



NANOOG and IPv6

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Agenda

- What is NANOOG?
- Recent IPv6 activities at NANOOG
 - Conference presentations
 - Mailing list discussion
- My thoughts on IPv6



What is NANOG?

North American Network
Operators' Group



History of NANOOG

- Pre-history: NSFNET and the commercial Internet
- Modern era: Evolution to a self-governing independent organization



NSFNET

- Research and Education
- Funded by the National Science Foundation
- NSFNET backbone
- Regional access networks
- “Regional-Techs” group



Commercial Transition

- Commercial backbones
- Internet Exchange Points
- NSF-funded transition
- 1994: Regional-Techs becomes NANOOG
 - Organized by Merit Network with NSF funding (at first)



NANOLOG Evolution

- 2005: Partial self-governance
 - Elected Steering Committee
 - SC selects Program and Mailing List Committees
- 2011: Transition to a standalone 501(c)3 nonprofit corporation
 - Elected Board of Directors
 - Full fiscal responsibility



Current status

- Independent 501 (c)3 nonprofit corporation
- Membership organization
- Elected board of directors
- Operational staff
- Committee volunteers



NANOLOG is not...

- A standards body
 - IETF does that
- A governance body
 - ICANN does that



NANOOG is...

- A forum for Internet operators to exchange technical information
 - Conferences (3 times per year)
 - Mailing list
 - Online resources
- “Collaborating to make the Internet better!”



Future Possibilities

- Expand educational offerings
- Best Common Practices
- Scholarships and outreach



Recent Presentations

- Tutorial: IPv6 Technology Overview
 - Byju Pularikkal, Cisco Systems, Inc
- Pushing the Limits, A Perspective on Router Architecture Challenges
 - Greg Hankins, Brocade
- The Impact of IPv4/IPv6 Interworking on Lawful Intercept
 - Yi Liu, AT&T



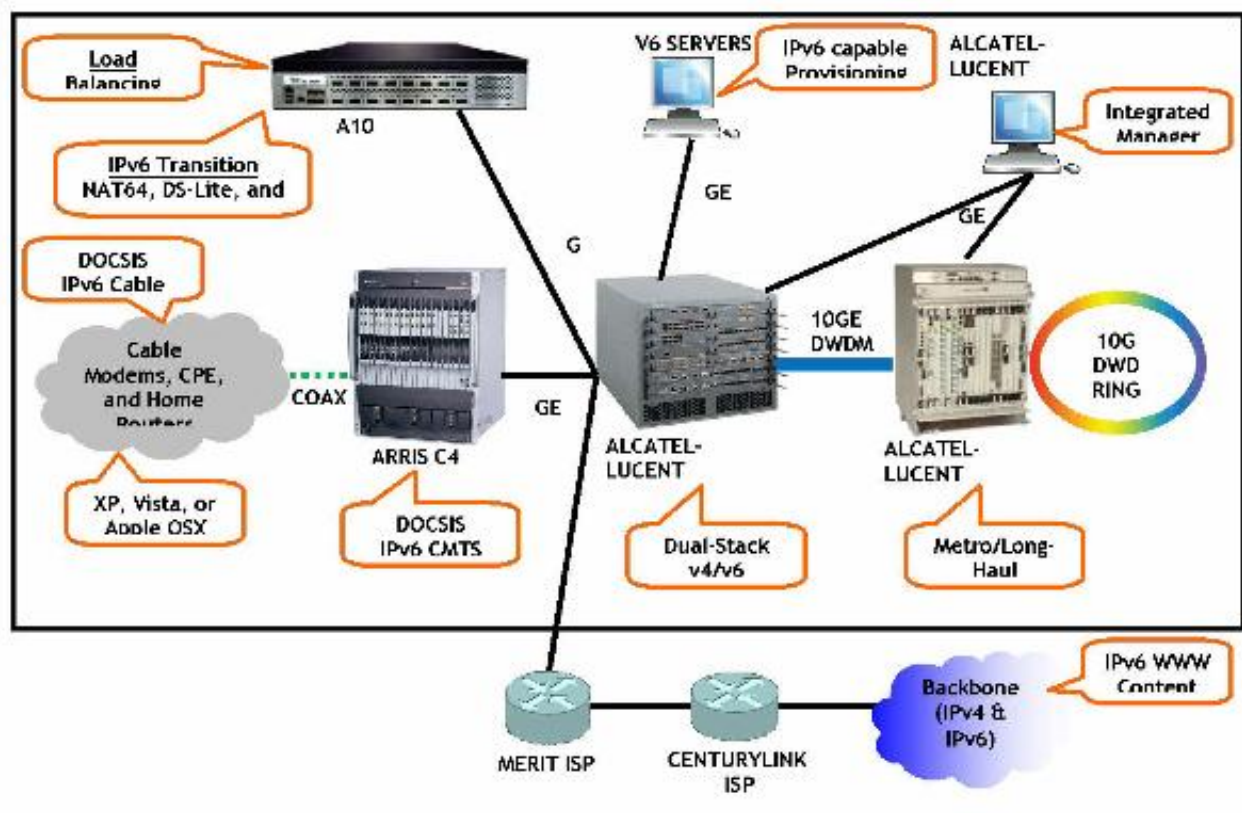
Recent Presentations (2)

- Keynote: A Progress Report on IPv4 Address Exhaustion
 - Geoff Huston, Chief Scientist, APNIC
- Economics of IPv4 Address Markets on IPv6 Deployment
 - Andrew Dul, Cascadeo Corp.
- Lightning Talk: IPv4 as MIMO Spectrum (Reliable Use of Probable Prefixes)
 - Todd Underwood, et. al.
 - See Todd's talk from NANOG49 first...



NOGLab

- IPv6 network demonstration
- Participants included:
 - A10 Networks
 - Alcatel-Lucent
 - Cisco
 - Comcast



Recent Email Topics

- “NAT444 or ?”
- “IPV6 over a PPTP Link”
- “Cisco 7600 PFC3B(XL) and IPv6 packets with fragmentation header”
- “F.ROOT-SERVERS.NET moved to Beijing?”

More Email...

- “Botnets buying up IPv4 address space”
- “using IPv6 address block across multiple locations”
- Lots of “<x> on IPv6 is broken”



One Person's Thoughts

- IPv4 space is almost gone
- Schemes to extend IPv4 useful life are complex and potentially unfair
- IPv6 is almost ready for prime time
 - But we need to help!

Remaining Problems

- Lack of CPE support
- Tunnels everywhere
 - Suboptimal routing
 - MTU problems
- Back-end software
- Middleboxes help, but...



How We Can Help

- Bug your providers and vendors
- Run a trial
 - Limited, manageable subset of your environment
 - Fix issues, then repeat
- Compare experiences
- Another IPv6 Day?



NANOG

Collaborating to make
the Internet better!

<http://www.nanog.org>