NV2 Live Demo
Real World Testing

MikroTik User Meeting

Phoenix, AZ - 2010

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About Me.......

Brian Vargyas, Owner, Baltic Networks

- Over 8 years experience using RouterOS
- Specialization in Wireless, Hotspot and the Dude
- MikroTik Certified Trainer
- Always want something faster.....
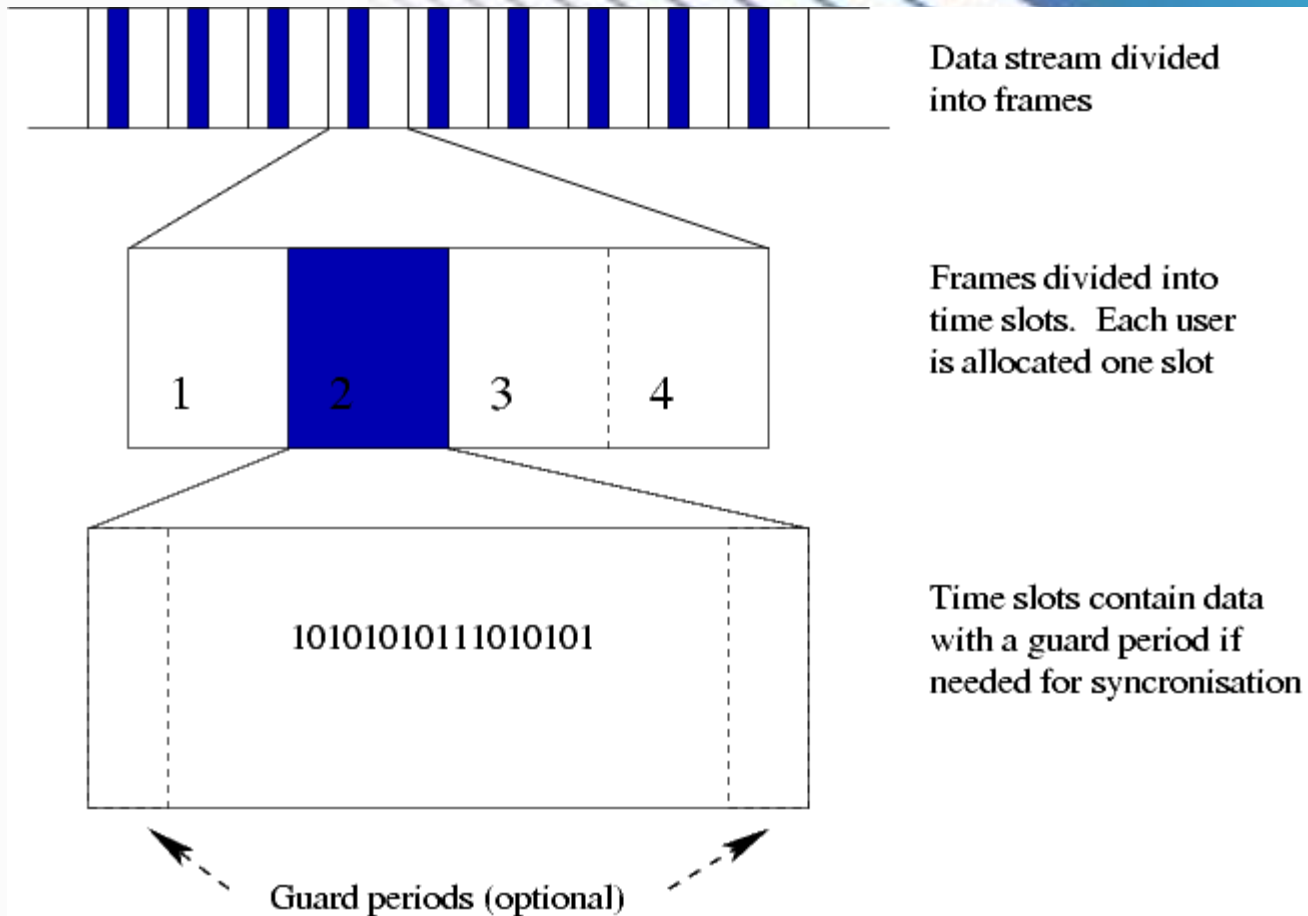
Overview of NV2 Live!

- What is NV2?
- We're getting there….
- The good, bad and ugly!
- A 7 Mile PTP
- A 3 Mile PTP
- Cheap, Fast NV2?
- Live Tabletop Demonstration of a NV2

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What is NV2?

- Nstreme Version 2 is MikroTik's Implementation of TDMA on low cost Atheros chipsets, works down to 5414 chips (A/G)
- Time Division Multiple Access breaks transmissions down into a time slot system.
- Stable Latency, No distance Limitations
- Higher concentrations of clients in PMTP

TDMA Time Slotting

Data stream divided into frames

Frames divided into time slots. Each user is allocated one slot

| 1 | 2 | 3 | 4 |

1010101011010101

Time slots contain data with a guard period if needed for syncronisation

Guard periods (optional)

We're getting there....

- RouterOS 5beta6 had working NV2 using MPLS and VPLS tunnels.

- RouterOS 5beta7 brought some stability

- RouterOS 5RC1 now has WDS Client/Station large frame support without needing MPLS.

The good....

- With WDS support, anyone can do this!

- Latency very stable while link is under full load

- 5 & 10Mhz channels now work on 802.11N

- Backwards compatible with Nstreme and 802.11 clients on the same access point

- Adjustable cell radius and TDMA period for optimal network performance.

- Potential for AP synchronization.

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The Bad...

- Signal strength of transmitter as client sees it not reported back like it was in Nstreme

- RB800 required to obtain full performance of link

- Limited to 511 clients?

- Long Guard Interval only means 270Mbps Max.
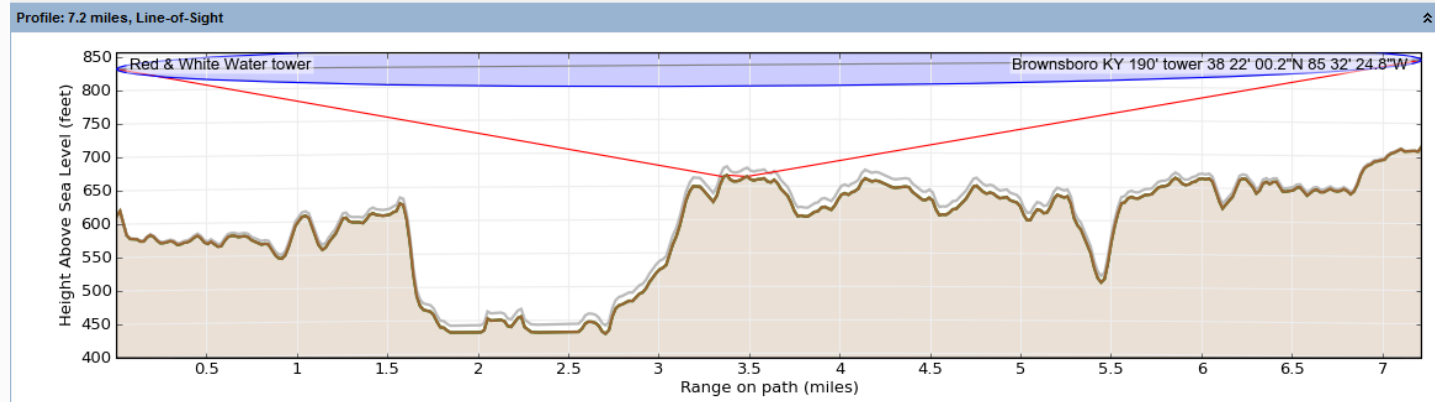
- Not much else not to like!

And the Ugly….

The 7 Mile Hop

- 2 foot rocket dishes with UBTIK's
- Link in southern Indiana across a river
- RouterOS 5.0beta7
- Had to use MPLS, WDS support didn't exist
- Temporary link for event, was taken down, so no opportunity to retry RC1.

Link Calculations

- Used Motorola Link Planner

- PTP58600 Lite seems to match R52Hn profile

- Predicted Speed: 146.17Mbps Aggregate

Both Ends...

Conclusion

- We might not have been in perfect alignment

- One end had a bad RF jumper cable

- The cell radius was limiting our speeds

- TDMA Period could have been changed to 4

- Reflection off the backside of the water tower was potentially causing multipath problems

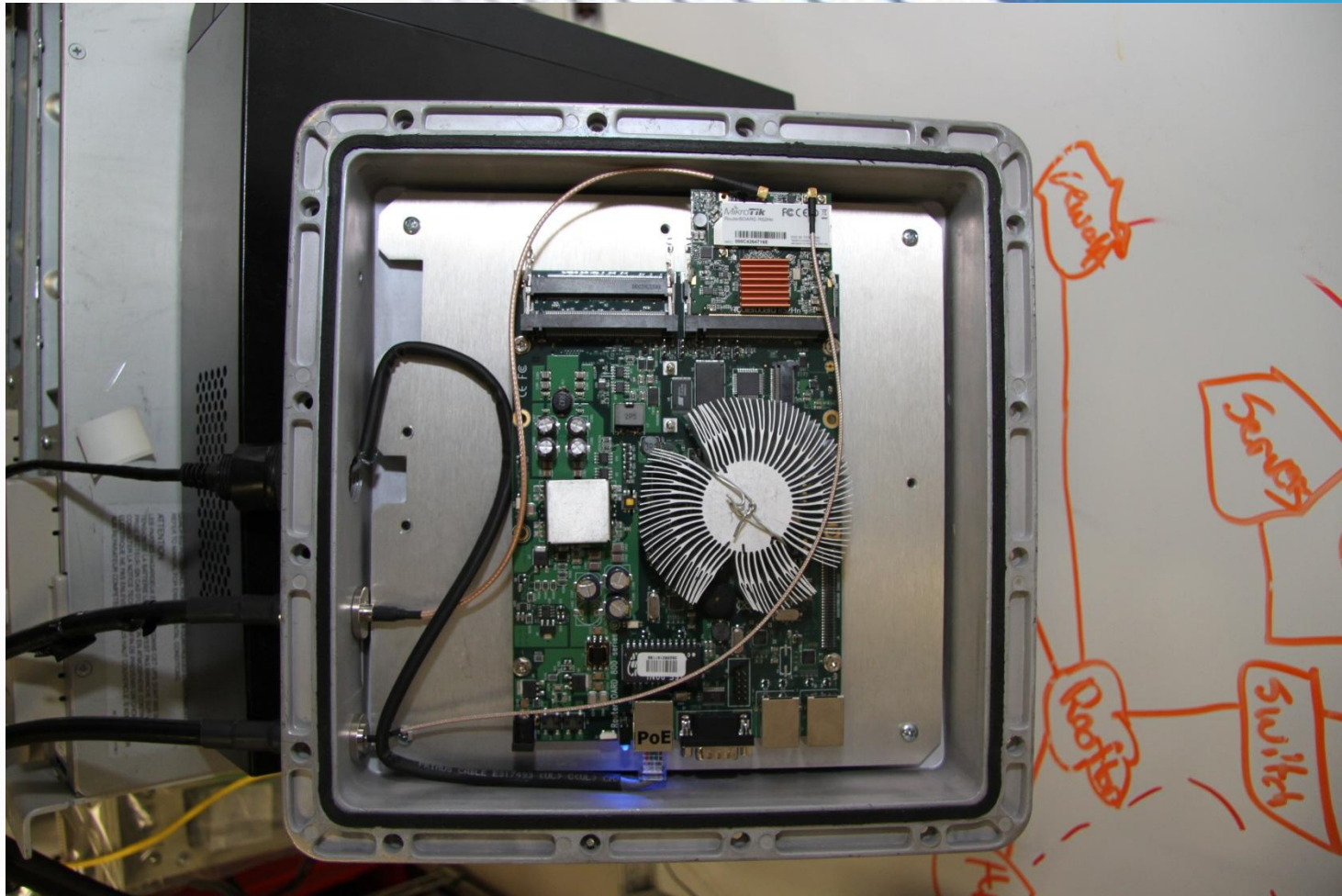- Limited time for repair due to customer requirements

The 3 Mile Hop

- Using RB800's with R52Hn cards
- Crosses through large electrical field
- Building rooftop has 10+ 5ghz links plus four cellular carriers – lots of RF noise.
- 2 foot rocketdish on rooftop
- 2 foot Pac-Wireless dish on tower site with Radome
- Removed Rocket M5's

The preparations….

RB800 Turbo Cooler?

Are we level yet?

Just a little interference thrown in for good measure....

Remote Tower Site

Rooftop RB800

| 23:16:32 | Memory: 228.9 MiB | CPU: 34% |

Signal Strength (dBm)	Tx/Rx Rate
-54	270.0Mbps/270.0Mbps

Tx/Rx Rate:	270.0Mbps/270.0Mbps
Tx/Rx Packets:	2 112 525/1 413 801
Tx/Rx Bytes:	2875.3 MiB/507.7 MiB
Tx/Rx Frames:	1 986 129/380 733
/Rx Frame Bytes:	2875.7 MiB/325.5 MiB

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active-fan: main
   voltage: 36.1V
cpu-temperature: 67C
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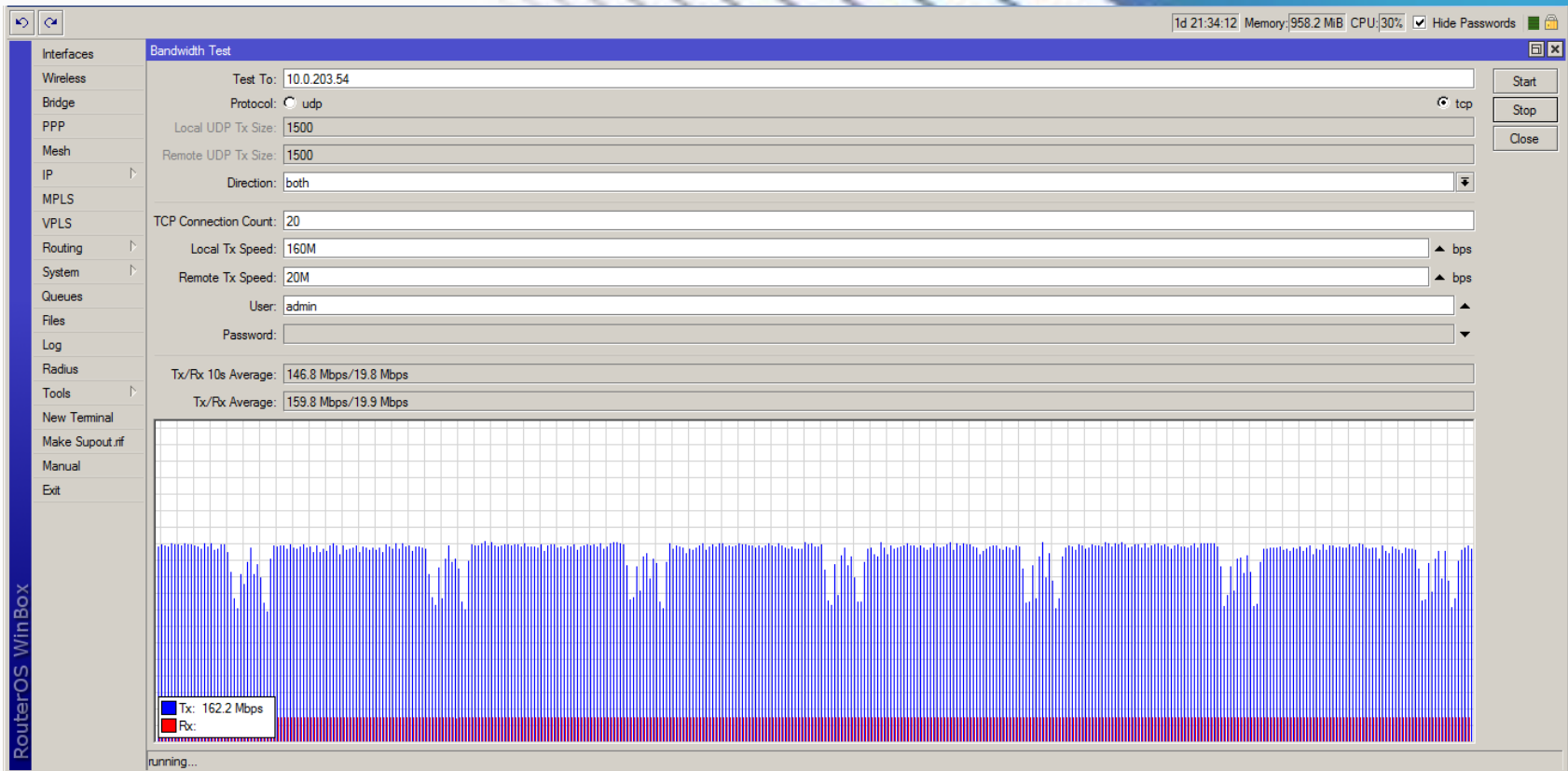
Remote Tower RB800

Signal Strengt...	Tx/Rx Rate
-54	270.0Mbps/270.0Mbps

	Name	Type	L2 MTU	Tx	Rx	Tx Pac...	Rx Pac...	Tx
R	bridge1	Bridge	1600	44.7 kbps	8.2 kbps	7	8	
R	ether1	Ethernet	1600	173.0 Mbps	25.7 Mbps	14 965	9 822	
	ether2	Ethernet	1600	0 bps	0 bps	0	0	
	ether3	Ethernet	1600	0 bps	0 bps	0	0	
R	wlan1	Wireless (Atheros 11N)	2290	25.4 Mbps	172.6 Mbps	9 786	14 926	

One strange thing.... Every minute

3 Mile Summary

- Very impressed with speeds
- Will go into production this week
- Tower happens to feed our office ☺
- Nothing can compare to the speed/price ratio
- Estimated cost $750/end or $1,500/link.

Want Cheaper?

Ask MikroTik, where is it????

RB/411GAH?

Another way to have cheap NV2!

- RB711 with integrated radio… 1x1

- Tested 50Mbps full duplex TCP in lab

- Only about $90 for complete 18dBi client with PoE power supply

- Works with older Atheros Cards, so you may already have a link you can upgrade today without replacing equipment.
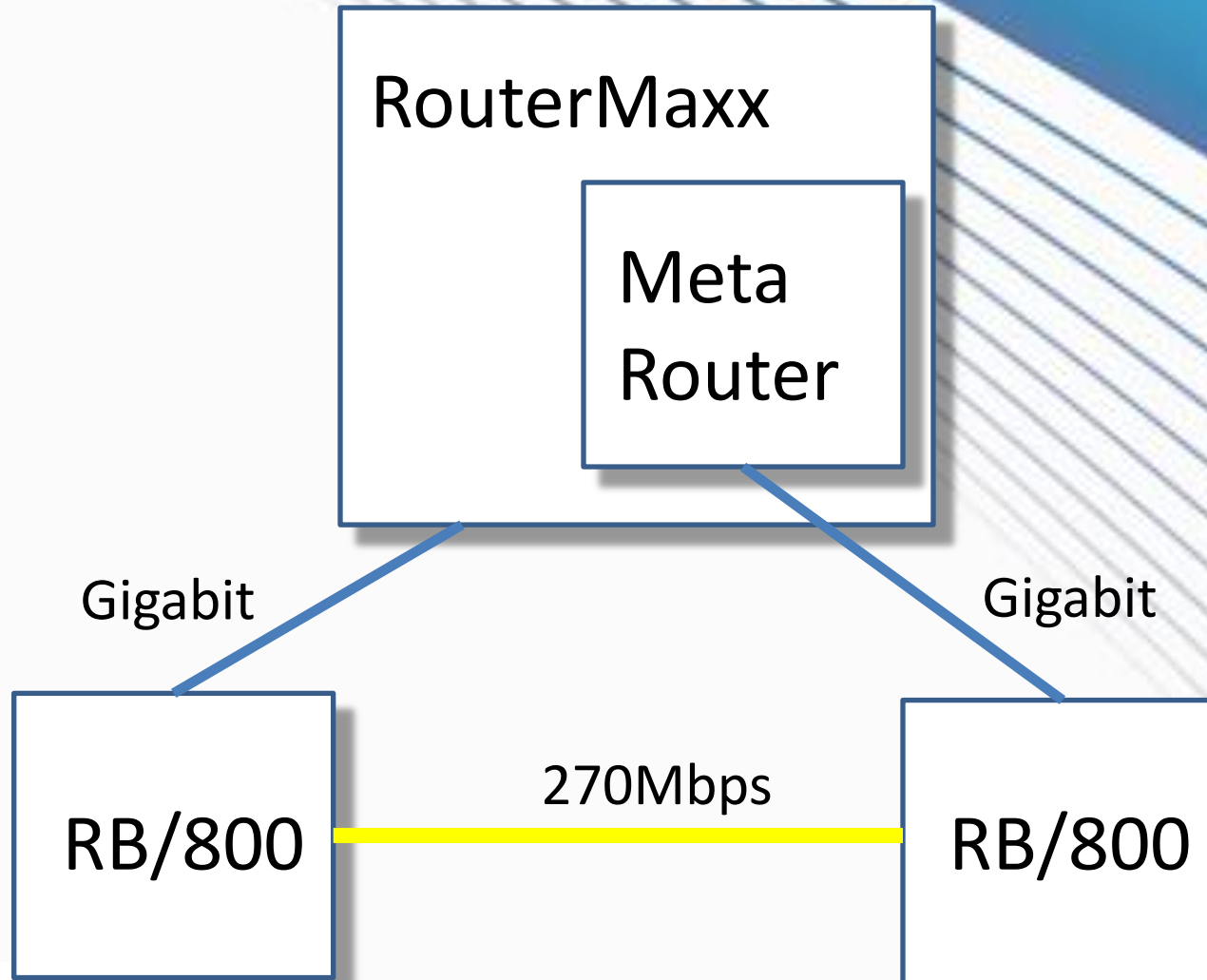
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Online Documentation

- Lots of information on MikroTik Wiki
  http://wiki.mikrotik.com/wiki/Manual:Interface/Wireless

- MikroTik Message Forum
  http://forum.mikrotik.com

- Baltic Networks (www.balticnetworks.com)

Live Demonstration Time!

- Two RB800's with R52Hn cards

- MaxxWave RouterMaxx 1200 Dual Core 2.8Ghz, 2GB Ram, 2GB Flash – RouterOS 5

- MetaROUTER (KVM) as receiver on port 9

- Bandwidth test across two RB800's

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Logical Layout

RouterMaxx

Meta Router

Gigabit

Gigabit

RB/800

270Mbps

RB/800

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Questions?