IPv6 over Constrained Node Networks(6lo) Applicability & Use cases

draft-ietf-6lo-use-cases-11

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- 2nd revision : draft-ietf-6lo-use-cases-02 (Jul.03.2017)
- 3th revision : draft-ietf-6lo-use-cases-03 (Oct.30.2017)
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- 10th revision : draft-ietf-6lo-use-cases-10 (Feb.21.2021)
- **11th revision : draft-ietf-6lo-use-cases-11 (Jul.12.2021)**

Updates after Last meeting

- Comments from Tero Kivinen
  - Received after submission of the previous draft
  - Consideration of IEEE Std 802.15.9-2016 recommend practice
  - Expression of IEEE Standards
  - Old title of an IEEE Standard
  - Removing an explicit external standard

- Comments from Jianqiang Hou (Derek)
  - Typos of IEEE 1902.1 and IEEE 1902.2

Comments from Tero Kivinen (1/4)

- Consideration of IEEE Std 802.15.9-2016 recommend practice
  - This draft does not take into account the IEEE Std 802.15.9 recommend practice
  - The IEEE Std 802.15.9 provides multiplexing and fragmentation layer for the IEEE Std 802.15.4.
  - This document should also note that in some IEEE Std 802.15.4 networks those might not be needed, and the methods provided by the IEEE Std 802.15.9 could also be used.

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IPv6 requires its underlying layer to support an MTU of 1280 bytes.
Furthermore, those IEEE Std 802.15.4 variants do not offer
fragmentation and reassembly functionality.  (It is noted that IEEE
Std 802.15.9-2016 provides multiplexing and fragmentation layer for
the IEEE Std 802.15.4[IEEE802159].)  Therefore, an appropriate
adaptation layer supporting fragmentation and reassembly must be
provided below IPv6.  Also, the limited IEEE Std 802.15.4 frame size
and low energy consumption requirements motivate the need for packet
header compression.  The IETF IPv6 over Low-Power WPAN (6LoWPAN)
working group published a suite of specification that provide an
adaptation layer to support IPv6 over IEEE Std 802.15.4 comprising
the following functionality:
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Comments from Tero Kivinen (2/4)

- Expression of IEEE Standards
  - The proper way to refer to the IEEE Standards is to use "IEEE Std 802.15.4" or "IEEE Std 1901-2010"
  - Note the "Std" between the IEEE and the standard number, and that there is no "." after the Std.

  - Change "IEEE 802.15.4" to "IEEE Std 802.15.4"
  - Change "IEEE 1901-2010" to "IEEE Std 1901-2010"
  - Change "Std." to "Std"

Comments from Tero Kivinen (3/4)

- Old title of an IEEE Standard
  - Normative references also has old title for IEEE Std 802.15.4.
  - The title used there was changed in 2011 to "Part 15.4: Low-Rate Wireless Personal Area Networks (LR-WPANs)", then simplified in 2015 to "IEEE Standard for Low-Rate Wireless Personal Area Networks (WPANs)" and simplified again in 2020 to "IEEE Standard for Low-Rate Wireless Networks".

  - Change "IEEE Std. 802.15.4, Part. 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks" to "IEEE Standard for Low-Rate Wireless Networks"

Comments from Tero Kivinen (4/4)

- Removing an explicit external standard
  - I am not sure current Thread group uses IEEE Std 802.15.4-2006 anymore, i.e., any features that were there in 2006, but which are no longer in newer versions (i.e., features which were deprecated).
  - Anyways providing such level of details is unnecessarely and might be misleading when those external standards evolve, so I would recommend removing that kind of version specific details.

  - Delete the sentence "The IEEE 802.15.4-2006 and IEEE 802.15.4-2015 versions of the specification are used by Thread."

Comment from Jianqiang Hou (Derek)

- Typos of IEEE 1902.1 and IEEE 1902.2
  - IEEE 1902.1 [IEEE1901.1] defines a medium frequency band
  - ////"1902.1" should be "1901.1"
  - IEEE 1902.2 [IEEE1901.2] defines a narrowband variant of PLC
  - ////"1902.2" should be "1901.2"

IEEE Std 1901 [IEEE1901] defines a broadband variant of PLC but is effective within short range. This standard addresses the requirements of applications with high data rate such as: Internet, HDTV, Audio, Gaming etc. Broadband operates on Orthogonal Frequency Division Multiplexing (OFDM) modulation.

IEEE Std 1901.1 [IEEE1901.1] defines a medium frequency band (less than 12 MHz) broadband PLC technology for smart grid applications based on OFDM. By achieving an extended communication range with medium speeds, this standard can be applied both in indoor and outdoor scenarios, such as Advanced Metering Infrastructure (AMI), street lighting, electric vehicle charging, smart city etc.

IEEE Std 1901.2 [IEEE1901.2] defines a narrowband variant of PLC with less data rate but significantly higher transmission range that could be used in an indoor or even an outdoor environment. It is applicable to typical IoT applications such as: Building Automation, Renewable Energy, Advanced Metering, Street Lighting, Electric Vehicle, Smart Grid etc. Moreover, IEEE Std 1901.2 standard is based on the 802.15.4 MAC sub-layer and fully endorses the security scheme defined in 802.15.4 [RFC8036]. A typical use case of PLC is smart grid.

Thanks!!

Questions & Comments