IPv6 Renumbering

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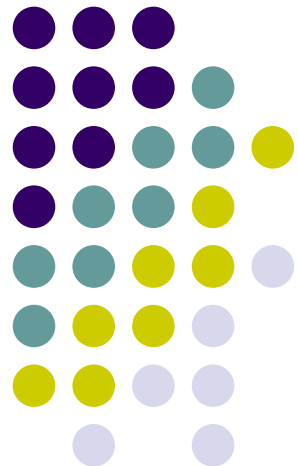
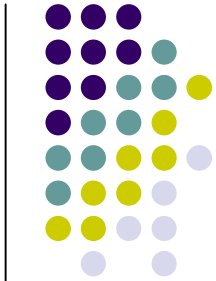
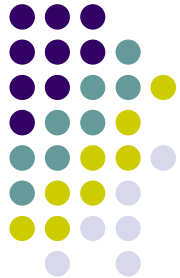


Why is IPv6 and renumbering an issue?



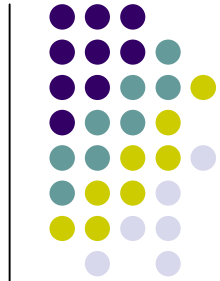
- An issue for IPv4 as well, but some unique issues regarding IPv6
- Only IPv6 Provider Assigned addresses
  - No PI addresses (at least not yet…)
  - There is a proposal to ARIN suggesting that anyone qualifying for an ASN can get PI addresses
- No IPv6 NAT
  - Using IPv4 and NAT a site can change providers and their external globally unique addresses while keeping the internal private addresses

What can we do about it?



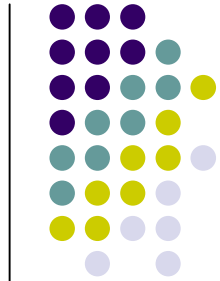
- Don’t expect renumbering to ever become trivial or automatic
- But perhaps we can make it simpler
- Trying to find places where renumbering issues are likely to occur
- There might be ways to write applications and performing network and system administration tasks that make renumbering easier

Addressing guidelines



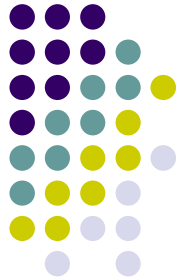
- Customers should always get the same prefix size independent of ISP (/48)
  - This makes it easier to switch provider
- Customers should get a static prefix
  - This means they don’t need to renumber while staying with the same ISP
  - This has an impact on the size of the prefix the provider needs
- Use of ULAs internally at a site might help preserve internal communications while renumbering
  - Do we want ULA to be used by sites connected to the Internet?
  - Some of the application problems with site local addresses coming back?

Other guidelines



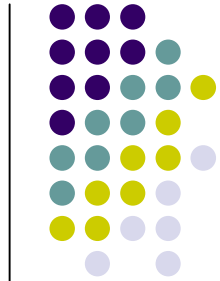
- Use DNS for lookups rather than literal addresses (for apps and admins)
- Apps should not inappropriately cache DNS lookups
- Also issues with resolver libraries (e.g. NSCD on Solaris/Linux) caching results, and also not coping with DNS server address changes
- Use syntactic tricks in configs, such as symbolic prefix names (e.g. in ACLs, router configs)
  - Use new (or both?) when prefix update received by RA, DHCP-PD or even manually asserted
- This boils down to using symbols (e.g. FQDNs, symbolic names etc, rather than literal addresses)

Some related work



- Procedures for Renumbering an IPv6 Network without a Flag Day
  - draft-ietf-v6ops-renumbering-procedure-05, in RFC Editor Queue, RFC soon
- Things to think about when Renumbering an IPv6 network
  - draft-chown-v6ops-renumber-thinkabout-01
- IETF PIER (Procedures for Internet Enterprise Renumbering) WG worked on IPv4 renumbering (RFC 1916, 2071, 2072)
- IPv6 Prefix Options for DHCPv6, RFC 3633
- Router Renumbering for IPv6, RFC 2894
  - Not aware of any implementations
- That one can have multiple IPv6 addresses (and prefixes) for an interface helps (e.g. no flag day)
  - Multihomed during renumbering
- Some tests done by 6NET project
  - Some problems found. E.g. not all stacks successfully handles deprecation and expiry of old prefixes to give smooth transition to new prefix

What are your experiences?



- Have any of you renumbered your network or had customers doing so?
  - Many of us have renumbered from 6bone to production (or 6to4 to native)
  - What did you learn?
  - This is probably easier for provider networks than end sites
- We would like some feedback
- What are your thoughts?

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