IS-IS Flooding Speed advertisement

draft-decraene-lsr-isis-flooding-speed-01

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IGP flooding: introduction

IGP flooding is paramount for Link State IGP

Slow flooding directly translates to
- Delayed network reaction to failure hence packet loss
- LSDB inconsistency hence routing inconsistencies and micro-loops.

IGP flooding is hard
- Needs to be fast to have LSDB in sync
  • A single node failure → N LSPDUs → need to fast flood N LSPDUs
- Needs to be slow enough to not overload the routers
  • Not overloading my adjacent neighbors is enough
IS-IS flooding: status

IS-IS has no signaling to control flooding speed.

Current flooding speed is extremely conservative
- Default delay between LSPDUs: 33ms or 100ms
  → 30pps / 340kbit/s per neighbor
- vs BGP policer set to 20 000pps/ 224Mbits/s

Same flooding speed for the last 20 years
- While CPU and interfaces speed improved a lot
Proposed evolution

1 TLV in IS-IS Hello: Flooding Speed TLV
Advertises my LSPDU receiving speed to my upstream flooding neighbors.
Speed Parameters

Parameters based on existing implementations /knobs

– Reduces implementation effort
– Increases adoption likelihood
– Avoids changing touchy parts of the code

```plaintext
+-----------------------------+
| minimumInterfaceLSPTransmissionInterval (2 octets) |
+-----------------------------+
| maximumInterfaceLSPTransmissionBurst (2 octets) |
+-----------------------------+

Figure 1: Flooding Speed TLV
Delay between 2 LSPDUs

minimumInterfaceLSPTransmissionInterval

• The minimum interval, in milliseconds, between two consecutive LSPDUs

• Matches (all) existing flooding implementations
  lsp-interval (C, J), lsp-pacing-interval (N, H), lsp tx interval (A)

• Akin to a CPU/processing performance
Fast Flood N LSP

maximumInterfaceLSPTransmissionBurst

- Number of (un-acknowledged) LSPDUs which may be sent in a burst
- Matches some implementations
  - fast-flood (H), DDoS filtering (bandwidth-limit; burst-size-limit) (J)
- Akin to a memory/buffer size
Toward flow control

Acknowledging the reception of LSPDUs using existing ISO specification (PSNP, CSNP) provides dynamic flow control

- maximumInterfaceLSPTransmissionBurst serves as the static transmission window
- xSNP serves as dynamic acknowledgement
Summary (1)

Improving IS-IS flooding speed.
By advertising two static parameters
    from the flooding downstream node
    to the flooding upstream node
Matching existing implementations behavior
Summary (2)

Draft is short but allows for a choice of 3 levels of improvements on the upstream flooding node:

1. Coordination of Lsp-pacing
   - No change on flooding implementation
   - Significant improvement in real life (e.g. x10)

2. Use of a burst size
   - Significant improvement for the advertisement of a set of LSPs (node failure)

3. Dynamic flow control
   - Significant improvement compared to Lsp-pacing

Local choice/behavior of the upstream node when receiving the (same) TLV.