Packet Expiration Time in 6LoWPAN Routing Header IETF 98

draft-lijo-6lo-expiration-time-02

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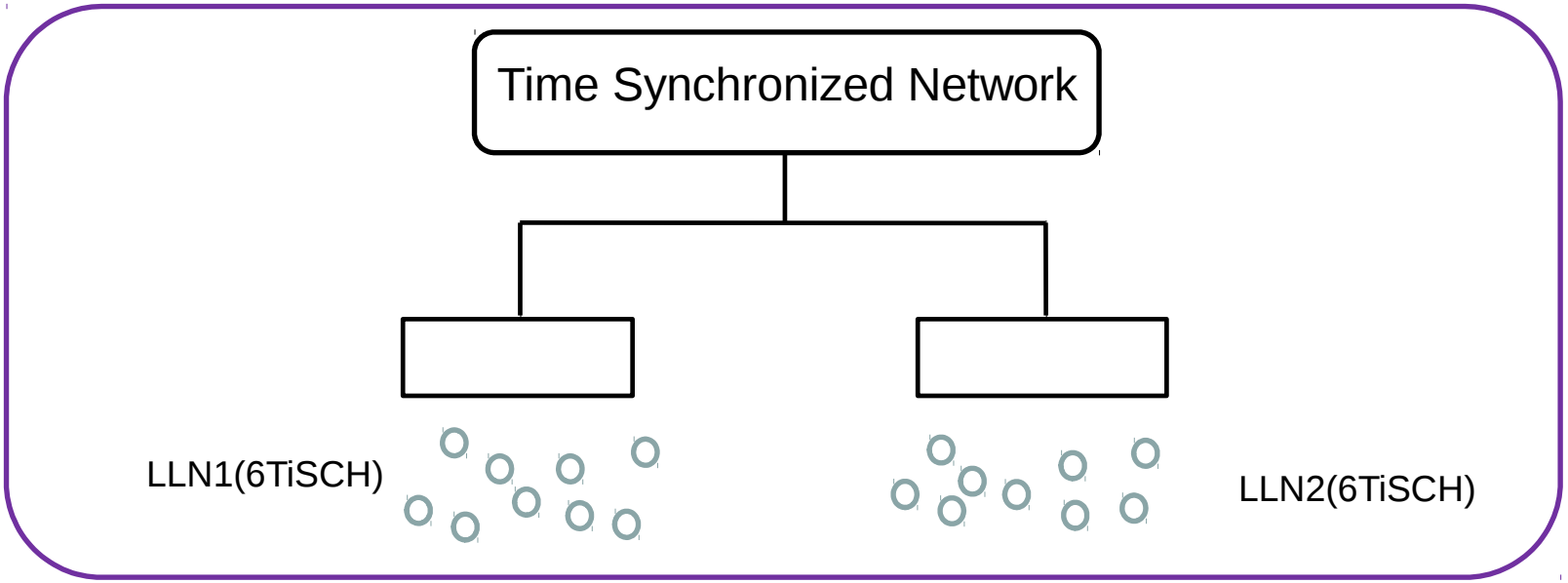
Overview

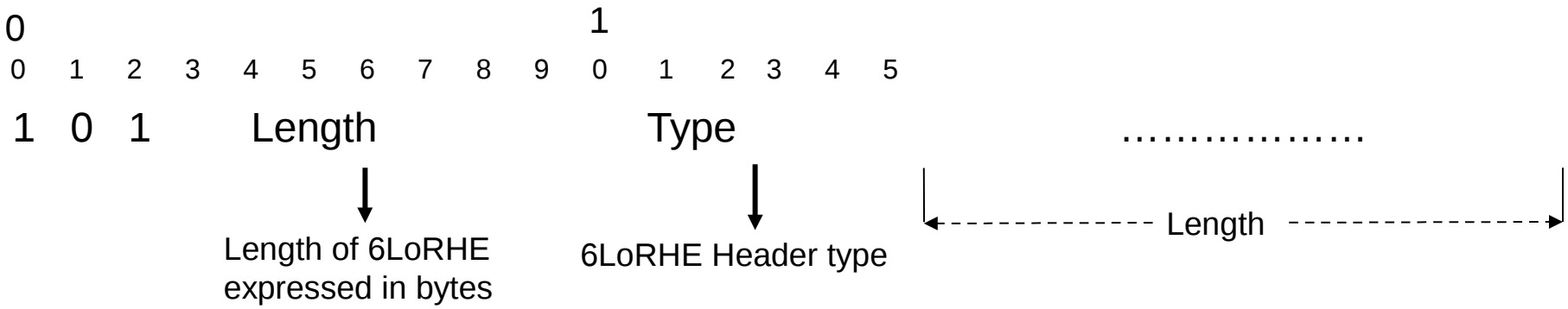
- Deadline-6LoRHE type for 6LoWPAN dispatch page 1
  - Carries Packet Expiration Time
  - Optional Packet Origination Time
- Enables delay-aware forwarding and scheduling decisions
- Operates on time-synchronized constrained networks
- Handles different time zones over heterogeneous networks



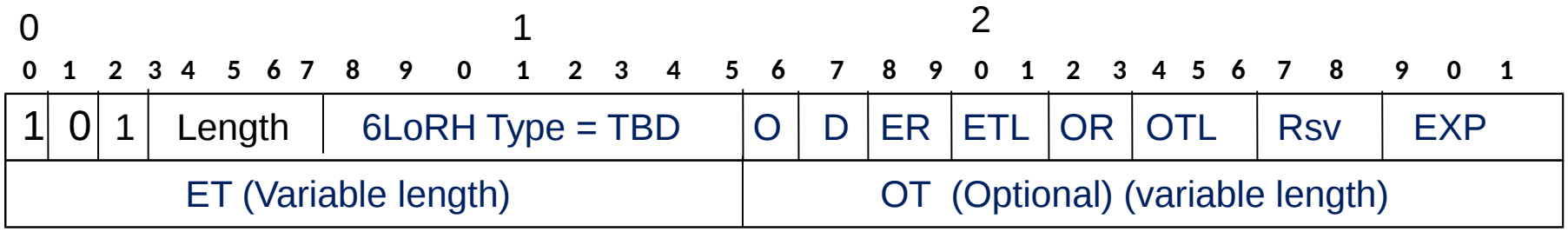
WG Comments on …-00 version

- The 6Lo RH Header was declared as an elective header and the size field was altered - Pascal
- Origination Time as well as Expiration - Thomas
  - Added (optional) Origination Time field
- Feedback from Dale
  - Renamed Timestamp-6LoRH to Deadline Header
  - Scheme for compressed time representation
  - Several editorial corrections
- Thanks Pascal, Thomas and Dale !

Deadline-6LoRH Elective Header for Packet Expiration Time



Elective 6LoWPAN Routing Header



Deadline-6LoRH Format

Deadline-6LoRH Message Format

- Length (5 bits) **:** Length of the Expiration Time in octets
- 6LoRH Type (8 bits) **:** TBD
- ‘O’ flag (1 bit) **:** Origination Time field
  1 **:** Origination Time is present
  0 **:** Origination Time is absent
- ‘D’ flag (1 bit) **:** On Time Expiration
  1 **:** Drop
  0 **:** Ignore and forward
- ‘ER’ (2 bits) **:** Units of Expiration Time
  00 **:** Time in microseconds
  01 **:** Time in milliseconds
  10 **:** Time in seconds
  11 **:** User Defined

Deadline-6LoRH Message Format (Cont'd)

- 'ETL' (3 bits [bbb]) **:** [bbb]+1 = Length of Expiration Time
  e.g., 000 **:** Length of ETL is "1 octet",
  111 **:** Length of ETL is "8 octets"

- 'OR' (2 bits) **:** Units of Origination Time

- 'OTL' (3 bits [bbb]) **:** [bbb]+1 = Length of Origination Time field
  e.g., 000 **:** Length of OTL is "1 octet",
  111 **:** Length of OTL is "8 octets"

- 'Rsv' (2 bits) **:** Reserved

- 'EXP' (3 bits) **:** Multiplication factor (exponent of base 2)

- 'ET' (Variable length) **:** Expiration Time value

- 'OT' (Variable length) **:** Origination Time value

Origination Time Procedure

- Delay incurred by packets is useful for network diagnostics and performance monitoring
- Origination Time Computation

OT_{new_net} : Origination Time in new network

CT_{new_net} : Current Time in new network

D_{prev_net} : Delay already incurred in previous network(s)

$$OT_{new\_net} = CT_{new\_net} - D_{prev\_net}$$

Next Steps ?

- Should ASN be a choice for scale of ET and OT units?

Comments and Questions

Thanks !!!