

IPv6 Applications



Engineering Workshops

Security Considerations

- Sit down and think, “What do I do for IPv4?”
 - Go through your best security practices
 - Create campus/department best security practices if necessary
 - Check off each practice for IPv6 as well as IPv4
- Most Host OS implementations have IPv6 on by default
- Firewalls (host or router)
 - Do they support IPv6?
 - Are they on for IPv6 by default?
 - Mimic rules for IPv6!!!
- Know your services!
 - Scan all hosts and routers for IPv6 services
 - Nmap supports IPv6 – does NOT support subnet sweeps for IPv6 (approx. 28 years+ for 1 subnet)

Security Considerations (continued)

- Check status of IPv6 support for your security tools
 - Use netflow9 for IPv6 flow support on Cisco
 - IDS/IPS support?
 - Firewall support?
 - Vulnerability scanner support?
 - Etc.
- Don't allow mission critical areas to bring up IPv6 without audit/scan of devices by security group
 - Human Resources department
 - Credit Card depart
 - HIPAA, FERPA, etc.

Security Considerations (continued)

- Watch out for router/application Access Control Lists and various IPv6 address types
 - IPv6 Mapped addresses can cause problems if application uses them and you don't allow them
 - IPv6 Multicast groups are necessary for basic network connectivity
 - Routers will use link-local addresses for routing
- Be careful with stateless autoconfig
 - Hosts are “live” on the net with no administrative interaction

Security Considerations (continued)

- Automatic IPv6 tunneling can enable hosts to be on IPv6 network without realizing it
 - Can also skew traffic delay results
- Prevent hosts on your networks from spoofing IPv6 addresses
 - Use access lists
 - Or, on Cisco platforms that support it, use `ipv6 verify unicast reverse-path`
- IPSec inherent to IPv6
- IPv6 Security Threats whitepaper - <http://www.seanconvery.com/v6-v4-threats.pdf>

Operating Systems - Windows

- Windows XP – Supported since initial release
 - Type “ipv6 install” on XP (no service pack)
 - Type “**netsh interface ipv6 install**” for SP1 or SP2 or use control panel to add network protocol
- Advanced Networking Service Pack adds support for Teredo
- Web browser IPv6-enabled
- 6to4, ISOTAP and Teredo supported
- www.microsoft.com/ipv6/

Operating Systems - Windows

- IPv6 is on by default in Windows Vista, and will be supported across all Microsoft products eventually
 - Active DNS supports AAAA but not transport
 - Office does not support IPv6 yet
 - Exchange and SQL should in next versions
- Firewall in Windows 2003 server with SP1 supports IPv6
- Firewall in Windows XP with SP2 supports IPv6
- Ping, tracert, telnet, ftp, netstat and netsh commands all support IPv6
- In Windows Vista, some P2P and/or collaboration tools are IPv6-only
 - If the two hosts communicating with these tools don't have native IPv6 connectivity, the IPv6 traffic will be encapsulated in tunnels

Operating Systems – MacOS X

- IPv6 is enabled by default on all interfaces, and can be manually configured through the Network Preferences panel
- 6to4 can be configured, and will track IPv4 address changes
- The Security panel configures both v4 and v6 firewalls (ipfw and ip6fw)

Operating Systems – MacOS X

- IPv6 support has been added for:
 - AppleShare
 - ssh and sshd
 - ftp and ftpd
 - Safari (uses v6 for sites without v4 addresses)
 - DNS queries
 - multicast DNS
 - many other system utilities (telnet, ping, traceroute, syslog, xinetd, etc.)

Operating Systems - Linux

- www.linux-ipv6.org – USAGI Project (WIDE)
- www.tldp.org/HOWTO/Linux+IPv6-HOWTO/
- www.deepspace6.net – "the Linux IPv6 Portal"
- Most major open source applications support IPv6
 - Red Hat / Fedora enable IPv6 by default but do NOT install ip6tables by default!
- Debian IPv6 Developer's List:
<http://lists.debian.org/debian-ipv6/>

Operating Systems - UNIX

- www.kame.net – WIDE's FreeBSD IPv6 site
- www.sun.com/software/solaris/ipv6/ — IPv6 is standard in Solaris since version 8

IPv6-ready hardware and software

- www.ipv6ready.org
 - Focuses mostly on routers, network equipment and operating systems at present
 - Includes participation by WIDE, IPv6 Forum, University of New Hampshire Interoperability Lab
- www.ipv6-to-standard.org
- Presentations by Ron Broersma of DREN
 - <http://events.internet2.edu/speakers/speakers.php?go=people&id=1141>

DVTS

- DVTS – Digital Video Transport System

www.sfc.wide.ad.jp/DVTS/

www.dvts.jp

A product of the WIDE Project, DVTS is openly available software which encapsulates DV video in IPv4 or IPv6 packets.

- Supports IPv4 and IPv6 Multicast

OpenH323 Project

- Aims to create a full featured, interoperable, Open Source implementation of the ITU-T H.323 teleconferencing protocol that can be used by personal developers and commercial users without charge.
- Includes “OpenMCU”
- www.openh323.org
- Supports IPv4 and IPv6

6Voice

- www.telscom.ch/6voice/
- “Basically 6Voice, means that Voice can be transmitted over IPv6 network, rather than the familiar public switched telephone network. This Package has SIP and RTP implementation.”

Apache v.2

- IPv6 support built-in (no patches or other modifications needed)

Traffic: the NNTP Experiment

- IPv6 addresses show up explicitly in three configuration files:
 - incoming.conf - who can transfer articles to you
 - innfeed.conf - where you are feeding articles
 - readers.conf - who can read/post from your server

All work the way you'd expect, and can accept either host names or IPv6 colon-formatted addresses (if you use colon-formatted raw addresses, enclose them in double quotes due to the use of colons as punctuation in the innfeed.conf file).

Resources

- <http://www.ipv6book.ca>
- <http://www.ipv6book.ca/allocation.html>
- <http://ipv6gate.sixxs.net>
- <http://www.sixxs.net>
- <http://www.ipv6forum.com>
- <http://www.ipv6tf.org>
- <http://go6.net>
- <http://www.hexago.com>

Contacts

Internet2 IPv6 Working Group

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