Joining Forces

The Industrial Internet Consortium, now incorporating OpenFog (IIC), held its first-quarter member meeting of 2019 on February 11th - 14th in Raleigh, North Carolina, USA. It was as busy and productive as usual, with 23 testbed sessions 81 working sessions, and 236 people attending.

But first…

The IIC is five years old! Founded 2014-03-27 by five global companies to accelerate the development of the industrial internet, we are now over 200 members strong, with over 4000 individuals on the roster, and steadily turning out testbeds, frameworks, white papers and most importantly, the Resource Hub, a global resource to support our mission. And we have just joined forces with the OpenFog Consortium.

OpenFog and IIC Join Forces

The biggest news this quarter is that on 2019-01-31, possibly the two largest and most influential international consortia in industrial IoT, fog and edge computing, the Industrial Internet Consortium and the OpenFog Consortium, joined forces to create the world's largest consortium devoted to accelerating the development of the industrial internet. Joining forces has injected energy into the combined organization and we have a louder voice. We offer greater influence to members, a lower-risk path to the future for industrial users and most importantly, we will clarify the market giving industrial users confidence that the market is becoming significant. This will reduce confusion, and confusion in the market is one of the largest impediments to adoption of this technology. In other words, we are stronger together.

The combined memberships will drive the development and promotion of industry guidance and best practices for edge-fog computing. Industrial customers will receive guidance on application architectures, network design, and how to optimize the performance, versatility and total lifecycle cost of ownership of their IIOT systems. The IIC, now incorporating OpenFog, is now the go-to organization for high performance edge-fog IoT application, network and element design.

We asked Chuck Byers, Chief Technical Officer of the OpenFog Consortium why this was a good idea for his organization.

> "The OpenFog Consortium sees great potential for growth in the edge-fog marketplace. We realized that we needed larger scale and a broader perspective to break through to the next level. Combining with IIC was a natural choice for us, because the two consortia had complementary viewpoints.

> Combining the OpenFog vision and Reference Architecture with the IIC Edge Computing work and the Industrial Internet Reference Architecture produces an end-to-end architecture for computation, storage and networking from the "things", through a collection of edge-fog devices, all the way to the bottom of the cloud.
>
> Working together allows us to focus our efforts, with one set of specifications, four meetings a year instead of seven, one fee and so on. IIC has a large, active member body, and a vibrant culture, which has been welcoming to those of us coming from OpenFog. We will benefit from the increased momentum, generating many new opportunities for OpenFog members of IIC. The OpenFog membership is excited to join forces with IIC, and many joint activities are already underway."

In technical matters, what is the difference between "edge" and "fog"? Not much. There are plenty of conversations to be had to define the exact differences, but the community is in the early stages of edge and fog development, and experience shows that what appear at first to be the hills on which we might take a stand turn out, over time, to be mere mounds. They don't make a lot of difference to the market. They need to be clarified for technical reasons, to be sure, but that is no reason to hinder the market, which can easily hang up on the minor technical differences of little consequence.

Marketing, technical groups, testbeds, use cases, architectural visions and regional groups will combine over the coming months, starting with some spirited discussions in Raleigh. There, we decided to continue the existing work of the OpenFog Consortium, typically within existing IIC groups. The OpenFog Technical Framework document, a separate piece of work, has been taken over by a new Fog Computing Task Group.

OpenFog brings detailed use cases and additional testbeds to diversify those in IIC. The regional teams also dovetail well, with OpenFog strong in Japan and in China (to collaborate with our existing China Regional Team) and IIC having a long-standing German Regional Team. Moreover, OpenFog has strong university members and a presence with the IEEE standards body that boost IIC's capabilities.

We welcome two new Steering Committee members from OpenFog:

Ron Zahavi is Chief Strategist for IoT Standards, Microsoft Azure IoT. Ron has extensive experience managing technology and strategy, business transformation, and integrating software and applications to meet business requirements. Ron represents Microsoft in several standards organizations and consortia. He is on the OMG board of directors, leads the Microsoft internal IoT community and was a member of the OpenFog board of directors. He is co-author of several books including *Business Modeling: A Practical Guide to Realizing Business Value* and IIC's own IoT Security Maturity Model.

Mung Chiang is the John A. Edwardson Dean of the College of Engineering and the Roscoe H. George Distinguished Professor of Electrical and Computer Engineering at Purdue University. Previously he was the Arthur LeGrand Doty Professor of Electrical Engineering at Princeton University. His research on networking received the 2013 Alan T. Waterman Award, the highest honor to US young scientists and engineers. He founded the Princeton EDGE Lab in 2009, which bridges the gap from proofs to prototypes in edge computing. His MOOCs reached over 400,000 students. He coauthored the best-seller Power of Networks and confounded several startups.

A full list of Steering Committee members, and full biographies can be found here.

We also welcome the following new IIC members from OpenFog:

- Aalto University, Department of Computer Science
- *Chinese University of Hong Kong, Institute of Network Coding*
- *Concordia University*
- *Institute for Information Industry*
- *Nanyang Technological University*
- *National Chiao Tung University*
- *Princeton University*
- *Purdue University College of Engineering*
- *Redis Labs*
- *Seagate Technology LLC*
- *Shanghai Institute of Microsystem and Information Technology*
- *ShanghaiTech University*
- *University of Warwick, Warwick Business School*

The IIC is planning a conference in December 2019, in Long Beach, CA to showcase fog and edge innovation as a continuation of the Fog World Congress established by the Open Fog Consortium.

We will be the center of gravity for the future of Industrial IoT systems across industry verticals.

TESTBEDS

Testbeds provide an environment for companies and multi-disciplinary stakeholders to team up, prove out complex systems and gain real-world experience. With 26 Approved IIC Testbeds and more in the pipeline, participants are generating best practices, insights, priorities, use cases and recommendations for SDOs. Please also see this video: Why Build Testbeds?

The Smart Factory Web Testbed published *Outcomes, Insights and Best Practices from IIC Testbeds: Smart Factory Web Testbed* in the March 2019 edition of the IIC Journal of Innovation.

The paper describes the testbed from concept to reality and gives a summary of usage scenarios, standards implemented, and results to date. The testbed was awarded a standards testbed badge for its use of OPC-UA, AutomationML, SensorThings API among other standards. Additional information about testbeds, and badges awarded to them, are found in the IIC Resource Hub.

GROUP ACTIVITIES

Our groups continue to make progress on their various activities and deliverables. You can find a complete list of IIC publications on the Technical Papers, Publications and White Papers webpage.

The ecosystem group held another IIC Connect event during our first quarter member meeting. It attracted 54 participants, with 36 one-on-one sessions. Feedback continues to indicate that these sessions are an effective way to meet members and expand contacts. More sessions will be scheduled to give members greater opportunity to connect with one another.

The liaison group expanded the number of active liaisons to forty-two adding OPC Foundation and Wi-SUN Alliance. The IIC, along with the OPC Foundation, hosted a joint workshop in Raleigh, North Carolina. This workshop, *Building Industrial Internet Solutions with the OPC Foundation,* featured speakers from both IIC and OPC Foundation and supported the joint work to gather requirements for tailoring and extending specifications to address specific IIoT scenarios. A description of this liaison workshop, and other workshops, resides at the IIC liaison activity site.

The security group published the IoT Security Maturity Model (SMM): Practitioner's Guide that provides detailed actionable guidance enabling IoT stakeholders to assess and manage the security maturity of IoT systems. The SMM builds on the concepts identified in the Industrial Internet Security Framework (IISF) and provides a path for IoT providers to understand where they need to be, make intelligent choices about which mechanisms to use and how to invest in the mechanisms to meet their needs. They also developed the IoT SMM: Practitioner's Guide to extend the value of the SMM and assist stakeholders in the assessment process. IIC members prepared a webinar "*Get a True Sense of Security Maturity*" to provide more information that is now available on demand.

The IoT SMM: Description and Intended Use White Paper was updated for consistency with the IoT SMM: Practitioner's Guide, including revised diagrams and updated terminology. This white paper introduces the concepts and approach of the IoT SMM.

EVENTS

We showcased member-led innovations and hosted networking events at a number of industry events since the beginning of 2019. At DistribuTECH in New Orleans, member Cisco, hosted an IIC reception in their booth where members and guests discussed problems and challenges in the energy industry The Distributed Energy Resources Testbed was showcased nearby. In February, we hosted a busy booth at Mobile World Contress in Barcelona. Member KETI delivered a

presentation and hosted the Smart Factory Web Testbed and a networking reception at their large stand at Smart Factory Expo + Automation World in Gangnam, Korea.

GLOBAL EVENT SERIES

Along with our partner, RIoT, we held a public forum on Building Intelligent Infrastructures at our host, SAS's headquarters in Cary, North Carolina. Speakers and panelists contributed to an outstanding agenda and a successful event. The audience was treated to thought leadership from IIC members: Cisco, Huawei, Itron, LHP Engineering Solutions, NetApp, RTI, SAS, Tata Consultancy Services and the following guests, Building Clarity, Honeywell, Town of Cary, and Volvo Trucks NA. Technology demonstrations were offered during the networking breaks. Our next event in the series is a Smart Manufacturing Forum and takes place on 2019-05-23 at Cork Institute of Technology in Cork, Ireland.

Details about this and past global event series events can be found on the IIC Events page.

TECHNICAL INNOVATION AWARD WINNER

The winner of the Q1 Technical Innovation member award is Pieter van Schalkwyk, CEO, XMPro Inc**.** The award was presented to Pieter by the Steering Committee during the opening session of the Q1 member meeting in Raleigh, North Carolina. Pieter was recognized by his peers for his overall leadership and continued dedication to the IIC by:

- actively contributing to the IIC by sharing his vision and leading IIC groups to many in-depth discussions that benefit all members,
- co-chairing the Digital Twin Interoperability, Industrial Digital Transformation and Industrial Distributed Ledger Task Groups, as well as previously co-chairing the Ecosystem Task Group and
- authoring of Journal of Innovation articles – *Causal Analytics in IIoT - AI That Knows What Causes What and When* and *A Practical Framework to Turn IoT Technology into Operational Capability.*

Congratulations Pieter!

NEW MEMBERS

Please welcome new members this quarter:

- *451 Research*
- *Beeond, Inc.*
- *Blue Planet-works, Inc.*
- *BruVue, Inc.*
- *Dassault Systémes*
- *Instrumentation Technology and Economy Institute*
- *Jiangsu Sino Logistics Networking Technology Co., Ltd.*
- *Fathom Solutions, Inc.*
- *IoTeX*
- *Irdeto*
- *Reliabilityweb.com*
- *ZYFRA OY*

The Industrial Internet Consortium, now with OpenFog, is the world's leading membership program transforming business and society by accelerating the Industrial Internet of Things. Our mission is to deliver a trustworthy Industrial Internet of Things in which the world's systems and devices are securely connected and controlled to deliver transformational outcomes. Founded March 2014, the Industrial Internet Consortium catalyzes and coordinates the priorities and enabling technologies of the Industrial Internet. The Industrial Internet Consortium is a program of the Object Management Group® (OMG®).

Visit www.iiconsortium.org.

IIC members gain experience they could never have as a non-member. They experience member meetings unlike any local meet-up groups. Here are some key benefits of membership:

- ***Networking***—Make the connections; find the needed expertise.
- ***Information & News***—A fast pass to newsworthy industry developments.
- ***Competitive edge***—Stay ahead of the competition or take advantage of changes and developments that might otherwise have passed you by.
- ***Create a market***—Join a collective voice supporting a single mission; create the disruption in the market and develop the business opportunities.
- ***Establish a vision*** –Members work to define future architectures and innovate technologies for IIoT.
- ***Success***—Members are building businesses and dedicating their professional lives to IIoT. They want to be successful, and they want others to succeed.
- ***Professional development***—Grow your career, meet mentors and mentees, career prospects.
- ***Solve important problems—***and help your partners and customers.