FROST & SULLIVAN

INTELLIGENT MIDDLEWARE

A Frost & Sullivan White Paper

INTRODUCTION

Cisco has partnered with Frost & Sullivan to compose an industry White Paper focused on assessing the need for Intelligent Middleware and Intelligent Building Systems (IBS) solutions. Cisco is a global leader in Intelligent Building Systems and a key advocate and innovator towards the convergence of building systems and IT. The company provides powerful technology based solutions that integrate and elevate building systems to global IT standards.

Cisco's vision is to open up the traditional building automation systems (BAS) by using the interoperability of its technology. Buildings are on a path of migration toward open systems that can provide a wide gamut of advantages such as seamless integration which allows individual brilliances to come together, an aspect that forms the basis of an Intelligent Building. The goal of this White Paper is to analyze and interpret the needs and challenges of building systems integration.

CONVERGING TO INTELLIGENT BUILDING SYSTEMS

Building controls have traditionally been divided into separate and disparate systems. With the increasing needs for automated buildings, these independent proprietary legacy systems have to be interconnected to deliver more intelligent capabilities. To support intelligence, a building system has to provide a truly open infrastructure that supports real-time control systems, enterprise applications and seamless flow of information. This ultimately leads to improved occupant comfort, optimized energy consumption, and cost-effective building operations.

> *"We engaged with RZ, now part of Cisco, because we found the Building Management Systems are highly proprietary in nature. RZ, now part of Cisco, allows us to connect inside these environments and reach the assets we want to manage."*
> *Ravi Meghani, Wipro, Bangalore India*

The appropriate design and installation of a BAS is the central source for seamless integration of all applications, and paramount in assuring the functionality of the building control system. Despite the fact that open protocols have been in the market for over a decade, end-users have limited options to fully integrate a building's control into one single system. A lack of awareness of BAS and the benefits of integrated systems represents a major challenge facing this industry.

BAS companies tend to keep, at a minimum, a layer of proprietary protocols at the user interface, creating a closed front-end BAS system. This traditional architecture of BAS only facilitates a small sub-set of the vast amount of information within a building. The good news is that there is a tremendous and growing appetite for information from data residing within the building that needs to be streamed to a common platform.

Although traditional BAS tend to function with separate technology silos, the building automation space is rapidly adopting Internet protocols (IP), Web services, and other

technologies that are beginning to converge with traditional IT infrastructures. Emerging standards are enabling data-sharing between building systems and other business applications to improve efficiency and enable real-time control over building systems.

TECHNOLOGY OF THE FUTURE - THE IP MANTRA

With the vision to drive the building automation industry to the next level, Cisco's open protocol technology facilitates the flow of data for simpler and more efficient BAS operations. The technology introduced entails a multi protocol platform, which means it can normalize data into an IT-friendly format to integrate with other formats. For customers this means easy data access through the Internet and simplified interoperability and integration between new and existing building infrastructures.

With the right equipment and solution, building owners and facility managers have the ability to embrace the diversity found within buildings and provide a future-proof integration infrastructure. Bringing together open communications protocols for control devices and IT provides customers with options and functionality at cost levels that were never before possible. To allow this, the intelligent middleware plays a critical role as the center piece translating all the data onto a Multi-Protocol eXchange (MPX) platform that allows users to leverage existing building assets.

From an end-users' perspective, this is a huge value addition because with solutions from Cisco they can upgrade the existing legacy systems and tie in enterprise data with building systems and building automation data for better control and performance efficiencies. A seamless integration is the ultimate aim that will lead to the fulfillment of the Intelligent Building concept.

> *"The Mediator enabled us to provide a vendor-free or a vendor-independent relationship for our clients. It's enabling best of breed and the connectivity of our services that we offer our clients." Patty Myer, McKinstry Co., Seattle, Washington*

THE CAPABILITY GAP

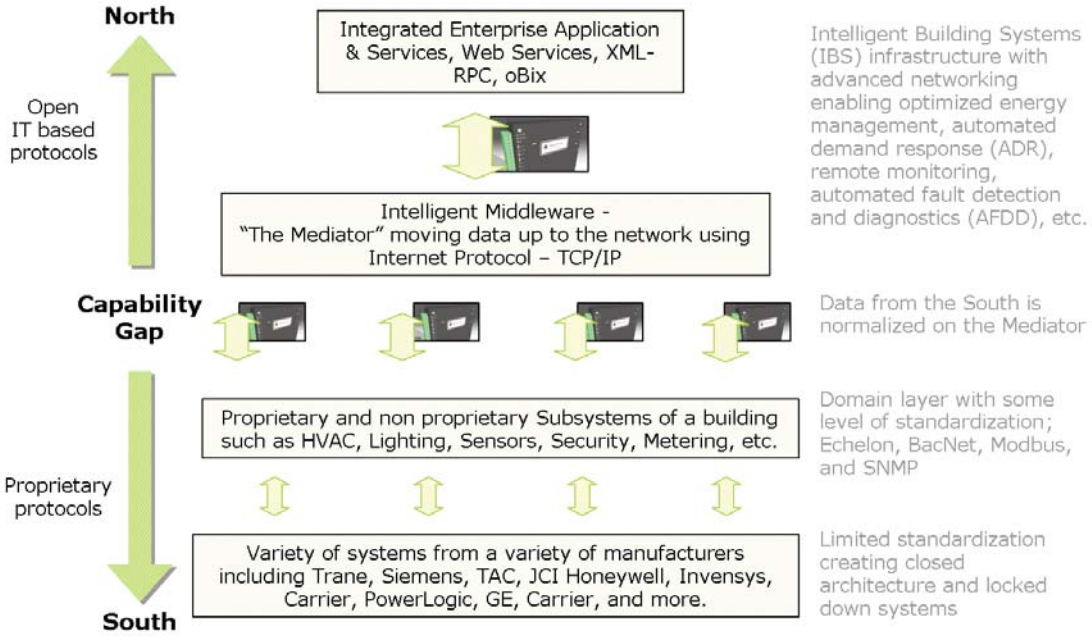
The capability gap refers to the South and North side of a building's data infrastructure. Within any building, the bottom of the architecture holds different systems from various manufacturers. The next level of the infrastructure contains the building domains including sensors, HVAC, security, lighting, and metering. Above this layer is where the industry provides some form of standardization through protocols such as Lonworks, BACnet, Modbus, and SNMP being the most common. These standards have birthed and emerged from completely different industries. Lonworks came from field bus topology and devices, BACnet from HVAC and ASHRAE, Modbus from metering and process control and SNMP from telecommunications. All of these industries are converging as well. A building

automation protocol is designed to communicate the needs of building automation and the various control systems for applications such as HVAC, lighting control, access control, and fire detection systems. The protocol provides a mechanism by which information exchange can easily take place between the systems.

> *"Other vendors or technologies in the market have what we call open-in / closed-out systems, in other words, a technology that pulls in data from proprietary systems and making it fully available – open-in. However, they remain proprietary because they have proprietary analytics and their own locked down capabilities so you can't bring anyone else into the network level – closed out. With Richards-Zeta, now part of Cisco, it's an open-in / open out system, we can pull in all data and add any new enterprise, analytics and other capabilities because it uses internet protocols, it's completely open." Michael Wadden, Accenture, Santa Barbara, Ca.*

Large scale building owners typically have one of every system and protocol layer. The presence of proprietary technology within building automation network standards can portray a false image of being a true open system. The Mediator can bridge that capability gap and move everything from the south (building systems) up to the north (IP network enterprise applications and services) allowing building owners to interconnect the various systems and protocols into one common platform.

The Mediator – Enabling Convergence from the South to the North



Source: Frost & Sullivan

INTELLIGENT MIDDLEWARE - THE MEDIATOR

The Mediator is a web based solution that populates enterprise applications that can be remotely monitored to enable the integration and connectivity of a variety of products from multiple manufacturers. This open system has changed the way building automation is addressed and facilitates the information flow from the south to the north. The open system vision of building controls network encompassing every building system is designed to provide building operators with the right information at their fingertips, even remotely.

> *"The information on the network provided by the Mediator allows customers to determine if their facilities are delivering the ROI or ROA they need to measure performance." Rick Huijbregts, Cisco, San Jose, CA*

The Multi-Protocol eXchange (MPX) platform

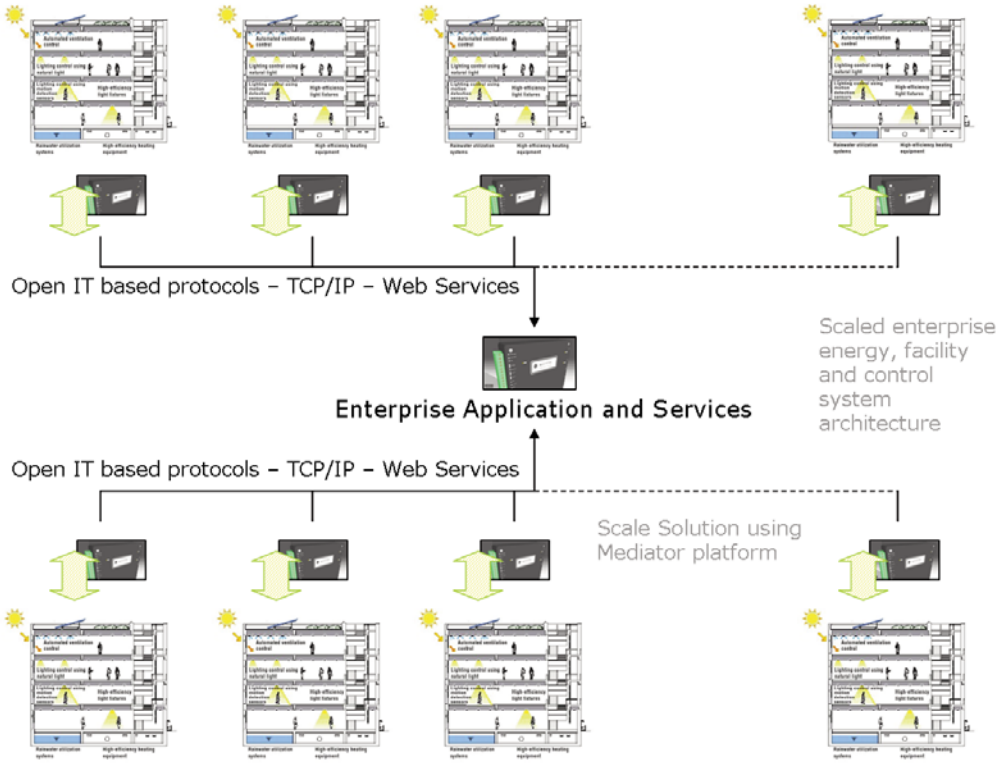
The intelligent middleware plays a critical role as the center piece in IBS, translating data unto a Multi-Protocol eXchange (MPX) platform that allows users to integrate existing building assets with other systems and consolidate all the data into one comprehensible network. With an MPX platform, all points within the framework are identified by a unique identifier (URI), and all information can be presented in common formats, such as HTML, SOAP or XML-RPC. Benefits of MPX are extended to value-added service providers that specialize in specific areas such as Intelligent Building Systems (IBS) infrastructure, building systems analytics, automated fault detection and diagnostics (AFDD), automated demand response (ADR), remote monitoring, predictive maintenance, and renewable energy solutions. Integrating intelligence is not only desirable but is becoming a mandatory requirement to provide clients the best automation solutions with the simplest connections to real-time data, Web-based data, and the corporate enterprise.

> *"From our perspective the data is everything; we need it to do the diagnosis to find the problems in order to propose solutions. The Mediator is basically an enabler for our Fault Detection and Diagnostic (FDD) technology." Dr. Haorong Li, Peter Kiewit Institute (PKI) University of Nebraska*

Scalability Scenario - Facility and Enterprise

Open system integration provides effective overall control of a large number of buildings with capabilities of remote monitoring and diagnostics. Remote access to all building systems is one of the boons of an Intelligent Building System. Advances in networking technologies and the Internet have opened the door to a network-enabled world. With device networking technology and system integration, an intelligent building can be created, allowing control over virtually every system from a remote location, and can allow for predictive fault detection, timely diagnosis, and prognosis capabilities for all connected buildings anywhere in the world from a centralized location.

Scalability Scenario – Enterprise



Source: Frost & Sullivan

COLLABORATION BETWEEN CHANNEL MEMBERS

The demand for connecting enterprise application, services, and remote monitoring to buildings is driving a new architecture where intelligent middleware becomes a critical piece to enable the convergence. As a result of this driver, multi billion dollar IT companies like Accenture, IBM, Cisco and Wipro are expanding its core expertise or business of IT services into the facility and energy services. With IP networking fast becoming the standard for connecting the field devices and sensors of each of these systems (HVAC, lighting, alarm, energy management, security) to their central control, there is also a lot of interest shown by major IT players to enter the Intelligent Buildings industry.

> *"Companies are not going to be held captive by the BAS companies that don't want to play, they are not going to stand for it, they will rather spend the money versus being held hostage."*
>
> *David Shroyer, NetApp, Sunnyvale, California*

While the barriers of disparate systems are crumbling by the disruptive forces of middleware companies, the traditional BAS companies are also starting to develop products that are versatile enough to communicate with different protocols. Increasingly, products and services will evolve to a stage where the choice of protocol will be largely irrelevant, and the winning solution shall be determined on the basis of project

execution, bundling of products & services, bottom-line cost, product innovation and technological support & maintenance.

Progressively, the IT companies' are partnering with BAS companies to provide network infrastructure. By leveraging that relationship, BAS can extend their facility management and remote monitoring services, and IT companies can penetrate into the facility management and energy management space despite the fact that they do not have domain expertise. The future is likely to see more consolidation among companies in the IT and the BAS industries.

> *"Working with somebody like Richards-Zeta, now part of Cisco, who gets it, who understands and has a passion and a sense to achieve certain goals, makes all the difference in the world. That passion is built on delivery and accommodation, not just purely profit motive." Patrick Nielsen, Google Mountain View, California*

However, a majority of BAS are designed for a closed architecture whereas the models by IBM, Cisco, Accenture and Wipro's are based on enterprise application requiring advanced networking and open system integration. This presents the opportunity for improved integration between the individual systems and extends the scope for interaction with other IP-based systems such as communications systems and IT. BAS companies have to think in these terms to be able to deliver not just today's BAS solutions but more importantly tomorrow's.

INTELLIGENT BUILDING SYSTEMS - OPTIMIZED ENERGY CONSUMPTION AND HIGHER ROI

Environmental issues like green house gas emission from buildings and fluctuating energy prices drive developments such as energy management systems (EMS), which form an important part of the Intelligent Building solution leading to lowering of both cost and energy usage. Whether from a green building or energy management perspective, Intelligent Buildings provide end-users with the means to increase efficiency, generate cost savings, and provide energy savings as well as lower the carbon footprint.

> *"You can only save energy when you enhance connectivity and visibility to all these multiple applications and the end result will always be that you save energy." Patrick Davis, Facilities Solution Group (FSG), Dallas, Texas*

CASE STUDIES

Accenture

Accenture is an over $20 billion consulting, technology, and outsourcing services company. The company provides outsourcing services for Finance and Accounting, Procurement, Human Resources, IT, and several industry specific vertical solutions. Accenture is one of the most respected technology and outsourcing providers in the market servicing clients in almost every country around the world and was recently ranked number-one on the Global Outsourcing 100 list by the International Association of Outsourcing Professionals.

Accenture's SMART Buildings Solution is an outsourced data service that extracts data from facilities and performs advanced analytics to optimize energy and maintenance functions within the facilities from a remote Network Operations Center. The end result is a lower energy consumption, reduced operating cost and a more comfortable and productive work environment for employees. Lower energy consumption also translates into a lower carbon footprint, which is extremely important to those companies who have set their global sustainability targets.

Challenge

Building technologies in the past have been and remain very proprietary in nature and have now collided with IT and the Internet. Accenture views this as a market opportunity made possible by several new technologies such as the Mediator that's changing the way in which facilities operate.

Solution

As phase I of the SMART Buildings implementation approach, Accenture installs the Mediator infrastructure which allows them to access data inside facilities. Using advanced analytics software, Accenture performs analysis from the data provided by the Mediator to optimize each facility and take corrective actions in order to reduce energy and maintenance costs for clients. Accenture is working closely with RZ, now part of Cisco, to scale the Mediator technology for their larger clients who own vast portfolios of real estate and require scalable solutions.

The SMART Buildings analytical tools, such as fault detection and diagnostics, provide new insights for optimizing a facility that can save clients between 10 to 25 percent in operational costs and deliver a Return on Investment in less then two years. The challenge comes in delivering this capability for Global Fortune 1000 clients who own billions of square feet of real estate across several different industries. This is where Accenture has created a scalable model that utilizes different analytic models for unique facility portfolios. Hotels, offices, distribution centers, IT Data Centers, and retail facilities all have distinctive operational characteristics that will require a slightly different analytical model and optimization approach.

Accenture's SMART Buildings Solution also optimizes all energy sources (HVAC, lighting, machinery, servers, PCs, etc.) since heating and cooling systems (HVAC) are only a subset of the energy consumption source in facilities such as IT Data Centers, Distribution

Centers, and Sorting Facilities. Accenture is currently utilizing SMART Buildings to optimize their own global facilities and have one of the most lean and cost efficient real estate portfolios in their industry. Through Accenture's consulting integration capabilities, the company also assists clients with implementing all the necessary process changes and provides strategies for sustainability to assist clients in reducing their carbon footprint and undertake more sustainable and green initiatives. We believe that Accenture's depth of experience in technology & outsourcing, advanced analytics, and Sustainability consulting services positions them to be a strong leader in this new Intelligent Building Systems emerging area.

Facilities Solutions Group (FSG)

FSG is a Texas based one-stop source for wholesale lighting and electrical products, lighting design support, electrical services, electrical construction, and energy management services for building owners, managers, and retailers. FSG's national accounts central office serves regional and national customers in the commercial and retail sectors.

Challenge

FSG services reaches across all 50 states, Canada, and Puerto Rico serving multi-site customers anywhere and at anytime. With the plethora of precise data that is available within a building, FSG required a means to accurately compute cost of building operation. Due to its increasing success and coverage, many controls companies have courted FSG to deploy their systems as a value add to its products and services solutions.

Based on FSG understanding of the industry, many BAS solutions can be described as open-in and closed-out system, meaning open in taking in information but not in giving out the same. This is because the data is provided in a proprietary format that can be decoded only by that particular vendor. In contrast, an open-in and open-out solution has information systems on the building side (also referred as the south side) being interconnected via open standards.

Solution

FSG choose the Mediator to help integrate its multiple installations across the country. The decision was based on the Mediator's open protocol design and its solution-specific rather than brand-specific approach. Using the Mediator, FSG enhanced connectivity with components like databases, energy and facility management systems, and other applications for greater visibility into building operations and greater energy efficiency.

In addition, the Mediator enabled FSG to conduct predictive calculations by automatically displaying the impact of a set point change in terms of cost incurred. By being able to acquire accurate and detailed near real-time data, FSG is able to elevate the profile of facilities personnel to the point of being involved in making decisions in a proactive manner.

Google

Google is widely recognized as the world's largest search engine, providing an easy-to-use free service that can return relevant search results in a fraction of a second. Google owns and operates a vast number of data centers and corporate real estate to meet its massive IT needs. One of Google' objectives as part of it's Corporate Social Responsibility is to be energy efficient and create a healthy and innovative environment where its employees can be productive. As part of this initiative, Google has focused on reducing their carbon footprint, improving energy efficiency, utilizing renewable power, and investing in carbon offset projects.

Challenge

To operate with clean and affordable energy, Google's mission is to develop electricity from renewable sources using advanced solar thermal power, wind power technologies, and enhanced geothermal systems. For the emissions the company cannot reduce directly, Google is investing in projects that help offset the carbon generated. In order to help facilitate this, Google has embarked on an aggressive deployment of an Intelligent Building System (IBS) infrastructure and backbone.

Solution

Google has connected more than thirty buildings, which required the networking of various building controls systems, metering and sub-metering systems, UPS systems, Solar PV systems, Fuel Cells, power generators, irrigation systems ,and weather stations that communicate under different protocols. To be able to connect all of these systems and bring them together in a coherent and cogent manner, Google enlisted Richards-Zeta's, now part of Cisco, support to help move data up to the IT network and facilitate real time remote monitoring of energy consumption, HVAC, safety, and security.

Richards-Zeta, now part of Cisco, has developed for Google several custom facility dashboards with real-time data content and hyperlinks to all of the integrated building systems. Summary screens were built for Google, which allow their facility manager to manage how much energy is being produced using real-time data at a regional level. Over the course of the integration and implementation of Google's Mountain View Campus, Google has begun producing 15 to 30 percent of its energy demand through the advanced deployment of photovoltaic inverters.

Network Appliance Inc. (NetApp)

NetApp provides innovative network storage and data management solutions. NetApp is a Fortune 1000 company with more than 6,500 employees and 94,000 installations distributed throughout 138 countries. NetApp offers a proven data center solutions

portfolio to a worldwide enterprise of customers outpacing the industry by three times.

NetApp's approach to lower power consumption is using storage more efficiently to reduce machines and disks from the energy equation. The company's storage and data management services are desinged to reduce network complexity, and minimize maintenance and labor costs by improving network efficiency and performance.

Challenge

NetApp's corporate headquarters in Sunnyvale, California, features seven buildings totaling 1 Million sq. ft. of data center, office, lab, and amenities for which the company spent 89 percent of its annual $7.7 Million utility bill on electricity. NetApp was already using cogeneration measures to produce 2MW. Using its energy management solutions and energy demand reduction programs, NetApp set out to reduce its own energy consumption and improve energy efficiency at its facilities.

As an eco-conscious organization, NetApp enthusiastically embraced Automated Demand Response (ADR). However, using Building Automation System (BAS) with controls products from multiple vendors with different protocols made smart metering a challenge. NetApp realized that to achieve the full range of benefits, it had to encourage more communication and interaction between IT, facilities, and the lab engineering. NetApp needed an intelligent middleware infrastructure in place that would aggregate, normalize, and make available all of the data from the disparate building systems and allow data to pass bi-directionally from the building systems to the demand response automation server (DRAS) via web services.

Solution

NetApp focused on the interoperability of their buildings' systems and turned towards open standards to create system interfaces for their existing disparate building automation systems, metering systems, power distribution units, and uninterruptible power supply (UPS).

By deploying the Mediator, NetApp was able to offer the benefits of inter-operability despite the existence of differing protocols. The Mediator also facilitates trending and reporting of ADR events and is used for measurement and verification for ADR program participation. The Mediator is able to enable predictive-maintenance capabilities to intervene in peak-demand loads by issuing appropriate instructions to various devices and services on the basis of pre-determined/pre-set control strategies that enabled NetApp to reduce power by almost one MW within 10 minutes.

In terms of return on investment (ROI), strictly from a hardware and installation cost standpoint, the payback is less than three years, which is within the threshold of most corporate executives investments. However, considering the multiple energy efficiency measures enabled by the Mediator allowing for strategic planning, decision making, integration, and energy efficiency, ROI was achieved on day one. With its energy management solutions and energy demand reduction programs, NetApp was able to

significantly reduce its own energy consumption and improve energy efficiency at its facilities. NetApp has over 22 Mediators operating on-site at its facilitties and is currently undertaking multiple client projects using the Mediator.

Secutech Automation Pvt. Ltd. (Secutech)

Secutech is a leading system integrator in Inda specializing in providing solutions for life safety & security, and intelligent building automation controls. Secutech's mission is to drive all building systems and services to an enterprise level open platform, which the company percieves as a requisite for sustainability today.

Secutech' business is structured in three divisions; the first is a turn-key integration division, which executes contracts to provide complete integration solutions for life safety, security and building controls. The second division is an advisory and managed services provider wherein Secutech provides technology consultation and guidance on customer technology requirements, energy audits, and energy management services. The third division provides remote monitoring services for primarily energy monitoring.

Challenge

Secutech focuses on two primary solution approaches; one is below the TCP/IP layer at the unitary level, and the other is above the TCP/IP layer enabling monitoring capabilities. Proprietary protocol layers can be found at the unitary layer while the monitoring layer is locked with proprietary software. To provide total building systems integration, Secutech has to drive all proprietary building systems and services to an enterprise level open platform.

Solution

Despite the broad range of controls and protocols, Secutech can integrate systems by adopting the Mediator platform. Using the Mediator, Secutech can integrate into different AHU DDC, AHU VFD, MGE UPS, Precision A/C, Energy Meters, Chillers, Fire Alarm, Electrical Breakers, Water Meters, and VAV's, providing a complete integrated intelligent building system (IBS).

Secutech is also able to realize multiple benefits such as structure building automation data into XML so it can be transmitted over the web and easily read by other programs or software systems. The Mediator acts as a protocol to TCP/IP conversion tool allowing any protocol from the building layer to be plugged into the TCP/IP network. With the Mediator platform, legacy products and applications can find relevance and can communicate with modern-day open protocols.

INDUSTRY TESTIMONIALS

Cisco Systems, Inc. (Cisco)

Cisco provides internet and communications infrastructures from routing and switching to everything that starts at the back end of a computer – basically its an information highway provider. Cisco's solutions enable people to make powerful connections in business, education, philanthropy, and creativity. The company's hardware, software, and service offerings are supported by Internet Protocol (IP) based networking technologies enabling customers easy access to information anywhere and at any time.

Challenge

Cisco promotes communication and collaboration between people to people, people to machines, and machines to machines. From Cisco's perspective, the key driving forces behind system integration are optimizing energy, security and safety, and the user experience.

> *"The Mediator is a very attractive technology, the most comprehensive middleware and protocol conversion in one box to date. We are very interested in seeing how it can help us extend the IP based network to bring in a whole host of other data sets that we didn't have easy access to before."*
>
> *Robert Aldrich, Cisco, San Jose, CA*

To achieve its vision for comprehensive communications interoperability, Cisco delivers interoprable IP communications system that enable communication across multiple devices. Through its advanced network capabilities, Cisco enables customers to offer new services, increase productivity, and lower its ownership costs.

Cisco is a firm believer in creating more holistical technology solutions. In order to drive energy savings and reduce the impact on the carbon footprint of buildings. This boils down to information and communication sharing between systems that can provide new services, new experiences, and new energy-saving features. With dozens of different BAS protocols in the industry, Cisco requires a platform that can speak TCP/IP to create true interoperable and open platform solutions and allow the concept of plug-and-play by adding systems, devices, and new technologies.

Solution

To benefit from integrated information and communication protocols, Cisco used the open infrastructures provided by Richards-Zeta's, now part of Cisco, Inteligent Building Systems (IBS) that allows for interoperability between BAS. The Mediator enables the network to normalize the different communication protocols between all these different systems and capture it on one information network. The information on the network provided by the Mediator allows customers to determine if their facilities are delivering the ROI or ROA they need to measure performance.

Concurrent Technologies Corporation (CTC)

CTC is an independent, nonprofit, applied scientific research and development professional services organization that provides innovative management and technology-based solutions in areas of advanced materials and manufacturing, homeland security, and energy and environmental sustainability. CTC is a leader in demonstrating and validating the performance of a wide range of energy and environmental technologies for military and civilian applications.

Problem

In providing customers with a wide range of energy and environmental technologies for military and civilian applications, the company continues to encounter limited options in creating open and integrated solutions within the realm of BAS. CTC had inherited legacy systems that needed significant technical updates and had limited support options outside of its locked down BAS, as a result, CTC was forced to pay high cost for replacement parts.

Solution

With the Mediator, CTC was able to integrate and migrate to more open protocol operations and leverage the existing assets that remained in good shape and well serviced. This approach enabled CTC to obtain more competition for its business as opposed to being dependent on only one vendor.

Edward C. Smyers Co. (Smyers)

Smyers is a distributor/wholesaler of automatic controls and temperature instruments. Smyers provides a complete line of automatic controls, instruments, and Building Systems to commercial, industrial, or residential applications. Smyers is a systems integrator providing assistance to the engineering field in product selection and solutions support.

Problem

A common problem Smyers faces is that many of its customers do not have a large budget and lack a lot of patience for complicated and drawn out BAS solutions. As a solution provider of integrated building automation, energy, and security systems, Smyers' challenge was to integrate different protocols within a building in a cost effective and user friendly manner.

Solution

Smyers turned to the Mediator to provide a cost effective and simple to manage integration and interface network solution. Through the Mediator, Smyers was able to meter, measure, monitor, and save money for its clients immediately. Because almost every building has issues with integrating different protocols, the Mediator is one of the most powerful products that can integrate protocols in a short amount of steps. For Ken Smyers, this continues to be his "first step solution."

Marc Services

Marc Services is a full service HVAC mechanical contractor. The company services and installs HVAC equipment from a fully automated sheet metal shop where it fabricates its own ductwork. Among other things, the company's controls division provides services and installation of DDC controls.

Challenge

Marc Services has numerous proprietary BAS instalations with a closed front-in and one single work station. Marc Services' goal was to move away from the proprietary workstation to a universal system that can be accessed over the Internet using a web browser.

Solution

Marc Services found that Richards-Zeta, now part of Cisco, was the only company that could offer this type of integration into its current systems. Marc Services can now provide its customers a migration pathway from the legacy building automation system using a web-based user interface that connects buildings to the same enterprise network.

Simon Property Group, Inc. (SPG)

SPG is an S&P 500 company and the largest U.S. retail REIT (real estate investment trust). SPG is a fully integrated real estate company engaged in ownership, development, and management of regional malls, premium outlet centers, community/lifestyle centers and international properties. SPG currently operates 380 properties comprising over 258 million square feet of gross leasable area in North America, Europe, and Asia.

Problem

With so much leasable space to operate and manage, SPG was in need of a way to integrate and automate its metering reading systems. Historically, SPG had to manually read thousands of meters to examine its energy usage across its many properties.

Solution

SPG installed the Mediator as a solution to enable automated reads of more than 8,000+ meters networked in 100 malls to optimize energy efficiency monitoring services. The Mediator integrated into the existing BAS to aggregate all data and export via XML to network operations center enabling tremendous flexibility on the building controls and the metering systems. SPG can now react effortlessly and cost effectively to any changes dictated by the local utility companies.

CONCLUSION

With the right equipment, infrastructure, and solution, building owners and facility managers have the ability to embrace the diversity found within buildings and provide a future-proof integration infrastructure. Furthermore, bringing together open communications protocols for control devices and IT provides customers with options and functionality at cost levels that were never before possible.

Educating the end-users about open and interoperable solutions has been a key challenge. With a lack of industry wide standards and reigning confusion over the definitions of open and interoperable building automation systems, expectation levels among end-users are often higher than what can be practically achieved. This often results in customer dissatisfaction limiting demands for building automation systems.

The future of building systems is likely to see a lot of convergence and is expected to address the challenges of building integration. This driver is likely to result in collaborative efforts between the IT and the building domain specialists who share a highly positive synergy when it comes to Intelligent Buildings Systems (IBS).

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ABOUT FROST & SULLIVAN

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