

# MFNERC Needs IPv6

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# 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 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 immediately.

# 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 Subject 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](#)