

BODi rS™

More Bandwidth. More Reliability. More Survivability

Intelligent Load Balancing: Weighted Balance

Application Note

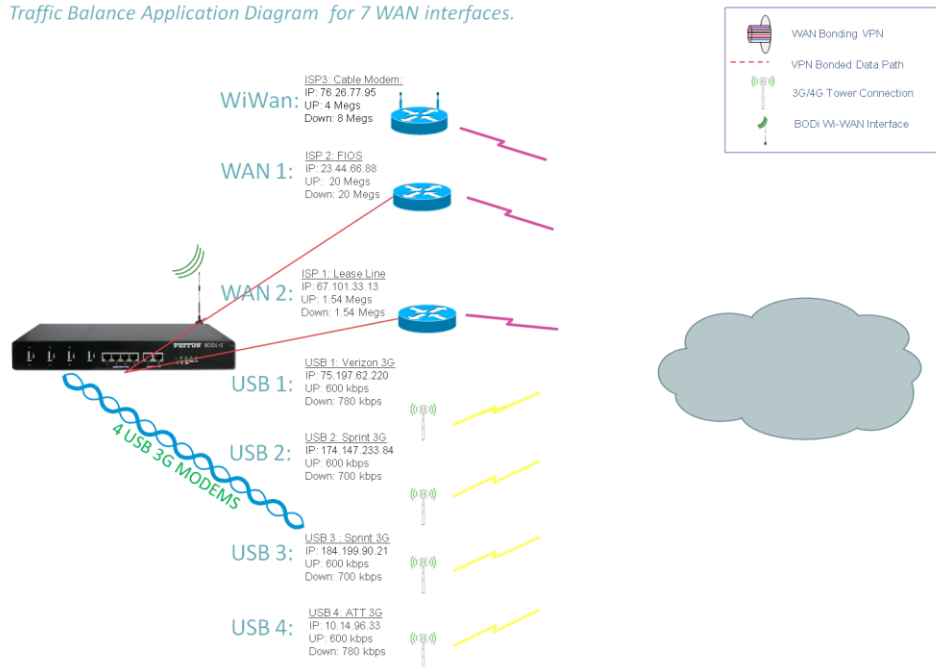
Understanding Outbound Balance Routing

- BODi delivers a simple, cost effective way to manage Multi WAN network environments through intelligent Load Balancing Algorithms and advanced VPN bonding technology.
- BODi delivers in-box solutions to help migrate away from expensive lease line WAN providers in favor of less expensive WAN deliveries, such as cable providers, fiber, and dsl providers, while providing or maintaining business or mission critical reliability and survivability to your network.
- This application note will focus on the Weighted Balance Algorithm and how to easily setup and configure your BODi rS for your network needs.

Load sharing across multiple WAN connections

- **Balance up to 7 WAN interfaces using preconfigured balancing algorithms**
 - **Weighted Balance:** Assign more traffic to a faster links or less traffic to a connection with a costly bandwidth caps.
 - **Priority:** Route traffic to your preferred link as long as it's available.
 - **Overflow Balance:** Prevent traffic flow from slowing down when the connection runs out of available bandwidth.
 - **Least Used:** Help you choose the better connection with more free bandwidth.
 - **Enforced:** Restrict outbound traffic to a particular connection.
 - **Lowest Latency:** Give you the fastest response time when using applications like online gaming.
 - **Persistence:** Eliminate session termination issue for HTTPS, E-banking, and other secure websites.




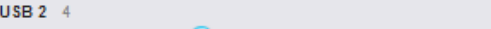
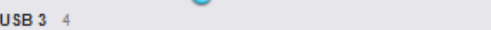

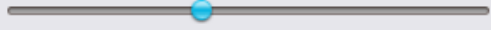
Traffic Balance Application Diagram for 7 WAN interfaces.



WAN Optimization: Let's Explore Weighted Balance

- Configure each WAN interface according to bandwidth
 - Assign more traffic to faster links
 - Assign less traffic to slower links
 - Easily assign a weight to each connection for outgoing traffic
 - Traffic is proportionally assigned according to Load Distribution Weight

This configuration window shows the ratio directly related to outgoing traffic requests over all of the active WAN links

Algorithm	<input type="button" value="?"/> Weighted Balance
Load Distribution Weight	<input type="button" value="?"/> WAN 1 10  WAN 2 8  USB 1 4  USB 2 4  USB 3 4  USB 4 4  Wi-Fi WAN 10 

Weighted Balance configuration window

This 1st Balance rule is created for all our staff on the 10.10.5.0/24

Add a New Custom Rule

New Custom Rule	
Service Name *	<input type="text" value="WB-Staff"/>
Enable	<input checked="" type="checkbox"/>
Source	IP Network <input type="text" value="10.10.5.0"/> Mask: <input type="text" value="255.255.255.0 (/24)"/>
Destination	<input type="text" value="Any"/>
Protocol	<input type="text" value="Any"/> ← <input type="text" value=":: Protocol Selection Tool ::"/>
Algorithm	<input type="text" value="Weighted Balance"/>
Load Distribution Weight	<p>WAN 1 10 </p> <p>WAN 2 5 </p> <p>USB 1 4 </p> <p>USB 2 4 </p> <p>USB 3 4 </p> <p>USB 4 0 </p> <p>Wi-Fi WAN 10 </p>
Terminate Sessions on Link Recovery	<input type="checkbox"/> Enable

Weighted Balance configuration window

This 2nd Balance rule is created for all our guest network on 10.10.6.0/28

Add a New Custom Rule

New Custom Rule																						
Service Name *	WB-guest																					
Enable	<input checked="" type="checkbox"/>																					
Source	IP Network 10.10.6.0 Mask: 255.255.255.240 (/28)																					
Destination	Any																					
Protocol	Any ← :: Protocol Selection Tool ::																					
Algorithm	Weighted Balance																					
Load Distribution Weight	<table><tr><td>WAN 1</td><td>10</td><td><input type="range"/></td></tr><tr><td>WAN 2</td><td>0</td><td><input type="range"/></td></tr><tr><td>USB 1</td><td>0</td><td><input type="range"/></td></tr><tr><td>USB 2</td><td>0</td><td><input type="range"/></td></tr><tr><td>USB 3</td><td>0</td><td><input type="range"/></td></tr><tr><td>USB 4</td><td>0</td><td><input type="range"/></td></tr><tr><td>Wi-Fi WAN</td><td>10</td><td><input type="range"/></td></tr></table>	WAN 1	10	<input type="range"/>	WAN 2	0	<input type="range"/>	USB 1	0	<input type="range"/>	USB 2	0	<input type="range"/>	USB 3	0	<input type="range"/>	USB 4	0	<input type="range"/>	Wi-Fi WAN	10	<input type="range"/>
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USB 4	0	<input type="range"/>																				
Wi-Fi WAN	10	<input type="range"/>																				
Terminate Sessions on Link Recovery	<input type="checkbox"/> Enable																					

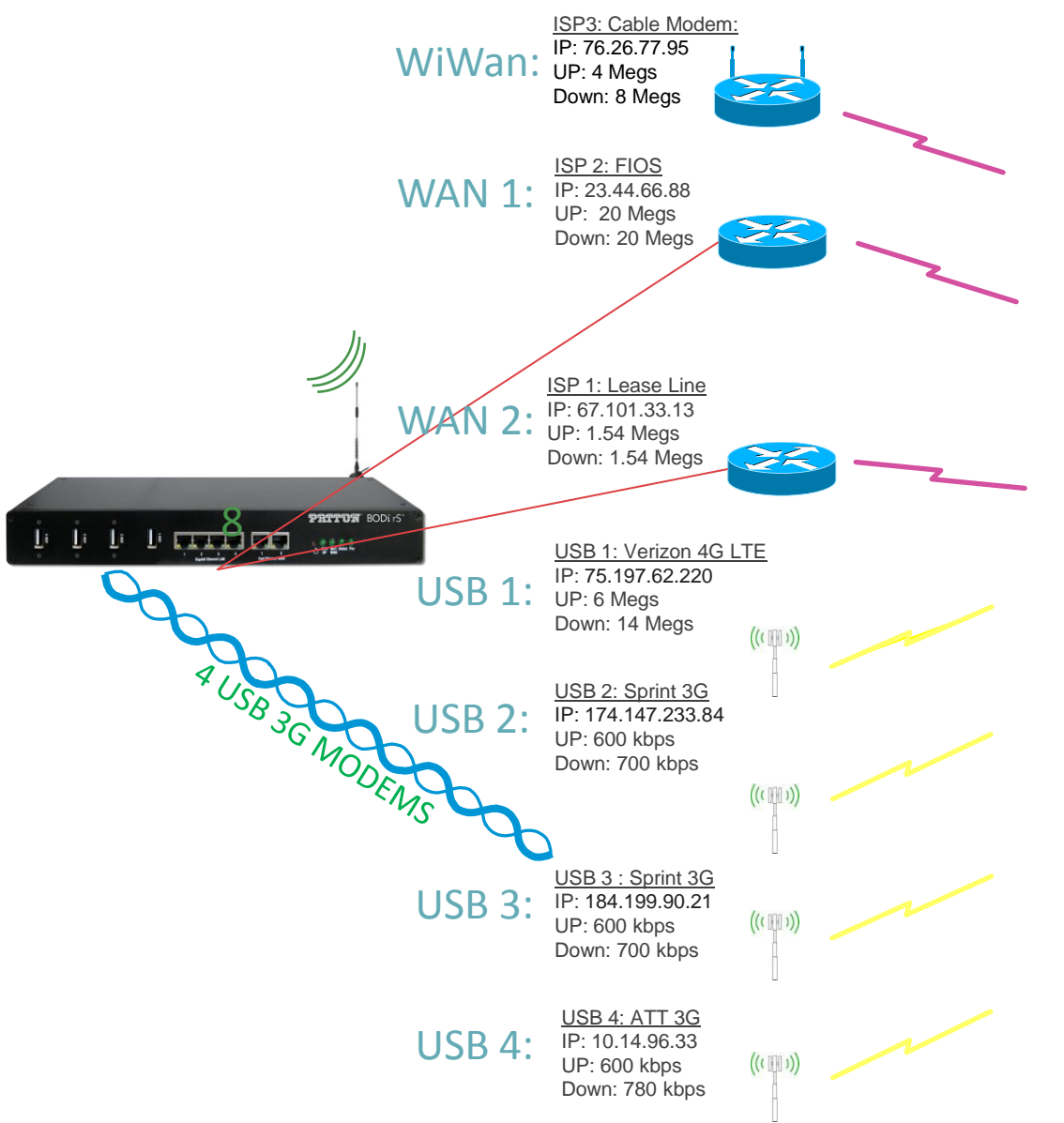
Weighted Balance configuration window





This 2nd Balance rule is created for all our guest network on 10.10.6.0/28

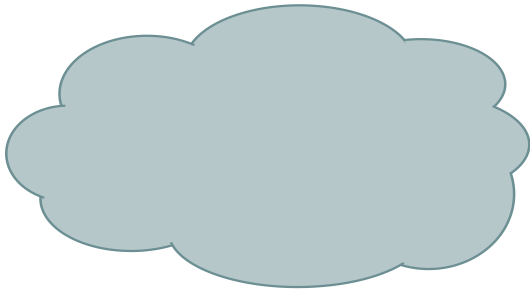
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USB 4	0																					
Wi-Fi WAN	10																					
Terminate Sessions on Link Recovery	<input type="checkbox"/> Enable																					

Weighted Outbound Traffic Balance App

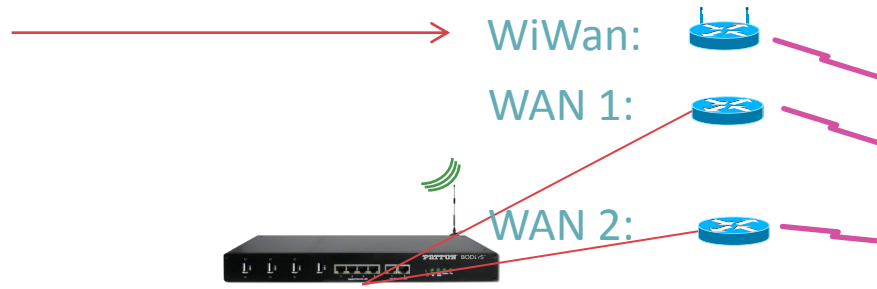


-  WAN Bonding VPN
-  VPN Bonded Data Path
-  3G/4G Tower Connection
-  BODi Wi-WAN Interface



Weighted Outbound Traffic Balance App

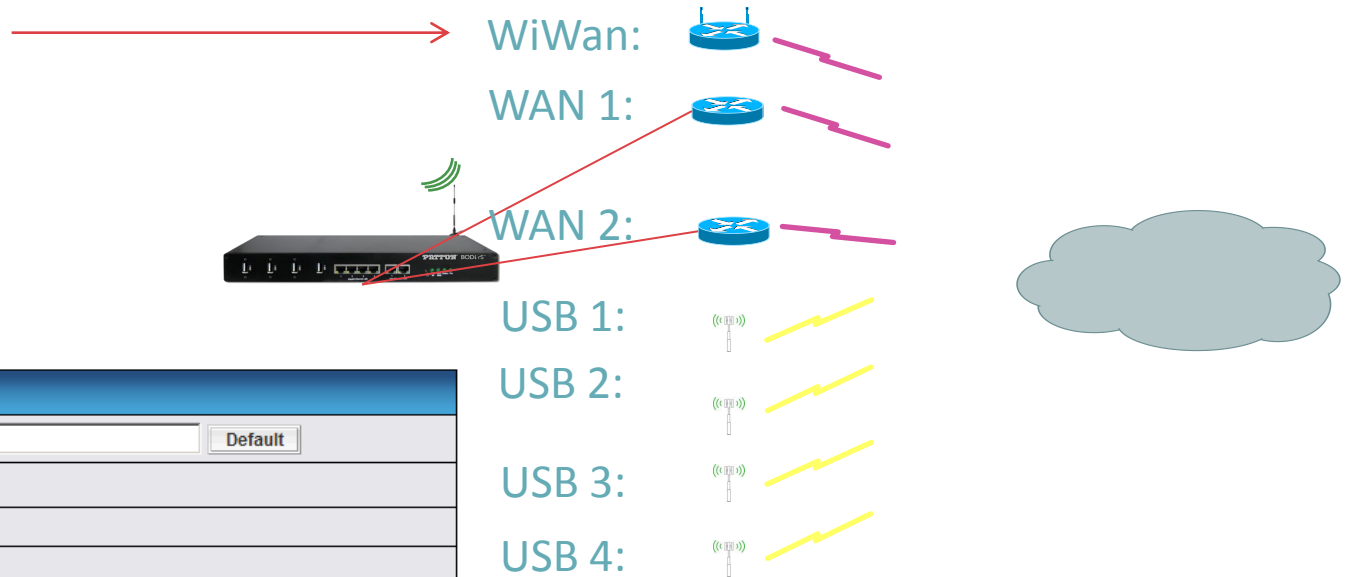
ISP 2: FIOS
 IP: 23.44.66.88
 UP: 20 Megs
 Down: 20 Megs



WAN Port	
WAN Connection Name	WAN 1 Default
Connection Method	Static IP
Routing Mode	NAT
IP Address	67.101.23.10
Subnet Mask	255.255.255.248 (/29)
Default Gateway	67.101.23.9
DNS Servers	<input checked="" type="checkbox"/> Use the following DNS server address(es) DNS Server 1: 8.8.8.8 DNS Server 2: 8.8.8.4
Standby State	<input checked="" type="radio"/> Remain connected <input type="radio"/> Disconnect
Upstream Bandwidth	20 Mbps
Downstream Bandwidth	20 Mbps
Health Check Method	DNS Lookup
Health Check DNS Servers	Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as Health Check DNS Servers <input type="checkbox"/> Include public DNS servers

Weighted Outbound Traffic Balance App

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This value is referenced when default weight is chosen for outbound traffic and traffic prioritization. A correct value can result in effective traffic prioritization and efficient use of upstream bandwidth.

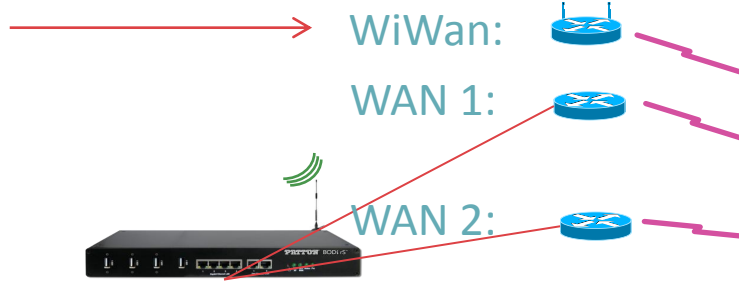
Weighted Outbound Traffic Balance App

ISP 3: Cable Modem

IP: 76.26.77.95

UP: 4 Megs

Down: 8 Megs

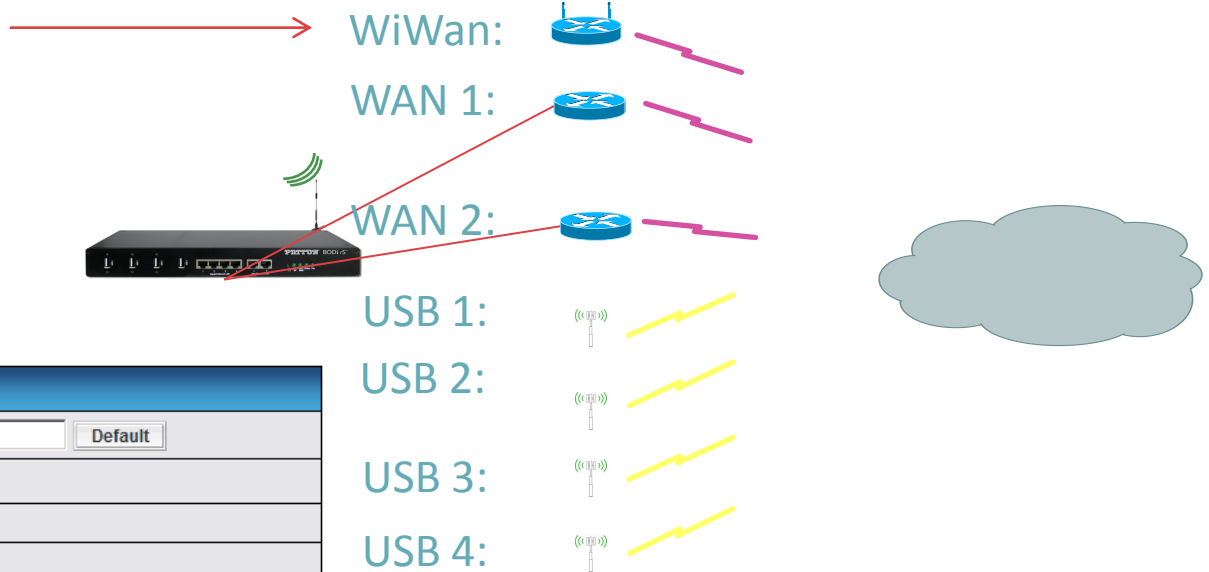


WAN Port	
WAN Connection Name	Cable Modem Default
Connection Method	Static IP
Routing Mode	NAT
IP Address	76.26.77.95
Subnet Mask	255.255.255.248 (/29)
Default Gateway	76.26.77.65
DNS Servers	<input checked="" type="checkbox"/> Use the following DNS server address(es) DNS Server 1: 8.8.8.8 DNS Server 2: 8.8.8.4
Standby State	<input checked="" type="radio"/> Remain connected <input type="radio"/> Disconnect
Upstream Bandwidth	4 Mbps
Downstream Bandwidth	8 Mbps
Health Check Method	DNS Lookup
Health Check DNS Servers	Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as Health Check DNS Servers <input type="checkbox"/> Include public DNS servers

- USB 1:  
- USB 2:  
- USB 3:  
- USB 4:  

Weighted Outbound Traffic Balance App

ISP 3: Cable Modem
 IP: 76.26.77.95
 UP: 4 Megs
 Down: 8 Megs



WAN Port	
WAN Connection Name	Cable Modem Default
Connection Method	Static IP
Routing Mode	NAT
IP Address	76.26.77.95
Subnet Mask	255.255.255.248 (/29)
Default Gateway	76.26.77.65
DNS Servers	<input checked="" type="checkbox"/> Use the following DNS server address(es) DNS Server 1: 8.8.8.8 DNS Server 2: 8.8.8.4
Standby State	<input checked="" type="checkbox"/> Remain connected <input type="checkbox"/> Disconnect
Upstream Bandwidth	4 Mbps
Downstream Bandwidth	8 Mbps
Health Check Method	DNS Lookup
Health Check DNS Servers	Host 1: <input type="text"/> Host 2: <input type="text"/> <input checked="" type="checkbox"/> Use first two DNS servers as Health Check DNS Servers <input type="checkbox"/> Include public DNS servers

New Custom Rule	
Service Name *	WBDemo
Enable	<input checked="" type="checkbox"/>
Source	IP Network 192.168.51.0 Mask: 255.255.255.224 (/27)
Destination	Any
Protocol	Any ← Protocol Selection Tool →
Algorithm	Weighted Balance
Load Distribution Weight	WAN 1 10 WAN 2 8 USB 1 4 USB 2 4 USB 3 4 USB 4 4 WI-FI WAN 10
Terminate Sessions on Link Recovery	<input type="checkbox"/> Enable

Step-by-Step: Configuration for Weighted Balance Policy

The screenshot displays the Patton router's web-based configuration interface. At the top, a blue navigation bar contains the Patton logo and menu items: Dashboard, Network, Advanced (highlighted), System, and Status. On the right side of this bar is an 'Apply Changes' button. A left-hand sidebar lists various configuration categories: Advanced, NAT Mappings, QoS, Firewall, and Misc. Settings. Under the 'Advanced' category, several sub-items are listed with expandable arrows: Wi-Fi Settings, WAN Bonding, IPsec VPN, Outbound Policy (highlighted in blue), and Port Forwarding. The main content area shows the 'Outbound Policy' configuration page, which has a blue header with a question mark icon and a 'Custom' policy name in a grey box with an edit icon.

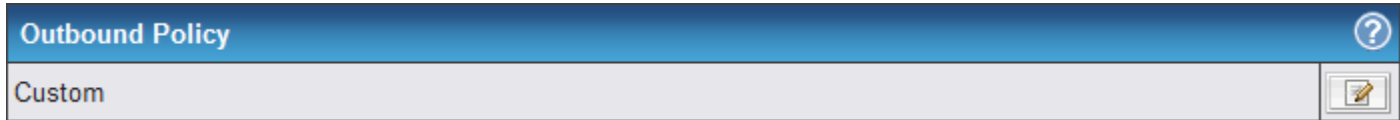
1. Click Advanced -> Click Outbound Policy

Step-by-Step: Configuration for Weighted Balance Policy

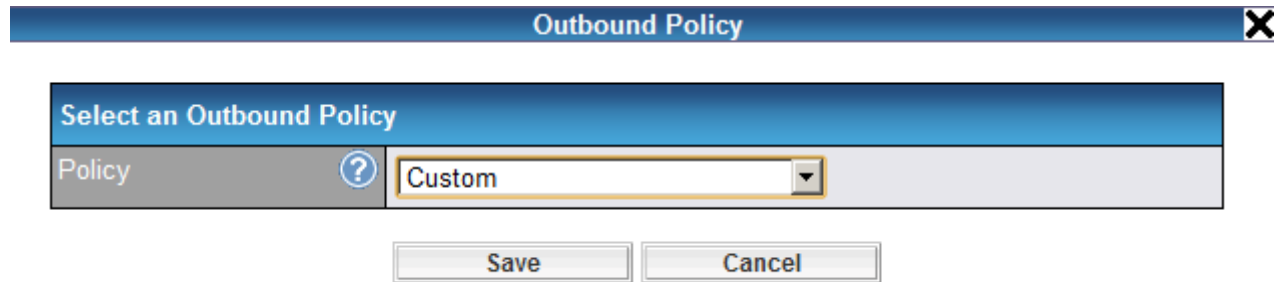


- Advanced**
 - Wi-Fi Settings
 - WAN Bonding
 - IPsec VPN
 - Outbound Policy**
 - Port Forwarding
- NAT Mappings**
- QoS**
 - User Groups
 - Bandwidth Control
 - Application
- Firewall**
- Misc. Settings**
 - PPTP Server
 - Service Forwarding
 - Service Passthrough

1. Click Advanced -> Click Outbound Policy



2. Create Custom Outbound Policy and Save



Step-by-Step: Configuration for Weighted Balance Policy

Patton Dashboard Network **Advanced** System Status Apply Changes

Advanced

- Wi-Fi Settings
- WAN Bonding
- IPsec VPN
- Outbound Policy**
- Port Forwarding

NAT Mappings

QoS

- User Groups
- Bandwidth Control
- Application

Firewall

Misc. Settings

- PPTP Server
- Service Forwarding
- Service Passthrough

1. Click Advanced -> Click Outbound Policy

Outbound Policy Custom

2. Create Custom Outbound Policy and Save

Outbound Policy

Select an Outbound Policy

Policy Custom

Save Cancel

3. Add Rule

Rules (Drag and drop rows to change rule order)

Service	Algorithm	Source	Destination	Protocol / Port
Default			(Auto)	

Add Rule

Step-by-Step: Configuration for Weighted Balance Policy

The screenshot shows the Patton router configuration interface. The top navigation bar includes 'Dashboard', 'Network', 'Advanced' (selected), 'System', and 'Status'. An 'Apply Changes' button is located on the right. The left sidebar contains a menu with categories: 'Advanced' (Wi-Fi Settings, WAN Bonding, IPsec VPN, Outbound Policy, Port Forwarding), 'NAT Mappings', 'QoS' (User Groups, Bandwidth Control, Application), 'Firewall', and 'Misc. Settings' (PPTP Server, Service Forwarding, Service Passthrough). The 'Outbound Policy' item is highlighted. The main content area displays a list of steps for creating a rule for the staff network.

4. Create the Rule for the staff network

- Service Name: Text
- Enable:
- Source
- Destination
- Choose Weighted Balance Algorithm
- Slide the Weight for each WAN Interface
- Save
- Apply Changes

Step-by-Step: Configuration for Weighted Balance Policy



- Advanced
 - Wi-Fi Settings
 - WAN Bonding
 - IPsec VPN
 - Outbound Policy**
 - Port Forwarding
- NAT Mappings
- QoS
 - User Groups
 - Bandwidth Control
 - Application
- Firewall
- Misc. Settings
 - PPTP Server
 - Service Forwarding
 - Service Passthrough

4. Create the Rule for the staff network

Add a New Custom Rule

New Custom Rule															
Service Name *	WB-Staff														
Enable	<input checked="" type="checkbox"/>														
Source	IP Network 10.10.5.0 Mask: 255.255.255.0 (/24)														
Destination	Any														
Protocol	Any Protocol Selection Tool														
Algorithm	Weighted Balance														
Load Distribution Weight	<table><tr><td>WAN 1</td><td>10</td></tr><tr><td>WAN 2</td><td>5</td></tr><tr><td>USB 1</td><td>4</td></tr><tr><td>USB 2</td><td>4</td></tr><tr><td>USB 3</td><td>4</td></tr><tr><td>USB 4</td><td>0</td></tr><tr><td>Wi-Fi WAN</td><td>10</td></tr></table>	WAN 1	10	WAN 2	5	USB 1	4	USB 2	4	USB 3	4	USB 4	0	Wi-Fi WAN	10
WAN 1	10														
WAN 2	5														
USB 1	4														
USB 2	4														
USB 3	4														
USB 4	0														
Wi-Fi WAN	10														
Terminate Sessions on Link Recovery	<input type="checkbox"/> Enable														

Save Cancel

Step-by-Step: Configuration for Weighted Balance Policy

The screenshot displays the Patton network management interface. The top navigation bar includes 'Dashboard', 'Network', 'Advanced', 'System', and 'Status', with 'Apply Changes' on the right. The left sidebar lists various configuration categories: Advanced (Wi-Fi Settings, WAN Bonding, IPsec VPN, Outbound Policy, Port Forwarding), NAT Mappings, QoS (User Groups, Bandwidth Control, Application), Firewall, and Misc. Settings (PPTP Server, Service Forwarding, Service Passthrough). The 'Outbound Policy' section is active, showing a table of rules.

Service	Algorithm	Source	Destination	Protocol / Port	
WB-staff	Weighted Balance 10:5:4:4:4:0:10	IP Network 10.10.5.0/24	Any	Any	
WB-guest	Weighted Balance 10:0:0:0:0:0:10	IP Network 10.10.6.0/28	Any	Any	
Default	(Auto)				

Below the table is an 'Add Rule' button.

NOTE: Each outbound policy that is created is processed from the top down. You can prioritize each rule by dragging each in the priority you wish. The highest priority is at the top of the rule list is executed first.

FOR FURTHER INFORMATION

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