Problem Statement for Renumbering IPv6 Hosts with Static Addresses

draft-carpenter-6renum-static-problem-00

Brian Carpenter
Sheng Jiang

November 2011
Reasons for static addresses

- Other hosts need to be configured with a literal numeric address for the host.
- Avoid issues of address lifetime and DNS TTL for servers.
- Virtual server farms require static addressing.
- Asset management and security incident tracking.
- Software licensing.
- Network element config files.
Static Addresses Imply Static Prefixes

- If servers have static addresses, the subnet prefix needs to be static too.
- Note that HOMENET is challenging this model. Will the same pressure to automated prefix delegation arise in enterprise networks?
Analysis (summary 1)

- Other hosts need to be configured with a literal numeric address for the host.
  - This will arise in smaller networks, e.g. for printers
  - Could be addressed in IPv6 by putting such devices under a ULA prefix, where static is OK

- Lifetime issues for servers
  - To be compatible with RFC 4192 renumbering, we must be able to handle address deprecation and DNS TTL expiry correctly. That seems to require a change of habits, numbering servers with stateful DHCPv6 and using DDNS.
  - Then addresses can be static until we need to change them 😊
Analysis (summary 2)

- **Static Virtual Machine Addresses**
  - This is an extension of the previous case – address stability is needed so that VMs can be migrated to a different physical server.
  - But the conclusion is the same – even VM addresses need to be managed by a stateful procedure (can this be vanilla DHCPv6?)

- **Asset Management and Security Tracing**
  - This creates the same situation for user machines as described above for servers. Again, stateful DHCPv6 and DDNS seem to allow an RFC 4192 procedure.
Analysis (summary 3)

- **Software licensing**
  - Since posting the draft, we have learned that software licensing based on IP addresses or prefixes is still quite widely used.
  - No easy answer. In an RFC 4192 procedure, the licenses for the old and new prefix would have to overlap.

- **Network Elements**
  - Router interfaces are quite commonly numbered statically in config files, Pearl scripts or whatever…
  - Even if these cannot be changed to an automated method, manual procedures would have to carefully follow the RFC 4192 method.
Issues

- Impossible to completely avoid static addresses
  - But if a prefix changes, static addresses also need to be changed
- Static normally implies manual. In that case, fully automatic renumbering is impossible.
  - Or can static addresses be configured centrally?
  - But that will still not cover software licensing.
- Are static subnet prefixes unavoidable?
  - Or can Homenet-like prefix mechanisms be applied in enterprise networks?
Questions?

- Any major topics missed?
- Can we make useful recommendations?
- Does 6renum want to work on this document?