BACnet SECURE CONNECT

BUILDING AUTOMATION FOR OPTIMUM PROTECTION

**BACnet/SC
INSIDE**

BACnet/SC

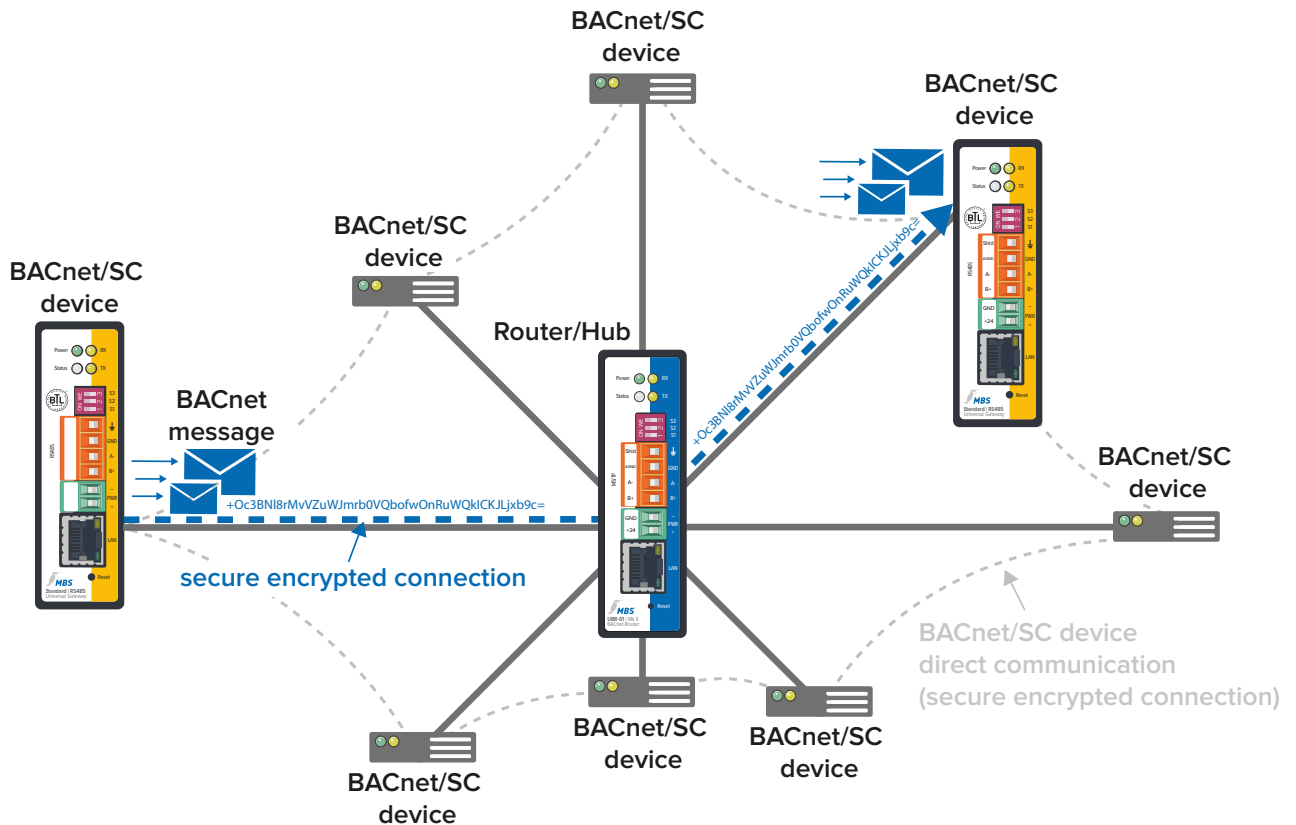**Optimum protected building automation**

At present, some 25 million devices exchange data via BACnet, the first version of which appeared in 1995. Now, with its own security structure, the manufacturer-independent communication standard is fit to face the demands of digitalisation.

Initially, with its closed networks and long innovation cycles, the requirements of building automation in terms of operational safety were very different to those of information technology (IT). Today, however, internet technologies, the convergence of IT and building automation (GA) and cloud-based applications call for a high degree of protection for communications (such as access restrictions, authentication, authorisation, encryption).

For more information, visit www.mbs-solutions.de

BACnet/SC

Optimum protected building automation

BACnet/SC device

BACnet/SC device

BACnet/SC device

BACnet/SC device

BACnet/SC device

Router/Hub

BACnet message

+Oc3BNl8rMvVZuWJmrb0VQbofwOnRuWQkICKJLjxb9c=

secure encrypted connection

BACnet/SC device

BACnet/SC device

BACnet/SC device

BACnet/SC device

BACnet/SC device direct communication (secure encrypted connection)

Minimising the risks

The aim of the federal government's KRITIS strategy is to safeguard critical infrastructures in order to supply key goods and services to the state, industry and society. From airports and chemical plants to municipal properties, more and more operators of building automation are required to prove that they can guarantee a secure supply. This also applies to BACnet networks, which until recently could only be properly safeguarded at high expense. Now BACnet Secure Connect (BACnet/SC) offers a technology for establishing secure communication links at relatively low cost. After all, current standard practice in IT will ensure the security of networks and information in building automation in future.

A number of challenges will have to be overcome to complete this process effectively. For a long time, there has been a much greater awareness of security in IT circles than in building automation. Anyone who trawls the internet in search of unsecured BACnet networks will quickly find them. At the

same time, building technology cannot simply be handed over to a security-approved IT administration without compromising the guarantee of the device manufacturer. We therefore perceive a need for pragmatic ways to implement the new standard so that operators can apply it without problems. Accordingly, the standard now incorporates several mechanisms that have proven effective in the field of information technology.

From hub to node

First of all, the network topology of BACnet/SC looks different. Previously, broadcasts were used for initial connection attempts in BACnet, partly with the support of BACnet Broadcast Management Devices (BBMD) – not a commonplace method in the IT field. A different approach has now been chosen for the configuration: every network has a central point known as the hub. This controls data traffic between any required number of nodes (devices) and performs an analysis of data traffic to determine whether information should be forwarded to one node or to all nodes. A direct connection can also be established to ensure direct communication between two nodes.

BACnet/SC also has a failover mechanism which ensures the system remains functional even when the hub fails or is disconnected for maintenance. The new topology significantly simplifies configuration, commissioning and administration, while BBMDs and the configuration thereof become superfluous.

Encryption and certificates

Für die geschützte Datenübertragung wird TCP (Transmission Control Protocol) mit WebSocket verwendet – zwei

zuverlässige Mechanismen auf Basis des Internet-Protokolls IP, das in der IT nahezu flächendeckend genutzt wird. TCP/IP löst die bisher von BACnet verwendete Netzwerkprotokollschicht UDP (User Data Protocol) ab und für eine abhörsowie fälschungssichere Kommunikation wird TLS eingesetzt. TLS (Transport Layer Security) ist als Grundlage für den sicheren Webzugriff (https) in der IT ebenfalls weit verbreitet.

As far as encryption is concerned, a company-wide procedure must be put in place for the necessary digital certificates. The certification and registration authorities responsible for the internet in connection with public key infrastructures are not specified in BACnet/SC. This means building automation operators can take account of their individual network structures.

To ensure problem-free implementation in existing networks, the security mechanisms have been defined in BACnet as an additional data link layer. The new standard in the latest revision (22) is also downwardly compatible. The advantage of this is that the existing system can always communicate with the new BACnet/SC devices via appropriate routers. A secure investment is therefore assured.

Projecting the somewhat long-term innovation cycles in building automation onto the introduction of Secure Connect is to underestimate the urgency fuelled by current trends such as cloud services and the Internet of Things.

BACnet/SC
Optimum protected building automation

Start now!

BACnet/SC is still in its infancy; no doubt it will be several years before the standard is rolled out across Germany and the rest of Europe. However, waiting to see how things develop is not an option: operators should take action now. After all, setting up or expanding a network with BACnet/SC-compatible devices is not enough in itself to provide security; establishing an awareness of security amongst all persons involved with BACnet networks will be essential.

Operators should also familiarise themselves with the details of revision 22 in order to plan for the changeover: what will it mean to switch from UDP to IP with TLS? From a technical viewpoint, what is needed to make the changeover as smooth as possible? Will extra devices or lines be required? What must be done to create and sign digital certificates and load these on field devices? What tools are available for the changeover? How can we take advantage of existing IT mechanisms?

As regards the new product range, BACnet/SC is a technology that most operators of building automation will seek to implement in the future. It is possible that smaller companies will be faster to enter the market with new products than larger organisations. Seeking out manufacturers that were involved in developing the latest revision may be worthwhile. It may also be useful for property operators to take advice by joining a general or company-specific training course; this is one way to ensure BACnet/SC is successfully applied to a specific property.

.info

Need help with BACnet/SC?

Contact us!

+49 21 51 72 94-0
vertrieb@mbs-solutions.de

INVITATION TO A VIRTUAL PLUGFEST WITH BACnet/SC
A test environment for secure communication with BACnet/SC, set up on the initiative of Delta Controls and MBS GmbH, is now available to all manufacturers. "You are very welcome to link up to our virtual platform free of charge," say the two BACnet/SC pioneers.

https://www.mbs-solutions.de/bacnetsc-plugfest

PLUGFEST
BACnet/SC