IPv6 Neighbor Discovery
Multicast Address Listener
Registration

draft-ietf-6lo-multicast-registration

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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?