Dynamic Flooding On Dense Graphs

draft-li-lsr-dynamic-flooding-01
(from draft-li-dynamic-flooding-05)
Review: Dynamic Flooding

- Decouple flooding topology (FT) from physical topology
- Centralized vs. distributed mode
- Not to discuss algorithms for computing the FT
- IS-IS and OSPF TLVs:
  - Area Leader Sub-TLV (preference for becoming an AL)
  - Area System IDs TLV (all systems in the flooding topology)
  - Flooding Path TLV (adjacency matrix for the flooding topology)
Changes from Previous Version

- **New Protocol Elements**
  - IS-IS Dynamic Flooding Sub-TLV
  - IS-IS Flooding Request TLV
  - OSPF Dynamic Flooding Sub-TLV
  - OSPF Flooding Request Bit

- **Treatment of Topology Events**
  - Temporary Flooding
Protocol Elements: IS-IS TLVs

- **Dynamic Flooding Sub-TLV**
  - Used for
    - Optimizing the flooding topology
    - Selecting optimal algorithm in distributed mode
  - Indicates
    - Whether the node supports dynamic flooding
    - What algorithms are supported in distributed mode

- **Flooding Request TLV**
  - Used for
    - Requesting temporary flooding from the adjacent node
  - Indicates
    - Which circuit type and flooding scope for temporary flooding
IS-IS Dynamic Flooding Sub-TLV

- Sub-TLV of the IS-IS Router Capability TLV (242)

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<table>
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<tr>
<th>Type</th>
<th>Length</th>
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- Type: TBD
- Length: 0-255; number of Algorithms
- Algorithm: zero or more numeric identifiers in the range 0-255 that identifies the algorithm used to calculate the flooding topology
IS-IS Flooding Request TLV

- MAY be included in IIH PDUs

```
+-----------------------------+
|     Type      |     Length    | Circuit Type  |R|  Scope      |
|-----------------------------|
```

- Type: TBD
- Length: 1 + number of advertised Flooding Scopes
- Circuit Type: as specified in [ISO10589]. Needed in P2P.
- R: Must be 0 and ignored on receipt
- Scope: LSP Flooding Scope Identifier Registry defined by [RFC7356]
Protocol Elements: OSPF TLVs

- Dynamic Flooding Sub-TLV
  - Both v2 and v3
  - In the Router Information LSA [RFC7770]

- Flooding Request Bit
  - Both v2 and v3
  - Option bit in the LLS Type 1 Extended Options and Flags field [RFC2328]
OSPF Dynamic Flooding Sub-TLV

- Type: TBD
- Length: 0-255; number of Algorithms
- Algorithm: zero or more numeric identifiers in the range 0-255 that identifies the algorithm used to calculate the flooding topology
Temporary Flooding

- Nodes supporting dynamic flooding MUST use flooding topology (FT) for flooding.
- Cases to temporarily add a link to the FT:
  - A new link is added and one of the adjacent nodes is not in current FT
  - A local link fails and the node has one or no connection to the FT
- Adjacency up: existing mechanism for link state database resync
- Start temporary flooding on a link:
  - Enable flooding on local
  - Request flooding from the neighbor (using the flooding request TLV)
- Stop temporary flooding:
  - When both adjacent nodes are on the FT
A Tradeoff

- Stability vs. Fast convergence
  - Excessive flooding: may lead to instability
  - Less flooding: may lead to slow convergence

- To be considered in both flooding topology and enabling temporary flooding