MFNERC Needs IPv6

Theo Baschak

Infrastructure Group

Overview

- The Internet is Critical to MFNERC daily operations.
- The Looming Problem: IPv4 Exhaustion
- Implications of IPv4 Exhaustion to MFNERC
- IPv6: The solution
- Risks Involved
- What will deploying IPv6 cost?
- Conclusion and Call for Action

Internet Criticality

- MFNERC is a Service Provider:
  - School Information System
  - Wapaskwa Virtual Collegiate
  - MFNEDU.org school email
  - Video Conferencing services
- Internet issues and outages now affect many internal and external staff, and students.
- E-mail communications also very important to the organization.
  - Example: Spam blacklisting noticed immmediately.

IPv4 Exhaustion

- IPv4 Exhaustion has been a topic for many years.
  - Already a reality in Europe and Asian IP networks.
  - ARIN hit 1x aggregate /8 left April 23.
  - ARIN was at 2x /8 when we started BGP process in Sept 2013.
- There will be a point very soon when no more IPv4 addresses are available.
  - Expected to be 2014 or 2015.
- IPv6 Planned, Tested, and Ready to roll much better place to be than caught with pants down
  - Big Bang implementations risky and costly

Org IP Needs

- MFNERC has 1x /24 allocated to it from ARIN.
  - 256 IP addresses (minus subnetting overhead)
- Currently using roughly 40 IP Addresses between Shaw, Commstream, and our BGP.
- More IP Addresses will be needed for VC Units, and other new MFNERC Services.
  - These all require Public IPs.

Solution: IPv6

- Base IPv6 specs defined in 1998, 15+ years ago now.
- Much larger address space:
  - IP version 4:
    - 32 bits
    - ex: 206.220.195.237
    - Smallest ARIN allocation: /24
    - LAN Subnet Size: /24
  - IP version 6:
    - 128 bits
    - ex: 2604:4280:d00d:202:8d45:516d:c5e0:ec67
    - Smallest ARIN allocation: /48
    - Enough for 65536 /64 Networks
    - LAN Subnet Size: /64

Risks

- Risks of Inaction:
  - Inability to connect to new IPv6 subscribers (students) and content
  - Optics: Falling behind the curve
  - Increased MFNERC network complexity with more NAT
- Risks of Action:
  - New unknown security risks with new unknown transport protocol
  - Introducing new protocol to network
  - v4/v6 feature parity not entirely there, some things won't be possible at this time

Deployment Costs

- Switches: IPv6 ready
- BGP Routers: IPv6 ready
- Firewalls: Cisco ASA: IPv6 ready, Watchguard: IPv6 ready
- OSs:
  - Windows 2008 R2: IPv6 ready
  - Windows 2012: IPv6 ready
  - Windows 7 SP1: IPv6 ready
  - Windows 8: IPv6 ready
  - Win XP: Being phased out rapidly within MFNERC already
- PBX: NOT IPv6 ready
- Phones: NOT IPv6 ready
- Address Space: $500 one time to ARIN, $100/yr to maintain

Conclusion

- I strongly encourage MFNERC to pursue IPv6 in 2014.
- Presentation source/download available at github