

IETF80 March 2011

Selective DIS -00

`draft-dejean-roll-selective-DIS-00`

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New leaf node joins established network

- Node needs to find a few good parents
 - Within short time
 - With little network energy expenditure

With current RPL spec

- Node either waits for incoming DIOs
 - Long time, any router, suppression
- Or multicasts DIS to prompt for DIOs
 - All routers nearby reset their Trickle timer
 - Lots of DIOs will be sent until timers relax to long period
 - Each DIO triggers energy consumption in vicinity (multicast)

Proposal

- One flag in DIS header (L bit)
- Allow DMC option in DIS messages

Proposal

- One flag in DIS header (L bit) to mean
 - "do not reset your Trickle timer"
 - Avoids streams of DIOs
 - "reply to me with unicast DIO"
 - DIO transmitted within short time
 - Saves energy at other nodes
- Allow DMC option in DIS messages
 - "reply only if constraints are matched"
 - Targets "good" candidates

Example of use

- Solicit info from routers Max hop 1 Max LQL 3
 - *No response*
- Solicit info from routers Max hop 1 Max LQL 6
 - *No response*
- Solicit info from routers Max hop 2 Max LQL 3
 - ***Response heard***
- Solicit info from routers Max hop 2 Max LQL 6
- Solicit info from routers Max hop 3 Max LQL 3

Thank you!

Appendix: nuts and bolts

DIS base object format

RPL draft

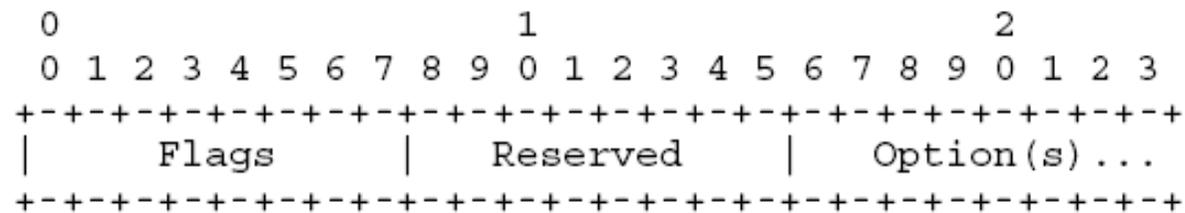


Figure 13: The DIS Base Object

Flags: 8-bit unused field reserved for flags. The field MUST be initialized to zero by the sender and MUST be ignored by the receiver.

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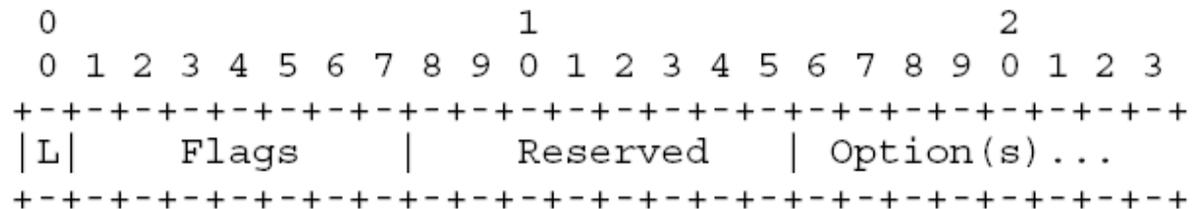


Figure 1: The DIS Base Object

L bit behavior

RPL draft

8.3. DIO Transmission

...

The following packets and events MUST be considered inconsistencies with respect to the Trickle timer, and cause the Trickle timer to reset:

...

- When a node receives a multicast DIS message without a Solicited Information option, unless a DIS flag restricts this behavior.
- When a node receives a multicast DIS with a Solicited Information option and the node matches all of the predicates in the Solicited Information option, unless a DIS flag restricts this behavior.

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A node that receives a DIS with the "Leaf Node" bit set MUST NOT reset its DIO Trickle timer, even if it matches the options carried by the DIS.

Metric Container in DIS

RPL draft

6.2.3. DIS Options

The DIS message MAY carry valid options.

This specification allows for the DIS message to carry the following options:

- 0x00 Pad1
- 0x01 PadN
- 0x07 Solicited Information

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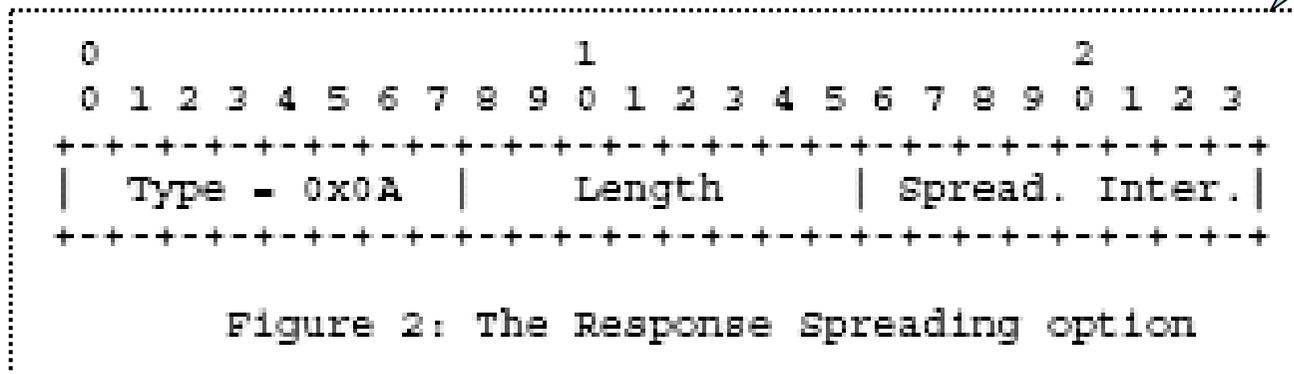
In addition to those already listed in [I-D.ietf-roll-rpl], the following option is declared valid for a DIS message:

- 0x02 Metric Container

A node that receives a DIS with a Metric Container option MUST ignore any Metric object in it, and MUST parse the Constraint objects in it, if any. The constraint values are compared to the values of the corresponding metrics known to the node.

(TBC) Collision mitigation option

this draft



- Who wants it? Who needs it?