CONTROL

From Building Automation to Facilities Optimization: Cloud Connectivity Is Key First Step

The Secure Integration of BACnet-based Systems Promises New Benefits for Building Owners, Integrators and Equipment Manufacturers

S ince the advent of digital systems in the realm of building automation and control, proprietary, integrated systems have been the norm. As in the industrial automation sector, information sharing among disparate systems has long been cumbersome and impractical—as much for commercial reasons as for technical ones.

But the Internet of Things (as well as its industrial sidekick, the IIoT) is bringing with it a shift toward ecosystem solutions enabled by open, scalable architectures that can leverage today's computing and communications technologies to deliver new value for building owners as well as equipment manufacturers and integrators.

This transition is made easier by the industry's longstanding work to develop and evolve the BACnet standard (for Building Automation and Control network). Also known as ANSI/ASHRAE standard 135-2016 and the international standard ISO 16484-5, BACnet established a common, object-based vernacular for information exchange among building systems from different manufacturers more than two decades ago, including systems used for functions such as HVAC, lighting, security/access control, and fire alarms.

And while BACnet connectivity over Ethernet (BACnet/IP) and serial (BACnet MS/TP) networks is now *de rigeur* for the majority of building systems on the market (Figure 1), it's often still implemented only as a local solution. The new frontier of building automation, however, rests in the ability to securely integrate these on-premise solutions at the edge with the computing power and elevated perspective offered by the cloud.
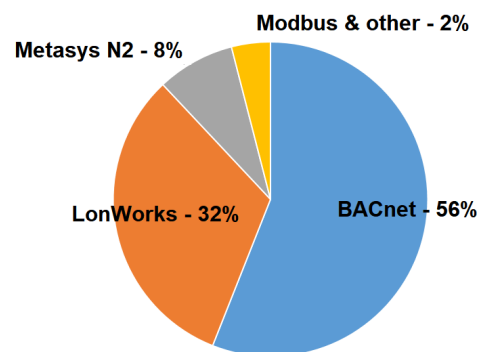

Figure 1. Market Share of Building Automation Protocols - North America

(Pie chart showing: BACnet - 56%, LonWorks - 32%, Metasys N2 - 8%, Modbus & other - 2%)

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Cloud connectivity's value proposition

Clearly, the use of building automation systems is now common practice in new commercial and industrial buildings. A significant impact on the energy efficiency of HVAC and lighting systems—often measured in double-digit percentages—and its concomitant effects on greenhouse gas emissions are a central motivation. As an open communications protocol, BACnet has helped to streamline these efforts, allowing a single operator at a unified operator station to effectively interface with a range of building systems.

But if access to BACnet data is no longer limited to the on-premise operator, it opens up a range of new possibilities. With cloud access, for example, building owners can use analytics to compare side-by-side the operation of fleets of buildings. This allows them to find outliers and identify opportunities for further performance improvement.
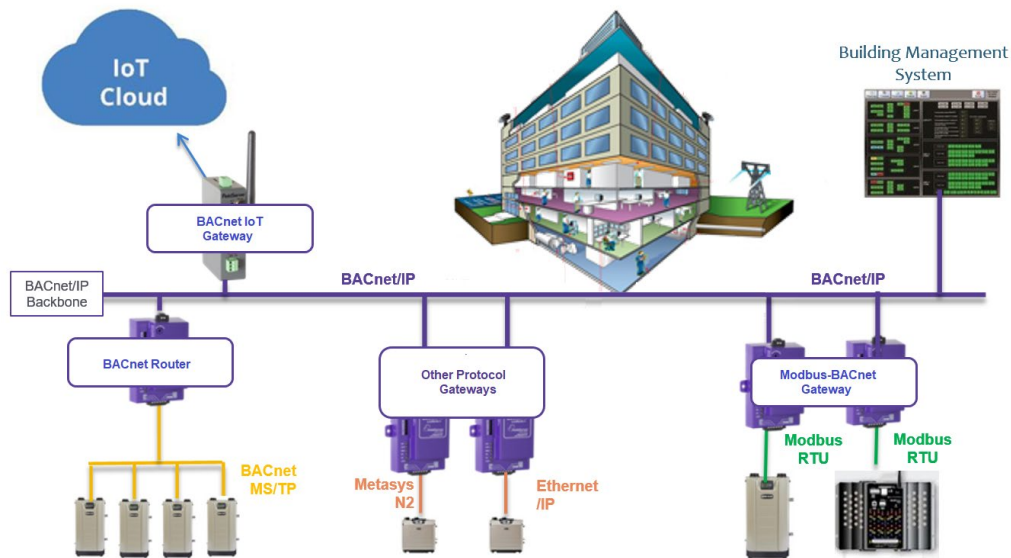
Figure 2. Schematic of a Cloud-connected Smart Building

Original equipment manufacturers (OEMs) can monitor the performance of their machines in the field—bird-dogging upcoming maintenance needs and helping to prevent downtime on behalf of building owners. Greater visibility into equipment performance in the field can also improve the design of next-generation systems for machine builders.

Cloud connectivity also means that all parties have mobile visibility into role-based system data wherever they may be. A maintenance supervisor might be alerted to an emerging issue overnight via a text to her smartphone. Meanwhile, a service technician has greater visibility into his tasks, and better information means he's more likely to bring with him—the first time—the tools and parts needed for any given job.

Implementation concerns

While the potential benefits are significant, connecting your BACnet-based systems to the cloud is not to be undertaken lightly. Look first for partners that can help to ensure that your BACnet IoT gateway—whether connecting through a wired LAN, wireless network or cellular modem—is properly secured and that robust permissions management approaches are utilized.

Also, look for partners that can deliver cloud hosting platform functionality out-of-the-box so that you can begin to deliver value quickly. This includes tools for automatic discovery and management of BACnet devices, pre-built dashboards for data trending and visualization, configurable email and SMS alarm notifications, and well as a RESTful application programming interface (API) to bring in third-party applications. A responsive mobile application and the ability to download data files in CSV or JSON formats should also make your considerations list.

As an industry, we've just begun to discover the potential of increased visibility and improved data access on the performance of our building systems. Start small, and discover what's possible today—you can be sure that much more will be possible in a very short time.

This white paper was made possible by Sierra Monitor Corporation, which for three decades has served the industrial and commercial facilities management market with solutions for automation and safety. With more than 200,000 products, supporting over 140 protocols, installed in commercial and industrial facilities, the company's FieldServer protocol gateway (BACnet IoT Gateway shown) is the industry's leading multi-protocol gateway. For more information on how FieldServer and the SMC Device Cloud are used by facility managers, OEMs and system integrators to enable local and remote monitoring and control, visit https://www.sierramonitor.com/

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