Packet Delivery Deadline Time in 6LoWPAN Routing Header

draft-ietf-6lo-deadline-time-01

Lijo Thomas <lijo@cdac.in>
Akshay P.M <akshay.pm@smartenspaces.com>
Satish Anamalamudi <satishnaidu80@gmail.com>
S.V.R Anand <anand@ece.iisc.ernet.in>
Malati Hegde <malati@ece.iisc.ernet.in>
Charles E. Perkins <charliep@computer.org>

6lo WG meeting - IETF 101
22.03.2018
Overview

• Deadline-6LoRHE type for 6LoWPAN dispatch page 1
  – Carries Packet Delivery Deadline Time
  – Optional Packet Origination Time

• Enables delay-aware forwarding and scheduling decisions

• Operates on time-synchronized constrained networks

• Handles different time zones over heterogeneous networks
Draft History

- **IETF 97** - Presented the first version of draft: <draft-lijo-6lo-expiration-time>

- **IETF 98** - 1\textsuperscript{st} and 2\textsuperscript{nd} revision
  - Included Origination Time (OT)
  - Provided header compression mechanism

- **IETF 99** - 3\textsuperscript{rd} and 4\textsuperscript{th} revision
  - Network ASN included as new Time Unit (TU) representation
  - Improved header compression mechanism

- **Implemented** the draft in OpenWSN platform for a 6tisch network; the code has been merged with OpenWSN

- **IETF 100** - **Adopted as a WG Document**: <draft-ietf-6lo-deadline-time>
Draft Updates

• Added references for **Time Synchronization mechanism / protocols**

• Updated the **iOAM draft reference** to <draft-ietf-ippm-ioam-data>

• Based on comments received, modified the usage of ‘Drop’ Flag from **SHOULD** to **MUST**

• Added text for describing the **kinds of delays** observed in a network
### Deadline-6LoRHE Format

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Flag</strong></th>
<th><strong>Description</strong></th>
<th><strong>Details</strong></th>
</tr>
</thead>
</table>
| O flag  | Origination Time flag | 1: Origination Time is present  
0 : Origination Time is absent |
| D flag  | Drop flag | 1 : **MUST** drop the packet if the deadline time is elapsed
0 : MAY ignore and forward |
| DTL (3 bits [bbb]) | Length of DT field := [bbb]+1
 000 : Length of DT is “1 octet”
 111 : Length of DT is “8 octets” |
| OTL (3 bits [bbb]) | Length of OT field := [bbb]+1
 000 : Length of OT is “1 octet”
 111 : Length of OT is “8 octets” |

| **TU** (2 bits) | Indicates the time units for DT and OT
 00 : Time in microseconds
 01 : Time in seconds
 10 : Network ASN
 11 : Reserved |
| **EXP** (3 bits) | Multiplication factor (exponent of base 10) |
| **RSV** (3 bits) | Reserved |

| **DT** (Variable length) | Deadline Time value (8..64-bit) |
| **OT** (Variable length) | Origination Time value (Optional) (8..64-bit) |
Way Forward

Need more peer review and request for WG LC

Comments and Questions

Thanks !!!