CONTENTS

INTRODUCTION 03
KEY FACTS & FIGURES 05
NEWS HIGHLIGHTS 07
DIFFERENTIATORS 09
CERTIFICATION COMMITTEE UPDATES 10
TECHNICAL COMMITTEE UPDATES 12
MARKETING COMMITTEE UPDATES 16
MEMBER ECOSYSTEM 39
INTRODUCTION | LoRaWAN®: The Right Time. The Right Choice.

2019 has been another major growth year for the LoRa Alliance®. We saw mass deployments sky-rocketed last year—leveraging our strong infrastructure of both public and private LoRaWAN networks. In 2019, we recognized more than 120 LoRaWAN network operators operational in more than 140 countries. As you’ll see, we’ve been very active over the past 12 months, driving our members’ businesses forward through a variety of activities.

First and foremost, we’ve strengthened our certification program, which is critical to the success of the Internet of Things (IoT). Customers and end users alike must have confidence that their devices will perform as intended over their full life span, often 10 or more years. To make it easier than ever to certify, we developed and launched the LoRaWAN Certification Test Tool (LCTT), allowing members to pretest devices at their own facility to ensure the devices work as expected and to accelerate the certification process. Additionally, in Europe, the Operator Qualification Program announced that devices must be LoRaWAN Certified™ to be connected to their networks—a program that will be extended to cover all geographic areas in 2020.

LoRaWAN technology is best-in-class and continues to be augmented and refined by our technical committee. Additionally, we are now supported by a full-time regulatory consultant and additional regional experts as required to lobby on LoRa Alliance’s behalf around the world. These regulatory activities are of the utmost importance to keep the current spectrum available and to secure additional spectrum in new geographies.

Donna Moore,
CEO & Chairwoman, LoRa Alliance®
We’ve worked to make it easier than ever for all of our members to provide input into our activities. Any employee from any member company can now participate in some of our committees’ working groups and regional task forces, and we can’t wait to have their support and to benefit from their considerable insight. We’ve doubled the number of industry alliances we collaborate with, as no one single technology can address every IoT use case.

We have also expanded our outreach and increased global visibility through increased marketing activities, including trade shows, PR, content development, blogging and social media. This year, we rolled out the LoRaWAN® showcase, which is the only global resource of all LoRaWAN Certified™ devices and related LoRaWAN products and services. New automation and CRM tools nurture leads, allowing us to more effectively educate web visitors and drive new business opportunities for our members. The list goes on and on!

As we look ahead to 2020, our fifth year as the leading LPWAN technology alliance, we’re excited to enter this next phase of growth. Our Board has been hard at work engaging with members to plan our strategy for the next five years with a goal of simplifying IoT. To reach the projected billions of devices, we recognize that we must reduce deployment complexity and continue to support our members and the global LoRaWAN community as they roll out the technology across the globe. LoRaWAN has unlimited potential to drive sustainable businesses, protect the planet’s resources and positively impact human lives.

I sincerely hope you will all join me in Paris for the LoRaWAN World Expo—the largest LoRaWAN event ever—where we will celebrate our success over the past five years and share our vision for connecting a smarter planet. These are exciting times, and I’m honored to work with our members to drive the LoRaWAN standard forward.
KEY FACTS & FIGURES

NEW MEMBERS IN 2019: +143

2019 CERTIFIED PRODUCT GROWTH: +45

2019 SPECIFICATION DOWNLOADS: 58,207

2019 WHITE PAPER DOWNLOADS: 6,636
- LoRaWAN & NB-IoT White Paper: 2,585
- WiFi & LoRaWAN White Paper: 2,141
- Connecting Utility Assets using LoRaWAN: 1,910

2019 LoRaWAN® NETWORK OPERATORS ADDED: +33

REGIONAL SPECIFICATION:
AS923 modified to support Indonesia, Vietnam, Israel, Philippines, Cuba and European 915MHz bands.
LoRaWAN® NETWORK COVERAGE

143 Countries with LoRaWAN deployments

133 LoRaWAN network operators

December 2019
All information contained herein is current at time of publishing – LoRa Alliance® is not responsible for the accuracy of information presented.
<table>
<thead>
<tr>
<th>LoRaWAN® NEWS HIGHLIGHTS</th>
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<tr>
<td><strong>2019:</strong> 32,400 MENTIONS</td>
</tr>
<tr>
<td><strong>21</strong> PRESS RELEASES</td>
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<tr>
<td><strong>364</strong> TIER 1 ARTICLES</td>
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<tr>
<th>LORA SURPASSES 100 IOT NETS</th>
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<tr>
<td><strong>EE Times</strong></td>
</tr>
<tr>
<td>Rick Merritt</td>
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<tr>
<td>Published: January 22, 2019</td>
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<tr>
<th>LORA ALLIANCE CLAIMS 75 PER CENT OF IOT BEST SUITED FOR LPWAN TECH</th>
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<tr>
<td><strong>TELECOM TV</strong></td>
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<tr>
<td>Ian Scales</td>
</tr>
<tr>
<td>Published: June 3, 2019</td>
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<tr>
<th>LORA ALLIANCE DRIVES LORAWAN USAGE IN UTILITY METERS WITH CLOSER DLMS INTEGRATION</th>
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<tr>
<td><strong>Enterprise Insights</strong></td>
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<tr>
<td>James Blackman</td>
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<td>Published: April 5, 2019</td>
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<tr>
<th>LORA ALLIANCE EXPANDS LORAWAN CERTIFICATION TESTING</th>
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<tr>
<td><strong>Electronics Weekly.com</strong></td>
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<tr>
<td>David Manners</td>
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<td>Published: June 4, 2019</td>
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<th>HOW AMAZON IS DEFINING THE SMART HOME</th>
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<td><strong>INTERNET OF THINGS</strong></td>
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<td>Stacey Higginbotham</td>
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<td>Published: September 2019</td>
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<tr>
<th>INDIA’S LPWAN NETWORK GROWS TO MEET SMART CITY DEMAND</th>
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<tr>
<td><strong>EET India</strong></td>
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<tr>
<td>Nitin Dahad</td>
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<td>Published: October 28, 2019</td>
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<tr>
<th>EXPERTS: ENTERPRISE IOT ENTERS THE MASS-ADOPTION PHASE</th>
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<tr>
<td><strong>EE TIMES</strong></td>
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<tr>
<td>Jon Gold</td>
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<td>Published: May 22, 2019</td>
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<th>SAVING ON CONNECTIONS TO AND IN THE FIELD</th>
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<tr>
<td><strong>THE WESTERN PRODUCER</strong></td>
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<tr>
<td>Robin Booker</td>
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<tr>
<td>Published: July 18, 2019</td>
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<th>LORAWAN ON THE IOT TRACK</th>
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<tr>
<td><strong>WCCN Editorial</strong></td>
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<tr>
<td>Published: November 2019</td>
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2019 LoRa ALLIANCE® ANNUAL AWARDS

Corporate Award
- Semtech
- MultiTech

Lifetime Achievement Award
- Alper Yegin, Actility SA

Working Group Leadership Award
- Julien Catalano, Kerlink
- Olivier Beaujard, Semtech

Distinguished Service Award
- Dave Kjendal, Senet, Inc.
- Markus Ridder, IMST GmbH
- Xiaobo Yu, Alibaba (China) Co., Ltd
- Marc Le Gourrierec, Sagemcom Broadband SAS
- Ali Hosseini, SenRa Tech Pvt. Ltd.
- Diego Bartolome, DEKRA Testing and Certification, S.A.U.
LoRaWAN® DIFFERENTIATORS

The successful adoption and deployment of LoRaWAN is based in large part on a number of key differentiators, which make it the strongest LPWAN technology for a massive number of use cases. Key differentiators include:

• Firmware updates over the air (FUOTA)
• Different network deployment models that give freedom of choice to B2B customers (public, i.e., no need to license spectrum, and private networks)
• More than 100 million end devices are already deployed globally, making LoRaWAN the de facto LPWAN technology of choice for IOT solutions
• LoRaWAN is a future-proof, open source protocol developed through industry collaboration, allowing customers choice from a wide range of products
• Open ecosystem of developers delivering many solutions that can be used around the world
• Strength and coverage in all key vertical markets with numerous, sustainable use cases and documented ROI
• Open interconnection between any type of network (public, private, licensed or unlicensed operator)
• Strong liaison with the Wireless Broadband Alliance to enable network slicing and a strong joint market proposition presented in a very successful white paper
• Test tools and certification enhancements ensure optimal customer experience
CERTIFICATION COMMITTEE UPDATES

Our major initiative in 2019 was the commissioning and development of the LoRaWAN® Certification Test Tool (LCTT) for precertification testing of devices at the developer’s site prior to sending it to one of the LA Authorized Test Houses (ATH) for formal certification. The LCTT has been made available to all LA members for free and will significantly accelerate the certification process and well as save time and money, allowing devices to be fully debugged to complete the final design earlier.

Another major initiative in 2019 was working with a significant group of public network operators in Europe to incorporate additional tests from their device qualification programs into the LoRaWAN Certification testing to avoid having the individual network operators perform these tests themselves, and instead mandating the use of LoRaWAN Certified® devices to be connected to their networks.

As part of a very successful members meeting in New Delhi, the LoRa Alliance® Certification Director was invited by the director general of the Telecommunication Engineering Center, as part of the Ministry of Communication for the government of India, to present the LoRaWAN Certification program to them. This was requested to assist them in establishing the requirements of certification for IOT devices in India.

Global registration of the LoRaWAN Certified™ logo was achieved in 2019 for use by LoRa Alliance members who achieve certification of their LoRaWAN devices.
LoRaWAN CERTIFIED™
AUTHORIZED TEST HOUSES

Two new LoRa Alliance® Authorized Test Houses were granted approval to perform LoRaWAN® Certification in India in 2019:

- **BENGALURU, INDIA**
- **MUMBAI, INDIA**
TECHNICAL COMMITTEE UPDATES

2019 was another active year for the Technical Committee (TC). It has finished generating the LoRaWAN® L2 1.0.4 spec, which is now in IPR review. This spec takes LoRaWAN L2 1.0.3 as the baseline, and applies several clarifications, bug fixes and backward-compatible enhancements imported from the LoRaWAN L2 1.1 spec. Per a newly agreed policy, the spec will be published along with the reference implementation and the associated certification program.

The Backend Interfaces 1.1 specification was also completed in 2019. This spec includes support for geolocation across roaming interfaces, and bug fixes. Publication of the specification is awaiting validation by the first vendor to implement this spec.

Roaming was another focus of the TC’s efforts, and following interop among multiple network platforms from distinct vendors that was carried out in the Roaming Working Group, there are now 7 networks that have implemented operational roaming. Stages vary between trial to commercial for these implementations.

Additional development of FUOTA first rolled out last year and continued into 2019, with the FUOTA Process Summary Technical Recommendation TR002 v1.0.0 published. Additionally, the FUOTA Working Group delivered the following:

- New specifications release candidates are in development (pending publication):
  - LoRaWAN Application Layer Clock Synchronization Specification TS003 v2
  - LoRaWAN Fragmented Data Block Transport Specification TS004 v2
  - LoRaWAN Remote Multicast Setup Specification TS005 v2
  - LoRaWAN Firmware Management Protocol Specification TS006 v1
  - LoRaWAN Multi Package Access Specification TS007 v1
  - Application Layer Package Design Guidelines TR003
TECHNICAL COMMITTEE UPDATES

- New documents to support development and implementation of FUOTA:
  - FUOTA Interoperability Tests
  - Application Layer Design Guidelines
- First interoperability tests passed:
  - 7 companies
  - 10 successful interoperability sessions
  - Covering 3 regions

As a global technology, the importance of the TC’s work to develop regional parameters cannot be understated. The LoRaWAN Regional Parameters RP002-1.0.0 was officially released November 1, 2019, covering:

- Summary of worldwide support and channel plan assignment
- Universal support for LoRaWAN® Layer 2 Specifications (both 1.0.x and 1.1.x revision tracks)
- Extensive clarifications (aligned with LoRaWAN TS001-1.0.4)
- CN470-510 was rewritten for current China regulatory considerations
Additionally, the LoRaWAN® Regional Parameters RP002-1.0.1 DRAFT prepared during 2019 is nearing completion and will be submitted to the TC in January 2020. In this document, AS923 is modified to support Indonesia, Vietnam, Israel, Philippines, Cuba and the European 915MHz bands.

The TC also focused on continued adaptation of widespread applications stacks to LoRaWAN, including DLMS and Wireless M-Bus. For DLMS, the LoRa Alliance® has established a liaison agreement with DLMS-UA. We have neared completion of the technical work, and published a highly downloaded white paper earlier this year: https://lora-alliance.org/sites/default/files/2019-11/dlms-lorawan-whitepaper_v1.pdf.

Additionally, TC members have been actively involved in IETF, defining the support for IETF SCHC over LoRaWAN, which enables both uplink-fragmentation and transportation of IP packets over LoRaWAN. This work is being used by the aforementioned DLMS work and may also be used by any other application with similar needs (use of IP, or transportation of payloads larger than the LoRaWAN frames). For clarification, this is about uplink fragmentation, whereas earlier specs published by the TC already provided support for downlink fragmentation.

Finally, TC members contributed to several sections of the eBook published this year, including security, activation, roaming, FUOTA and IP over LoRaWAN.
REGULATORY WORKING GROUP

In 2019, the LoRa Alliance® launched the Regulatory Working Group with the objective to keep the current spectrum available for LoRaWAN® and to secure additional spectrum in new geographies. This working group’s 2019 highlights are called out below.

- **China**: adoption of regulation for LoRaWAN® deployments in China
- **Singapore**: new technology-neutral regulation to include LoRaWAN
- **Vietnam**: channel plans for LoRaWAN deployments
- **Colombia**: CRC speech on benefits of LoRaWAN in ISM spectrum below 1GHz
- **Uganda**: member support for the discussions with regulator (access to spectrum + specifications...)
- **Italy**: government lobbying for liberalisation of 868MHz band (plus coordination of the contract with Cattaneo)
- **Morocco**: regulator influence to permanently authorise LoRaWAN in 868MHz band and for devices to roam in the Kingdom
- **Israel**: information on redefinition of the spectrum for LoRaWAN below 1GHz
- **Czech Republic**: RFID interference common position definition
- **Responses to consultations in France (ARCEP) and UK (OFCOM)**
- **Technical Committee coordination for preparation of position regarding under control, active discovery, interference management**
- **Circulation of information in bi-weekly regulatory conference call**
- **Russia**: cryptography
MARKETING COMMITTEE UPDATES

The rapid growth of the LoRa Alliance®, along with the maturing of LoRaWAN® technology and ecosystem, called for a segmentation of our marketing activities in 2019. The Marketing Committee decided to promote the alliance and technology through both vertical and horizontal marketing campaigns, leveraging a wide variety of tactics, including trade shows, social media, public relations, webinars, digital marketing, use case and content development.

The horizontal campaigns focused on promoting LoRaWAN and its technical features (FUOTA, security), white paper collaboration with industry analysts and other industry organizations, LoRaWAN certification, and continued growth in network operators and geographic availability. The biggest shift in marketing in 2019 was to deepen its vertical market focus and ramp activities to increase visibility in: smart agriculture, smart buildings, smart cities, smart industry, smart logistics and smart utilities. To engage members with a particular interest in one of these industries, the Marketing Committee launched vertical market working groups. These groups consist of Sponsor and Contributor members who collaborate to deliver their message and products to their specific market segment. Finally, on our website, we have built vertical landing pages that present information about each of the vertical markets and examples of real-life applications developed in each of them.
VERTICAL MARKETS STRATEGY & RESULTS

In 2019, we participated in the following vertical events, during which all LoRa Alliance® members were given the opportunity to showcase their products and demonstrate their LoRaWAN® applications.

SMART AGRICULTURE

InfoAg Conference

- St. Louis, U.S., July 23-25
- Individual presentations:
  - Jurriaan Ruys (Sensoterra): “The real-life case for IoT. Get ROI in one crop cycle – how smart soil moisture data helps farmers grow more, with less”
  - Matt Murray (Tech Ag), “The real-life case for IoT. How smart data integration improves crop understanding & yield”
- Workshop delivered by Noelani McGadden (Senet), Jurriaan Ruys (Sensoterra), Jason Steffen (Teralytic)

Agritechnica

- Hanover, Germany, November 10-16
- Speakers:
  - Emmanuel Mounier (Semtech)
  - Gottfried Pessl (Pessl Instruments GmbH)
  - Richard Stamvik (MultiTech Systems, Inc.)
  - Christine Fraser-Boer (Sensoterra)
VERTICAL MARKETS STRATEGY & RESULTS

SMART BUILDINGS

NFMT
• Baltimore, U.S. March 26-28
• Speaker: Charles Paumelle (Microshare): “Achieving Operational Excellence for Your Buildings”
• Participating members with demos: TEKTELIC, Microshare

IFMA World Workplace
• Phoenix, U.S. October 17-19
• Participating members with demos: Microshare, Open Sensors
• Speakers:
  - Panel discussion “How new wireless technology and cloud-based computing are changing.” Moderated by Byron BeMiller (Semtech) with panelists: Mike Moran (Microshare) and Lucy Fox (Open Sensors)

IBS – Intelligent Building Systems
• Paris, October 2-3
• Participating members with demos: Decentlab, Microshare and Skiply (joint demo); myDevices, OrbiWise and Sysdev (joint demo); Open Sensors, Robustel and TEKTELIC
• Speakers:
  - Charles Paumelle (Microshare) and Christophe Fouillé (Objenious): “Sustainability and Green Buildings”
VERTICAL MARKETS STRATEGY & RESULTS

SMART CITIES

5th Smart Cities India 2019 Expo

- New Delhi, May 22-24
- Participating members with demos: SenRa, myDevices, Kerlink, Microchip
- Speaker: Ali Hosseini (SenRa): “Disruptive Technologies for Smart Cities”

Smart Cities Solutions

- Stuttgart, Germany, September 17-19
- Speaker: Boris Stöckermann (Minol Zenner): “LoRaWAN® and Data Management Make a City Smart”

Smart City Expo World Congress

- Barcelona, Spain, November 19-21
- Participating members with demos: Decentlab, Actility, OrbiWise, Digimondo

SMART INDUSTRY

Industry of Things World

- Berlin, September 16-17
- Participating members with demos: Skiply, Aloxy, TEKTELIC
- Speakers:
  - Roelof Koopmans (Semtech): “LoRa Alliance® and LoRaWAN”
VERTICAL MARKETS STRATEGY & RESULTS

SMART LOGISTICS

Innovatech

- Santiago, Chile, May 2-4
- Participating members with demos: Semtech, OrbiWise, Carnegie Technologies
- Speaker: Jorge Varona (Semtech), Keynote and panel discussion: "Connectivity in the IoT: Choosing the Right Direction"

Intermodal Europe

- Hamburg, Germany, November 5-7
- Participating members with demos: Viloc, Invoxia, Eolane, Stimio, Abeeway, JRI
- Speakers: Pierre Gelpí (Semtech), Moderator: LoRa Alliance® panel discussion featuring Viloc, Invoxia, Eilane, Stimio, Abeeway and JRI

SMART UTILITIES

Distributec

- New Orleans, February 5-7
- Speaker: Ben Doyle, (Senet): "How Metering and Utilities can Benefit from Low-Power, Wide-Area Networking"

India Smart Utility Week

- New Delhi, March 12-16
- Speaker: Ali Hosseini (SenRa): "AMI, Communications and Advanced Analytics" panellist
VERTICAL MARKETS STRATEGY & RESULTS

China Utility Week
- Shanghai, April 15-16
- Speakers:
  - Media presentation delivered by Jeffrey Tan (Alibaba)
  - Hub session delivered by Xiaobo Yu (Alibaba)

AWWA ACE19
- Denver, June 9-12
- Participating members with demos: Haxiot, Senet, TEKTELIC
- Speaker: Ben Doyle (Senet): “LoRaWAN® for Smart Water Utilities”

European Utility Week
- Paris, November 12-14
- Marquis Demo: The Euridis association showcased the first implementation of DLMS over LoRaWAN featuring electricity network products from Cahors and Sicame with support from Acklio, Actility, Semtech and VienTech.
- Participating members with demos: Acklio, IHM Pacific, ProEsys, Vertical M2M
- Speakers:
  - Remi Demerlé (Semtech): “New Digital Applications of LoRaWAN”
  - Jaap Groot (Semtech), “LoRa Alliance® and LoRaWAN Overview”
VERTICAL MARKETS STRATEGY & RESULTS

The LoRa Alliance® hosted 6 webinars covering different aspects of key vertical markets in 2019, including:

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<thead>
<tr>
<th></th>
<th>Date</th>
<th>Topic</th>
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<tr>
<td>1</td>
<td>May 28</td>
<td>LoRaWAN® Technologies accelerating the Digital Transformation of GAS Utility Companies (Utilities)</td>
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<tr>
<td>2</td>
<td>September 19</td>
<td>How LoRaWAN and the IoT enable Smart Farm management (Agriculture)</td>
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<tr>
<td>3</td>
<td>October 21</td>
<td>How LoRaWAN Can Make Your Workspace More Sustainable and Efficient (Buildings)</td>
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<td>4</td>
<td>December 2</td>
<td>LoRaWAN: Different Scenarios for Industrial Asset Inventory (Logistics)</td>
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<tr>
<td>5</td>
<td>December 10</td>
<td>How LoRaWAN Empowers Our Smart Cities (Smart Cities)</td>
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<tr>
<td>6</td>
<td>July 2</td>
<td>GS1 &amp; LoRa Alliance (Logistics)</td>
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WEBSITE & LoRaWAN® SHOWCASE

Another major investment this year is the LoRaWAN Showcase, the LoRa Alliance®'s online digital catalog of all LoRaWAN Certified™ devices, as well as all LoRaWAN products and services. It is the only official global resource where customers can search to find all LoRaWAN services and solutions, and the Showcase allows ecosystem members to connect, partner and collaborate to develop end-to-end solutions, providing opportunities for new business leads to drive your business forward. The response from our members has been tremendous, and in just the first few months since coming online, the LoRaWAN Showcase reflects more than 200 product listings, with more than 150 of those being certified devices.
DESIGN HIGHLIGHTS

In 2019, we continued to evolve the brand, finding innovative new ways to deliver impactful and meaningful visuals that stay true to our branding guidelines. A major activity was migrating all assets to the new registered trademarks for LoRa Alliance® and LoRaWAN®, as well as supporting the graphic requirements for our member meetings and significant tradeshow presence.
DESIGN HIGHLIGHTS

CONNECTING SMART CITIES
Low-power, long-range LoRaWAN® networks support IoT applications for smart cities

LoRaWAN demonstrations supported by our members:
- Smart Parking
- Smart Bin
- Smart Water
- Smart Gas
- Remote Temperature and Humidity Control

SAVE THE DATE!
OPEN TO THE PUBLIC!

LoRaWAN® Live! is coming to New Delhi October 17, 2019

Join the LoRa Alliance™ for a full day of educational programs and networking opportunities to learn about LoRaWAN. We invite new and prospective members and end users of LoRaWAN to advance business development opportunities across our ecosystem.

Learn more: lora-alliance.org/events/india-members-meeting-2019
DESIGN HIGHLIGHTS

Ventilation
Humidity
Predictive cleaning of washrooms
Indoor Asset Tracking
Entry/Exit Equipment
Leak Detection
Structural Integrity
Energy Usage
Temperature
Occupancy
Illumination
Smart Parking
Smart Building Infographic
CUW Booth Design
Certification Test Tool Icon
DESIGN HIGHLIGHTS

LoRa Alliance

- Open, non-profit association of >500 members launched in 2015 focused on standardizing LPWAN & promoting the LoRaWAN™ protocol
- We develop and maintain the global, open LoRaWAN™ specification
- Certification available globally for LoRaWAN devices; look for the LoRaWAN Certified™ mark

Creating Valuable IoT Connections

- Water Metering, Electricity Metering
- Traffic Lights, Waste Management
- Connected Cars, Safety Monitoring
- Smoke Detection, Temperature Regulation
- Asset Tracking, Rail Temperature Monitoring
- Soil Moisture, Animal Tracking

Smart Tech for A Sustainable Planet Theme

Smart Building

Secure bi-directional communication, mobility and localization services

- Public or Private Networks
- Future Proof & FUOTA
- Strong Certification Program
- Long Range
- Low Power
- Low Cost

Smart City

loRa-alliance.org

Innovatech Booth

FierceWireless
DESIGN HIGHLIGHTS

Smart City Barcelona

LoRaWAN® World Expo Logo Suite

European Utility Week Booth
# 2019 Member Meetings

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<tr>
<th>Event</th>
<th>Location</th>
<th>Sponsors/Contributors &amp; Institutional</th>
<th>Adopters</th>
<th>Open House Non-Members/Media</th>
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<tr>
<td>10th AMM &amp; LoRaWAN® Live</td>
<td>San Diego</td>
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<td>47</td>
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<td>11th AMM &amp; LoRaWAN Live</td>
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<td>298</td>
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LoRaWAN® Ambassador Charles Paumelle from member company Microshare took The Things Conference Stage to discuss why it is impossible to be a complete end-to-end IoT export and the importance of collaboration.
LoRaWAN® AMBASSADOR SPEAKING ENGAGEMENTS

TTN Conference
Alper Yegin, Actility; David Smith, MultiTech; Charles Paumelle, Microshare; Derek Hunt, LoRa Alliance

Distribtech
Ben Doyle, Senet

MWC 2019
Donna Moore, LoRa Alliance

Robustel Global Partner Summit
Jon Pearce, Evernet

India Smart Utility Week 2019
Ali Hosseini, SenRa

NFMT
Charles Paumelle, Microshare

China Utilities Week
Jeffery Tan & Xiabo Yu, Alibaba

IoT Innovatech
Jorge Varona, Semtech

IoT World
Donna Moore, LoRa Alliance

ARC European Industry Forum
Richard Stamvik, MultiTech

Smart Cities India
Ali Hosseini, SenRa

Internet of Manufacturing
Sara Brown, MultiTech

ACE 19 - Innovating the Future of Water
Ben Doyle, Senet

Explorers Festival
Tim van Dam, Smart Parks
LoRaWAN® AMBASSADOR SPEAKING ENGAGEMENTS

IoT Tech Expo Europe
Jaap Groot, Semtech

InfoAg Conference
Jurriaan Ruys & Matt Murray, Sensoterra

IoT Expo China
Shibo Yu, Alibaba

Industry of Things World
Daniel Quant, MultiTech

Smart Cities Solutions
Boris Stöckermann, Minol Zenner

IBS - Intelligent Building Systems
Charles Paumelle, Microshare; Christophe Fouillé, Objenious

IFMA World Workplace
Byron BeMiller, Semtech (moderator); Lucy Fox, Open Sensors; Mike Moran, Microshare

IoT Solutions World Congress
Charles Paumelle, Microshare

European Utility Week
Remi Demerlé & Jaap Groot, Semtech

Intermodal Europe
Pierre Gelpí, Semtech

Agritechnica
Emmanuel Mounier, Semtech; Richard Stamvik, MultiTech; Gottfried Pessl, Pessl Instruments GmbH; Christine Fraser-Boer, Sensoterra

IoT Tech Expo North America
Sara Brown, MultiTech
In alignment with our vertical market strategy in 2019, we targeted expansion of our reach in the Twittersphere to more vertically focused audiences, resulting in an overall increase in followers of 27%, finishing the year with 13K followers.

- **2019 FOLLOWERS:** 13K
- **2019 TWEETS:** 766
- **2019 IMPRESSIONS:** 2.26M
- **2019 AVERAGE IMPRESSIONS/MONTH:** 188.84K
- **2019 AVERAGE ENGAGEMENT RATE:** 0.8%
- **2019 RETWEETS:** 2,634
- **2019 RETWEETS/DAY:** 219.5
- **2019 LINK CLICKS:** 6,363
- **2019 AVERAGE LINK CLICKS/DAY:** 530.25
As the leading B2B platform with strong engagement, LinkedIn was a major aspect of our social media strategy and activity in 2019. With this dedicated focus, we successfully grew our LoRa Alliance® LinkedIn page audience by a staggering 212%, ending the year with 11,389 followers. This massive growth was driven by our increased number of vertically focused posts and our highly engaged ecosystem sharing and reposting content about LoRaWAN® and the LoRa Alliance.

2019 IMPRESSIONS: 1.1M
APPROXIMATE IMPRESSIONS/MONTH: 91,350
2019 ENGAGEMENT RATE: 4.28%

2019 LINK CLICKS: 26,549
2019 AVERAGE LINK CLICKS/DAY: 72
2019 TOTAL SHARES: 986
2019 AVERAGE SHARES/DAY: 2.6
2019 REACTIONS: 13,712
2019 AVERAGE NUMBER OF REACTIONS: 37.6
LoRa Alliance® visibility in the media remained strong in 2019, with more than 50% share of voice against competitive technologies in the LPWAN space. We issued 21 press releases and media alerts during the year, 6 of which were significant news for the LoRa Alliance. In addition, we hosted 12 major media engagements: 100 Operator Milestone Release, San Diego Member Meeting, Mobile World Congress Barcelona, NFMT, AWWA Ace, China Utility Week, Berlin All Members Meeting, InfoAg, India Member Meeting, LoRaWAN® and Wi-Fi White Paper release, European Utility Week, and Intermodal, which generated significant coverage throughout the year and met a key goal of broadening LoRa Alliance exposure and awareness in key vertical markets.

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**364** PIECES OF TIER 1 COVERAGE

**5.25M** ESTIMATED COVERAGE VIEWS

**10** MEDIA EVENTS

**1.26B** ONLINE READERSHIP

**61** MEDIA BRIEFINGS

**50** AVERAGE DOMAIN AUTHORITY

**10K** PRINT CIRCULATION

**3.16K** SOCIAL SHARES

**21** PRESS RELEASES
## PRESS RELEASES ISSUED

<table>
<thead>
<tr>
<th>Date</th>
<th>Details</th>
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<tbody>
<tr>
<td>January 14</td>
<td>LoRa Alliance® announces keynote speakers at The Things Conference</td>
</tr>
<tr>
<td>January 22</td>
<td>LoRa Alliance® Passes 100 LoRaWAN® Network Operator Milestone with Coverage in 100 Countries</td>
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<tr>
<td>January 24</td>
<td>LoRa Alliance® to Host LoRaWAN® Live Day in San Diego to Showcase Latest Advances in LoRaWAN Technology, Products and Services</td>
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<tr>
<td>February 21</td>
<td>LoRa Alliance® Ecosystem Highlights Vast Year on Year Growth in LoRaWAN® Deployments and Use Cases in Multiple Verticals at Mobile World Congress Barcelona 2019</td>
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<tr>
<td>March 21</td>
<td>LoRa Alliance® to Show How LoRaWAN® Achieves Operational Excellence for Smart Buildings with Data-Driven Intelligence at NMFT 2019</td>
</tr>
<tr>
<td>March 28</td>
<td>NFC Forum and LoRa Alliance® Enter Liaison to Explore Technical Cooperation for IoT Applications</td>
</tr>
<tr>
<td>April 3</td>
<td>LoRa Alliance® and DLMS User Association to Bring Internet of Things to Utilities</td>
</tr>
<tr>
<td>April 11</td>
<td>Adoption of LoRaWAN® Accelerating in China for Utilities and Energy Applications</td>
</tr>
<tr>
<td>May 2</td>
<td>LoRa Alliance® Bringing LoRaWAN® Live! to Berlin; Biggest LoRaWAN Event of the Year will Showcase Value of LoRaWAN Deployments and Certification/Die LoRa Alliance bringt LoRaWAN Live! nach Berlin; das größte LoRaWAN-Ereignis des Jahres zeigt den Wert der LoRaWAN-Implementierungen und Zertifizierung</td>
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<tr>
<td>May 30</td>
<td>LoRa Alliance® Reports Significant Growth in LoRaWAN® Metering Deployments; Will Show Technology’s Value for Water Metering and Management During AWWA ACE 2019</td>
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<tr>
<td>June 4</td>
<td>LoRa Alliance® Expands LoRaWAN® Device Certification Program to Ensure Quality of Millions of Connected IoT Devices/LoRa Alliance erweitert das LoRaWAN-Gerätezertifizierungsprogramm, um die Qualität von Millionen von angeschlossenen IoT-Geräten sicherzustellen</td>
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<tr>
<td>Date</td>
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<td>June 13</td>
<td>LoRa Alliance® Recognizes Key Contributors and Introduces 2019 Board of Directors at All Members Meeting /LoRa Alliance verleiht auf der Mitgliederversammlung Auszeichnungen an die wichtigsten Mitglieder und stellt den Vorstand 2019 vor</td>
</tr>
<tr>
<td>September 4</td>
<td>LoRa Alliance® to Promote Smart Tech for a Sustainable Planet at LoRaWAN® Live! India</td>
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<tr>
<td>September 11</td>
<td>LoRa Alliance® Announces Expanded LoRaWAN® Live! India Program to Promote Smart Tech for a Sustainable Planet</td>
</tr>
<tr>
<td>September 12</td>
<td>LoRa Alliance® to Showcase Industrial LoRaWAN® Solutions at Industry of Things World Berlin</td>
</tr>
<tr>
<td>September 23</td>
<td>LoRa Alliance® to Show How to Achieve Operational Excellence for Smart Buildings at Intelligent Building Systems (IBS) Paris 2019</td>
</tr>
<tr>
<td>September 24</td>
<td>WBA &amp; LoRa Alliance® Explore New IoT Use Cases Incorporating Wi-Fi &amp; LoRaWAN® Technologies</td>
</tr>
<tr>
<td>October 8</td>
<td>LoRa Alliance® Announces First Authorized Test Houses in India and Global Availability of the LoRaWAN® Certification Test Tool</td>
</tr>
<tr>
<td>October 29</td>
<td>LoRa Alliance® Demonstrates Leadership in Utilities Networking Applications; To Showcase LoRaWAN® Solutions at EUW</td>
</tr>
<tr>
<td>November 12</td>
<td>Major Brands Join the LoRa Alliance® at Leadership Levels Confirming Continued Momentum for LoRaWAN® as the Global De Facto LPWAN Standard</td>
</tr>
<tr>
<td>December 9</td>
<td>LoRa Alliance® CEO and Chairwoman Donna Moore to Deliver Keynote At The Things Conference 2020</td>
</tr>
</tbody>
</table>
LIAISONS & COLLABORATIONS

- DLMS™
  - device
  - language
  - message
  - specification

- ICA

- Wireless Broadband Alliance
  - Driving Next Wireless Experience

- IEEE
  - Advancing Technology
  - for Humanity

- NFC Forum

- CABAA
  - Continental Automated Buildings Association
MEMBER ECOSYSTEM | Sponsors

The LoRa Alliance® is the largest LPWAN organization globally. Our work and the success of the LoRaWAN® standard wouldn’t be possible without our ecosystem, which is unrivalled in its size and range of companies. Our list of members as of December 31, 2019 follows.

- Actility
- Alibaba (China) Co., Ltd
- Amazon
- Objenious
- Bouygues Telecom
- Cisco Systems, Inc
- machineQ™
- Comcast Cable Communications Management LLC
- ER-Telecom
- Hangzhou Lowan Information Technology Co.
- kerlink
- Netze BW
- ORANGE
- Sagemcom
- SEMTECH
- Tencent Cloud Computing
- Shenzhen Tencent Computer Systems Company Limited
- STMicroelectronics International NV
- TEKTELC Communications Inc.
MEMBER ECOSYSTEM | Contributors

A2A Smart City S.p.A.
ACKLIO
Aexonis
Allion Labs, Inc.
Arduino SA
ARM Cloud Services Limited
AXATEL SRL
AXIANS
Birdz
Bureau Veritas Consumer Products Services, Inc
Carnegie Technologies, LLC
Charter Communications
CyberEye Research Labs & Security Solutions Pvt. Ltd.
DEKRA Testing and Certification, S.A.U.
Digita Oy
Dish Network
EDF
eleven-x
Etteplan
Everynet BV
IDEMIA SA
IMST GmbH
Intel Corporation
Interlink Electronics
Itron, Inc.
Kiwi Technology Inc.
KPN
LORIOT.io
M2B Communications Inc.
meshify
Microchip Technology
Microshare Inc
Minol ZENNER International GmbH & Co. KG
Multi-Tech Systems, Inc
myDevices
National Narrowband Network Communication
NEC Corporation
Neptune Technology Group, Inc.
Netmore Group
Netzikon GmbH
New H3C Technologies Co., Ltd.
Nippon Telephone and Telegraph
<table>
<thead>
<tr>
<th>Member Ecosystem</th>
<th>Contributors</th>
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<tr>
<td>OrbiWise</td>
<td>Spark New Zealand Trading Limited</td>
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<td>Oresundskraft AB</td>
<td>Swisscom Broadcast AG</td>
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<td>Paige Wireless, LLC</td>
<td>Syniverse Technologies</td>
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<td>Proximus SA</td>
<td>Tata Communications</td>
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<td>Renesas Electronics Corporation</td>
<td>Telecommunications Technology Association</td>
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<td>Schneider Electric</td>
<td>The Things Network Foundation</td>
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<tr>
<td>Senet, Inc.</td>
<td>Thingstream AG</td>
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<td>SenRa Tech Pvt. Ltd.</td>
<td>TUV Rheinland Group</td>
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<td>SenseWay, Inc.</td>
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<td>SK Telecom</td>
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<td>SoftBank Corp.</td>
<td>Ventia Utility Services Pty Ltd</td>
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### MEMBER ECOSYSTEM | Adopters

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<tr>
<th>Company Name</th>
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<td>1M2M</td>
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<td>2j, L.t.d.</td>
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<td>AAEON Technology Inc.</td>
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<td>Aartesys AG</td>
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<td>ABB Switzerland Ltd</td>
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<td>Aloxy</td>
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<td>Andorra Telecom SAU</td>
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<td>Beijing Commsat Technology Development Co., Ltd.</td>
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<td>BH TECHNOLOGIES</td>
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<td>Bosch Connected Devices and Solutions</td>
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<td>Braveridge Co., Ltd.</td>
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<td>DataAlliance, Inc.</td>
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MEMBER ECOSYSTEM | Adopters

GWF MessSysteme AG
H2O Degree
habemu$ electronic + transfer GmbH
Hangzhou Watermeter Co., Ltd.
Hawle Armaturen AG
Hexing Electrical Co., Ltd.
Holley Technology Ltd.
hoopo systems Ltd.
HouwaSystemDesign K.K.
Humax USA, Inc.
Hydrelis SAS
ICE Gateway GmbH
IEM SA
iioote AB
IMBuilding B.V.
Informir SA
Inovonics
Insight SIP SAS
Intellienergy Tech SRL
INTERCOMP S.p.A.
Internet Initiative Japan Inc.
Internet of Things America LLC
Internet of Things Ukraine
Intracom S.A. Telecom Solutions
Invenit B.V.
Invisible Systems Ltd
Invitech Megoldasok Zrt.
INVOXIA
IOT AONCHIP SL
IOT NETWORK AS
IoT Ventures Ltd
Iris Technologies Inc.
ISA Co., Ltd.
ITK IOT
JRI
JSC Axioma Metering
Kamstrup A/S
KELLER AG für Druckmesstechnik
Keysight Technologies
Kolff Computer Supplies b.v.
Kolmostar Inc.
Komro GmbH
Konica Minolta Business Solutions Europe
Konnex Enterprises Inc.
Kontron Modular Computers
KotahiNet
Lacuna Space Ltd.
Laird Connectivity, Inc.
Lapp Automaatio
Legrand
Lineable Inc
LINZ STROM GAS WARME GmbH
Lite-On Technology Corp.
LM Ingenierie
Lobarо GmbH
Lucy Zodion
Lyngsoe Systems Ltd
Lyse AS
Lysir ehf
Machines Talk
Macnica, Inc
Maddalena S.p.A.
Magnitude Space B.V.
## MEMBER ECOSYSTEM | Adopters

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<th>Company Name</th>
<th>Company Name</th>
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<td>Omniimpex GmbH</td>
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<td>Onethinx B.V.</td>
<td>Renau Corporation</td>
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<td>REQUEA</td>
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<td>ResIOT UbIsoftware Srl</td>
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<td>Orion System LLP</td>
<td>Richardson RFPD</td>
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<td>NEPTUNE Information Technologies GmbH</td>
<td>OXIT LLC</td>
<td>Rohde &amp; Schwarz GmbH &amp; Co KG</td>
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</table>
MEMBER ECOSYSTEM | Adopters

Rossma LTD
RSAWEB
RTX A/S
Rubicon Systems Australia PTY LTD
Ruckus Wireless, Inc
RuiXingHengFang Network(Shenzhen) Co., ltd
Ryden Corporation
Saft
SAMSON KT-Elektronik
Sauermann Group
Schreder SA
SEAS-NVE
Seba Dynatronic Mess und Ortungstechnik GmbH
Seeed Technology Co., Ltd
Sensative AB
Sensedge d.o.o.
Sensile Technologies SA
Sensing Lab
Sensor Network Services GmbH
Sensoterra
Sercomm Corp
Shanghai Holystar Information Technology
Shanghai Shuncom Smart Technology
Shenzhen Friendcom Technology Development
Shenzhen HOPE Microelectronics Co., Ltd
Shenzhen Kaifa Technology Co., Ltd.
Shenzhen Winext Technology Co Ltd
Shinko Shoji Co., Ltd.
Sichuan Changhong Network Technologies Co., Ltd
Siema Application
Signify
sigrenEa SAS
SIRADEL
Siterwell Electronics Co., Ltd
Skyhook Wireless, Inc
Skysens Teknoloji A.S. (SKYSENS)
Slovanet a.s.
Small Data Garden Oy
SMK Corporation
Social Area Networks Co., Ltd.
Soluciones y Servicios Integrales Telco SA
Solum
Solvera Lynx
Sontex SA
SORACOM INC.
SparkLAN Communications Inc.
ST Electronics (Info-Comm Systems) Pte. Ltd.
STACKFORCE GmbH
STEINEL Solutions AG
STIMIO
STREGA SPRL
Swarm Technology
Switch Science, Inc.
Syrinx Industrial Electronics b.v.
SYSDEV Srl
TalkPool AB
Target Corporation
TDK Corporation
Tech Mahindra Ltd
MEMBER ECOSYSTEM | Adopters

Tehama Wireless Design Group
Tekelek
Telekom Srbija
Telemar spa
Telematics Wireless
telent GmbH
Telit Communications S.p.A
Telkom Indonesia
Telog Instruments, Inc.
Teltronic AG
Teneo IoT
Terranova Srl
Thingenix LLC
TKF (Twentsche Babelfabriek) B.V.
Towercom, a.s
TRUSTED OBJECTS S.A.S
Turbo Technologies Corporation
Ubicquia, LLC
Ueda Japan Radio Co., Ltd.

Umpi srl
Unitron NV
Unterhalt Und Dienst Iberica S.L.
Urbana Smart Solutions Pte Ltd
Ursalink Technology Co., Ltd.
Vertical M2M
Viaanix
Viloc
Vision Metering, LLC
Vision Valley
VOLANSYS TECHNOLOGIES PVT. LTD.
VT iDirect Inc.
VTC Digital Telecommunications One Member Company Limited
Water Einstein, Inc.
WaterBit, Inc.
Webdyn
WEG Drives & Controls

Wi6labs
Wickedride Adventure Services Pvt Ltd
Wifx Sarl
WIKA Alexander Wiegand SE & Co. KG
Witlink Co., Ltd.
Worldsensing S.L.
Wyres SAS
X-Telia Group inc.
Xiamen Four-Faith Communication Technology Co., Ltd.
XterConnect SAS
Yokogawa Electric Corporation
Yosensi Sp z.o.o
ZTACOM
ZXCLAA Technology Co.Ltd.
MEMBER ECOSYSTEM | Institutional

4CG Cymru 2010 Ltd
ABINC - Associação Brasileira da Internet das Coisas
ADEMED - Asociatia Pentru Dezvoltare Si Mediu
AFNIC
Bharat Institute of Engg + Tech
BICSI South Pacific
CableLabs
China Academy of Information Communications Technology
China Electronics Standardization Institute
CSEM
Digital Catapult
Federal University of Technology Campus Apucarana
Hamnet Gauteng South
HEIG-VD
Holy Cross of Davao College
Hong Kong Applied Science and Technology Research Institute
HTW Berlin
Indian Institute of Technology Bombay
Indian Society for Remote Engineering and Data Science (INSORED)
Instituto Brasilia de Tecnologia e Inovacao- IBTI
International Centre for Free and Open Source Software (ICFOSS)
Korea Institute of Science and Technology Information (KISTI)
MLR Institute of Technology
MXC Foundation gGmbH
Nanjing University of Science and Technology
Nucleon e.V.
OpenIoT
Telecommunications Circuits Lab, EPFL
Terre des Hommes Foundation
Universidad Politecnica de Cartagena
Universidade Federal de Santa Maria UFSM
Universidade Federal do Ceará UFC - Campus Sobral
Universitas Narotama
Universitat Oberta de Catalunya
Universiti Kuala Lumpur (UniKL MIIT)
University Grenoble Alpes
University of Saskatchewan
VIA University College, Campus Horsens
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