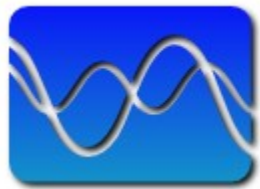


MikroTik Core Router at ISP NOC



NET SOLUTION

ISP Tech Partner

- MikroTik Routers to deliver Giga-bits of Internet Traffic

- **By: Kumar Doshi**

mum

MikroTik User Meeting in India
New Delhi, August 25, 2012

About Net Solutions

- Working with Broadband providers for More than 12 Years
- Provide HTTP Caching to ISP
- Provide Network Monitoring
- Provide Voice, Video and Collaboration Services
- Specialized in Network Resource planning and utilization for ISP.

Presentation Objectives

- MikroTik as Core Router for ISP
 - Limitations of MikroTik
 - Advantages of MikroTik
 - Sizing and choosing Suitable Hardware
 - Splitting Load to Multiple Routers

Target Audience

- ISP more than 500 mbps Bandwidth.
- Fast growing Broadband ISP who will reach 500 mbps bandwidth at NOC
- ISP looking for cost effective Redundant Core Router
- ISP interested in implementing IPV6 without disturbing their existing Network

Current Trends

- Options available for ISPs

Core Router:

- CISCO
- JUNIPER

Limitations of MikroTik

- Router Hardware
 - Tested & Certified Hardware with Benchmark
 - Best performing Network Adapters
- System CPU Uses 32 bit
- Difficulty in Expansion & Scaling
- Slow Packet Forwarding & packet Drops at High Load

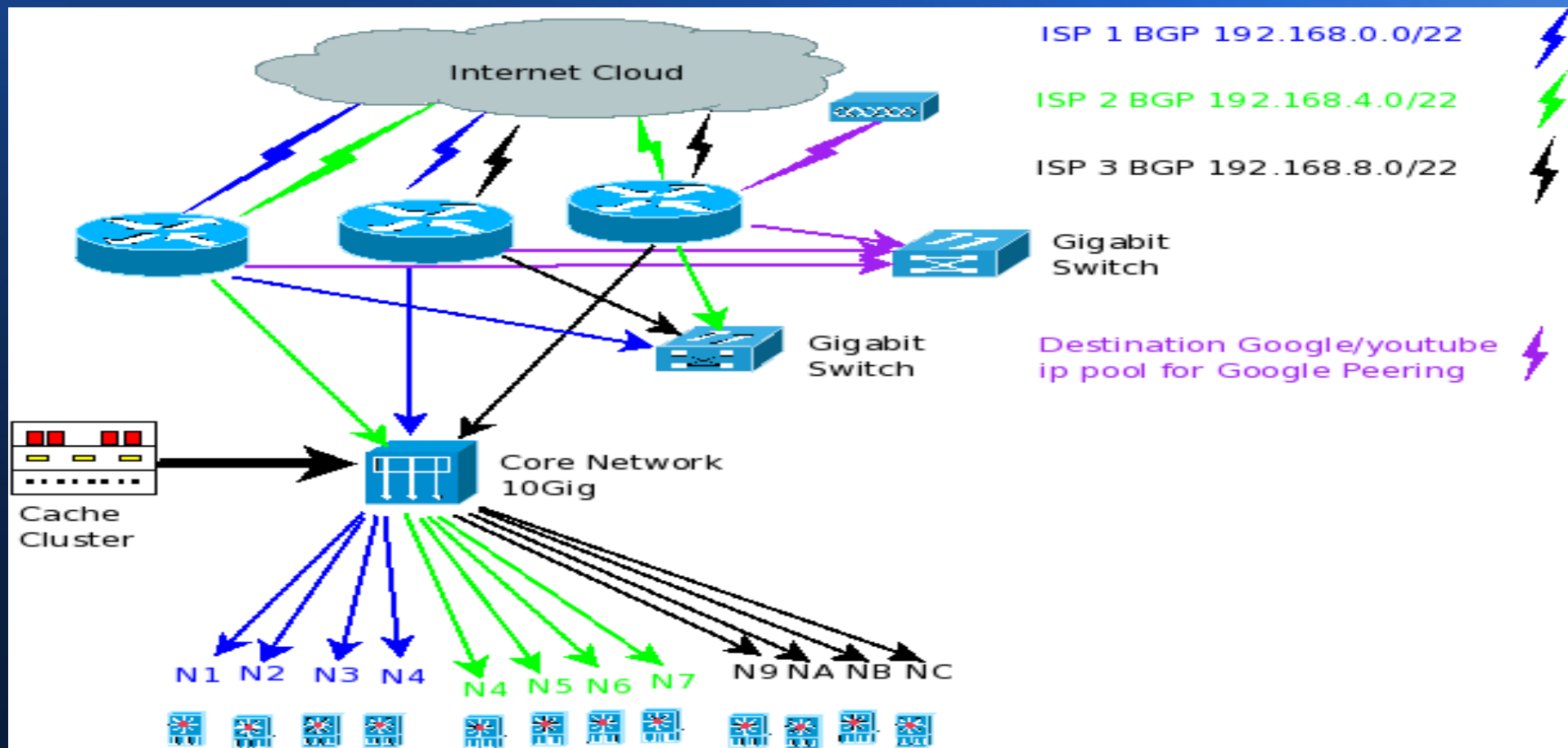
MikroTik Advantage

- Runs on Standard Hardware
- Quick, simple and Low Cost Licensing
- Use Existing Knowledge and experience on MikroTik
- GUI to monitor
- Cost Effective Redundancy
- Planned Scale-ability

Common Do's and Don't

- Separate Core And Access Routers
- Avoid NAT
- Avoid Connection Tracking
- Allocate One Interrupt per LAN Card
- Allocate One CPU Core per LAN
- Local Traffic not through Core Router
- Suitable GBP options for minimum resources
- Fast CPU & RAM

Proposed Configuration



Case Study



- Five Network Solution (I) Pvt. Ltd.
- Largest Broadband Service Provider of Mumbai.
- End to End MikroTik

Core Router Cluster

- Two MikroTik Routers to Connect Up-link 6 STM TATA & 6 STM Spectranet, Intel i7 3 Ghz, 2 GB RAM, MikroTik Level 6, 6 Nos. Intel/Broadcom Gigabit LAN Cards on PCI-e Bus
- One MikroTik Router to Connect Up-link 6 STM TATA and 2 GBPS Google Peering Intel i7, 3 GHz 2 GB RAM, MikroTik Level 6, 8 Nos. Intel/Broadcom Gigabit LAN Cards on PCI-e Bus

MikroTik NAS

194-HighSpeed	66	0	205-Mirabhayander	394	0	235-Compunet	25	0	254-DeepCommunic	282	0	188-Agarwada	204	0	84-Snetwork Bala	187	0
0M 0M			55.3M 17.4M			40.1M 56M			40.1M 15.2M			64.8M 21.2M			76M 12.3M		
195-AnmolCable	21	0	218-Rajnet	44	0	236-RajeevVideo	357	36	A18-TalkFree	15	0	64-SSV Kalyan	102	0	81-Khushi Cable	5	0
4.2M 1.3M			12M 3.4M			28.5M 49.6M						56.2M 6.5M			1.9M 0.2M		
196-SamratCable	200	0	219-SaiMedia	76	0	237-SwastikNetwork	418	0	184-VirendraStar	222	0	67-Vaznet	132	0	75-SSInfonet	0X	0
86.2M 17M			10.7M 1.9M			6.9M 21M			91M 12.4M			50.7M 7.7M			0M 0M		
197-OmSaiAtharva	161	0	220-Omguru2	269	361	238-OmSaiBroadban	45	0	186-5NetKurla	116	0	69-Viraj3	13	0	59-Pragati Network	1	0
53.4M 8.8M			0M 0M			30.4M 1.6M			91.5M 7.8M			4.6M 1.3M			0.5M 0.1M		
198-BhiwandiCityCat	148	0	221-AhuraBroadband	396	0	239-Siddhivinayak	78	0	A50-Igate	0X	0	71-Spidernet2	23	0	45-Net9Online2	0X	0
0M 0M			78.9M 25.2M			7.9M 2.3M						18.9M 2.5M			0M 0M		
199-SuryaNet	588	2	222-OmGuruBroadb	106	10	240-ShreeNet9	184	6	214-Kinjal	160	24	70-K K Net	186	0	P3-Mikronet	204	0
0M 0M			25.2M 5.6M			93.8M 10.7M			60.8M 23.9M			110.2M 14.4M			73.6M 14.7M		
200-AirhantDharavi	65	0	223-DeepBroadband	107	0	241-SpiderNet	172	0	179-N S Ganesh	17	0	72-Swastik2	436	0	148-Dnet	12	0
12.4M 2.3M			27.8M 6.5M			62M 12.5M			0M 0M			106.5M 37.8M			2.5M 0.2M		
201-DolphinInfonet	100	21	224-SainetworkDines	17	0	242-UnityCableNetw	403	68	212-Arihant2	128	0	73-Ambika Net	10	1	91-BCNS	13	0
23.4M 6.5M			0.9M 0.1M			10.16M 38.3M			20.2M 7M			0.8M 0.2M			1.7M 0.5M		
202-ManishCable	72	11	225-GaneshMulticha	62	0	243-ReubenNetwork	27	0	180-Trinity	33	0	68-Suryanet2	363	0	177-Nbc3	343	0
14.7M 3.2M			23.5M 8.8M			7M 2.9M			5.5M 1M			67.9M 18.9M			102.4M 18M		
203-Spovernet	57	0	226-ShamsCableNet	160	20	244-SonaliInternet	510	0	178-StarVision	99	0	74-MyBroadband	3	0	9-Satellite Star	35	0
11.7M 3.9M			69.2M 28.2M			82.9M 50.1M			49.8M 9M			0.6M 0.2M			7.8M 2.7M		
204-Skywaves	89	0	227-Net9Online	591	5	245-Pd	10	0	213-Sainetservices	290	0	76-Weblink2	254	0	6-Qnet2	101	0
32.9M 20.6M			97.4M 45.7M			1.9M 4.8M			60M 16.2M			70.1M 7M			2.4M 3.3M		
206-InetMalabharhill	69	31	228-MawinEthernet	118	0	181-Viraj2	235	0	79-Spidernet3	31	0	77-Chitchat3	186	0			
22.6M 6.5M			41.1M 22.1M			73.5M 18.6M			25.9M 2.3M			94.9M 9.3M					
207-Gigabyte	25	6	229-BandwidthUnlimi	80	0	247-Weblink	425	0	191-NIS Dharavi	14	0	183-Rajeevvideo3	347	0			
3.8M 2M			12.9M 6.5M						1.9M 1M			108.8M 19.9M					
208-MMBSBhandup	68	0	230-GeminiTelecom	160	0	248-Chitchat	422	17	187-Surf Fast	22	0	78-Swastik3	95	0			
0M 0M			28.7M 36.7M			49.7M 43.1M			16.3M 2.2M			15.8M 11.5M					
209-Infonet	251	0	231-AjitStarCable	292	19	249-Qnet	390	23	192-Universal	166	0	246-Nbc2	461	0			
88.1M 23.5M			24.7M 26.7M			7.8M 31.3M			65.9M 14M			100.2M 29.7M					
210-InetChembur	47	0	232-KGN	4	0	250-ArihantMatunga	359	5	185-ArihantMahim	50	0	211-SSVBadlapur	291	0			
6.5M 7M			1.1M 0.1M			10.19M 26.9M			11.5M 1.9M			0M 0M					
215-Snet	26	0	233-SainetServicesB	422	0	251-Freyne	94	1	190-Rajeev2	322	0	85-ShreeGanesh2	42	0			
2M 0.2M			0M 0M			34.6M 8.9M			6.3M 27.1M			38M 2.3M					
216-VirajServices	246	0	234-ShreeGanesh	324	0	252-5NetWadala	93	11	189-Chitchat2	257	0	82-NBCKalyan	154	0			
67.4M 24.8M			24.7M 24.3M			19.1M 3.1M			86.1M 29.4M			47.3M 9.8M					

Online Users

Total Users

19067

4444M

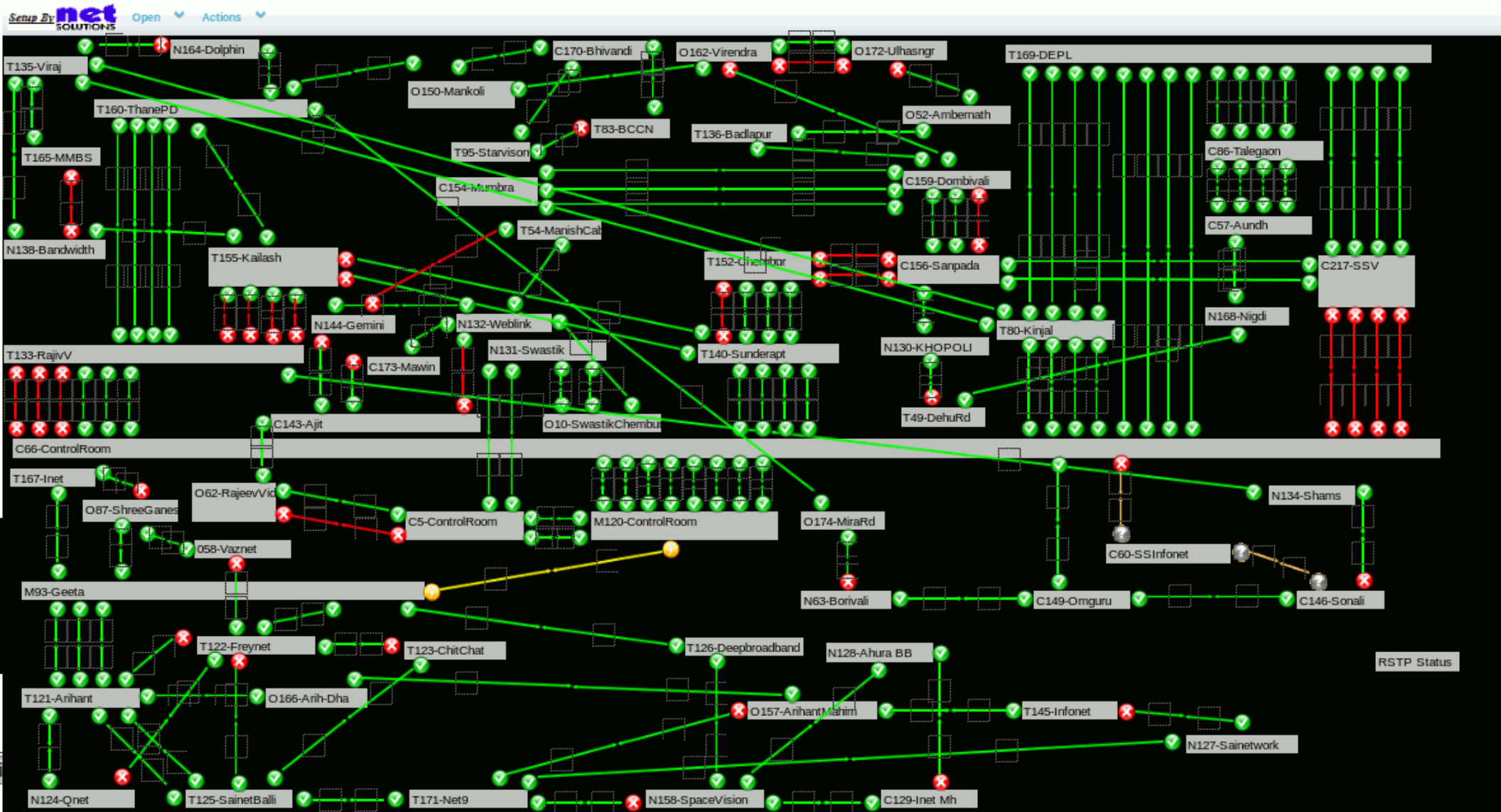
1291M

MikroTik NAS Details

- Total NAS 125
- Maximum Online Users 21000
- Total Internet Traffic 6 GBPS +
- No Buffering on all YouTube Video for all plans

Setup By net SOLUTIONS		Open	Actions
193-SSV Vashi	182 13	A18-Cbd2	33 0
55.3M 85M		52M 9M	
A3-CbdBelapur	123 149	182-SSV2	239 0
44.9M 95.9M		0M 0M	
A4-Kamothe	69 3	A19-Nerul2	104 5
10.4M 34.6M		2.6M 69.1M	
A5-Panvel	157 12	A20-Kamothe2	34 0
8M 83.6M		20.8M 10.3M	
A6-Seawood	3 0	A21-Sanpada2	56 1
0.1M 0.1M		45M 50.8M	
A7-Kharghar	225 13	A22-Airoli New	12 5
27.4M 95.3M		5.8M 0.7M	
A8-Kalamboli	42 0	A23-Ghansoli	12 0
63.1M 33.8M		5.9M 2M	
A9-Sanpada	56 0	A24-Panvel2	4 0
25M 36.1M		1.5M 0.1M	
A10-Koparkhairne	234 2		
43.1M 83.9M			
A11-Airoli	56 0		
24.1M 82.7M			
A12-Seawoods2	99 5		
63.6M 39.8M			
A13-Kharghar2	169 14		
6.5M 47.7M			
A14-Nerul	199 27		
99.2M 92.6M			
A15-Khanda	20 0		
28.4M 0M			
A16-Khanda2	23 0		
38.3M 5.2M			
A17-Turbhe	17 0		
24.2M 32.7M			

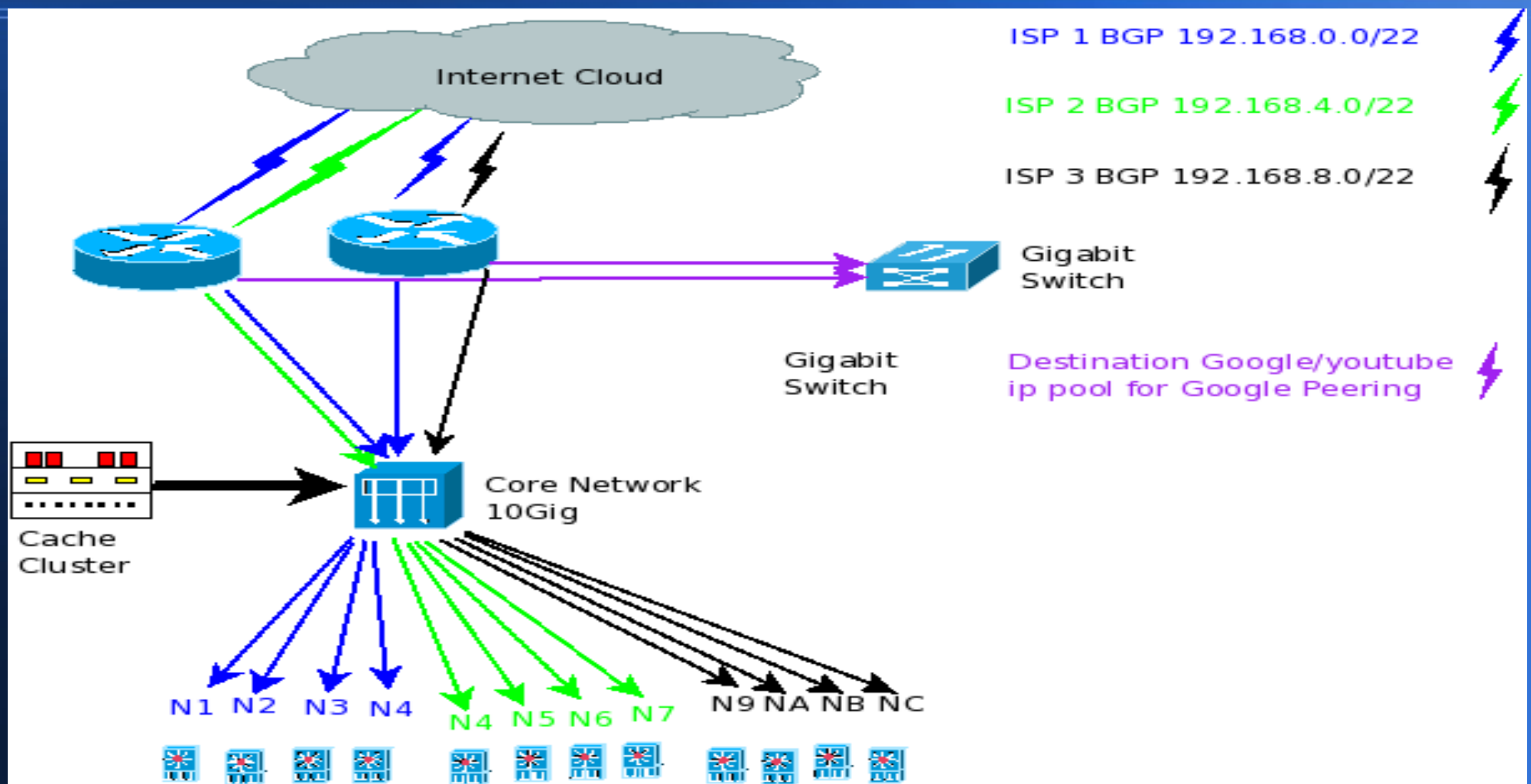
Redundant Backbone with Trunking



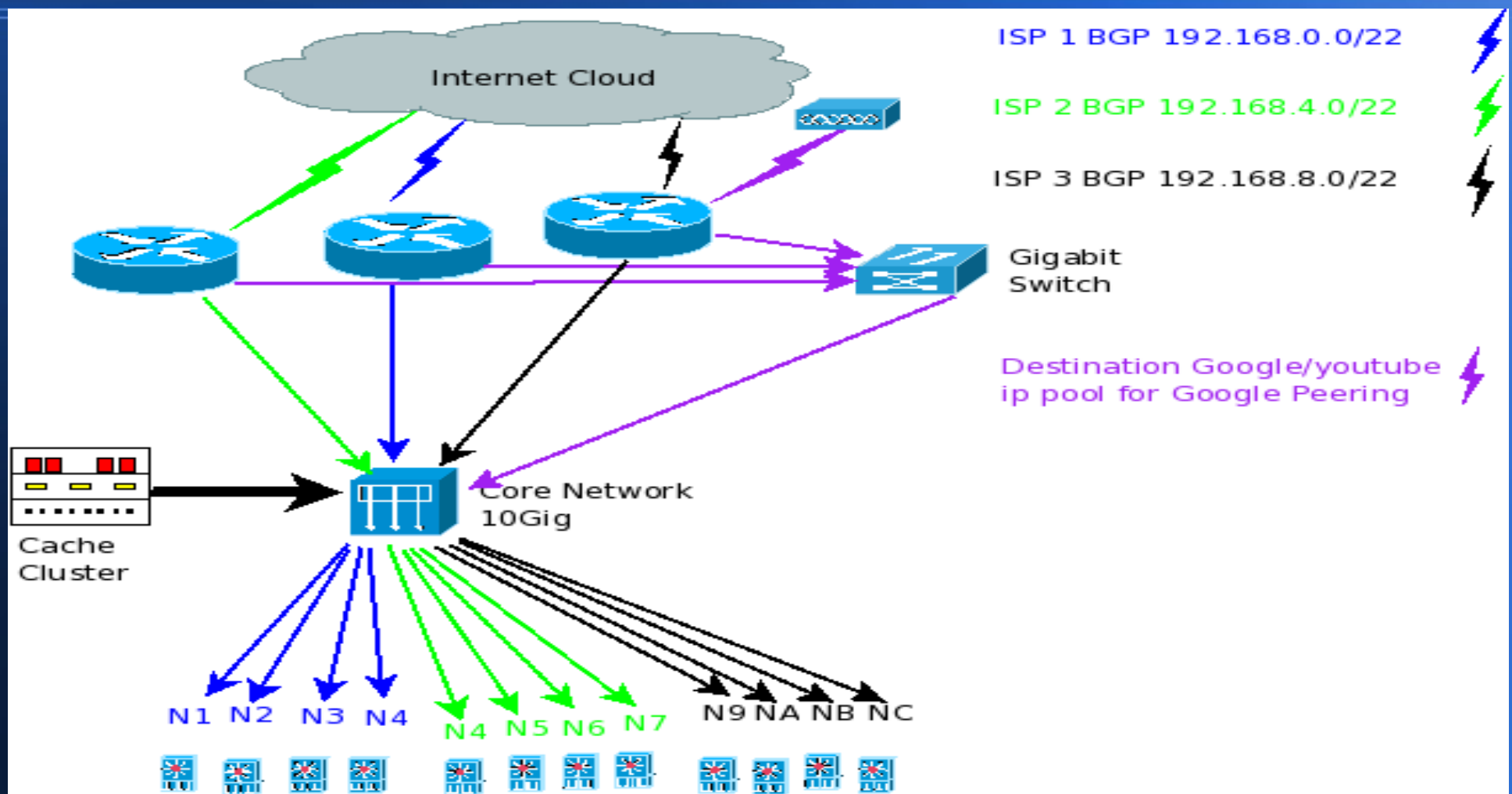
10 Gig Local 6 Gig Internet Traffic

- Gigabit Port Trunking on Switches for High Throughput upto 8 GBPS
- Intelligent Routing of Intranet Traffic
- Network Redundancy using rstp
- Remote Management of All Switches and NAS
- Network and NAS Monitoring using NMS
- SMS alert to respective managers for Link/NAS

Schematic Diagram 1



Current Setup Diag



Scalability

- Current Setup is can be scaled to 10 gig or more.
- Standby Router is kept for fail over
- Total Cost of ownership of this setup is just 5% of other options
- Existing Experience and knowledge on MikroTik is used for configuration and management.
- No dependancy on any proprietary hardware.

QUESTIONS

Thank You