IETF 112 ROLL - online

Routing over Low-Power And Lossy Networks

Chairs:
Dominique Barthel
Ines Robles

Secretary:
Michael Richardson
Note Well

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- BCP 25 (Working Group processes)
- BCP 25 (Anti-Harassment Procedures)
- BCP 54 (Code of Conduct)
- BCP 78 (Copyright)
- BCP 79 (Patents, Participation)

Source: https://www.ietf.org/about/note-well/
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Source: https://www.ietf.org/about/note-well/
Online meeting tips

- Make sure your video is off unless you are chairing or presenting
- Mute your microphone unless you are speaking
- You are encouraged to use a headset/earbuds, etc.
- Bluesheets are automatically generated via Meetecho
- Chatrooms in meetecho are connected to the Jabber chatrooms listed in the datatracker agenda.
- More information and assistance:
  - Open a ticket: [https://www.ietf.org/how/meetings/issues/](https://www.ietf.org/how/meetings/issues/)
  - Meetecho guide: [https://www.ietf.org/how/meetings/111/session-participant-guide](https://www.ietf.org/how/meetings/111/session-participant-guide) (yes 111)
Meeting Materials

● Session: 14:30-15:30 (UTC) Wednesday Session II
● Remote Participation
  ○ Meetecho: https://meetings.conf.meetecho.com/ietf112/?group=roll&short=&item=1
  ○ CodiMD: https://codimd.ietf.org/notes-ietf-112-roll
  ○ Material: https://datatracker.ietf.org/meeting/112/session/roll
  ○ Jabber: xmpp:roll@jabber.ietf.org?join
  ○ Minute takers: Please volunteer, thank you :)
IETF - ROLL IETF 112

Wednesday, November 10, 2021

14:30-15:30 (UTC) Wednesday Session II

Material: https://datatracker.ietf.org/meeting/112/session/roll
Etherpad/Bluesheet: https://codimd.ietf.org/notes-ietf-112-roll

<table>
<thead>
<tr>
<th>Time</th>
<th>Duration</th>
<th>Draft/Topic</th>
<th>Presenter</th>
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<tr>
<td>14:30 - 14:45</td>
<td>15 min</td>
<td>WG Status</td>
<td>Ines/Dominique</td>
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<tr>
<td>14:45 - 15:00</td>
<td>15 min</td>
<td>AODV-RPL MOP</td>
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<td>15:00 - 15:15</td>
<td>15 min</td>
<td>draft-thubert-6lo-multicast-registration</td>
<td>Pascal</td>
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<td>15:15 - 15:29</td>
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<td>Open Issues:</td>
<td>Ines/Dominique/</td>
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<td></td>
<td></td>
<td>- Reviews on DAO-Projection: WGLC? (5 min)</td>
<td>Everyone</td>
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<td></td>
<td></td>
<td>- Adoption for draft-iwanicki-roll-rnfd? (5 min)</td>
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## State of Active Internet-Drafts

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<td>draft-ietf-roll-efficient-npdao-18</td>
<td>RFC 9009</td>
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<tr>
<td>draft-ietf-roll-turnon-rfc8138-18</td>
<td>RFC 9035</td>
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<tr>
<td>draft-ietf-roll-unaware-leaves-30</td>
<td>RFC 9010</td>
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<td>draft-ietf-roll-useofrplinfo-44</td>
<td>RFC 9008</td>
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<td>draft-ietf-roll-capabilities-09</td>
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<td>draft-ietf-roll-dao-projection-21</td>
<td>Discussion Today</td>
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<td>draft-ietf-roll-enrollment-priority-05</td>
<td>Discussion Today</td>
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<tr>
<td>draft-ietf-roll-mopex-04</td>
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<td>draft-ietf-roll-nsa-extension-10</td>
<td>Submitted to the IESG for publication</td>
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<tr>
<td>draft-ietf-roll-aodv-rpl-11</td>
<td>AD Evaluation::Revised I-D Needed</td>
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<tr>
<td>draft-ietf-roll-rpl-observations-06</td>
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## Related Internet-Drafts

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<td>draft-iwanicki-roll-rnfd-01</td>
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<tr>
<td>draft-pthubert-roll-rfc6550bis-01</td>
<td>Open to Work</td>
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<tr>
<td>draft-jadhav-roll-storing-rootack-03</td>
<td>New version - please review</td>
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# Expired Internet-Drafts

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<td>To be Continued later</td>
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<tr>
<td>draft-ietf-roll-dis-modifications-01</td>
<td>To be Continued later</td>
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<tr>
<td>Draft-ietf-roll-mpl-yang-02</td>
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<tr>
<td>Draft-ietf-roll-bier-ccast-01</td>
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## Done Milestones

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<tr>
<td>DONE</td>
<td>Initial submission to the IESG of mechanism to turn on RFC8138 compression feature within a RPL network draft-ietf-roll-turnon-rfc8138</td>
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<td>DONE</td>
<td>Initial submission of Common Ancestor Objective Functions and Parent Set DAG Metric Container Extension to the IESG draft-ietf-roll-nsa-extension</td>
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<tr>
<td>DONE</td>
<td>Initial submission of routing for RPL Leaves draft to the IESG draft-ietf-roll-unaware-leaves</td>
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<tr>
<td>DONE</td>
<td>Initial submission of a reactive P2P route discovery mechanism based on AODV-RPL protocol to the IESG draft-ietf-roll-aodv-rpl</td>
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<td>DONE</td>
<td>Initial Submission of a proposal with uses cases for RPI, RH3 and IPv6-in-IPv6 encapsulation to the IESG draft-ietf-roll-useofrplinfo</td>
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<td>Initial submission of a solution to the problems due to the use of No-Path DAO Messages to the IESG draft-ietf-roll-efficient-npdao</td>
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<td>Milestone</td>
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<td>Oct 2021</td>
<td>Recharter WG or close</td>
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<tr>
<td>Dec 2020</td>
<td>Initial submission of Mode of Operation extension and Capabilities for RPL to the IESG - <em>draft-ietf-roll-mopex-cap</em></td>
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<td>Jul 2020</td>
<td>Initial submission of a root initiated routing state in RPL to the IESG - <em>draft-ietf-roll-dao-projection</em></td>
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<td>Jul 2020</td>
<td>Initial submission of a YANG model for MPL to the IESG - <em>draft-ietf-roll-mpl-yang</em></td>
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<td>Jun 2020</td>
<td>Initial submission of Enabling secure network enrollment in RPL networks draft to the IESG - <em>draft-ietf-roll-enrollment-priority</em></td>
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<td>Jun 2020</td>
<td>Initial submission of a proposal to augment DIS flags and options to the IESG - <em>draft-ietf-roll-dis-modifications</em></td>
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<tr>
<td>Jun 2020</td>
<td>Initial submission of a proposal for Source-Route Multicast for RPL to the IESG - <em>draft-ietf-roll-ccast</em></td>
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Dear authors, check your tickets and update/close them as needed
AODV-RPL

Draft-ietf-roll-aodv-rpl-11

Discussion on
- MOP to use
- Whether it obsoletes RFC6997
AODV-RPL MOP background

- In current draft, specified Mode of Operation is MOP=5
- Options:
  - Continues with MOP=5: eats into limited space
  - Change to MOP=4:
    - P2P-RPL is experimental, not widely implemented
      - Are you aware of any implementation? (RIOT)
      - Please provide your thoughts to the ML
    - Could AODV-RPL obsolete P2P-RPL
    - Or clarify that both implementations (P2P-RPL and AODV-RPL) can not coexist on same network
      - What would happen if they overlapped?
AODV-RPL MOP discussion status

- Email thread on WG ML asking for opinion (launched Oct 6th )

- Results:
  - Received 5 answers
  - 1 (20%) in favor of keeping MOP=5
  - 4 (80%) in favor of changing to MOP=4
IPv6 Neighbor Discovery
Multicast Address Listener Registration

draft-ietf-6lo-multicast-registration

Pascal Thubert
IETF 112
Virtual
6LoWPAN ND (IPv6 Stateful Address Autoconfiguration)

- **RFC 6775** (original 6LoWPAN ND)
  - Defines ARO for registration and DAD operations for stateful AAC
- **RFC 8505** (extended 6LoWPAN ND)
  - Extends ARO, updates the registration procedure
  - Allows registering to network services inc. proxy
- **RFC 8928** (Address Protection for ND)
  - Secures ownership and enables SAVI
- **RFC 8929** (Backbone Router – proxy ND)
  - Defines a proxy ND operation. Updates EDAR to transport ND options such as SLLAO.
- **draft-thubert-6lo-unicast-lookup** (Unicast Address lookup on backbone)
  - Allows the 6LBR to respond to lookups and saves broadcasts
- **draft-ietf-6lo-multicast-registration** (Anycast and Multicast Address Registration)
  - Registers anycast and multicast addresses (in addition to unicast per RFC 8505)
Changes in draft-ietf-6lo-multicast-registration

- Generated as a response to a request from Wi-Sun alliance
  - Remove the need for MLD, and its reactive broadcast REPORT polling
- Extends RFC 8505
  - New flags in the EARO to signal anycast and multicast
  - 6LN operation virtually unmodified, just setting the flags
  - New 6LR behavior that accepts multiple registration with different ROVR
- Extends RFC 9010 (RPL Unaware Leaves)
  - To inject the anycast and multicast addresses in RPL, with new flags
- Extends RFC 6550
  - New MOP for Non-Storing Multicast (MOP 5?), new DAO / RTO flags
  - New anycast support also in Storing Mode Multicast (MOP 3)
New Non-Storing Multicast Mode of Operation

• MOP (5) => manage collision with AODV-RPL
• 6LRs with listeners register the multicast and anycast address to the Root
  • New flags in DAO messages echo those in EARO
• Packets reach up to the Root as if unicast within the DODAG
• The Root performs Ingress Replication for multicast
  • to all the 6LRs that registered
  • Same encapsulation as external routes (RUL), SRH to the 6LR
  • 6LR decapsulates and distributes to all 6LNs that subscribed (new term)
• The Root performs Destination Selection for Anycast
  • Passes the anycast packet to only one 6LR
New RPL Anycast Operation

- For MOP 3 and the new MOP (?5), also MOP 1 for backward compatibility
- Indistinguishable from anycast, applies to both addresses and prefixes
- TID is irrelevant since multiple nodes can originate an advertisement
  - Multihomed mobile target should be advertised as unicast
- RPL advertises multiple paths as for multicast
  - A tree in Storing Mode, multiple paths at the Root in NS-mode
- But a packet follows only one of those paths
- No instruction for flow stickiness and load balancing given
Backward compatibility and deployment considerations

• Discusses interaction with other multicast protocols
  • e.g., Root performing MPL flooding instead of RPL Ingress Replication

• Allows single DODAG with MOP 1 for brown field
  • Support of multicast / anycast must be signaled otherwise (config, mgt)
  • 6LRs that support this spec signal so with 6CIO

• Incremental operation in DODAG with MOP 3
  • MOP 3 (Storing Mode with Multicast) extended to accepted anycast
  • Recognize legacy DAO multicast from address FF::/8 assume M flag set
Next steps

- Some editorials
- Update draft-thubert-bess-secure-evpn-mac-signaling to align
- Progress on 6lo list for now, please cc 6lo when discussing RPL aspects
- Feedback?
Open Issues

DAO-projection

Draft-iwanicki-rnfd

Enrollment-priority
Root initiated routing state in RPL

draft-ietf-roll-dao-projection

Pascal Thubert, Rahul Arvind Jadhav, Matthew Gillmore

IETF 112

Virtual
Status of the draft

• Latest rev is draft-ietf-roll-dao-projection-21
• Includes IOT-DIR review by Toerless (next slide)
  ♦ Deep, excellent review: kudos to Toerless
  ♦ No final ack?
• Now formally updates RFC 6553
  • for the new RPL Option Flags subregistry
• Ready for WGLC (Editor’s assessment)
  • Chairs called for the pre-WGLC review by Remous-Aris
• Also pending co-author final review before WGLC
  • After the deep changes during CoViD and IOT-DIR review
IOT-DIR review (1): shuffled sections for readability

- More Terms
- New and Moved Text
- More Cases
- Protocol Operation in one big Section
- New variations non-LLN Cases

Shorter, moved to Section 3
- Expanded for Path Maintenance
- Moved up in Context and Goal Section
- Moved back to Main Text in Section 3
Summary of draft-iwanicki-roll-rnfd-01

Initially submitted as draft-iwanicki-roll-rnfd-00 on April 6th, 2021, presented at the August 2021 interim, just resubmitted.

Changes:

• applied WG's comments related to:
  • floating DODAGs,
  • virtual DODAG roots,
  • sentinel selection,
  • minor comments and suggestions by Michael and Pascal.
• added mechanisms for activating and deactivating the protocol on demand.

Questions? → Konrad Iwanicki <iwanicki@mimuw.edu.pl>

IETF 112, November 10th, 2021
Interest?
Adoption?
Co-authors?
Standards Track vs. Experimental?
draft-ietf-roll-enrollment-priority-05

Choice: GLOBAL, FLEXIBLE?
Reviews
Address issues
WGLC
Open Floor

AOB