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India SMART UTILITY Week 2025

Session : Global and Indian Lessons

MIOTY vs Wi-SUN Rollout of Large AMI Systems

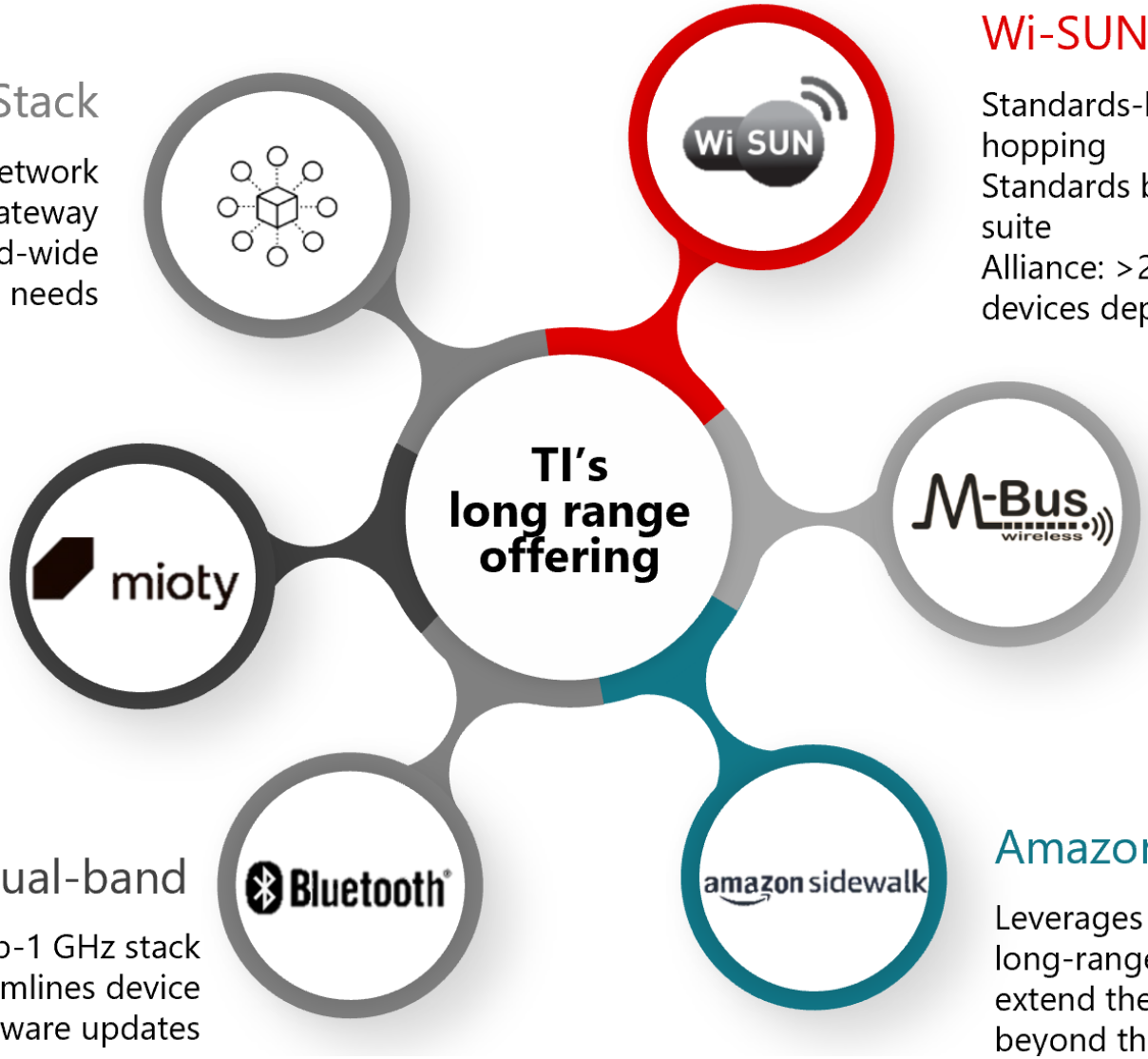
Presented By

Rizwan Murji, Director of Applications Engineering, LPCS, Texas Instruments

INTRODUCTION

- Look at solutions offered by TI
- A closer look at MIOTY vs Wi-SUN and considerations in a large scale deployment
- Advantages and disadvantages of MIOTY
- Advantages and disadvantages of Wi-SUN
- Summary

Sub-1 GHz Software Solutions



IEEE 802.15.4: TI 15.4 Stack

Complete standards based star network
Low-power end nodes & gateway
Many RF PHYs to choose from for world-wide regulatory compliance & application needs

Wi-SUN

Standards-based robust mesh network, frequency hopping
Standards based multi-layer security & IPv6 protocol suite
Alliance: >230 members from 26 countries, 95M devices deployed WW. **TI is a Promoter member!**

MIOTY

New standards-based LPWAN solution backed by major industry players including TI
Up to 5km in urban / 15km in rural areas
Low data rate, low power network
TI is a part of the Alliance!

Wireless M-BUS

Only European standard for metering
Sub-1GHz star network with long range using 433MHz / 868MHz
Multiple options to suit your meter with wireless network processor or single SoC

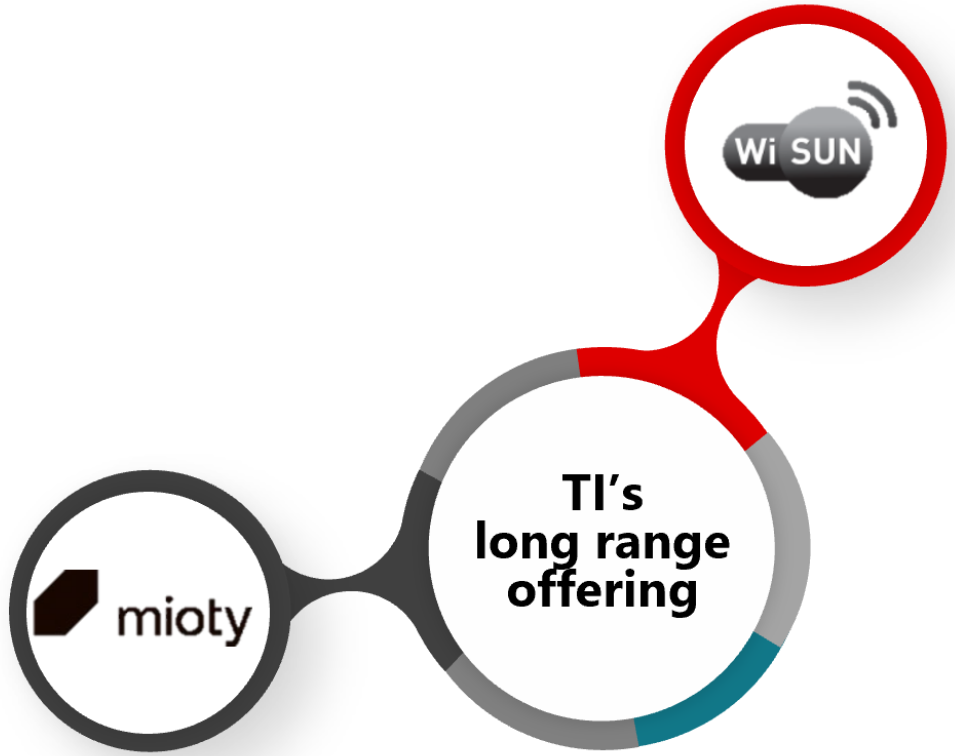
Dual-band

Adding BLE to a Sub-1 GHz stack significantly streamlines device configuration & OTA firmware updates

Amazon Sidewalk

Leverages the 900 MHz band to create a long-range, low-power home network to extend the range of low-bandwidth devices beyond the home Wi-Fi network

Sub-1 GHz Software Solutions



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Advantages and Disadvantages of MIOTY

Summary: MIOTY technology is a new low-power wide-area network (LPWAN) solution, and is a true standardized technology based on ETSI 103 357. MIOTY achieves long range with Sub-1 GHz communication, and offers robust networks due to its innovative telegram splitting. Telegram splitting also makes MIOTY capable of scaling to thousands of devices on a single base station. Target applications are ultra-low power sensor devices, such as metering and environmental/industrial monitoring.

Advantages:

- **Network:** MIOTY is a star network with +10,000 nodes.
- **Power consumption:** MIOTY is used in ultra-low power applications, achieving up to 15+ years battery lifetime.
- **Throughput:** MIOTY has very low data rates at 400 Bps with a long communication range.
- **Range:** MIOTY excels at long range, with 5 kilometers in an urban environment, and up to 15 kilometers in rural areas.

Potential Disadvantages:

- **Throughput:** MIOTY is not geared towards applications that require higher throughput such as e-meters.

(1) Wireless Connectivity Technology Guide
(2) Getting started with MIOTY

Advantages and Disadvantages of Wi-SUN

Summary: Wi-SUN® is a standards-based mesh network with frequency hopping. The Wi-SUN Alliance has more than 300 members from 46 countries, with 100M+ devices deployed world-wide. Wi-SUN supports IPv6 protocol suite and standards based multi-layer security. The standard supports multiple data rates and frequency bands to meet different regulatory requirements world-wide. Applications include smart grid and smart city applications, with certified products enabling multivendor interoperability.

Advantages:

- **Range:** Typical Wi-SUN networks will cover up to a few square km of urban area with 5 - 10 hops. The Wi-SUN standard allows up to 24 hops (or levels).
- **Power Consumption:** – All router nodes in a Wi-SUN network participate in enabling the mesh and are not intended for battery operation. Wi-SUN FAN 1.1 introduced a Limited Functionality Node (LFN) that support battery operated devices as well.
- **Security:** Wi-SUN FAN supports best-in-class network security based on IEEE 802.1x specification. It uses public key infrastructure with x.509 certificates, and each device on the Wi-SUN network is expected to have its own unique certificate. Device identity certificates can be obtained either from a Wi-SUN Alliance approved third-party Certificate Authority (CA) or a manufacturer CA can be used.

Potential Disadvantages:

- **Power consumption:** The Wi-SUN FAN standard only supports routers that are always on, which is a challenge for battery operated devices. With the introduction of LFN nodes in the FAN 1.1, the standard now also supports sleeping nodes running on batteries.
- **Security:** Wi-SUN FAN requires use of security certificates, which adds overhead in an application where high level of security is not required.

(1) Wireless Connectivity Technology Guide

(2) Getting started with Wi-SUN

Example Applications

- **MIOTY examples applications:** MIOTY is perfect for applications where low data rates are sufficient. In the smart grid sector, flow (gas and water) meters are a good example of this. Asset tracking is another application that aligns well with MIOTY. A rapidly growing market is smart agriculture. This includes applications such as environmental and soil monitors, farm asset tracking, and irrigation controls.
- **Wi-SUN example applications:** The largest installed base of Wi-SUN products is in Smart Metering, but Smart City applications such as Street Lighting is gaining traction. Wi-SUN is a good fit for any Smart City application that demands long RF transmission range, good level of security and high number of nodes.

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