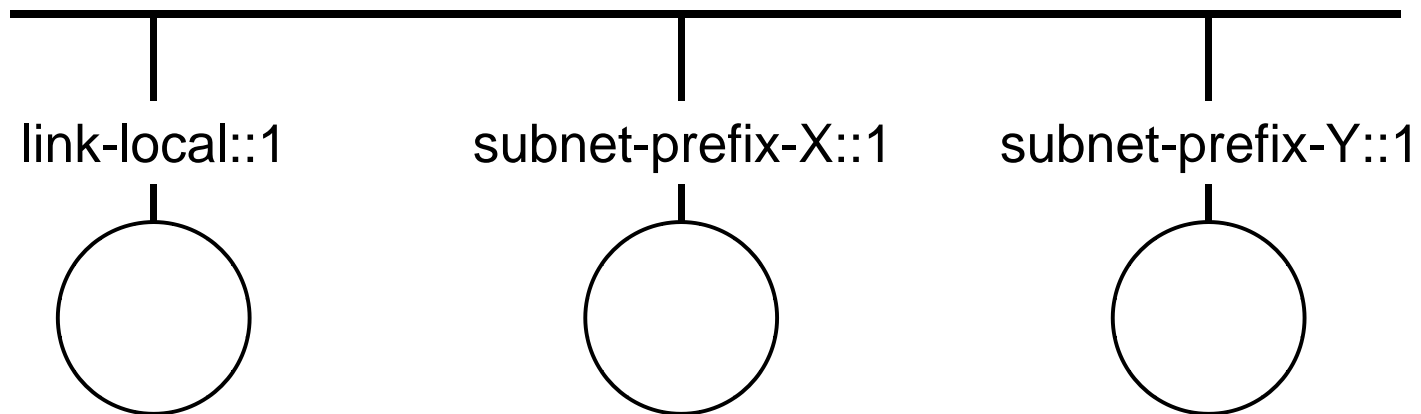# Uniqueness Properties of Interface Identifiers (IIDs); and DAD vs. DnD

IPv6 address architecture spec (RFC 2373, draft-ietf-ipngwg-addr-arch-v3-08.txt) says that IIDs of unicast addresses must be unique on a link, independent of subnet prefix

i.e., this is illegal:

link-local::1   subnet-prefix-X::1   subnet-prefix-Y::1

Pros / Cons

- the alternative would be to require only that unicast addresses be unique on a link, so previous example would become "legal"

- advantages of current requirement:
  - if DAD succeeds on link-local address, can omit doing DAD on other addresses with same IID => less overhead on link
  - when managing/diagnosing networks, convenient to have each IID identify a different node, regardless of prefix

- disadvantages of current requirement :
  - more restrictive than necessary for "correctness"
  - misunderstanding of requirement has lead to inconsistency in our specs

Document Inconsistencies

- Addr Arch (RFC 2373) requires uniqueness of unicast IIDs

- Stateless Addr Conf (RFC 2462) allows DAD on link-local alone, <u>but only for statelessly autoconf'ed IIDs</u>

- Temporary/Privacy Addr spec (RFC 3041) requires DAD only for generated (global) addrs

- DHCPv6 draft spec doesn't say anything about uniqueness requirements of assigned IIDs (?)

Issues to Resolve

- what do we want the uniqueness properties to be?

- what do we want to "enforce" via DAD (or DIID), which may be different than what we require?

- what document changes are needed to clean this up?

- what implementation changes are needed to clean this up?

One Proposal from the Chairs

omit DAD for any address containing an IID derived from IEEE 802 or EUI-64 MAC, or generated at random al la RFC 3041

- probability for collision is already very low
  - yes, probability is non-zero, but DAD isn't 100% reliable anyway
- in our opinion, main reason for DAD is to defend against duplicates from manual configuration or small DHCP pools

Consequences of Proposal

- would require text updates to:
  - stateless addr conf
  - privacy addr spec
  - basic addr arch (maybe, depends on choice of uniqueness model)
  - DHCPv6 spec?

  but, doesn't require any implementation changes

- would eliminate delay and overhead of DAD on links where IEEE-802/EUI-64 derived addresses or random addresses are used

Discussion?