

The X-factor in Integration

Incompatible control technologies have long plagued improvements in operational efficiency and cost reduction of security and other building systems. Peter Manolescuc suggests that XML technology provides true integration via the IT network

IMPROVING THE PERFORMANCE of an organization's fixed assets and ancillary operations whilst controlling and reducing their cost has a simple and powerful appeal. The reality can often be messy and seemingly incoherent. Senior management will gladly rid themselves of non-core distractions. The promise of cost reductions makes the idea even more attractive but the FM can be left with a rag-bag of people, contracts and systems that have just grown over the years - bolted onto the company when the need arose with no master plan. If organizations could start with a clean sheet of paper, it is unlikely they would specify what exists today. Complete redesign is usually out of the question. Even if much of the capital equipment has been completely depreciated, the fact that it still works is proof enough to the financial director that there is little need for change or replacement. So after outsourcing, supply contract renegotiation and process improvement where to look for savings, operational improvement and increased efficiency without major investment?

Today's security installations (intrusion, fire, access control and CCTV) are typical of the ad-hoc approach to installing building systems. Piping for sprinklers for fire systems must be planned early in building design. So fire detection and suppression are usually installed at an initial stage by the developer along with basic utilities and HVAC. Intrusion detection usually comes after building purchase, but multi-tenant facilities can create conflicting requirements leading to delays and incompatibilities. Specific organizational concerns define the need for access control and CCTV systems. A visit to a control cabinet or ceiling void will present a mish-mash of wires and cables, all installed at different times by different companies; evidence of the 'problem-solution' thinking that characterizes the most common approach to systems in buildings.

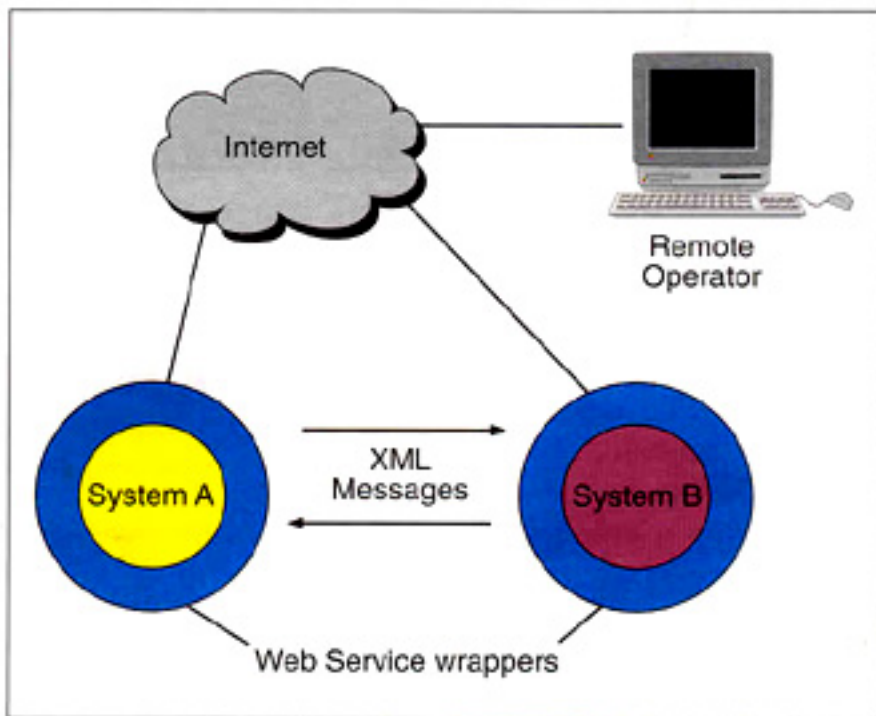
Coherent planning

The big problem with planning is to know now what tomorrow's requirements will be. Organisational flexibility is the key requirement. Departments may move, merge or disappear at short notice. New facilities such as call centres may be required in just a few weeks. If security doesn't keep up, staff may be exposed to unnecessary risks that can slow or stop operations. Once set up, systems may not work together operationally. Alarms need checking and verifying. Much valuable time can be wasted working out which camera covers the

area in question. Unless systems are integrated, expensive, error-prone humans must fill the gaps.

After many years these two problems of flexibility and integration are being resolved in the IT industry with a bold new initiative - Web Services. All major players such as Microsoft, IBM, Sun and Oracle have agreed on standards for system integration and interoperability. Web Services are based on a relatively simple technology: called eXtensible Markup Language (XML). Your web browser uses Hypertext Markup Language (HTML). This allows computers to talk to humans. XML is a development that enables computers to talk to each other.

The technology is now well developed and supported. OASIS, an industry wide, not-for-profit organization (www.oasis-open.org), is responsible for controlling and developing standards, which are adhered to by all the major IT companies. Interoperability with building control protocols such as BACnet and LonWorks is under way. The Continental Automated Building Association (www.caba.org) is setting up a committee to spread knowledge of this



XML joins islands of automation

then greets her guest personally and activates the barrier from a menu on the phone. The access control system logs the image of the guest, his details, time of entry and automatically read the car registration number. His exit details are also logged when he leaves. If a visitor is still present after the normal hours of business, the host is contacted to obtain authorization or a security officer is notified.

All this is possible because systems interoperate by sending XML messages between their Web Service wrappers. By automating much of the operations, fewer staff are needed on site and a remote operator can supervise a number of buildings via the Internet.

IT network

To realize these benefits security systems must be attached to, and interoperate with, the IT network. No IT director will allow devices and systems to be connected to his network indiscriminately; the organization's vital data is too important to be compromised! However security is now the number one issue in most IT departments. A large proportion of attacks on corporate IT systems originate from within the organization so managers should welcome the opportunity to integrate their computer security with the physical protection systems. IT directors will also welcome systems based on XML as their management tools and experience are

instantly applicable.

As organizations upgrade their networks from 10 Mbps (Megabits per second) to 100 or 1000 Mbps, the original wiring can be re-used for building automation (HVAC, lighting etc) and security. This makes sense especially if the telephone system is also digitized using voice over IP (VoIP) and sent down the same wire. As a result the number of different cables snaking through a building is greatly reduced. Those that remain all use the same technology which simplifies maintenance and spare parts.

An additional benefit is the ease with which such a building can be altered or reconfigured. Organizations need to adapt quickly to changing market conditions and this applies to facilities as much as organizational structures. New departments have to be planned in days not months. Indeed the trend is more to 'virtual' departments with members sited on different continents. Only computerized systems can cope with the resulting flux and complexity.

By specifying systems that are based on Web Services and XML, facilities managers will be freed from either the tyranny of buying from one supplier to guarantee interoperability or the obligation to choose between incompatible control technologies. Instead, 'best of breed' can be pursued, safe in the knowledge that it will all work together, interoperating with what already exists and easily adapting to an unpredictable future.



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technology.

Surprisingly, XML is not so difficult for ordinary people to understand. For example an access control system might send the message `<request_to_enter door='front' ID='938953'>`. Apart from one or two odd symbols, the meaning is perfectly clear. This is because the name of the information as well as its value is sent. Compared to classic control signals, XML messages are somewhat longer. This is not a problem for the structured Ethernet cabling found in almost every building today for computer networking. As a result we get another benefit. Instead of cabling every system individually, they can all be attached to the building's Ethernet 'nervous system'. Not only does this reduce cost and installation time but reconfiguration for operational change is a snap.

Integration

We can even go one stage further and dispense with cables all together. Wireless networks that power computer systems can work just as well for security and other building automation systems. Of course messages must be encrypted to prevent eavesdropping and hacking but most wireless IT systems come out of the box with all the necessary protections.

So how can XML technology help to integrate current and future systems? The answer comes again from IT in the form of Web Services. IT

departments face a similar problem to the facilities manager - how do you make different systems, bought at different times from different companies (often working on very different technology) work together? The answer is to wrap each one in a Web Service and make them talk to each other and to browser-based control points, using XML messages. As long as we define these messages in a standard way, each system can communicate in a common language and because browsers understand XML, we can control systems from anywhere, even a continent away, via the Internet.

What are the immediate benefits of basing systems on XML? At present most large building systems terminate in a control room within the building itself. An operator will sit at a console checking on the output of sensors all over the facility. Individual systems will be automated but operations across systems require human intervention. For example, the visitor's parking intercom must be answered at irregular intervals; names checked against today's register, the visitor's host informed and the barrier control activated. Human beings are necessary to link one system to another.

Now introduce Web Services. When the host invites her visitor, she sends an entry code (properly encrypted) by e-mail. At the barrier, the visitor taps in the code. A camera then sends an image of the guest, along with an XML alert, to the browser of the host's mobile phone. She

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