Wi-SUN

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NETWORK DEPLOYMENT + TARGET APPS

- Breaking with the template format
- Realization that what LPWAN is targeting seems narrower than the domain covered by IEEE802.15.4
  - 802.15.4 is highly flexible with a range of different capabilities
  - Allows for optimized L1/L2 approaches depending on application (in-building, Industrial IoT, Field Area Networks of various classes, etc)
  - Supports both structured and ad hoc, self forming network architectures
- IETF and IEEE802 have been collaborating for years on IP based IoT network solutions
- Consequently, most needed network layer elements already exist, although work continues
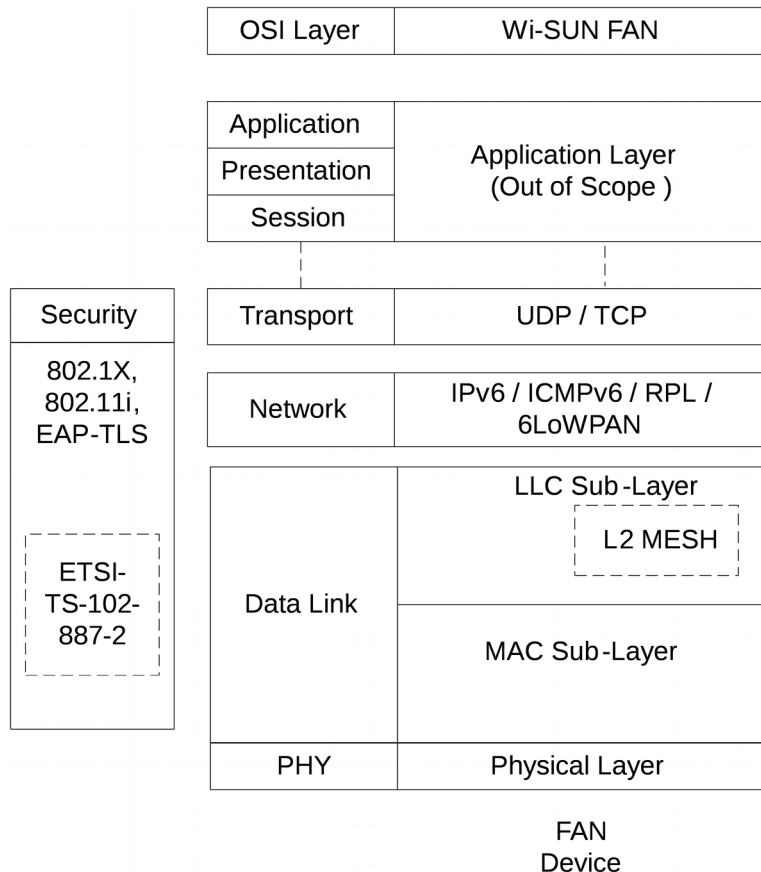
The Wi-SUN Alliance

- For those who might not know, the Wi-SUN Alliance is an organization very much like the Wi-Fi Alliance

- We develop key network profiles using IEEE802 and IETF standards (and those of other SDOs as needed)

- We develop supporting test and certification programs

- We do not develop technology, we work with appropriate Standards Bodies

Wi-SUN Alliance Profiles

- Current completed profiles and test and certification programs include:
  - A Field Area Network (FAN) profile (see next slide)
  - A profile for TEPCO Route B
  - A Home Area Networking (HAN) profile
- Route B and HAN are examples of "pt to pt" and "pt to multi-pt" profiles using 6lowpan and PANA, whereas the current FAN profile is an ad hoc self forming network
- Projecting over 60 million Route B and HAN installed devices in Japan by 2020

Wi-SUN FAN Stack Overview

OSI Layer	Wi-SUN FAN

Application	
Presentation	Application Layer (Out of Scope)
Session	

Security		
802.1X, 802.11i, EAP-TLS	Transport	UDP / TCP
	Network	IPv6 / ICMPv6 / RPL / 6LoWPAN
ETSI-TS-102-887-2	Data Link	LLC Sub-Layer / L2 MESH / MAC Sub-Layer
	PHY	Physical Layer

FAN
Device

IPv6 protocol suite
- TCP/UDP
- 6LoWPAN Adaptation + Header Compression
- DHCPv6 for IP address management.
- Routing using RPL.
- ICMPv6.
- Unicast and Multicast forwarding.

MAC based on IEEE 802.15.4e + IE extensions
- Frequency hopping
- Discovery and Join
- Protocol Dispatch (IEEE 802.15.9)
- Several Frame Exchange patterns
- Optional Mesh Under routing (ANSI 4957.210).

PHY based on 802.15.4g
- Various data rates and regions

Security
- 802.1X/EAP-TLS/PKI Authentication.
- 802.11i Group Key Management
- Optional ETSI-TS-102-887-2 Node 2 Node Key Management

Supports a variety of IP based app protocols :
DLMS/COSEM, ANSI C12.22, DNP3, IEC 60870-5-104, ModBus TCP, CoAP based management protocols.

Why is Wi-SUN here

- We serve the LPWAN space, among others

- Our interest in this effort is
  - awareness (in the event changes are needed)
  - to help ensure consistency of approach
  - share relevant experience
  - Since these solutions will be used in the same markets in complementary ways, there is a need to co-exist and potentially interoperate
  - Wi-SUN FAN uses IP, it can connect to Wi-Fi and Wired networks through routers