

Multicast Forwarding in LLNs

(draft-ietf-roll-trickle-mcast-01)

Jonathan Hui
Richard Kelsey

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!