

# IPv6 Neighbor Discovery Multicast Address Listener Registration

`draft-ietf-6lo-multicast-registration`

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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

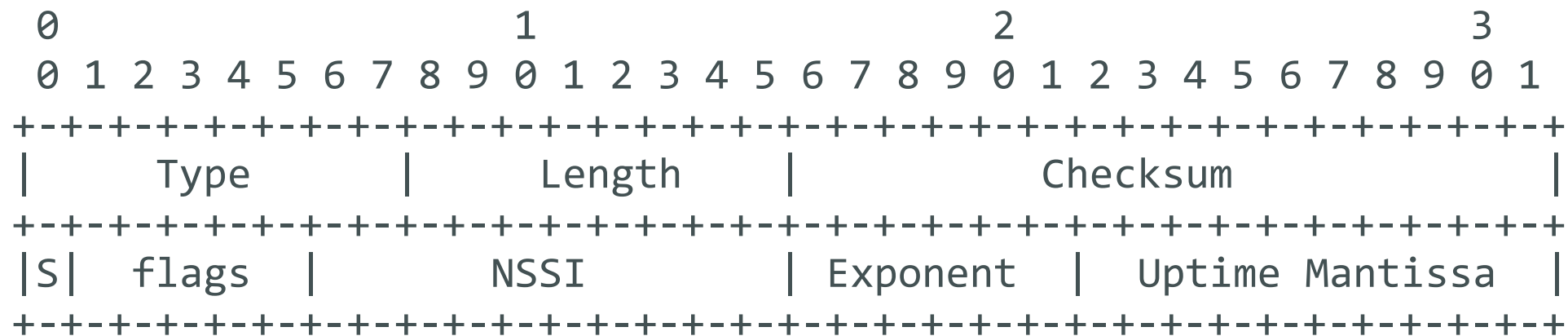
- Generated as a response to a request from Wi-Sun alliance
  - Remove the need for MLD, and its reactive broadcast REPORT polling
- Extends RFC 8505
  - New flags in the EARO to signal anycast and multicast
  - 6LN operation virtually unmodified, just setting the flags
  - New 6LR behavior that accepts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