IPv6 Unique Local Addresses
Report on IETF Activity

Policy SIG
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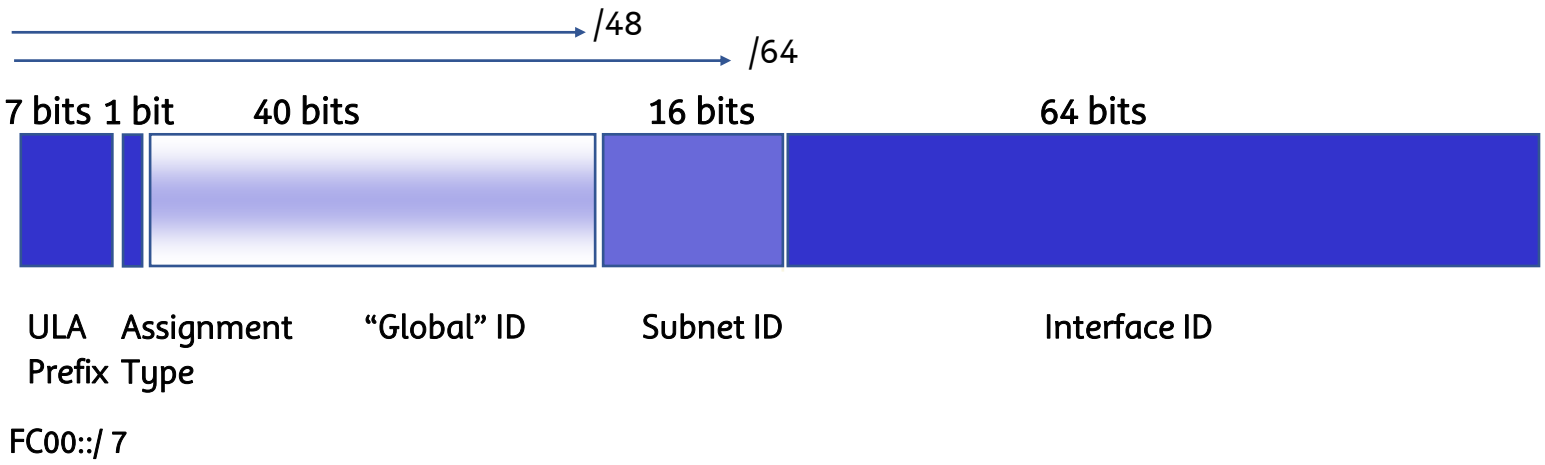
Unique Local Addresses

- "Local" Use instead of "Global " Use
  - Private addresses in terms of uniqueness
  - Global addresses in terms of uniqueness
- Objectives
  - Single address pool subdivided into /48 prefixes
  - Each prefix to be globally unique
    - or "probably" unique
  - Not intended to be globally routed
    - Easily filtered at 'edges'
  - Is intended to be locally routed in context of various forms of private use
  - No hierarchical structure
  - No provider addresses

ULA pools

- Two address pools
  - Local self-assigned ULA prefixes
  - Centrally assigned ULA prefixes
- Why Two?
  - Local FD00::/8
    - Self selection of a prefix
    - No coordinated registration records maintained
    - Probably unique, but not definitely unique
  - Central FC00::/8
    - Prefixes assigned by a registry function
    - Registration records are maintained
    - Globally unique prefixes

IPv6 ULA Address structure



Locally assigned local addresses

draft-ietf-ipv6-unique-local-addr-05.txt

- Specification of the unique local address structure
- Specification of the self-selection prefix: FD00::/8
- Random self-selection of the unique* 40 bit identifier:
  trunc(MD5(local time . local EUI-64), 40bit)
- Intended to overlay provider (global) ID, with each numbered entity having common low 80bits (subnet ID, Interface ID)
- Address selection algorithm inferred as local preferred over global
- Requires split horizon (two-faced) DNS
- May also require non-authoritative synthesis of PTR records for local addresses

* almost unique!

Centrally assigned local addresses

draft-ietf-ipv6-ula-central-00.txt

- Specification of centrally-allocated unique local addresses
- Specification of the centrally managed prefix: Fc00::/8
- Attributes of the 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.*
- Random selection of a unique global prefix

Open issues with ULAs and IPv6

- This effort poses a number of followup questions in the context of the IPv6 architecture, including:
  - How could ‘leakage’ of ULA prefixes into the global routing table be prevented?
  - Why is prevention of such leakages an important objective?
  - Is this destined to become a surrogate mechanism for distribution of IPv6 unicast prefixes?
  - How does host-based address selection work for multi-addressed hosts?
  - How does a two-faced DNS server know when to provide responses that include local address values?
  - Should local addresses be used by preference?
  - Should local addresses be used at all when global addresses exist?
  - Is this yet another attempt to re-run the 8+8 architecture?
  - Are these prefixes the seed of a IPv6 identity space?

Thank you!

- Questions