

IETF 114 ROLL Session

26 July 2022

Chairs: Dominique Barthel, Ines Robles

Secretary: Michael Richardson

This session is being recorded

IETF 114 Philadelphia
hosted by



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.

As a reminder:

- By participating in the IETF, you agree to follow IETF processes and policies.
- If you are aware that any IETF contribution is covered by patents or patent applications that are owned or controlled by you or your sponsor, you must disclose that fact, or not participate in the discussion.
- As a participant in or attendee to any IETF activity you acknowledge that written, audio, video, and photographic records of meetings may be made public.
- Personal information that you provide to IETF will be handled in accordance with the IETF Privacy Statement.
- As a participant or attendee, you agree to work respectfully with other participants; please contact the ombudsteam (<https://www.ietf.org/contact/ombudsteam/>) if you have questions or concerns about this.

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)
- <https://www.ietf.org/privacy-policy/> (Privacy Policy)

Resources for ROLL@IETF 114 Phili

- Remote Participation

- Meetecho:

<https://meetings.conf.meetecho.com/ietf114/?group=roll&short=&item=1>

- Material: <https://datatracker.ietf.org/meeting/114/session/roll>

- CodiMD: <https://notes.ietf.org/notes-ietf-114-roll>

- Minute takers: **Please volunteer, thank you :)**

This session is being recorded

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

Agenda

Tuesday, July 26th, 2022

17:30 - 18:30 (UTC) - Tuesday Session II

Time (UTC)	Duration	Draft/Topic	Presenter
17:30 - 17:45	15 min	WG Status	Ines/Dominique
17:45 - 18:00	15 min	draft-ietf-roll-dao-projection	Pascal
18:00- 18:20	20 min	draft-ietf-6lo-multicast-registration	Pascal
18:20 - 18:30	10 min	Open Floor	Everyone

Draft status

Common Ancestor Objective Function and Parent Set DAG Metric Container Extension draft-ietf-roll-nsa-extension-10	AD evaluation, revised I-D needed
Supporting Asymmetric Links in Low Power Networks: AODV-RPL draft-ietf-roll-aodv-rpl-14	Back to the working group, addressing open issues
Root initiated routing state in RPL draft-ietf-roll-dao-projection-27	Discussed today, In WGLC
Controlling Secure Network Enrollment in RPL Networks draft-ietf-roll-enrollment-priority-06	Addressing Open Issues
Mode of Operation extension draft-ietf-roll-mopex-04	waiting for attention
RPL Capabilities draft-ietf-roll-capabilities-09	waiting for attention
RPL Storing Root-ACK draft-jadhav-roll-storing-rootack-03	WG adoption to be called
RNFD: Fast border router crash detection in RPL draft-ietf-roll-rnfd-00	New Work adopted by the WG, review needed

Milestones

Milestones

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

Done milestones

Date	Milestone	Associated documents
Done	Initial submission to the IESG of mechanism to turn on RFC8138 compression feature within a RPL network	draft-ietf-roll-turnon-rfc8138
Done	Initial submission of Common Ancestor Objective Functions and Parent Set DAG Metric Container Extension to the IESG	draft-ietf-roll-nsa-extension
Done	Initial submission of routing for RPL Leaves draft to the IESG	draft-ietf-roll-unaware-leaves
Done	Initial submission of a reactive P2P route discovery mechanism based on AODV-RPL protocol to the IESG	draft-ietf-roll-aodv-rpl
Done	Initial Submission of a proposal with uses cases for RPI, RH3 and IPv6-in-IPv6 encapsulation to the IESG	draft-ietf-roll-useofrplinfo
Done	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

Open Tickets

draft-ietf-roll-enrollment-priority Public

Issues 7 Pull requests 4 Discussions Actions Projects Wiki Security

Filters

7 Open 1 Closed

- ☐ ☒ add explicit lollipop counter into enrollment priority option
#13 opened on Nov 24, 2021 by mcr
- ☐ ☒ should root 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 dbarthel-ol
- ☐ ☒ 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 Public

Code Issues 3 Pull requests Actions Projects Wiki Security

Filters

3 Open 2 Closed

- ☐ ☒ Review of draft-ietf-roll-aodv-rpl-13 by Pascal
#3 opened on Mar 18 by inesrob
- ☐ ☒ draft-ietf-roll-aodv-rpl-11 review by Ben (DISCUSS ballot)
#2 opened on Nov 10, 2021 by inesrob
- ☐ ☒ draft-ietf-roll-aodv-rpl-10 review by John Scudder (DISCUSS)
#1 opened on Nov 1, 2021 by inesrob

Open Tickets

/ [rpl-observations](#) Public

[Issues](#) 3 [Pull requests](#) [Actions](#) [Projects](#) [Wiki](#) [Security](#) [Insights](#) [Settings](#)

Filters

☐ 3 Open ✓ 4 Closed

☐ Parent Address MUST be empty in Transit Information for storing MOP
#10 opened on Mar 16, 2020 by nyrahul

☐ Implications of using smaller lollipop counter window
#9 opened on Dec 12, 2019 by nyrahul

☐ Path Control bits handling
#6 opened on Nov 12, 2019 by nyrahul

/ [mopex](#) Public

[Issues](#) 1 [Pull requests](#) [Actions](#) [Projects](#) [Wiki](#) [Security](#) [Insights](#)

Filters

☐ 1 Open ✓ 1 Closed

☐ do-not-join-instance flag in RPL ext control option
#8 opened on Mar 31, 2021 by nyrahul

Joint meeting with MANET and BABEL to discuss about multicast

Friday, July 29, 2022				
12:30-14:00	Liberty Ballroom Foyer & Independence Foyer			Continental Breakfast
12:30-17:00	Liberty Ballroom Foyer			B IETF Registration
14:00-16:00 Friday Session I				
M	Freedom E/F	art	httpapi	Building Blocks for HTTP APIs
B	Liberty C	ops	mops	Media OPerationS
M	Independence A/B	ops	opsawg	Operations and Management Area Working Group Combined OpsAWG/OpsAREA
B	Liberty B	rtg	lsr	Link State Routing
M	Freedom G	rtg	manet	Mobile Ad-hoc Networks Joint MANET/BABEL/ROLL
M	Independence C	sec	openpgp	Open Specification for Pretty Good Privacy
M	Philadelphia North	tsv	tcpm	TCP Maintenance and Minor Extensions
16:00-16:30	Liberty Ballroom Foyer			B Beverage and Snack Break

Root initiated routing state in RPL

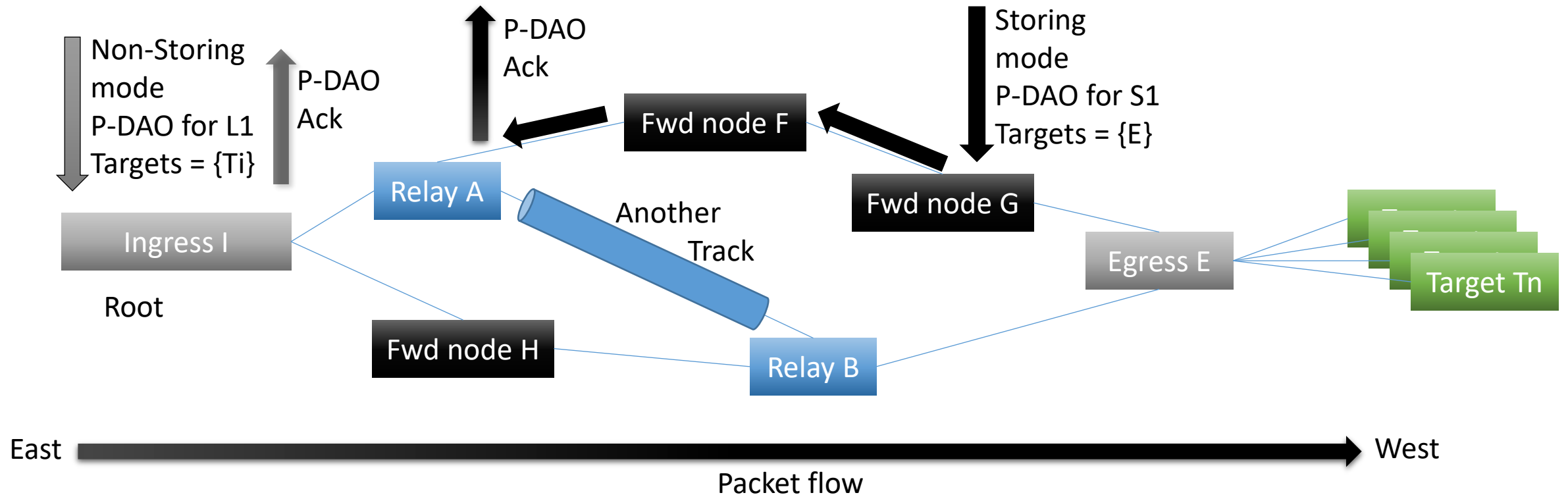
draft-ietf-roll-dao-projection

Pascal Thubert, Rahul Arvind Jadhav, Michael Richardson

IETF 114

Presenter: Pascal Thubert, remote.

The RPL Track: A DODAG rooted at Ingress



Targets {Tx }

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

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

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

Status of the draft (cont.)

- > 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)

draft-ietf-6lo-multicast-registration

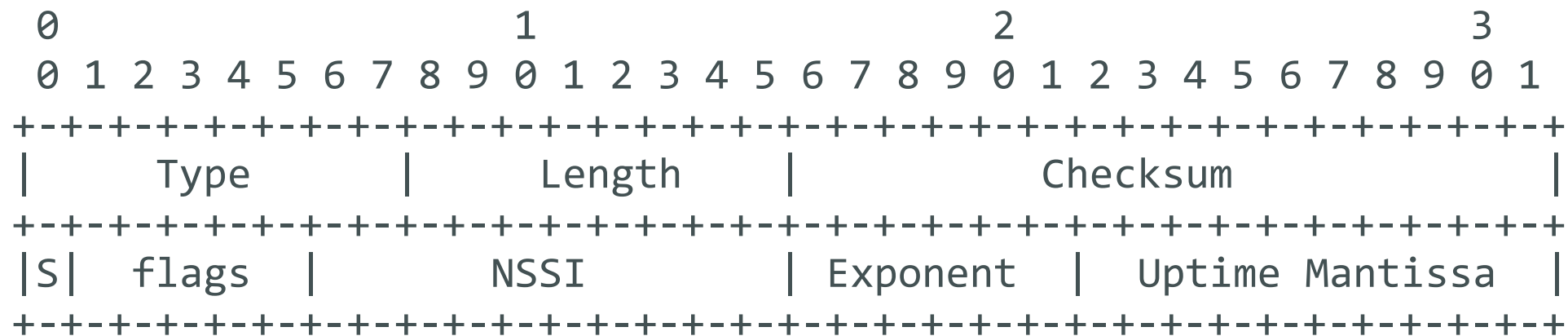
- Generated as a response to a request from Wi-Sun alliance
 - Remove the need for MLD, and its reactive broadcast REPORT polling
- Extends RFC 8505
 - New flags in the EARO to signal anycast and multicast
 - 6LN operation virtually unmodified, just setting the flags
 - New 6LR behavior that accepts 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)

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