IPv6

March 17, 2011

Addresses

- IPv4: 2^{32}
  - But, can't allocate all due to routing table size considerations
  - Last blocks allocated by IANA, the Internet Assigned Number Authority, the “top level” allocator of IP addresses, in February 2011 (LAST MONTH)
- IPv6: 2^{128}
  - That's 2^{96} times as many!
  - Not necessarily allocated as efficiently as IPv4; does this matter?

Other IPv6 changes

- Format of packets
- Mandatory support for encryption
- Mandatory support for mobility
- In theory should eliminate need for “NAT”, meaning every network interface should have a globally routable address
- Others

Implications

- Although IANA allocated the last IPv4 addresses to the five regions, it will be a little while until they have allocated all their addresses to ISPs and and then ISPs have allocated all their addresses to customers
- But soon (12-24 months) some customers will receive ONLY IPv6 ADDRESSES
  - Their servers will only be reachable via IPv6
  - Their clients will only reach servers via IPv6

Required changes

- Packet forwarding – enabling all routers between you and the IPv6 destination
  - Possible workaround: tunneling
- IP Address Assignment – IPv6 address to host
  - DHCPv6, or automatic address assignment
- DNS (Domain Name System) servers
  - Must provide IPv6 (AAAA) addresses
- Applications
  - Must be updated to handle 128-bit IPv6 addresses

Affect on researchers

- Need to get new versions of the externally supplied programs we use to access the network
- Need to update any programs we write that access the network
- Need to revise any application level protocol definition documents that might include a discussion of addresses

World IPv6 Day

- June 8, 2011
- Sponsored by the Internet Society
- IPv6 Day FAQ
- Several major sites will enable IPv6 access
  - If you are on an Ipv6 enabled machine, it may attempt to connect via IPv6 to that site
  - If a router between you and the site does not forward IPv6 packets, you will not be able to reach the site

UNB Readiness

- Information that I know; not all verified
- CANARIE is providing IPv6 support
- Commercial supplier, e. g. Bell/Aliant: can be done
- UNB ITS: under development; expect testing over the next several months
- UNB CS: can't support without hardware upgrade of it's main router

Other references

- IPv6 Portal
- CANARIE announcement May 11, 2010