IETF 114 ROLL Session
26 July 2022

Chairs: Dominique Barthel, Ines Robles
Secretary: Michael Richardson

This session is being recorded
Note Well

This is a reminder of IETF policies in effect on various topics such as patents or code of conduct. It is only meant to point you in the right direction. Exceptions may apply. The IETF’s patent policy and the definition of an IETF "contribution" and "participation" are set forth in BCP 79; please read it carefully.

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Definitive information is in the documents listed below and other IETF BCPs. For advice, please talk to WG chairs or ADs:

- BCP 9 (Internet Standards Process)
- BCP 25 (Working Group processes)
- BCP 25 (Anti-Harassment Procedures)
- BCP 54 (Code of Conduct)
- BCP 78 (Copyright)
- BCP 79 (Patents, Participation)
Resources for ROLL@IETF 114 Phili

- Remote Participation
  - Meetecho: [https://meetings.conf.meetecho.com/ietf114/?group=roll&short=&item=1](https://meetings.conf.meetecho.com/ietf114/?group=roll&short=&item=1)
  - Material: [https://datatracker.ietf.org/meeting/114/session/roll](https://datatracker.ietf.org/meeting/114/session/roll)
  - CodiMD: [https://notes.ietf.org/notes-ietf-114-roll](https://notes.ietf.org/notes-ietf-114-roll)
  - Minute takers: Please volunteer, thank you :)

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This page provides resources for remote participation at the ROLL session at IETF 114 in Philadelphia. It includes links to Meetecho, Material, CodiMD, and a call for minute takers. Please feel free to volunteer to take minutes. Thank you!
IETF 114 Meeting Tips

In-person participants
- Make sure to sign into the session using the Meetecho (usually the “Meetecho lite” client) from the Datatracker agenda
- Use Meetecho to join the mic queue
- Keep audio and video off if not using the onsite version

Remote participants
- Make sure your audio and video are off unless you are chairing or presenting during a session
- Use of a headset is strongly recommended
<table>
<thead>
<tr>
<th>Time (UTC)</th>
<th>Duration</th>
<th>Draft/Topic</th>
<th>Presenter</th>
</tr>
</thead>
<tbody>
<tr>
<td>17:30 - 17:45</td>
<td>15 min</td>
<td>WG Status</td>
<td>Ines/Dominique</td>
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<tr>
<td>17:45 - 18:00</td>
<td>15 min</td>
<td>draft-ietf-roll-dao-projection</td>
<td>Pascal</td>
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<tr>
<td>18:00 - 18:20</td>
<td>20 min</td>
<td>draft-ietf-6lo-multicast-registration</td>
<td>Pascal</td>
</tr>
<tr>
<td>18:20 - 18:30</td>
<td>10 min</td>
<td>Open Floor</td>
<td>Everyone</td>
</tr>
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<td>Draft status</td>
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<tr>
<td>Common Ancestor Objective Function and Parent Set DAG Metric Container Extension</td>
<td>draft-ietf-roll-nsa-extension-10</td>
<td>AD evaluation, revised I-D needed</td>
<td></td>
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<tr>
<td>Supporting Asymmetric Links in Low Power Networks: AODV-RPL draft-ietf-aody-rpl-14</td>
<td>Back to the working group, addressing open issues</td>
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<td></td>
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<tr>
<td>Root initiated routing state in RPL draft-ietf-roll-dao-projection-27</td>
<td>Discussed today, In WGLC</td>
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<tr>
<td>Controlling Secure Network Enrollment in RPL Networks draft-ietf-roll-enrollment-priority-06</td>
<td>Addressing Open Issues</td>
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<tr>
<td>Mode of Operation extension draft-ietf-roll-mopex-04</td>
<td>waiting for attention</td>
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<td></td>
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<tr>
<td>RPL Capabilities draft-ietf-roll-capabilities-09</td>
<td>waiting for attention</td>
<td></td>
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<td>RPL Storing Root-ACK draft-jadhav-roll-storing-rootack-03</td>
<td>WG adoption to be called</td>
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<tr>
<td>RNFD: Fast border router crash detection in RPL draft-ietf-roll-rnfd-00</td>
<td>New Work adopted by the WG, review needed</td>
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## Milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestone</th>
<th>Associated documents</th>
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<tbody>
<tr>
<td>Nov 2023</td>
<td>Initial submission of Fest Border Router Crash Detection in RPL to the IESG</td>
<td></td>
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<tr>
<td>Nov 2023</td>
<td>Recharter WG or close</td>
<td></td>
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<tr>
<td>Nov 2023</td>
<td>Initial submission of a proposal to augment DIS flags and options to the IESG</td>
<td>draft-ietf-roll-dis-modifications</td>
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<tr>
<td>Nov 2023</td>
<td>Initial submission of a proposal for Source-Route Multicast for RPL to the IESG</td>
<td>draft-ietf-roll-cast</td>
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<td>Nov 2023</td>
<td>Initial submission of a YANG model for MPL to the IESG</td>
<td>draft-ietf-roll-mpl-yang</td>
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<tr>
<td>Jun 2023</td>
<td>Initial submission of Capabilities for RPL to the IESG</td>
<td>draft-ietf-roll-capabilities</td>
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<tr>
<td>Nov 2022</td>
<td>Initial submission of Mode of Operation extension for RPL to the IESG</td>
<td>draft-ietf-roll-mopex</td>
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<tr>
<td>Sep 2022</td>
<td>Initial submission of Controlling Secure Network Enrollment in RPL networks draft to the IESG</td>
<td>draft-ietf-roll-enrollment-priority</td>
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<tr>
<td>May 2022</td>
<td>Initial submission of a root initiated routing state in RPL to the IESG</td>
<td>draft-ietf-roll-dao-projection</td>
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### Done milestones

<table>
<thead>
<tr>
<th>Date</th>
<th>Milestone</th>
<th>Associated documents</th>
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<tbody>
<tr>
<td>Done</td>
<td>Initial submission to the IESG of mechanism to turn on RFC8138 compression feature within a RPL network</td>
<td>draft-ietf-roll-tumon-rfc8138</td>
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<tr>
<td>Done</td>
<td>Initial submission of Common Ancestor Objective Functions and Parent Set DAG Metric Container Extension to the IESG</td>
<td>draft-ietf-roll-mnst-extension</td>
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<tr>
<td>Done</td>
<td>Initial submission of routing for RPL Leaves draft to the IESG</td>
<td>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</td>
<td>draft-ietf-roll-aodv-rpl</td>
</tr>
<tr>
<td>Done</td>
<td>Initial Submission of a proposal with uses cases for RPI, RH3 and IPv6-in-IPv6 encapsulation to the IESG</td>
<td>draft-ietf-roll-useofrplinfo</td>
</tr>
<tr>
<td>Done</td>
<td>Initial submission of a solution to the problems due to the use of No-Path DAO Messages to the IESG</td>
<td>draft-ietf-roll-efficient-npdao</td>
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</table>
Open Tickets

draft-ietf-roll-enrollment-priority

7 Open

- add explicit lollipop counter into enrollment priority option
  #13 opened on Nov 24, 2021 by mcr

- should explicitly reset trickle timer?
  #12 opened on Nov 24, 2021 by mcr

- what EB and priority, if any should a node with no feasible parent emit?
  #11 opened on Nov 24, 2021 by mcr

- should priority have more than 1 bit join disabled/enabled?
  #10 opened on Nov 24, 2021 by mcr

- 05 Section 3.1, questions
  #7 opened on Aug 31, 2021 by dianthel-al

- explain how new option values are related to DODAGVersionNumber
  #5 opened on Aug 10, 2021 by mcr

- enrollment priority option name
  #4 opened on Aug 10, 2021 by mcr

roll-wg/aodv-rpl

3 Open

- Review of draft-ietf-roll-aodv-rpl-13 by Pascal
  #3 opened on Mar 18 by inesro

- draft-ietf-roll-aodv-rpl-11 review by Ben (DISCUSS ballot)
  #2 opened on Nov 10, 2021 by inesro

- draft-ietf-roll-aodv-rpl-10 review by John Scudder (DISCUSS)
  #1 opened on Nov 1, 2021 by inesro
Open Tickets

For /rpl-observations:
- **3 Open**
  - Parent Address MUST be empty in Transit Information for storing MOP
    - #10 opened on Mar 10, 2020 by nryahul
  - Implications of using smaller lollipop counter window
    - #9 opened on Dec 12, 2019 by nryahul
  - Path Control bits handling
    - #6 opened on Nov 12, 2019 by nryahul

For mopex:
- **1 Open**
  - do-not-join-instance flag in RPL ext control option
    - #6 opened on Mar 31, 2021 by nryahul
Joint meeting with MANET and BABEL to discuss about multicast
Root initiated routing state in RPL

draft-ietf-roll-dao-projection

Pascal Thubert, Rahul Arvind Jadhav, Michael Richardson

IETF 114

Presenter: Pascal Thubert, remote.
The RPL Track: A DODAG rooted at Ingress

Ingress I

Root

Relay A

P-DAO Ack

Non-Storing mode
P-DAO for L1

Targets = \{Ti\}

Relay B

P-DAO Ack

Storing mode
P-DAO for S1

Targets = \{E\}

Fwd node F

Another Track

Fwd node G

Egress E

Target Tn

East PACKET FLOW

West

Targets \{Tx\}

Segements

S1 = A=>F=>G to E , S2 = I=>H to B

L1 = I->A->E to \{Ti\}, L2 = I->B->E to \{Ti\}, L3 = I->A->B->E to \{Ti\}

SubTracks

Any Set \subset \{L1, L2, L3\} but \{\}
Status of the draft

-> 23: Li’s review, first round with questions left opened
   Clarifications
   Introducing P-DAO ACK
   Introducing the bidirectional flag in Sibling Info Option (SIO)

-> 24: More of Li’s review, treated as GitHub issues
   Allows more than one target options, will reach 1st + undefined subset.
   Use of the bidirectional flag in Sibling Info Option (SIO) / what if dup
   Michael’s edits on Amends and Extends. Michael becomes co-author

-> 25: Rephrasing terminology on Legs and SubTracks
   Legs are loose hop sequences from Track Ingress to Egress
   SubTracks (of a Track) are collections of Legs of the Track
Status of the draft (cont.)

-> 26 Remous-Aris’ review, intense but mostly cleanup

-> 27 Dominique’s review
  • Lacking text about SIO in RPL multicast DAO
  • Used to discover relaying neighbor for 2-hops P2P
  • Also this AMENDS RFC 6550 section 9.10
  • 2-hops via a common Sibling is loop less
  • A Cisco related IPR to be declared
27 Dominique’s review: discussion on Loop avoidance

- Need a strict precedence (A uses B => B cannot use A)
- Missing clear order of both precedence and preference
- Proposed when forwarding along a Track:
  direct 1 hop > Via common neighbor > Segment > Track > drop
- Note: fwd along Segment is only direct 1 hop
  Allows Via common neighbor? would respect the precedence
Next

• Publication request?
IPv6 Neighbor Discovery Multicast Address Listener Registration

draft-ietf-6lo-multicast-registration

Pascal Thubert

IETF 114

Remote
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)
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)
Changes in draft-ietf-6lo-multicast-registration since IETF 113

• From 04 to 07

• Clarification as a push alternate to MLD

• Clarification that TID-based freshness assertion is not done

• New ARO Status to indicate a "Registration Refresh Request" (see Table 7)
  • In NA messages
  • sent to a unicast or a multicast link-scope address (e.g., all nodes)
  • 6LNs requested to reregister all previously registered addresses to sender

• New Node Uptime Option to discover a reboot (next slide)

• IANA revisited
New Node Uptime Option

This specification introduces a new option that characterizes the uptime of the sender. The option may be used by routers in RA messages and by any node in NA, NA, and RS messages. It is used by the receiver to infer whether some state synchronization might be lost, e.g., due to reboot.
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
• In case of collision (flag set / not set) consider all DAOs as anycast
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
  • Anycast / unicast collision is processed as anycast for all
Next steps

• Missing items?
• Important new features for ROLL in this spec
• Got Reviews from ROLL participants => Common WGLC?
AOB?
Thank you very much for your attention