

BODi rS™

More Bandwidth. More Reliability. More Survivability

Mobile WAN Aggregation

Application Note

BODi Multi-WAN Aggregation or 'Bonding'

- The BODi is capable of combining the bandwidth of 7 similar or dissimilar WAN connections to deliver high-speed, high-reliability, and high-security networking. It is resilient to Internet connection outage and you have the option to protect your data with 256-bit military-grade AES encryption.
- The BODi 004 & 007 WAN interfaces:
 - 2 Ethernet interfaces supporting GIG
 - 1 Wifi WAN interface
 - 4 USB interfaces

Understanding VPN Bonding Requirements

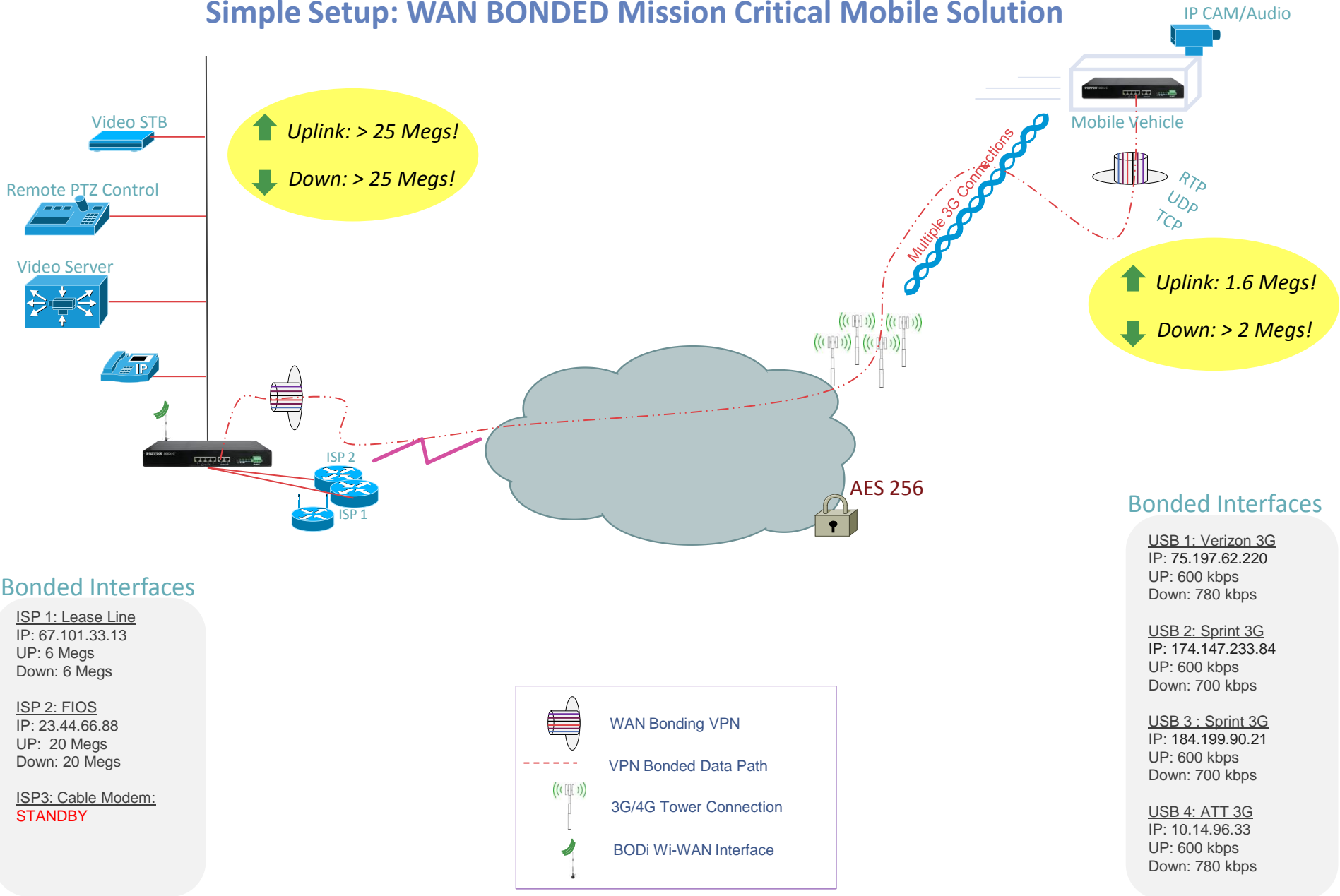
Hardware Requirements:

- *Pairs* - You must have (2) BODi routers to establish a WAN Bonded solution.
- *Peers* - BODi 007 & 004 are capable of terminating one VPN BONDED connection per unit.
 - Up to 7 WAN connections thru similar or dissimilar networks.
- BODi 1000 is capable of terminating up to 50 WAN Bonded *peers*.
 - Up to 5 WAN connections + USB 3G/4G reliability and failover connection.

Network Requirements:

- One global (reachable) IP address between the pairs.
- Behind firewall or Edge router: TCP port 32015 and UDP port 4500 for establishing VPN connections by default. You can change the "Data Port" from UDP port 4500 to another one inside the WAN Bonding Profile.

Simple Setup: WAN BONDED Mission Critical Mobile Solution







↑ Uplink: > 25 Megs!
 ↓ Down: > 25 Megs!

↑ Uplink: 1.6 Megs!
 ↓ Down: > 2 Megs!

Bonded Interfaces

- ISP 1: Lease Line
 IP: 67.101.33.13
 UP: 6 Megs
 Down: 6 Megs
- ISP 2: FIOS
 IP: 23.44.66.88
 UP: 20 Megs
 Down: 20 Megs
- ISP3: Cable Modem:
STANDBY

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

Bonded Interfaces

- USB 1: Verizon 3G
 IP: 75.197.62.220
 UP: 600 kbps
 Down: 780 kbps
- USB 2: Sprint 3G
 IP: 174.147.233.84
 UP: 600 kbps
 Down: 700 kbps
- USB 3 : Sprint 3G
 IP: 184.199.90.21
 UP: 600 kbps
 Down: 700 kbps
- USB 4: ATT 3G
 IP: 10.14.96.33
 UP: 600 kbps
 Down: 780 kbps

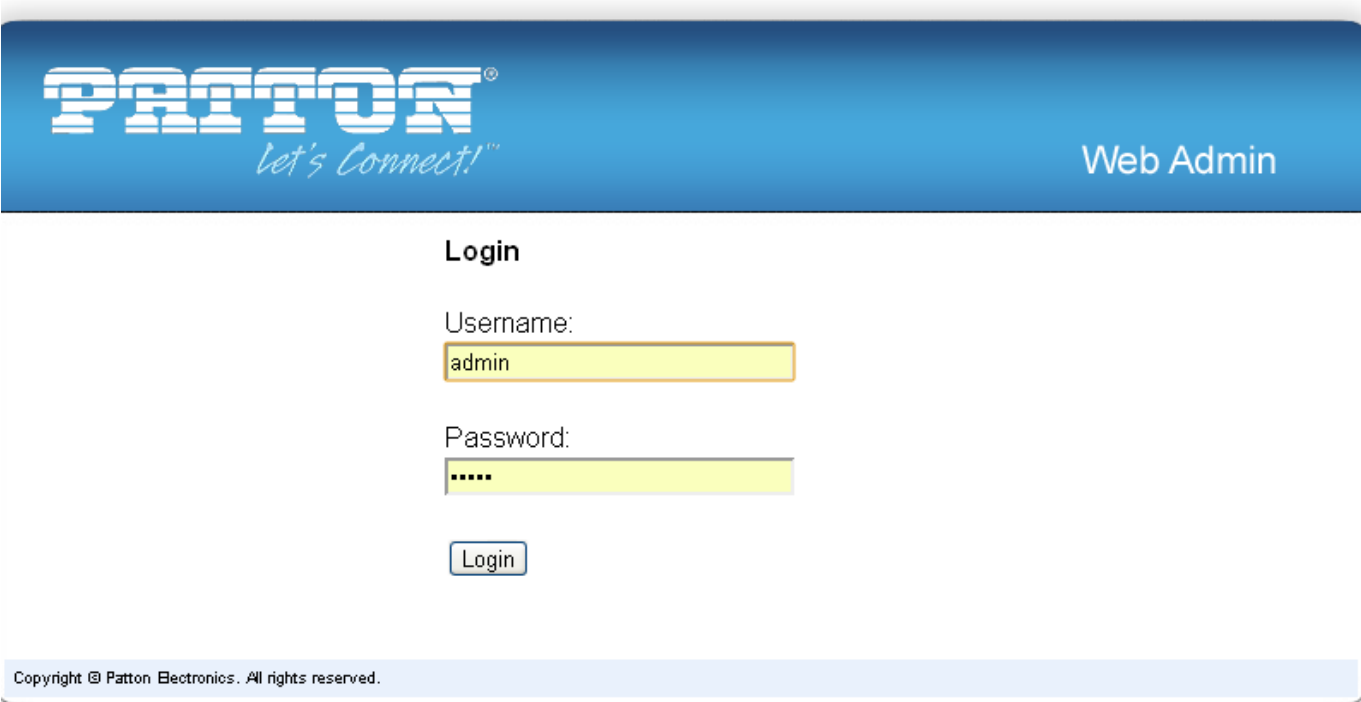
Understanding Bonding

- The BODi product family uses a proprietary VPN Bonding Protocol to establish a peer to peer connection over multiple WAN interfaces.
 - VPN BONDING only works BODi to BODi
 - This can be configured with or without AES 256 Encryption.
 - The VPN BOND can have multiple end-points configured on both sides of the VPN for reliability and survivability.
 - VPN Bonds can be prioritized and identified as a WAN interface for QOS, Access Control and Enforced WAN Load Balancing.
 - Packet distribution within the WAN BONDED connection can be prioritized by Uplink and Downlink Speeds manually and dynamically.

Let's look at SETUP:

- All management for the BODi is through the WEB Interface.
- You need to setup both BODi Routers for a WAN Bonding Connection
 - Remote Router Setup
 - Create WAN Bonding Profile
 - Enter REMOTE ID of FarEnd Router (H.E.U or PEER)
 - Enter WAN or WAN(s) interface Global IP Address or Addresses for VPN Connection
 - SET Priority of WAN Interfaces inside the BOND
 - Central Office or Head End Router Setup
 - Create WAN Bonding Profile
 - Enter REMOTE ID of FarEnd Router (R.E.U or PEER)
 - Set Priority of WAN interfaces inside the BOND

Configure the REMOTE END UNIT: Login WEB GUI



PATTON[®]
Let's Connect!

Web Admin

Login

Username:

Password:

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1. Navigate to Advanced tab > WAN BONDING
2. Click New Profile

Step 2

The screenshot displays the Patton network management interface. The top navigation bar includes 'Dashboard', 'Network', 'Advanced', 'System', and 'Status'. The 'Advanced' tab is selected and circled in red. The left sidebar contains various settings categories: 'Advanced' (with 'WAN Bonding' selected and circled in red), 'NAT Mappings', 'QoS', 'Firewall', and 'Misc. Settings'. The main content area shows the 'WAN Bonding' configuration page. At the top, there is a table with columns 'Profile', 'Remote ID', and 'Remote Address(es)'. A row shows a profile named 'DEMO' with Remote ID '1824-8483-DBD7' and Remote Address(es) '67.101.23.13'. Below the table is a 'New Profile' button, which is highlighted by a red arrow labeled 'Step 2'. Below the table, the 'WAN Bonding' section shows 'Local ID' set to 'BODI-007'. The 'Link Failure Detection' section shows 'Link Failure Detection Time' set to 'Recommended (Approx. 15 secs)'. Other options include 'Fast (Approx. 6 secs)', 'Faster (Approx. 2 secs)', and 'Extreme (Under 1 sec)'. A note states: 'Shorter detection time incurs more health checks and higher bandwidth overhead'. A 'Save' button is located at the bottom of the configuration area.

3. Create WAN BONDING Profile

- a. Name of Profile
- b. Encryption ? Optional
- c. Remote ID: Serial Number of PEER or HEU
- d. Pre-Shared Key (Optional)
- e. Remote IP(s) of PEER or HEU

a. DEMO

WAN Bonding Profile ?	
Name ?	<input type="text"/>
Active	<input checked="" type="checkbox"/>
Encryption ?	<input checked="" type="radio"/> 256-bit AES <input type="radio"/> Off
Remote ID ?	<input type="text"/>
Pre-shared Key (Optional) ?	<input type="text"/> <input checked="" type="checkbox"/> Hide Characters
Remote IP Addresses / Host Names (Optional) ?	<input type="text"/> <small>If this field is empty, this field on the remote unit must be filled</small>
Data Port ?	<input checked="" type="radio"/> Default <input type="radio"/> Custom <input type="text"/>

c. 1824-8483-DBD7

e. 67.101.23.13
78.44.101.30
101.44.99.18

NOTE: Multiple we have multiple IP Addresses for Reliability and Survivability.

3. Create WAN BONDING Profile

Last few Steps: Set WAN Priority, Save and Apply Changes

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

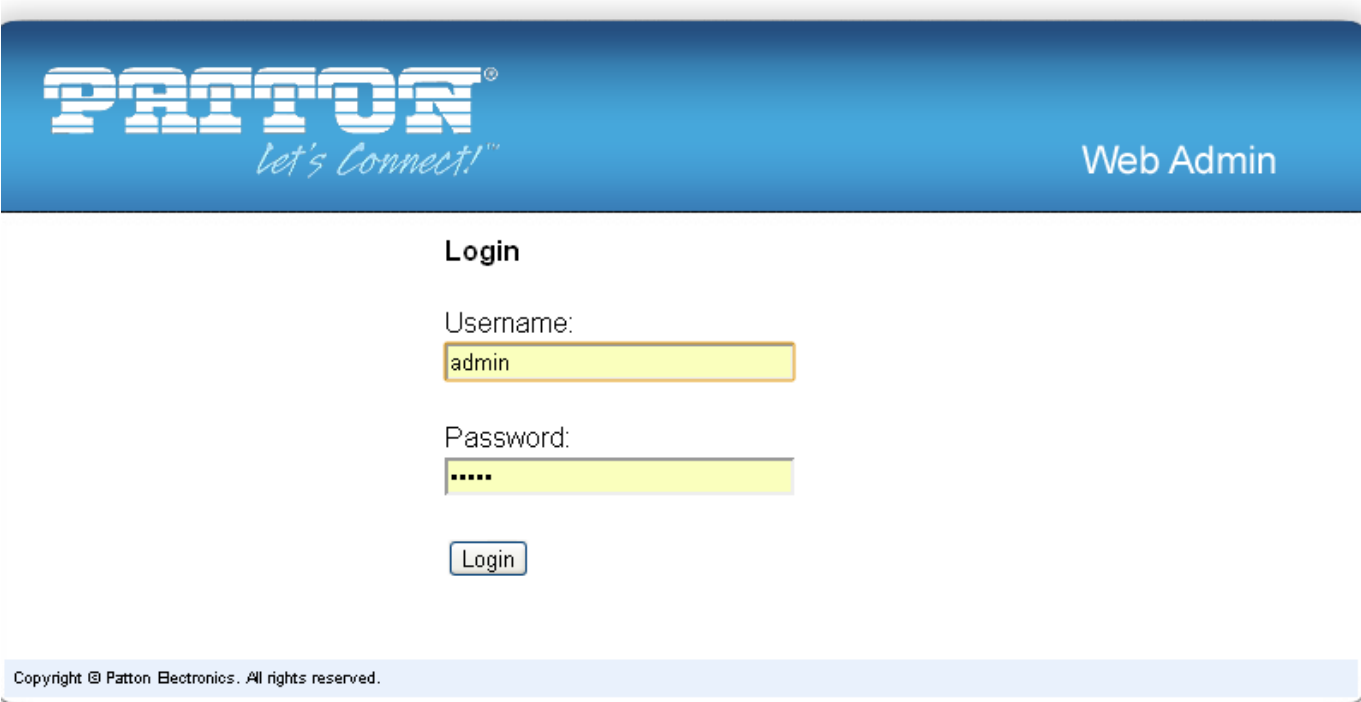
Saved! Changes will be effective after clicking the 'Apply Changes' button.

WAN Bonding Profile	
Name	<input type="text" value="DEMO"/>
Active	<input checked="" type="checkbox"/>
Encryption	<input type="radio"/> 256-bit AES <input checked="" type="radio"/> Off
Remote ID	<input type="text" value="1824-8483-DBD7"/>
Pre-shared Key (Optional)	<input type="text"/> <input checked="" type="checkbox"/> Hide Characters
Remote IP Addresses / Host Names (Optional)	<input type="text" value="67.101.23.13"/> <input type="text" value="78.44.101.30"/> <input type="text" value="101.44.99.18"/> <small>If this field is empty, this field on the remote unit must be filled</small>
Data Port	<input checked="" type="radio"/> Default <input type="radio"/> Custom <input type="text"/>

Manually set packet distribution From 1 (highest) to 7 (lowest).

WAN Connection Priority	
1. WAN 1	Priority: <input type="text" value="--- OFF ---"/>
2. WAN 2	Priority: <input type="text" value="--- OFF ---"/>
3. USB 1	Priority: <input type="text" value="1 (Highest)"/>
4. USB 2	Priority: <input type="text" value="1 (Highest)"/>
5. USB 3	Priority: <input type="text" value="1 (Highest)"/>
6. USB 4	Priority: <input type="text" value="7 (Lowest)"/>
7. Wi-Fi WAN	Priority: <input type="text" value="--- OFF ---"/>

Configure the HEAD END UNIT: Login WEB GUI



PATTON[®]
Let's Connect!

Web Admin

Login

Username:

Password:

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1. Navigate to Advanced tab > WAN BONDING
2. Click New Profile

Step 2

The screenshot displays the Patton device configuration interface. The top navigation bar includes 'Dashboard', 'Network', 'Advanced' (circled in red), 'System', and 'Status'. The left sidebar lists various settings, with 'WAN Bonding' (circled in red) selected under the 'Advanced' section. The main content area is divided into three sections:

- Profile Table:** A table with columns 'Profile', 'Remote ID', and 'Remote Address(es)'. It contains one entry: 'DEMO' with Remote ID '1824-8483-DBD7' and Remote Address(es) '67.101.23.13'. Below the table is a 'New Profile' button, which is highlighted by a red arrow pointing from the text 'Step 2'.
- WAN Bonding Section:** A section titled 'WAN Bonding' with a 'Local ID' field containing 'BODI-007' and a question mark icon.
- Link Failure Detection Section:** A section titled 'Link Failure Detection' with a 'Link Failure Detection Time' field. It features four radio button options: 'Recommended (Approx. 15 secs)' (selected), 'Fast (Approx. 6 secs)', 'Faster (Approx. 2 secs)', and 'Extreme (Under 1 sec)'. Below these options is a note: 'Shorter detection time incurs more health checks and higher bandwidth overhead'. A 'Save' button is located at the bottom of this section.

3. Create WAN BONDING Profile

Last few Steps: Set WAN Priority, Save and Apply Changes

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

Saved! Changes will be effective after clicking the 'Apply Changes' button.

WAN Bonding Profile	
Name	<input type="text" value="DEMO"/>
Active	<input checked="" type="checkbox"/>
Encryption	<input type="radio"/> 256-bit AES <input checked="" type="radio"/> Off
Remote ID	<input type="text" value="BODi-007"/>
Pre-shared Key (Optional)	<input type="text"/> <input checked="" type="checkbox"/> Hide Characters
Remote IP Addresses / Host Names (Optional)	<input type="text"/> <small>If this field is empty, this field on the remote unit must be filled</small>
Data Port	<input checked="" type="radio"/> Default <input type="radio"/> Custom <input type="text"/>

Remote ID can be configured to support custom created ID's.

WAN Connection Priority	
1. WAN1	Priority: <input type="text" value="1 (Highest)"/>
2. WAN2	Priority: <input type="text" value="1 (Highest)"/>
3. WAN3	Priority: <input type="text" value="2"/>
4. WAN4	Priority: <input type="text" value="3"/>
5. WAN5	Priority: <input type="text" value="4"/>
6. Mobile Internet	Priority: <input type="text" value="6 (Lowest)"/>

Optional: Test your link and bandwidth capabilities. System -> WAN Bonding Test

The screenshot shows the Patton device web interface. The top navigation bar includes 'Dashboard', 'Network', 'Advanced', 'System', and 'Status'. The 'System' menu is expanded, showing options like 'Admin Security', 'Firmware', 'Time', 'Email Notification', 'Remote Syslog', 'SNMP', 'Configuration', 'Reboot', 'Tools', 'Ping', 'Traceroute', and 'WAN Bonding Test'. The 'WAN Bonding Test' option is selected. The main content area displays the 'SpeedFusion™ Throughput Test' configuration form. The 'Profile' is set to 'DEMO'. The 'Type' is set to 'TCP' (indicated by a red arrow and the label 'TCP'). The 'Direction' is set to 'Upload'. The 'Duration' is set to '10' seconds. A 'Go!' button is present below the form. The 'Results' section is currently empty.

SpeedFusion™ Throughput Test	
Profile	DEMO
Type	<input checked="" type="radio"/> TCP <input type="radio"/> UDP
Direction	<input checked="" type="radio"/> Upload <input type="radio"/> Download
Duration	10 seconds (5 - 600)

Go!

Results
(Empty)

Optional: Test your link and bandwidth capabilities. System -> WAN Bonding Test

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

System

- Admin Security
- Firmware
- Time
- Email Notification
- Remote Syslog
- SNMP
- Configuration
- Reboot

Tools

- Ping
- Traceroute
- WAN Bonding Test**

Logout

SpeedFusion™ Throughput Test

Profile	DEMO
Type	<input type="radio"/> TCP <input checked="" type="radio"/> UDP
Bandwidth	1500 Kbps (10 - 500000)
Direction	<input checked="" type="radio"/> Upload <input type="radio"/> Download
Duration	10 seconds (5 - 600)

Go!

Results

(Empty)

UDP

Dashboard Network Advanced System Status

Apply Changes

- System
 - Admin Security
 - Firmware
 - Time
 - Email Notification
 - Remote Syslog
 - SNMP
 - InControl
 - Configuration
 - Reboot
 - Tools
 - Ping
 - Traceroute
 - SpeedFusion™ Test
- Logout

SpeedFusion™ Throughput Test	
Profile	MASTER
Type	<input checked="" type="radio"/> TCP <input type="radio"/> UDP
Direction	<input checked="" type="radio"/> Upload <input type="radio"/> Download
Duration	10 seconds (5 - 600)

[Admin](#)

User Configuration this page
Web Page: http/https and port
WAN Management control

Results

SpeedFusion™ Throughput Test	
Profile	MASTER
Type	<input type="radio"/> TCP <input checked="" type="radio"/> UDP
Bandwidth	600 Kbps (10 - 500000)
Direction	<input checked="" type="radio"/> Upload <input type="radio"/> Download
Duration	10 seconds (5 - 600)

Go!

Results

Preparing throughput test.

Starting throughput test... ok

0.0655 MB / 1.00 sec = 0.5491 Mbps	0 / 52 ~drop/pkt	0.00 ~%loss
0.0718 MB / 1.00 sec = 0.6019 Mbps	0 / 57 ~drop/pkt	0.00 ~%loss
0.0629 MB / 1.00 sec = 0.5280 Mbps	0 / 50 ~drop/pkt	0.00 ~%loss
0.0780 MB / 1.00 sec = 0.6547 Mbps	0 / 62 ~drop/pkt	0.00 ~%loss
0.0667 MB / 1.00 sec = 0.5597 Mbps	0 / 53 ~drop/pkt	0.00 ~%loss
0.0629 MB / 1.00 sec = 0.5280 Mbps	0 / 50 ~drop/pkt	0.00 ~%loss
0.0730 MB / 1.00 sec = 0.6125 Mbps	0 / 58 ~drop/pkt	0.00 ~%loss
0.0881 MB / 1.00 sec = 0.7392 Mbps	0 / 70 ~drop/pkt	0.00 ~%loss
0.0718 MB / 1.00 sec = 0.6019 Mbps	0 / 57 ~drop/pkt	0.00 ~%loss
0.0730 MB / 1.00 sec = 0.6125 Mbps	0 / 58 ~drop/pkt	0.00 ~%loss
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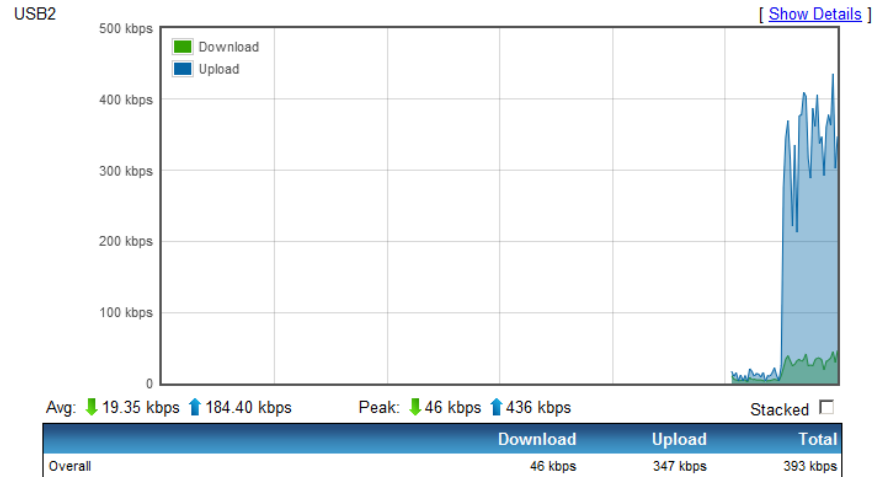
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testing

Dashboard Network Advanced System Status

[Apply Changes](#)

Results					
Preparing throughput test.					
Starting throughput test... ok					
0.0655 MB / 1.00 sec =	0.5491 Mbps	0 /	52	~drop/pkt	0.00 ~%loss
0.0718 MB / 1.00 sec =	0.6019 Mbps	0 /	57	~drop/pkt	0.00 ~%loss
0.0629 MB / 1.00 sec =	0.5280 Mbps	0 /	50	~drop/pkt	0.00 ~%loss
0.0780 MB / 1.00 sec =	0.6547 Mbps	0 /	62	~drop/pkt	0.00 ~%loss
0.0667 MB / 1.00 sec =	0.5597 Mbps	0 /	53	~drop/pkt	0.00 ~%loss
0.0629 MB / 1.00 sec =	0.5280 Mbps	0 /	50	~drop/pkt	0.00 ~%loss
0.0730 MB / 1.00 sec =	0.6125 Mbps	0 /	58	~drop/pkt	0.00 ~%loss
0.0881 MB / 1.00 sec =	0.7392 Mbps	0 /	70	~drop/pkt	0.00 ~%loss
0.0718 MB / 1.00 sec =	0.6019 Mbps	0 /	57	~drop/pkt	0.00 ~%loss
0.0730 MB / 1.00 sec =	0.6125 Mbps	0 /	58	~drop/pkt	0.00 ~%loss
0.0730 MB / 1.00 sec =	0.6125 Mbps	0 /	58	~drop/pkt	0.00 ~%loss
0.0667 MB / 1.00 sec =	0.5597 Mbps	0 /	53	~drop/pkt	0.00 ~%loss
0.0718 MB / 1.00 sec =	0.6019 Mbps	0 /	57	~drop/pkt	0.00 ~%loss
0.0667 MB / 1.00 sec =	0.5597 Mbps	0 /	53	~drop/pkt	0.00 ~%loss
0.0743 MB / 1.00 sec =	0.6230 Mbps	0 /	59	~drop/pkt	0.00 ~%loss
0.0768 MB / 1.00 sec =	0.6442 Mbps	0 /	61	~drop/pkt	0.00 ~%loss
0.0655 MB / 1.00 sec =	0.5491 Mbps	0 /	52	~drop/pkt	0.00 ~%loss
0.0743 MB / 1.00 sec =	0.6230 Mbps	0 /	59	~drop/pkt	0.00 ~%loss
0.0718 MB / 1.00 sec =	0.6019 Mbps	0 /	57	~drop/pkt	0.00 ~%loss
0.0718 MB / 1.00 sec =	0.6019 Mbps	0 /	57	~drop/pkt	0.00 ~%loss
0.0730 MB / 1.00 sec =	0.6125 Mbps	0 /	58	~drop/pkt	0.00 ~%loss



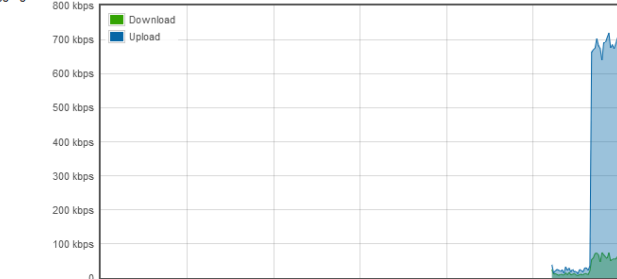
Data transferred since installation (Tue Jun 05 16:11:25 WET 2012)

	Download	Upload	Total
All WAN Connections	0.35 GB	0.66 GB	1.00 GB

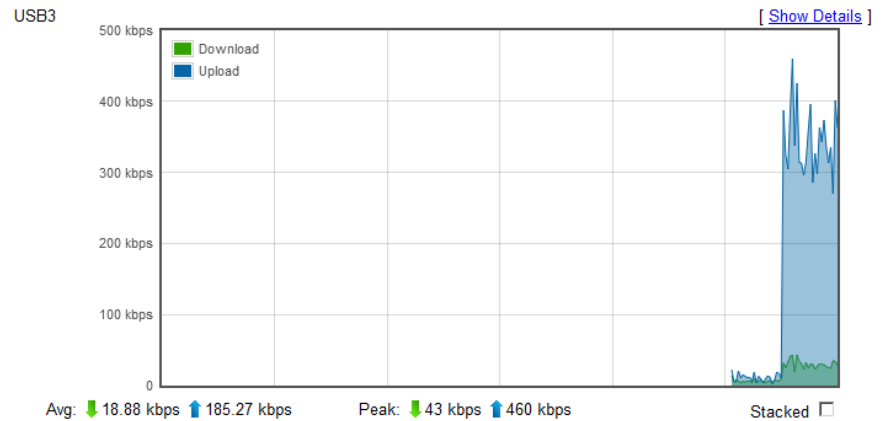
Data transferred since last reboot [\[Show Details \]](#)

	Download	Upload	Total
All WAN Connections	45 MB	92 MB	137 MB

Aggregated Transfer



	Download	Upload	Total
Overall	67 kbps	701 kbps	768 kbps



FOR FURTHER INFORMATION

For Further information visit us @ www.patton.com or contact us:

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