Industrial and Automation
Communication Protocols in the Age of IIoT

Achieving Consistency, Reliability, High Availability, and Autonomy

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ABSTRACT

Over the last 30 years, typical water wastewater SCADA systems have exploded in the quantity of data expected to be gathered from an ever-increasing number of digital field devices. The communication "pipelines" used to connect these devices now include a multitude of serial, Ethernet, radio, and cellular communication mediums via a plethora of communication protocols. What used to be simple has now become complex. Or is it just the opposite - What used to be complex has now become simple?

In 2013, the IoT (Internet of Things) was defined as "the infrastructure of the information society." For us, the IIoT (Industrial IoT) emerged. Many in our industry have rightly argued that "we have always had an IIoT" because of our documented standards, mechanisms, and best practices for how to gather information from the field devices, store the data centrally, analyze and make decisions accurately, and command and control the field devices through this recursive process. Yet today's IIoT buzz largely focuses on TCP/IP communication over Ethernet and takes advantage of the expanding IoT technologies, connectivity, and possibilities.

Utility-wide SCADA system successes have created a hunger for data, a desire for standardization, and a realistic concern about security. And while emerging technologies seem to be helping drive the vision, we must continue to place a proper importance and a balanced perspective on proven technologies and best practices. We must remember the goals of our industry – "to reliably and efficiently provide safe drinking water to the public and remove, clean, and restore the waste water through environmentally responsible methods."

This paper explores the proven communication protocols used in today's SCADA systems and how they compare, contrast, and complement emerging IIoT functionalities.

ABOUT THE AUTHORS

Alan Hudson *is US Sales Manager for Trihedral Engineering, manufacturer of VTScada. Alan holds degrees in Mathematics from Samford University and Electrical Engineering from Auburn University and has been in the water wastewater segment for 27 years with experience in engineering, consultative design, programming, and system integration. Contact: alan.hudson@trihedral.com*