

# Use cases for IPv6 over Networks of Resource- constrained Nodes

*draft-hong-6lo-use-cases-01.txt*

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**6lo WG Meeting@IETF 95 – Buenos Aires, Argentina  
2016.4.7**

# History and status

- Discussed from IETF 89
- Initial Document: draft-hong-6lo-use-cases-00.txt (Oct.17.2015)
  - Presented at IETF-94 6lo WG meeting
- Update 01: draft-hong-6lo-use-cases-01.txt (Mar.21.2016)
  - Carles Gomez (UPC/i2cat) and Deoknyong Ko (SKtelecom) added in Authors
  - 6lo Link layer technologies : ITU-T G.9959(Z-wave), BLE, DECT-ULE, MS/TP, NFC, LTE MTC
  - Design space dimensions : Deployment/Bootstrapping, Topology, L2-Mesh or L3-Mesh, Multi-link subnet, Data rate, Buffering requirements, Security Requirements, Mobility across 6lo networks and subnets, Time synchronization requirements, Reliability and QoS, Traffic patterns, Security Bootstrapping, Power use strategy, Energy limitation
  - 6lo use cases :
    - Use case of NFC: Alternative Secure Transfer
    - Use case of ITU-T G.9959: Smart Home
    - Use case of Bluetooth Low Energy: Smartphone-Based Interaction with Constrained Devices
    - Use case of DECT-ULE: Smart Home
    - Use case of LTE MTC

# Goals

- Describe the specific information of 6lo usages and how 6lowpan requirements can vary on different L2 technology use cases
- Describe the practical deployment scenarios of 6lo technologies with the consideration of 6lo link layer technologies and identify the requirements
- Inform relevant information about 6lo applicability to external audience

# 6lo Link layer technology Use cases

- ITU-T G.9959 (Z-wave) : RFC 7428
- Bluetooth Low Energy : RFC 7668
- DECT-ULE : draft-ietf-6lo-dect-ule-04
- Master-Slave/Token-Passing : draft-ietf-6lo-6lobac-04
- NFC : draft-ietf-6lo-nfc-03
- LTE MTC : 3GPP TS 36.306 V13.0.0 [ ??]

# Design parameters for 6lo use cases

- Deployment/Bootstrapping
- Topology
- L2-Mesh or L3-Mesh
- Multi-link subnet
- Data rate
- Buffering requirements
- Security Requirements
- Mobility across 6lo networks and subnets
- Time synchronization requirements
- Reliability and QoS
- Traffic patterns
- Security Bootstrapping
- Power use strategy
- Energy limitation

# 6lo use cases

- Use case of NFC: Alternative Secure Transfer
  - Example: Secure Transfer by Using NFC in Healthcare Services with Tele-Assistance
- Use case of ITU-T G.9959: Smart Home
  - Example: Use of ITU-T G.9959 for Home Automation
- Use case of Bluetooth Low Energy: Smartphone-Based Interaction with Constrained Devices
  - Example: Bluetooth LE-based Body Area Network for fitness
- Use case of DECT-ULE: Smart Home
  - Example: use of DECT-ULE for Smart Metering
- Use case of LTE MTC
  - Example: Use of wireless backhaul for LoRa gateway

# Example NFC : 6lo use case parameters

- Dominant parameters in secure transfer by using NFC in healthcare services:
  - **Deployment/Bootstrapping:** Pre-planned. MP2P/P2MP, P2P.
  - **Topology:** Small, NFC-enabled device connected to the Internet.
  - **L2-mesh or L3-mesh:** NFC does not support L2-mesh, L3-mesh can be.
  - **Multi-link subnet, single subnet:** a Single-hop for gateway; patient's body network is mesh topology.
  - **Data rate:** Small data rate.
  - **Buffering requirements:** Low requirement.
  - **Security requirements:** Data privacy and security must be provided.
  - **Mobility:** Moderate (patient's mobility).
  - **Time Synchronization:** Highly required.
  - **Reliability and QoS:** High level of reliability support, role-based.
  - **Traffic patterns:** Short data length and periodic (randomly).
  - **Security Bootstrapping:** Highly required.
  - Other Issues: Plug-and-play configuration, Real-time data acquisition and analysis , Efficient data management, Reliability and robustness

# Status of Collaboration with JTC 1/ WG 10

- Requested Contributions on IoT Use cases on February
- On-going standard projects under WG 10 are
  - 1. ISO/IEC 30141 – IoT Reference Architecture
  - 2. ISO/IEC 20924 – Definition and vocabulary for IoT
  - 3. ISO/IEC TR on IoT Use Cases (WG10 N0314)
  - 4. ISO/IEC XXXX – IoT Interoperability – Part 1: Framework
- Difference between two SDOs
  - JTC1 contribution may want to gather IoT use cases and related actors (entities that communicate and interact, can include people, software applications, systems, databases, IoT system etc)
  - On the contrary, the 6lo use case document focused on the applicability and consideration of several design spaces of 6lo technologies to efficiently implement typical IoT services
- Current status : Contacting with JTC 1/WG10 convenor and discussing with 6lo WG chairs

# Conclusions

- (informal) Comments on morning discussion
  - Change the title : Deployment scenarios and requirement of 6lo ~ ~
  - Make a comparison table of each 6lo use cases
  - It is valuable to develop the 6lo use cases document
- Discussion points
  - How to handle missing 6lo use case of specific link layer technologies
  - How to describe the 6lo requirements
    - Common 6lo requirement
    - Specific requirements of each 6lo link layer technology
  - How to develop this document
    - Tele. Conference
    - Editing group