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FALL 2015

Processors slow to open their 'intranets' of things

Risks still outweigh benefits for broad adoption of IP-based IIoT architectures

BY JIM MONTAGUE

"The medium is the message" has been true since before Marshall McLuhan made his famous quote about how movies and television alter and even supplant the content they convey. It was true for the telephone and telegraph that came before, and presciently for the computers and Internet that came after.

However, for manufacturing applications and their users, it's the messages and content that are still what's most important. Despite all the hoopla surrounding the Internet of Things (IoT) and its industrial counterpart, the IIoT, keeping manufacturing processes up and running safely and productively remains the primary goal for users—no matter the media through which that critical data flows.

APPLICATIONS ABOVE ALL

"IIoT is just a platform—an architecture of technologies that enable data-driven, highly distributed applications with near-universal access, but it's the applications that deliver value and benefits," said Peter Zornio, chief strategy officer at Emerson Process Management in his keynote address to *Smart Industry 2015* attendees. "Real-world manufacturing relies on sensors, real-time data, logic and algorithms, which provide actionable data via networks using fieldbuses and, increasingly, IP-based networks.

"In the process industries, information about pressures, temperatures, flows and levels is displayed on supervisory control and data acquisition [SCADA] systems, and controlled using programmable logic controllers [PLCs], remote terminal units [RTUs] and distributed control systems [DCSs]. HART, FOUNDATION fieldbus and PROFIBUS are the main instrument-level communication protocols, but use of Internet protocols (IP) to feed displays and controls has been increasing since the 1990s. And, for the past seven years, we've pioneered wireless networking, which makes it easier to install sensors and other devices."

IIOT PUSHING ONTO PLANT FLOOR

Indeed, Emerson launched its own IIoT-style automation architecture, PlantWeb, nearly 20 years ago. It talks with sensors in numerous oil and gas refineries and other process plants, covers entire facilities via an intranet-based network, and provides diagnostic information to aid control, asset management and reliable performance. "This isn't just process control. It's also energy, reliability and safety," said Zornio.

"More recently, the infrastructures many other applications run on, such as Hadoop and Azure, have been hugely expanding, generating big data sets that run on cloud-based services with unlimited data storage, and delivering automated analysis and information—like FitBit for IP networks."

Despite this overall expansion, Zornio added that IIoT hasn't grown as much or as widely in the process industries, which have established communication and data-storage procedures that must function over long distances with limited power that IP-based protocols haven't been able to match yet. "A $2 sensor is not intrinsically safe, isn't able to run on a twisted-pair line, and can't be mounted on an offshore platform to run for 30 years," he said. "Even with wireless, we're trying to have devices run five or 10 years on one battery, but they first have to meet intrinsic safety, outdoor and other relevant classifications.

CONCERNS AND COMPARISONS

Zornio reiterated that process control and automation's goal is always actionable information. "The more we can get to specific, take-action messages, the better. The simpler the problem, the easier it is to handle," he said. "But we also have difficulties with false positives, which can hurt instead of help because they eventually get ignored, and can mask real problems.

"Big data is bringing us some new tools and approaches, but our process industry customers are concerned about IIoT deployments because they're often in 'boomable' applications and facilities. Many are paranoid about data leaving through networks, so they still prefer an 'intranet of things,' even though they may not have the skills in-house to maintain one. The largest process firms like ExxonMobil and Shell run their own private clouds, but smaller companies don't have the capabilities to do big data analytics yet."

Zornio added that process industry users must also prove the delivered value of new systems versus perceived cost and risk before any new equipment is deployed. "A good example of this is the real-time monitoring of big motors and compressors, which we've been doing for 30 years," he explained. "Other equipment may just be nice to have, so we still look, and try to prove which applications have the most real value."

In short, the process industries are very conservative, so disruptive technologies seldom "sneak up and knock you
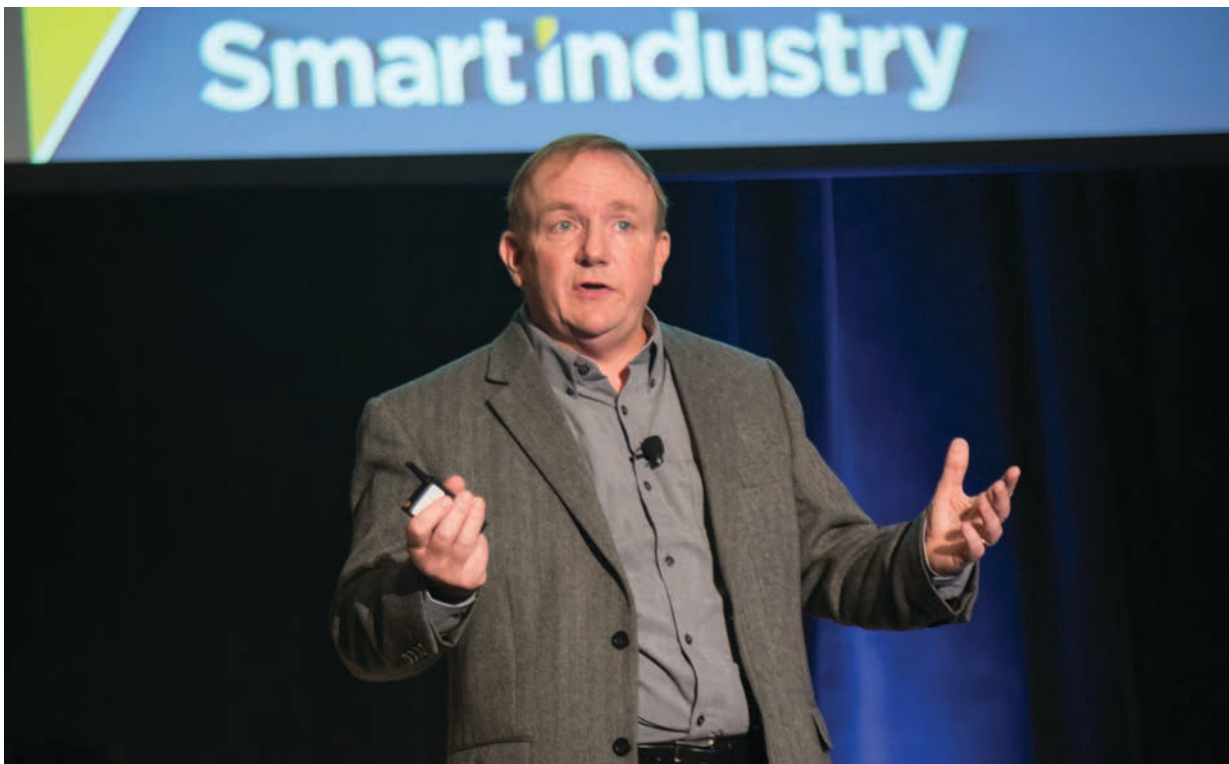
"It's the applications that deliver value and benefits." Emerson's Peter Zornio reminded Smart Industry 2015 attendees that the Industrial Internet of Things is really only a platform for delivering business benefits.

out" from a competitive perspective, Zornio added. "This makes it challenging to introduce new technologies to process applications and users." For example, it took a while to get the process industries to accept and use wireless.

WHERE IIOT WINS

"At present, we can help customers monitor and manage large rotating equipment, steam traps, valves and automation systems. IIoT technologies potentially can do that, too," he said. "To do more on IIoT, one option is to put in an added, 'invisible' IT architecture," Zornio continued.

"Sensors and steam traps already send data to Emerson's cloud service, but this gets harder when users have to pull large amounts of data from complex systems," he said. Consequently, IIoT can beat local deployment in overall knowledge efficiency and reduced customer capital expenditures. "Eventually, IIoT is going to become a competitive necessity, and it's already happening today."

"Running sensors analytics on an intranet is becoming old hat, and using the IIoT instead can open up huge opportunities for new applications, sensors, platforms and analytics," Zornio said. "But many customers are still reluctant to move from their intranets to IIoT, so we're figuring out which ways to use it are the most attractive and useful."

Zornio added that security and privacy remain two of the biggest hurdles to IIoT acceptance and adoption across the process industries. "These are new business models, and so many potential users are still unfamiliar with them," he added. "Still, the IIoT is when, not if. There are too many good reasons to use IIoT, so we have to get out of our in-house systems. Over the next 10 years, we'll shake things out, and find which IIoT solutions prove the most useful."