Multicast Forwarding in LLNs
(draft-ietf-roll-trickle-mcast-01)

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ROLL WG Meeting
84th IETF Meeting
Vancouver, Canada
History

• 2011-04-11: draft-ietf-roll-trickle-mcast-00
  – Expired 2011-10-13

• 2012-07-13: draft-ietf-roll-trickle-mcast-01
  – No changes to content
Overview

• Problem
  – Forward IPv6 multicast messages without maintaining a multicast forwarding topology

• Solution
  – Flood (disseminate) IPv6 multicast messages
  – All devices in LLN receive the message
Dissemination Overview

- On receiving a message
  - If “new” message,
    - retransmit the message,
    - pass to upper layers if subscribed to mcast group
  - Otherwise, drop message

- What is “new”?
  - IPv6 HbH Option (SeedID, SeqNo)
  - SeedID: device that initiates dissemination
  - SeqNo: duplicate detection, message ordering
Retransmission Strategies

- Simple flooding (low latency)
  - Retransmit N times

- Controlled dissemination (low redundancy)
  - Trickle [RFC6206]
    - Adaptive transmission timing
    - Redundant transmission suppression
  - Advertise summaries rather than actual data messages

- Trickle parameterization
  - Simple flood: set k to infinity (no suppression)
  - Controlled dissemination: set k to small value
Sliding Windows

- Disseminate multiple messages from same SeedID
  - Receiving messages out of order will filter old messages

- Sliding window
  - Bounded history to allow some out-of-order
  - May size window based on memory constraints
Implementations

- ZigBee
  - Component of SEP 2.0
  - Implementation by several vendors
  - Simple flooding used with mDNS

- Cisco
  - Simple flooding and controlled dissemination

- Peter van der Stok
  - Controlled dissemination in simulation

- Others?
Next Steps

- IPv6-in-IPv6 Encapsulation
  - Insert/remove HbH Option

- Reserve bits for straightforward evolution
  - Flags/version/etc.

- Incorporate suggestions in draft-vanderstock-roll-mcreq

- Add more text, tighten up specification, etc.

- More feedback from WG!