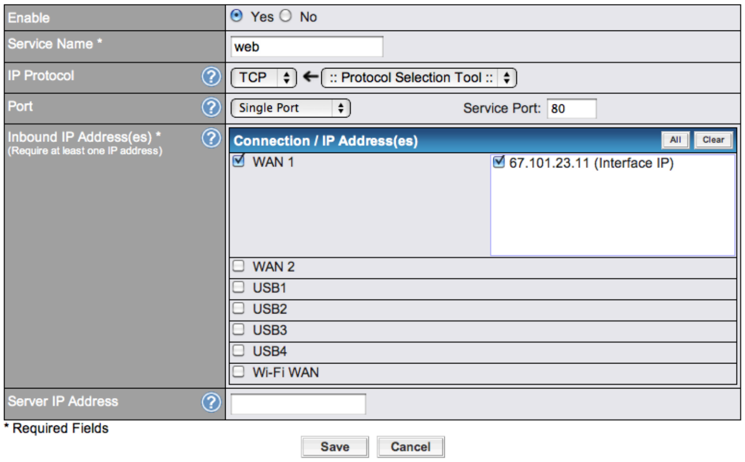
Service	IP Address(es)	Server	Protocol	Action
No Services Defined				

UPnP / NAT-PMP Settings

UPnP	□ Enable
NAT-PMP	□ Enable

Figure 40. Advanced > Port Forwarding

To define a new service, click the **Add Service** button and the following window displays:



Enable: ● Yes ○ No

Service Name *: web

IP Protocol: TCP ← :: Protocol Selection Tool ::

Port: Single Port Service Port: 80

Inbound IP Address(es) * (Require at least one IP address):

Connection / IP Address(es)

☑ WAN 1 ☑ 67.101.23.11 (Interface IP)

□ WAN 2

□ USB1

□ USB2

□ USB3

□ USB4

□ Wi-Fi WAN

Server IP Address:

* Required Fields

Figure 41. Advanced > Port Forwarding > Add Service

Table 33. Port Forwarding Service: New Service Settings

Field	Description
Enable	Specifies whether the inbound service rule takes effect. Select **Yes** for the inbound service rule to take effect. If the inbound traffic matches the specified IP Protocol and Port, BODi rS will take action based on the other parameters of the rule. Select **No** to disable the inbound service rule. BODi rS will disregard the other parameters of the rule.
Service Name	Identifies the service to the System Administrator. Valid values for this setting consist only of alphanumeric and the underscore "_" characters.
IP Protocol	Specifies the protocol of the service as TCP, UDP, ICMP or IP. Traffic that is received by BODi rS via the specified protocol at the specified port(s) is forwarded to the LAN hosts specified by the **Servers** setting. (See below for details on the **Port** and **Servers** settings.) Alternatively, use the **Protocol Selection Tool** drop-down menu 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, you may still manually modify the **Protocol** and **Port** settings.

Table 33. Port Forwarding Service: New Service Settings

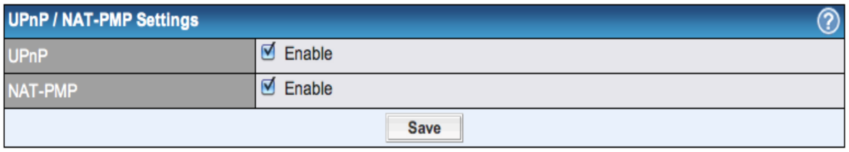
Field	Description
Port	Specifies the port(s) that correspond to the service, and can be configured to behave in one of the following ways: • **Any Port:** All traffic that is received by BODi rS via the specified protocol is forwarded to the servers specified by the **Servers** setting. – For example, 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 BODi rS 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 BODi rS 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 **Single Port** and **Service Port 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 BODi rS 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 Map Service Port 80** and **Map to Port 88**, TCP traffic on Port 80 is forwarded to the configured servers via Port 88. • **Range Mapping:** Traffic that is received by BODi rS 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 Addresses	Specifies the WAN connections and internet IP address(es) from which the service can be accessed.It is required to select at least one IP address.
Server IP Address	Specifies the LAN IP address of the server that handles the service requests

UPnP/NAT-PMP Settings

Universal Plug and Play (UPnP) and NAT Port Mapping Protocol (NAT-PMP) are network protocols that automate the process of inbound port forwarding. UPnP and NAT-PMP allow a computer on the LAN to automatically configure the router to allow parties on the WAN to connect to itself.

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

Click on **Status** > **UPnP/NAT-PMP** and check the corresponding box(es) to enable UPnP and/or NAT-PMP. Only enable these features if you trust the computers on the LAN. A list of the forwarded ports controlled via UPnP or NAT-PMP will display.



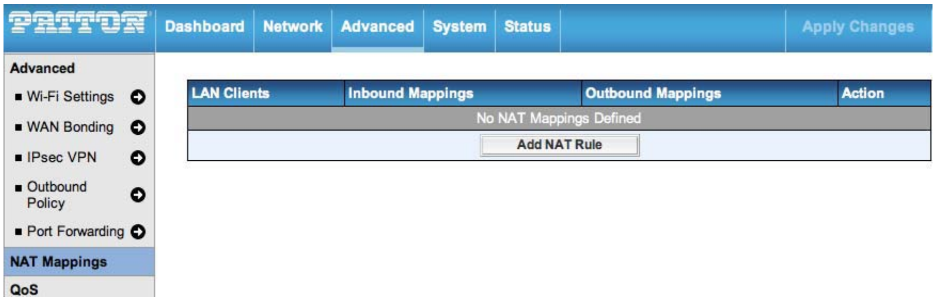
UPnP / NAT-PMP Settings

UPnP	☑ Enable
NAT-PMP	☑ Enable

Figure 42. Status > UPnP/NAT-PMP

Configuring NAT Mappings

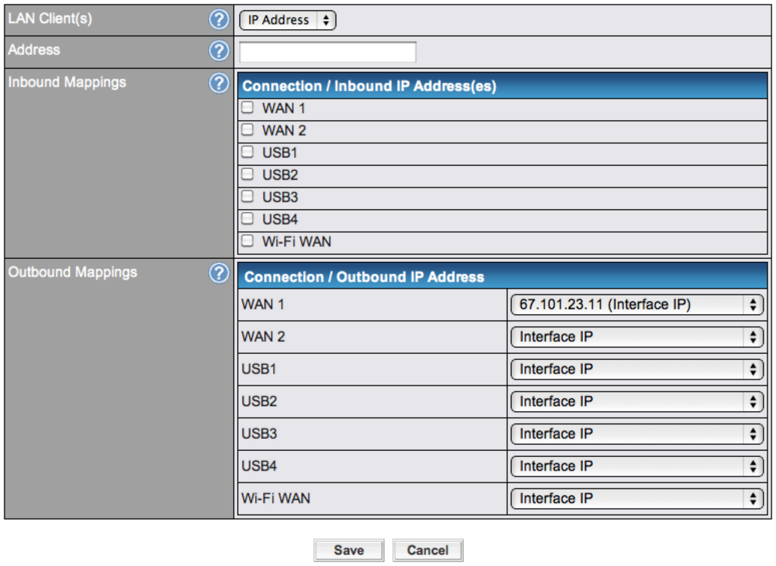
This section describes how to set up NAP mappings on BODi rS. A NAT Mapping configuration allows BODi rS to map IP addresses of all inbound and outbound NAT traffic to and from an internal client IP address. To configure NAT mappings, click on **Advanced > NAT Mappings** in the Web Admin Interface.



LAN Clients	Inbound Mappings	Outbound Mappings	Action
No NAT Mappings Defined			

Figure 43. Advanced > NAT Mappings

To add a rule for NAT Mappings, click **Add NAT Rule** and the following window displays:



LAN Client(s)	IP Address
Address	
Inbound Mappings	Connection / Inbound IP Address(es) □ WAN 1 □ WAN 2 □ USB1 □ USB2 □ USB3 □ USB4 □ Wi-Fi WAN
Outbound Mappings	Connection / Outbound IP Address

Connection	Outbound IP Address
WAN 1	67.101.23.11 (Interface IP)
WAN 2	Interface IP
USB1	Interface IP
USB2	Interface IP
USB3	Interface IP
USB4	Interface IP
Wi-Fi WAN	Interface IP

Figure 44. NAT Mappings > Add NAT Rule

Table 34 on page 81 explains the new NAT rule settings.

Table 34. NAT Mappings: New Rule Settings

Field	Description
LAN Client(s)	Specifies where the new rule applies: a single **LAN Address**, an **IP Range**, or an **IP Network**.
Address	Refers to the LAN host's private IP address. The system maps this address to a number of specified public IP addresses in order to facilitate inbound and outbound traffic. *This option is only available when **IP Address** is selected as the **LAN Client**.
Range	Refers to a contiguous group of private IP addresses used by the LAN host. The system maps these addresses to a number of specified public IP addresses to facilitate outbound traffic. *This option is only available when **IP Range** is selected as the **LAN Client**.
Network	Refers to all private IP addresses and ranges managed by the LAN host. The system maps these addresses to a number of specified public IP addresses to facilitate outbound traffic. *This option is only available when **IP Network** is selected as the **LAN Client**.
Inbound Mappings	Specifies the system to bind on these WAN connections and corresponding WAN-specific IP addresses. 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 as the **LAN Client**. **Note** Inbound Mapping is not needed for WAN connections in drop-in or IP forwarding mode. **Note** Each WAN IP address can be associated to one NAT Mapping only.
Outbound Mappings	Specifies which WAN IP addresses to use 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** If you do not want to use a specific WAN for outgoing accesses, you should select the **Default** option, then customize the outbound access rule in the **Outbound Policy** section. **Note** WAN connections in drop-in or IP forwarding mode are not shown.

Click **Save** to save the new configuration.

Note Inbound firewall rules override the Inbound Mapping settings.

Chapter 8 Configuring Quality of Service

Chapter contents

Introduction

This chapter describes managing Quality of Service (QoS) settings for BODi rS. To configure QoS settings, click on **Advanced > QoS** in the Web Admin Interface. There are three services that you can manage under QoS: User Groups, Bandwidth Control, and Applications.

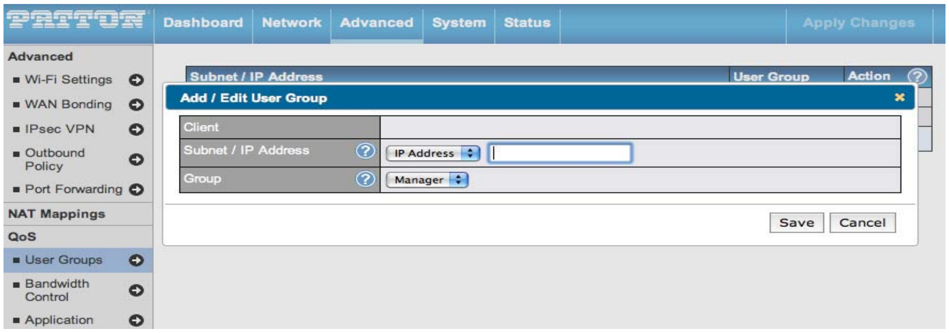
Managing User Groups

LAN and PPTP clients can be categorized into three user groups– **Manager**, **Staff**, and **Guest**. The **User Group** table 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.

The table is automatically sorted, and the table order signifies the rules' 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 ☒ to remove the defined rule.

Two default rules are pre-defined and put at the bottom of the table. They include **All DHCP reservation clients** and **Everyone**; these rules cannot be removed from the table. **All DHCP reservation clients** represents the LAN clients defined in the **DHCP Reservation** table in 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

Client	
Subnet / IP Address	IP Address
Group	Manager

Figure 45. Advanced > QoS > User Groups

Table 35. QoS: User Group Settings

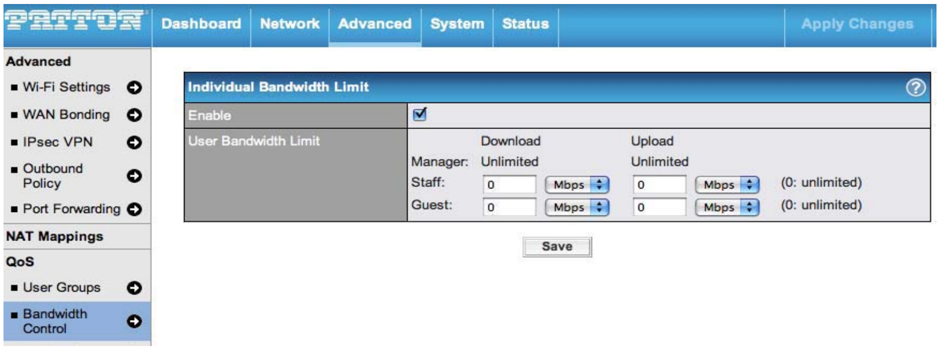
Field	Description
Subnet / IP Address	Select an option from the drop-down menu to define the client via **Subnet** or **IP Address**. Select **IP Address** to enter a name defined in the **DHCP Reservation** table or a LAN client's IP address. Select **Subnet** to enter a subnet address and specify a subnet mask.
Group	Defines the **User Group** for the specified **Subnet / IP Address**

Once users have been assigned to a user group, their internet traffic will be restricted by the rules defined for that particular group. For more information on setting these rules, refer to "Setting Up Bandwidth Control" on page 84 and "Configuring Applications" on page 84.

Setting Up Bandwidth Control

You can define a maximum download speed (over all WAN connections) and upload speed (for each WAN connection) that each individual Staff and Guest member can consume. No limit can be imposed on individual Manager members.

By default, Download and Upload Bandwidth Limits are set to unlimited (set as **0**).



Individual Bandwidth Limit

Enable ☑

User Bandwidth Limit

	Download		Upload		
Manager:	Unlimited		Unlimited		
Staff:	0	Mbps	0	Mbps	(0: unlimited)
Guest:	0	Mbps	0	Mbps	(0: unlimited)

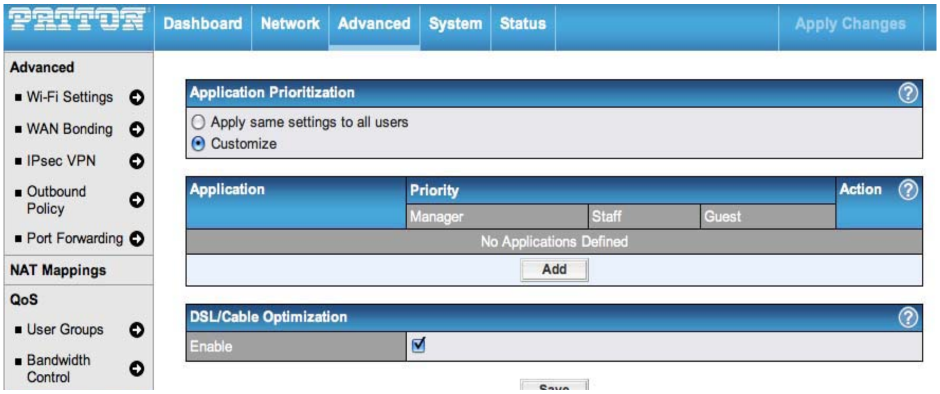
Figure 46. Advanced > QoS > Bandwidth Control

Configuring Applications

You may use the **Application** section of the QoS page for prioritizing and optimizing Application services.

Application Prioritization

You can choose whether to apply the same Prioritization settings to all user groups or customize the settings for each group.



Application Prioritization

○ Apply same settings to all users
● Customize

Application	Priority			Action
	Manager	Staff	Guest	
No Applications Defined				

DSL/Cable Optimization

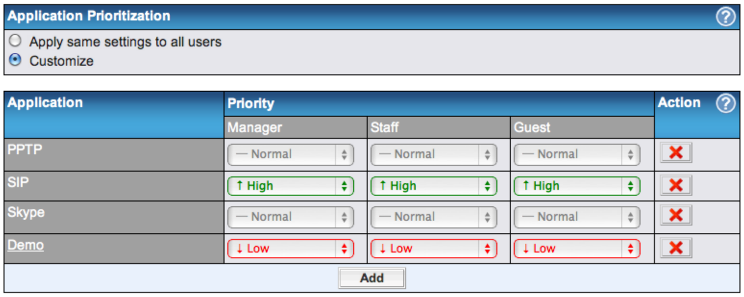
Enable ☑

Figure 47. Advanced > QoS > Application Prioritization

You may choose from three priority levels for application prioritization: ↑**High**, –**Normal**, and ↓**Low**.

Prioritization for Custom Applications

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



Application Prioritization

○ Apply same settings to all users
● Customize

Application	Priority			Action
	Manager	Staff	Guest	
PPTP	— Normal	— Normal	— Normal	✖
SIP	↑ High	↑ High	↑ High	✖
Skype	— Normal	— Normal	— Normal	✖
Demo	↓ Low	↓ Low	↓ Low	✖

Figure 48. Advanced > QoS > Custom Applications Prioritization

Table 36. QoS: Application Prioritization Settings

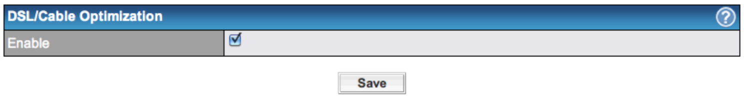
Field	Description
PPTP and IPSec VPN	Enable to prioritize any PPTP and IPSec traffic
SIP/Vonage	Enable to prioritize any SIP and Vonage voice traffic
Skype, Google Talk, RealVideo, Windows Streaming Media	Enable to prioritize any voice and video traffic from Skype, Google Talk, RealVideo, and Windows Streaming Media
Secure Web (HTTPS)	Enable to prioritize HTTPS (TCP Port 443) traffic

DSL/Cable Optimization

A DSL/cable-based WAN connection sets the upload bandwidth lower than the download bandwidth. With **DSL/Cable Optimization** option enabled, the download bandwidth of the WAN can be fully utilized in any situation.

When a DSL/cable circuit's uplink is congested, the download bandwidth will be affected. Users will not be able to download data in full speed until the uplink becomes less congested. The **DSL/Cable Optimization** feature can relieve issues with this case. When enabled, the download speed will become less affected by the upload traffic.

By default, this feature is **Enabled**.



DSL/Cable Optimization

Enable ☑

Figure 49. Advanced > QoS > DSL/Cable Optimization

Chapter 9 Configuring Firewall Settings

Chapter contents

Introduction

This chapter describes managing Firewall settings for BODi rS. To configure the Firewall, click on **Advanced** > **Firewall** in the Web Admin Interface. 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, offensive Web sites, and/or other inappropriate uses.

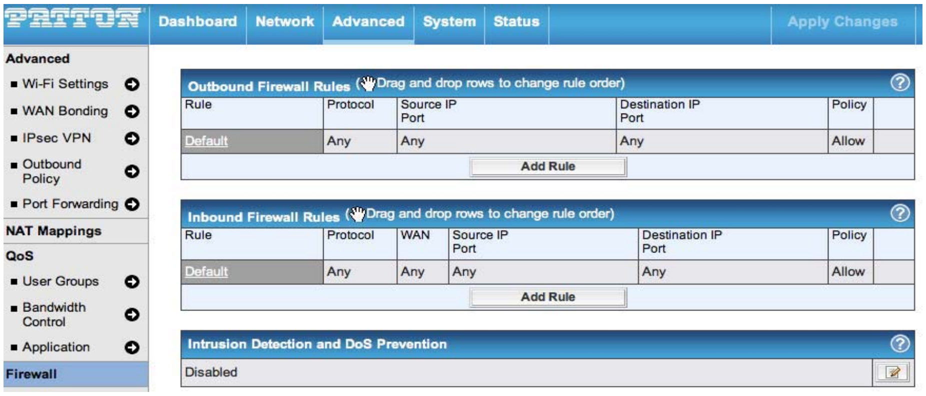
The firewall functionality of BODi rS supports the selective filtering of data traffic in both directions:

- Outbound (LAN to WAN)
- Inbound (WAN to LAN)
- Intrusion Detection and DoS Prevention

With Site-to-Site VPN enabled (see Chapter 5, "Configuring WAN Bonding" on page 57), the firewall rules also apply to VPN tunneled traffic.

Configuring Outbound and Inbound Firewall Rules

To configure the outbound and inbound firewall settings, click on **Advanced** > **Firewall** and click the **Add Rule** button.



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

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

Add Rule

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

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

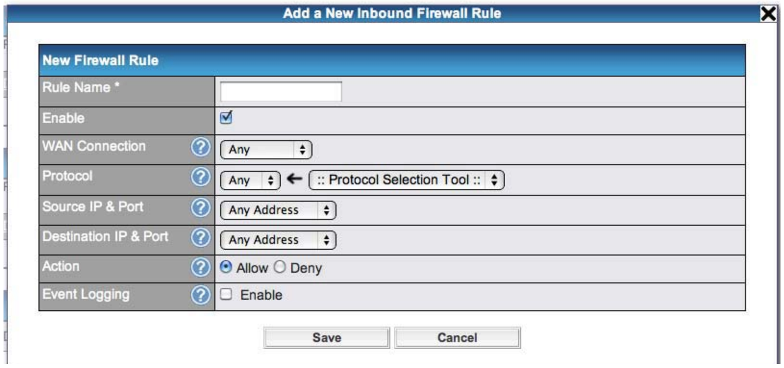
Add Rule

Intrusion Detection and DoS Prevention

Disabled

Figure 50. Advanced > Firewall > Outbound and Inbound Firewall Rules

After clicking **Add Rule**, the following configuration window displays:


Add a New Inbound Firewall Rule

New Firewall Rule

Rule Name *	
Enable	☑
WAN Connection	Any
Protocol	Any ← :: Protocol Selection Tool ::
Source IP & Port	Any Address
Destination IP & Port	Any Address
Action	● Allow ○ Deny
Event Logging	□ Enable

Figure 51. Advanced > Firewall > Add Firewall Rule

Table 37 on page 88 describes the settings for configuring a new firewall rule.

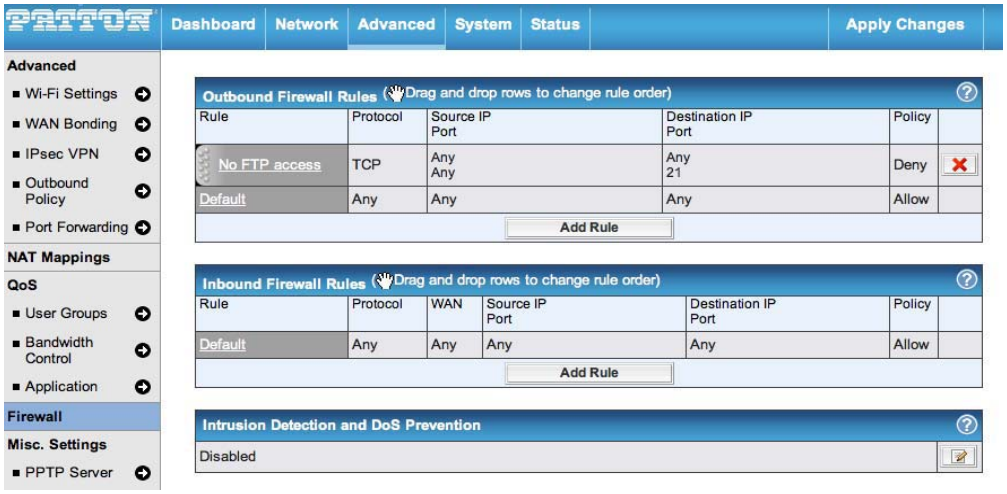
Table 37. Firewall: Inbound/Outbound Firewall Settings

Field	Description
Rule Name	Specifies a name for the firewall rule
Enable	Specifies whether the firewall rule should take effect. Select **Yes** for the firewall rule to take effect. If the traffic matches the specified Protocol/IP/Port, BODi rS will take action based on the other parameters of the rule. Select **No** to disable the firewall rule. BODi rS will disregard the other parameters of the rule.
WAN Connection	Specifies the WAN connections for the rule. Available options include: • Any (applies to all WAN connections) • Ethernet WAN • USB1 • USB2 • Wi-Fi WAN
Protocol	Specifies the protocol for the rule. Select one of the following protocols from the drop-down menu: • TCP • UDP • ICMP • IP Alternatively, you may use the **Protocol Selection Tool** drop-down menu 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, you may still modify the Protocol and Port number manually.
Source IP & Port	Specifies the source IP address(es) and port number(s) to match with the firewall rule. You may specify a single address or network, and a single port or a range of ports.
Destination IP & Port	Specifies the destination IP address(es) and port number(s) to match with the firewall rule. You may specify a single address or network, and a single port or a range of ports.
Action	Specifies what BODi rS should do upon encountering traffic that matches the Source IP & Port or Destination IP & Port. Select **Allow** to let the matching traffic pass through BODi rS (to be routed to the destination). Select **Deny** to disable the matching traffic from passing through BODi rS.

Table 37. Firewall: Inbound/Outbound Firewall Settings

Field	Description
Event Logging	Specifies whether or not to log matched firewall events. You may view logged messages by clicking on **Status > Event** Log. The following shows a sample log message: `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 specified in the log entry • **SRC:** Source IP address • **DST:** Destination IP address • **LEN:** Packet length • **PROTO:** Protocol • **SPT:** Source port • **DPT:** Destination port

Click **Save** to add the new rule to the **Firewall Rules** table. To reorder the rules in the table, hold the left mouse button on the desired rule, drag it to the new position, and release the mouse button:



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

Rule	Protocol	Source IP Port	Destination IP Port	Policy	
No FTP access	TCP	Any Any	Any 21	Deny	✖
Default	Any	Any	Any	Allow	

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

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

Intrusion Detection and DoS Prevention

Disabled

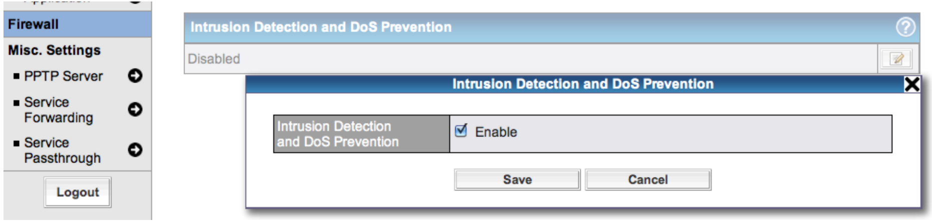
Figure 52. Advanced > Firewall > Reorder Rules List

To delete a rule from the table, click ✖. 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 connection, BODi rS will apply the **Default** rule. The **Default** rule is set to **Allow** for both outbound and inbound access.

Note If the default inbound rule is set to **Allow** for NAT-enabled WANs, no inbound allowed firewall rules will be required for inbound Port Forwarding and inbound NAT Mapping rules. However, if the default inbound rule is set to **Deny,** a corresponding **Allow** firewall rule will be required.

Enabling Intrusion Detection and DoS Prevention

BODi rS supports detecting and preventing intrusions and Denial-of-Service (DoS) attacks from the internet. To turn on this feature, click ✎ and check **Enable** for Intrusion Detection and DoS Prevention. Click **Save** to apply the setting.



Intrusion Detection and DoS Prevention

Disabled

Intrusion Detection and DoS Prevention

Intrusion Detection and DoS Prevention: ☑ Enable

Figure 53. Advanced > Firewall > Intrusion Detection and DoS Prevention

When enabled, BODi rS will detect and protect the network from 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**

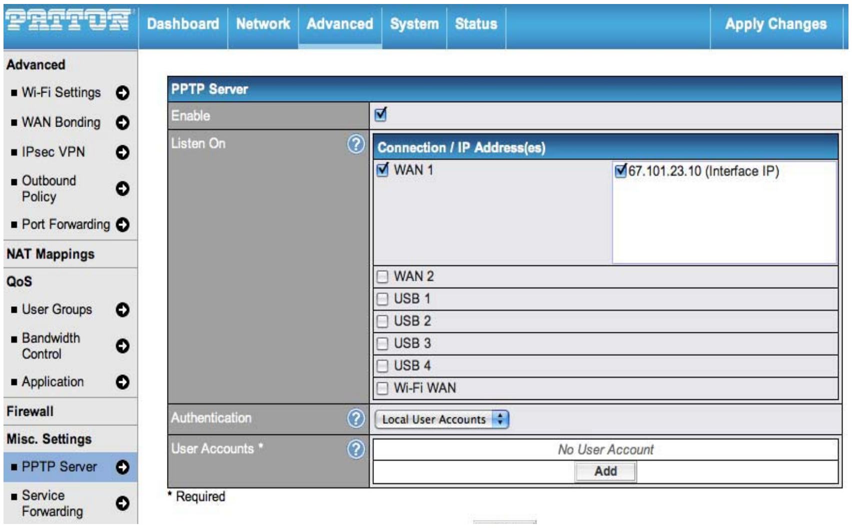
Chapter 10 Configuring Miscellaneous Services

Chapter contents

Introduction

To configure the PPTP Server, Service Forwarding, and Service Passthrough, click on **Advanced** > **Miscellaneous Settings** in the Web Admin Interface.

Enabling the PPTP Server



PPTP Server

Enable	☑
Listen On	Connection / IP Address(es) ☑ WAN 1 ☑ 67.101.23.10 (Interface IP) □ WAN 2 □ USB 1 □ USB 2 □ USB 3 □ USB 4 □ Wi-Fi WAN
Authentication	Local User Accounts
User Accounts *	No User Account Add

* Required

Figure 54. PPTP Server Application

BODi rS has a built-in PPTP Server that enables remote computers to conveniently and securely access the local network. To configure the PPTP server settings, click **Advanced** > **Misc. Settings** > **PPTP Server**.

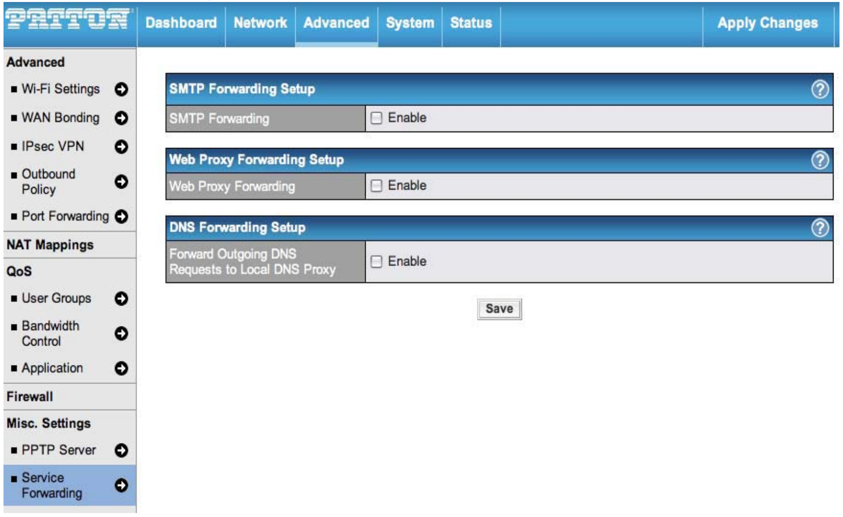
Check the **Enable** box to turn on the PPTP server function. To view all connected PPTP sessions, click on **Status** > **Client List** (see "Viewing the Client List" on page 114).

Table 38. Misc Settings: PPTP Server

Field	Description
Listen On	Specifies the WAN connection(s) and IP address(es) where the PPTP server should listen.
User Accounts	Defines the PPTP User Accounts. Click **Add** to enter a 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 a corresponding account.

Enabling Service Forwarding

To configure service forwarding settings, click on **Advanced** > **Misc. Settings** > **Service Forwarding** in the Web Admin Interface. The following section displays:



SMTP Forwarding Setup

SMTP Forwarding ☐ Enable

Web Proxy Forwarding Setup

Web Proxy Forwarding ☐ Enable

DNS Forwarding Setup

Forward Outgoing DNS Requests to Local DNS Proxy ☐ Enable

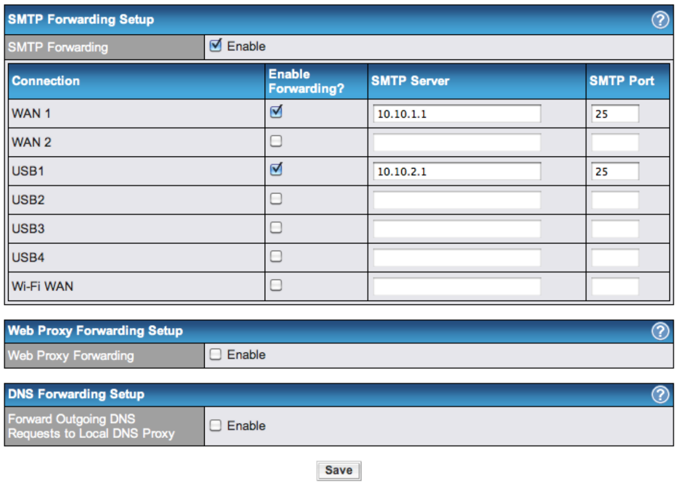
Figure 55. Advanced > Miscellaneous Settings > Service Forwarding

Table 39. Misc. Settings: Service Forwarding

Field	Description
SMTP Forwarding	Click **Enable** to intercept all outgoing SMTP connections destined for any host at **TCP Port 25**. These connections will be redirected to a specified SMTP server and port number. SMTP server settings for each WAN can be specified after selecting **Enable**. For more information, see “SMTP Forwarding” on page 94.
Web Proxy Forwarding	Click **Enable** to intercept all outgoing connections destined for the proxy server specified in **Web Proxy Interception Settings** 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**. For more information, see “Web Proxy Forwarding Settings” on page 95.
DNS Forwarding	Click **Enable** to intercept all outgoing DNS lookups to the built-in DNS name server. If any LAN device is using 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. For more information, see “DNS Forwarding Settings” on page 95.

SMTP Forwarding

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



SMTP Forwarding Setup

SMTP Forwarding ☑ Enable

Connection	Enable Forwarding?	SMTP Server	SMTP Port
WAN 1	☑	10.10.1.1	25
WAN 2	□		
USB1	☑	10.10.2.1	25
USB2	□		
USB3	□		
USB4	□		
Wi-Fi WAN	□		

Web Proxy Forwarding Setup

Web Proxy Forwarding □ Enable

DNS Forwarding Setup

Forward Outgoing DNS Requests to Local DNS Proxy □ Enable

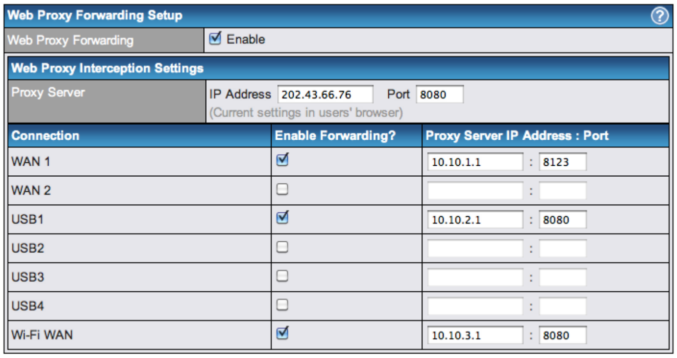
Figure 56. Miscellaneous Settings > Service Forwarding > SMTP Forwarding

To turn on SMTP forwarding, select the **Enable** check box under **SMTP Forwarding Setup**, then select the boxes for the WAN connections in the **Enable Forwarding** column that require forwarding. Enter the ISP's e-mail server address and TCP port number for each WAN service.

BODi rS will intercept SMTP connections, select a WAN with reference to the Outbound Policy, and then forward the connection to the forwarded SMTP server if the chosen WAN has enabled forwarding. If the forwarding is disabled for a WAN connection, BODi rS will forward the SMTP connections to the connection's original destination.

Note To route all SMTP connections only to specific WAN connection(s), you should create a rule in **Outbound Policy** (see "Creating Custom Rules for the Outbound Policy" on page 68).

Web Proxy Forwarding Settings



Web Proxy Forwarding Setup

Web Proxy Forwarding: ☑ Enable

Web Proxy Interception Settings

Proxy Server: IP Address 202.43.66.76 Port 8080
(Current settings in users' browser)

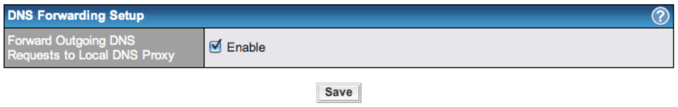
Connection	Enable Forwarding?	Proxy Server IP Address : Port
WAN 1	☑	10.10.1.1 : 8123
WAN 2	□	:
USB1	☑	10.10.2.1 : 8080
USB2	□	:
USB3	□	:
USB4	□	:
Wi-Fi WAN	☑	10.10.3.1 : 8080

Figure 57. Miscellaneous Settings > Service Forwarding > Web Proxy Forwarding

To turn on Web Proxy forwarding, select the **Enable** check box under **Web Proxy Forwarding Setup**. When enabled, BODi rS will: 1) intercept all outgoing connections destined for the proxy server specified in the **Web Proxy Interception Settings**, 2) choose a WAN connection with reference to the Outbound Policy, and 3) forward them to the specified web proxy server and port number.

You may configure the redirected server settings for each WAN in the **Web Proxy Interception Settings** section. If forwarding is disabled for a WAN, BODi rS will forward the web proxy connections for the WAN to the connection's original destination.

DNS Forwarding Settings



DNS Forwarding Setup

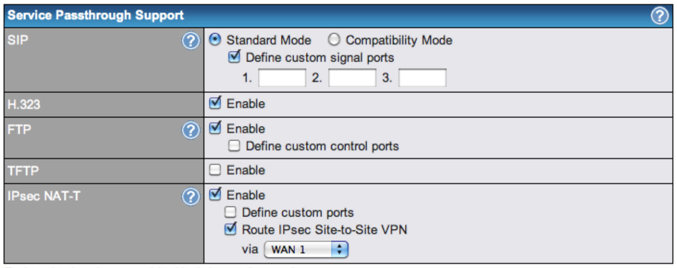
Forward Outgoing DNS Requests to Local DNS Proxy: ☑ Enable

Figure 58. Miscellaneous Settings > Service Forwarding > DNS Forwarding

To turn on DNS forwarding, select the **Enable** check box under **DNS Forwarding Setup**. When enabled, BODi rS will intercept all clients' outgoing DNS requests and forward them to the built-in DNS proxy server.

Enabling Service Passthrough

To configure service passthrough settings, click on **Advanced** > **Misc. Settings** > **Service Passthrough** in the Web Admin Interface. The following section displays:



Service Passthrough Support	
SIP	● Standard Mode ○ Compatibility Mode ☑ Define custom signal ports 1. ___ 2. ___ 3. ___
H.323	☑ Enable
FTP	☑ Enable □ Define custom control ports
TFTP	□ Enable
IPsec NAT-T	☑ Enable □ Define custom ports ☑ Route IPsec Site-to-Site VPN via WAN 1

(Registered trademarks are copyrighted by their respective owner)

Figure 59. Advanced > Miscellaneous Settings > Service Passthrough

Some internet services require special handling in a multi-WAN environment. BODi rS supports handling these services so that that internet applications do not notice it is behind a multi-WAN router.

Table 40. Misc. Settings: Service Passthrough Support

Field	Description
SIP	With Voice-over-IP (VoIP) Session Initiation Protocol (**SIP**), BODi rS acts as a SIP Application Layer Gateway (ALG) that binds connections for the same SIP session to the same WAN connection and translate IP address in the SIP packets correctly in NAT mode. This type of passthrough support is always enabled. Available options include **Standard Mode** and **Compatibility Mode**. If your SIP server's signal port number is non-standard, check the box **Define custom signal ports** and enter the port numbers into the text boxes.
H.323	With **H.323** enabled, BODi rS defines protocols that provide audio-visual communication sessions on any packet network to pass through BODi rS.
FTP	**FTP** sessions consist of two TCP connections: one for control and one for data. In multi-WAN situations, FTP sessions must be binded to the same WAN connection. Otherwise, problems will arise when transferring files. By default, BODi rS 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, check the box **Define custom control ports** and enter the port numbers into the text boxes.
TFTP	BODi rS monitors outgoing **TFTP** connections and routes any incoming TFTP data packets back to the client. Select **Enable** if you want to turn on **TFTP Passthrough** support.
IPSec NAT-T	With **IPsec NAT-T Passthrough** enabled, BODi rS monitors UDP ports 500, 4500 and 10000 by default. Select the box **Define custom ports** to add more custom data ports for your IPsec system. If the VPN contains IPsec Site-to-Site VPN traffic, you must check the box **Route IPsec Site-to-Site VPN** and select the **WAN connection** to route traffic. If you have **IPsec Site-to-Site VPN** traffic routed, check the **Route IPsec Site-to-Site VPN** option and select a **WAN** to force routing traffic to the specified WAN.

Chapter 11 **Managing System Settings**

Chapter contents

Introduction

This chapter describes setting up and managing general system administration utilities, including security, upgrades, time, notifications, logs, SNMP, and connection tests.

Configuring Administration Security Settings

This section describes the following settings for managing account and connection access via the BODi rS Web Admin Interface: user account settings (see "Admin Settings" on page 98) and connection access settings (see "WAN Connection Access Settings" on page 101).

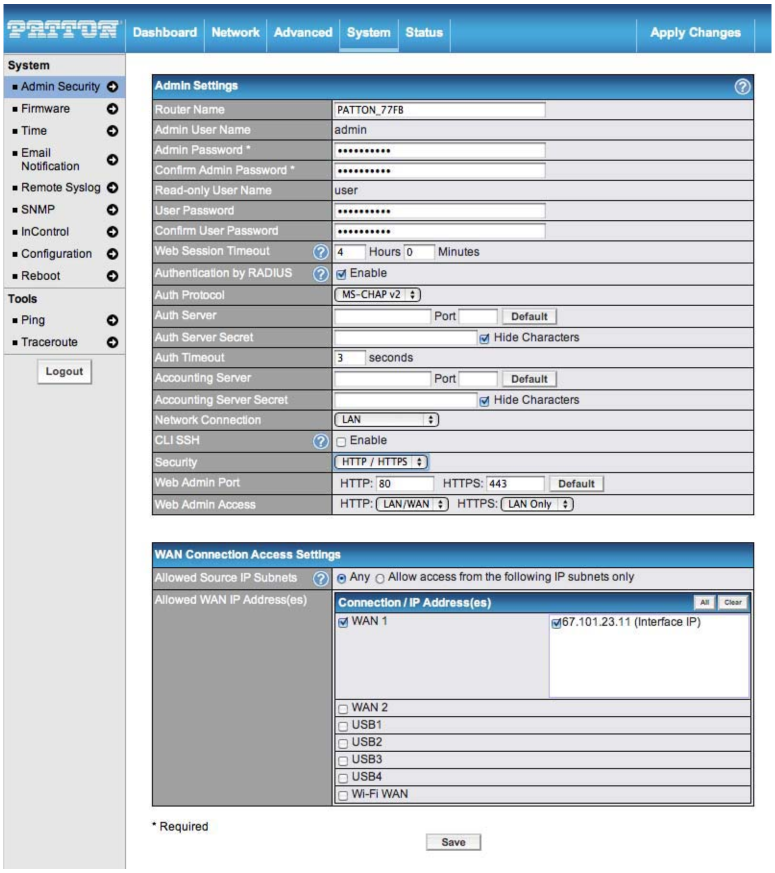
Admin Settings

BODi rS provides two user accounts for accessing the Web Admin: **admin** and **user**. The **admin** account has full administration access, while **user** is a read-only account. The **user** account can only access the device's status information and cannot make any changes to the configuration.

Web login sessions will log out automatically after being idle for longer than the specified **Web Session Timeout**. The default timeout is 4 hours. Before the session expires, click the **Logout** button in the Web Admin Interface to close the session.

For security reasons, you should change the administrator password after logging into the **admin** account for the first time. You may also configure access to the **admin** account from the LAN only to improve system security.

To configure user accounts and sessions, click on **System > Admin Security** in the Web Admin Interface (Figure 60 on page 99).



Admin Settings

Router Name	PATTON_77FB
Admin User Name	admin
Admin Password *	••••••••••
Confirm Admin Password *	••••••••••
Read-only User Name	user
User Password	••••••••••
Confirm User Password	••••••••••
Web Session Timeout	4 Hours 0 Minutes
Authentication by RADIUS	☑ Enable
Auth Protocol	MS-CHAP v2
Auth Server	Port Default
Auth Server Secret	☑ Hide Characters
Auth Timeout	3 seconds
Accounting Server	Port Default
Accounting Server Secret	☑ Hide Characters
Network Connection	LAN
CLI SSH	□ Enable
Security	HTTP / HTTPS
Web Admin Port	HTTP: 80 HTTPS: 443 Default
Web Admin Access	HTTP: LAN/WAN HTTPS: LAN Only

WAN Connection Access Settings

Allowed Source IP Subnets	● Any ○ Allow access from the following IP subnets only
Allowed WAN IP Address(es)	Connection / IP Address(es) ☑ WAN 1 ☑67.101.23.11 (Interface IP) □ WAN 2 □ USB1 □ USB2 □ USB3 □ USB4 □ Wi-Fi WAN

* Required

Figure 60. System > Admin Security

Table 41. System: Admin Security Settings

Field	Description
Router Name	Defines a name for this specific BODi rS unit.
Admin User Name	*Non-configurable. Set as **admin** by default.
Admin Password	Specifies a new password for the **admin** account.
Confirm Admin Password	Verifies and confirms the new password for the **admin** account.
Read-only User Name	*Non-configurable. Set as **user** by default.
User Password	Specifies a new password for the **user** account. When confirmed, the user account will be available for read-only use.
Confirm User Password	Verifies and confirms the password for the **user** account
Web Session Timeout	Specifies the number of hours and minutes that a web session can remain idle before BODi rS terminates the session. Default = 4 hours

Table 41. System: Admin Security Settings

Field	Description
Authentication by RADIUS	Select the **Authentication by RADIUS** option to authenticate access using an external RADIUS server. BODi rS treats authenticated users as **admin** users with full read-write permissions. 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. *Authentication options will be available once this box is checked.
Auth Protocol	Specifies the authentication protocol used. Available options include: **MS-CHAP v2** and **PAP**.
Auth Server	Specifies the access address of the external RADIUS server
Auth Server Secret	Defines the secure password phrase for accessing the RADIUS server
Auth Timeout	Specifies the time value for authentication timeout
Accounting Server	Specifies the access address of the external Accounting server
Accounting Server Secret	Defines the secure password phrase for accessing the Accounting server
Network Connection	Specifies the network connection that BODi rS will use for the authentication connection. Select an option from LAN, WAN and VPN connections.
Security	Specifies the authorized protocol(s) for accessing the Web Admin Interface: • **HTTP** • **HTTPS** • **HTTP/HTTPS**
Web Admin Port	Specifies the port number to use to access the Web Admin Interface
Web Admin Access	Specifies the authorized network interfaces for accessing the Web Admin Interface: • **LAN only** • **LAN/WAN** (see "WAN Connection Access Settings" on page 101)

WAN Connection Access Settings

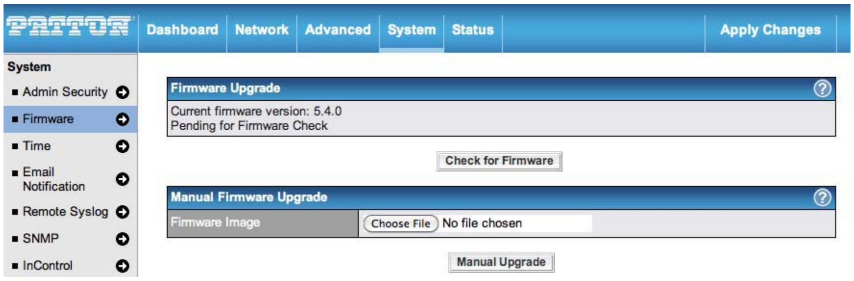
To configure **WAN Connection Access** settings, select **LAN/WAN** as the **Web Admin Access** option in the **Admin Settings** section.

Table 42. System: WAN Connection Access Settings

Field	Description
Allowed Source IP Subnets	Specifies authorized IP subnets that may access the Web Admin Interface. Available options include: • **Any:** Allow web admin access from any location, without IP address restrictions. • **Allow access from the following IP subnets only:** Only the defined IP subnets may access the Web Admin Interface. When selected, this option displays a text field that allows you to enter the authorized IP subnet addresses. 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) – */m* is the subnet mask in CIDR format, which is between 0 and 32 inclusively. (e.g.168.0.0/24) To define multiple subnets, enter only one IP subnet on each line. For example: *168.0.0/24* *10.8.0.0/16*
Allowed WAN IP Addresses	Specifies the WAN IP address(es) where the web server should listen for activity

Upgrading the Firmware

This section describes how to upgrade the firmware for BODi rS through the Web Admin Interface. To reach the firmware page, click on **System** > **Firmware**:



Current firmware version: 5.4.0
Pending for Firmware Check

No file chosen

Figure 61. System > Firmware

To use the **online** upgrade option, click on the **Check Again** button in the **Firmware Upgrade** section of the screen. With this option, BODi rS checks online for new firmware. If a new firmware update is available, BODi rS will automatically download the new firmware file. BODi rS will automatically initiate the upgrade process after downloading the new firmware file.

To use the **manual** upgrade option, go to **www.patton.com/support/upgrades** and select BODi rS from the **Model Number** drop-down menu. Then, click the **Download** hyperlink for the desired software release. In the BODi rS Web Admin Interface, click **Browse...** to select the firmware file from the local computer, and then click **Manual Upgrade** to send the firmware to the unit. BODi rS will automatically initiate the upgrade process after downloading the new firmware file.

BODi rS has the ability to 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.

Firmware Upgrade Status

During the firmware upgrade, the **Status** LED on the front of the unit shows the upgrade process:

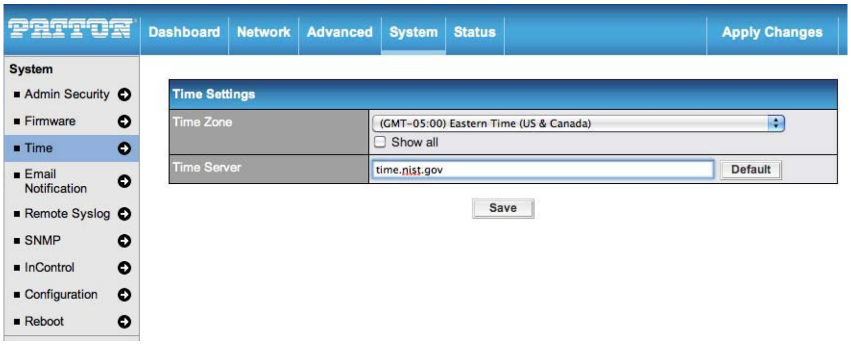
- **OFF**: Firmware upgrade in progress (DO NOT disconnect the power)
- **Red:** BODi rS is rebooting
- **Green:** The firmware upgrade is successfully completed.

Note

- The firmware upgrade process may not necessarily preserve the previous configuration, and the behavior varies on a case-by-case basis.
- Do not disconnect the power during the firmware upgrade process.
- Do not attempt to upload a non-firmware file, or a firmware file that is not supported by BODi rS.
- Upgrading BODi rS with an invalid firmware file will damage the unit, and may void the warranty.

Configuring the Time Server

The Time Server functionality enables the system clock of BODi rS to synchronize with a specified Time Server. To configure the time server settings, click on **System > Time** in the Web Admin Interface.



Time Settings

Time Zone: (GMT-05:00) Eastern Time (US & Canada)

□ Show all

Time Server: time.nist.gov

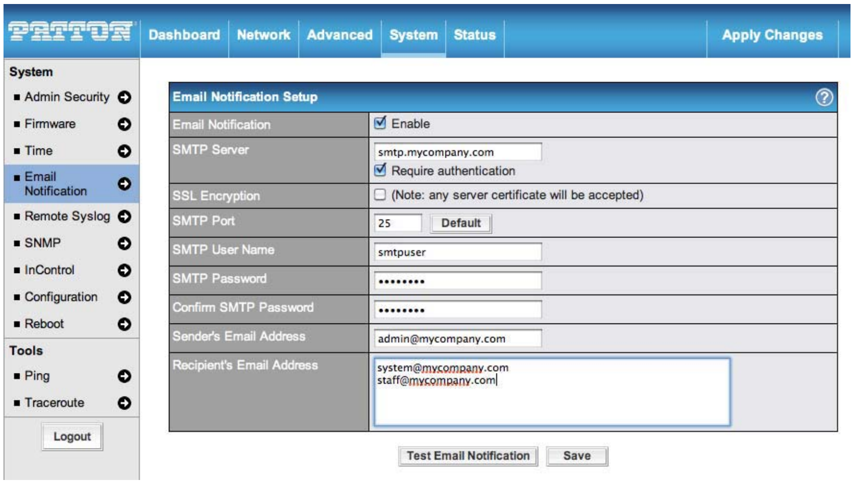
Figure 62. System > Time

Table 43. System: Time Server Settings

Field	Description
Time Zone	Specifies the time zone (along with the corresponding Daylight Savings Time scheme) for BODi rS. The Time Zone value affects the time stamps in the Event Log of BODi rS and E-mail notifications. Select the box for **Show all** to view all available time zone options.
Time Server	Specifies the NTP network time server to be utilized by BODi rS.

Configuring Email Notifications

The Email Notification functionality of BODi rS sends the System Administrator up-to-date information on the network status. To configure notification settings, click on **System > Email Notification** in the Web Admin Interface.



Email Notification Setup

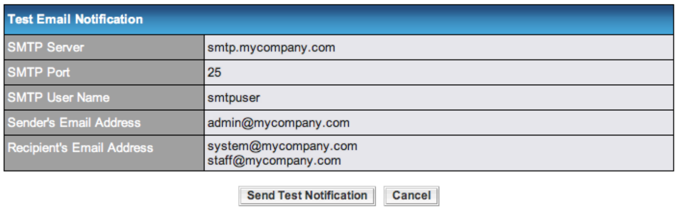
Email Notification	☑ Enable
SMTP Server	smtp.mycompany.com ☑ Require authentication
SSL Encryption	□ (Note: any server certificate will be accepted)
SMTP Port	25 Default
SMTP User Name	smtpuser
SMTP Password	••••••••
Confirm SMTP Password	••••••••
Sender's Email Address	admin@mycompany.com
Recipient's Email Address	system@mycompany.com staff@mycompany.com

Figure 63. System > Email Notification

Table 44. System: Email Notification Settings

Field	Description
Email Notification	Select **Enable** to allow BODi rS to send email messages to a System Administrator when the WAN status changes, or when new firmware is available. If the Enable box is not checked, BODi rS will not send email messages about the system.
SMTP Server	Specifies the SMTP server used for sending email. If the server requires authentication, select **Require authentication**.
SSL Encryption	Select the box to **Enable SMTPS**. When enabled, the **SMTP Port** field will change to **465** automatically.
SMTP Port	Specifies the SMTP Port number; by default, this is set to **25**. Select the **SSL Encryption** box to automaticaly change the port to **465**. You may also enter a new port number, or you may click **Default** to restore the default port setting.
SMTP Username/ Password	Specifies the **SMTP username** and **password** while sending email. Select **Require authentication** in the **SMTP Server** field to view these options.
Confirm SMTP Password	Verifies and confirms the new administrator password
Sender's Email Address	Specifies the sender email address shown on the email notifcations sent by BODi rS.
Recipient's Email Address	Specifies the email addresses where BODi rS may send notifications to the administrator(s). You may enter multiple recipients' email addresses in this field.

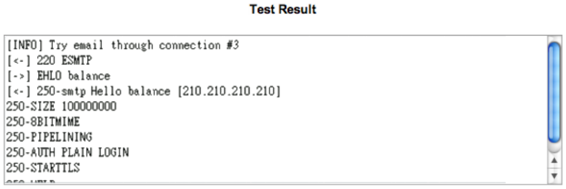
After you have completed the settings, click the **Test Email Notification** button to test the settings before saving it. The following screen displays to confirm the settings:



Test Email Notification	
SMTP Server	smtp.mycompany.com
SMTP Port	25
SMTP User Name	smtpuser
Sender's Email Address	admin@mycompany.com
Recipient's Email Address	system@mycompany.com staff@mycompany.com

Figure 64. Test Email Notification

Click **Yes** to confirm. Wait a few seconds, and a window displays with detailed test results:



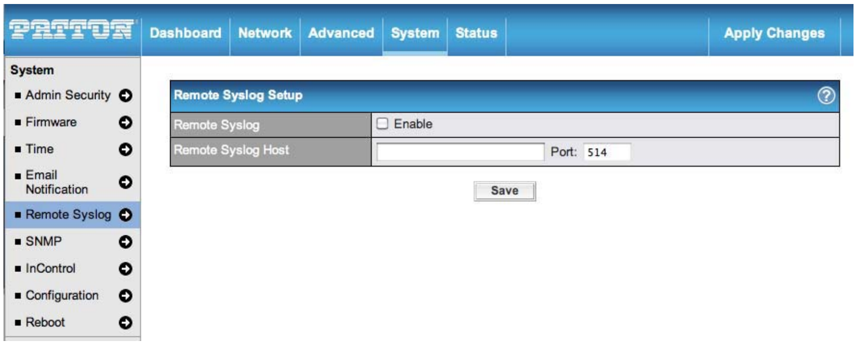
Test Result

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

Figure 65. Test Email Result

Setting Up the Remote System Log

The Remote Syslog functionality of BODi rS enables event logging at a specified remote Syslog server. To configure the remote system log settings, click on **System > Remote Syslog** in the Web Admin Interface.



Remote Syslog Setup

Remote Syslog	□ Enable
Remote Syslog Host	Port: 514

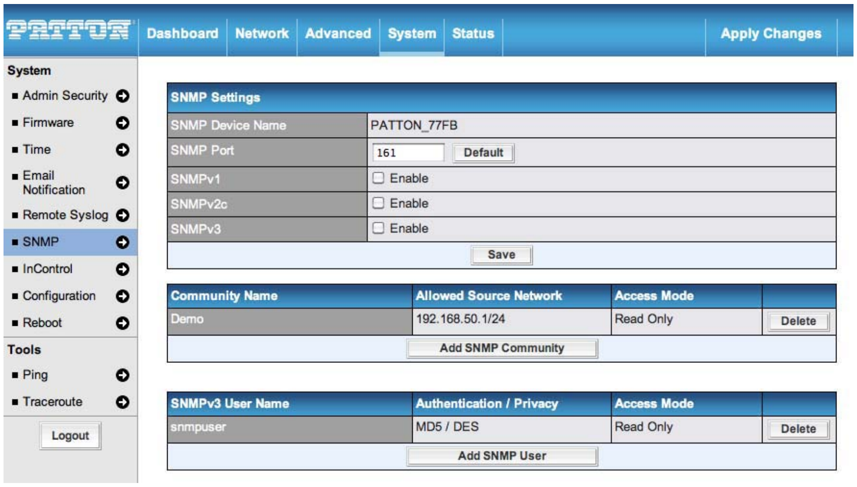
Figure 66. System > Remote Syslog

Table 45. System: Remote Syslog Setup

Field	Description
Remote Syslog	Specifies whether or not to log events at the specified remote Syslog server
Remote Syslog Host	Specifies the IP address or host name of the remote Syslog server
Remote Syslog Host Port	Specifies the port number of the remote Syslog service Default = **514**

Configuring Simple Network Management Protocol (SNMP)

Simple Network Management Protocol (SNMP) is an open standard that can be used to collect information from BODi rS. To configure SNMP settings, click on **System > SNMP** in the Web Admin Interface.



SNMP Settings	
SNMP Device Name	PATTON_77FB
SNMP Port	161 Default
SNMPv1	□ Enable
SNMPv2c	□ Enable
SNMPv3	□ Enable
Save	

Community Name	Allowed Source Network	Access Mode	
Demo	192.168.50.1/24	Read Only	Delete
Add SNMP Community			

SNMPv3 User Name	Authentication / Privacy	Access Mode	
snmpuser	MD5 / DES	Read Only	Delete
Add SNMP User			

Figure 67. System > SNMP

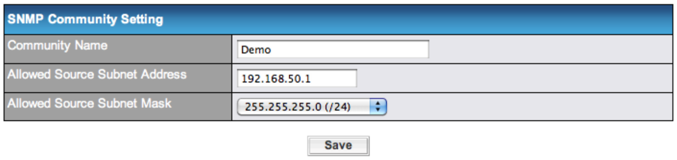
General SNMP Settings

Table 46. System: SNMP Settings

Field	Description
SNMP Device Name	Displays the router name defined in ***System > Admin Security***
SNMP Port	Specifies the SNMP port to use. Default = **161**
SNMPv1	Select the box to **Enable SNMP version 1**.
SNMPv2	Select the box to **Enable SNMP version 2**.
SNMPv3	Select the box to **Enable SNMP version 3**.

SNMP Community Settings

To add a community for either SNMPv1 or SNMPv2, click the **Add SNMP Community** button in the **Community Name** table. The following screen displays:



SNMP Community Setting

Community Name	Demo
Allowed Source Subnet Address	192.168.50.1
Allowed Source Subnet Mask	255.255.255.0 (/24)

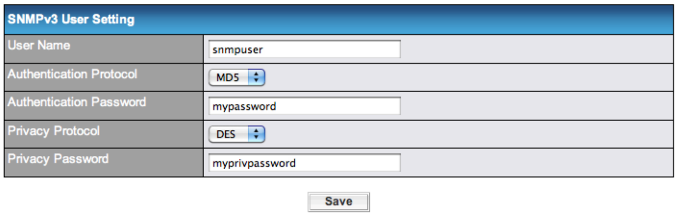
Figure 68. System > SNMP Community

Table 47. System: SNMP Community Settings

Field	Description
Community Name	Specifies aunique name for the SNMP Community
Allowed Source Subnet Address	Enter a subnet address where the SNMP Server will allow access
Allowed Source Subnet Mask	Specifies the subnet mask that corresponds with the Allowed Source Subnet Address *(e.g. 255.255.255.0).*

SNMPv3 User Settings

To define a user name for SNMPv3, click **Add SNMP User** in the **SNMPv3 User Name** table. The following screen displays:



SNMPv3 User Setting

User Name	snmpuser
Authentication Protocol	MD5
Authentication Password	mypassword
Privacy Protocol	DES
Privacy Password	myprivpassword

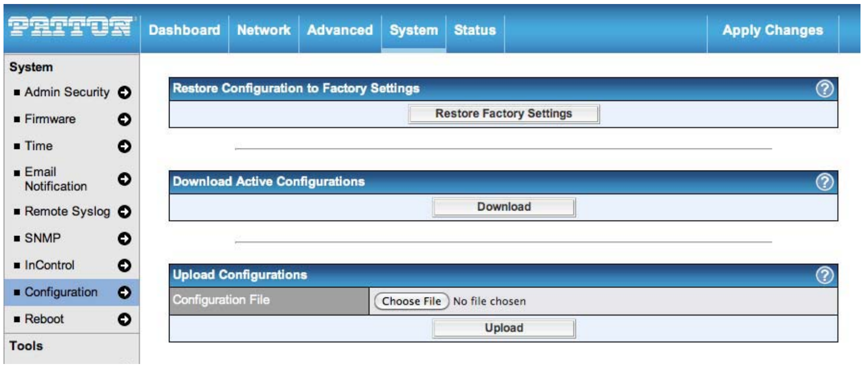
Figure 69. System > SNMPv3 User

Table 48. System: SNMP Community Settings

Field	Description
User Name	Specifies an account name to use with SNMPv3
Authentication Protocol	Select an authentication protocol from the drop-down menu. Available options include: • **NONE** • **MD5** • **SHA**
Authentication Password	Specifies the authentication password (only applies to **MD5** or **SHA**)
Privacy Protocol	Select a privacy protocol from the drop-down menu. Available options include: • **NONE** • **DES**
Privacy Password	Specifies the privacy password (only applies to **DES**)

Importing and Exporting System Configuration Files

Backing up BODi rS settings immediately after successful completion of the initial setup is strongly recommended. To configure the settings for uploading and downloading system files, click on **System** > **Configuration** in the Web Admin Interface.



Configuration File: No file chosen

Figure 70. System > Configuration

Restore Configuration to Factory Settings

Use the **Restore Factory Settings** button to reset BODi rS to the factory default settings. You must click the **Apply Changes** button for the new settings to take effect.

Downloading Active Configurations

Use the **Download** button to back up the current active settings and save the configuration file.

Uploading Configurations

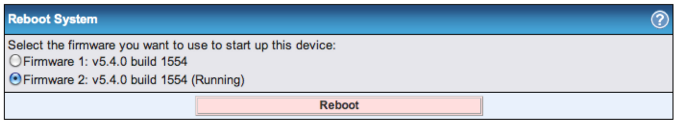
To restore or change settings based on a configuration file, click **Browse…** to locate the configuration file on the local computer, and then click **Upload**. You must click the **Apply Changes** button for the new settings to take effect.

Rebooting the System

For the highest reliability, BODi rS provides two copies of the firmware in different versions. The firmware marked **(Running)** is the current system firmware file used for booting up.

Note A firmware upgrade always replaces the inactive firmware partition.

To restart BODi rS, click on **System** > **Reboot System** in the Web Admin Interface. Select a firmware file, then click the **Reboot** button.



Select the firmware you want to use to start up this device:
○ Firmware 1: v5.4.0 build 1554
● Firmware 2: v5.4.0 build 1554 (Running)

Figure 71. System > Reboot

Testing System Connections

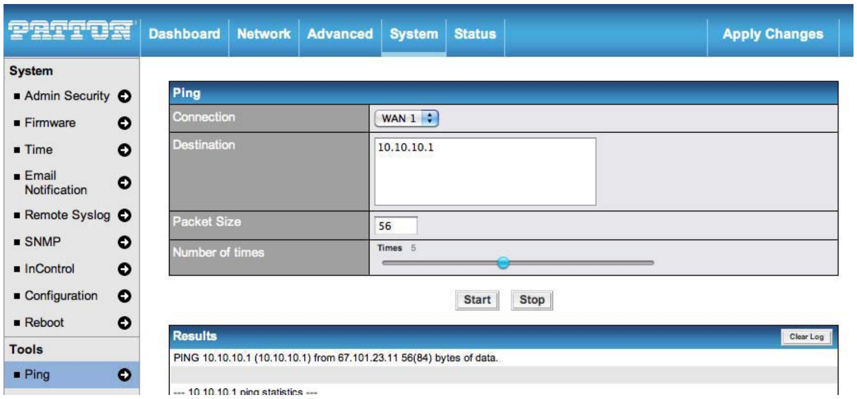
You may test the health of connections using the BODi rS built-in system utilities. To access the setup screens for these tests, click on **System > Tools** in the Web Admin Interface.

- Use the **Ping Test** (see "Ping Test" on page 110) to view the connectivity of a WAN or VPN link.
- Use the **Traceroute Test** (see "Traceroute Test" on page 111) to view the connection path of a WAN or VPN link.
- Use the **VPN Test** (see "VPN Test" on page 111) to view the throughput between different VPN peers.

Ping Test

BODi rS provides a **Ping Test** tool that checks the connection of a specified Ethernet interface or a Site-to-Site VPN link. A System Administrator can use the Ping utility to manually check the connectivity of a particular LAN/WAN connection. You can specify the number of pings in the **Number of Times** field (to a maximum of 10 times), and you may specify the **Packet Size** (to a maximum of **1472** bytes).

To run a ping test on a BODi rS connection, click on **System > Tools > Ping** in the Web Admin Interface. Select an option from the **Connection** drop-down menu. If desired, adjust the packet size and number of times for the connection test to run, then click the **Start** button. Click **Stop** to end the ping test.



Ping

Connection	WAN 1
Destination	10.10.10.1
Packet Size	56
Number of times	Times 5

Results

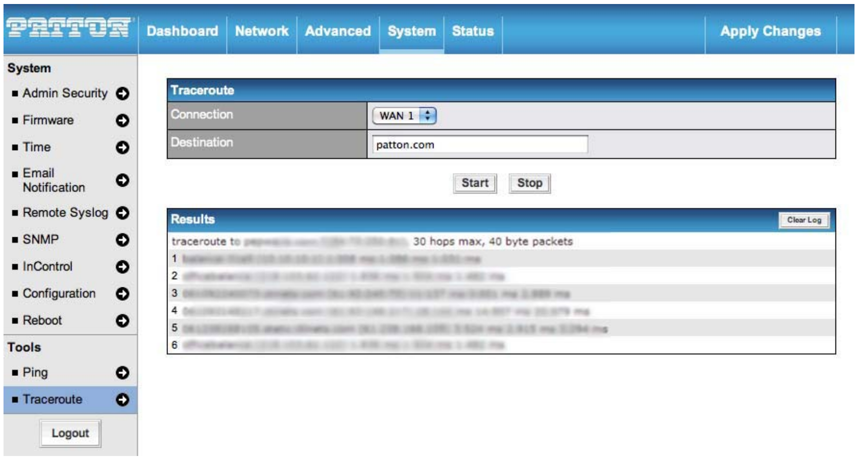
```
PING 10.10.10.1 (10.10.10.1) from 67.101.23.11 56(84) bytes of data.

--- 10.10.10.1 ping statistics ---
```

Figure 72. System > Tools > Ping Test

Traceroute Test

BODi rS provides a **Traceroute Test** tool that follows and reports the routing path to the destination through a particular Ethernet interface or a Site-to-Site VPN connection. A System Administrator can use the Traceroute utility to analyze the connection path of a LAN/WAN connection.

To run a traceroute test on a BODi rS connection, click on **System > Tools > Traceroute** in the Web Admin Interface. Select an option from the **Connection** drop-down menu, then click the **Start** button. Click **Stop** to end the traceroute test.



Traceroute

Connection: WAN 1

Destination: patton.com

Results

```
traceroute to [redacted] 30 hops max, 40 byte packets
1 [redacted]
2 [redacted]
3 [redacted]
4 [redacted]
5 [redacted]
6 [redacted]
```

Figure 73. System > Tools > Traceroute Test

VPN Test

BODi rS provides a **VPN Test** tool that tracks the throughput between different VPN peers. To run a VPN test on a BODi rS connection, click on **System > Tools > VPN** in the Web Admin Interface. Select an option from the **VPN Profile** drop-down menu, and select the **Test Type** and **Direction**. Enter the length of time for the test (in seconds), then click the **Go!** button.

Chapter 12 **Managing Status Settings**

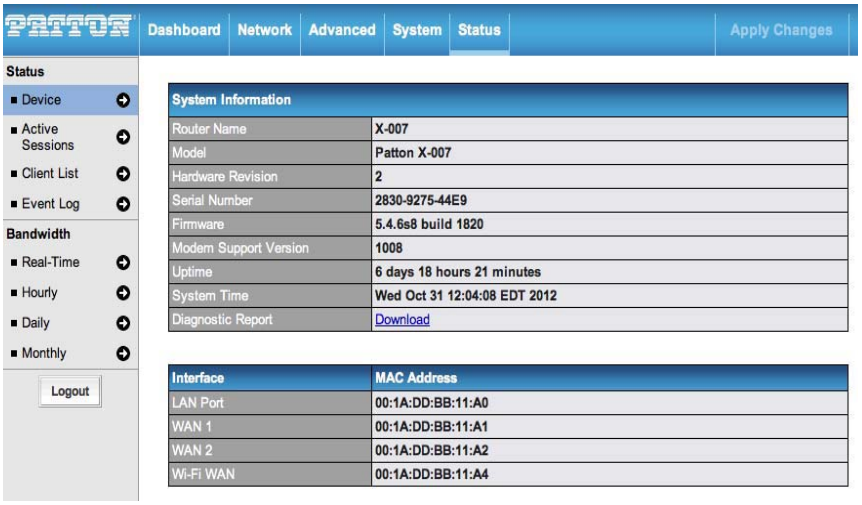
Chapter contents

Introduction

This chapter describes viewing system information for BODi rS, including active sessions, the client list, the WINS client list, Site-to-Site VPN connections, UPnP/NAT-PMP information, events, and bandwidth statistics.

Viewing General Device Information

To view system status information, click on **Status** > **Device** in the Web Admin Interface:



System Information	
Router Name	X-007
Model	Patton X-007
Hardware Revision	2
Serial Number	2830-9275-44E9
Firmware	5.4.6s8 build 1820
Modem Support Version	1008
Uptime	6 days 18 hours 21 minutes
System Time	Wed Oct 31 12:04:08 EDT 2012
Diagnostic Report	Download

Interface	MAC Address
LAN Port	00:1A:DD:BB:11:A0
WAN 1	00:1A:DD:BB:11:A1
WAN 2	00:1A:DD:BB:11:A2
Wi-Fi WAN	00:1A:DD:BB:11:A4

Figure 74. Status > Device

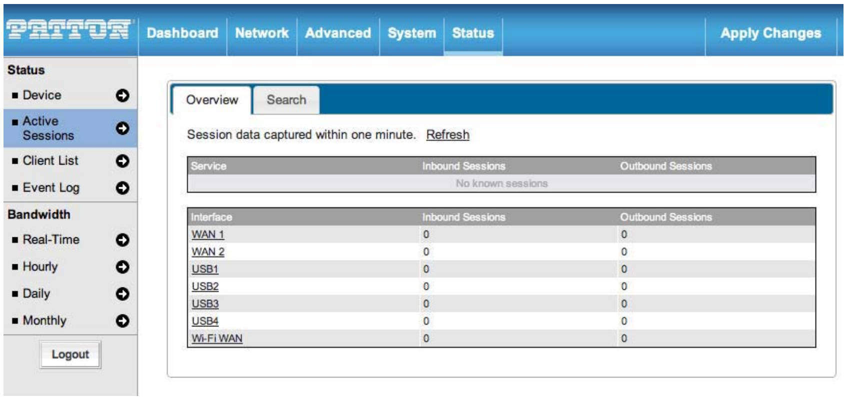
Table 49. Status: System Information

Field	Description
Router Name	Displays the name specified for this specific BODi rS device in the Router Name field located in ***System > Admin Security***
Model	Shows the model name and number of this specific BODi rS device
Hardware Revision	Shows the hardware version of this specific BODi rS device
Serial Number	Shows the serial number of this specific BODi rS device
Firmware	Shows the firmware version that BODi rS is currently running
Uptime	Shows the length of time since BODi rS has rebooted
System Time	Shows the current system time
Diagnostic Report	Use the **Download** button to export a diagnostic report file of system statistics.

The second table on the **Device** status page shows the MAC address of each LAN/WAN interface connected to BODi rS.

Viewing Details of Active Sessions

The **Active Sessions** section displays the active inbound / outbound and UDP / TCP sessions of each WAN connection on BODi rS. To view information about current sessions that are currently active on BODi rS, click on **Status > Active Sessions** in the Web Admin Interface. A filter is available to help sort out the active session information. Enter a keyword in the field or check one of the WAN connection boxes for filtering:



Session data captured within one minute. Refresh

Service	Inbound Sessions	Outbound Sessions
No known sessions		

Interface	Inbound Sessions	Outbound Sessions
WAN 1	0	0
WAN 2	0	0
USB1	0	0
USB2	0	0
USB3	0	0
USB4	0	0
Wi-Fi WAN	0	0

Figure 75. Status > Active Sessions

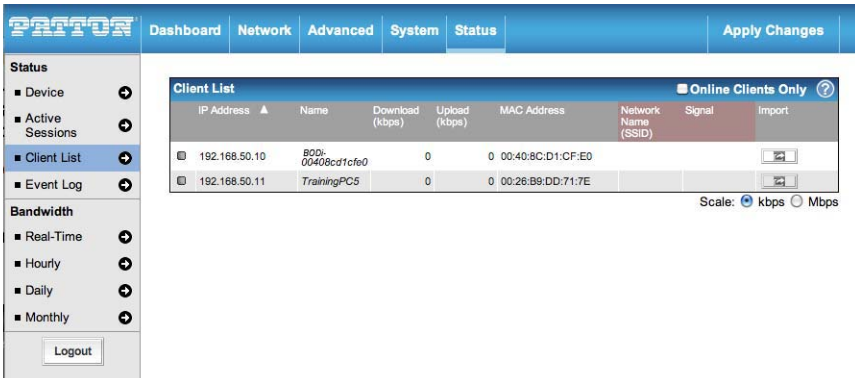
Viewing the Client List

The **Client List** section shows DHCP clients associated with BODi rS since it has powered up. To view information about DHCP clients, click on **Status > Client List** in the Web Admin Interface.

The table lists the DHCP client **IP Addresses**, their **Names** (retrieved from DHCP reservation table or defined by users), current **Download** and **Upload** rates, and **MAC addresses**.

The Network Name (SSID) and Signal refers to the information about Wi-Fi AP, which is the name of the Network and its signal strength. Clients can be imported into the DHCP Reservation table by clicking the arrow button in the far right column. To update the record after importing clients, go to **Network > LAN**.

If you have enabled the PPTP Server (see "Enabling the PPTP Server" on page 92), you may see the corresponding connection name listed in the Name field of the Client List:



	IP Address ▲	Name	Download (kbps)	Upload (kbps)	MAC Address	Network Name (SSID)	Signal	Import
□	192.168.50.10	*BODi-00408cd1cfe0*	0	0	00:40:8C:D1:CF:E0			
□	192.168.50.11	*TrainingPC5*	0	0	00:26:B9:DD:71:7E			

Scale: ● kbps ○ Mbps

Figure 76. Status > Client List

Viewing the WINS Client List

The **WINS Client** section shows Windows Internet Name Service (WINS) clients associated with BODi rS. This section is only available if you have enabled the WINS Server (see "WINS Server Settings" on page 33). To view information about WINS clients, click on **Status** > **WINS Client** in the Web Admin Interface.

The table lists the names of clients retrieved and automatically matched with the DHCP Client List (see "Viewing the Client List" on page 114). Click the button **Flush All** to clear the table of all WINS client records.

Viewing Site-to-Site VPN Connection Details

The **Site-to-Site VPN** section shows the current status and details of all VPN peers. To view details about peer WAN connections, click on **Status** > **Site-to-Site VPN** in the Web Admin Interface.

Viewing UPnP and NAT-PMP Connection Details

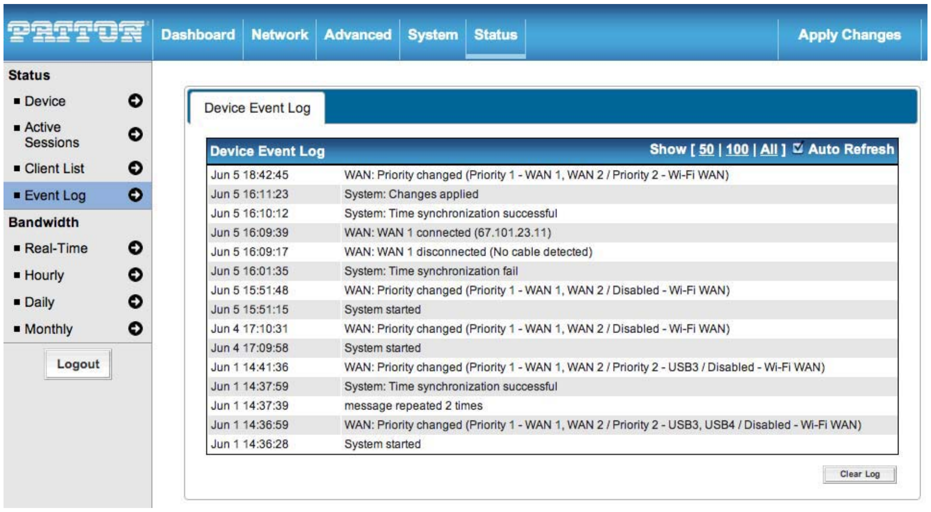
The **UPnP/NAT-PMP** section shows forwarded ports using UPnP and NAT-PMP protocols. This section is only available if you have enabled UNnP/NAT-PMP functions (see "UPnP/NAT-PMP Settings" on page 79). To view details about these connections, click on **Status** > **UPnP/NAT-PMP** in the Web Admin Interface.

Click the **X** button to delete a single UPnP / NAT-PMP record in its corresponding row. To delete all records, click the **Delete All** button below the table. UPnP/NAT-PMP records are deleted immediately without confirmation.

Viewing Event Log Details

The **Event Log** section displays a list of events that have taken place on BODi rS. To view log details, click on **Status** > **Event Log** in the Web Admin Interface.

Click the **Refresh** button to update the list of log entries. Click the **Clear Log** button to remove all of the log entries. Select the number of entries to show in the log screen at a time: **50**, **100**, or **all**.



Device Event Log

```
Jun 5 18:42:45   WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Priority 2 - Wi-Fi WAN)
Jun 5 16:11:23   System: Changes applied
Jun 5 16:10:12   System: Time synchronization successful
Jun 5 16:09:39   WAN: WAN 1 connected (67.101.23.11)
Jun 5 16:09:17   WAN: WAN 1 disconnected (No cable detected)
Jun 5 16:01:35   System: Time synchronization fail
Jun 5 15:51:48   WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Disabled - Wi-Fi WAN)
Jun 5 15:51:15   System started
Jun 4 17:10:31   WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Disabled - Wi-Fi WAN)
Jun 4 17:09:58   System started
Jun 1 14:41:36   WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Priority 2 - USB3 / Disabled - Wi-Fi WAN)
Jun 1 14:37:59   System: Time synchronization successful
Jun 1 14:37:39   message repeated 2 times
Jun 1 14:36:59   WAN: Priority changed (Priority 1 - WAN 1, WAN 2 / Priority 2 - USB3, USB4 / Disabled - Wi-Fi WAN)
Jun 1 14:36:28   System started
```

Figure 77. Status > Event Log

Viewing Bandwidth Usage Statistics

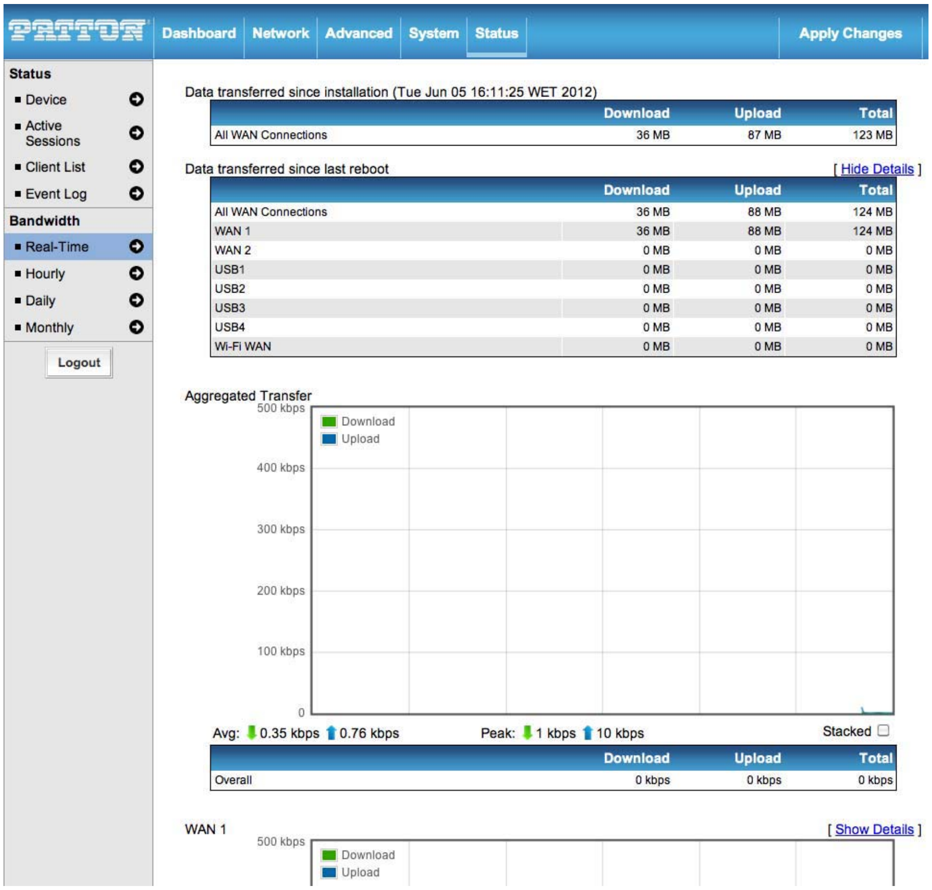
The **Bandwidth** section shows bandwidth usage statistics for BODi rS, including details about real-time, daily, and monthly bandwidth usage. To view bandwidth statistics, click on **Status > Bandwidth** in the Web Admin Interface.

- "Real-Time Bandwidth Usage" on page 116
- "Daily Bandwidth Usage" on page 117
- "Monthly Bandwidth Usage" on page 118

Real-Time Bandwidth Usage

The **Data Transferred since installation** table shows you how much network traffic has been processed by BODi rS since the first bootup.

Click the **Show Details** link in the top right corner of each table to display the details of transferred data. Select the **Stacked** box below the data transferred graph to show the aggregated transferred rate of both traffic directions.



Data transferred since installation (Tue Jun 05 16:11:25 WET 2012)

	Download	Upload	Total
All WAN Connections	36 MB	87 MB	123 MB

Data transferred since last reboot [Hide Details]

	Download	Upload	Total
All WAN Connections	36 MB	88 MB	124 MB
WAN 1	36 MB	88 MB	124 MB
WAN 2	0 MB	0 MB	0 MB
USB1	0 MB	0 MB	0 MB
USB2	0 MB	0 MB	0 MB
USB3	0 MB	0 MB	0 MB
USB4	0 MB	0 MB	0 MB
Wi-Fi WAN	0 MB	0 MB	0 MB

Aggregated Transfer

Avg: ↓0.35 kbps ↑0.76 kbps Peak: ↓1 kbps ↑10 kbps Stacked □

	Download	Upload	Total
Overall	0 kbps	0 kbps	0 kbps

WAN 1 [Show Details]

Figure 78. Real-Time Bandwidth Usage

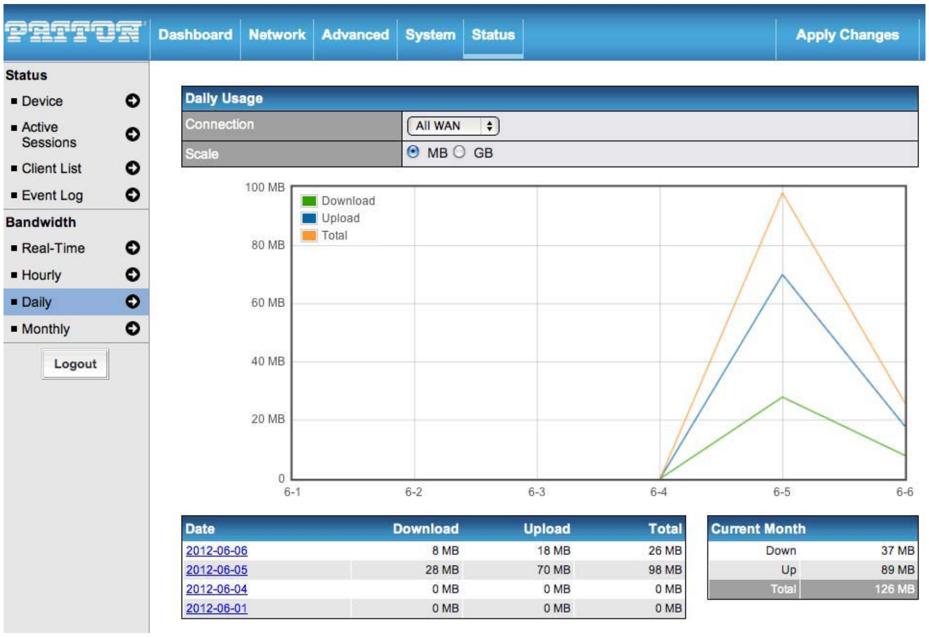
Daily Bandwidth Usage

The **Daily Bandwidth** status page shows the daily bandwidth usage for all WAN connections and for each specific WAN connection.

From the drop-down menu, select theWAN connection to display its bandwidth information. If you have enabled the **Bandwidth Monitoring** feature (see "Bandwidth Allowance Monitor" on page 53), BODi rS will display the **Current Billing Cycle** table for that specific WAN connection.

In the **Client Bandwidth Usage** table, click on a date hyperlink to view the client bandwidth usage for that specific date. This feature is not available if you have selected to view the bandwidth usage of one specific WAN connection.

In the **Daily Usage** table, you may select to show the scale of the graph in **Megabytes (MB)** or **Gigabytes (GB).**



Daily Usage

Connection	All WAN
Scale	● MB ○ GB

Date	Download	Upload	Total
2012-06-06	8 MB	18 MB	26 MB
2012-06-05	28 MB	70 MB	98 MB
2012-06-04	0 MB	0 MB	0 MB
2012-06-01	0 MB	0 MB	0 MB

Current Month	
Down	37 MB
Up	89 MB
Total	126 MB

Figure 79. Daily Bandwidth Usage

Monthly Bandwidth Usage

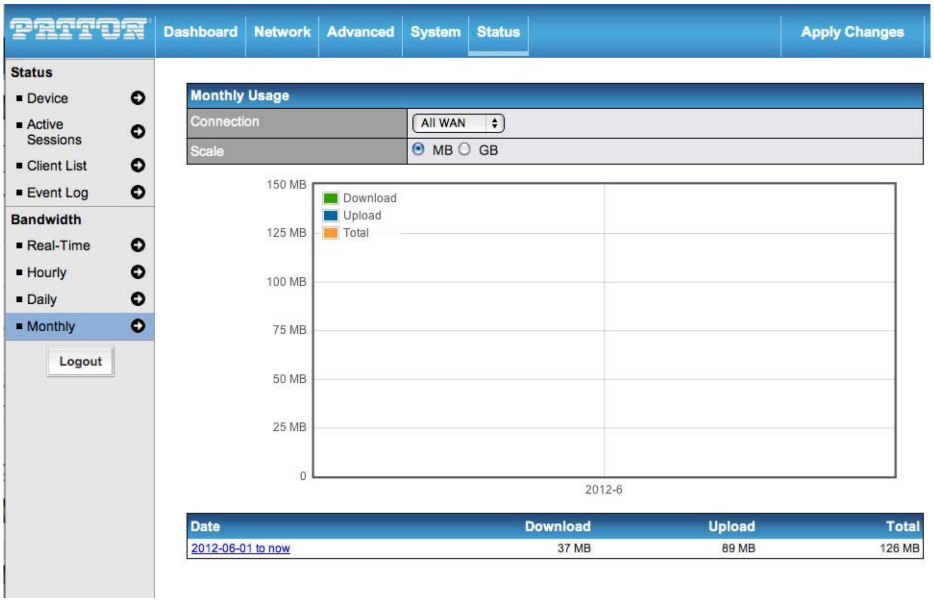
The **Monthly Bandwidth** status page shows the bandwidth usage for each month for each specific WAN connection.

From the drop-down menu, select a specific WAN connection to display its monthly bandwidth usage information. If you have enabled the **Bandwidth Monitoring** feature (see "Bandwidth Allowance Monitor" on page 53), BODi rS will display the **Billing Cycle** or **Calendar Month** for that specific WAN connection.

In the **Client Bandwidth Usage** table, click on the first or second row to view the client bandwidth usage for the current month. This feature is not available if you have selected to view the bandwidth usage of one specific WAN connection.

In the **Monthly Usage** table, you may select to show the scale of the graph in **Megabytes (MB)** or **Gigabytes (GB).**

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



Monthly Usage

Connection	All WAN
Scale	● MB ○ GB

Date	Download	Upload	Total
2012-06-01 to now	37 MB	89 MB	126 MB

Figure 80. Monthly Bandwidth Usage

Chapter 13 Contacting Patton for assistance

Chapter contents

Introduction

This chapter contains the following information:

- "Contact information"—describes how to contact Patton technical support for assistance.
- "Warranty Service and Returned Merchandise Authorizations (RMAs)"—contains information about the warranty and obtaining a return merchandise authorization (RMA).

Contact information

Patton Electronics offers a wide array of free technical services. If you have questions about any of our other products we recommend you begin your search for answers by using our technical knowledge base. Here, we have gathered together many of the more commonly asked questions and compiled them into a searchable database to help you quickly solve your problems.

Patton support headquarters in the USA

- Online support: available at **www.patton.com**
- E-mail support: e-mail sent to **support@patton.com** will be answered within 1 business day
- Telephone support: standard telephone support is available five days a week—from **8:00 am** to **5:00 pm** EST (**1300** to **2200** UTC/GMT)—by calling **+1 (301) 975-1007**
- Fax: **+1 (301) 869-9293**

Alternate Patton support for Europe, Middle East, and Africa (EMEA)

- Online support: available at **www.patton.com**
- E-mail support: e-mail sent to **support@patton.com** will be answered within 1 business day
- Telephone support: standard telephone support is available five days a week—from **9:00 am** to **5:30 pm** CET (**0800** to **1630** UTC/GMT)—by calling **+41 (0)31 985 25 55**
- Fax: **+41 (0)31 985 25 26**

Warranty Service and Returned Merchandise Authorizations (RMAs)

Patton Electronics is an ISO-9001 certified manufacturer and our products are carefully tested before shipment. All of our products are backed by a comprehensive warranty program.

Note If you purchased your equipment from a Patton Electronics reseller, ask your reseller how you should proceed with warranty service. It is often more convenient for you to work with your local reseller to obtain a replacement. Patton services our products no matter how you acquired them.

Warranty coverage

Our products are under warranty to be free from defects, and we will, at our option, repair or replace the product should it fail within one year from the first date of shipment. Our warranty is limited to defects in workmanship or materials, and does not cover customer damage, lightning or power surge damage, abuse, or unauthorized modification.

Out-of-warranty service

Patton services what we sell, no matter how you acquired it, including malfunctioning products that are no longer under warranty. Our products have a flat fee for repairs. Units damaged by lightning or other catastrophes may require replacement.

Returns for credit

Customer satisfaction is important to us, therefore any product may be returned with authorization within 30 days from the shipment date for a full credit of the purchase price. If you have ordered the wrong equipment or you are dissatisfied in any way, please contact us to request an RMA number to accept your return. Patton is not responsible for equipment returned without a Return Authorization.

Return for credit policy

- Less than 30 days: No Charge. Your credit will be issued upon receipt and inspection of the equipment.
- 30 to 60 days: We will add a 20% restocking charge (crediting your account with 80% of the purchase price).
- Over 60 days: Products will be accepted for repairs only.

RMA numbers

RMA numbers are required for all product returns. You can obtain an RMA by doing one of the following:

- Completing a request on the RMA Request page in the *Support* section at **www.patton.com**
- By calling **+1 (301) 975-1007** and speaking to a Technical Support Engineer
- By sending an e-mail to **returns@patton.com**

All returned units must have the RMA number clearly visible on the outside of the shipping container. Please use the original packing material that the device came in or pack the unit securely to avoid damage during shipping.

Shipping instructions

The RMA number should be clearly visible on the address label. Our shipping address is as follows:

Patton Electronics Company
RMA#: xxxx
7622 Rickenbacker Dr.
Gaithersburg, MD 20879-4773 USA

Patton will ship the equipment back to you in the same manner you ship it to us. Patton will pay the return shipping costs.

Appendix A **Compliance Information**

Chapter contents

Compliance

EMC

- EN55022, Class A
- EN55024
- EN 301 489-1
- EN 301 489-17

Low-Voltage Directive (Safety)

- UL 60950-1/CSA C22.2 No. 60950-1
- IEC/EN60950-1, 2nd edition

CE Declaration of Conformity

Patton Electronics, Inc declares that this device is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC. The Declaration of Conformity may be obtained from Patton Electronics, Inc at www.patton.com/certifications.

The safety advice in the documentation accompanying this device shall be obeyed. The conformity to the above directive is indicated by CE mark on the device.

Authorized European Representative

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Appendix B Specifications

Chapter contents

WAN Interface

4 x USB

2 x Gigabit Ethernet Ports

802.11b/g/n Wi-Fi Modem

Support for PPPoE, Static IP, DHCP

WAN Link Health Check

Bandwidth Allowance Monitor

LAN Interface

4-Port Gigabit Ethernet Switch

802.11b/g/n Wi-Fi Access Point

Extended DHCP Options

DHCP Reservation

Support for Dynamic DNS services

DNS Proxy for LAN Clients

Antenna

4 x 5.5dBi Magnetic Base

Omni Metal Antenna for Wi-Fi

VPN

Complete VPN Solution

Site-to-Site VPN Bonding

Bandwidth Aggregation

Intelligent Failover

256-bit AES Encryption

Pre-shared Key Authentication

Dynamic Routing PPTP VPN Server

RADIUS, LDAP Authentication

IPsec VPN (Network-to-Network)

Load Balancing

Intelligent Failover

Session Persistence

Per-Service Load Distribution

Multiple Algorithms

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

Advanced QoS

User Groups

Bandwidth Reservation

Individual Bandwidth Limit

Custom Application QoS

Application Prioritization

Device Management

Web Administrative Interface

Email Notification

Active Client & Session Lists

Bandwidth Usage Statistics

Web Reporting Services

Syslog Service

SNMP v1, v2c and v3

Physical

BD007

Dimensions: 35.6L x 21.6W x 4.3H cm (14L x 8.5W x 1.7H inch)

Weight: 4.4lbs (2kg)

Operating temperature: -40–149°F (-40–65°C)

BD004

Dimensions: 35.6L x 13.5W x 4.3H cm (14L x 5.8W x 1.7H inch)

Weight: 2.9lbs (1.32kg)

Operating temperature: -40–149°F (-40–65°C)

Appendix C **Terms**

Chapter contents

Abbreviations

Abbreviation	Meaning
3G	3rd Generation standards for wireless communications (e.g. HSDPA)
4G	4th Generation standards for wireless communications (e.g. WiMAX, LTE)
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
EVDO	Evolution-Data Optimized
HSDPA	High-Speed Downlink Packet Access
GRE	Generic Routing Encapsulation
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