SMART SERVICES FOR INTELLIGENT BUILDING OWNERS AND USERS

Chris Irwin, *Regional Director at Tridium Europe explains how through the convergence of building automation with information technology systems at a network level, a 'smart services' solution can bring added-value for property owners and users of stand-alone buildings, groups of buildings or entire nationwide estates.*

Modern commercial buildings today are typically equipped with a diverse range of 'smart' devices to control HVAC, energy management, lighting, security and other systems. These inherently intelligent devices contain valuable information but frequently work in isolation from each other and are therefore not being used to their full potential. The challenge to date has been communication, since these devices do not easily 'talk' to each other. Systems for HVAC, security and lighting have traditionally used many different proprietary and non-IP communication protocols which have made it difficult to link them to each other and with the building enterprise. Historically, the added cost and complexity of connecting such diverse systems has meant such integration and enterprise connectivity has not been implemented so the building systems remain as islands and their data is under-utilised.

However, times are changing. In the building controls world we have seen the development and proliferation of open communication standards such as BACnet®, DALI® and LonWorks®, which has made linking some systems together easier. But to achieve real value from all of this smart device data in the building, more comprehensive integration is required and we need to take remote communication to another level. This will ensure that real time building data can be used by enterprise applications for energy analysis, maintenance planning, plant optimisation, asset tracking and effectively uniting the building automation systems with a building's accounting, ERP (enterprise resource planning), or business intelligence applications. This demand has led to the emergence of 'middleware' which is capable of providing the bridge at network level between the building control automation and information technology systems to create a converged information and integration infrastructure. As a result, this enables data embedded within a building's smart control devices to be accessed, consolidated and shared in ways that were not possible before with previously separate systems. The resulting 'smart services' allow buildings to be run more efficiently, using less energy and reducing service costs whilst lowering downtime.

The comprehensive monitoring of data in the Meydan, Dubai development data centre will insure continual optimised operation of all buildings

For example, the process of managing and maintaining a building or group of buildings can now be effectively streamlined. Currently, regimes operate on a routine or a reactive approach. Equipment in the building may be serviced on a regular basis, determined by calendar, irrespective of need, or will be serviced, repaired or replaced when it breaks down. Better information and access to this information retained in the smart devices enables maintenance schedules to be synchronised much more effectively on a demand-basis. The intervention will be triggered by concerns over degrading performance and efficiency, before any serious or more expensive breakdowns occur, thus keeping utility and maintenance costs to an absolute minimum.

By tapping into real-time figures from the HVAC system, it's possible to see the true cost impact of energy expenses across an entire business as a core element in an accounting system. This information could be helpful in identifying ways to take more control of peaks in energy load and work with energy suppliers to reduce costs.

Metering data could be used more effectively to assist in providing accurate utility billing to multiple tenants on a development. Meaningful data collected here could also be used to help monitor, measure and verify carbon footprint initiatives within facilities.

Such information could have other purposes. Where energy consumption is concerned, there is typically, a 20% gap between the actual and the theoretical design performance of a building. Smart services data could be effectively linked to energy analysis and automatic monitoring and targeting programmes. This would enable the identification of buildings which are not performing and usefully drill down to the equipment level and diagnose why.

M2M and the Pervasive Internet

We see the gradual convergence of numerous networks onto the open standard of IP, to streamline processes, as inevitable and believe it will eventually provide a single connection for all building and IT systems. Driven by the ubiquitous internet, global businesses can not operate without it and there is a strong argument for saying the network has acquired its own utility status. This will bring huge financial and operational advantages, significantly improve workplace efficiency and real estate utilisation whilst reducing operating costs dramatically.

It makes perfect sense for new buildings to be pre-cabled for this fourth utility at construction stage, as, indeed, they are for electricity, water, and telephones. If this is achieved, then all telephony and building services-related networking can be handled by the IP infrastructure so there is no longer a need to run separate networks, nor indeed a requirement to employ dedicated people to run these separate networks.

What we would then have is a new model for the way buildings are used and managed – a comprehensive, smart services approach to buildings.

Tridium's NIAGARA AX® technology is a software framework and development environment that solves the challenges associated with building Internet-enabled products, device-to-enterprise applications and distributed Internet-enabled automation systems.

This pioneering software framework normalises the data and behaviour of diverse devices, whatever the manufacturer or communication protocol, to enable the implementation of seamless, IP-connected, web-based systems. It is a critical component in delivering truly intelligent buildings and connecting them to smart services.

Tridium's middleware enables seamless linking of data between the intelligent building sub-systems and the building owner or users business applications
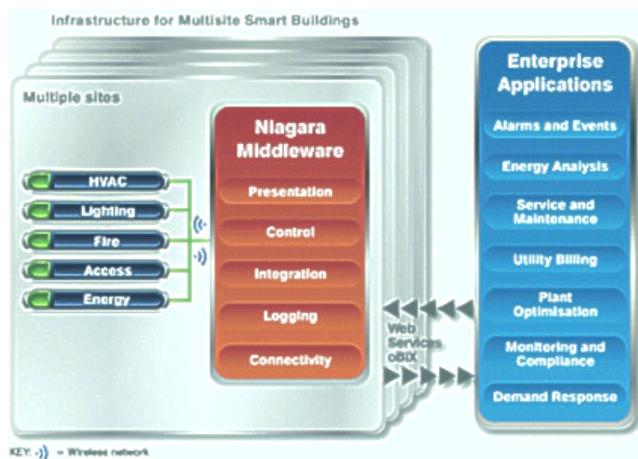
Running on PC, and distributed low-cost embedded controller platforms, NIAGARA^{AX} enables "convergence" of all building systems onto the IP infrastructure, and, just as importantly, allows their easy interoperation and communication to enhance workplace functionality.

As middleware, NIAGARA AX fulfils three distinct functions; Presentation, Integration and the provision of a Service-orientated Architecture. It enables all information for the various different systems to be displayed on a single user interface using a browser. The framework's integration capabilities ensure effective interaction of different systems within the building. Meanwhile, its service-orientated architecture enables the exchange of information with various Enterprise Application packages to create effective and efficient service and management of the buildings.

The value of the NIAGARA middleware is equally relevant in large buildings, estates or major infrastructure projects and smart city developments as it is in smaller buildings or related groups of smaller units e.g. petrol station forecourts, retail shops.

Conclusion

The delivery of smart services can help create new intelligent and energy-aware buildings, where technology is used to reduce its impact on the environment, ease the usability of services, and enhance the lifestyle of the people working within its walls. One day, in the not too distant future, all commercial buildings will surely be built this way.

About Tridium

Tridium is the world's leading open framework specialist for building control systems and a primary enabler of smart services solutions for buildings. Tridium has established key strategic alliance with leading corporations in the energy services, building automation and data management industries. The company markets its framework solutions to a wide range of controls manufacturers, HVAC equipment manufacturers, and a network of Tridium Systems Integrators. The company has its EMEA headquarters in Coolham, West Sussex. Additional information is available on www.tridium.com.

About Control Network Solutions (CNS)

CNS is a Tridium Partner and Niagara AX Developer. It has in addition to client specific project work involving open standards intelligent distributed networking technologies recently launched its first "off the shelf" Niagara AX product called *elitedali for Niagara AX®*. This enables networks of global open standard DALI® intelligent lamps to be directly connected to a Niagara AX platform for the purposes of commissioning, control, maintenance and management of lights. As it is a native Niagara AX solution it seamlessly enables the integration of lighting data and information with all other intelligent systems connected to the same Niagara AX platform. More information is available at www.elitedali.com or www.control-network-solutions.co.uk .