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

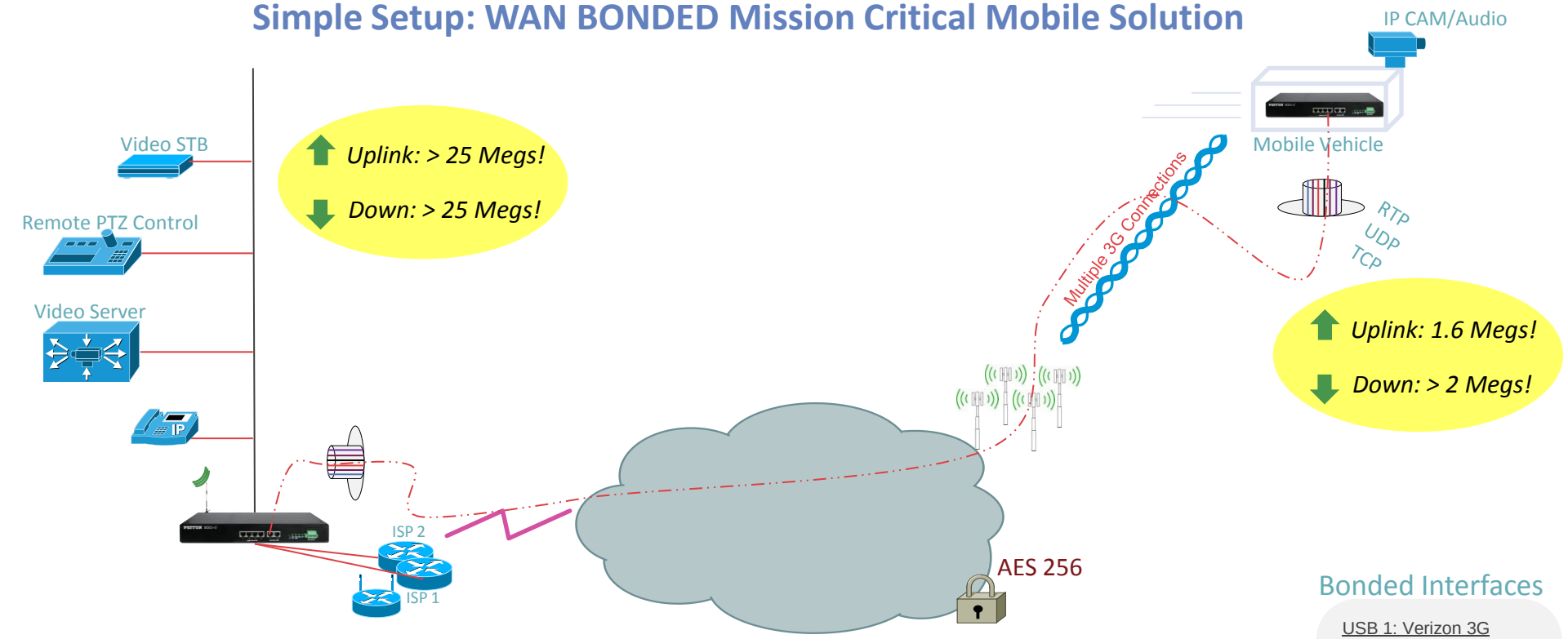
Hardware Requirements:

- *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 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

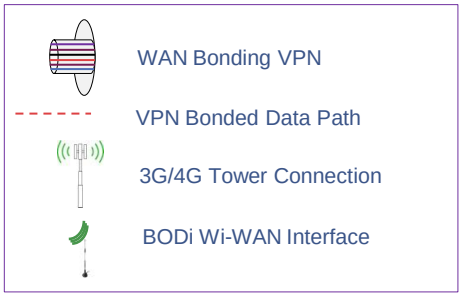


Bonded Interfaces

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



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

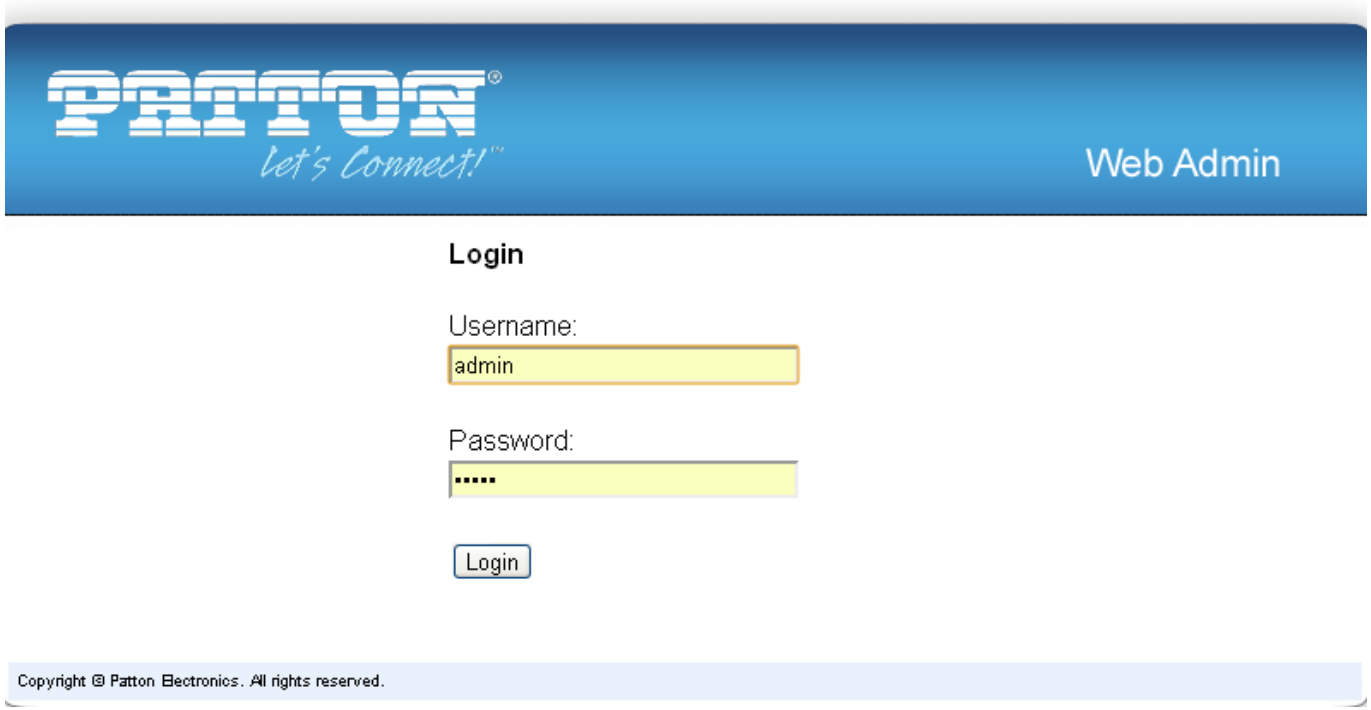
Understanding Bonding

- 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.

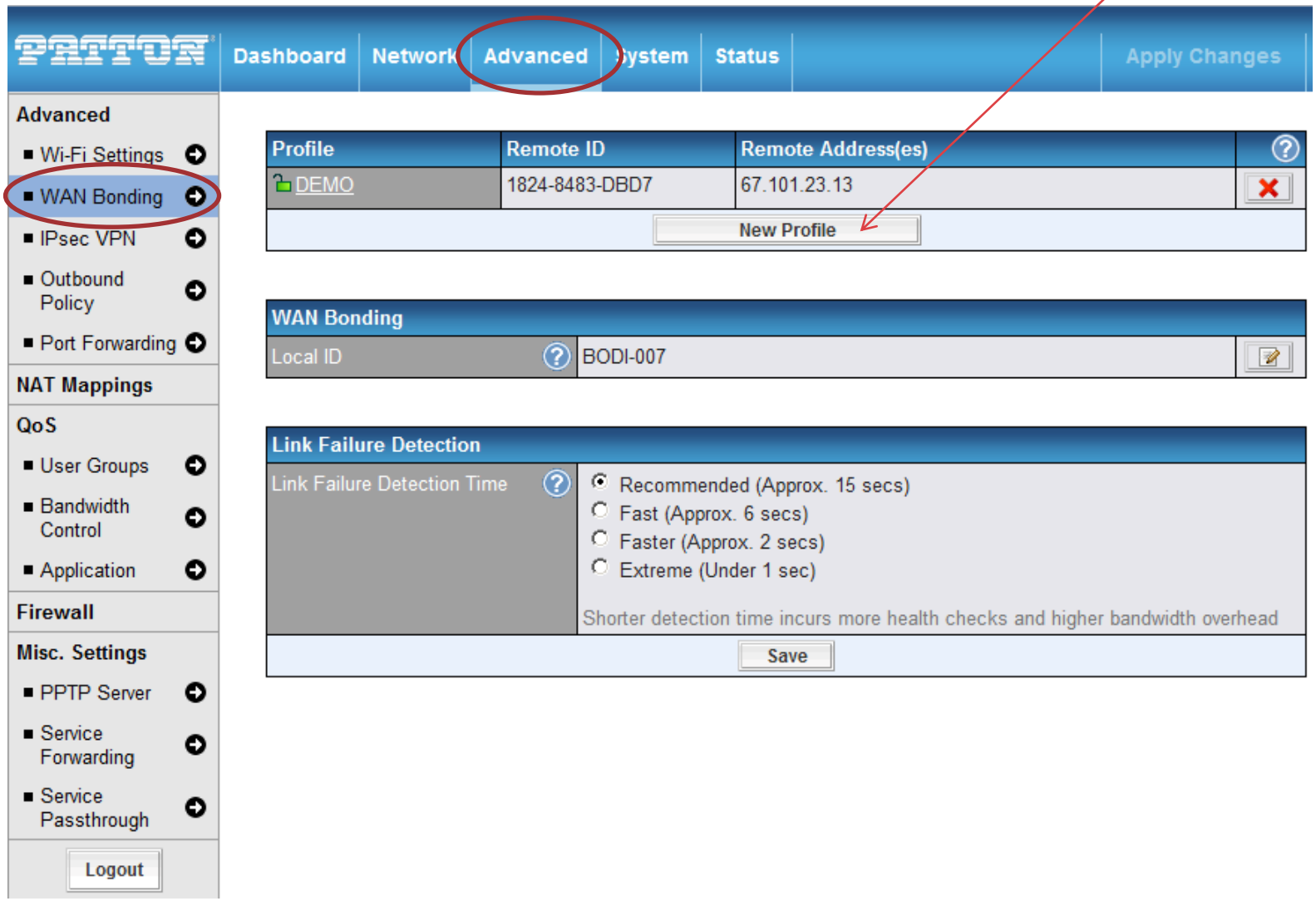
Let's look at SETUP:

- All management for the BODi is through the WEB Interface.
- You need to setup both BODi Routers for a WAN Bonding Connnection
  - 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

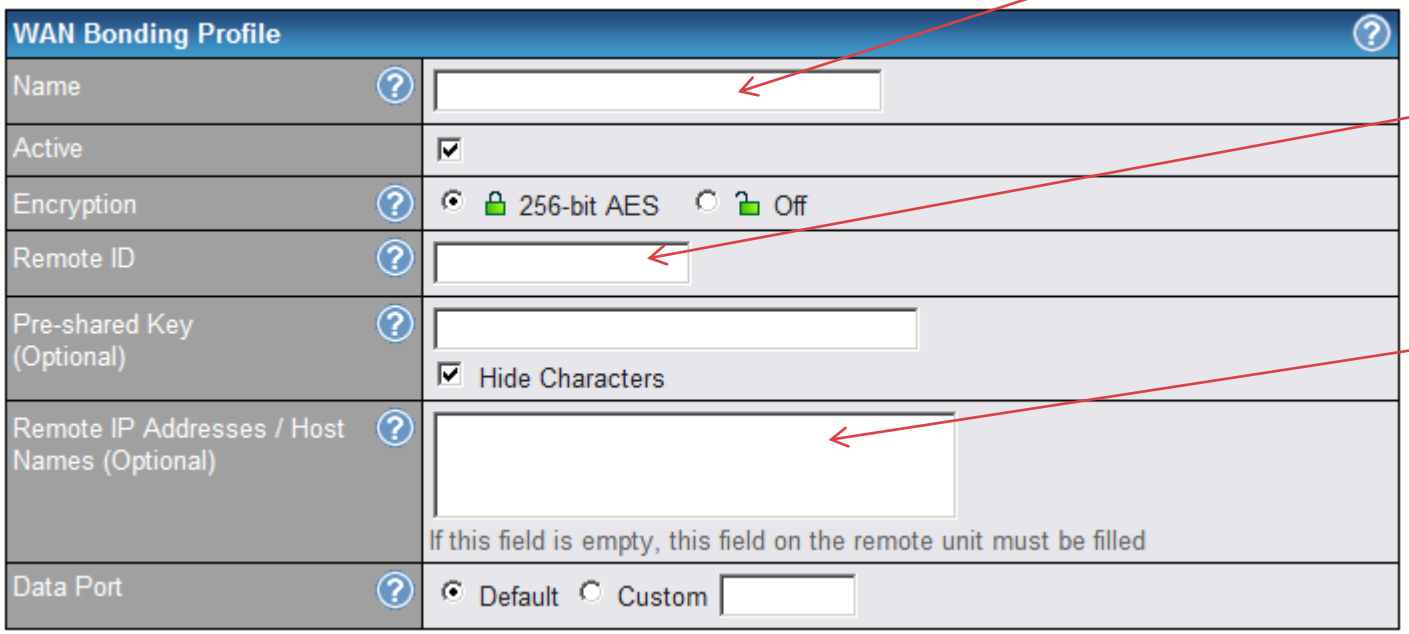


1. Navigate to Advanced tab > WAN BONDING
2. Click New Profile



3. Create WAN BONDING Profile

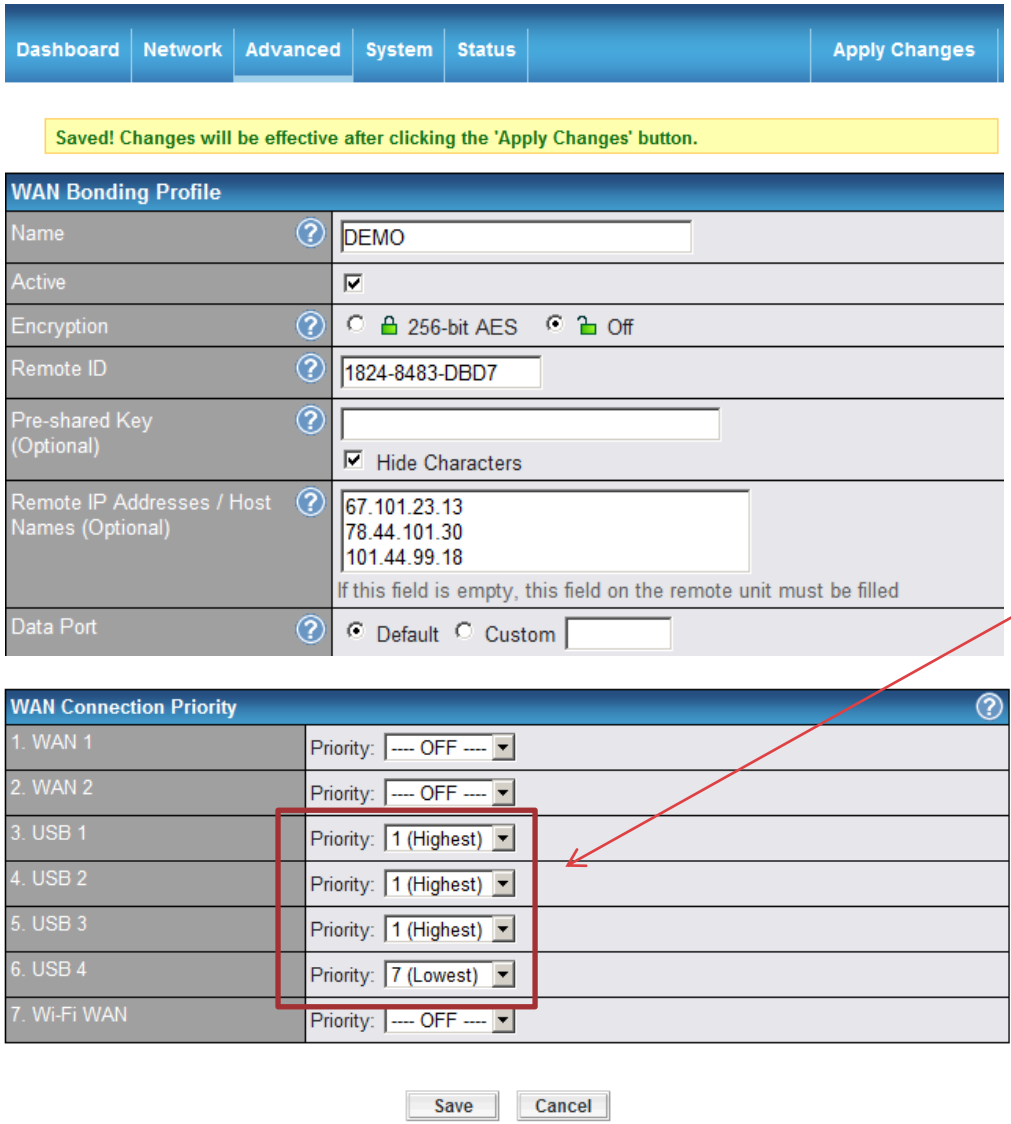
a. Name of Profile
b. Encryption ? Optional
c. Remote ID: Serial Number of PEER or HEU
d. Pre-Shared Key (Optional)
e. Remote IP(s) of PEER or HEU



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

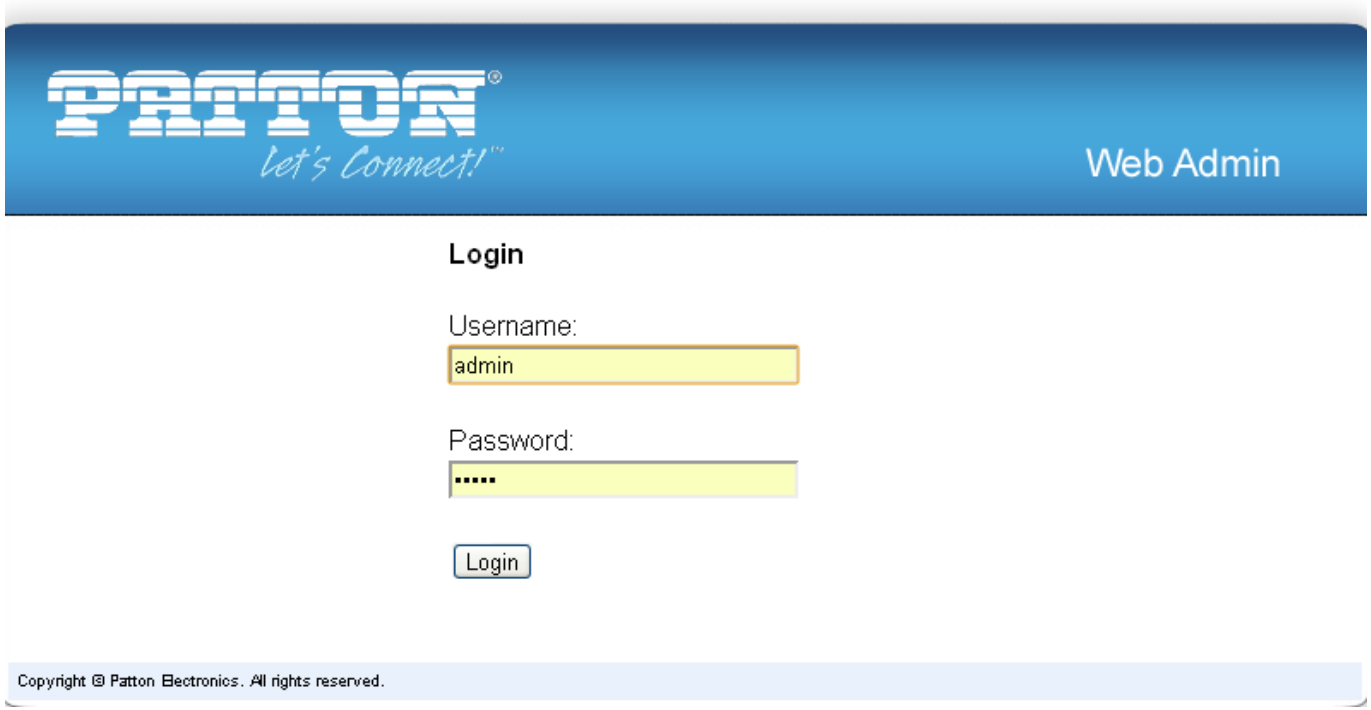
3. Create WAN BONDING Profile

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

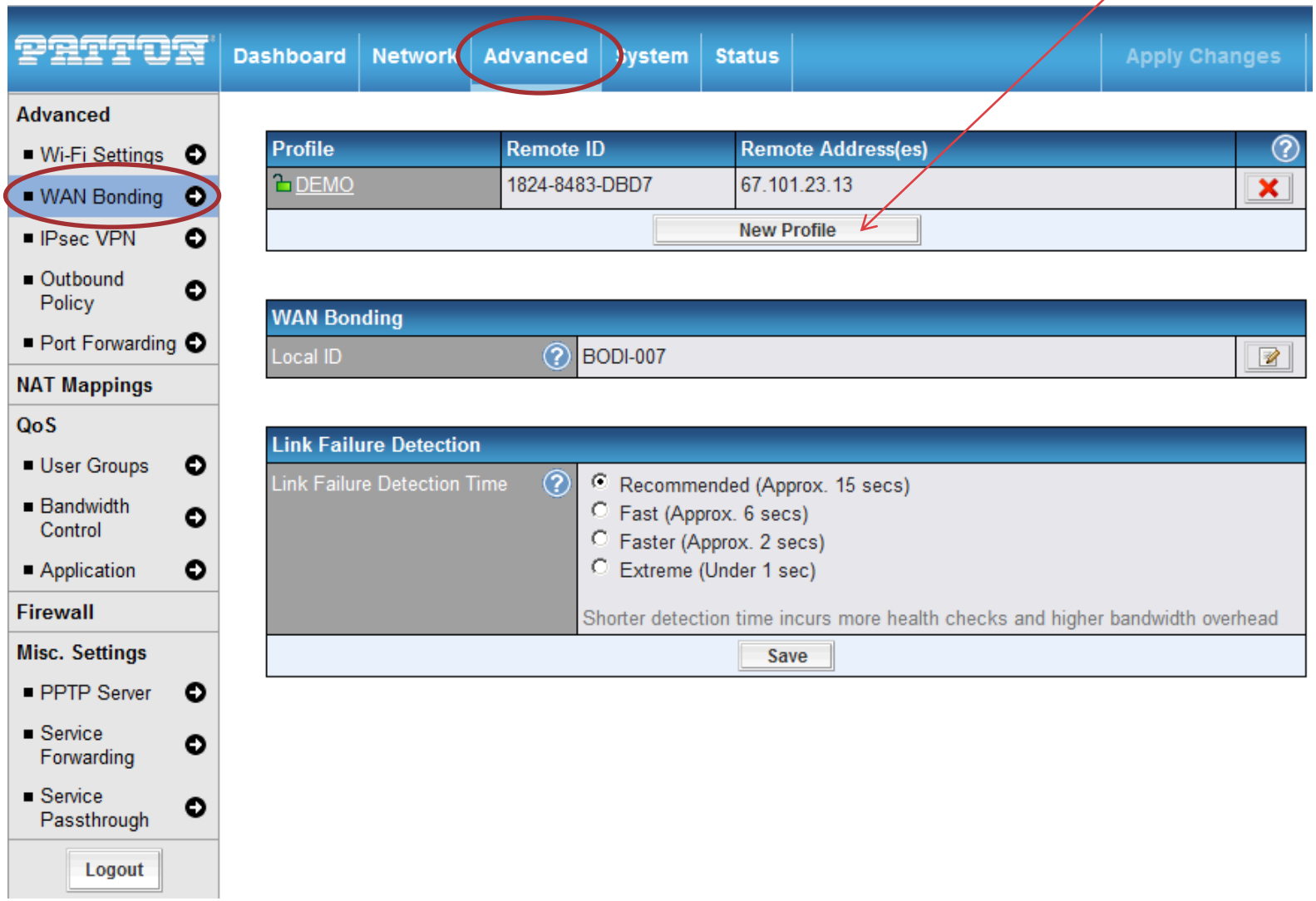


Manually set packet distribution
From 1 (highest) to 7 (lowest).

Configure the HEAD END UNIT: Login WEB GUI

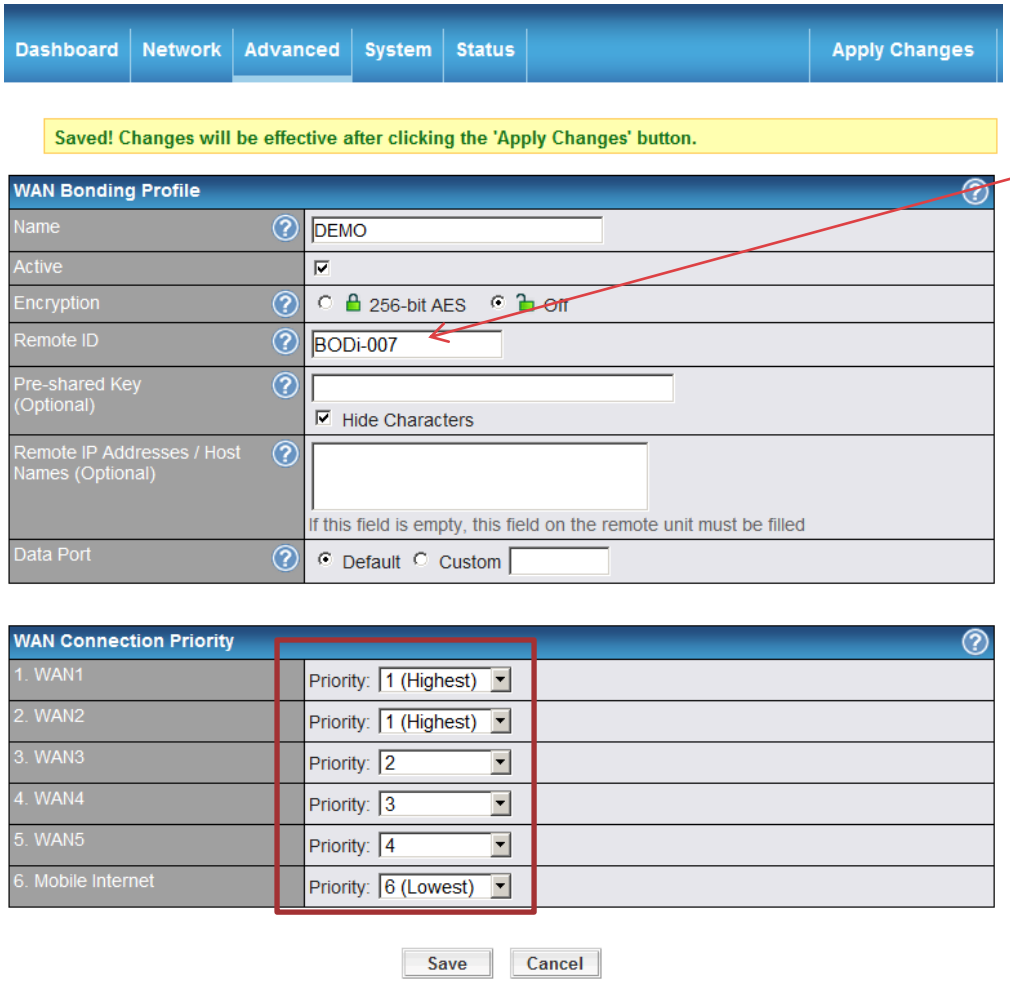


1. Navigate to Advanced tab > WAN BONDING
2. Click New Profile



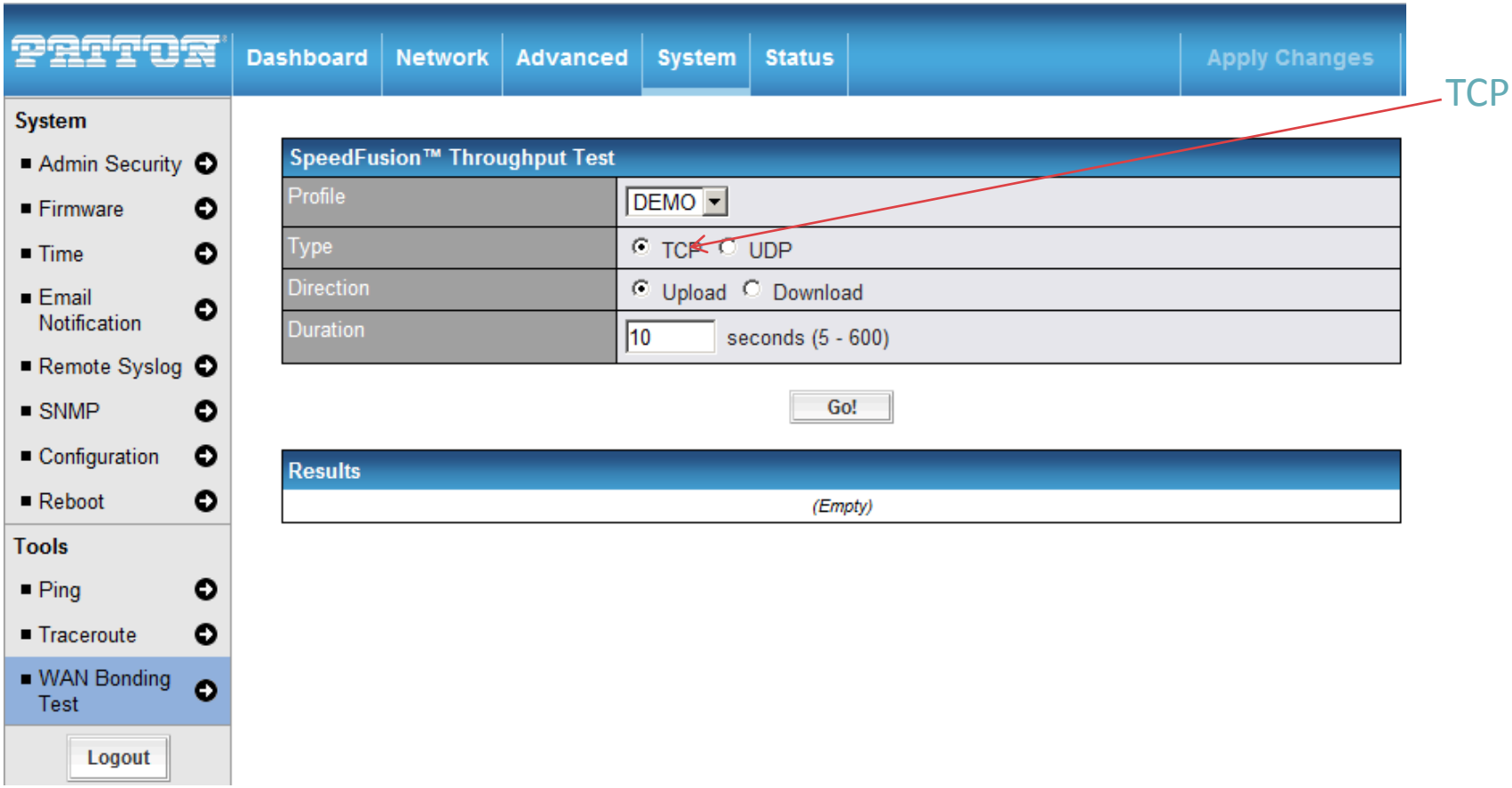
3. Create WAN BONDING Profile

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



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

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



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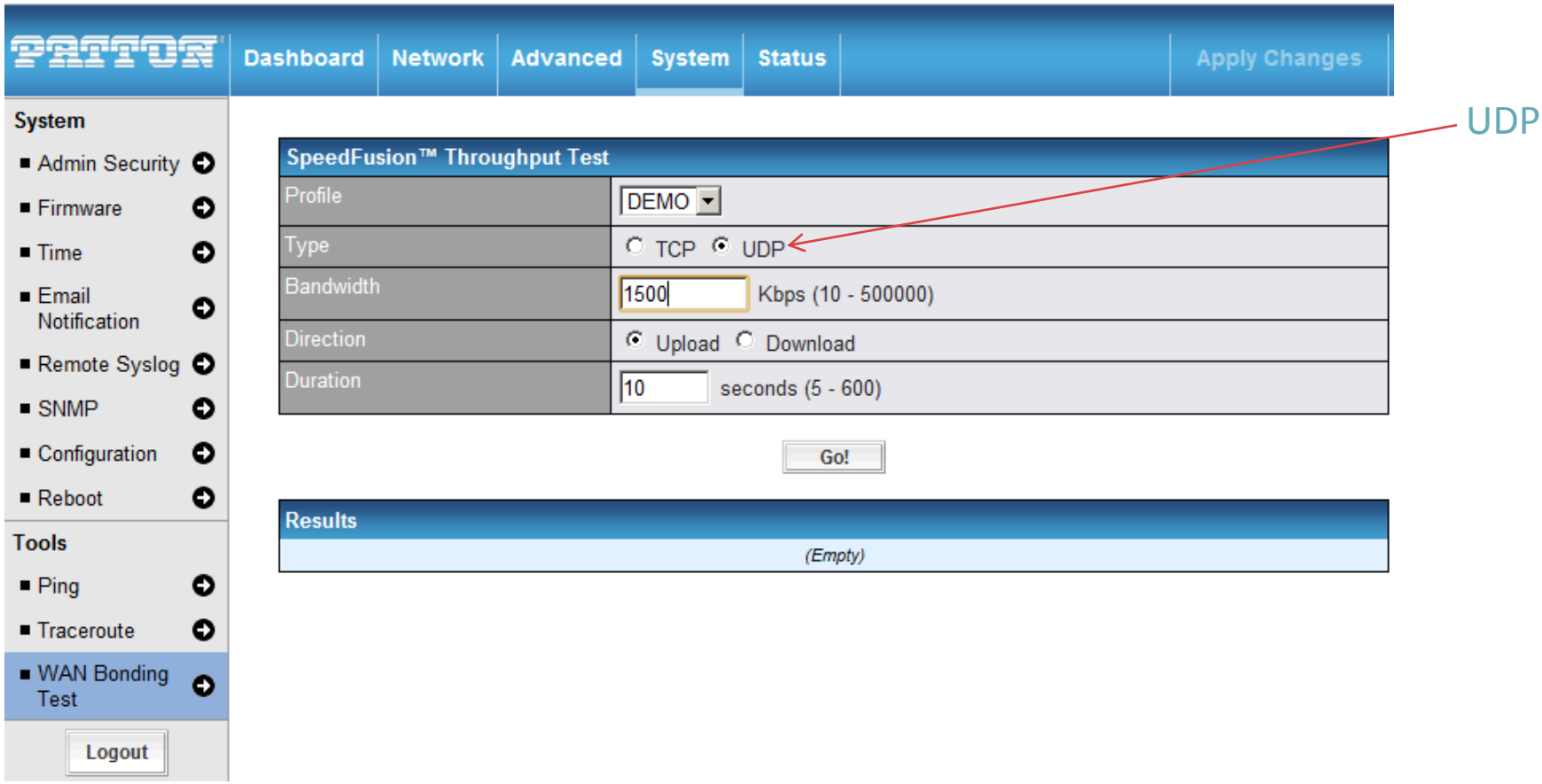
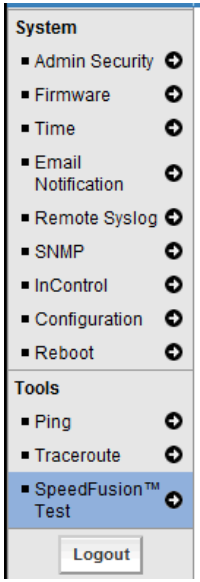
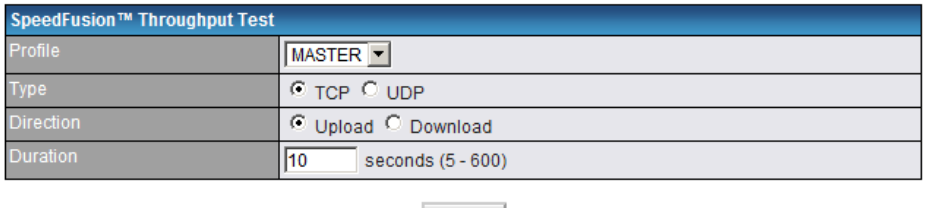




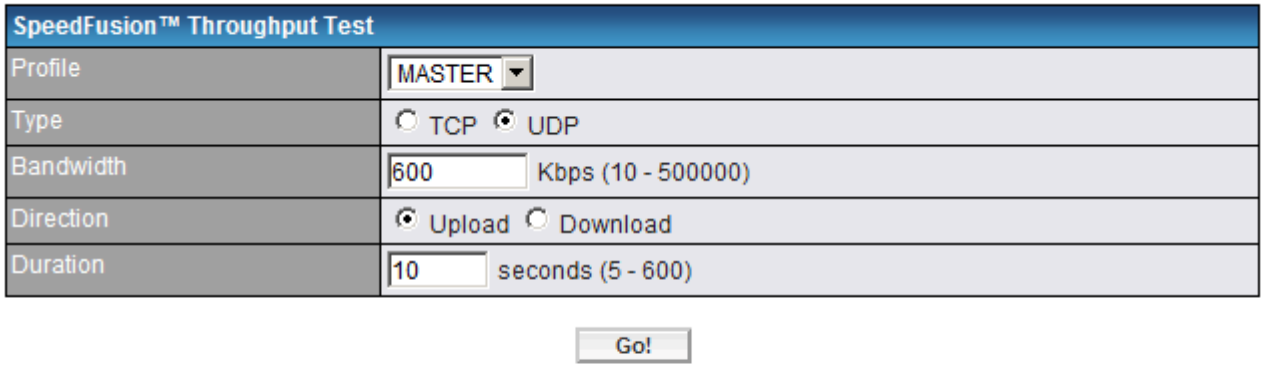


Admin

User Configuration this page

Web Page: http/https and port

WAN Management control



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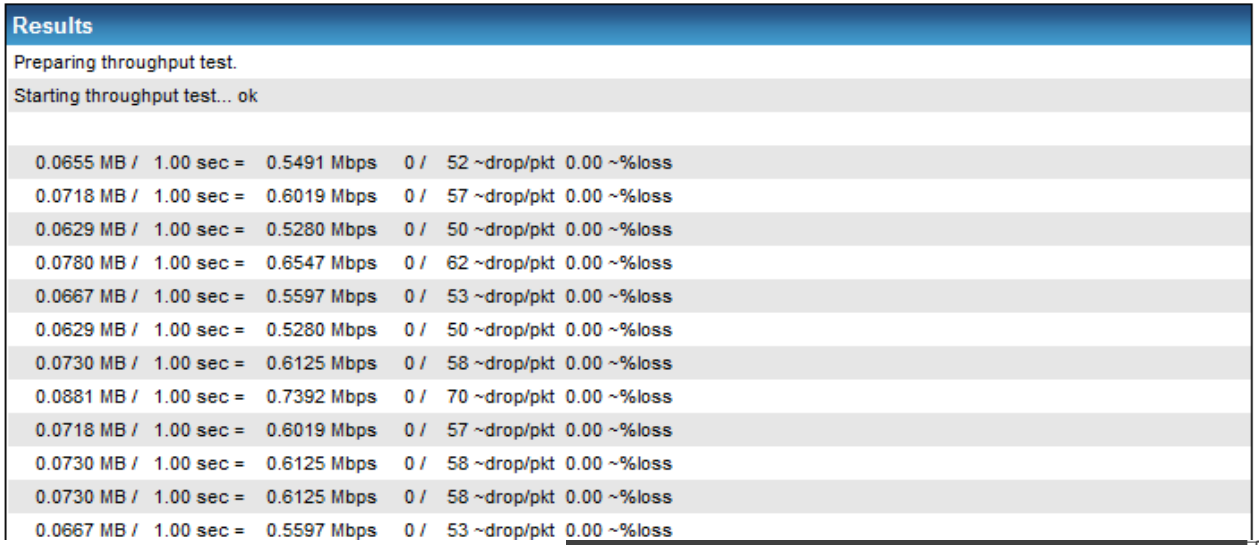

testing

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
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0.0730 MB /	1.00 sec =	0.6125 Mbps	0 /	58 ~drop/pkt	0.00 ~%loss

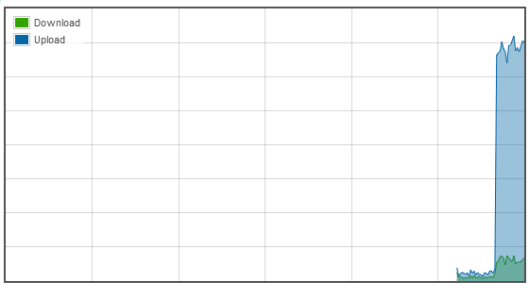
Data transferred since installation (Tue Jun 05 16:11:25 WET 2012)

	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

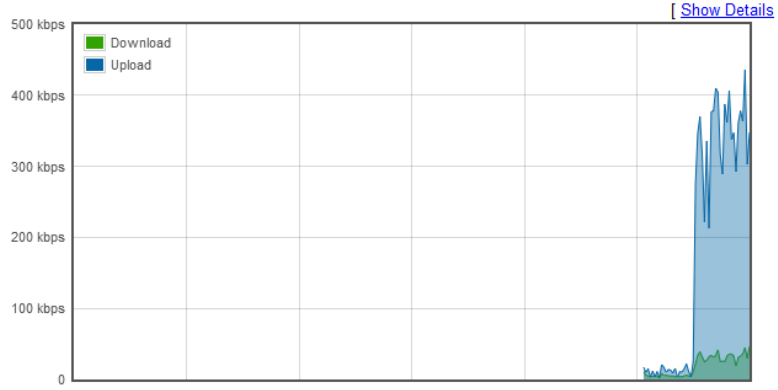
Aggregated Transfer



Avg: ⬇ 33.20 kbps ⬆ 304.50 kbps Peak: ⬇ 75 kbps ⬆ 719 kbps Stacked ☐

	Download	Upload	Total
Overall	67 kbps	701 kbps	768 kbps

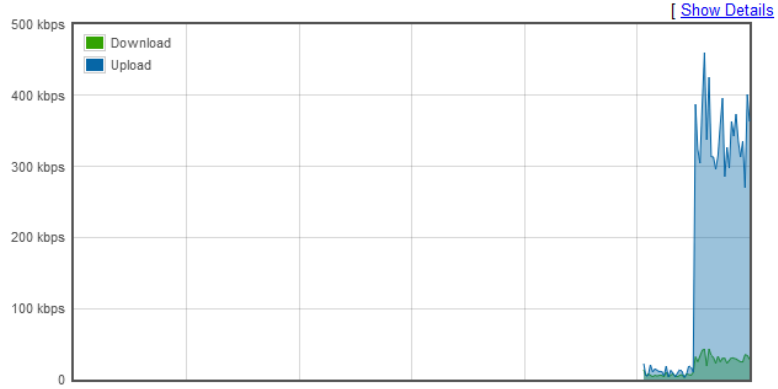
USB2 [Show Details]



Avg: ⬇ 19.35 kbps ⬆ 184.40 kbps Peak: ⬇ 46 kbps ⬆ 436 kbps Stacked ☐

	Download	Upload	Total
Overall	46 kbps	347 kbps	393 kbps

USB3 [Show Details]



Avg: ⬇ 18.88 kbps ⬆ 185.27 kbps Peak: ⬇ 43 kbps ⬆ 460 kbps Stacked ☐

FOR FURTHER INFORMATION

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

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