Yokogawa Collaboration to Develop IIoT Architecture

By Mits Sagae

Figure 1. IIoT technologies are becoming vital to successful operations in the oil and gas, LNG and LPG industries

Yokogawa Electric Corp. has announced that it will work with Microsoft Corp., Foghorn Systems Inc., Bayshore Networks Inc. and Telit IoT Platforms LLC to integrate their technologies into an IIoT architecture for the delivery of new services. These four companies each possess technologies that will be key components of this IIoT architecture.

Outline of the Tie-up

IIoT technology is now ready for practical use thanks to advances in network technology, the availability of low-cost, large-capacity data communications, and the shifting of corporate information systems to the cloud. However, the use of IIoT technology presents many technical challenges in areas that include sensing, automation and security, and it is also costly to build such systems an develop the necessary applications (Figure 1). With its wide range of expertise in fields ranging from sensor technology to control logic and applications technology, Yokogawa aims to transform its business model and expand its business scope, and to help its customers address issues by providing end-to-end solutions that incorporate sensing, control and cloud-based processing.

Through this architecture, business process applications can be configured that enable plug-and-play sensors (the ability to automatically detect sensors and other instruments connected to a network, make appropriate settings and enable them to work immediately), sensing clouds with automatic provisioning (for the efficient utilization of cloud platforms, the process of connecting sensors and other devices to the cloud via a network, and dynamically making the necessary changes for the exchange of data), database clouds, historian (data storage) clouds, and application development environments that foster collaboration.

This undertaking will be led by the Architecture Development Division California, which was set up in November 2016. Yokogawa's IIoT architecture will integrate the cloud-based

Microsoft Azure IoT Suite; FogHorn's fog computing software; Bayshore's security technology for layer 7 (the application layer- the top layer in the open systems interconnection reference model) of the OSI reference model (a model in which the functions of communication devices are divided into seven layers, and defined by the ISO to facilitate data communication among different communication systems); and Telit's communication modules, sensor onboarding and device management.

The cloud-based Microsoft Azure IoT Suite platform, which provides businesses with globally scalable, pre-configured IoT solutions, will enable Yokogawa to connect its devices, analyze previously untapped data and integrate business systems.

FogHorn Systems is a Silicon Valley-based startup that has been deeply involved in developing core software for fog computing and that owns advanced technology in this field. Yokogawa invested in the company in July 2016. Fog computing is an architectural concept designed to avoid communication congestion by establishing a "fog" distributed computing layer between the cloud and devices in the field. Fog computing eliminates communication delays and fluctuations by locating the processing of certain data near the field devices and sending only essential information to the cloud. This technology is expected to lead to a number of new IoT applications.

Founded in 2012 and headquartered in the Washington D.C. area, Bayshore develops industrial cyber security solutions, offering visibility, control and protection for operational technology infrastructure and applications. Yokogawa invested in this company in November 2016.

Telit is a leading enabler of end-to-end IoT solutions. The company offers a broad portfolio of integrated IoT products and services, including cellular communications modules, IoT connectivity plans and IoT platform services.

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