IPv6 Unique Local Addresses
Update on IETF Activity

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Objectives

• Define a Private / Local Scope Use IPv6 address pool
  • Use in context of:
    • Addressing for isolated networks
    • Persistent local-context addresses (independent of provider-based addresses)
    • VPN-styled interconnection of local network contexts
Site Locals and IPv6

• But wasn’t this Site Local Addresses in IPv6?
  • Shortcomings of site locals – see RFC 3879
  • Proposal of a “better alternative” to site local address prefix
    • Retain: Simple, stable and “private”
    • Remove: Explicit scope declaration
    • Add: Non-ambiguous addresses
Unique Local Addresses

• “Local” Use instead of “Global “ Use
  • Private addresses in terms of routing scope
  • Global addresses in terms of uniqueness

• Attributes:
  • Single address pool subdivided into /48 prefixes
  • Each prefix is intended to be unique
  • Not intended to be globally routed
    • Easily filtered at network “edges”
  • Is intended to be locally routed in context of various forms of private use
  • No hierarchical super-structure
  • Not aggregatable
  • Not provider-based addresses
IPv6 ULA Address structure

ULA Assignment  "Global" ID  Subnet ID  Interface ID
Prefix Type

FC00::/7
ULA Addresses

• Two Address Pools:

  • Locally Defined Addresses: FD00::/8
    • Assignment type = 1
    • Self selection of a /48 prefix
    • No coordinated registration records maintained
    • No global AAAA or PTR DNS records

  • Centrally Assigned Addresses: FC00::/8
    • Assignment type = 0
    • Defined as a set of prefixes to be assigned by a common registry function
    • Uniquely assigned address prefixes
    • May be in the global DNS, but not in the global IPv6 routing table
    • Current status appears to be dormant within the IETF IPv6 Working Group
Locally-Assigned Local addresses

draft-ietf-ipv6-unique-local-addr-09.txt

Approved by IESG – in RFC Editor Queue

• Specification of the unique* local address structure
• Specification of the common selection prefix: FD00::/8
• Suggested random self-selection of the unique* 40 bit identifier:
  trunc(SHA-1(local time . local EUI-64), 40bit)
• Address selection algorithm inferred as local preferred over global
• Not to be added into the Global DNS
  • Requires split horizon (two-faced) DNS
  • May also require non-authoritative synthesis of PTR records for local
    addresses
• Caveats about leakage into the public global routing tables

* almost unique!
Centrally-Assigned Local addresses

draft-ietf-ipv6-ula-central-01.txt
IETF IPv6 Working Group draft – currently dormant

• Specification of centrally-allocated unique local addresses
• Specification of the common address prefix: FC00::/8
• Central Allocation Registry:
  • Available to anyone in an unbiased manner
  • Permanent with no periodic fees
  • Allocation on a permanent basis, without any need for renewal and without any procedure for de-allocation
  • Provide mechanisms that prevent hoarding of these allocations
  • The ownership of each individual allocation should be private, but should be escrowed
• May be entered in the global DNS
• “Inadviseable” to route in a public context
Some Related Questions

• How can leakage of ULA prefixes in the global routing table be prevented?
• How can leakage of locally assigned prefixes in the DNS be prevented?
• Is this a surrogate mechanism for the distribution of IPv6 unicast address prefixes?
• Is assured uniqueness important?
• Are these prefixes useable in the context of an IPv6 identity space?
• What is the problem space that such addresses are intended to solve?
Thank you

Comments?