SILICON LABS
CONNECTED INTELLIGENCE

2026 tech talks
WEBINAR SERIES

# Expanding LPWAN Deployment Models

How the protocol scales from local meshes to infrastructure-grade IoT

Wi-SUN

# Agenda

01 What Wi-SUN is

02 Why it matters for infrastructure IoT

03 The Silicon Labs Wi-SUN platform

04 Micro mesh vs. massive mesh

05 Choosing your architecture

06 Live Q&A with panelists

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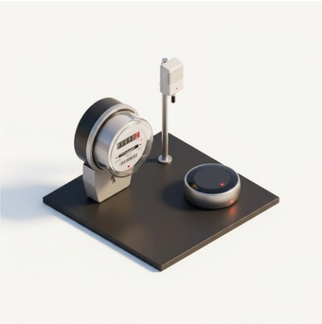
THE SHIFT

# IoT is moving from connecting devices to operating networks.

Three tiers, three sets of requirements. The third is what Wi-SUN is built for.

TIER 1 · DEVICES



## A few

connected devices

Direct connections. Star topologies. The world before mesh.

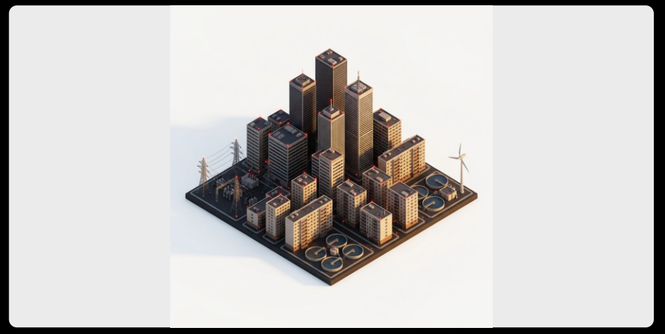
TIER 2 · LOCAL MESH

## 10s–100s

nodes per network

Localized coverage. Buildings, campuses, sites.

TIER 3 · MASSIVE MESH



## 1000s–100K+

nodes per network

Infrastructure-scale IoT. Cities, utilities, regional grids.

TAKEAWAY Wi-SUN is designed for networks that scale across all three tiers—and stay reliable at the top.

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DEFINITION

# Wi-SUN is an IPv6-based, self-forming, self-healing mesh.

### IPv6-based architecture

IPv6, 6LoWPAN, and RPL routing — every node has a real internet address.

### Self-forming, self-healing mesh

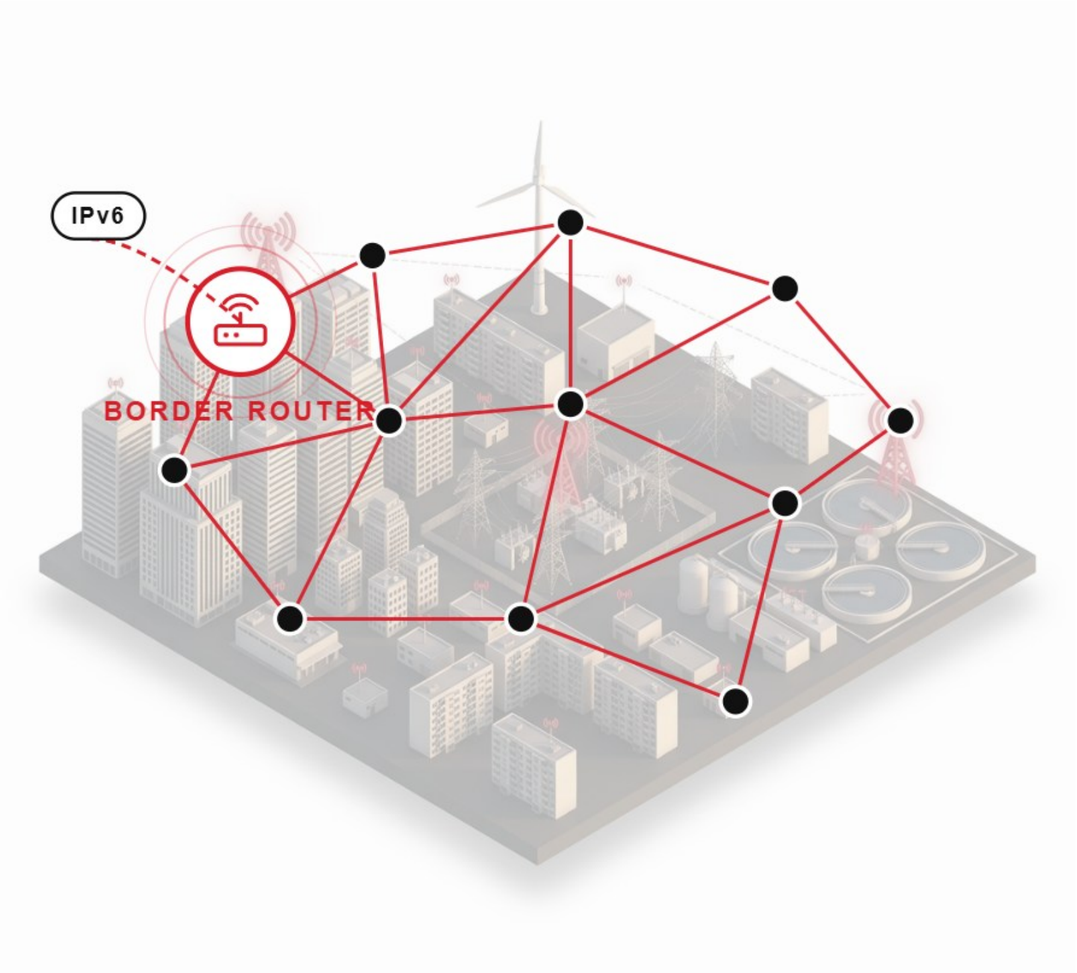
Multi-hop routing across large areas. Nodes find new paths automatically.

### Standards-based and secure

IEEE 802.15.4g radio, certificate-based security, no vendor lock-in.

### Multiple node types

Border routers, full-function nodes, and low-power limited-function nodes.

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WHY IT MATTERS

# Three things infrastructure IoT needs at once.

No single alternative delivers all three. Wi-SUN does.

01 · Interoperability

## Multi-vendor by design

Standards-based IEEE 802.15.4g + IPv6 stack. Procure across vendors and avoid lock-in for the 20-year life of the network.

IEEE 802.15.4g

open standard

02 · Scale

## Hundreds to 100K+ nodes

Mesh topology with distributed routing scales horizontally—add nodes and border routers without re-architecting.

100,000+

nodes per network

03 · Longevity

## Built for 10–20+ years

OTA-friendly memory headroom, multi-rate PHYs, and certificate-based security designed to outlast the deployment.

10–20+ years

deployment lifecycle

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COMPARED

# How Wi-SUN compares to the alternatives.

Three rows. Each is a place where infrastructure IoT typically breaks.

| | WI-SUN IEEE 802.15.4G | PROPRIETARY MESH | CELLULAR NB-IOT / LTE-M | PROPRIETARY LPWAN |
|---|---|---|---|---|
| Multi-vendor interoperability | ● Yes · standards-based | ◐ Vendor-defined | ◐ Carrier-based | ◐ Vendor-defined |
| Network scale | ● 100K+ nodes | ◐ 100s to 1000s | ● Millions (per carrier) | ◐ 100s to 1000s |
| Operating cost (OPEX) | ● Low · no carrier fees | ● Low | ○ High · ongoing carrier fees | ● Low |

**Only Wi-SUN delivers all three at once.** Standards-based interoperability, infrastructure-scale deployment, and long-term operating economics in a single architecture.

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THE PLATFORM

# The Silicon Labs Wi-SUN platform.

From silicon to system — one platform, four layers, two SoCs.

| | |
|---|---|
| L4 · APPLICATIONS<br>Vertical use cases | Smart metering · Smart cities · Industrial IoT · EV charging · Building automation |
| L3 · WI-SUN STACK<br>FAN 1.1 certified | IPv6 / 6LoWPAN · RPL routing · Self-forming & self-healing · PKI security |
| L2 · SDK & TOOLS<br>Developer ecosystem | Wireless SDKs · Simplicity Studio · Analysis & profiling · Reference designs |
| L1 · SILICON<br>Two purpose-built SoCs | EFR32FG25 (scale & performance) · EFR32FG28 (dual-band & edge) |

**EFR32FG25**

Scale & performance. Built for large-scale Wi-SUN networks.

**EFR32FG28**

Flexibility & integration. Sub-GHz + BLE in one SoC.

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SOC · EFR32FG25

# EFR32FG25 — built for scale.

Memory headroom, advanced PHY, and infrastructure-grade security for the largest Wi-SUN networks.

## MEMORY FOR SCALE

### Up to 1920 kB Flash / 512 kB RAM

Supports large FAN 1.1 stacks and future OTA updates without sacrificing application headroom.

## NETWORK EFFICIENCY

### Concurrent OFDM + FSK detection

Improves channel access in dense, congested RF environments — fewer collisions, better throughput.

EFR32FG25 · IEEE 802.15.4g · Sub-GHz

## ADVANCED PHY

### OFDM · up to ~2.4 Mbps · mode-switch

Higher throughput and lower latency than legacy FSK-only radios — multi-Mbps OFDM for large-mesh routing nodes.

## INFRASTRUCTURE SECURITY

### Secure Vault™ High

Hardware root-of-trust and key management — designed for 10–20+ year deployments.

TAKEAWAY Your network is only as scalable as your node architecture. FG25 is the architecture choice for scale.

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SOC · EFR32FG28

# EFR32FG28 — dual-band edge.

Sub-GHz networking and BLE local access in a single SoC, for devices that need to talk to both the mesh and the user.

DUAL-BAND INTEGRATION

### Sub-GHz + BLE in one SoC

Long-range mesh networking and local Bluetooth connectivity without two-chip designs.

USER EXPERIENCE

### Mobile commissioning & control

Setup, maintenance, and user interaction over BLE from any phone or tablet.

EFR32FG28 · Wi-SUN + Bluetooth LE

SIMPLIFIED ARCHITECTURE

### Eliminates dual-chip designs

Reduces BOM, board space, power budget, and development complexity.

SYSTEM FLEXIBILITY

### Ready for evolving protocols

Scales features and connectivity as use cases and standards grow over time.

TAKEAWAY Not every Wi-SUN device is just a network node. FG28 covers the user-facing edge.

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TWO ARCHITECTURES

# Same protocol. Different architecture.

## MICRO MESH

Local. Flexible. Application-focused.

| | |
|---|---|
| Scale | 10s – 100s of nodes |
| Coverage | Localized · buildings, campuses, sites |
| Routers | A single border router is usually enough |

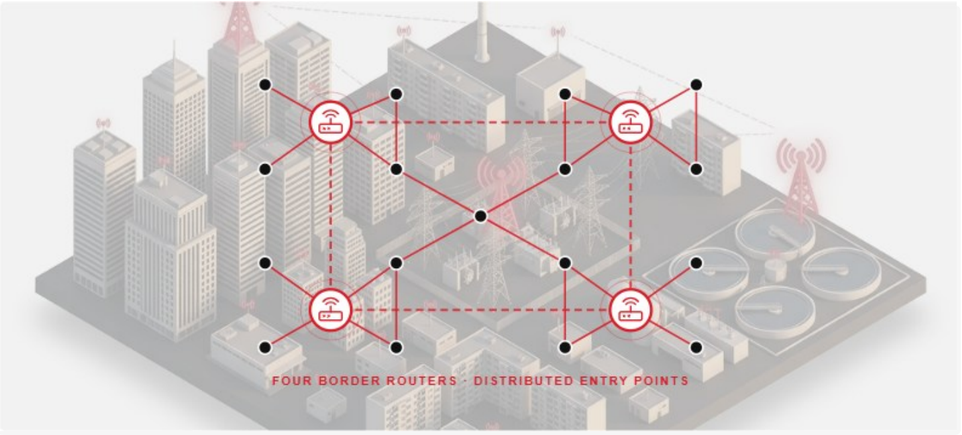
SCALE

LIFECYCLE

INTEROP.

## MASSIVE MESH

Wide-area. Resilient. Built for infrastructure.




| | |
|---|---|
| Scale | 1,000s – 100K+ nodes |
| Coverage | Wide-area infrastructure · cities, utilities |
| Routers | Multiple border routers · redundant entry points |

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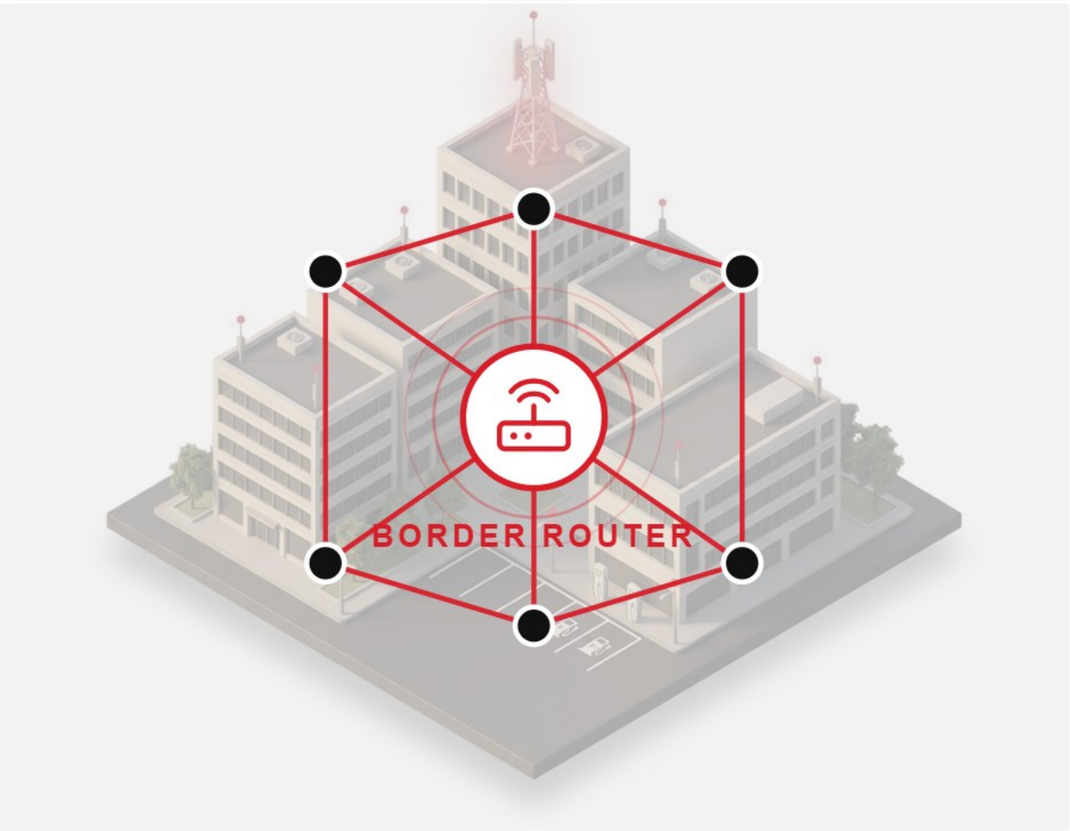
# Wi-SUN micro mesh.

Standards-based connectivity, simplified infrastructure, sized for localized deployments.




### 10s – 100s of nodes

Sized for a single building, campus, or site.

### Single border router

One simple gateway typically connects and manages the whole network.

### Standards-based interoperability

Mix vendors freely from day one; scale up later without re-architecting.

## WHERE MICRO MESH FITS

- Commercial buildings
- Campus infrastructure
- EV charging clusters
- Industrial sites

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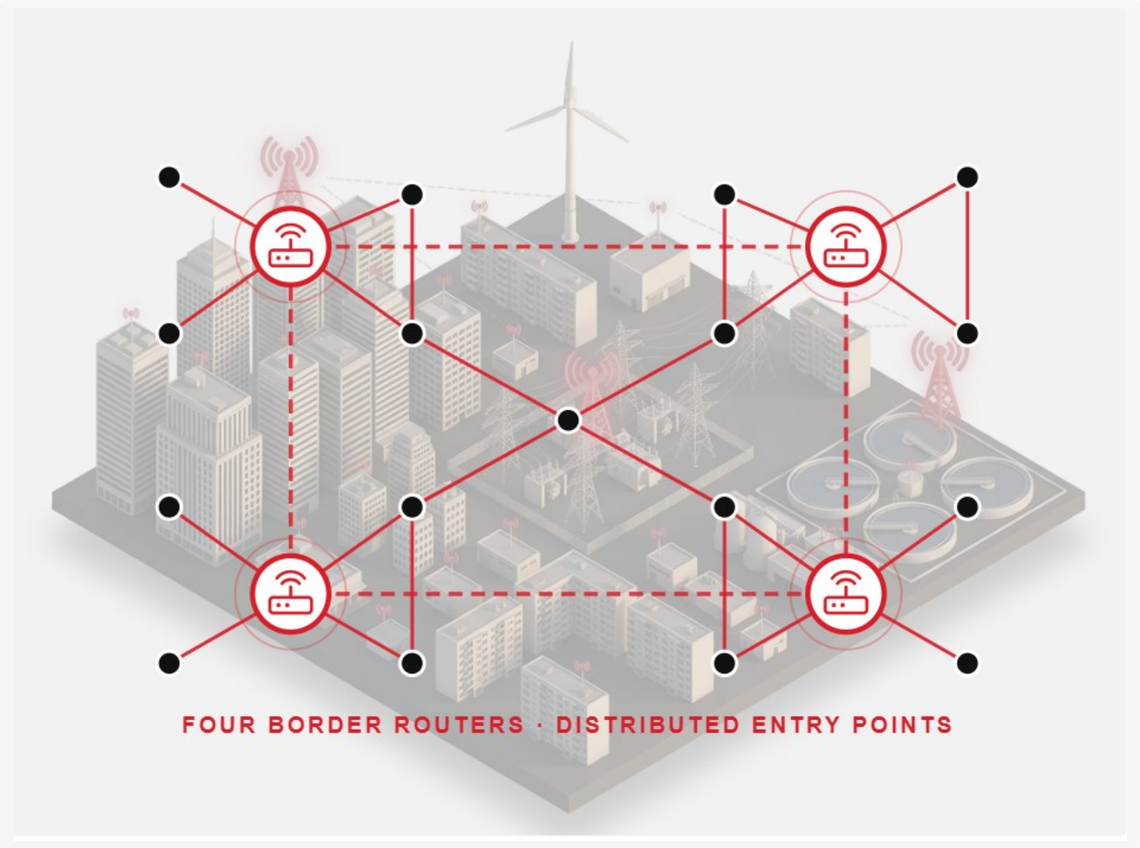
# Wi-SUN massive mesh.

Distributed infrastructure for thousands to tens of thousands of nodes — engineered for 10–20+ year lifecycles.




### 1,000s to 100K+ nodes

Proven in 1,000+ node deployments; designed to scale to tens of thousands in a single coordinated mesh.

### Wide-area infrastructure

Designed for geographic coverage — cities, utility grids, public networks.

### Multiple border routers

Distributed entry points provide capacity, redundancy, and resilience.

### Long-lifecycle, mission-critical

Engineered for 10–20+ year deployments with infrastructure-grade reliability.

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ARCHITECTURE CHOICE

# Choosing your Wi-SUN architecture.

Same protocol underneath. The right architecture — and the right SoC — depends on scale and intent.

WHEN MICRO MESH

## Local deployments where simplicity wins.

- 10s – 100s of nodes inside a building, campus, or site
- A single border router is sufficient
- You want flexibility and standards-based interoperability today, room to grow tomorrow

WHEN MASSIVE MESH

## Infrastructure-scale deployments built to last decades.

- 1,000s – 100K+ nodes across a city, utility, or region
- Distributed border routers for capacity and redundancy
- Mission-critical, 10–20+ year lifecycles with security and OTA headroom

TOGETHER FG25 + FG28 cover the full Wi-SUN spectrum — from the user-facing edge to the infrastructure backbone.

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KEY TAKEAWAYS

# What to remember from today.

01 Wi-SUN isn't just a protocol — it's a scalable network architecture.

02 Only Wi-SUN combines interoperability, scale, and longevity in one stack.

03 The same protocol covers micro mesh and massive mesh — same skills, different deployment.

04 EFR32FG25 + FG28 give you the silicon range for both ends of the spectrum.

CLOSING Interoperability is the foundation of long-term IoT success.

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