Eliding and Querying RPL Information

draft-thubert-roll-eliding-dio-information

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ROLL Virtual Meeting

Changes Highlights

- No Change Since IETF 106
- Needs WG attention to progress
- So far we were really busy
  - What with NP-DAO, RUL, turnon-RFC8138, UseOfRPLInfo drafts!
- Now a good time to reboot this?
- Next To Do's
  - Adapt to new MOPEXT/ CAPABILITIES split

What is this draft?

- The draft presents a method to safely elide a group of RPL options in a DIO message by synchronizing the state associated with each of these options between parent and child
- This is achieved using a new sequence counter in DIO messages called RPL Configuration State Sequence (RCSS)
- A child that missed a DIO message with an update of any of those protected options detects it by the change of RCSS and queries the update with a DIS Message.
- The draft also provides a method to fully elide the options in a DAO message.

Proposed method

- New RPL Configuration State Sequence (RCSS)
- Updates base objects
  - DIO to add RCSS
  - DAO to indicate it is abbreviated
  - DIS base objects to query missing options
- New “Abbreviated Option” Option (AOO)
  - Replacement for a full option, indicates last RCSS

Protected Options

The protected options are:

1. The Route Information Option (RIO) defined in section 6.7.5 of [RPL]
2. The DODAG Configuration Option (DCO) defined in section 6.7.6 of [RPL]
3. The Prefix Information Option (PIO) defined in section 6.7.10 of [RPL]
4. The Extended MOP Option (MOPex) defined in [MOPEX-CAP]
5. The Global Capabilities Option (GCO) defined in [MOPEX-CAP]

New Abbreviated Option Option

- Used as replacement of the full option
- Indicates the RCSS of the last change for this option

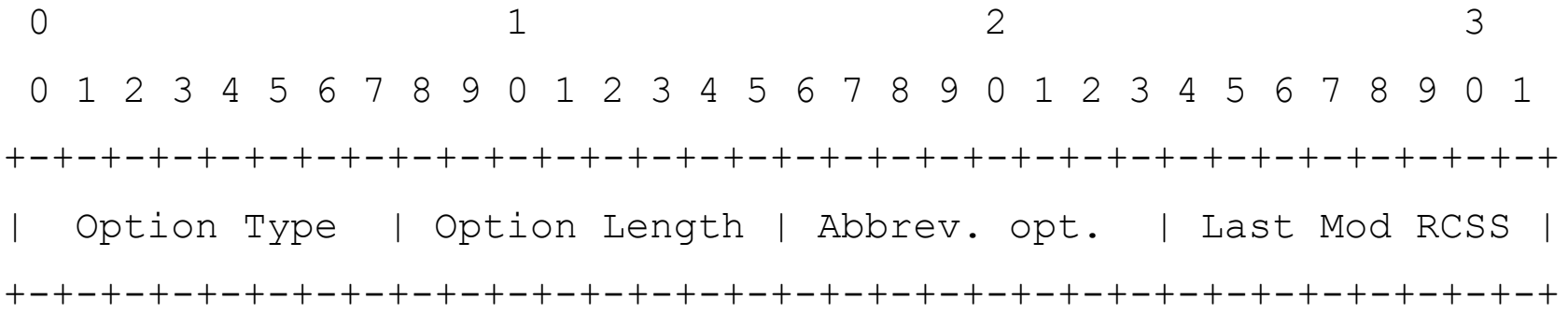

Figure 3: Abbreviated Option Option Format

Updated DIS object

- New bits to indicated requested options
- Last RCSS to which this node is synchronized

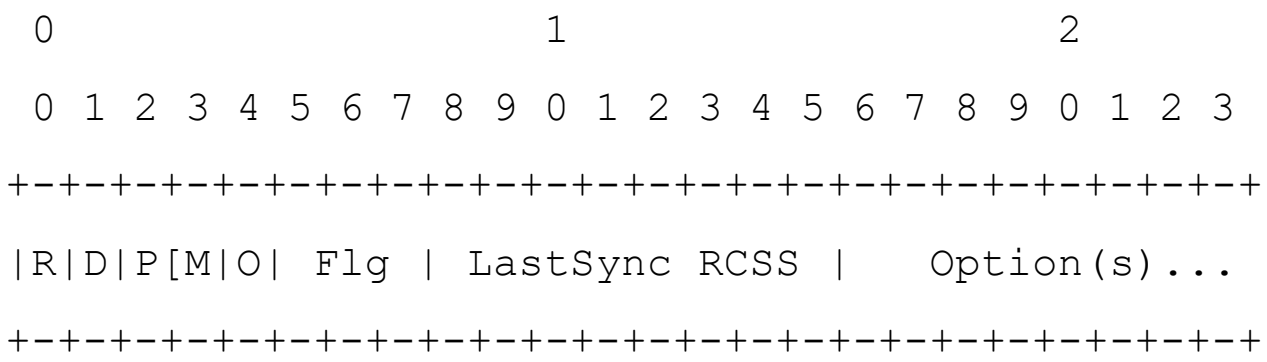

Figure 2: Updated DIS Base Object

RCSS operation

- The RCSS applies to a DIO Message and a same value of the RCSS can be used in DIO messages that are sent consecutively with no change in the protected options.
- The RCSS is incremented by the Root using a lollipop technique
- A reboot of the Root is detected when the RCSS moves from the circular to the straight part of the lollipop.
- During the straight part of the lollipop, a second reboot of the Root might not be recognized. For that reason the protected options MUST be provided in full with each increment on the RCSS during the straight part of the lollipop.
- When a field is modified in one of the protected options, the Root MUST send a DIO with an incremented RCSS and the modified protected option(s) in full.

Resync operation

A child can resynchronize any of the protected options to the latest RCSS by sending a DIS Message to a candidate parent that advertises that RCSS in DIO messages.

The child MUST set the desired combination of 'R', 'D', 'P', 'M' and 'O' flags to indicate the option(s) that it needs updated.

The child MUST signal in the Last Synchronized RCSS field of the DIS the freshest value of RCSS for which it was fully synchronized

The DIO message that is sent in response MUST contain in full all the options that are requested and that were updated since the Last Synchronized RCSS in the DIS Message. The other options MUST be added in the abbreviated form.

The options MAY be spread over more than one DIO message sent in a quick sequence.