draft-li-dynamic-flooding-05

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Changes From Previous Version

• Includes extensions for ISIS, OSPF and OSPFv3
• Two modes of operation
  • Centralized
  • Distributed
Area Leader

• Centralized mode
  • Responsible for computing and distributing the flooding topology

• Distributed mode
  • The distributed algorithm advertised by the Area Leader MUST be used by all routers that participate in Dynamic Flooding

• Not every router needs to be a candidate to become an Area Leader
  • Single candidate is sufficient for correct operation
  • Multiple candidates recommended for redundancy
Computation of Flooding Topology

• Centralized mode
  • Exact algorithm does not need to be known and standardized

• Distributed mode
  • All nodes in the IGP area MUST use the same algorithm to compute the flooding topology
  • It is possible to use private algorithms to compute flooding topology, if the all nodes in the area use the same one
    • Responsibility of the operator to make sure that all nodes have a common understanding of what the given algorithm value represents
  • Routers that do not support the value of algorithm advertised by the Area Leader MUST continue to use legacy flooding mechanism.
IS-IS Area Leader Sub-TLV

- Algorithm - a numeric identifier in the range 0-255 that identifies the algorithm used to calculate the flooding topology.

  - 0: Centralized computation by the Area Leader
  - 1-127: Standardized distributed algorithms
  - 128-254: Private distributed algorithms
  - 255: Reserved
IS-IS Area System IDs TLV

- Only used in centralized mode
- “Ending Index” has been removed – was redundant
  - we have the TLV length
- Handling of multiple IS-IS Area System IDs TLVs with the L bit set
Flooding Behavior

• Link state updates received on one link in the flooding topology MUST be flooded on all other links in the flooding topology

• Link state updates received on a link not in the flooding topology MUST be flooded on all links in the flooding topology

• When the flooding topology changes on a node the node MUST continue to flood on the union of the old and new flooding topology for a limited amount of time.
  • Provide all nodes sufficient time to migrate to the new flooding topology
  • Makes sure that the flooded data will be delivered to all nodes at all times
OSPF Extensions

• OSPF Area Leader Sub-TLV
  • Top level TLV of the Router Information LSA
  • Used by both OSPF and OSPFv3
  • Used in both centralized and distributed modes

• OSPFv2 Dynamic Flooding Opaque LSA
  • New OSPFv2 Opaque LSA
  • Only used in Centralized mode

• OSPFv3 Dynamic Flooding LSA
  • New OSPFv3 LSA
  • Only used in centralized mode

• OSPF Area Router IDs TLV, OSPF Flooding Path TLV
  • Top level TLVs of:
    - OSPFv2 Dynamic Flooding Opaque LSA
    - OSPFv3 Dynamic Flooding LSA
Next Steps ...

• WG adoption
• Continue to evolve the draft
• Define a standardized distributed algorithm(s) for computing flooding topology.
  • Ideas are welcomed
• Work on implementation