



Wednesday 2021/11/10

# IETF 112 ROLL - online

Routing over Low-Power And Lossy Networks

**Chairs:**

Dominique Barthel

Ines Robles

**Secretary:**

Michael Richardson



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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)

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- 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/>
  - Meetecho 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](xmpp:roll@jabber.ietf.org)?join
  - Minute takers: **Please volunteer, thank you :)**

# Agenda

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>

Time	Duration	Draft/Topic	Presenter
14:30 - 14:45	15 min	WG Status	Ines/Dominique
14:45 - 15:00	15 min	AODV-RPL MOP	Ines/Dominique
15:00 - 15:15	15 min	draft-thubert-6lo-multicast-registration	Pascal
15:15 - 15:29	14 min	Open Issues: - Reviews on DAO-Projection: WGLC? (5 min) - Adoption for draft-iwanicki-roll-rnfd? (5 min) - Reviews on enrollment-priority: WGLC? (4 min)	Ines/Dominique/ Everyone
15:29 - 15:30	1 min	AOB	Everyone

# State of Active Internet-Drafts

	Draft	Status
2 IPRs	<b>draft-ietf-roll-efficient-npdoa-18</b>	RFC 9009
	<b>draft-ietf-roll-turnon-rfc8138-18</b>	RFC 9035
	<b>draft-ietf-roll-unaware-leaves-30</b>	RFC 9010
	<b>draft-ietf-roll-useofrplinfo-44</b>	RFC 9008
	<b>draft-ietf-roll-capabilities-09</b>	Work in Progress
1 IPR	<b>draft-ietf-roll-dao-projection-21</b>	<b>Discussion Today</b>
	<b>draft-ietf-roll-enrollment-priority-05</b>	<b>Discussion Today</b>
	<b>draft-ietf-roll-mopex-04</b>	Work in Progress
2 IPRs	<b>draft-ietf-roll-nsa-extension-10</b>	Submitted to the IESG for publication
	<b>draft-ietf-roll-aodv-rpl-11</b>	AD Evaluation::Revised I-D Needed
	<b>draft-ietf-roll-rpl-observations-06</b>	Work in progress

# Related Internet-Drafts

Draft	Status
<b>draft-iwanicki-roll-rnfd-01</b>	Discussion Today
<b>draft-pthubert-roll-rfc6550bis-01</b>	Open to Work
<a href="#"><u>draft-jadhav-roll-storing-rootack-03</u></a>	<b>New version - please review</b>



# Expired Internet-Drafts

Draft	Status
draft-thubert-roll-eliding-dio-information	To be Continued later
draft-ietf-roll-dis-modifications-01	To be Continued later
Draft-ietf-roll-mpl-yang-02	To be Continued later
Draft-ietf-roll-bier-ccast-01	To be Continued later

# Done Milestones

Date	Milestone
<b>DONE</b>	Initial submission to the IESG of mechanism to turn on RFC8138 compression feature within a RPL network draft-ietf-roll-turnon-rfc8138
<b>DONE</b>	Initial submission of Common Ancestor Objective Functions and Parent Set DAG Metric Container Extension to the IESG draft-ietf-roll-nsa-extension
<b>DONE</b>	Initial submission of routing for RPL Leaves draft to the IESG draft-ietf-roll-unaware-leaves
<b>DONE</b>	Initial submission of a reactive P2P route discovery mechanism based on AODV-RPL protocol to the IESG draft-ietf-roll-aodv-rpl
<b>DONE</b>	Initial Submission of a proposal with uses cases for RPI, RH3 and IPv6-in-IPv6 encapsulation to the IESG draft-ietf-roll-useofrplinfo
<b>DONE</b>	Initial submission of a solution to the problems due to the use of No-Path DAO Messages to the IESG draft-ietf-roll-efficient-npdo

# Milestones

Date	Milestone	Comment/Action Point
Oct 2021	Recharter WG or close	Date to be updated
Dec 2020	Initial submission of Mode of Operation extension and Capabilities for RPL to the IESG - <b>draft-ietf-roll-mopex-cap</b>	Will <b>split</b> into 2 milestones
Jul 2020	Initial submission of a root initiated routing state in RPL to the IESG - <b>draft-ietf-roll-dao-projection</b>	Work in Progress, <b>to update the date</b> (Feb 2022?)
Jul 2020	Initial submission of a YANG model for MPL to the IESG - <b>draft-ietf-roll-mpl-yang</b>	?
Jun 2020	Initial submission of Enabling secure network enrollment in RPL networks draft to the IESG - <b>draft-ietf-roll-enrollment-priority</b>	Work in Progress, <b>to update the date</b> (March 2022?)
Jun 2020	Initial submission of a proposal to augment DIS flags and options to the IESG - <b>draft-ietf-roll-dis-modifications</b>	<b>To update the date</b> (Nov 2022?)
Jun 2020	Initial submission of a proposal for Source-Route Multicast for RPL to the IESG - <b>draft-ietf-roll-ccast</b>	?

# Tickets

- <https://trac.ietf.org/trac/roll/report/2>
  - aodv-rpl (#199, #200): should be fixed with the new version to submit, new comments from IESG review [issues marked also in github]
  - dao-projection (#179, #180), RPLv2 (#187, #188)
- <https://github.com/roll-wg/xxx/issues>
  - rpl-observations ( 3 Open)
  - dao-projections (5 Open, new tickets to add based on recently emails)
  - Mopex (1)
  - Enrollment priority (3)

**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

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# 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<sub>6</sub>

# 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

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# 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

Shorter, moved to Section 3

Expanded for Path Maintenance

Moved up in Context and Goal Section

Moved back to Main Text in Section 3

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More Terms

New and Moved Text

More Cases

Protocol Operation in one big Section

New variations non-LLN Cases

# 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](mailto:iwanicki@mimuw.edu.pl)>

IETF 112, November 10th, 2021

# **draft-iwanicki-roll-rnfd-01**

Interest?

Adoption?

Co-authors?

Standards Track vs. Experimental?

# **draft-ietf-roll-enrollment-priority-05**

Choice: GLOBAL, FLEXIBLE?

Reviews

Address issues

WGLC

# Open Floor

AOB