IPv6 Unique Local Addresses
Update on IETF Activity

ARIN Public Policy Meeting

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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)
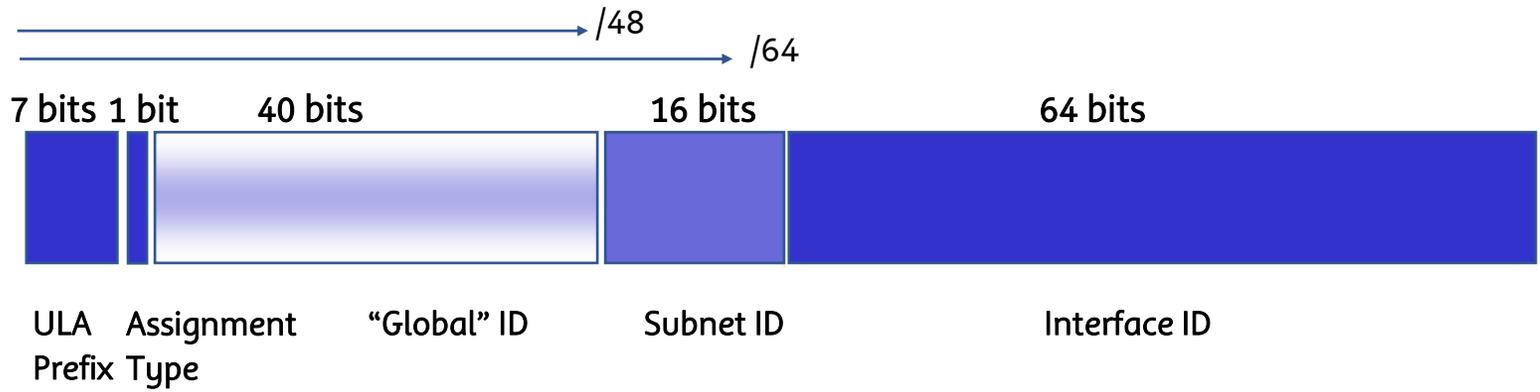   - VPN-styled interconnection of local network contexts

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
  - <u>Private</u> addresses in terms of routing scope
  - <u>Global</u> 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

/48

/64

7 bits	1 bit	40 bits	16 bits	64 bits

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

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 in to 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

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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?