

# BODi rS™

More Bandwidth. More Reliability. More Survivability

## Multi-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.

# WAN Bonding - Branch Office Solution

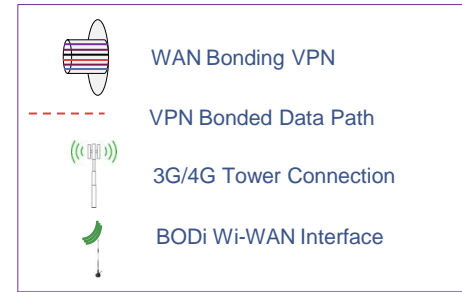
## Bonded Interfaces

ISP 1: Lease Line T1 MLPPP  
 Down: 6 Megs  
 UP: 6 Megs

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

ISP 3: FIOS  
 Down: 20 Megs  
 UP: 20 Megs

ISP 4: Cable Modem  
**STANDBY**



## Bonded Interfaces

ISP 1: FIOS Connection  
 Down: 20 Megs  
 UP: 20 Megs

ISP 2: DSL Connection  
 Down: 7.5 Megs  
 Up: 3 Megs

ISP 3: WiWan Cable Modem  
 Down: 10 Megs  
 UP: 3 Megs

USB 1: Verizon 3G  
 UP: 400 kbps  
 Down: 780 kbps

USB 2: Sprint 3G  
 UP: 400 kbps  
 Down: 700 kbps

USB 3: Sprint 3G  
 UP: 400 kbps  
 Down: 700 kbps

USB 4: ATT 3G  
**STANDBY**

## Bonded Interfaces

ISP 1: FIOS Connection  
 Down: 20 Megs  
 UP: 20 Megs

ISP 2: DSL Connection  
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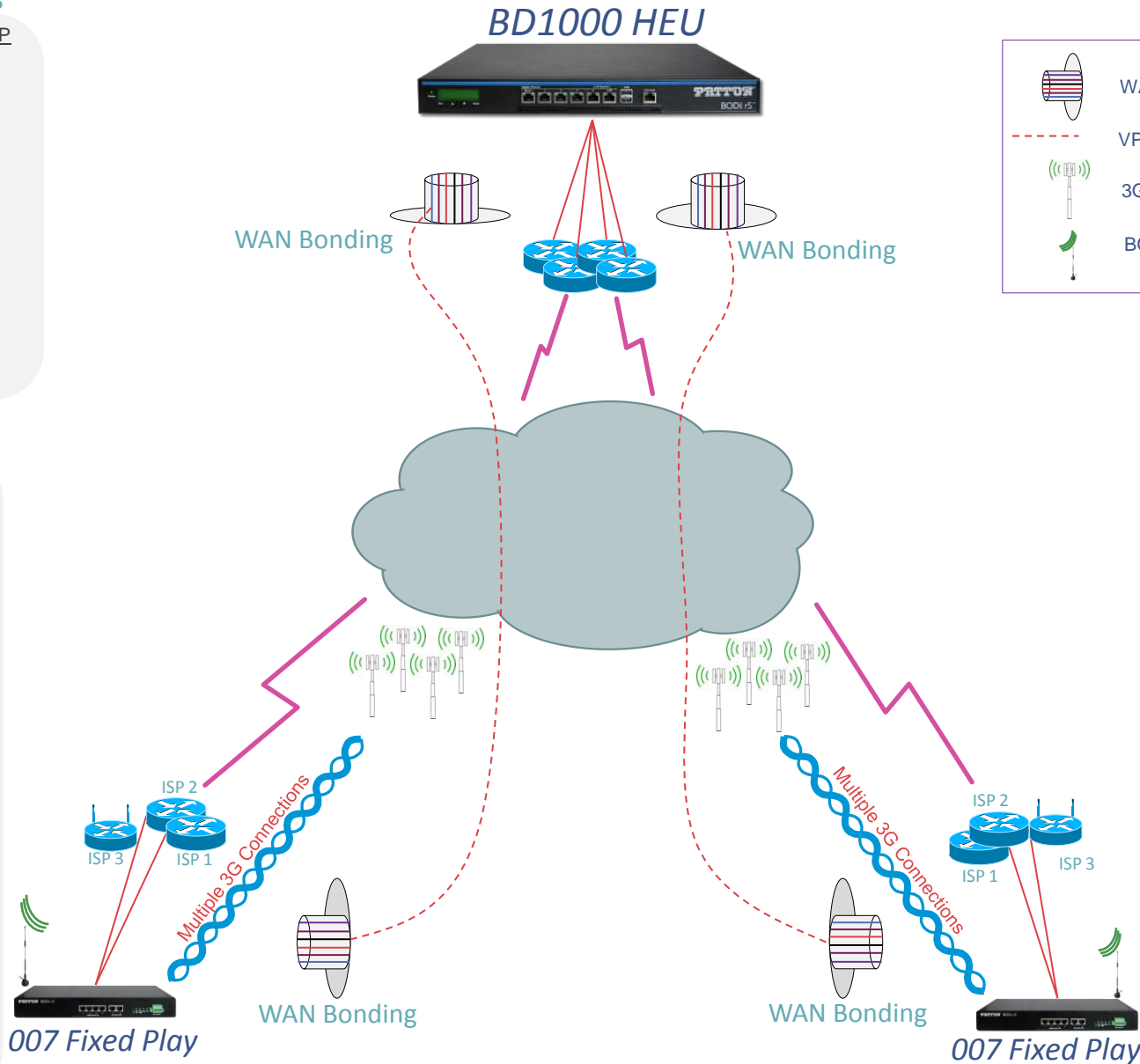
ISP 3: WiWan Cable Modem  
 Down: 10 Megs  
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USB 1: Verizon 3G  
 UP: 400 kbps  
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USB 2: Sprint 3G  
 UP: 400 kbps  
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USB 3: Sprint 3G  
 UP: 400 kbps  
 Down: 700 kbps

USB 4: ATT 3G  
**STANDBY**



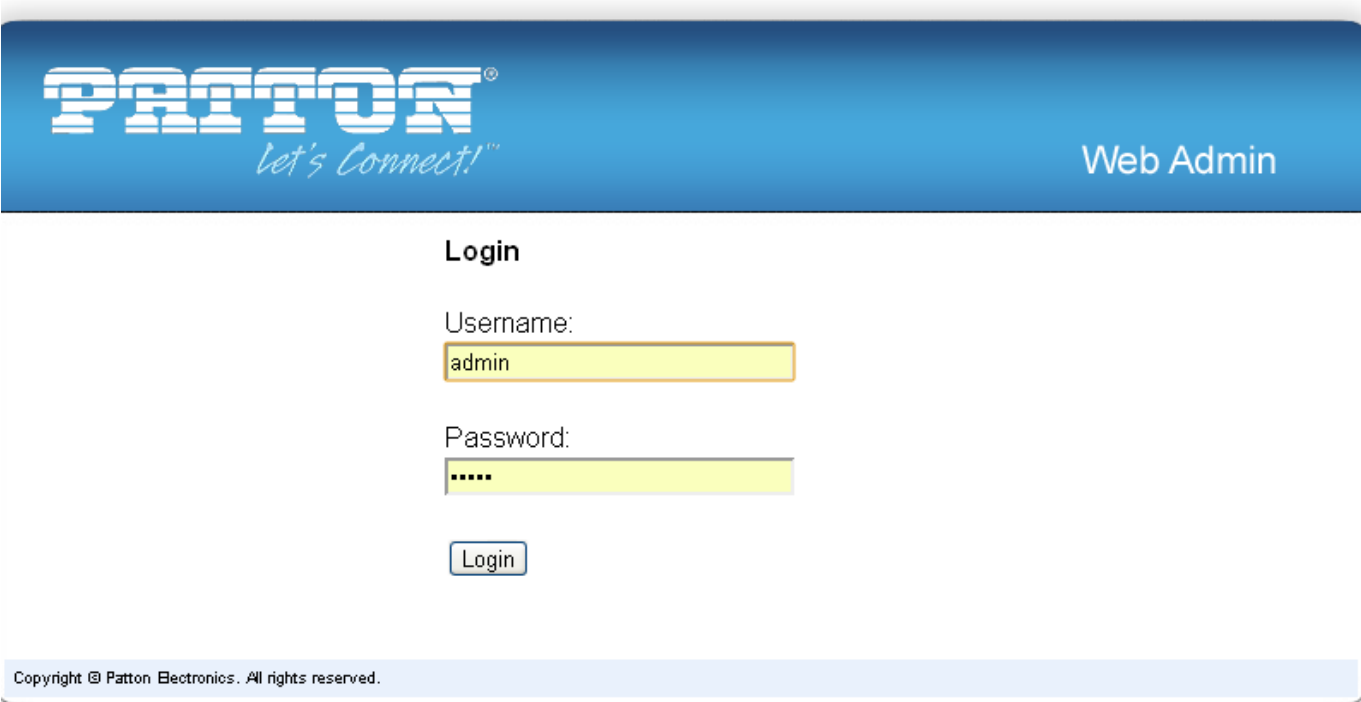
## Understanding Bonding

- 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**<sup>®</sup>  
*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 configuration categories, with 'WAN Bonding' selected and circled in red. The main content area shows a table of WAN profiles:

Profile	Remote ID	Remote Address(es)	
DEMO	1824-8483-DBD7	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 is visible, showing 'Local ID' set to 'BODI-007'. The 'Link Failure Detection' section shows 'Recommended (Approx. 15 secs)' selected as the detection time. A 'Save' button is at the bottom.

### 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**

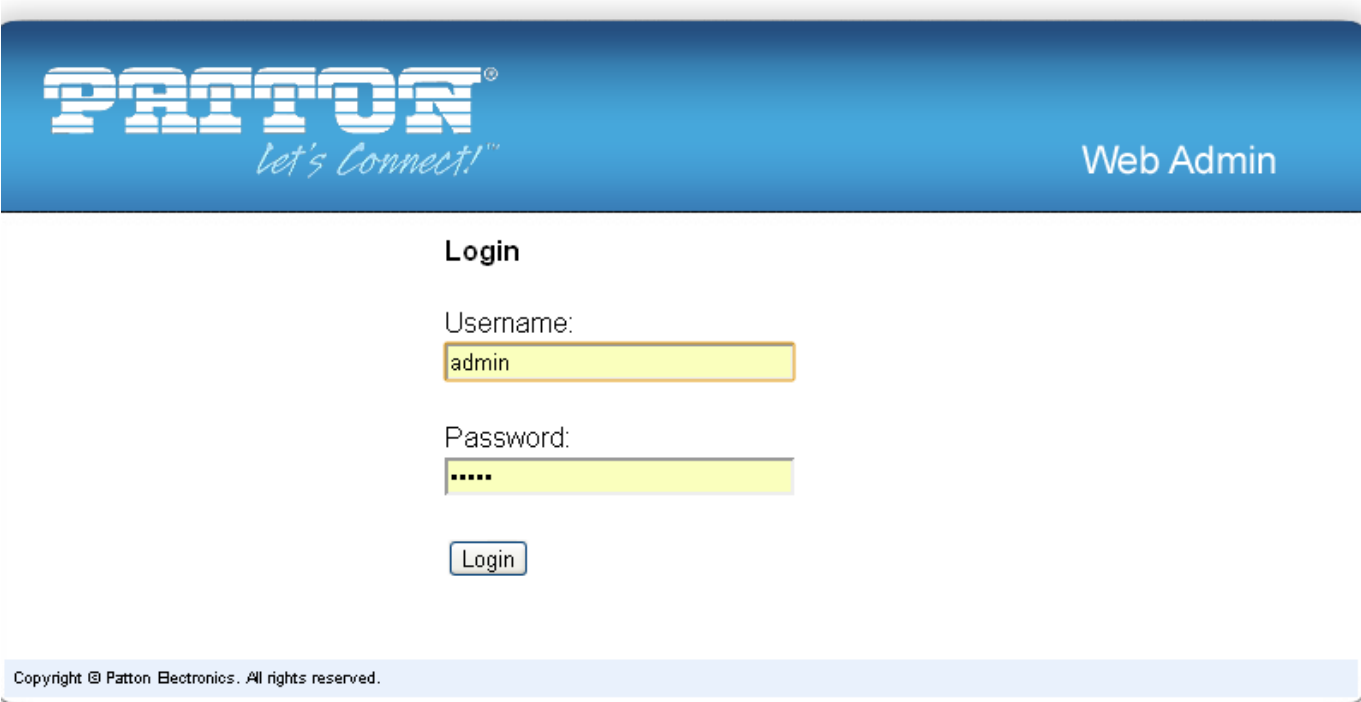
Saved! Changes will be effective after clicking the 'Apply Changes' button.

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**<sup>®</sup>  
*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', 'System', and 'Status'. The 'Advanced' tab is selected and circled in red. The left sidebar contains various configuration categories, with 'WAN Bonding' selected and circled in red. The main content area shows a table of WAN profiles:

Profile	Remote ID	Remote Address(es)	
DEMO	1824-8483-DBD7	67.101.23.13	[X]

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 is visible, showing the 'Local ID' as 'BODI-007'. The 'Link Failure Detection' section shows the 'Link Failure Detection Time' set to 'Recommended (Approx. 15 secs)'. The 'Save' button is at the bottom of the settings area.

### 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 web interface with the following elements:

- Navigation Bar:** Dashboard | Network | Advanced | System | Status | Apply Changes
- System Menu:** Admin Security, Firmware, Time, Email Notification, Remote Syslog, SNMP, Configuration, Reboot
- Tools Menu:** Ping, Traceroute, WAN Bonding Test (highlighted)
- Logout Button:** Logout
- SpeedFusion™ Throughput Test Form:**
  - Profile: DEMO
  - Type:  TCP  UDP (TCP is selected and highlighted by a red arrow and the text 'TCP')
  - Direction:  Upload  Download
  - Duration: 10 seconds (5 - 600)
  - Go! Button
- Results Section:** Results (Empty)

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

The screenshot shows the Patton device configuration interface. The top navigation bar includes 'Dashboard', 'Network', 'Advanced', 'System', 'Status', and 'Apply Changes'. The left sidebar has a 'System' section with options like 'Admin Security', 'Firmware', 'Time', 'Email Notification', 'Remote Syslog', 'SNMP', 'Configuration', and 'Reboot'. Below that is a 'Tools' section with 'Ping', 'Traceroute', and 'WAN Bonding Test' (which is highlighted). A 'Logout' button is at the bottom of the sidebar.

The main content area is titled 'SpeedFusion™ Throughput Test'. It contains the following configuration fields:

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)

Below the configuration fields is a 'Go!' button. Underneath is a 'Results' section which is currently empty, indicated by the text '(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](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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0.0667 MB / 1.00 sec = 0.5597 Mbps	0 / 53 ~drop/pkt	0.00 ~%loss

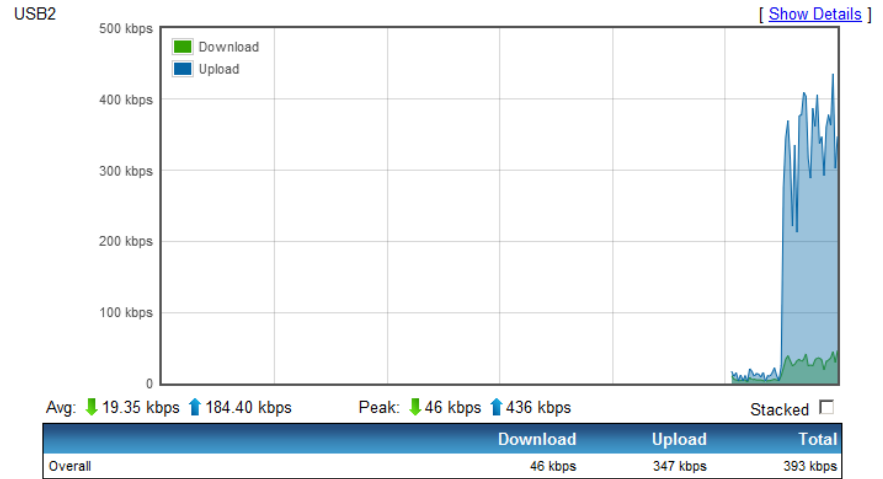
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testing

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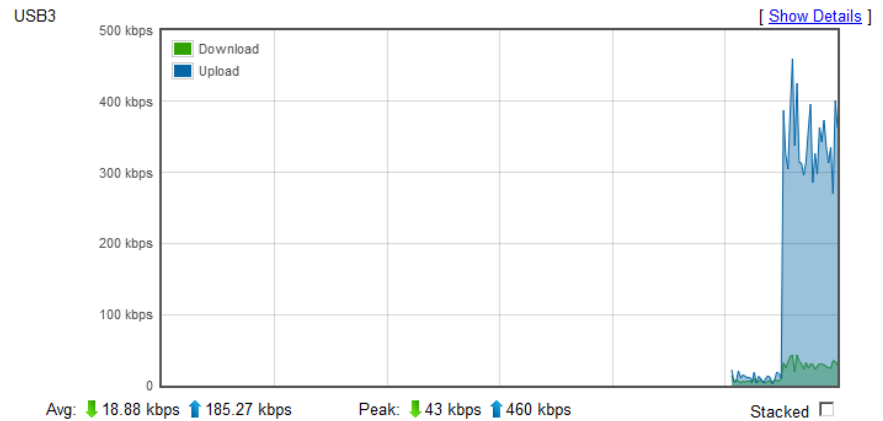
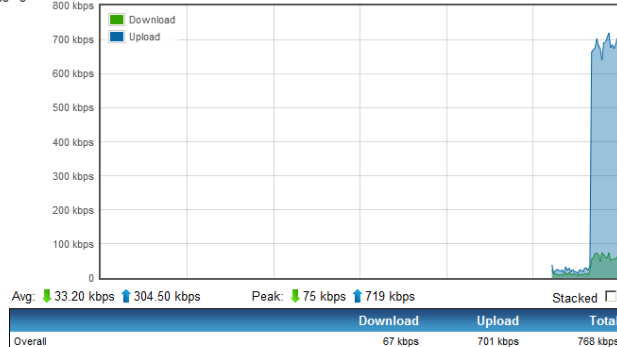
Data transferred since installation (Tue Jun 05 16:11:25 WET 2012)

	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



## FOR FURTHER INFORMATION

For Further information visit us @ [www.patton.com](http://www.patton.com) or contact us:

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