Packet Delivery Deadline Time in 6LoWPAN Routing Header

draft-lijo-6lo-expiration-time-04

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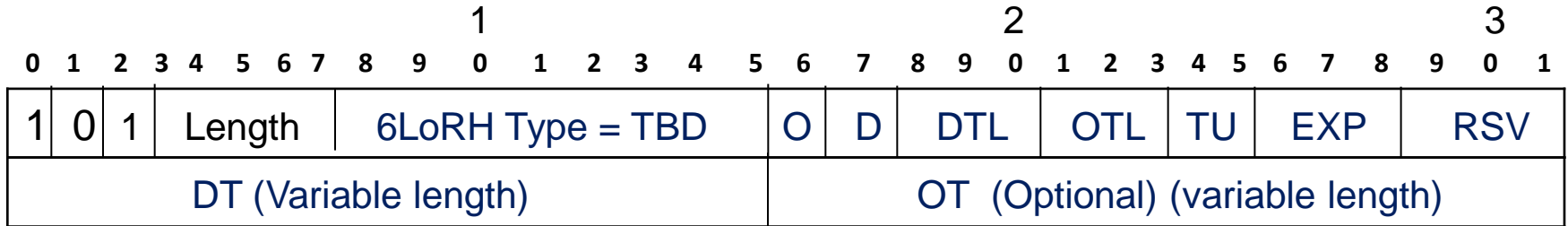Charles E. Perkins charliep@computer.org

IETF 99, Prague

Overview

- Deadline-6LoRHE type for 6LoWPAN dispatch page 1

  - Carries Packet Delivery Deadline Time

  - Optionally carries Packet Origination Time

- Enables delay-aware forwarding and scheduling decisions

- Operates on time-synchronized constrained networks

- Handles different time zones over heterogeneous networks

Changes since revision …-03

- Included "Network ASN" as one of the time units so that the draft can be used more easily with 6tisch networks

- Revised Time Unit (TU) representation
  - 00 : Time in microseconds
  - 01 : Time in seconds
  - 10 : Network ASN
  - 11 : Reserved

- Deadline-6LoRHE Format has been modified for better compression

- Editorial improvements
  - Make consistent use of "deadline" instead of "expiration time"

Deadline-6LoRHE Format

0 1 2	3 4 5 6 7	8 9 0 1 2 3 4 5	6	7	8 9 0	1 2 3	4 5	6 7 8	9 0 1
1 0 1	Length	6LoRH Type = TBD	O	D	DTL	OTL	TU	EXP	RSV
DT (Variable length)			OT (Optional) (variable length)						

O flag (1 bit)	Origination Time flag 1: Origination Time is present 0 : Origination Time is absent
D flag (1 bit)	Drop flag 1 : SHOULD drop the packet if the deadline time is elapsed 0 : MAY ignore and forward
DTL (3 bits [bbb])	[bbb]+1 = Length of DT field 000 : Length of DTL is "1 octet" : 111 : Length of DTL is "8 octets"
OTL (3 bits [bbb])	[bbb]+1 = Length of OT field 000 : Length of OTL is "1 octet" : 111 : Length of OTL 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)

Draft Implementation

- Implemented the draft in OpenWSN platform for a 6tisch network

- The code has been merged with OpenWSN and is available for download:

  - https://github.com/openwsn-berkeley/openwsn-fw

  - https://github.com/openwsn-berkeley/openwsn-sw

  - Thanks OpenWSN team for your support !!!!

- Implemented a basic EDF (Earliest Deadline First) scheduling policy to demonstrate the draft's applicability

Way Forward

Request for WG adoption of our draft

Comments and Questions?

Thanks !!!