Transmission of IPv6 packets over IEEE 1901.2 networks (NB-PLC)

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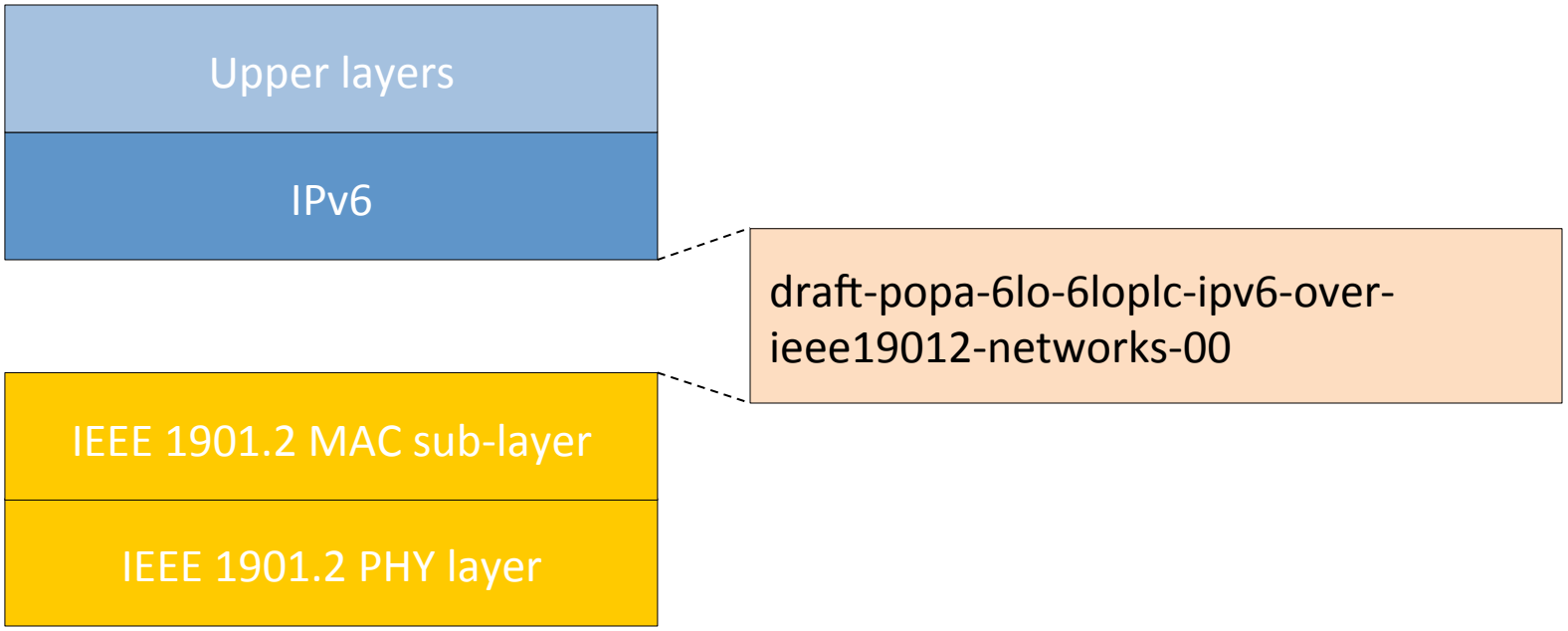
Agenda

- Overview of IEEE 1901.2 standard
- The need for an 6LowPAN-like adaptation layer and why existing 6LowPAN standards (RFC 4944 and RFC 6282) are not enough
- Key assessments
  - IEEE 1901.2 link-layer supports an MTU = 1280 octets => no need for IPv6 packet fragmentation
  - IPv6 header compression is still suitable as 1901.2 PHY frame payload < 1280 octets
    - MAC sub-layer specifies per-hop fragmentation and re-assembly

Overview of IEEE 1901.2 standard (1)

- Standard published in 2013
  - Target market is smart grid market
  - Specifically designed for low power and constrained devices
  - Specifies a PHY and MAC sub-layer for Narrowband Power Line Communication (NB-PLC) networks



Overview of IEEE 1901.2 standard (2)

- PHY layer supports multiple data rates
  - OFDM modulation with concatenated coding (RS + CC) and frequency-time interleaving
  - Low bit rate & robust mode (long range) to high bit rate (short range)
  - PHY frame payload up to 512 octets

- MAC sub-layer
  - Endorses 802.15.4-2006 MAC frame format with a number of changes
    - Information Elements (not relevant to this discussion)
    - Uses only 16-bits and 64-bits MAC addressing scheme
    - MAC frame payload up to 1280 octets
    - Segment Control field : prepended to 802.15.4-2006 MAC frame to manage reliable per-hop fragmentation and re-assembly

The need for a 6LowPAN-like adaptation layer

- Avoid market confusion
  - 6LowPAN refers to IPv6 over 802.15.4 wireless networks
  - 6loPLC will refer to IPv6 over 1901.2 NB-PLC networks

- 6LowPAN defines per-hop header compression and fragmentation while
  - IEEE 1901.2 networks do not need IPv6 packet fragmentation
  - IEEE 1901.2 networks may need IPv6 header compression

- Implementers very often wonder what to implement from 6LowPAN standards (RFC 4944 and RFC 6282) when implementing IPv6 over 1901.2 NB-PLC networks

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- Objective
  - Specify the transmission of IPv6 packets over IEEE 1901.2 links
  - Do not specify IPv6 protocol behavior over IEEE 1901.2 links

- Target
  - Standard draft

- Status
  - Revision -00 – currently on the website
    - IPv6 (+UDP) header compression as per RFC 6282 is mandatory (MUST)
    - IPv6 fragmentation as per RFC 4944 is optional (and NOT RECOMMENDED)
  - Revision – 01 – next on the website
    - Feedback from the WG
    - Make IPv6 fragmentation a MUST NOT rather than NOT RECOMMENDED

Questions?