draft-ppsenak-lsr-igp-ureach-prefix-announce

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Overview

• Summarization becomes reality as IGP networks scale to larger numbers
  • SRv6 allows summarization

• Summarization results in suppression of the individual prefix state
  • useful for triggering fast-convergence mechanisms outside of the IGPs - e.g., BGP PIC Edge, etc.

• Draft describes how the use of existing protocol mechanisms can be used to announce the prefix unreachability
  • To preserve BGP PIC functionality – detection of the egress PE becoming unreachable

• Backward compatible solution - no new protocol extension defined

• Draft defines a new “purpose” for advertising unreachable prefix
  • Unreachable Prefix Announcement (UPA)
Unreachable Prefix Announcement (ISIS)

- RFC5305
  - "If a prefix is advertised with a metric larger than MAX_PATH_METRIC (0xFE000000, see paragraph 3.0), this prefix MUST NOT be considered during the normal SPF computation. This allows advertisement of a prefix for purposes other than building the normal IP routing table."

- RFC5308
  - "...if a prefix is advertised with a metric larger than MAX_V6_PATH_METRIC (0xFE000000), this prefix MUST NOT be considered during the normal Shortest Path First (SPF) computation. This will allow advertisement of a prefix for purposes other than building the normal IPv6 routing table."
Unreachable Prefix Announcement (ISIS)

• Existing nodes in a network which receive UPA advertisements will ignore them. This allows flooding of such advertisements to occur without the need to upgrade all nodes in a network.

• Recognition of the advertisement as UPA is only required on routers which have a use case for this information.
  • Configurable

• L1/L2 routers which would be responsible for propagating UPA advertisements into other areas would need to recognize such advertisements.

• A specific metric value in (0xFE000000, 0xFFFFFFFF) can be bound to the UPA functionality.
  • Configurable
Unreachable Prefix Announcement (OSPF)

• RFC2328
  • LSInfinity The metric value indicating that the destination described by an LSA is unreachable. Used in summary-LSAs and AS- external-LSAs as an alternative to premature aging (see Section 14.1). It is defined to be the 24-bit binary value of all ones: 0xffffffff.

• RFC5340
  • "Architectural constants for the OSPF protocol are defined in Appendix B of OSPFv2."
  • indicating that these same constants are applicable to OSPFv3.
Unreachable Prefix Announcement (OSPF)

• Existing nodes in a network which receive UPA advertisements will propagate it following existing standard procedures defined by OSPF. This allows flooding of such advertisements to occur without the need to upgrade all nodes in a network.

• Recognition of the advertisement as UPA is only required on routers which have a use case for this information.
  • Configurable

• OSPF Area Border Routers (ABRs), which would be responsible for propagating UPA advertisements into other areas would need to recognize such advertisements.
Deployment Consideration

• It is also recommended that implementations limit the number of UPA advertisements which can be originated by ABR/ASBR at any given time
  • Configurable

• UPA advertisements should be withdrawn after a modest amount of time, that would provide sufficient time for UPA to be flooded network-wide and acted upon by receiving nodes
  • Configurable
Next Steps ...

• Comments are welcome