

## NI, Bosch Rexroth, Cisco, Intel, KUKA, Schneider Electric and TTEch Announce Collaboration on Time Sensitive Networking Testbed With the Industrial Internet Consortium

Testbed to deliver a new network infrastructure to support the future of the Industrial Internet of Things

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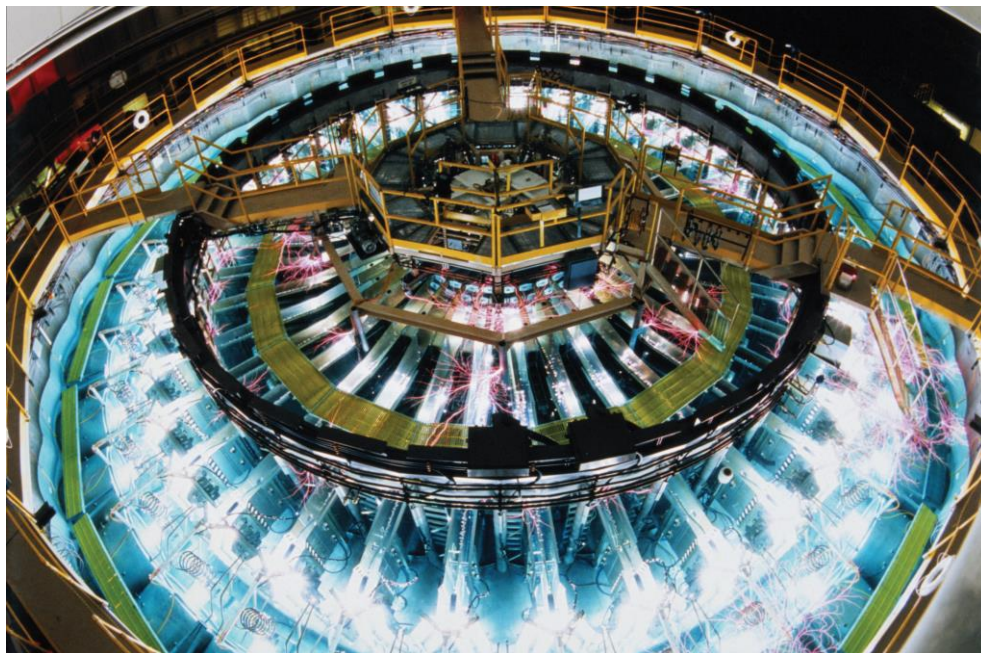
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**AUSTIN, Texas – Feb. 23, 2016** – NI (Nasdaq: NATI), the provider of platform-based systems that enable engineers and scientists to solve the world's greatest engineering challenges, announced today a collaboration with the Industrial Internet Consortium (IIC) and industry leaders Bosch Rexroth, Cisco, Intel, KUKA, Schneider Electric and TTEch to develop the world's first Time Sensitive Networking (TSN) testbed.

These organizations aim to advance the network infrastructure to support the future of the Industrial Internet of Things (IIoT) and Industry 4.0. To support new digital capabilities, connected manufacturing, designers and users need more reliable and secure access to smart edge devices. Standard network technologies must evolve to meet the demanding requirements of these next-generation industrial systems and improve the way we operate our machines, electrical grids and transportation systems.

The goal of this testbed is to display the value of new Ethernet IEEE 802 standards, referred to as TSN, in an ecosystem of manufacturing applications. TSN powers a standard, open network infrastructure supporting multivendor interoperability and integration with new guaranteed performance and delivery. The technology can support real-time control and synchronization, for example between motion applications and robots, over a single Ethernet network. TSN can at the

same time support other common traffic found in manufacturing applications, driving convergence between IT and operational technologies. Previously, many real-time control applications were deployed using nonstandard network infrastructure or unconnected networks that leave the devices and data much harder to access, if accessible at all. TSN's value is derived from driving convergence and increased connectivity, unlocking the critical data needed to achieve the IIoT promise of improved operations driven by big data analytics and enabling new business models based on smart connected systems and machines. "Testbeds are a major focus and activity of the IIC and its members. Our testbeds are where the innovation and opportunities of the industrial Internet – new technologies, new applications, new products, new services and new processes – can be initiated, thought through and rigorously tested to ascertain their usefulness and viability before coming to market," said Dr. Richard Soley, executive director of the IIC.

**The testbed will:**

- Combine different critical control traffic (such as OPC UA) and best-effort traffic flows on a single, resilient network based on IEEE 802.1 TSN standards
- Demonstrate TSN's real-time capability and vendor interoperability using standard, converged Ethernet
- Assess the security value of TSN and provide feedback on the ability to secure initial TSN functions
- Show ability for the IIoT to incorporate high-performance and latency-sensitive applications
- Deliver integration points for smart real-time edge cloud control systems into IIoT infrastructure and application

**Quotes:**

"We are excited to host the new IIC TSN testbed. TSNs are a critical attribute of a standard Internet model that enables the convergence of real-time control applications and devices onto open, interconnected networks. This technology is necessary for the future of the IIoT and the IIC is providing a community, as well as enabling real-world testbeds, where industry leaders can collaborate to make this a reality," said Eric Starkloff, executive vice president of global sales and marketing at NI.

"Standardized and open communication is a key feature in our drive and control automation solutions. We at Bosch Rexroth regard the IIC TSN testbed to be a very important contribution for further improvement of vendor interoperability and of exchanging data in an IIoT infrastructure," said Ralf Koeppel, vice president of engineering and manufacturing electric drives and controls at Bosch Rexroth.

"The new IIC TSN testbed is an opportunity for KUKA to work with other industry leaders to prove standard technology for distributed real-time control systems as needed for edge cloud computing also known as "Fog Computing". We view TSN, combined with OPC UA Publish/Subscribe, as a core element to implement



Industry 4.0 standards,” says Christian Schloegel, chief technology officer of the KUKA group.

“As an innovator in the field of deterministic Ethernet, TTTech is delighted to join forces with industry leaders on the IIC TSN testbed. TTTech brings 20 years’ experience in time-scheduled networks and critical real-time controls to the IIC and looks forward to collaborating with the other testbed members to build an open, standard platform for the IIoT,” said Georg Kopetz, cofounder and member of the executive board for TTTech.

To learn more about this testbed, visit <http://www.iiconsortium.org/time-sensitive-networks.htm>

### **About National Instruments**

Since 1976, NI ([ni.com](http://ni.com)) has made it possible for engineers and scientists to solve the world’s greatest engineering challenges with powerful, flexible technology systems that accelerate productivity and drive rapid innovation. Customers from a wide variety of industries – from healthcare to automotive and from consumer electronics to particle physics – use NI’s integrated hardware and software platform to improve the world we live in.