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November 2022

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BACnet/SC Has Arrived

Dear Readers

After a 2½ year delay due to the pandemic, Light+Building returned to Frankfurt, Germany in October 2022. The BACnet Interest Group Europe was there with several member companies demonstrating their new BACnet/SC products. BACnet Secure Connect was added to the BACnet standard by the ASHRAE BACnet Committee as a secure, encrypted communication datalink layer specifically designed to meet the requirements, policies, and constraints of minimally managed to professionally managed IP infrastructures. It does not replace existing BACnet options but complements them.

BACnet/SC allows two BAS devices to establish a highly secure and encrypted connection between each other, over which conventional BACnet messages can be sent and received. This involves encrypting, decrypting, and certificates using well established technologies from the IT world such as WebSockets and Transport Layer Security (TLS). Another goal of the BACnet/SC initiative was to eliminate the need for BACnet Broadcast Message Device (BBMD) which can be confusing to manage on larger IP networks. A BBMD allows broadcast messages, commonly used with the BACnet protocol, to span multiple IP subnets. To accomplish encryption while eliminating the need for a BBMD resulted in a hub and spoke architecture where all secure BACnet transmissions initiated by nodes pass through a centralized hub.

In addition to eliminating broadcast messages, and BBMDs, BACnet/SC eliminates the need for VPNs. BACnet communication can occur on the Internet using similar security measures found in VPNs. Other common Internet protocols such as DNS and DHCP can now be used, providing added convenience.

To help speed development of BACnet/SC, BACnet International created a reference implementation that was made available to BACnet International members in the form of source code on SourceForge. Contemporary Controls was an early adopter and worked with other BACnet International members to ensure interoperability of the technology. For many years, Contemporary Controls has been providing BACnet connectivity products for BACnet/IP and BACnet MS/TP networks. Adding BACnet/SC connectivity is a natural extension of the company's Building on BACnet product line.

While Contemporary Controls was exhibiting BACnet/SC products at Light+Building, company engineers were participating in interoperability testing with other BACnet International members at a plugfest in the United States. I have always been impressed with the high level of cooperation demonstrated by members of the BACnet community in ensuring BACnet continues to benefit users worldwide.

George M. Thomas
President
Contemporary Controls

ABB drives for HVACR
Effortless connectivity for building automation

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Cover picture:
Ahmad Bin Ali Stadium.
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This issue can be downloaded from www.BACnetjournal.org

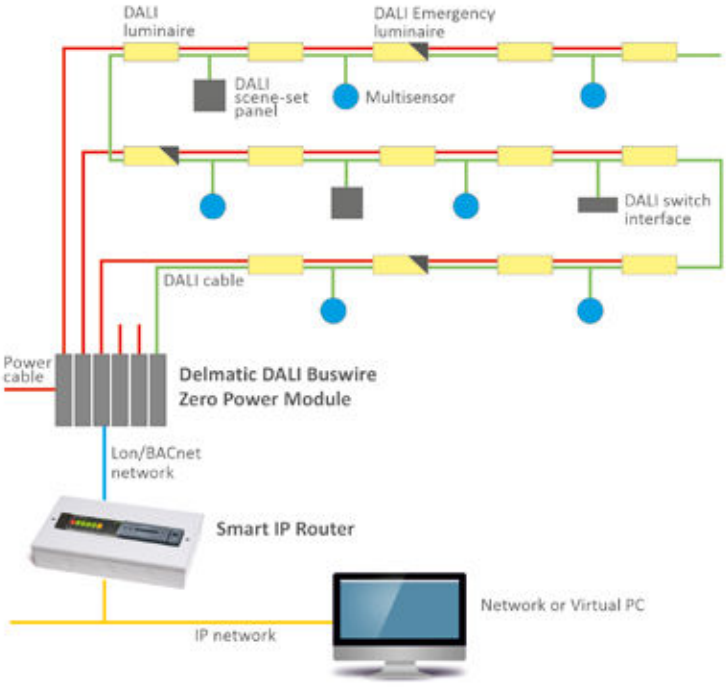
SmartServer™ IoT to Connect Lighting Control to the BMS at World Cup Football Stadium

Ahmad Bin Ali Stadium.

Delmatic, an international supplier of advanced lighting management solutions, was appointed to provide a lighting control solution with the highest levels of sustainability for the 92,000 sq. meter Ahmad Bin Ali Stadium, one of the major sporting venues hosting the FIFA World Cup Qatar 2022™.

SmartServer IoT Seamlessly Networks DALI to LON and BACnet BMS

Delmatic's lighting solutions, based on DALI/DALI-2 (Digital Addressable Lighting Interface), provide addressable scene-setting of normal, emergency and decorative lighting across the event stadium's canopies and façades. The lighting control modules for Ahmad Bin Ali Stadium use LON FT-10. Delmatic needed a solution that would easily route the FT-10 signals from the lighting control modules onto Ethernet, and they needed the solution to act as a BACnet gateway so the LON-based lighting control modules could connect with the BMS.



Schematic of the Delmatic lighting management system at Ahmad Bin Ali Stadium. © Delmatic

Delmatic chose Renesas' SmartServer IoT™ to act as a LON router and also as a BACnet gateway. SmartServer IoT is an open, easy to use, freely customisable, BACnet-ready edge server that enabled Delmatic to seamlessly and securely connect the DALI system to the LON based lighting control modules via Ethernet (IP) and connect the modules to the BMS via BACnet. Delmatic had used the SmartServer IoT previously and knew they could get it up and running quickly.

The Ahmad Bin Ali Stadium lighting control system uses sixteen IP/LON Routers controlling 584 LON nodes. Data from all sixteen routers is converged into one SmartServer IoT and effectively routes the LON messages through its standards-based data fabric called the IoT Access Protocol (IAP), which provides a common information model and standard services that are harmonised with BACnet object models. Via an MQTT based message bus, IAP enables autonomous cross communication across disparate protocols and services, handling all translations and data normalisation. It creates digital twins of the LON control modules and feeds them into the BMS, which sees each LON datapoint as a native BACnet datapoint.

© Delmatic

Delmatic's Smart IP Router incorporating the SmartServer IoT.

To maximise operational efficiency and sustainability, the lighting management system is capable of tracking the stadium's energy usage and sharing key sensor data with connected services and the BMS via BACnet/IP. Delmatic modules feature DALI Zero Power technology, which smartly turns off the mains power to areas where lights are digitally off, thereby eliminating wasteful standby parasitic power consumption. The SmartServer IoT in conjunction with DALI Zero Power technology, optimises the transmission and sharing of module data with the BMS.

For its lighting control systems at the World Cup Stadiums, Delmatic received the High Commendation in the Entertainment & Architectural category at the 2021 DALI Lighting Control Awards. The systems were recognised for their array of technical features that maximise efficiency and sustainability. Delmatic's smart lighting system using SmartServer IoT contributes to the stadium's four-star Global Sustainability Assessment System (GSAS) rating.

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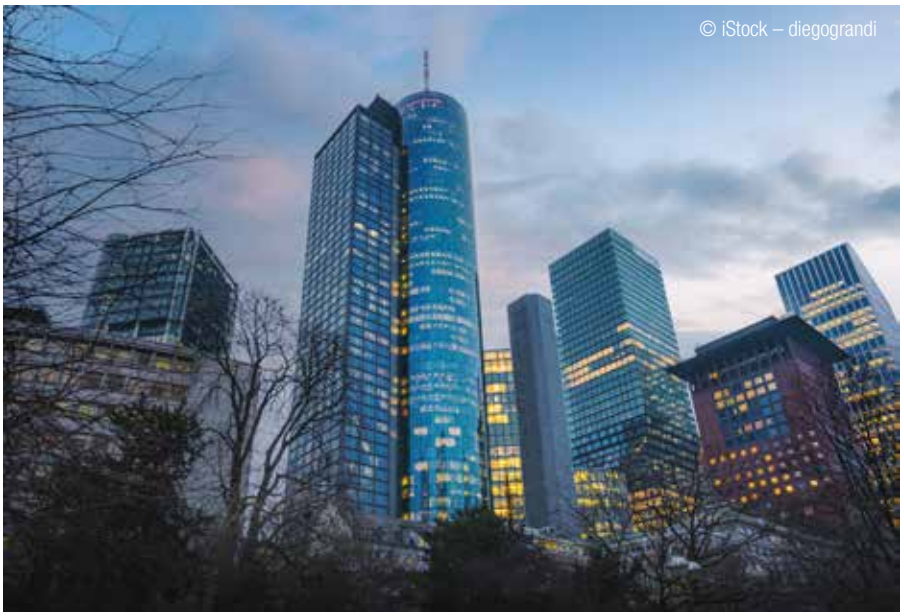
Building Operation System for MAIN TOWER Frankfurt



The MAIN TOWER is part of the Frankfurt am Main skyline. In 2022, a comprehensive modernization of the building control system as well as the building and room automation was started.

3D-Visualization of MAIN TOWER. © OAS

With BACnet and the Niagara Framework®, OAS Open Automation Systems, Tridium-authorized distributor and BIG-EU member since 2021, lay the foundation for the planning of a building operation system in the 55 story MAIN TOWER in Frankfurt. Suitable automation components are already in use on a sample floor. The OAS partner for the system integration is PGA Automation.

The MAIN TOWER is part of the Frankfurt am Main skyline. Opened in 1999, with a height of 200 meters and 55 floors it is one of the four tallest high-rise buildings in Germany. With an outstanding environmental performance, it was certified to LEED Gold Standard in 2011 and to LEED Platinum Standard in 2016. To further improve energy efficiency, a comprehensive modernization of the building control technology as well as the building and room automation began in 2022. As an integration platform for the new and existing systems, the BACnet®-compliant Niagara controller, JACE 8N4 from the OAS Smart Building Solutions series is being tested.

Service-neutral GA Ethernet

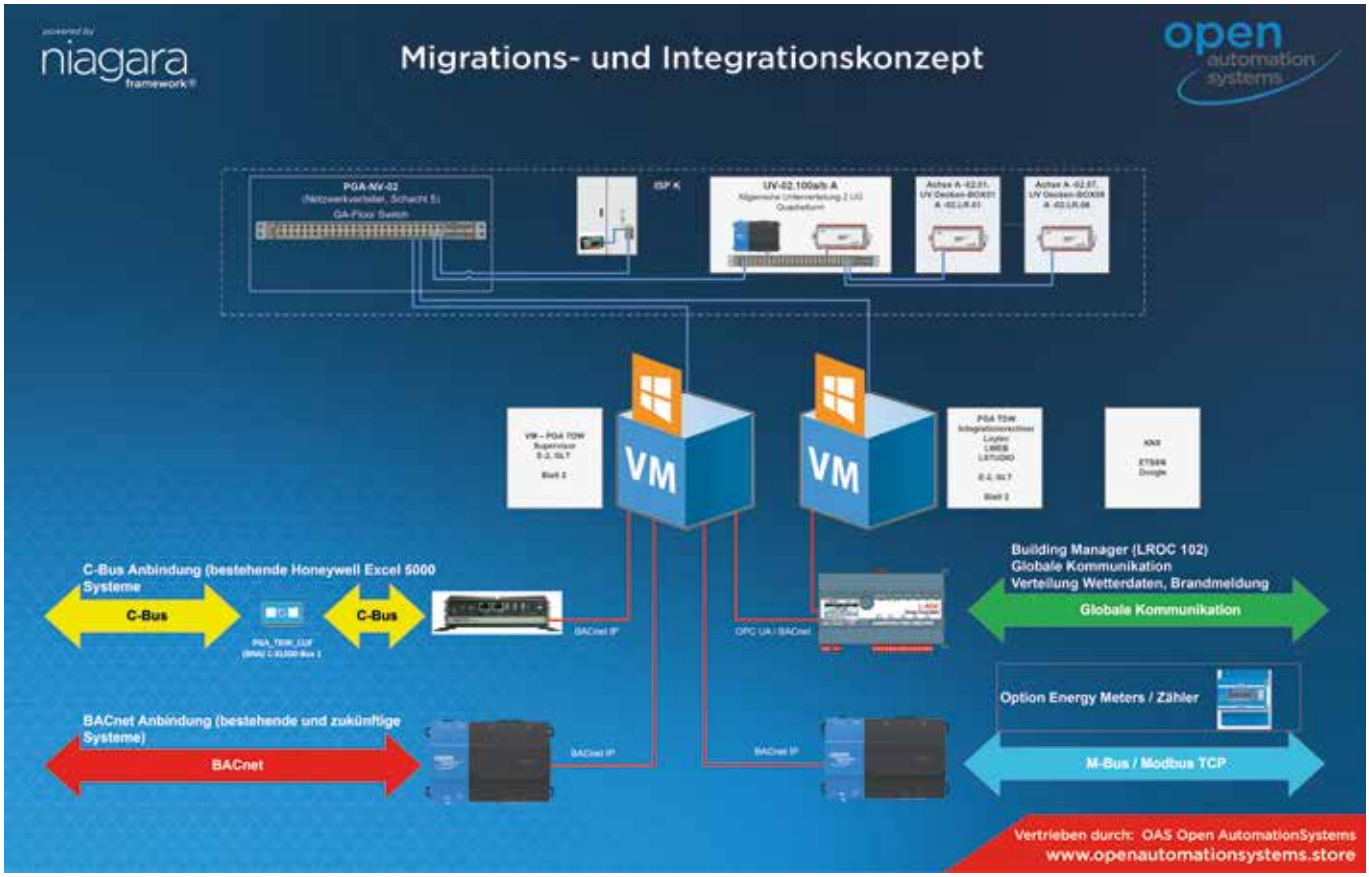
One of the central requirements of the modernization project is system openness. For future tasks of the Internet of Things (IoT) and Artificial Intelligence (AI), all components of the technical building equipment must interact in a technology-open manner. All trades and functions, including IoT sensors and software tools, are to be integrated. To this end, a move of all heterogeneous communication systems and interfaces to an overarching and service-neutral Building Automation Ethernet was first planned. A migration concept for over 60 information focal points and 750 electrical distributors is to be developed, covering communication via BACnet, DALI, EnOcean, Honeywell C-Bus, KNX, LCN, LonWorks, Modbus, Niagara FOXs, OPC-DA, OPC-UA and Profinet in the main and subnetworks.

BACnet-capable overall concept

An optimal solution for the integration of these different systems, but also of future tasks, is a BACnet-capable building operation system (BOS). This ensures interaction with existing systems at the field and automation level and enables connection to future BACnet automation and control technology. The investor lays the foundation for the development of the BOS with the model solution for the digitization of OAS, which is based on the Niagara Framework®. This enables the building operating system in the MAIN TOWER to become the BOS framework, the digital heart of building technology, the central software platform that connects all the different technologies. The migration is to take place step by step. During operation, heterogeneous existing systems can be integrated, while at the same time, old subsystems are replaced by new building automation and room automation systems. In parallel to the existing BMS, the operator can already use the new “MAIN TOWER BMS Supervisor” from OAS with this planning, so that the interfaces to the fire alarm system, energy management and other trades can be migrated without interruption.Even before the start of the project, OAS developed a fully equipped sample floor with end-to-end digitalization of the room automation. The integration of the room automation with Loytec components into the Niagara Framework was also carried out here via BACnet/IP. For efficient migration in the MAIN TOWER, OAS also offers further services from a single source: For programming and development of all user interfaces and integration levels, the potential of the “OAS Supervisor Utilities Application” can be used. Embedded in the BACnet®-certified Niagara Supervisor, the OAS Supervisor Utilities Application enables the rational, structured, and semi-automated creation of an open BMS, energy management or SCADA solution. The use of the web visualization platform “OAS BMS-Supervisor” is possible to quickly find and safely operate all floors, trades, plants, and functions.

> “Sustainable management of the MAIN TOWER is the goal. OAS and PGA demonstrate how the digital future works on a sample surface.”
>
> Michael Wellenberg, Senior Project Manager, GGM Gesellschaft für Gebäude-Management

OAS BMS Supervisor MAIN TOWER – Floor View. © OAS



Migration and integration concept. © OAS

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Integrated Ecosystem for State of Art Hospital in the United Arab Emirates

Johnson Controls implemented a comprehensive building management system for state of art 720 bed hospital in United Arab Emirates, extending over 358,000 square meters of space designed for specialized clinics, medical rehabilitation, and teaching hospital.

Enabling Facility Goals

Execution of this new hospital, considered as one of the most important healthcare projects in the country forms part of the efforts to provide high quality healthcare services throughout the country.

Some of the prime characteristics to drive quality service required for this facility are as below:

- Convenient access to the facility
- Controlled indoor environment
- Safety of the facility
- Round the clock service
- Technology to support critical patient care

Creating a Multi-Level Connected System with BACnet

Using Metasys 10.1 building automation system from Johnson Controls, numerous third-party systems were seamlessly integrated via a combination of BACnet MS/TP, BACnet/IP, and other BAS protocols as listed below:

- Chillers
- Access Control System
- CCTV System
- Air Handling Units
- Fan Coil Units
- Under Floor Cooling System
- Close Control Units
- Car Park Management System
- Plumbing systems

Metasys is a true integrations platform to unify even non-HVAC systems – like Fire Alarm System, Access Management and Video Management– into a single interface using standard data formats and communication protocols, including BACnet. Johnson Controls BACnet based Network Automation Engines (NAEs) deliver comprehensive equipment monitoring and control through features like scheduling, alarm and event management, energy management, data exchange, data trending, and data storage. These network engines helped streamline integration to enhance interoperability between systems in this multi-disciplinary, specialized hospital while ensuring smoother, and efficient operations.

Johnson Controls has also deployed the latest Metasys User Interface for this project which helps to maximize efficiency and protect client investments with its intuitive space-based navigation and award-winning Cyber Health Dashboard for fast access to critical data.

Contributing towards an optimum healthcare complex

The integration of the 20,000 data points realized with the help of the higher-level server Metasys ADX has empowered this healthcare facility operators with data analytics and real-time management of the systems to deliver smart, connected and healthcare-tailored solutions thus taking advantage of BACnet's value proposition of being able to implement a unified control system.

With the recent release of Metasys 12.0 in the Middle East & Africa (MEA) region, Johnson Controls now delivers a future-ready BAS with enhanced security and a clear path to modernization.

Leonardo Varela
Regional Products Director – Middle East & Africa
Johnson Controls
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More Than Just Secure Data Transmission: BACnet/SC

BACnet Secure Connect (BACnet/SC) is primarily associated with secure data transmission and protection from hacker attacks. In fact, its applications in building automation go far beyond this. Various scenarios can be securely implemented with solutions from SAUTER.

BACnet/SC is the latest addition to the BACnet standard (ISO 16484-5), which combines the aspect of security ("secure") with new possibilities for data exchange ("connect"). This means that BACnet not only follows the latest security standards, but also offers a modern way to connect systems, because using the internet and cloud services opens up new potential for building automation. BACnet/SC also eliminates some of the restrictions of BACnet/IP:

- Virtual private networks (VPN) are no longer absolutely necessary.
- Existing network infrastructures can be used by consistently applying IT standards.

This paves the way for BACnet applications to use existing IT networks. IT network administrators no longer view BACnet as an alien element in their network.

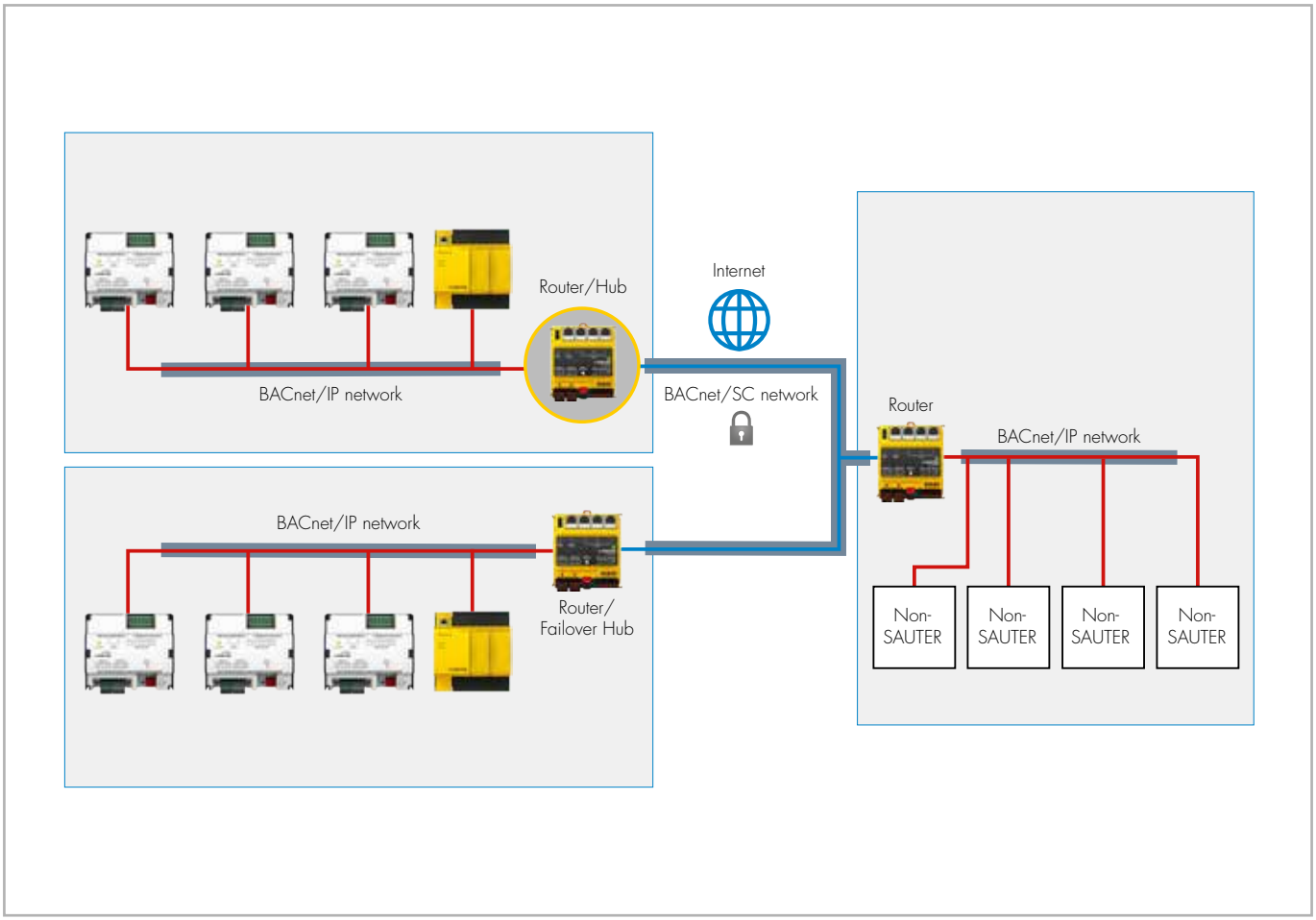
SAUTER took these aspects into account when integrating BACnet/SC into its current product portfolio. The new SAUTER BACnet/SC router modu630-RT has been added to the Secure Connect product portfolio. In addition to ist router function, it can optionally be used as a BACnet/SC hub or a BACnet/SC failover hub. Its new possibilities make it the key to secure, unlimited communication. Nothing stands in the way of migrating existing installations – for example with BACnet/IP communication – to BACnet/SC systems.

The SAUTER BACnet/SC product portfolio offers solutions for any number of challenges. Two scenarios are presented here.

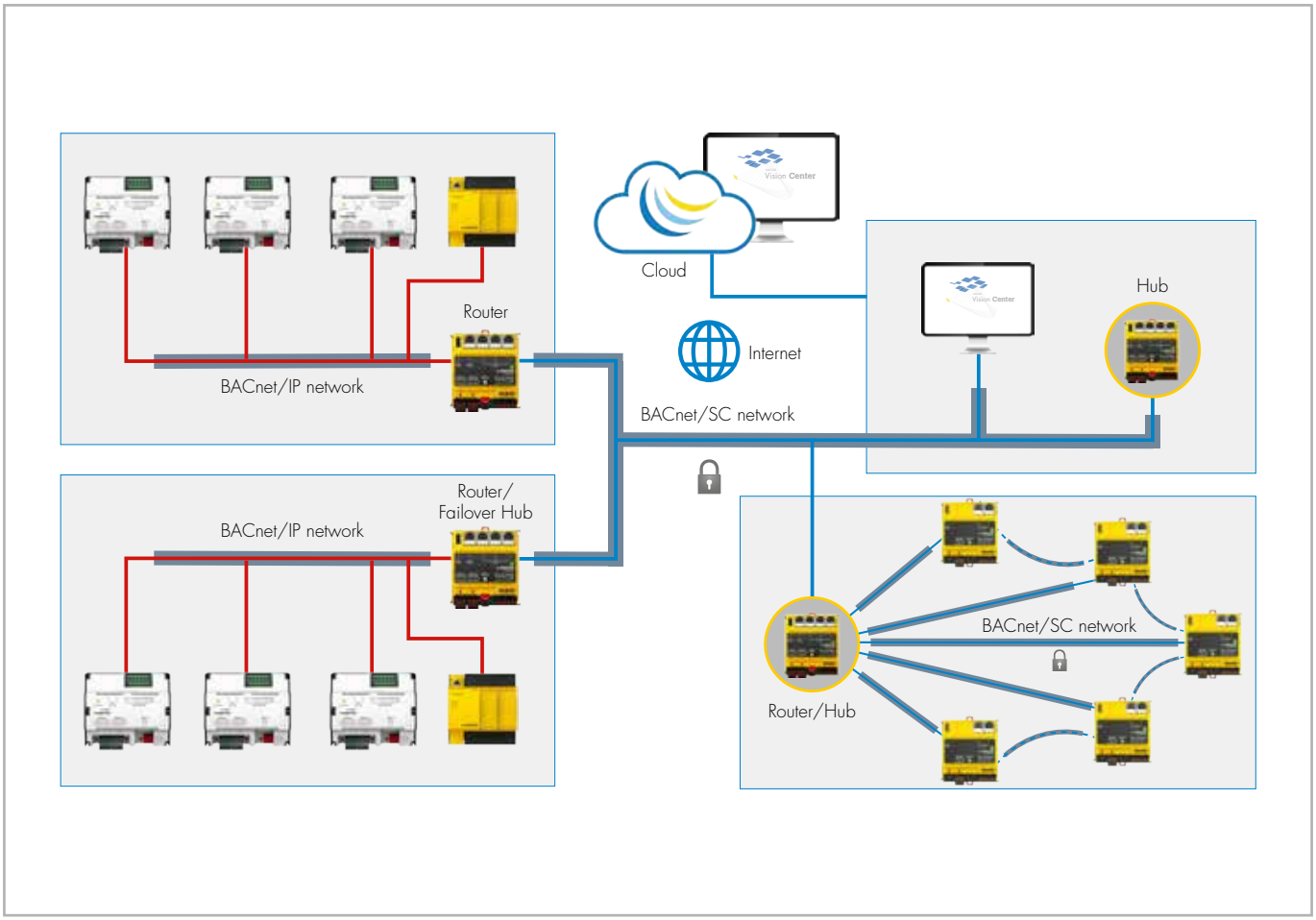
"Safe connections" scenario

Challenge

Various buildings have building automation systems with corresponding local BACnet/IP networks. These are to be securely interconnected to form an overall BACnet network. A network infrastructure between the buildings is available. Alternatively, the internet is to be used for this purpose. This scenario could be the case in a hospital with two ward blocks, where we find an central air-conditioning installation and two separate technical networks (possibly from different manufacturers). These two networks are to be connected via the existing IT network. In this way, the central air-conditioning unit can be con-



"Safe connections" scenario.



"Distributed sites" scenario.

trolled according to demand in the future, which in turn is a requirement for achieving energy efficiency class A.

SAUTER BACnet/SC solution

In each building, a router from the modulo 6 product family is installed in the existing BACnet/IP network. The router is connected via the existing network infrastructure or via the internet. The communication between the buildings is secured via BACnet/SC. One of the routers is used for the hub function, while another assumes the failover hub function.

"Distributed sites" scenario

Challenge

Existing BACnet/IP installations are to be connected to SAUTER Vision Center, the web-based system for integrated building, energy and maintenance management, with a new BACnet/SC installation for uniform operation. In addition, multiple separate BACnet/SC networks are to be configured for segmentation and load distribution in the network. This scenario can be exemplified by a college or university with several buildings spread across the city. There is one new building operated natively with BACnet/SC, while the other properties are still equipped with BACnet/IP networks. All buildings are operated via a central management and operating level. A BACnet/SC network is used as the basic network.

SAUTER BACnet/SC solution

This can be operated on an existing IT infrastructure or alternatively via the internet. Each local BACnet/IP installation is connected to the existing IT infrastructure using a router from the modulo 6 product family. The new building automation with the BACnet/SC installation is connected to the central BACnet/SC network as a separate BACnet/SC network via a router.

SAUTER Vision Center can be connected directly to the BACnet/SC network as a native BACnet/SC participant or it can be installed in the cloud. A modu630-RT router simultaneously assumes the function of the hub or failover hub.

For more information and scenarios go to:

SAUTER
Creating Sustainable Environments.

SAUTER Head Office
Fr. Sauter AG
info@sauter-controls.com
www.sauter-cumulus.de

Switching to BACnet/SC

Creating a comprehensive infrastructure of BACnet/SC-compatible devices is one way for property operators to take advantage of BACnet Secure Connect (BACnet/SC) in building automation. However, when you consider that around 25 million end devices currently transfer their data via BACnet, it soon becomes clear that a complete switchover would involve significant effort and expense.

Those hoping to update their existing devices instead (an update that is still inconceivable) should consider that existing hardware may not be equipped for the computing power required by BACnet/SC.

It is therefore useful to plan for a transition, combining existing BACnet/IPv4 infrastructure (Internet Protocol version 4) with BACnet/SC-compatible hardware. When integrated into traditional infrastructure, this combination not only serves as a bridge between BACnet and BACnet/SC, it also allows users to physically encapsulate data exchange via BACnet/IP. This allows for secure, encrypted data communication in building automation. The following three graphics show the common network topologies for building automation with BACnet and aims to provide suggestions on how to successfully switch over to BACnet/SC.

In principle the topology of traditional networks must be changed to make them fit for BACnet/SC. In doing so, each network receives a central point in its configuration. This is called the hub. This hub

- controls data traffic between any required number of end devices; and
- analyses data traffic to verify how many end devices information should be sent to.

The Universal BACnet Router (UBR) from MBS can take on this role.

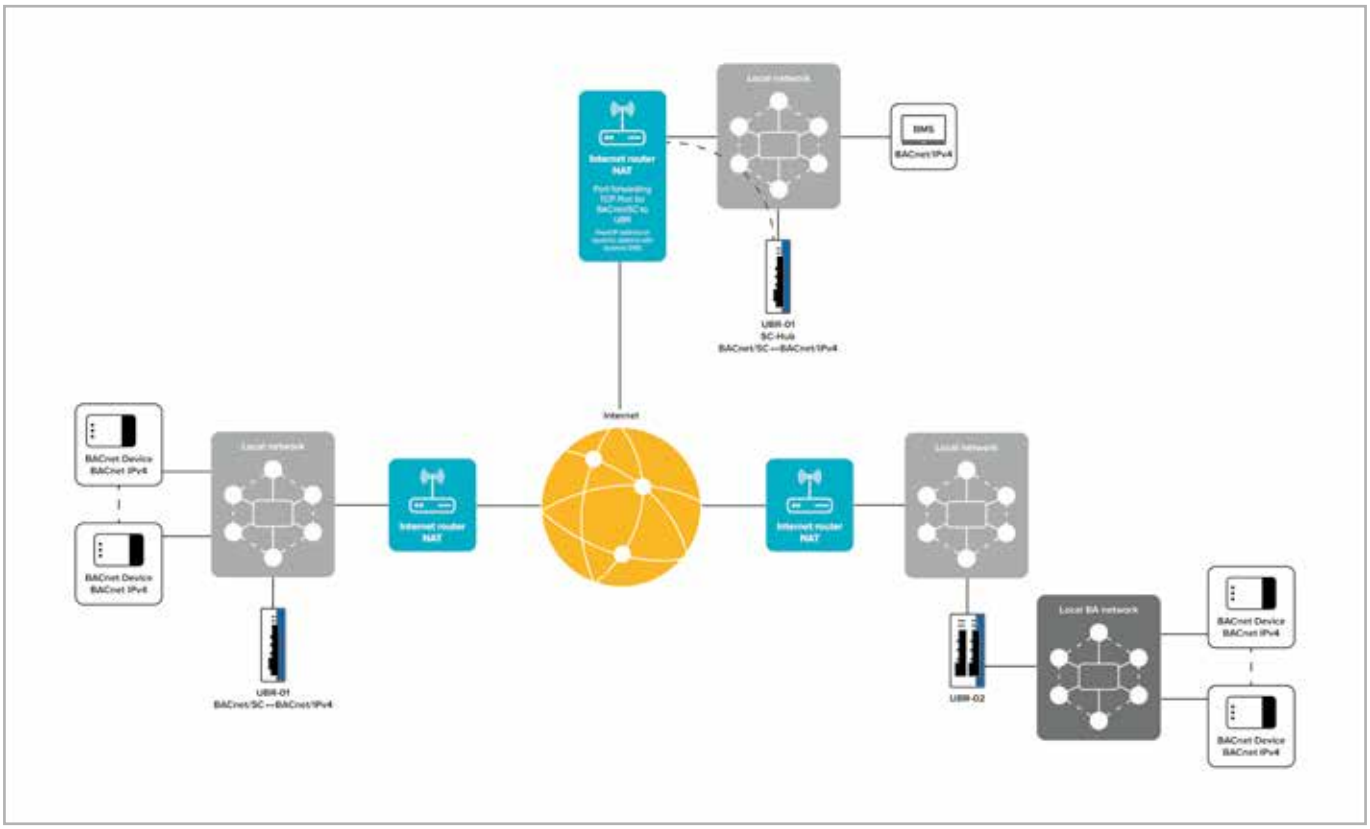
Located in the local management system network, the device has been used for implementing ISO 8802-2 BACnet network topologies (also known as BACnet/Ethernet), BACnet/IP and MS/TP (serial BACnet networks based on RS485) for quite some time. In the meantime, it also supports the current BACnet Revision 22 and can therefore be used to build the innovative BACnet/SC security structure. The UBR-01 contains one network card, the UBR-02 contains two. Which device can be used depends on the specific circumstances.

Graphic 1: Connect across systems over the Internet with BACnet/SC

Starting point: A hub with locations across the world that are connected to one another via the Internet. Currently, data exchange in building automation via BACnet/IPv4 would only be possible if all locations were connected via VPN. Application examples include a company with sites across the globe, authorities with affiliated schools and gymnasiums, or a supermarket chain with its various branches.

The hub contains the building control system, which accesses building automation systems. The interface to the World Wide Web comes in the form of an Internet router with a firewall.

The challenge: Data exchange via IPv4 is unencrypted. The DHCP (Dynamic Host Configuration Protocol) control protocol for automatic assignment of IP addresses (useful when managing large



Graphic 1: Cross-plant connection via Internet with BACnet/SC

BACnet in the campus network	BACnet/IPv4 - BBMD	BACnet/SC
Firewall options	Firewalls must allow for UDP (User Datagram Protocol) from each BACnet device in the network to every other BACnet device.	Firewalls can restrict BACnet traffic with TCP (Transmission Control Protocol) to the BACnet/SC router in the individual sub-networks.
IP configuration of individual BACnet devices	Each BACnet device must be configured to the local IP router/firewall so that it can reach all other BACnet devices (e.g. using a default route).	The BACnet devices must only communicate with other devices (including SC route in the local building automation network) directly. Internal IP routing across the entire campus network is not necessary.
Security in the campus network	The BACnet traffic in the campus network is unencrypted and unsecured via BACnet/IPv4.	The BACnet traffic in the campus network is encrypted and secured via BACnet/SC.
BBMD configuration	required	not required

networks) is also not supported. Complex VPNs (Virtual Private Network) were previously set up to secure such building automation networks.

The solution: In this example, the Internet router transmits the data to the UBR-01, which then serves as a media converter to translate the BACnet/IP4 data protocol into BACnet/SC using its built-in network card. It also encrypts the data communication.

Connecting to the hub: The hub's Internet IP router has either a static IP address from the Internet or its dynamic address is resolvable via a dynamic DNS. Extensive data packages are forwarded to a UBR-01 via a defined port (port forwarding). The UBR-02 acts as an SC hub and BACnet router here to allow users to continue to use a building control system with BACnet/IPv4.

Connecting locations: Two versions are shown below the central control centre, outlining how, in this scenario, the building-related systems at the various separate locations can be connected to the control technology.

On the right side of the graphic, a router is used for transmitting data between local systems and the Internet, e.g. an IP-compatible DSL router. This does not have to be compatible with port forwarding. The local networks include both internal networks with BACnet/IPv4-compatible devices for building automation and other end devices, such as PCs in administration.

Communication is not divided, meaning the other devices in the network can see the IPv4 traffic in BACnet and potentially influence it. To make this location fit for BACnet/SC, a UBR-02 containing two network cards can be used. One of the network cards routes the data into the local network for building automation. The network's end devices are therefore separated from other devices in the rest of the local network and thus secured.

The second network card connects the site network to the BACnet/SC hub in the control centre using the local Internet router. This allows for communication between the location and hub for encrypted data transmission.

Conclusion: The UBR-02 can ensure the most security for locations that only have a single Internet connection that is used by the whole building automation network.

The scenario on the left side of the graphic shows a similar local network at a company location. However, this scenario does not involve any other end devices other than BACnet/IPv4-compatible devices for building automation. For transmitting data between a local network and the Internet, an IP-compatible DSL router is also used (does not have to be compatible with port forwarding) as there is no need for static or dynamic IP addresses here.

In contrast to the scenario on the right side, however, the existing BACnet is translated into BACnet/SC and thus encrypted using a UBR-01 (with just one network card). The UBR-01 also uses the same network card to encrypt communication with the building control system via the DSL router.

Conclusion: This simplified set-up can be useful if the local network does not contain any other devices and the Internet connection is used solely for building automation.

Graphic 2: BACnet/SC in a campus network (variant 1)

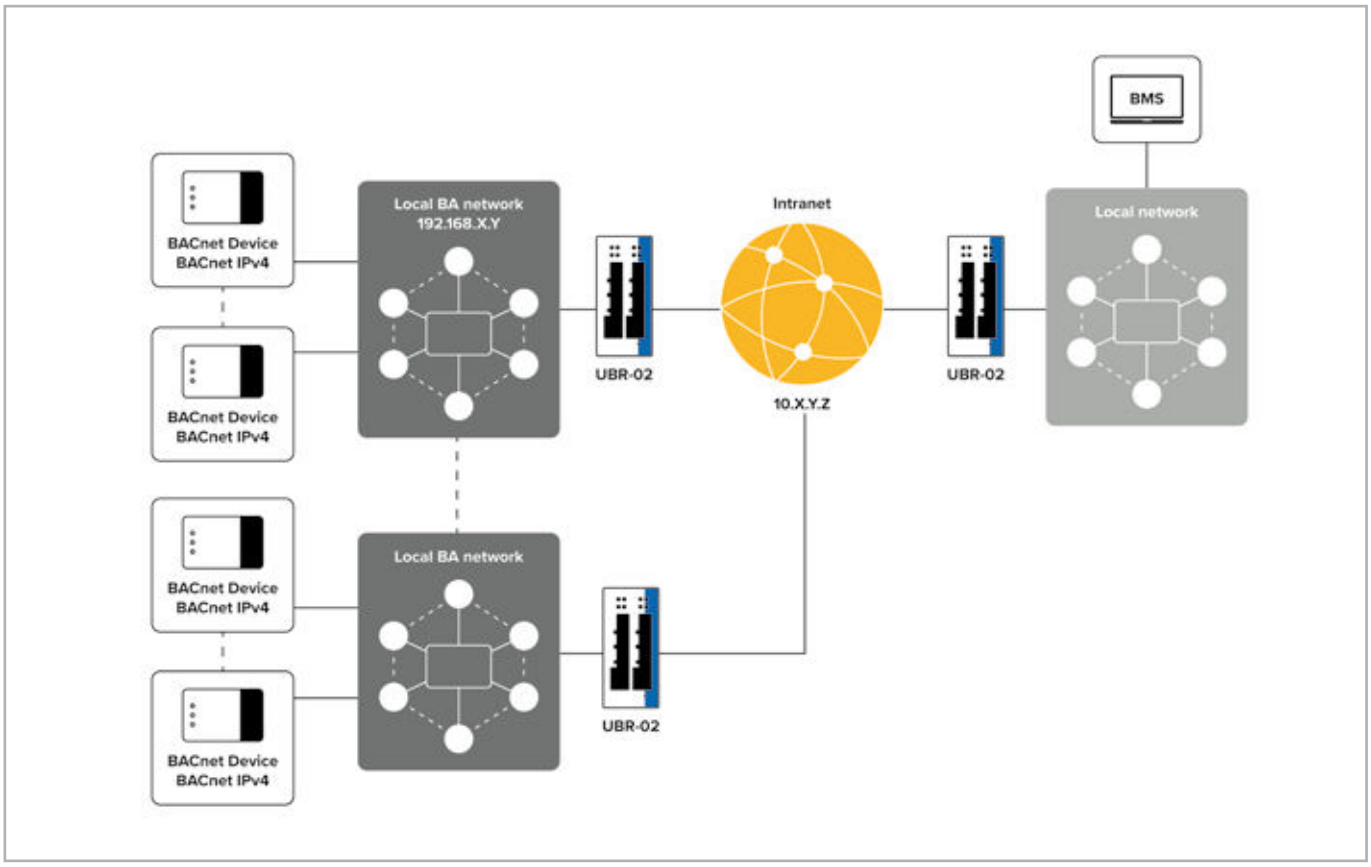
Starting point: A hub in a campus network with lots of participants that are interconnected via an intranet. Data exchange in building automation is currently carried out via BACnet/IPv4. Hospitals or university campuses are examples of this.

The hub is found in the building control system, which accesses the building-related systems in individual offices and building groups via an intranet.

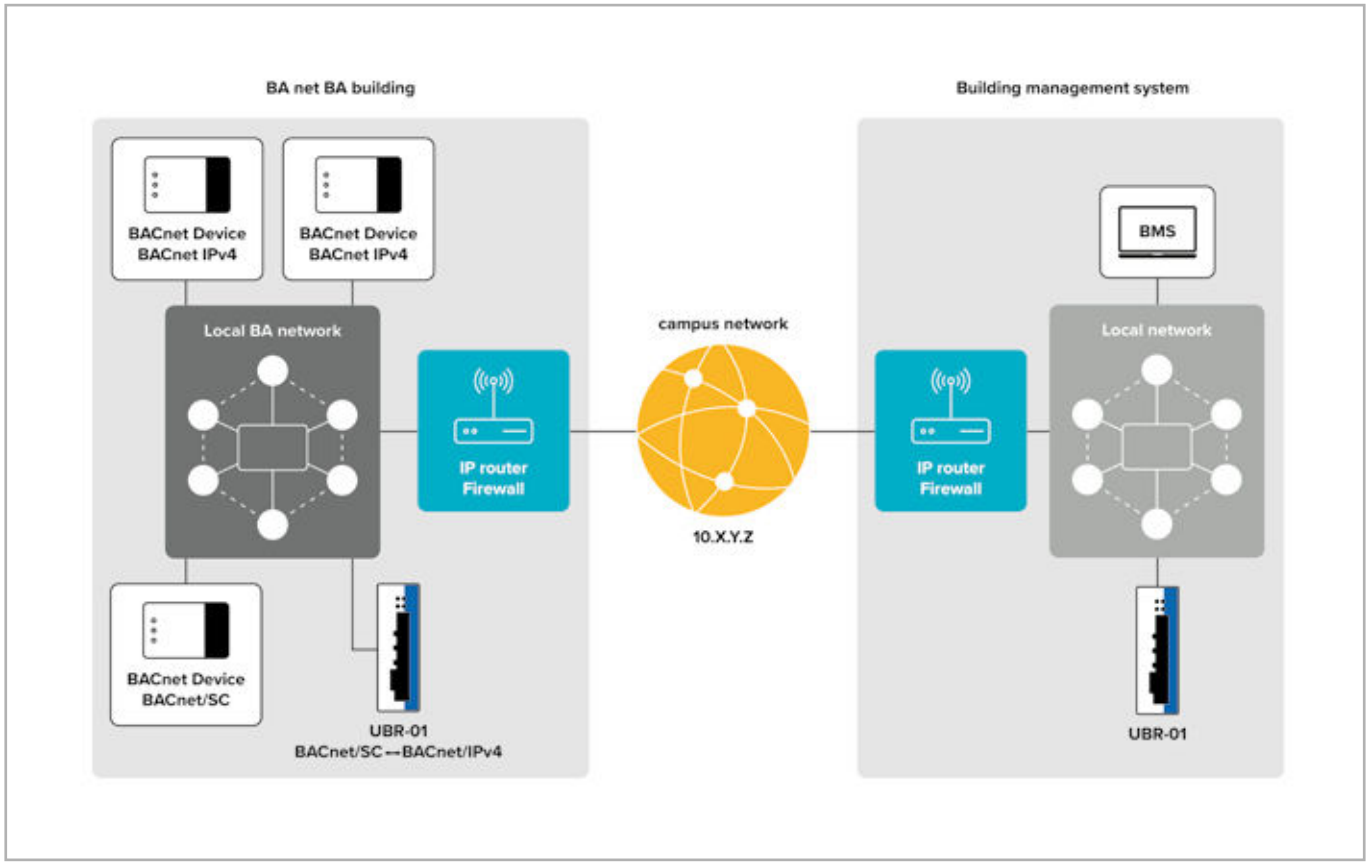
The local networks include both internal networks with BACnet/IPv4-compatible devices for building automation and other end devices, such as PCs in administration.

The challenge: These systems are virtual islands within local networks which exchange their data with BACnet/IPv4. The data packages are sent without encryption and can be viewed (and potentially changed) by all participants in the network.

The solution: A UBR-02 can be used to physically secure building-related systems. Both of its network cards allow users to separate campus and building automation networks: one network card is used to exclusively route BACnet data between both networks. The second network card is used to enable campus commu-



Graphic 2: BACnet/SC in a campus network (variant 1)



Graphic 3: BACnet/SC in a campus network (variant 2)

nication with BACnet/SC. The data traffic can no longer be viewed by participants outside of building automation thanks to encryption.

Conclusion: The UBR-02 can ensure the most security in a local campus network.

Graphic 3: BACnet/SC in a campus network (variant 2)

Starting point: A hub in a campus network with lots of participants that are interconnected via an intranet. Data exchange in building automation is currently carried out via BACnet/IPv4. Hospitals or university campuses are examples of this.

The hub is found in the building control system, which accesses the building-related systems in individual offices and building groups via an intranet. A local IP sub-network for general data traffic is shown on the right side. The local building automation network is shown on the left. Both sub-networks are connected to the network via an IP router.

The challenge: These building-related systems are virtual islands within local networks which exchange their data with BACnet/IPv4. The initial connection in BACnet is established using so-called BACnet Broadcast Management Devices (BBMD), which can be time-consuming to configure. The data packages are sent without encryption and can be viewed (and potentially changed) by all participants in the other sub-network.

The solution: A UBR-01 can be used in both sub-networks to physically secure building-related systems. Each of its network cards can be used to exclusively route BACnet/SC data into each sub-network. This ensures that data traffic on the intranet is encrypted. In addition, the individual devices no longer communicate individually via the intranet and instead communicate via the UBR-01.

Conclusion: The UBR-01 can provide the most security in a local campus network with sub-networks and makes configuring end devices much easier.

Our tip:

MBS GmbH can support businesses in transitioning from BACnet/IPv4 to BACnet/SC:

- property inventory
- network analysis
- development of suggestions for solutions and their implementation
- delivery
- installation of BACnet/SC-compatible devices
- as complete service or individual service (e.g. including training).

Contact us – we're happy to help. ■

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Metasys 12.0 is compliant with the new BACnet Secure Connect interoperability standard (BACnet/SC) to follow current IT security protocols and maintain interoperability.

Metasys Building Automation System and BACnet Secure Connect Provide Cyber Security

There was a time when all that was expected to make a Building Automation System secure was a user login at the supervisor. Times have changed and now cybersecurity is a fundamental part of any system. Today cyber secure and resilient building automation systems are considered important and of high priority by building owners, facility managers, and IT departments.

The Metasys building automation system from Johnson Controls is one of the most secure in the world. To stay ahead of increasing market demands for IT security, Metasys is continuously improved and equipped with new features. Features such as stronger passwords and user account policies that automatically identify dormant or unused accounts, ensure passwords are regularly changed and are suitably complex to provide protection from unauthorized users.

Additionally, Metasys BAS users can be validated using authentication servers (outside of Metasys). When a user logs in authentication is sent to the customers Advanced Directory LDAP Integration or ADFS authentication server. This component also provides the convenience of Single Sign-on access aligned to the customers' existing Active Directory Service.

Building automation system administrators need a way to review security related issues and this is achieved with a Cyber Health Dashboard. This dashboard enables customers to have a convenient way to assess the security status of their system. A security dashboard provides the system administrator with a centralized view of potential security-related issues or system issues which may not surface as part of general system alarms. Reducing risks associated with cyber security typically requires the software to be kept up-to-date and through this dashboard the administrator can also see out-of-date software and be advised of updates and patches as soon as they are made available. A Security

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The newest Metasys release 12.0 is designed to speed issue identification and resolution, help prevent unauthorized access and maximize system performance. This new release also helps reduce installation time and costs.

With the Metasys building automation system by Johnson Controls, administrators can conveniently check the security status of their system via an intuitive Cyber Health Dashboard.

Analysis widget provides a detailed breakdown of the Critical Issues and Potential Risks present with accounts and servers, along with an Informational tab showing the number of total user accounts and more.

Secure communications on the building network have also been addressed. Certificates from a Certificate Authority (CA) ensure encrypted and trusted communications. Cyber security standards such FIPS 140-2 are available to ensure approved cryptographic modules and algorithms are used for encryption.

Metasys and BACnet Secure Connect

BACnet Secure Connect (BACnet/SC) can be applied to any IP device as a licensed add-on feature for Metasys. Where BACnet communications previously consisted of BACnet MS/TP on RS485 networks and BACnet/IP for use with Ethernet networks, the Secure Connect update is now dedicated to improving the cybersecurity and integrity of the network infrastructure across the board. It creates a secure, encrypted data link layer specifically designed to meet the requirements, policies, and constraints of IP network infrastructures.

The new BACnet data connection enables secure message transport by using the standard IP application protocol Secure WebSocket. This HTTPS extension runs over Transport Layer Security (TLS). Thus, BACnet/SC provides a more secure mechanism for authenticating and authorizing a device for use on the network. In addition, the update does not require static IP addresses or network broadcast messaging. BACnet/SC works easily with firewall devices common in IT infrastructure and is compatible with existing BACnet systems and devices.

Seamless integration with OpenBlue

Metasys, including BACnet Secure Connect, integrates seamlessly with OpenBlue by Johnson Controls. That digital, cloud-based platform encompasses all building services components across key trades and integrates solutions that learn, adapt, and automatically respond to the needs of their environment using AI – to make buildings smarter, healthier, more efficient, and more sustainable.

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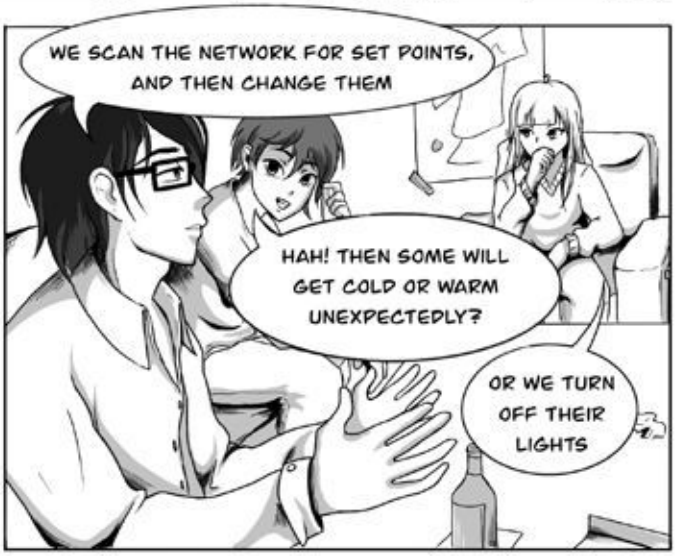
A TALE OF BACNET/SC

STORY BY: HANS SYMANCZIK

ARTIST: MAITA DIGITAL ARTS

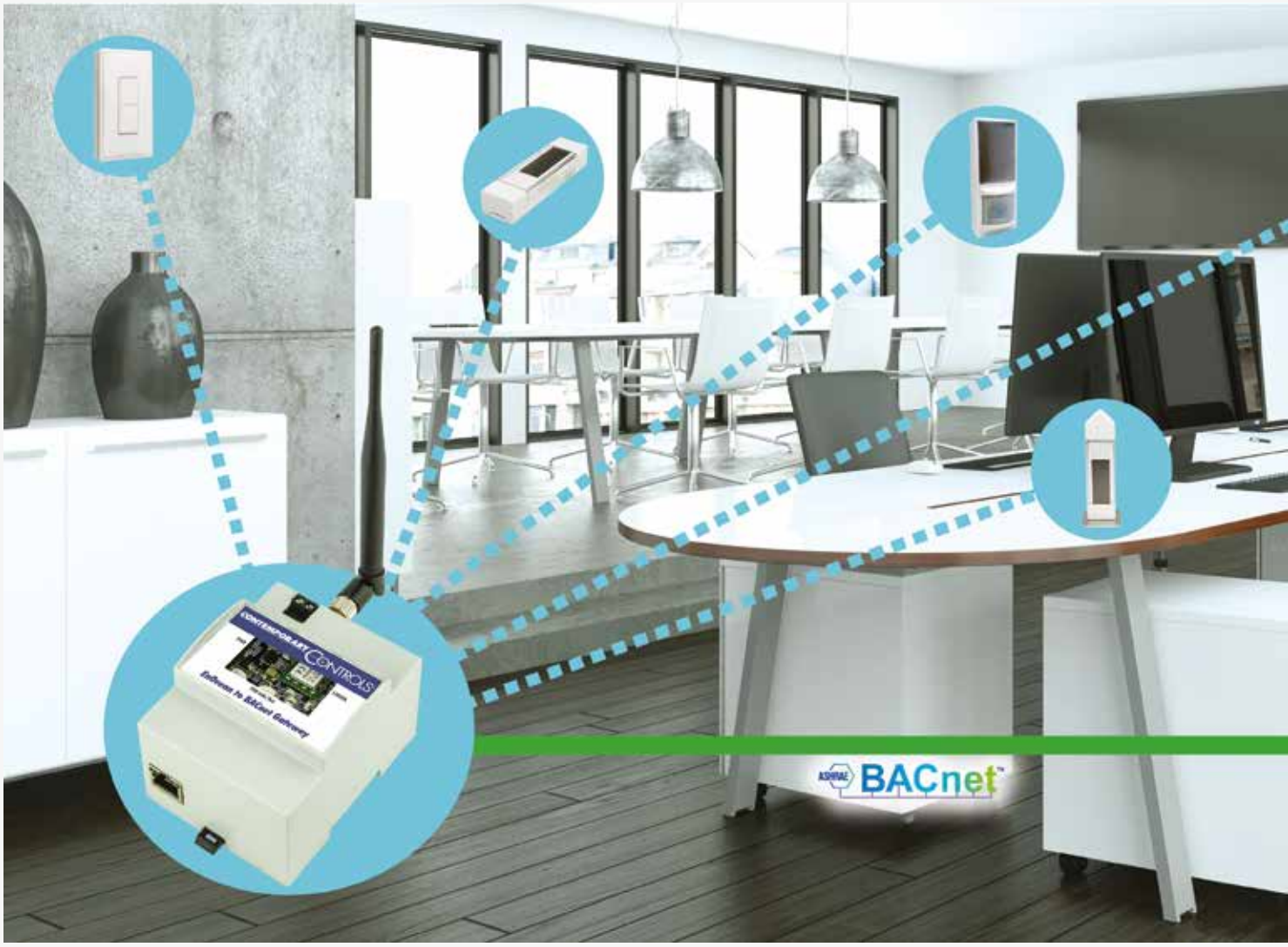



IT EVEN DESCRIBES HOW TO SEARCH FOR SETPOINTS
I THINK MY NEIGHBOUR MENTIONED BACNET, HE WORKS AT ENTERPRISE IN BUILDING AUTOMATION
COOL, I KNOW WHEN THE JANITOR TAKES A BREAK AT ENTERPRISE
THEN SATURDAY IS THE DAY WE GET IN!
I'M GOING TO LOOK FOR MORE INFORMATION ON THE INTERNET
SATURDAY NIGHT
CLICK
WHAT ARE YOU DOING NOW?
I'M SCANNING THE NETWORK


A WHILE LATER...
I CAN'T GET IN, THIS IS NOT NORMAL BACNET
OKAY... THEN LET'S LEAVE
THAT WAS POINTLESS...
HMPH...INTERNET, OPEN PROTOCOLS?
TWO DAYS LATER
I GUESS YOUR BACNET HACK DIDN'T WORK...
YES - THEY MUST HAVE UPDATED
UPDATED?
THERE MUST BE AN EXTENSION CALLED BACNET/SC
AND..?
IT IS NOW UP TO DATE WITH IT WITH TLS 1.3
CRAP.. THAT IS REALLY HACKER SECURED


FOUR WEEKS LATER...
HEY! HOW'S IT GOING? YOU'RE LOOKING NICE!
HEY THERE! I'M IN A HURRY, I HAVE TO GO TO WORK!
OH! YOU GOT A JOB?
YEAH! I WAS SO EXCITED ABOUT BACNET - I APPLIED FOR A JOB IN BA!
AND THERE ARE JOBS THERE?
YES! THEY ARE LOOKING FOR PEOPLE. I WILL PROBABLY ALSO BE GOING TO UNIVERSITY
ISN'T BA BORING?
IT'S SUPER EXCITING! IT'S THE NEWEST TECHNOLOGY AND YOU'RE DOING SOMETHING FOR THE ENVIRONMENT AND THE FUTURE!
... BUT I HAVE TO GO!
GOOD LUCK! SEE YOU!
THANK YOU! BYE!
THE END

Bringing EnOcean Devices to BACnet



A building automation system that utilizes an EnOcean to BACnet gateway to allow EnOcean devices to be linked to and controlled by devices in the system's BACnet network.

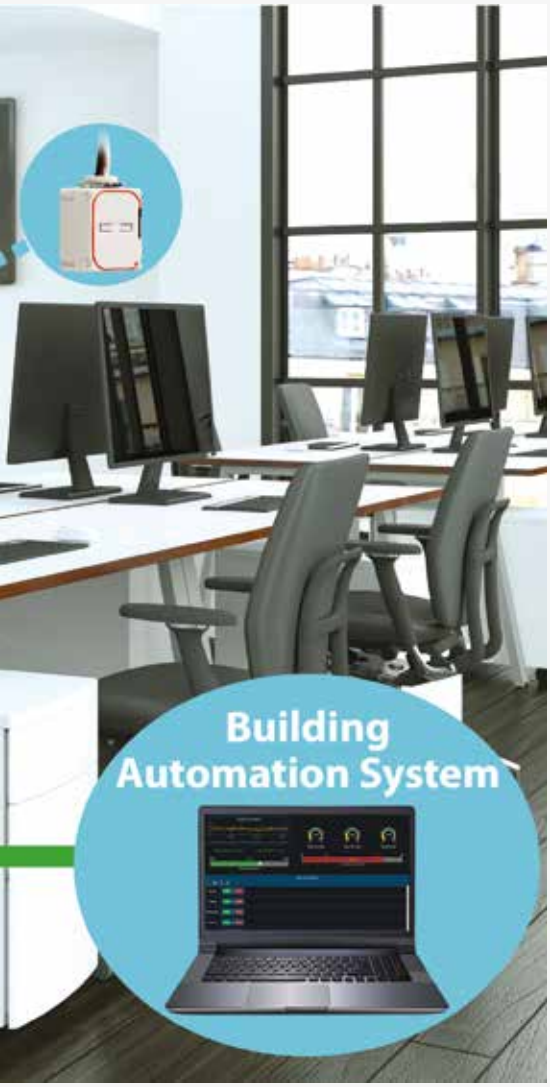
Low power, wireless EnOcean devices provide many features including a self-powered capability through solar power or kinetic energy. These can be useful where running wires for power or communications can be difficult. Because these devices are low power, their wireless messages are limited in size and cannot support the many features provided by BACnet. However, in their limited capacities, they can be useful in BACnet systems. An EnOcean to BACnet gateway can be used to bring EnOcean devices into BACnet systems.

EnOcean devices can be used to bring simple data into the BACnet system, such as temperature, humidity, presence, light levels, etc., where it is difficult to run wires to these sensors. This data can be useful to the BACnet system and allow it to help control zones save energy and provide better occupant comfort, such as indicating when zones are occupied, seeing large light levels, and providing more information about zone temperatures and humidity. The EnOcean devices normally lack the ability to control zones themselves and must rely on BACnet systems to provide this control, as well as alarms, schedules, or trends.

EnOcean is popular in lighting systems and individual EnOcean wall switches can be used to control individual LED lights. By adding an EnOcean to BACnet gateway, all lights can also be controlled by the BACnet system schedule. For example, during the day each light can be controlled by wall switches, and in the evening, as controlled by the BACnet schedule, all lights can be turned off at the end of the day to help conserve energy throughout the facility.

EnOcean communications are very different from BACnet communications and may cause some issues for the EnOcean to BACnet gateway. For example, most EnOcean devices transmit their data when it is appropriate, such as after a large temperature change or after a user has pressed a button. This means that the gateway may not have the most up to date data from the EnOcean device. The gateway should provide some information about the age of the data it is making available to BACnet.

Some EnOcean devices, such as wall switches, send a message when the button is pressed and another when the button is released in quick succession. If the pressed message is missed, the BACnet system will be unaware of the button press. The gateway should communicate these messages to the BACnet system via change of value (COV) so listening devices can learn about these button presses and not miss the event. In order for an EnOcean output device to have its state modified, it must be "linked" to an input



Contemporary Controls EnOcean to BACnet Gateway.

device or gateway before it can be controlled. In BACnet you simply address a message to a device to control its behavior. The Contemporary Controls EnOcean to BACnet gateway allows BACnet devices to receive EnOcean data from EnOcean input devices, such as temperature sensors, and to control EnOcean output devices through the BACnet objects it exposes to the network. Every EnOcean device registered with the gateway is given its own virtual BACnet device. Under this virtual BACnet device are a series of BACnet objects which, for input devices, represent the data produced by the EnOcean device. For output devices, the objects represent the data that must be written so the gateway can transmit a full EnOcean message in order to control the output EnOcean device. Once the BACnet headend or client has written all of the objects in the virtual output EnOcean device, it will transmit an EnOcean message to the output EnOcean device.

The gateway supports remote commissioning, allowing the gateway to be linked to the output EnOcean device via the gateway's webpages.

The Contemporary Controls gateway provides COV to communicate EnOcean messages and can be useful when working with wall switches where the button press is only provided in a single message. The gateway's BACnet objects provide additional information for the input EnOcean devices. For example, the received signal strength (RSSI) and the last time a message was received are provided as BACnet objects to help verify the network is working reliably.The Contemporary Controls EnOcean to BACnet gateway brings together the best of both BACnet and EnOcean technologies for the benefit of the building owner/operator.

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Deploying and Maintaining BACnet Systems in Today's Networks

HVAC has made long strides from the days of pneumatic controls to Direct Digital Controls (DDC). DDC systems allow for more precise control of the equipment and processes, leading to greater efficiency. These DDC systems can be networked together over a communication protocol evolving into a Building Automation System (BAS). The Building Automation Systems of today utilize various protocols, such as Modbus, LonWorks, and KNX, but BACnet is the most popular protocol utilized in HVAC/R control systems. There are multiple vendors that support this open protocol which provides a robust ecosystem of devices to choose from. Gateways are available to integrate other protocols to BACnet. BACnet supports communication over multiple transport layers, such as RS-485 interface with BACnet MS/TP, an Ethernet interface with BACnet/IP and BACnet over Ethernet, and more recently BACnet/SC. This article will explore some of the best practices to keep in mind while deploying BACnet. There are considerations which include choosing between MS/TP and Ethernet, size of networks, number of devices, integration with existing IT infrastructure, future expansion capability, and cost. A one-size-fits-all approach cannot be utilized anymore with these networked systems, and the contractor, systems integrator and building owner must all work in tandem to choose the best option based on their requirements.

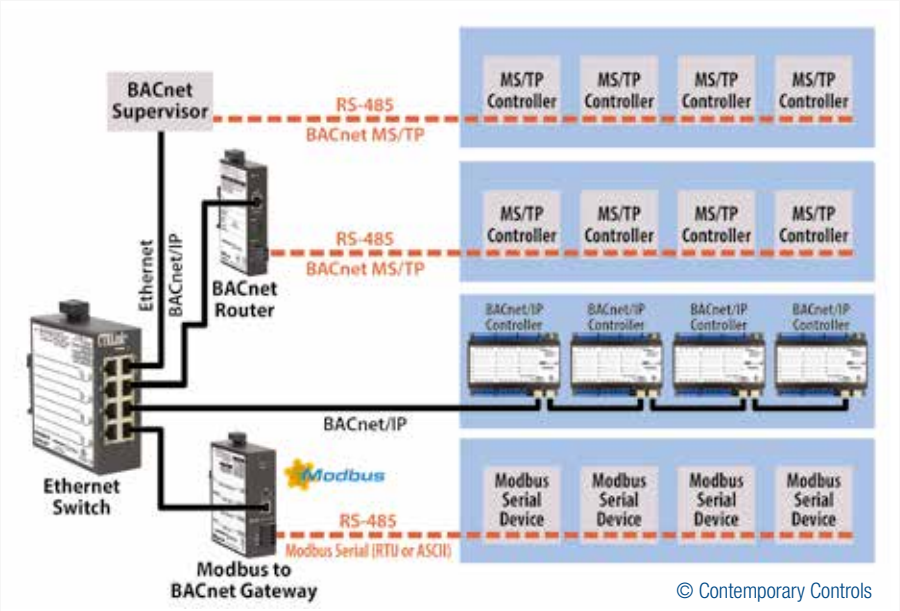
BACnet MS/TP Networks

Over a decade ago, MS/TP networks dominated building automation, and IP networks were rare. MS/TP provided longer cable distances, devices could be daisy chained over a bus, and MS/TP cables were cheaper than Ethernet cables. This allowed the MS/TP devices to be kept separate from the IP network traffic, but they could be easily integrated into a BACnet Supervisory Controller directly or by using a BACnet router. MS/TP networks specify a maximum load of 32 devices on the bus. However, with half or quarter load RS-485 transceivers, more devices can operate over the same segment. BACnet MS/TP can support up to 128 MS/TP master devices that participate in the token passing using MAC addresses from 0 to 127. The more the number of devices in the segment, the longer it will take for the token passing to occur on the bus leading to slower communication. In practice, 32-64 devices in a MS/TP segment are suggested for optimal communication. Using BACnet routers offers a low-cost option for segmenting MS/TP networks.

Specifying the MS/TP device MAC addresses in a consecutive range also eliminates polling for non-existing MS/TP master devices. The MS/TP devices provide a setting called Max Masters to indicate the highest MAC address on the bus. The default value of 127 should be changed to the actual highest MS/TP MAC for fastest communication. But if some additional MS/TP devices are planned to be added later to the segment, the Max Masters should be incremented to allow for that expansion. A common issue while adding MS/TP devices is having a Max Masters value lower than the MS/TP MAC of the new device thereby preventing it from receiving the MS/TP token and participating in communication. Today, MS/TP networks remain popular, providing communication to field devices with supervision from high performance BACnet/IP headends. Multiple BACnet routers can be used to integrate the MS/TP segments back to IP networks. Usually the MS/TP devices utilize less powerful CPUs, and BACnet routers can also provide additional features to separate the MS/TP segment from extra BACnet traffic. For example, blocking broadcast I-AM messages if there are only MS/TP end devices on the MS/TP segment saves valuable CPU resources, especially in a large network. Having a smaller MS/TP segment helps isolate a problem to that specific segment because one bad MS/TP device can impact the performance of all devices on that segment.

BACnet/IP in IT Infrastructure

Today, BACnet networks share IP infrastructure with business networks, high-speed cameras, and IP routers. The result is an immense amount of IP traffic, unrelated to BACnet, impacting the throughput of BACnet networks. The best way to handle the congestion is to restrict communication to only those devices that must be part of the BACnet communication. The use of IP protocol with BACnet/IP lends well to the use of IT best practices to manage the traffic and provide



Flexible Architecture with BACnet/IP and BACnet/MSTP

© Contemporary Controls

Tune MS/TP Settings for faster communicationn

security for BACnet networks. One technique available in TCP/IP routers to restrict the communication is the use of Allowlist to only accept traffic from specific BACnet devices. The Allowlist feature can restrict BACnet/IP traffic to only the BACnet headends and supervisors specified in the Allowlist, thereby providing additional security, and eliminating the devices' need to respond to unrelated messages. Additional options include segmenting networks either by restricting the number of devices in an IP subnet domain with the use of IP routers or separating them logically with the use of Virtual Local Area Networks (VLANs). This again leads to a choice between using low-cost, unmanaged Ethernet switches to connect the Ethernet segments with plug-and-play operation or using managed Ethernet switches that provide features such as VLAN, fault detection, SNMP for traffic count, and redundancy with Rapid Spanning Tree protocol (RSTP).

Managed Ethernet Switches – Redundancy and VLANs

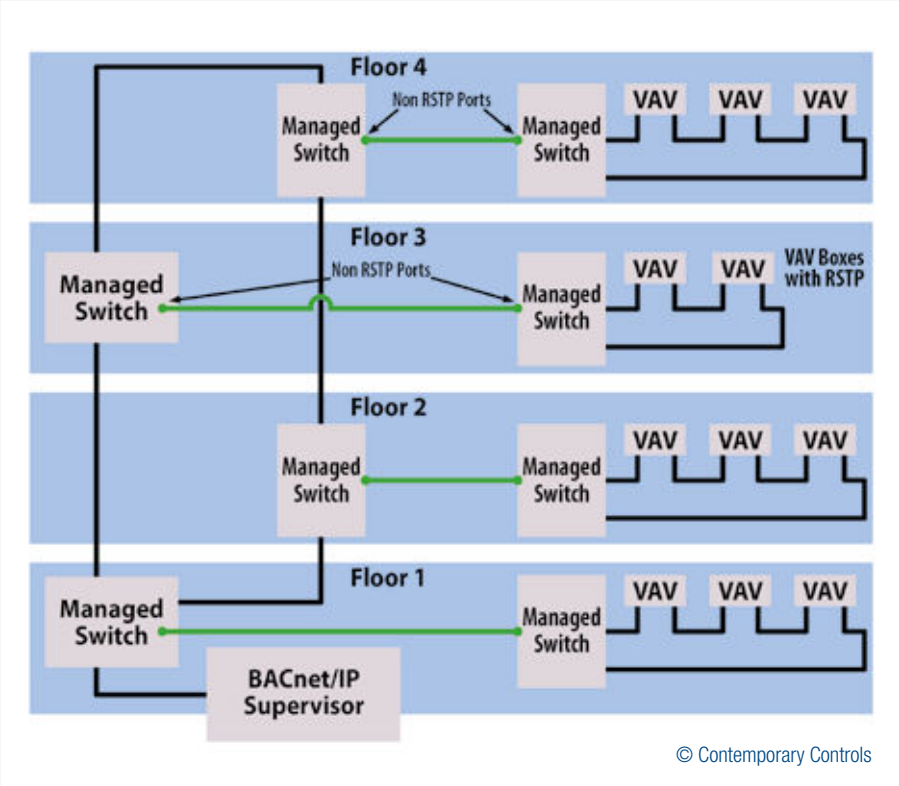
RSTP is an IEEE protocol that has been used to provide cable redundancy in Ethernet networks. Quite a few IP controllers and rooftop units (RTUs) and air handling units (AHUs) have two Ethernet ports to daisy-chain devices for easy wiring. An issue with daisy-chaining devices that impacts both MS/TP and IP devices is that a cable break renders the devices after the break unreachable. By using RSTP, the IP devices can be wired in a ring topology where the protocol keeps one Ethernet port in blocking state to prevent a communication loop. If a cable break occurs, the backup port is enabled allowing the communication to continue. The maximum number of devices in an RSTP ring is 40. This warrants the use of Managed Ethernet switches and all other devices to support and have the RSTP protocol enabled. A common issue seen is mixing unmanaged Ethernet switches to save cost by justifying that the cable break at the segment will not occur, thereby jeopardizing the whole setup. Another issue is having two RSTP rings conform to the size of 40 devices going back to the same managed switch backbone. A break in these two rings will lead to the violation and exceed the 40-device limit in the RSTP segment. It is advisable to use a separate backbone of Managed Ethernet switches with RSTP and then have another managed switch that provides an RSTP segment for the AHUs/RTUs. The RSTP protocol on the Ethernet ports connecting this managed switch for AHUs to the main RSTP backbone Ethernet switch should be disabled. To prevent communication loss due to a power failure, some dual Ethernet port devices utilize an internal relay to bridge the two Ethernet ports together, effectively incrementing the Ethernet segment length. The stipulation for maximum Ethernet segment length of 100 m still applies, and care must be taken not to exceed this distance when the device loses power.

Managed Ethernet switches also provide the VLAN feature to keep groups of devices in logical partitions even though the same physical Ethernet cable carries the traffic. This can be useful to keep the high traffic IP cameras separate from the BMS system. A 10-year-old BMS system may not be able to keep up with the high multicast traffic from the cameras, while new BACnet/IP controllers with powerful CPUs will work fine in the same network. Using managed switches with VLANs provides a secure and easy way to prolong the life of the BMS systems.

Network Sizing and Limiting Traffic using IP Routers

Segmenting using IP routers also provides a convenient way to manage and later expand IP networks. It may seem easy to have a flat network for all the devices, but then all the devices are inundated with the extra broadcast and multicast traffic on this single subnet. The IP routers keep the broadcast and multicast traffic constrained to their own IP subnets. A few years ago, a single bad Ethernet card was blamed for bringing down an airline system at an airport. This is analogous to having a big warehouse with an open office where all departments and personnel are trying to communicate over one another versus subdividing that office space into different sections and rooms. BACnet communication relies on the use of broadcast messages for device discovery, but a BACnet/IP Broadcast Management Device (BBMD) can easily be used to facilitate BACnet communication across subnets. Almost all the BACnet/IP to MS/TP routers provide BBMD functionality, though the support of the number of BBMDs/subnets may vary. Vendors may have different models to support different network sizes. A gas station with a few devices needs to be designed differently than a high-rise office building. Care must be taken not to create a BACnet loop by improper duplicate BBMD entries.

IP routers also facilitate the integration of BACnet devices in the existing IT infrastructure. The IT personnel only need to assign one IP address for the WAN port of the IP router, and all the BACnet devices can form their own network on the LAN subnet with an independent IP address scheme. Compare this to getting IP addresses for each device that must be integrated. The IT department may still need to know some information regarding the devices being added to the BMS system but will surely appreciate the option of not handing out additional IP addresses. We explored how to separate BACnet devices from extra traffic within business networks, but the reverse is also true. The IP routers also prevent the BACnet traffic from



Redundant topology with Managed Ethernet Switches and VAVs using RSTP

reaching the business system network. Additional IP router features, such as VPN, provide remote access for diagnostics and troubleshooting.

The BMS systems are installed for comfort, occupant safety, as well as energy savings. Many times, a BMS system must be changed when the building owner wants to change maintenance contractors, but the owner later finds out that he only has the login credentials for viewing the display graphics and doesn't have the administrative credentials to make additional changes. Having access to the administrative credentials for the BMS system is a must for building owners. The advent of security in BACnet with BACnet/SC and the push towards IP networks in general for BACnet will warrant a closer collaboration between HVAC and IT departments, and it is imperative that basic knowledge regarding IP networks be part of companies' training plans for their personnel.

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Elevator Integration with BACnet

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Andy McMillan (President BACnet International) and Karl Heinz Belser (President BACnet Interest Group Europe (BIG-EU)) on the TK Elevator Test Tower (from left to right).

New opportunities for system integration with BACnet were explored by high-ranking BACnet representatives during a visit to the TK Elevator Test Tower Rottweil (TKE). Karl Heinz Belser, President of the BACnet Interest Group Europe (BIG-EU) and Andy McMillan, President of BACnet International, highlighted the benefits of networking building automation and elevator control.

System integration enables new functions. Occupant Evacuation Operation (OEO) can be realized through BACnet communication of fire alarm systems with elevator technology. Elevators outside the burning part of the building can then be used for evacuation.

Cross-manufacturer communication between elevator and building technology has been part of the BACnet standard for many years. On this basis, a first industry exchange took place at the BACnet Indoor Mobility Conference 2019 in Frankfurt. In the course of communication with the VDMA specialist area "Elevators and Escalators", Karl Heinz Belser presented the topic in February.

With the visit in Rottweil, the application possibilities were deepened one more time. Joachim Dienelt, TKE and TK Aufzugswerke, guided the visitors through the 230 meter high test tower, in which a speed of eight meters per second is achieved. The focus was on challenges, but also very much on solutions that will occupy elevator and building technology in the future. "For both sides, the on-site meeting with the lively exchange was so important," summed up Karl Heinz Belser.

For further dialogue with the VDMA specialist area "Elevators and Escalators", the BIG-EU will participate in the E2 Forum, which will be held in Frankfurt on September 21–22, 2022: www.e2forum.com.

How the SSPC 135 Works

Interim Meeting in Atlanta – November 2019.

The SSPC135 is often mentioned in connection with the BACnet standard – as the body that defines BACnet. What is behind it?

SSPC 135 stands for Standing Standard Project Committee 135

The BACnet protocol is published by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers). The name BACnet is protected by ASHRAE. For the development, definition and maintenance of the standard, a "Standard Project Committee" (SPC) was established by ASHRAE, this committee was given the number 135. Because this committee is still active after first publication in 1995, it is given the prefix "Standing".

The SSPC has a Chairman (currently Coleman Brumley, Jr.) a Vice-Chair (Scott Ziegenfus), a Secretary (Salvatore Cataldi), and regular members. These must either be registered members with ASHRAE or at least be registered there. The latter can be done free of charge.
Some members have additional voting rights in case of decisions on the content of the standard. In total, 26 people are currently involved, 13 of whom have voting rights.

Membership

Membership in the SSPC is open to all interested parties who are knowledgeable in the discipline of the standard and is subject only to some minimal restrictions: There can only be one voting member per organization, and committee membership must be balanced in terms of "manufacturers," "users," and those "generally interested in the standard." New members and interested parties must apply to the Chairman - he proposes the membership, and the ASHRAE Standards Committee (StdC) approves it.

The meetings of the SSPC135 are open to the public. Anyone can therefore attend the meetings and actively participate in the further development of BACnet.

Concerns can also be forwarded to the SSPC directly or e.g. via the BACnet Interest Groups.

Working Groups

To accomplish its work, the SSPC has established a number of "working groups". Each working group addresses a specific topic of importance to the standard. Working Groups can be added as needed, or they can be set to Inactive. Currently, there are 11 active working groups. These are, for example, the IT WG focusing on information technology or the NS WG focusing on network security.

For more information about the SSPC, visit www.bacnet.org/Contact/SSPC.htm.

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The Future of BACnet Product Testing

In today's world of building automation and cybersecurity, providing standards for communication has never been more important. Through the BACnet Testing Laboratories (BTL) Certification process and the BTL Mark, BACnet not only provides critical standards for optimal communication, it also offers reliable proof these standards are met. And with advancements in the BACnet protocol and testing methods, suppliers can now meet the increased demand for secure building communications.

BTL Testing for BACnet Secure Connect (BACnet/SC) Available

Security is a critical piece in the networking of building technologies (Building Internet of Things – BIoT), which is the future of building automation. BACnet/SC is a secure, encrypted datalink layer that has been added as an addendum to the BACnet protocol, addressing the growing need of cybersecurity in building systems.

The BTL Working Group, which maintains and continuously improves the BACnet conformance certification and listing program, released a new Test Package at the beginning of this year which includes testing for BACnet/SC.

BACnet Testing Laboratories (BTL) supports compliance testing and interoperability testing activities. It oversees operation of the global BACnet product certification program and administers the BTL Working Group. https://www.btl.org

BACnet/SC Reference Implementation

The BACnet/SC Reference Stack is a Java implementation of BACnet/SC which includes a sophisticated Test Bench that helps suppliers gain in-house technical knowledge as well as enhance the interoperability of their products with other BACnet/SC devices. It is available for free on SourceForge. https://sourceforge.net/projects/bacnet-sc-reference-stack/

There have already been BACnet devices certified for BACnet/SC, with more continually being tested. Manufacturers realize the importance of adopting BACnet/SC in their product lines and have an outlet, through the BTL's conformance testing, to ensure their products are implementing it correctly.

The BTL Mark: a Mark of Distinction

BTL products that have successfully passed the industry standard, rigorous conformance tests conducted by independent Recognized BACnet Testing Organizations (RBTOs) are eligible for a BTL Certificate of Conformance and are added to the BTL Listing of Tested Products database. Only BTL Listed products in this database may use the BTL Mark. The BTL Mark is a mark of distinction and offers many benefits to both suppliers and users.

Benefits of the BTL Mark for Manufacturers, Suppliers and Distributors

The BTL Mark provides added confidence in product quality as well as providing greater buyer confidence with a competitive advantage.

- BACnet implementation errors are found and eliminated during the rigorous compliance testing.
- When integration problems arise in a multi-vendor environment, the weight falls most heavily on the manufacturer that has not demonstrated compliance through BTL Testing and Certification.
- Products with the BTL Mark lower the risk of integration problems and the project delays and cost overruns that come with them.
- Products with the BTL Mark provide a solid foundation for future system enhancements and extensions.

Benefits of the BTL Mark for Users and Building Owners/Operators

BACnet is the world's standard for building interoperable solutions, but it only works when products are correctly implemented. When customers buy products that are not correctly implemented it can cost them in terms of system integration time and money.

- Many building owners and control system designers have concluded that the **use of products that carry the BTL Mark accelerates and lowers the cost of system integration**. As such, it is becoming commonplace for specifications to require a BTL Mark on products included in project bids.
- Reliance on products with the BTL Mark lowers the risk of integration problems. In addition, the use of products with the BTL Mark provides a solid foundation for future system enhancements and extensions.
- The BTL Mark provides users with assurance that a product has been independently tested by a Recognized BACnet Testing Organization in accordance with the BTL requirements.
- The conformance tests are designed to validate that the product correctly implements a specified set of BACnet features. The specific BACnet features tested in a product with a BTL Mark are detailed in the BTL listing associated with that product.

Users can identify tested products through the BTL Listing Service which is available to users globally at no cost. There are over 1,250 products in the database with more being added every month.

For more information on BACnet testing and certification, visit the BACnet Testing Laboratories website at btl.org.

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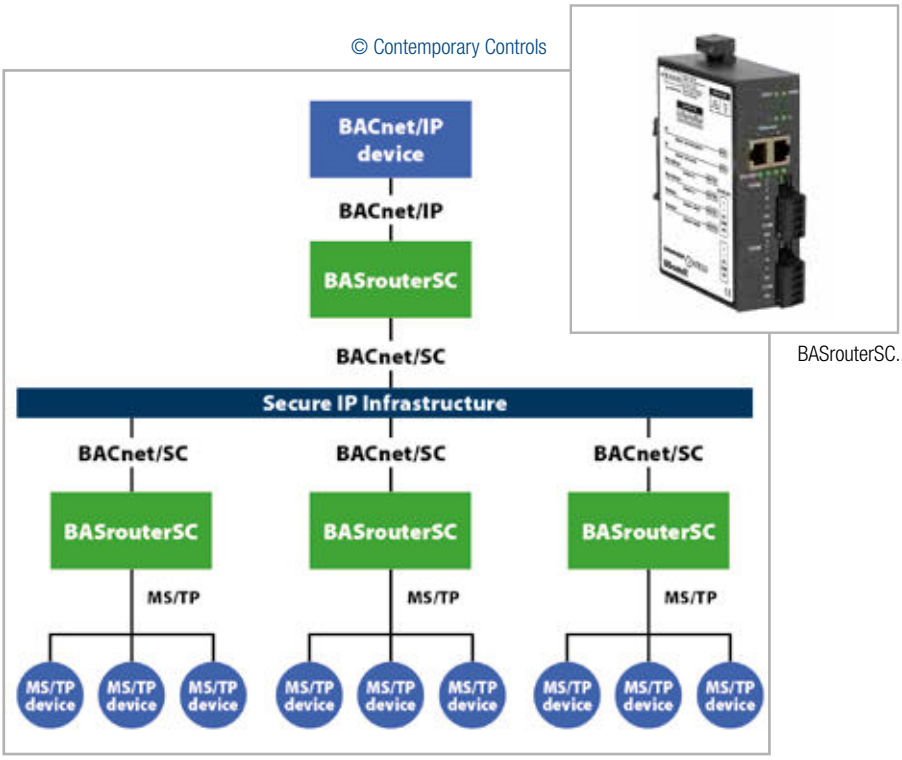
BASrouterSC – Bringing BACnet/SC to BACnet/IP- and MS/TP-Networks

Contemporary Controls' new BASrouterSC supports BACnet/SC as well as MS/TP, BACnet/Ethernet, and BACnet/IP devices. Designed with the same ease of configuration and operation as our popular BACnet routers - BASrouter and BASrouterLX - the BASrouterSC adds BACnet/SC to existing BACnet networks without the need for additional BACnet/SC equipment.

For example, in a BACnet/SC system devices need to act as BACnet/SC hubs. BACnet/SC devices also require certificates which must be signed by a certificate authority (CA). The BASrouterSC can act as the hub and CA for smaller BACnet/SC networks. It can also be part of a larger BACnet/SC network and utilize certificates from other CAs and communicate to other BACnet/SC hubs.



Using BASrouterSC to create secure IP infrastructure.

BASrouterSC.

The BASrouterSC retains the BACnet routing functionality found on our other BACnet routers, such as support for BACnet/IP, MS/TP, and BACnet Ethernet (ISO 8802-3) networks. It has two MS/TP ports and can bring these networks to BACnet/SC systems.

As BACnet networks may be a mix of BACnet/IP and BACnet/SC, the BASrouterSC provides two Ethernet ports, one for the BACnet/IP network and one for the BACnet/SC network. Thus, the Ethernet infrastructure supports secure BACnet/SC communications while connecting to one or more isolated BACnet/IP devices. The BASrouterSC also supports connection to BACnet/SC devices.

It is easy to configure using a standard web browser with Help text to guide you through the process. The BASrouterSC has webpages to help diagnose system issues and can capture BACnet communications to be analyzed by applications, such as Wireshark.

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Engineering Tool Increases Efficiency in Digitizing Building Services

The "OAS Supervisor Utilities Application" by OAS Open Automation-Systems is a powerful engineering toolset. It allows application developers to create BMS solutions for complex building and facility structures in a high-speed, ultra-effective and structured way – suitable for simple smart buildings to complex smart city or campus solutions.

powered by niagara framework®

The OAS Supervisor Utilities Application provides safe navigation through buildings, rooms and facilities.

Embedded in the BACnet®-certified Niagara® Supervisor, the OAS Supervisor Utilities Application enables the streamlined, structured and semi-automated creation of open and web-based BMS, energy management or SCADA solutions.

This new toolset offers intelligent functionalities on the Niagara® Workbench and on the server level for the structured and scalable integration of elementary to complex factory, campus, building and facility structures across all sectors of technical building services. The likewise openly scalable integration of networks from Niagara®-based integration platforms and third-party systems are part of this OAS solution.

With a guided set-up of clear, hierarchical structures, the OAS toolset supports secure navigation through all buildings, rooms and facilities. All objects, graphics, but also background images can be integrated effortlessly.

AnalyticWebChart and dashboard functionalities can be easily integrated. Exporting data and data sets is also supported. The OAS toolset simplifies the creation of trend and historical data. For simplified creation of the visualization, OAS offers an extensive graphic library. Further product information can be found here: www.openautomationsystems.store/produkte/oas-niagara-supervisor. ■

open automation systems

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Editorial Notes
BACnet Middle East Journal
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The BACnet Middle East Journal is the Middle East magazine for building automation based on BACnet technology. Experts, practitioners and professionals show the way in applying and developing the BACnet standard – from building automation trends to devices and application projects; from qualification and training to testing and certification; from who's who in the BACnet community to useful information on events and publications.

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BACnet PRODUCT TESTING FOR CYBERSECURITY

Meet the Increased Demand for Secure Building Communications

Security is a critical piece in the networking of building technologies (Building Internet of Things – BIoT), which is the future of building automation. **BACnet Secure Connect (BACnet/SC)** is a secure, encrypted datalink layer that has been added as an addendum to the BACnet protocol, addressing the growing need of cybersecurity in building systems.

Manufacturers can now ensure their products are correctly implementing BACnet/SC through BACnet Testing Laboratories (BTL) Certification and Testing. This rigorous, industry standard conformance testing, conducted through independent Recognized BACnet Testing Organizations, offers reliable proof that BACnet standards have been met.

Products that have successfully passed this compliance testing are eligible for a BTL Certification and added to the BTL Listing of Tested Products database. Only BTL Listed products in this database may use the BTL Mark. The BTL Mark is a mark of distinction and offers many benefits to both suppliers and users including assurance on product quality and performance, and lowered risk of integration issues.

There are currently over 1250 products in the database with more being added every month.

To find out more about testing and certification, as well as the BTL Mark, visit btl.org.

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BACnet is ISO 16484-5. The most successful communication standard in building automation has a global market coverage of 64%. Source: BSRIA 2021

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