

Organization: Wi-SUN Alliance

Tagline:

Wi-SUN Alliance: *Advancing Seamless Connectivity in Smart Ubiquitous Networks for the Internet of Things*

Elevator Pitch: The Wi-SUN Alliance is helping accelerate the global adoption of interoperable peer-to-peer wireless solutions using open standards such as IEEE 802.15.4 and other related standards. With more than 150 member companies, Wi-SUN can help expand these wireless solutions in markets serving the Internet of Things (IoT) in general, and specifically Advanced Metering Infrastructure (AMI), Distribution Automation (DA), Smart Cities, Infrastructure Management and Intelligent Transportation Systems (ITS).

About The Wi-SUN Alliance

Who is the Wi-SUN Alliance?

The Wi-SUN Alliance is a global non-profit member-based association consisting of industry leading companies focused on the global proliferation of interoperable wireless solutions. Wi-SUN seeks to accelerate the implementation of smart grids, smart cities and large-scale outdoor IoT applications by enabling the global adoption of interoperable solutions based on open standards from leading international standards development organizations, such as IEEE, IETF, TIA and ETSI.

The Wi-SUN Alliance has representation across the globe including the US, India, Singapore, Japan and Europe. Its membership consists of industry-leading silicon vendors, product vendors, utilities, universities, and government organizations. The Wi-SUN Alliance was founded in 2012 by Promoter Members, represented as the Board Directors. Today these Promoter Members include Analog Devices, Cisco, Itron, Murata NICT, Omron, Renesas, Rohm Semiconductor, Silver Spring Networks and Toshiba.

What is the Wi-SUN specification?

The Wi-SUN specification brings Smart Ubiquitous Networks (SUN) to service providers, utilities, municipalities, local government and other enterprises, by enabling interoperable, multi-service and secure wireless mesh networks. Mesh-enabled field area networks (FAN) offer resilient, secure and cost-effective connectivity with wide-range coverage and minimal additional infrastructure for a range of challenging environments, from dense urban neighborhoods to rural areas.

How is the Wi-SUN specification being deployed?

Wi-SUN is used for large-scale outdoor IoT wireless communications networks in a wide range of applications, including:

- Smart grids, comprising:
 - Advanced metering infrastructure, including meter reading for electric, gas and water
 - Peak Load Management
 - Control of power distribution, for example, outage management

- Alternative energy, for example, control of solar and wind farms
- Smart cities, such as:
 - Street lighting
 - Dynamic control of traffic lights
 - Smart parking
 - Smart waste management
- Structural health monitoring, including monitoring of the integrity of structures, such as bridges, buildings, etc.
- Agriculture, such as monitoring humidity and temperatures in greenhouses.

What is a Wi-SUN Profile?

A Wi-SUN Profile is a set of technologies streamlined from various international open standards to address a particular set of applications. Each Wi-SUN Profile consists of protocols from the Physical (PHY) layer up to the layer below the Application layer. Wi-SUN Alliance does not specify or certify the Application Layer, but rather maintains interactive collaboration with alliances and organizations that make this their mission. Today the Wi-SUN Profiles available to the industry include: the Field Area Network (FAN) Profile and the Wi-SUN Echonet Profile.

What are the features of the Wi-SUN Field Area Network Profile specification?

IEEE 802.15.4g physical layer congruent with the existing Wi-SUN Alliance PHY Certification Program, frequency hopping, network discovery/join and protocol dispatch, IPv6 protocol suite including 6LoWPAN, address management, routing using RPL, unicast and multicast forwarding, standards-based multi-layer security specification encompassing authentication, authorization, encryption. Further information can be found at <http://www.wi-sun.org/fan-resources>

What are the features of the Wi-SUN Echonet Profile specification?

Why does Wi-SUN provide certified programs?

The Wi-SUN Alliance certifies products based on their compliance to applicable standards and their ability to interoperate with other Wi-SUN certified products.

It reduces the time needed to evaluate new products, as behavior, performance and interoperability are well-defined.

Other benefits of the certification program include:

- Eliminates the need for custom integrations.
- Lowers overall costs, and/or increases the pace of feature/function improvement, by eliminating single-vendor lock-in.
- Encourages the development of a global ecosystem of products.

- Certified products indicate that a standard is likely to have longevity, reducing the risk and the costly impact of stranded assets.

How is Wi-SUN used in AMI (Advanced Metering Infrastructure)?

The Wi-SUN specification enables the AMI market by providing a robust, long-range wireless mesh network to interconnect meters and data concentrators. The Wi-SUN specification provides a multi-service communications network, enabling customers to choose the best protocol (e.g. DLMS/COSEM or ANSI C12.22) for their particular application. Customers can also use the same network connectivity for other applications that utilize standards, such as OpenADR for automated demand response.

Does the Wi-SUN Alliance collaborate with other industry organizations?

Yes, the Wi-SUN Alliance collaborates with other industry alliances to support Application Layer and heterogeneous network interoperability. Wi-SUN has agreements with the following organizations: IETF, IEEE, Echonet Consortium, ISGF, OpenADR Alliance, TIA, and JUTA.

The Wi-SUN Alliance and Smart Cities

How is Wi-SUN used in smart cities?

Smart utility networks and smart cities have many common communication requirements and can be supported by a common networking architecture. Smart cities can leverage existing Wi-SUN wireless communications infrastructure provided by AMI or street light networks to enable other applications, such as smart signaling, public transit signs, parking, electric vehicle charging stations, and more.

Where are the UK's smart cities?

Bristol is the first Wi-SUN-powered smart city in the UK, with more to be announced by the end of this year. Other Wi-SUN smart cities include Copenhagen, Glasgow, Paris and Stockholm.

How are you preventing a 'Big Brother' scenario?

The Wi-SUN specification provides all of the mechanisms to keep data private. Wi-SUN is an industry resource for companies that need assistance understanding the requirements and policies to deploy systems that protect users and their data.

Membership and joining the Wi-SUN Alliance

How many members do you have in the UK? How fast are you growing?

At least 50% of its members have representation in the UK. Wi-SUN Alliance membership is growing year on year with more than 150 member companies.

Why should an organization join the Wi-SUN Alliance?

The Internet of Things (IoT) and its adoption continue to evolve rapidly. Today there is no single communications technology that can satisfy all applications, but it is our belief that Wi-SUN will be the leading technology that succeeds in large-scale outdoor networking. This is because Wi-SUN profiles help enterprises, service providers and municipalities by enabling interoperable, multi-service and secure communications over a standard-based wireless mesh network. Gartner forecasts that endpoints of the IoT will grow at a 32.9% CAGR from 2015

through 2020, reaching an installed base of 20.4 billion units.

According to research by Rethink Technology, companies in the Wi-SUN ecosystem are set to enjoy continued growth at 20% CAGR, as mesh network technology begins to reach into new verticals and different business models are developed and implemented.

Major utilities are also recognizing the importance of interoperable standards-based wireless communication networks and are choosing the Wi-SUN Alliance for their smart grid networks.

Local government organizations and other end users can benefit from the experience and expertise of their peers who have deployed more than 40m nodes over the past decade.

Product vendors in particular benefit from using Wi-SUN profiles derived from these open standards as well as access to a global market and from a certification program that adds value to their products – the logo is fast becoming a recognized brand. A product with a Wi-SUN certified logo gives the marketplace confidence that products can work together in an interoperable, multi-vendor network.

According to a report by the Bank of America Merrill Lynch (BAML) on smart city investment – ‘21st Century Cities: Global Smart Cities Primer Picks’ – the smart technologies market is predicted to grow to a market worth up to \$1.6 trillion by 2020.

How do I become a member?

Wi-SUN Alliance currently has a four-tier membership:

- Promoters: contribute to the development of specifications, have access to general working group sessions and a seat on the Board of Directors.
- Contributors: contribute to the development of specifications, and have access to general working group sessions.
- Adopters: access to the final approved version of specifications and may participate in marketing events. Adopter members cannot certify any Wi-SUN products nor can they maintain product certifications.
- There is a special membership category for test laboratories ensuring independent and highly skilled testing of Wi-SUN products to ensure they meet the rigorous requirements of the Wi-SUN Alliance certification program.

Additional details of Membership benefits can be found [here](https://www.wi-sun.org/index.php/en/member-benefits/membership-benefits) <https://www.wi-sun.org/index.php/en/member-benefits/membership-benefits>. The Membership Fee structure can be found [here](https://www.wi-sun.org/index.php/en/member-benefits/membership-fees) <https://www.wi-sun.org/index.php/en/member-benefits/membership-fees>.

Is the Wi-SUN Alliance a standards organization?

The Wi-SUN Alliance is not a standards organisation and serves a different role from the likes of IEEE and IETF. Wi-SUN Alliance creates communications layer specifications based on open standards from organisations such as IEEE802, IETF, TIA, TTC and ETSI. It creates a robust testing and certification program guaranteeing that products implement the Wi-SUN specification interoperate. The Wi-SUN Alliance specifies the communications layer behaviour allowing multiple applications to run over the same network.

In a similar way to people using the Internet, Wi-SUN networks enable ‘things’ to communicate.

What are Wi-SUN’s greatest strengths?

The Wi-SUN Alliance is focused on developing a strong test and certification program to deliver interoperable products for the smart utility, smart city and related Internet of Things (IoT) markets.

Wi-SUN’s greatest strengths include:

- Promoting open standards – this means that it is accessible to any company, which in turn will lead to fast adoption and growth in the IoT.
- Security – is a core concern for any network as compromised devices can be used to mount attacks on other networks, result in costly technology replacements or, even worse, disrupt essential services or public safety as would be the case for critical IoT networks. Enterprise-grade security is the gold standard among IoT networks. Only Wi-SUN-based networks have achieved military-grade security – the equivalent to that used by banks.
- Scalability – in terms of capacity and size. Wi-SUN-based mesh networks have proven themselves for years in an array of challenging and remote environments across the globe. Tens of millions of reliably connected endpoints demonstrate that a Wi-SUN based IoT mesh network can achieve the ubiquity and scalability many IoT customers demand.
- Resilience – Wi-SUN networks offer great resilience against faults and interference. For example, it is extremely difficult to disrupt a Wi-SUN network, e.g. by a denial of service attack.
- Adaptability – Wi-SUN can adapt to the landscape and environment as it changes, e.g. a Wi-SUN network will reroute around a new high-rise building or will optimize routes for data transmission.
- Interoperability –All Wi-SUN certified products are rigorously tested to ensure that they work together effortlessly and securely.
- Low cost- proprietary systems can become obsolete within a few years and as a result are no longer as efficient or cost-effective as solutions based on open standards.
- Wi-SUN networks can support ‘over the air’ upgrades. These are essential for providing security patches and longevity for the network.

Are there any Wi-SUN certified products?

Wi-SUN Alliance has certified the communications capability of approximately 80 products worldwide, including many for connection of smart meters to home energy management systems.

What regions are supported by these solutions?

Wi-SUN solutions are currently or soon to be deployed in North America, Japan, Brazil, Australia, Asia Pacific, India, Europe, the Middle East and South Africa.

How many devices are there in total?

There are an estimated 85M+ RF mesh-based end points awarded worldwide, based on data from

Navigant Research and Wi-SUN member companies. These mesh-based devices are Wi-SUN capable.

*These are tracked awards only and do not include all projects.

What is the estimated installed base of Wi-SUN networks?

As of Q1 2017, there is an estimated 62.2M RF meshed-based end points worldwide according to Navigant Research and Silver Spring Networks. These mesh-based devices are Wi-SUN capable.

Who are your competitors?

Today there is no single communications technology that can satisfy all applications, but it is the Wi-SUN Alliance's belief that Wi-SUN will be the leading technology that succeeds in large-scale outdoor networking. LoRA, Sigfox, Ingenu focus on low usage, slow sensor networks, for example environmental monitoring or livestock management.

NB-IoT relies on a mobile network operator as the service provider. A major disadvantage is that the user is reliant on the cellular operator for continuation of service.

Wi-SUN supports a higher data rate than LoRA, Sigfox and Ingenu, which enables downloads such as 'over the air' upgrades. All of the above technologies, apart from Wi-SUN, are tower-based, so are not well suited to distributed/edge/FOG computing and are also susceptible to network outages by having a single point of failure.

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