



Product Documentation v2.3

Introducing the PowerRouter 732

The First Enterprise-Class Mikrotik RouterOS Router

Mikrotik RouterOS is the preferred choice of routers for many Wireless Internet Service Providers, WISPs, as well as many Wired Service Providers as well. From the full range of features and capabilities, the RouterOS software from Mikrotik is a powerhouse of features and capabilities.

MikroTiks' own product line of RouterOS hardware, such as the RouterBoard series of products, are a great product, a staple in the WISP industry. Larger providers though, have had difficulty in using Mikrotik RouterOS in their Enterprise Class networks. These networks, have hundreds of megs of throughput, thousands to tens of thousands of customers. Both wireless and wired customers, as well as hosting services.

These customers need a bit more. Mikrotik solved this issue by allowing x86 PCs to run their software. This made for good routers, based on workstation or server hardware. Quite a few providers and networks are using older servers, purchased off E-Bay. They plugged in some RB44s, maybe a wireless card or two and are up and running.

These servers work, and while they work, they work great, but the reliability and support of these systems are left to who? The end user, the WISP operator, your technical staff, etc. There is no one to call when your name brand server running RouterOS is not working, you can't call the manufacture, they will just say, its an unsupported operating system.

Link Technologies, Inc, has fought to solve this problem. What problem issue of having an high-end Mikrotik Solution that has the support and reliability that Enterprise-Grade networks, both wireless and wired, require.

We have SOLVED this issue, with the introduction of the PowerRouter 732. This Single U Rack-mountable Router is based on an industrial design. Designed to have the reliability that your company requires, these systems are designed for maximum reliability, high-

performance, and upgradeability.

We started by using a 3 Gigahertz Intel Pentium 4 Dual-Core Processor, the processor will no longer be a bottle-neck in your network. We also stacked in 7 Gigabit network connections, all front-mounted for easy access, and each run on individual PCI-Express channels. This provides your maximum bandwidth across your Ethernet ports.



With Gigabit Intel Pro 1000 chips, these will answer the needs of the ultra high-end backhaul links require.

512meg of DDR2 RAM comes standard. Your system will have enough memory for any of your Mikrotik RouterOS needs and if you need more you can upgrade it to 2 Gigabytes of RAM. (requires v3)

We also have space for a min-PCI Card for your wireless needs, plus a single 32-bit PCI Card Slot. Add a PCI to mPCI Adaptor for even more wireless options. If you need more than 7 Ethernet ports, then add a 4 port PCI card or drop in a TI Card.

The PowerRouter 732 also has two USB ports in the front of the unit for whatever your needs are, including USB UPS units, etc. A front mounted DB9 Cable also will get you console access to your router at any given time. It also outputs the BIOS Boot to the serial port.

The industrial Power Supply is designed to give you over 40,000 hours of continuous duty operation, and the system board is designed for over 90,000 hours!

The PowerRouter 732 is the first Enterprise-Grade Mikrotik RouterOS!

PowerRouter 732 Points of Interest

- 1U Form Factor
- Rack-Mountable
- High Performance
- High Reliability
- 7 Front Gigabit Ethernet Ports
- 2 front USB Ports
- Industrial Designed Main board, designed for over 90,000 hours of Operation!
- Industrial Power Supply for over 40,000 of continuous Duty Operation
- Over 5.9 Gigabits Overall Throughput
- Over 35megs Full Duplex Wireless Links
- Upgradeable, with mPCI, a PCI Slot, and 2.5 inch HD Bay!

The PowerRouter

powered by Mikrotik RouterOS



PowerRouter Features

- 3 Gigahertz Intel P4 Dual-Core Processor
- 512 Meg DDR2 RAM (upgradeable to 2 Gig)
- 7 Gigabit Intel Pro 10/100/1000 Network Interface Ports (Front Mounted and each with individual PCI-Express Addresses)
- 2 USB Ports
- 1U Rack-Mount Design
- Single mini-PCI Slot, plus one 32-bit PCI Slot
- 2.5 inch Hard-Drive bay support up to 250gig IDE or SATA drives
- Industrial Power Supply and System Board
- Designed for over 100,000 hours of Constant Operation
- Intel Based Industrial System Board designed with a MTBF of over 110,000 hours!
- 64meg Compact Flash for Dependable Operation
- Level 4 RouterOS License comes standard, Upgradeable!



“The PowerRouter solved our tower needs, by providing the processing power, to terminate hundreds of PPPoE sessions at the tower, dynamic routing, and even gives us a really small footprint in the equipment racks.”

PowerRouter 732 Performance Testing

One thing everyone is interested in is the performance and scalability of the PowerRouter 732.

We have done extensive testing using both Ethernet ports and wireless radio cards in the PowerRouters to let you know what you can expect out of them. We want you to know

what you are going to see when you put a router in place.

Bonded Ethernet Testing

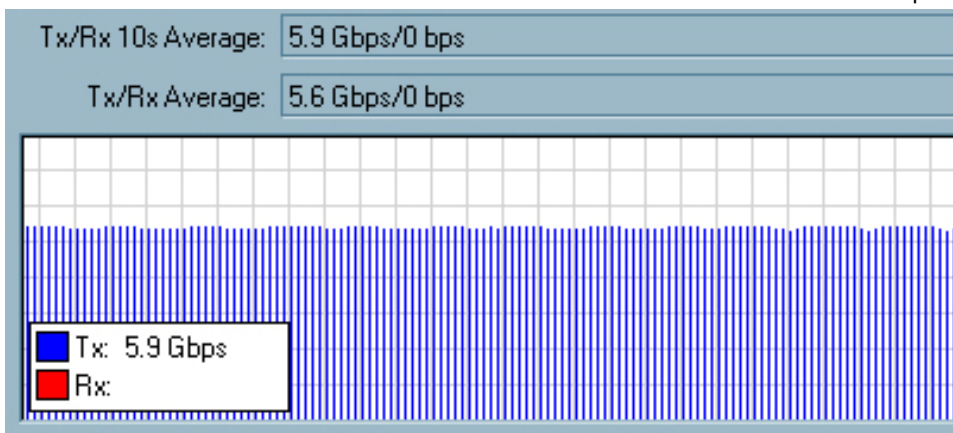
The first test is overall performance, using 6 of the on-board Gigabit Network interfaces bonded to form a 6 Gigabit Ethernet Link. We also opti-

mized this by allowing 4000 byte packets across the bonded Ethernets.

As you can see from the screen shot, with processor to spare, we can generate and send 5.9 Gigabits of data over 6 bonded Gigabit ports.

We never maxed out the CPU on this test, but we did max out the overall transmission speed of the physical media. We also were generating this traffic on the PowerRouters.

Another test using three network interfaces, gave us 3.3 gigabit up and 3.2 down. This test used three PowerRouters Two Generating traffic and passing it though one more.





Wireless Performance Testing

We also tested the PowerRouters as a high-end Full-Duplex Wireless Link. These tests were ran with Dual PowerRouter 732s, running RB14 PCI to mPCI Adaptors and twin Mikrotik R52 Radio Cards.

During tests we found that several things affected total throughput. Simple processor usage, signal strength, and the RX/TX Rates. Of course you need enough signal to maintain a high RX/TX Rate, if not your system performance will suffer more by letting it drop to lower rates. On the bench we had averages of -63 signal levels, something that is possible in the real-word. We tested using the Mikrotik Bandwidth tester that is in the Mikrotik RouterOS software.

General	Nstream Dual	Data Rates	Status	Traffic
Rx Signal Strength:		-66 dBm		
Tx Signal Strength:		-53 dBm		
Rx Rate:		54Mbps		
Tx Rate:		54Mbps		
<input checked="" type="checkbox"/> Connected				

“Wirelessly you can get 100+Mbps total throughput using a Dual N-Stream Full Duplex link, not bad for a link under \$4,500 bucks, plus you get all the features of the Mikrotik RouterOS!”

Dual N-Stream Tests

Using N-Stream Dual Links, we tested out at an average of over 100 Mbits per second total throughput. Showing averages of above 52 Mbps of traffic full duplex. This is using both N-Stream Dual, as well as Turbo mode. This shows the capabilities of the N-Stream Dual protocol as well as the performance of the PowerRouter 732.

Again, these tests were using the R52h Mikrotik Radio card in 802.11a Turbo mode. We did change several settings in an attempt to get more bandwidth, however, the stock configuration proved to be the simplest and most stable. We did see slightly higher spikes in the single direction tests that were performed, but these were just that, spikes, and we preferred to see stable and constant speeds.

