

## A Vision for Secure IoT

IoT has the potential to transform and enrich our lives and to drive significant productivity gains in the broader economy.

Need for Action:

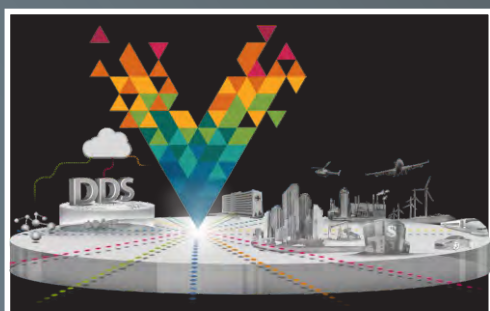
A Risk to Consumers and the Internet.



## Restart your IoT Device with a Flat Battery by adding a Chip of 5 x 5 mm

World-leading industrial and financial investors trust e-peas including:

Partech Ventures, Airbus, JCDecaux, Semtech ...



## VORTEX CLOUD - FOG - DDS by ADLINK

## VMware & ADLINK to Collaborate to Simplify IoT Implementations



## Digital Energy Supply versus Data Protection

Smart Meter Gateway (SMGW) is the answer

## Top 20 IIoT Applications



Internet of Things  
INSTITUTE™

## The Top 20 Industrial IoT App's

ABB, Airbus, Amazon, Boeing, Bosch, Caterpillar, Fanuc, Gehring, Hitachi, John Deere, Kaeser Kompressoren, Komatsu, KUKA, Maersk, Magna Steyr, North Star BlueScope Steel, Real-Time Innovations, Rio Tinto, Shell, Stanley Black&Decker

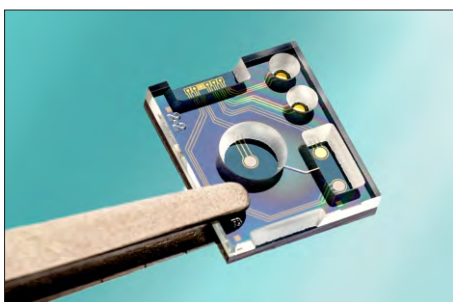
# In this Edition

- VMware to Collaborate with ADLINK to Simplify IoT Implementations

- 5G Network Slicing for Vertical Industries  
*Prepared by GSA (Global mobile Suppliers Association)  
with contributions from Ericsson, Huawei & Nokia*

- SMARC 2.0 - At the Heart of next Generation IoT Embedded Solutions - WHITE PAPER

- Imec and Analog Devices sign strategic research partnership for development of next-gen IoT devices



- Internet Scale Real-time Data Sharing via the Cloud

*Vortex Cloud extends the capabilities of Vortex-enabled applications with support for data sharing between Local Area Networks or over a Wide Area Network.*

- Energy Harvesting  
*World-leading industrial and financial investors trust e-peas*

- The Top 20 Industrial IoT Applications  
*ABB, Airbus, Amazon, Boeing, Bosch, Caterpillar, Fanuc, Gehring, Hitachi, John Deere, Kaeser Kompressoren, Komatsu, KUKA, Maersk, Magna Steyr, North Star BlueScope Steel, Real-Time Innovations, Rio Tinto, Shell, Stanley Black & Decker*

- The Transparent Citizen in the Smart Grid  
*Digital Energy Supply vs Data Protection*

- GE & Apple Team Up To Bring The Industrial Internet To The iPhone and iOS

- Nokia partners with Bosch Connected Devices & Solutions for Industrial IoT



Daniel Dierickx  
CEO & co-Founder  
at e2mos  
Acting Chief Editor

## Dear Reader,

Here is your free copy of **IoT World**, one of our five magazines published by e2mos.

Our aim is to provide you with relevant information.

Those five magazines are part of the e2mos « **Go-to-Market Platform** »

This GLOBAL Platform is a UNIQUE Set of Services for Telecom ICT, Video Broadcast, Embedded Computing, IoT and AI Vendors from Multicore Chips to Application-ready Systems & Rack Space Servers.

### Our WORLDWIDE Services:

- Business Discovery
- Customer Meeting Setup
- Telemarketing
- Call Campaigns
- e-mailings Worldwide
- and our 5 e-magazines, each magazines has its **own Website** (see below).

### Global Expertise & Added-Value

- Over 30 Years Global Expertise in those Markets
- we use a **UNIQUE Database** started in 1980 - **Daily UPDATES**

**FREE and Direct**  
**No Login, No Password**  
Just Click on the LOGO

**aiworld**

**IoT World**

**Telecom COTS World**  
Broadband Broadcast IoT Convergence

**Embedded Systems World**

**ATCA World**

**Editor/Publisher: e2mos**

WEB: [www.e2mos.com](http://www.e2mos.com)

Contact: [mgt@e2mos.com](mailto:mgt@e2mos.com)

# VMware to Collaborate with ADLINK to Simplify IoT Implementations

PALO ALTO, CA--(Marketwired – August 23, 2017) – VMware, Inc. (NYSE: VMW), a global leader in cloud infrastructure and business mobility, today announced a new collaboration with ADLINK Technology to provide mutual customers with a pre-integrated Internet of Things (IoT) solution that takes the guesswork out of selecting the hardware and software components of a typical IoT architecture.

As organizations embrace IoT, they cite vendor selection and integration as a major challenge. According to Gartner, through 2018, 75 percent “of IoT projects will take up to twice as long as planned, with consequent cost implications.” (1) Due to the lack of a single point IoT solution, enterprises are forced to cobble together multiple, disparate offerings and then invest time and effort to maintain them in the longer run—which is a major inhibitor to IoT adoption.

VMware and ADLINK are testing and enabling their respective IoT solutions to work together to offer mutual customers a comprehensive, supported IoT offering featuring the requisite hardware, software and services to tackle their IoT initiatives. Additionally, the companies expect to conduct joint go-to-market activities.

ADLINK is 'Leading EDGE COMPUTING' by delivering the network nodes that enable practical and scalable IoT systems. Building on its strong heritage in embedded computing, ADLINK provides the hardware and advanced Edge-aware software capabilities necessary for the multi-vendor, multi-standard connectivity required in end-to-end IT/OT business solutions.

With its strategic partners VMware, OSIssoft and IBM, ADLINK reduces the complexity and helps speed the deployment of enterprise IoT systems that liberate data from vendor silos and other islands-of-automation, thus enabling business improvement in terms of operational excellence, enhanced customer service and support for new business models.

The recently announced [VMware Pulse IoT Center](#) will deliver the monitoring, managing and security needs of IoT infrastructure from the edge to the cloud. Additionally, VMware Pulse IoT Center will simplify IoT complexity by managing all 'things' as one, improve the reliability and security of IoT infrastructure through accurate and real-time visibility of 'thing' health, and accelerate the ROI of IoT use cases by streamlining how IoT projects are deployed and scaled. VMware Pulse IoT Center is expected to become available in calendar 2017.

VMware's IT expertise as a leader in IT infrastructure along with ADLINK's deep knowledge about Operation Technology (OT) across various industries will benefit mutual customers as they implement IoT use cases throughout their organizations.



Click on the Logos



# 5G Network Slicing for Vertical Industries

Prepared by GSA (Global mobile Suppliers Association)  
with contributions from Ericsson, Huawei & Nokia



## Introduction: Digital Transformation

As the world becomes ever more digitally and globally connected, industries are experiencing an ICT-driven transformation.

There are many different global trends that can account for this dramatic projected growth, including:

- A rise in emerging economies, which are yet to be fully immersed in the digital world
- The urbanization of integrated mobility
- The digital revolution
- New health and wellbeing demands
- The scarcity and stability of resources.

Additionally, business trends such as hyper competition, new customer power and sophistication, the fast-paced change in business ecosystems and disruptive technological advances all affect vertical industries to different extents.



### MANUFACTURING

- > Hypercompetition with no sustainable competitive advantages
- > Increasing volatility from business cycles and product lifecycles
- > The smart factory is advancing from developments in the Internet of Things and automation



### HEALTHCARE

- > Increasing consumer attention on wellbeing
- > Increasing cost to fit with social demographic changes
- > Increasing demand on quality, patient safety and data storage
- > Changing consumer behaviour, freedom of choice and alternative service providers



### MEDIA AND ENTERTAINMENT

- > Shifting consumer role as a co-creator of media content
- > Increasingly interactive and immersive forms of entertainment
- > Expansion of digital content through new platforms and new market players (OTT and VOD)
- > Ecosystem complexity



### FINANCIAL SERVICES

- > Disruption from Fintech (technology used to support financial services) due to online payments, e-wallets etc.
- > Changing customer relations with online/mobile transactions and customized financial solutions
- > Structural changes - state involvement, protectionism and fiscal measures



### PUBLIC SAFETY

- > Growing public surveillance with CCTV and wearable cameras
- > Cyber-attacks - global integration and the digital economy
- > Engaged and connected citizens - Internet of Public Safety



### AUTOMOTIVE

- > Autonomous driving and connected traveler with telematics
- > Car sharing and changing commuter habits
- > Electric mobility with decreasing battery costs and a green agenda
- > Digital enterprise and connected supply chain
- > Digital vehicle ecosystem



### PUBLIC TRANSPORT

- > Infotainment on the move
- > Urbanization and Intermodality
- > Environmental awareness - CO<sub>2</sub> emissions and public spaces
- > Urban lifestyle and growing expectations on public transport



### ENERGY UTILITIES

- > Oil supply imbalance and instability, fracking advancements and carbon constraints
- > Structural shifts with increasing retiring assets
- > New decentralised business models
- > Electrification and renewable energy generation

... to next page

# 5G Network Slicing for Vertical Industries

Prepared by GSA (Global mobile Suppliers Association)  
with contributions from Ericsson, Huawei & Nokia



... from previous page

5G will be a major technology in growing industrial digitalization, creating and enhancing industry digitalization use cases such as immersive gaming, autonomous driving, remote robotic surgery and augmented reality support in maintenance and repair situations.

Figure 1 (previous page) outlines eight key industries; each of these identified areas faces numerous challenges due to industry trends, which could be addressed with the adoption of 5G digitalization.

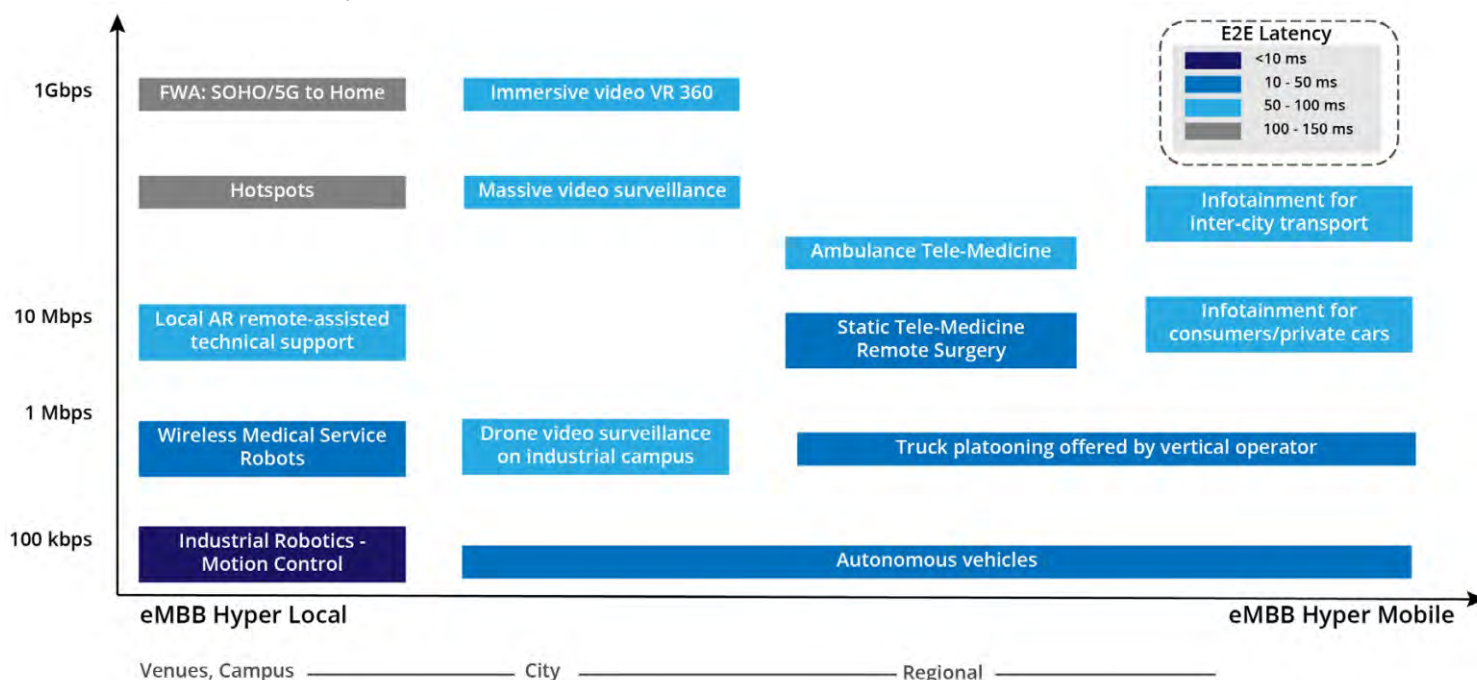
Vertical industries have addressed their connectivity and communication needs with dedicated or industry specific solutions.

5G technology will provide a common base to provide a more cost efficient, open, interoperable and large eco-system enabled solution platform for the various vertical industries.

5G is addressing the more stringent and business critical requirements of the vertical industries, such as real-time capabilities, latency, reliability, security and guaranteed Service Level Agreement (SLA)'s.

5G will provide an industry vertical optimized platform catering in an economical way the various requirements and business needs of each vertical. For service providers to offer these capabilities to vertical industries in an attractive, scalable and economical way, they will utilize cloud platforms, analytics, system automation and network slicing technologies as well as new business models.

Network slicing is one of the key capabilities that will enable flexibility, as it allows multiple logical networks to be created on top of a common shared physical infrastructure. The greater elasticity brought about by network slicing will help to address the cost, efficiency, and flexibility requirements imposed by the large variety of industrial vertical services. Moreover, network slicing will help new services and new requirements to be quickly addressed, according to the needs of the industries, i.e. a faster Time to Market.



## Vertical Requirements

5G will allow the creation of logical networks on top of a shared infrastructure.

Those networks can be optimized for specific use cases, service types and support various business models. "Network as a service" is the tool for implementing dedicated and customized virtual end2end networks, enabling vertical industries to rapidly deploy their services.

Vertical industries are very diverse and their requirements are dictated by the service characteristics of the related vertical segment. Examples of services requiring Low Latency and High Reliability are Autonomous Vehicles, Industrial Control, and Augmented Reality. Figure 2 on the next page shows the most relevant segments.

**Download the Report - 17 Pages**



# SMARC 2.0 - At the Heart of next Generation IoT Embedded Solutions - WHITE PAPER



The SMARC™ (Smart Mobility Architecture) standard has in a matter of a few years become a major driving force behind the enablement of innovative ultra-low-power embedded computing technology solutions. Market demand and the disruptive influence of the Internet of Things (IoT) have already hastened the arrival of a new specification, SMARC 2.0. What are the implications for embedded systems designers and developers?

High-performance embedded systems have been used in industrial, corporate and consumer sectors for some time for controlling larger computer systems, providing human-machine interfaces, as well as for collecting and analysing large volumes of data.

By definition embedded systems must not only be extremely small, very robust and high performing, they must also consume minimal power. Furthermore, with the advent of the IoT, embedded systems are becoming more and more critical for the hyper-scale interconnectivity of humans, machines and all kinds of devices in order to deliver an increasingly diverse, seemingly infinite, range of innovative applications.

Faced with these growing requirements, a new version of the now widely accepted Smart Mobility Architecture (SMARC) standard for Computer on Modules (COMs) was introduced in 2016, just three years after its inception by SGET (Standardization Group for Embedded Technologies).

With SMARC already proven in a range of applications, from industrial production to smart phones, tablets, and advanced human-machine interfaces, why was a new version necessary and what exactly makes the new version better than its predecessor?

## Download the Whitepaper

[https://www.kontron.com/smarc\\_wp](https://www.kontron.com/smarc_wp)

This paper discusses SMARC's ongoing evolution to ensure system designers and OEMs can address the growing challenges and requirements for more rapid and cost-effective development of next generation IoT-enabled embedded systems.



## INTRODUCTION: A CHANGING LANDSCAPE

In early 2016 Version 2.0 of the SMARC (Smart Mobility Architecture) embedded computing format was announced by SGET SDT 0.1 (Standardization Group for Embedded Technologies). Essentially, the SMARC2.0 specification provides an enhanced pinout to better accommodate customer needs and processor interfaces, perfectly matching the original standard set in 2013 for low-profile form factor modules.

In just three years SMARC had proved to be an innovation boost for the ultra-low power embedded market and it was this rapid success which largely contributed to the requirement for Version 2.0 in a comparatively short period. SMARC modules have rapidly emerged as scalable building blocks for enabling a whole new generation of embedded computing applications. Using SMARC, systems integrators can take full advantage of the user-interface options available to mobile device OEMs, providing access to the smaller, low-cost display modules employed in smart phones, tablets and advanced human machine interfaces.

Whilst SMARC was originally born out of the necessity for further development of Computer-on-Modules standards for energy-saving ARM System on Chip (SoC) processors, Intel subsequently improved the power efficiency of its processors with Atom-based SoCs, allowing x86 architecture products to also benefit from the SMARC format. At the same time, The Internet of Things (IoT) has become a hugely significant disruptor, bringing previously unforeseen opportunities as well as challenges for vendors seeking to connect numerous devices with different technological requirements.

Therefore, the need to accommodate universal IoT connectivity while at the same time bridging the gap between the specific interface requirements of ARM and Intel® processors became the catalyst for SMARC 2.0.

It ensures the compatibility of multiple different hardware components without complications, and is fit for purpose for meeting the hyper-scale interconnectivity demands of the rapidly evolving IoT Age.

# Imec and Analog Devices sign strategic research partnership for development of next-gen IoT devices

LEUVEN, Belgium & NORWOOD, MA - Oct. 12, 2017 — [Imec](#), the world-leading research and innovation hub in nanoelectronics and digital technologies and [Analog Devices, Inc.](#) (ADI) the leading global high-performance analog technology company, today announced they have entered into a strategic research partnership to develop the next generation of Internet of Things (IoT) devices. With two initiatives already underway, imec and ADI aim to innovate devices that are not only low-power but that also come with largely improved—or completely new—sensing capabilities. This new collaboration is the latest example of imec and ADI's long history of jointly developing high-performance low-power, cost effective circuits and systems.



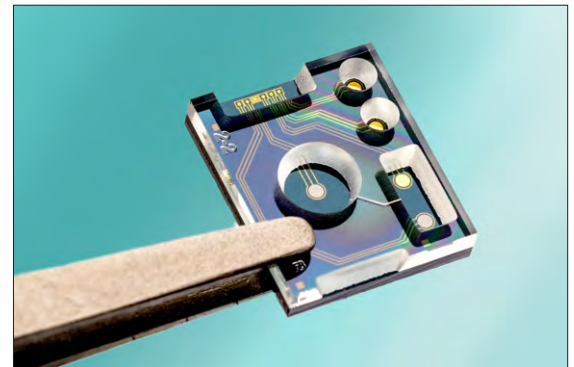
The IoT continues to grow and mature, and by 2020, it is expected to consist of billions of connected, “smart” objects that rely on unobtrusive sensors to constantly monitor the environment, provide status reports and receive instructions. By intelligently processing the data gathered, these devices then drive some type of short-term or long-term action. Today, however, the underlying sensors, and the chips upon which they are built, are often too big, too expensive and not accurate enough to be practical.

One joint research initiative that has already been started in the framework of the strategic collaboration focuses on localization technology.

“Building on imec's world-leading position in innovative ultra-low power implementations, ADI and imec will pursue the development of a low-power sensor for highly accurate indoor localization in the context of smart building or smart industry solutions,” stated Kathleen Philips, imec program director. “Concretely, we want this sensor to localize objects with a superior accuracy in a robust manner and achieve up to five times better accuracy than today's best-performing solutions.”

A second initiative includes the creation, and ultimately the commercialization, of a highly-integrated liquid sensor that can be used in a variety of application domains, such as the analysis of water, blood or urine.

Kathleen Philips added: “Our single-chip sensor comprises multiple electrodes and excels in terms of cost and size, while demonstrating industry leading sensitivity and accuracy.”



“Imec is widely recognized for its long-standing and global leadership when it comes to the development of ultra-low power circuits and devices, as well as innovative and smart algorithms,” noted Peter Real, SVP & CTO, ADI. “We have chosen to take our collaboration with imec to the next level because its expertise in each of those domains—and its position at the crossroads of both the scientific and industrial communities—is fundamental to helping us successfully develop the next generation of IoT sensors.”

“In ADI we have found a partner that brings to market professional-grade, high-value-add sensor systems. Thanks to ADI's commercial insights, in combination with its innovative mindset, we can build differentiating technology that meets IoT market requirements today and tomorrow,” added Rudi Cartuyvels, Executive Vice President at imec.



## Internet Scale Real-time Data Sharing via the Cloud

*Vortex Cloud extends the capabilities of Vortex-enabled applications with support for data sharing between Local Area Networks (LANs) or over a Wide Area Network (WAN). Vortex Cloud can be deployed on public or private clouds, it is elastic, fault-tolerant and highly scalable.*

### Overview

Vortex Cloud provides universally accessible Routing and Discovery Services that enable ubiquitous data sharing and WAN connectivity for Vortex systems or any other system/device that uses a compliant Data Distribution Service (DDS) software stack. Vortex Cloud provides transparent discovery and routing between data readers and data writers regardless of location. Vortex Cloud supports a number of different deployment and connectivity scenarios including, including individual device to cloud, system to cloud and also system federation.

*... to next page*



# Internet Scale Real-time Data Sharing via the Cloud

... from previous page

## Key Features

Vortex Cloud is composed of Routing and Discovery services, both of which can be deployed multiple times for fault-tolerance, scalability and load balancing purposes. The purpose of each service is as follows:

- Discovery Service – by default in a LAN environment applications discover each other using UDP multicast. Where this is not available, for example on a WAN using an Internet connection, then Vortex Cloud provides the Discovery Service to provide this capability.
- Routing Service – there are some circumstances that may lead two applications to be unable to communicate which each including:
  - o Both application are using TCP as the transport and are deployed behind a NAT that does not have a public address.
  - o Both applications are using UDP multicast and are deployed in two different LANs

Both applications are using different transports. The first is deployed in a LAN using UDP multicast and the second is deployed on a WAN using TCP.

In these cases a Routing Service with the help of a Discovery Service can establish a route to allow the data to flow between applications.

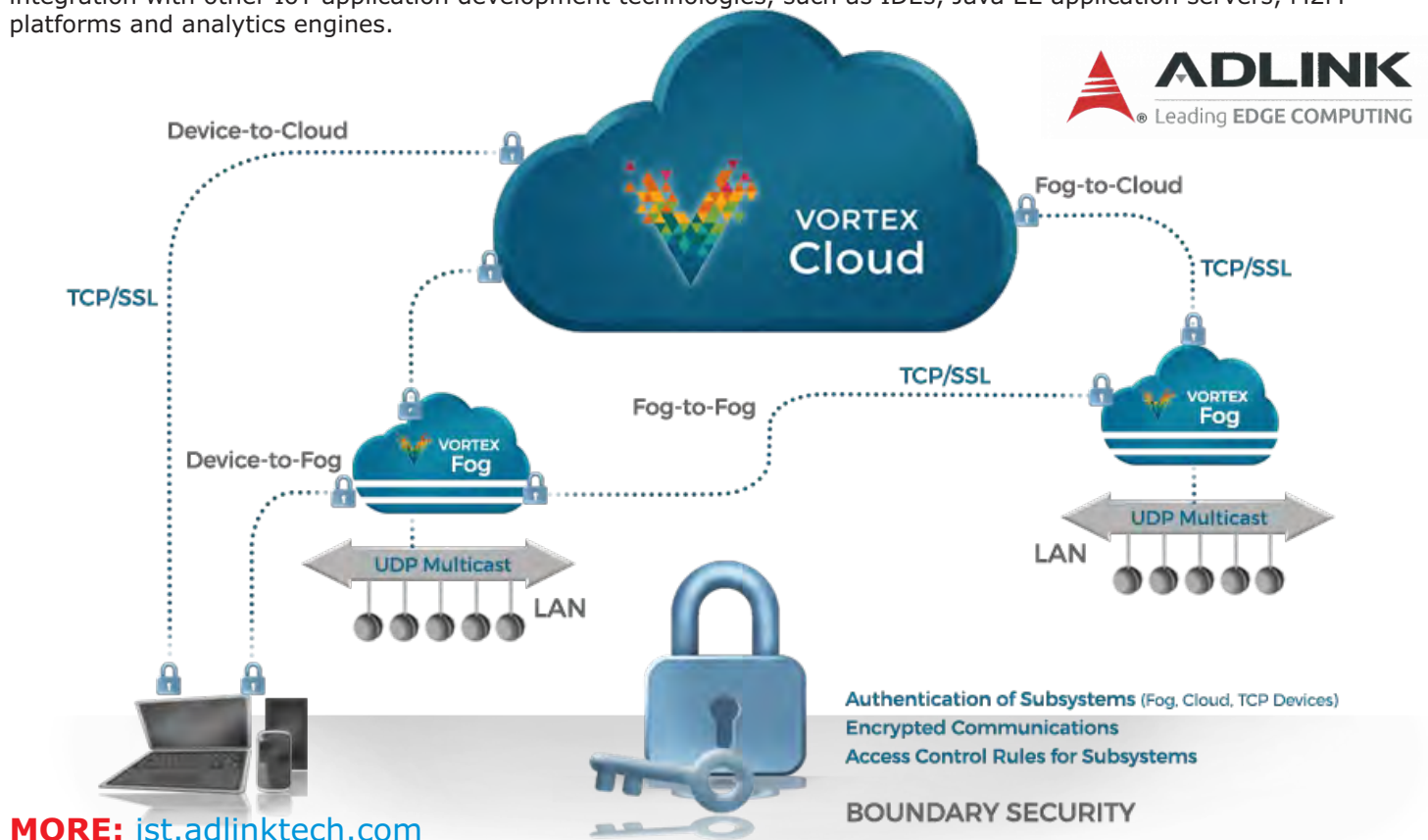
Vortex Cloud also enables Boundary Security for subsystems connected over a WAN by providing certificate-based authentication between individual nodes and subsystems sharing data via Vortex Cloud, secure encrypted communications and access control rules defining the privileges each subsystem has to read or write data.

## Complementary Technologies

Vortex Cloud is a key component of the Vortex Intelligent Data Sharing platform, an advanced suite of complementary interoperable technologies that enable business-critical and industrial IoT systems. In a number of cases Vortex Fog is deployed together with Vortex Cloud to provide Internet wide data sharing and connectivity with subsystems that are using UDP multicast for high performance communications.

The Vortex platform provides implementations targeting different device platforms, namely, Vortex Lite for embedded IoT devices, Vortex Café for Android and Java-centric environments, Vortex Web for browsers, and Vortex OpenSplice for enterprise servers. To support complex multi-protocol IIoT systems, Vortex Gateway can support the efficient integration of different communication technologies.

The Vortex platform also includes a complete set of tools to support system development and management (e.g. configuring, testing, optimizing, monitoring and recording system behavior) and it provides a rich and open API for integration with other IoT application development technologies, such as IDEs, Java EE application servers, M2M platforms and analytics engines.



# World-leading industrial and financial investors trust e-peas



Posted 25 October 2017

Continuing to make major advances in energy-autonomous technologies, e-peas has just completed a new round of funding of \$4.2 million (Euro 3.5 million) from leading investors. The group of industrial and financial investment firms involved in this funding round, led by Partech Ventures, comprises Airbus Ventures, JCDecaux Holding, Semtech, SRIW and Vives 2 – all well-known and respected investment and technology specialists from US and Europe.

Industry analysts at Gartner have predicted that there will be at least 20 billion Internet of Things (IoT) nodes in operation by 2020, and that this number will continue to rise rapidly over the course of the next decade. The vast majority of IoT nodes will be located in remote places and have severe power constraints to contend with. This is where e-peas' proprietary technology comes in, with the ambition to power the IoT without batteries or electrical cords.

Having initially gained both local government grants and private seed investment funding back in 2014, e-peas successfully brought its ground-breaking AEM10940 energy harvesting chip to market. Through this device, IoT nodes can draw energy from their surrounding environment, thereby freeing them from the heavy cost and inconvenience of battery replacements and ongoing maintenance. It has already led to e-peas winning several prestigious award nominations, including the highly coveted Electrons d'Or in France.

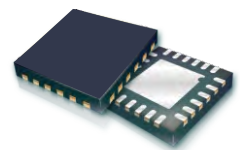
The new fund raising gives the Belgian start-up the finances needed to further progress its objective of relieving customers from the operational expenses that are normally associated with their IoT sensors. The additional investment will allow the company to strengthen its global business development capability and significantly expand its engineering workforce. Through this it will be able to accelerate the development, production and commercialization of an extended energy harvesting product portfolio, as well as exploring new product propositions and collaborations with other players in key application areas. Among these will be industrial monitoring, home automation, smart agriculture, assets tracking, healthcare, smart metering and wearables.

"With this fund raising, we have gained much more than financial support, we have found experienced partners for our growth that bring e-peas an important market access either directly or through their network, and great insights to improve our operational excellence in the semiconductor market," states Geoffroy Gosset, co-founder and CEO of e-peas.

"We have been incredibly impressed by the stellar execution and unique skills of the e-peas team, as well as the superiority of their proprietary technology. We see an untapped multi-B\$ opportunity with numerous applications in IoT, smart city, industry operations, logistics, and more. The whole Partech Ventures team in the US and Europe is determined to support e-peas in their fast growth both commercially and financially," added Romain Lavault, Board Member and General Partner at Partech Ventures.

"To unleash the full benefit of big data, sensors are being installed everywhere. Until now battery maintenance and wiring costs have prevented mass deployment/dissemination of sensors in the industrial environment. We believe e-peas is ideally positioned to support sensor deployment at scale in the industrial environment as its highly efficient low-power technology enable wireless and battery-less sensors," says Matthieu Repellin, Investment Partner with Airbus Ventures.

## Energy Harvesting



## Are you ready for your next IoT sensor design ?

Whatever your application, e-peas has you covered with a unique products portfolio, offering unmatched extremely-low-power consumption, robustness of operation and ease of integration.

We revolutionize the IoT industry by offering the best performing ambient energy harvesting, processing and sensing solutions that make the batteries of your wireless devices live forever

### Contact us

<https://e-peas.com/contact/>

# The Top 20 Industrial IoT Applications

By [Brian Buntz](#): Content Director, IoT Institute, Informa | Sep 20, 2017



We round up some of the most innovative and trailblazing industrial companies across the landscape of the industrial Internet of Things.

The term "Industrie 4.0" heralds the coming of a new industrial revolution through smart manufacturing. The term "industrial Internet of Things" has a more muted-sounding promise of driving operational efficiencies through automation, connectivity and analytics. But the focus of IIoT — on industry at large — is broader.

Here, we take a comprehensive view, rounding up 20 IIoT leaders and pioneers, drawing on the feedback from industry analysts and consultants. The focus here is not on vendors offering, say, a cloud-based platform for monitoring industrial machines but on the companies that themselves are using IIoT technology to drive their business forward.

For the sake of this feature, we focus on organizations that use connected technology in tandem with cloud-based analytics to drive efficiencies and launch new business models. We concentrate on organizations that focus on logistics, agriculture and traditional "hard-hat" undertakings such as construction, manufacturing, mining, energy production and supply. We leave out healthcare, and smart city and smart building applications, which occasionally get lumped into the IIoT domain.

The companies on this list, presented alphabetically, are not idly boasting about the promise of IIoT to transform their business; they have already begun the transformation.

[See eight industrial enterprises that have applied industrial IoT and are already reaping the benefits.]

## 1. ABB: Smart robotics

Power and robotics firm ABB is one of the most visible to embrace the concept of predictive maintenance, using connected sensors to monitor its robots' maintenance needs — across five continents — and trigger repair before parts break. Also related to IoT is the company's collaborative robotics. Its YuMi model, which was designed to collaborate alongside humans, can accept input via Ethernet and industrial protocols like Profibus and DeviceNet.

## 2. Airbus: Factory of the Future

To say that assembling a commercial jetliner is an elaborate affair would be an understatement. Such craft have millions of components and tens of thousands of assembly steps, and the cost of mistakes during the process can be enormous. To tackle the complexity, Airbus has launched a digital manufacturing initiative known as Factory of the Future to streamline operations and bolster production capacity. The company has integrated sensors to tools and machines on the shop floor and given workers wearable technology — including industrial smart glasses — designed to reduce errors and bolster safety in the workplace. In one procedure, known as cabin-seat marking, the wearables enabled a 500% improvement in productivity while nearly eliminating errors.

## 3. Amazon: Reinventing warehousing

The online retail giant doesn't often get called an IIoT company, but, to be sure, the company is an innovator when it comes to warehousing and logistics. As MIT Technology Review has put it:

Amazon is "testing the limits of automation and human-machine collaboration." While the company's ambitions to use drones for delivery has won considerable media attention, the firm's fulfillment warehouses make use of armies of Wi-Fi-connected Kiva robots. The basic idea behind the Kiva technology, which Amazon acquired for \$775 million in 2012, is that it makes more sense to have robots locate shelves of products and bring them to workers rather than have employees go to the shelves to hunt for products. In 2014, the robots helped the company cut its operating costs by 20%, according to Dave Clark, a senior vice president at Amazon.

## 4. Boeing: Using IoT to drive manufacturing efficiency

Aviation pioneer William Boeing quipped that it "behooves no one to dismiss any novel idea with the statement, 'It can't be done.'" The multinational aviation company founded in Boeing's name apparently still subscribes to that ethos. It is now working toward the long-term goal of making its service offerings more important than its products while being the most valuable information provider in aviation. The company has already made significant strides in transforming its business. Boeing and its Tapestry Solutions subsidiary have aggressively deployed IoT technology to drive efficiency throughout factories and supply chains. The company is also steadily increasing the volumes of connected sensors embedded into its planes.

## 5. Bosch: Track and trace innovator

In 2015, Bosch launched what would be the Industrial Internet Consortium's first test bed. The primary inspiration behind the so-called Track and Trace program is that workers would spend a sizable amount of their time hunting down tools. So the company added sensors to its tools to track them, starting with a cordless nutrunner. As the resolution of the tracking becomes more precise, Bosch plans to use the system to guide assembly operations.

*... to next page*



... from previous page

## 6. Caterpillar: An IIoT pioneer

Heavy-equipment maker Caterpillar has long been an IoT pioneer. Recently, the company, which now often goes by "Cat," has been showing off the fruits of its investments in the technology. For instance, consider how it is using IoT and augmented reality (AR) to give machine operators an at-a-glance view of everything from fuel levels to when air filters need replacing. If an old filter expires, the company can send basic instructions for how to replace it via an AR app. The company's marine asset intelligence division is also an innovator. Last year, Forbes ran an article explaining how the company used sensor-driven analytics to save a bundle of money on boats and shipping vessels.

[Industrial IoT World highlights the intersection of IoT and industry, showcasing how IoT transforms business across manufacturing, supply chain and operations. Get your tickets and free passes now.]

## 7. Fanuc: Helping to minimize downtime in factories

Robotics maker Fanuc is serious about reducing downtime in industrial facilities. Using sensors within its robotics in tandem with cloud-based analytics, the company can predict when failure of a component such as a robotic system or process equipment is imminent. While predictive maintenance is a familiar concept, Fanuc has embraced it more aggressively than most. Last year, GM awarded Fanuc's Zero Downtime (ZDT) system its Supplier of the Year Innovation Award.

## 8. Gehring: A pioneer in connected manufacturing

Gehring Technologies, a 91-year-old company that makes machines for honing metal, was early to embrace IIoT technology. Now, the company enables its customers to see live data on how Gehring's machines work before they place an order. It does so by using digital technology, beaming real-time information from a new machine to a customer to ensure that it meets the customer's requirements for precision and efficiency. Gehring uses the same cloud-based real-time tracking to reduce downtime and optimize its own manufacturing productivity through monitoring its connected manufacturing systems, visualizing and analyzing data from its machine tools in the cloud.

## 9. Hitachi: An integrated IIoT approach

The Japanese company stands out from other industrial companies in terms of its integration and experience across operational and information technology. While most other industrial conglomerates leverage partnerships to fill in the gaps in their IoT knowledge, Hitachi is more independent. The company has more than 16,000 employees focused on the technology in some capacity. While it offers an IoT platform known as Lumada, Hitachi also makes a plethora of products leveraging connected technology, including trains, which the company is beginning to sell as a service. Hitachi has also developed an IoT-enhanced production model that it claims has slashed production lead times by half within its Omika Works division, which manufactures infrastructure for electricity, traffic, steel manufacturing & more.

## 10. John Deere: Self-driving tractors and more

As the field of agriculture becomes more of a science and less of an art passed down the generational line, John Deere is responding by deploying Internet of Things technology — perhaps most notably with self-driving tractors. As The Washington Post wrote in 2015, Google didn't lead the self-driving vehicle revolution. John Deere did. The company also happens to be a pioneer in GPS technology. The most-advanced systems it uses in tractors are accurate to 2 centimeters. In addition, the company has deployed telematics technology for predictive maintenance applications.

## 11. Kaeser Kompressoren: Air as a service

Founded in 1919, the German maker of air pumps, compressed air dryers and filters is an innovator when it comes to integrating digital communications into its products. The company offers "digital twins" for its products and supports predictive maintenance. One of its best-known Industrie 4.0 efforts relates to its business model innovation as selling "air as a service," which is a remarkable feat for a company that has sold machinery for the past century.

## 12. Komatsu: Innovation in mining and heavy equipment

The Japanese heavy equipment maker has a plethora of IIoT innovations. Starting in 2011, it has deployed connected technology in its Japanese production facilities. Komatsu has linked all of its robots at its central production facilities to the internet, enabling managers to keep an eye on international operations in real time. The company is an innovative force in mining. Its massive self-driving trucks can be spotted in Rio Tinto's Mine of the Future in Australia. Komatsu recently acquired U.S. mining equipment maker Joy Global, which had developed connected longwall shearers for coal mining that can wirelessly send 7,000 data points per second to the company's data center.

## 13. KUKA: Connected robotics

German robotics specialist KUKA has an IoT strategy that extends to whole factories. For instance, Jeep asked the company to help build a factory that could churn out a car body every 77 seconds. The company responded by helping the company build an IoT-enabled factory with hundreds of robots linked to a private cloud. The plant can produce more than 800 vehicles each day.

... to next page

*... from previous page*

## **14. Maersk: Intelligent logistics**

Shipping millions of containers to 121 countries across the world, the Danish shipping company has embraced the Internet of Things to keep track of its assets and optimize fuel consumption and the routes of its ships. The technology has proven to be especially useful for refrigerated containers, whose contents could spoil in the absence of tight temperature control. Because the company spends some \$1 billion annually on transporting empty shipping containers, Maersk has enlisted sensors and data analytics to inform how it stores and locates them. The company is using blockchain technology to optimize its supply chain operations further.

## **15. Magna Steyr: Smart automotive manufacturing**

Austrian automotive manufacturer Magna Steyr is an innovator when it comes to smart factories. The company, which has 161,000 employees internationally, can precisely track assets ranging from tools to vehicle parts, automatically ordering a replenishment when necessary. Magna is also testing the use of "smart packaging," enhancing it with Bluetooth, to help keep track of components in its warehouses. Autonomous vehicles within its facilities help ferry components through plants during assembly, optimizing routes dynamically. Magna has a long history in custom automotive manufacturing, building different types of cars on the same assembly line since 1999. Now, it uses wearable technology to help guide its employees in the production of bespoke vehicles. Last year, the company won the AutomotiveInnovations Award from the Center of Automotive Management and PwC Germany.

## **16. North Star BlueScope Steel: Keeping workers safe**

Wearable technology has enjoyed a high profile since Fitbit was founded a decade ago, but the underlying use cases for most consumer-grade wearable devices has arguably changed little since then. In the industrial realm, however, steelmaker North Star BlueScope Steel has deployed wearables in helmets and wristbands in a proof-of-concept project to help managers track employee safety and spot hazardous scenarios before they lead to injuries. The wearables also track health metrics such as body temperature, pulse and activity levels, enabling supervisors to give taxed workers a break when necessary. In addition, the steel producer is using connected sensors to monitor extremes in environmental temperature as well as the presence of radiation and toxic gases.

## **17. Real-Time Innovations: Microgrid innovation**

RTI and a handful of partners have created innovative technology that divides the power grid into an array of microgrids that can each be managed independently. This strategy can help utilities manage the complicated network of energy that spans everything from solar panels to windmills to traditional natural gas, coal and nuclear plants. Such microgrid technology will become a necessity. The traditional monolithic method of transmitting electric power is simply not up to the task of managing a grid that derives most of its power from renewable sources.

## **18. Rio Tinto: Mine of the Future**

The British/Australian mining conglomerate launched an innovative automated mining initiative in Pilbara, a remote region in Western Australia with deep reserves of iron ore. Driverless trucks and trains haul ore away from the mining sites while an autonomous drill technology enables a remote worker to oversee multiple drills from a single console. Driverless ships may be in its future as well. The company has a control center complex in Perth that connects to its mines as well as its rail and port operations, where engineers, analysts, programmers and technicians remotely guide mining operations.

## **19. Shell: Smart oil field innovator**

Named the most innovative oil-and-gas company in a survey from Rigzone in 2016, Shell reports that its smart oil fields can obtain 10% more oil and 5% more gas than traditional fields. The company links its high-tech wells with fiber-optic cable that allows remote employees to monitor operations remotely. The company recently launched a digital twin initiative for an offshore rig in the southern North Sea.

## **20. Stanley Black & Decker: Connected technology for construction and beyond**

The maker of industrial and household tools is an IIoT pioneer in several respects. The company, which operates 16 core business units, has deployed connected technology for everything from commercial security to its manufacturing facilities to connected tooling used in its customers' factories. The company's smart factory program in Reynosa, Mexico, led to a 24% increase in production of routers used for woodworking. Where the company really shines, though, is in its connected job site initiative, which uses radio signals to help monitor the location of tools, monitor construction progress and comply with OSHA rules. The company's DeWalt division is also launching an initiative known as Construction Internet of Things, which will use a Wi-Fi mesh network and an IoT platform to monitor workers and equipment across the job site. Already, DeWalt has debuted a connected battery service that can not only monitor battery levels but shut down tools if a thief attempts to remove them from a defined area.

**Source + all Links**

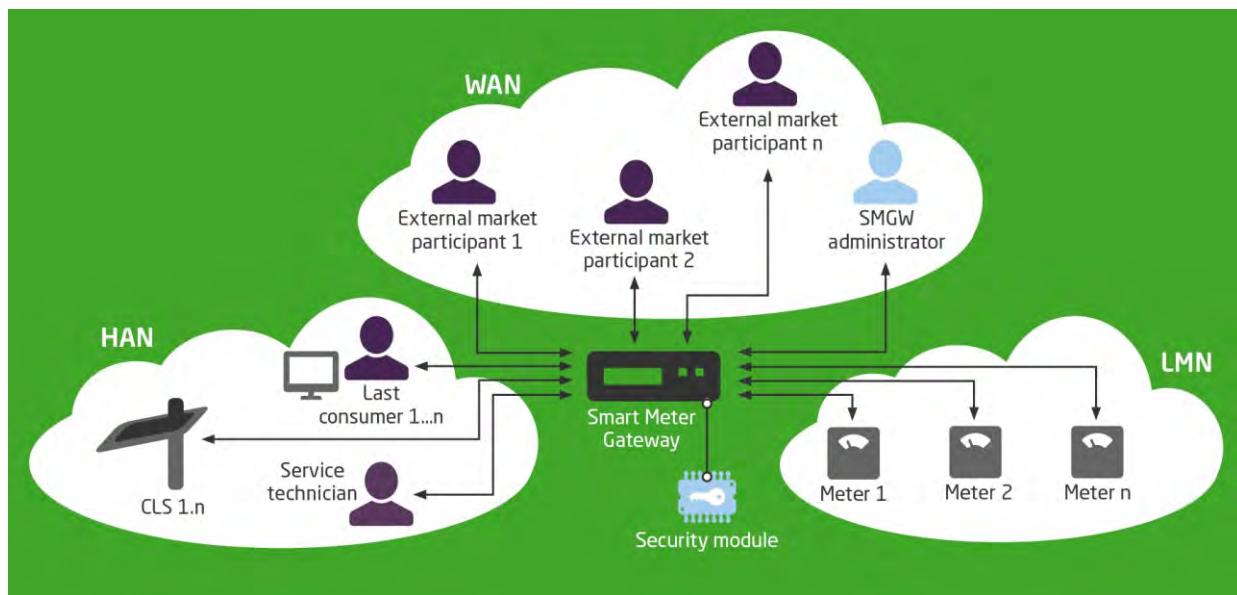
**Start Slideshow**

# THE TRANSPARENT CITIZEN IN THE SMART GRID DIGITAL ENERGY SUPPLY VS. DATA PROTECTION

By Q\_Perior -- 24 October 2017

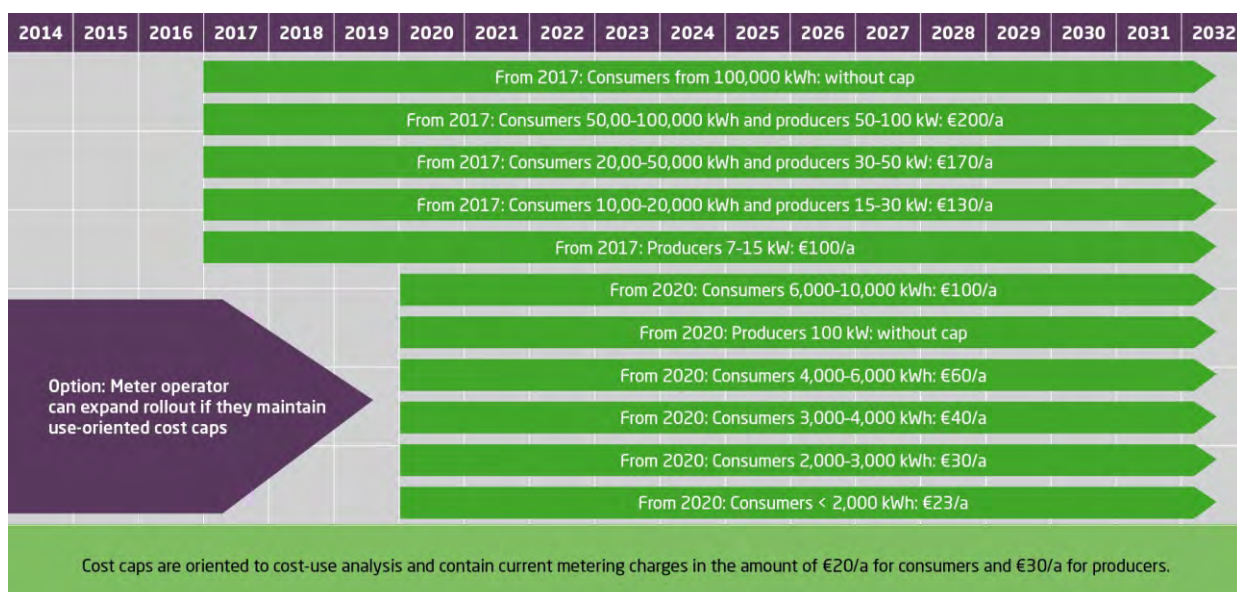
"Smart" solutions are the answer of energy supply companies to the digital transformation. Smart meter and smart grid hold huge potentials for energy supply companies and consumers. The most important requirement for using the potentials is an approach in compliance with data protection law. If the Ferraris meter is still installed in the basement at present, the modern measurement device or the smart measurement system will soon determine the consumption of individual households. If a smart measurement system is used, the measurement data of the customer will be made available by the meter operator via a secured data connection to the authorized agents in an encrypted manner. The meters no longer communicate directly, but rather by Smart Meter Gateway (SMGW) This gateway constitutes the communication unit which can integrate one or more technical devices (smart meter, generating units) into a communication network and has functionalities for recording, processing and sending data.

The following figure (1) illustrates the fundamental importance as a communication interface of the Smart Meter Gateway.



The customer's previous annual consumption determines whether they receive a smart measurement system or simply a modern measurement device in exchange for the Ferraris meter. If the annual consumption is under 6000 kWh per annum, only a modern measurement device is generally installed. All other customer segments receive a smart measurement system. The following figure (2) shows in what time frame which customers segments are affected by the legally-binding mandatory fitting:

Figure 2: The mandatory fitting of the smart measurement system applies for many customer groups  
(Source: [www.bmwi.de](http://www.bmwi.de))



... to next page



*... from previous page*

## Smart energy supply

New technology gives both the customer and the energy supplier many new and interesting possibilities. For example, the energy supplier can offer variable tariffs in the future, depending on the perspective, even depending on the customer or the day. The customer receives transparency regarding their own consumption pattern by using apps or customer displays. They therefore have the possibility to optimize it. For the provider, this in turn means: An accurate "image" regarding the current consumption pattern of the individual customer is required in order to make the needs-based energy tariffs available individually. They receive the basis of the data via the smart measurement system which communicates the current consumption pattern in readouts every 15 minutes (meter status rate measurement). The installation of smart measurement systems is also the first step in the direction of a smart grid. In a smart grid, installed network components such as for example substations, charging stations or even storage farms are communicatively linked and most importantly intelligently linked to each other (IoT) and thus allow controllability over the network management.

## Framework for energy supply companies under data protection law

If all the information recorded at the smart meter is compiled, conclusions can be drawn regarding requirements, living situation and behavior of the connection user. If one connection user consumes notably more energy compared to another connection user for a similar daily routine, this could indicate, for example, that the respective connection user uses outdated household appliances. This information could be used for advertising energy-efficient household appliances. It can be seen from this situation alone how closely connected the potentials of smart tools are with questions of data protection. For what purposes are the data of the connection user used? How is data security ensured to protect against data misuse or hacks? The legislature has passed special regulations to this end in order to ensure data protection and data security with regard to the operation and the use of smart measurement systems. In particular the "Law for the digitalization of the energy revolution" (abbreviated to GDEW) passed in 2016 contains "technical specifications for ensuring data protection and data security when using smart meter gateways" in Section 3. "Minimum requirements for smart measurement systems" thus emerge in particular from Section 21 GDEW. The permissible purposes of data processing are for example explained there as well as the requirements for a secure communication network. Section 22 also refers to the protection profiles of the Federal Office for Information Security (BSI). The following protection profiles are considered relevant in this regard:

- ☐ Protection profile for the communication unit of a smart measurement system for material and energy quantities
- ☐ Protection profile for the security module of the communication unit of a smart measurement system for material and energy quantities

Further requirements for data protection issued by the BSI are available on the BSI site. It is not only energy suppliers, but also consumers who ask questions regarding data protection. From their perspective, it is particularly interesting whether the BSI specifications are binding and whether they ensure effective protection of individual data? Where are the consumer data sent and who use these data and for what purposes?

Dealing with consumers, who would like to continue to live analogically is also completely unclear. The connection user will be informed in a letter regarding the change of meter, but they cannot refuse this.

## There is no way around an approach in compliance with data protection law

Smart energy solutions based on smart measurement systems effectively link energy generation and consumption. They offer a high level of comfort and added value to the consumer and the energy supply company. They can increase sustainability, both economic and ecological, in society if everyone can have energy capacities made available in accordance with their needs, or makes them available themselves. When designing the smart solutions in compliance with data protection law, the need for information is, however, still certainly there. Since even if providers already take into account aspects of data security, this is still not transparent for the consumer.

## WE ARE THERE FOR YOU!

With Q\_PERIOR, you have a strong partner at your side.

We look forward to your challenge!



**RALF RENTMEISTER**  
Associate Partner  
[info@q-perior.com](mailto:info@q-perior.com)



**MIRIAM SCHUMACHER**  
Senior Consultant  
[info@q-perior.com](mailto:info@q-perior.com)

# GE & Apple Team Up To Bring The Industrial Internet To The iPhone and iOS

*The Industrial Internet is about to get the Apple treatment.*

*GE and Apple announced today they will bring Predix, GE's software platform for the Industrial Internet, to Apple's iPhone smartphones and iPad tablets, used by 700 million people around the world.*

Oct 18, 2017 by [Amy Kover](#) -- The new Predix-iOS software development kit, which the companies will release at GE's Minds + Machines event on Oct. 26, will include tools that software developers can use to write industrial apps that will run on Apple's iOS Op.Sys.



The new partnership means that a wind turbine mechanic in Oklahoma and engineers in New York City can use their iPhones to collaborate on fixing a problem that normally would require a trip back to headquarters — by launching, say, Apple's FaceTime video chat — and make real-time decisions with instant visuals. "We are really taking these very complex industrial scenarios and bringing them together with the simplicity of the iOS experience," explains Kevin Ichhpurani, GE Digital's EVP & Corporate Officer who leads the unit's ecosystem and channels.

The new applications will make it easier for factory workers and engineers to collaborate no matter where they are. Ichhpurani says that colleagues can look remotely at a machine and analyze the last action taken, study notes and look at images. Instant communication can help industrial companies avoid expensive unplanned outages and utilize workers better.

GE has already developed an iOS app called Asset Performance Management Cases. The app tracks data streaming from sensors inside a power plant and helps operators determine whether a machine part — a bearing, for example — can remain in service and when it needs to be replaced. GE employees and customers can download it through the Apple app store. As part of the partnership, GE will make iPhones and iPads the preferred mobile devices for their workers around the world and offer Macs as an option. Apple will also use Predix as its analytics platform.

The partnership is a sign of the worldwide growth of the industrial internet of things (IIoT) — which connects machines with embedded devices. The IIoT is projected to add \$15 trillion to the global GDP by 2030, according to a PricewaterhouseCoopers study. Last year, GE Digital predicted that in the next five years the Industrial Internet could break the zettabyte barrier, making it roughly twice the size the World Wide Web was in 2009.

## Nokia partners with Bosch Connected Devices & Solutions for IIoT

- *Combination of smart sensor technology from Bosch Connected Devices and Solutions with Nokia connectivity, IIoT platform & services solutions brings new options for industrial IIoT*
- *Focus areas include logistics automation and tracking, environmental control and industrial automation; combined offering planned to be commercially available in early 2018*

Espoo, Finland - 18 October 2017 - Source Nokia -- Nokia and Bosch Connected Devices and Solutions GmbH have announced a strategic partnership to enable enterprises and Communications Service Providers to more easily deploy industrial IIoT solutions from sensors through to applications.

Initial work will focus on asset tracking, predictive maintenance and environmental monitoring use cases, with the companies currently doing several customer trials in Europe, the Middle East and Africa and commercially available solutions expected in early 2018. Nokia will provide its IIoT connectivity, IMPACT/Netguard secure IIoT Cloud platform and WING for IIoT connectivity services using the ecosystem of mobile operators and sensing services. Bosch Connected Devices and Solutions will provide smart connected sensor devices, which enable industrial customers to improve their overall equipment efficiency and safety. The intelligent devices measure and transmit relevant environmental data based on high-quality Bosch MEMS sensors embedded in an energy-efficient architecture. The partnership will enable easier and more rapid development of solutions designed for large logistics providers, operators and industrial players.

Laurent Le Gourierrec, head of strategic partnerships at Nokia, said: "Bosch is the world's leading smart sensor manufacturer, and we are delighted to have reached a strategic agreement with them. This combination of devices, connectivity and services from two worldwide leaders will allow for the rapid deployment of large-scale, innovative IIoT applications."

Dr. Markus Lang, Chief Executive Officer at Bosch Connected Devices and Solutions, said: "We are excited to announce this strategic partnership with Nokia. With our companies' complementary offering, Nokia is the perfect partner to build comprehensive IIoT business solutions. We strongly believe that collaboration and interoperability are key enablers to scale IIoT solutions. This cooperation is a major milestone on the way."