IS-IS Extension For Building Distribution Trees

draft-yong-isis-ext-4-distribution-tree-00

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Problem Statement

- IP network does not yet support multi-destination traffic transport
- IP network relies on PIM protocol and solutions to carry multi-destination traffic
- Pain points in PIM protocol solutions:
  - Use own "hello" protocol and hop-by-hop message
    - Additional convergence time besides IGP's
    - A lot of soft state and heavy CPU load
  - Packet may be forwarded to RP unnecessarily
  - Scalability Challenges to support overlay applications

Problem Statement Cont.

- PIM solutions hardly meet the requirements for network virtualization overlay, i.e. [NVO3]
  - IP as underlying network may carry many overlay VNs that contain some BUM traffic
    - PIM can't scale to
  - A VN topology may be spare and dynamic compared to underlying network topology
    - Massive PIM states burden the device
  - See draft-ghanwani-nvo3-mcast-issues-00

IS-IS Extension for Building Trees

- IS-IS has been used for unicast traffic routing
  - Can be for multicast traffic routing as well, like TRILL
- Simple IS-IS extension can achieve:
  - Build distribution trees for multi-destination transport
- The benefits to do this:
  - One protocol for both unicast and multicast transport
    - Use of LSDB and SPF algorithm to build a tree
    - Same convergence time for both unicast and multicast
  - Forwarding Optimization
  - Simpler solution and better scalability than PIM's
    - Meet the network virtualization overlay requirements

About This Draft

- Propose IS-IS Extension for building distribution trees in IGP
  - Need a new sub-TLV in Router Capability TLV
- Specify Router Process Procedures for multi-destination packet transport

Next Step

- Seek some comments and feedbacks
- Should we add this work item to the WG?