Analysis of Centrally-Assigned ULAs

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Goals of Draft/Presentation

- Understand current state of ULAs
  - Locally-assigned and centrally-assigned
- Discuss need for centrally-assigned ULAs (ULA-Cs
- Discuss costs of defining ULA-Cs
- Understand arguments for and against
- Reach WG consensus on whether or not we should define a centrally-assigned class of ULAs

Non-Goals of Draft/Presentation

- NOT to discuss the details of a specific ULA-C proposal

- NOT to adopt a specific ULA-C proposal as a WG draft

- Those steps may follow IFF we reach consensus that we should define some type of centrally-assigned ULAs

Current Status of ULAs

- ULAs are defined in RFC 4193
  - Defines concept of Unique Local Addresses (ULAs)
  - States the properties of these addresses
    - That they are local addresses, may not be globally routable
  - Allocates FC00::/7 for these addresses
  - Defines a local allocation method for half of the ULA address space (FD00::/8)
    - Based on local random number generation
  - States that the other half of the address space (FC00::/8) is reserved for ULAs that use "another assignment method"

Specific Benefits of ULA-Cs

- Greater assurance of uniqueness
  - May be important when private networks span many enterprises, each of which may use ULAs for other private networks
- Accountability
  - If conflict arises, an enterprise administrator can prove that his/he enterprise has a right to use the prefix
  - Makes it possible to find the source of local traffic that is leaking out of its local boundaries
- Reverse DNS
  - Centrally-assigned ULAs could be included in the Reverse DNS
  - Needed to work with "security" features of some protocols/applications
  - Especially important in multi-enterprise case, where use of a consistent "two-faced" DNS is difficult

Costs of ULA-Cs

- Address space consumption
  - ULA-Cs would use the other half of the ULA address space (FC00://8)
  - This would not reduce the number of general purpose IPv6 addresses, as these addresses have already been allocated for ULAs
- New type of address registration
  - Set-up and administration would consume some resources from the Internet community
    - What resources would depend on how these addresses are allocated, which is specific to ULA-C proposals
    - Costs might be offset by fees for ULA-C registration

Other Concerns about ULA-Cs

- Given that ULA-Cs have several benefits and minimal costs, why haven't we already defined them?

- Several other issues have been raised regarding these addresses…

Lack of Value

- Arguments that benefits do not justify additional complexity/costs
- Belief that centrally-assigned ULAs will have no real benefits for enterprise applications over locally-assigned ones
  - Enterprise administrators may not understand level of uniqueness provided by random number generation?

- Counter argument: See previous statement of benefits

Wrong Way to Influence Policy

- Innapropriate
  - Address prefixes should not be tied to specific registry policies (se
    architectural argument on next slide)
  - If the community wants these addresses, registry policies could be
    updated to allow these allocations from regular IPv6 address spac
    - No guarantee that any registry-allocated address space will be global
      routable, so how are these addresses different?
- Ineffective
  - No direct connection between publication of an RFC and
    implementation of an address registration service
  - Better to publish an RFC stating needs, rather than solution?
- Based on assumption that ULA-Cs would be allocated by
  current IPv6 address registries

Architecturally Flawed

- Argument that associating routing behaviour with specific address prefixes is architecturally unsound
  - For example, see issues with IPv4 240/8 space
- Note, though, that the routing properties of the full FC00::/7 space have already been defined in RFC 4193, so definition of ULA-Cs would not change that

May Be Used as Global PI Prefix

- Concerns have been raised that ULA-Cs may be used as globally-routable PI prefixes
  - Because they are not allocated on a per-provider basis, may result in individual enterprise routing in the Internet routing tables
  - May become similar to IPv4 "swamp space"
- Would also apply to PI allocation of regular address space for local networks
- Registries are already assigning PI addresses to enterprises in some cases

Enables IPv6 NAT

- Concerns have been expressed that these addresses could be used behind an IPv6 NAT
- However, centrally-assigned ULAs do not have an advantages for use behind NATs that are not already present in locally-assigned ULAs

Questions for WG

- Do we think that some type of centrally-assigned ULAs should be available?
  - Do the benefits outweigh the costs?
- If so, do we think that these addresses should be defined in the IETF?
  - As opposed to just stating the requirement in a communication to the registry community? Other choices?

- Until we answer these questions, it doesn't make sense to argue about the details of a specific proposal