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

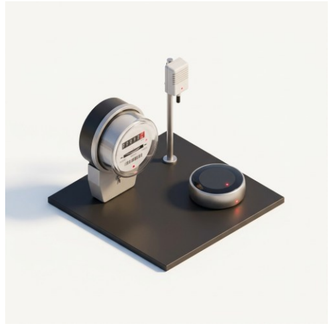
06 Live Q&A with panelists

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.

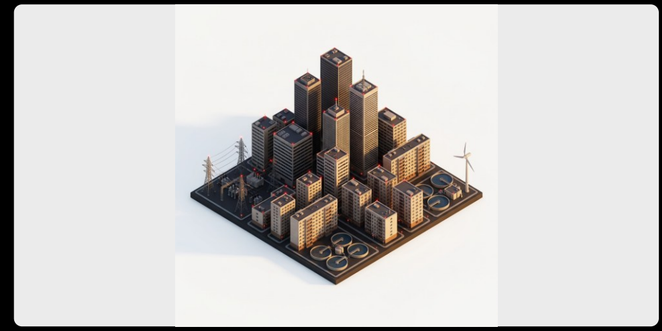
TIER 2 · LOCAL MESH

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.

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

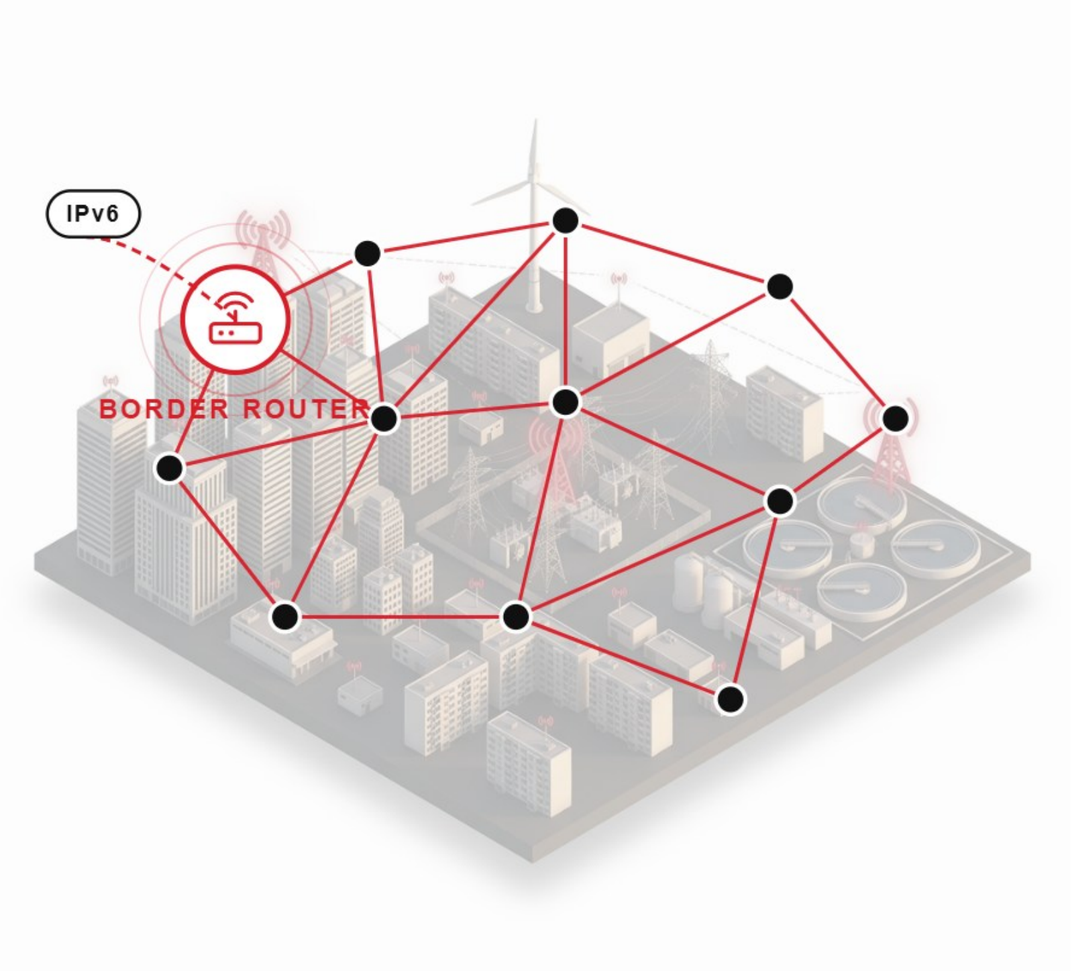
Multi-hop routing across large areas. Nodes find new paths automatically.

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.



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

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.

THE PLATFORM

The Silicon Labs Wi-SUN platform.

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

L4 · APPLICATIONS Vertical use cases	Smart metering · Smart cities · Industrial IoT · EV charging · Building automation
L3 · WI-SUN STACK **FAN 1.1 certified**	IPv6 / 6LoWPAN · RPL routing · Self-forming & self-healing · PKI security
L2 · SDK & TOOLS Developer ecosystem	Wireless SDKs · Simplicity Studio · Analysis & profiling · Reference designs
L1 · SILICON 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.

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.

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.

NETWORK EFFICIENCY

Concurrent OFDM + FSK detection

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

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.

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.

EFR32FG28 · Wi-SUN + Bluetooth LE

SIMPLIFIED ARCHITECTURE

Eliminates dual-chip designs

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

USER EXPERIENCE

Mobile commissioning & control

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

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.

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

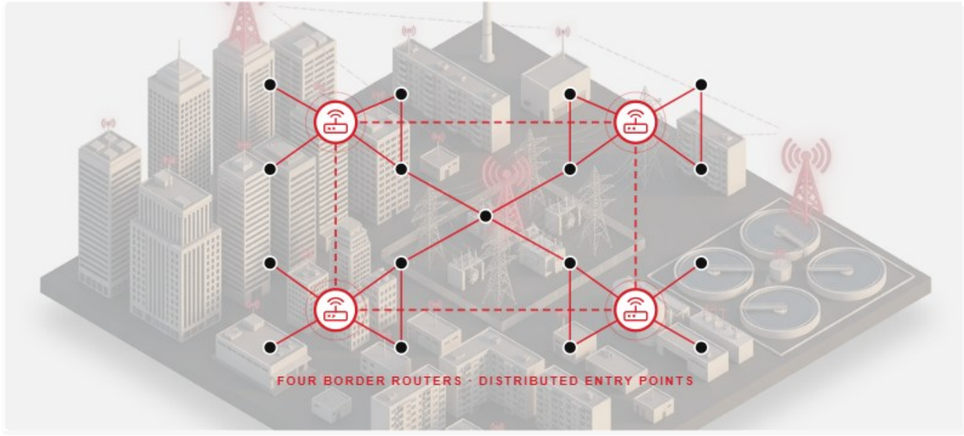
SCALE

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

ARCHITECTURE · MICRO MESH

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.

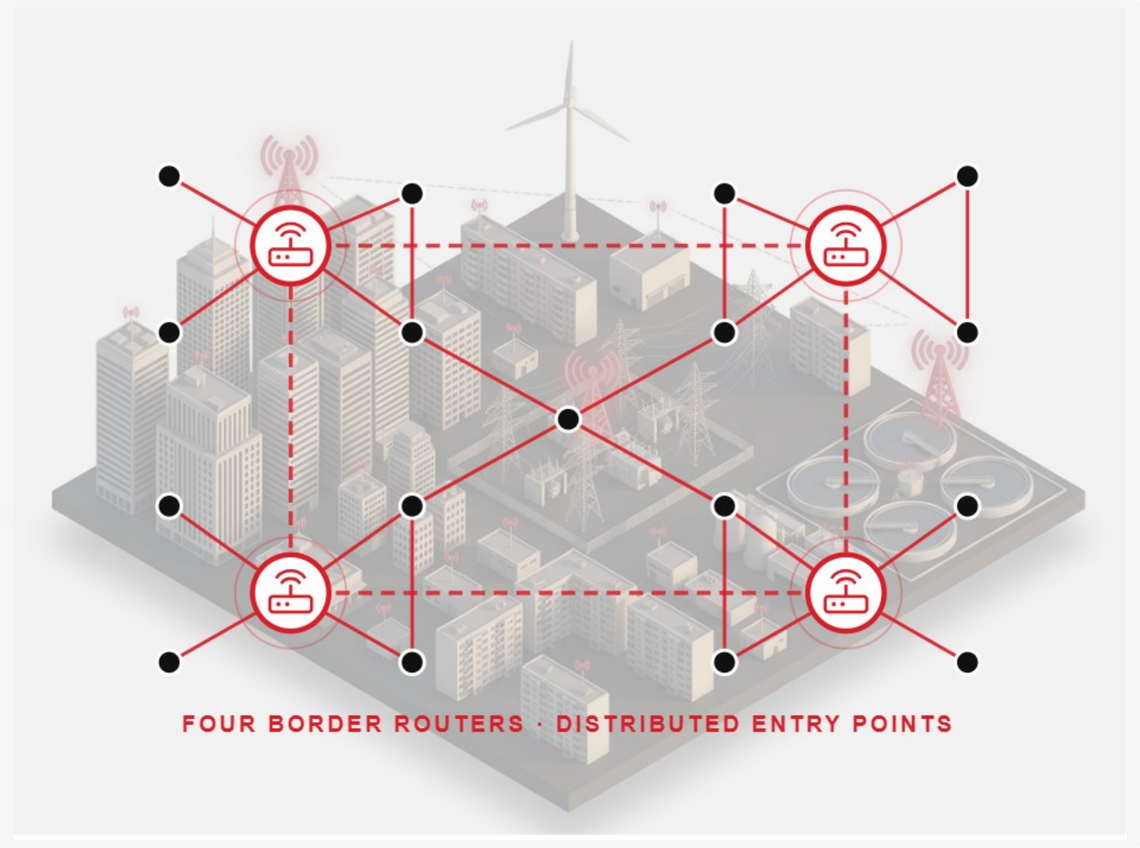
WHERE MICRO MESH FITS

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

ARCHITECTURE · MASSIVE MESH

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.

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.

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.