Ask the Expert

Have Your BACnet Questions Answered!

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Something to get us started

BACNET MOVING FORWARD
Have you heard any of these statements about BACnet?

- LEGACY protocol
- Not IT friendly does not use standard IT practices and protocols
- Not applicable to IoT
- Not secure
- Not Enterprise applicable
- Only HVAC
BACnet Covering the Built Environment

- HVAC
- LIGHTING
- ELEVATORS
- ACCESS CONTROL
- LIFE SAFETY
Industry Specific Device Profiles

Profile Families
A fundamental shift is happening to make specifying easier without the need for a PhD level of understanding in BACnet because of a new “family” approach to BACnet device profiles. This new approach just appeared in the newly available 2016 publishing of the BACnet standard.

TRADITIONAL

| BACnet Advanced Operator Workstation (B-AOWS) | Operator Interfaces |
| BACnet Operator Workstation (B-OWS) | |
| BACnet Operator Display (B-DD) | |
| BACnet Building Controller (B-BC) | |
| BACnet Advanced Application Controller (B-AAC) | |
| BACnet Application Specific Controller (B-ASC) | |
| BACnet Smart Actuator (B-SA) | |
| BACnet Smart Sensor (B-SA) | |

LIFE SAFETY

| BACnet Advanced Life-Safety Workstation (B-ALWS) | Life-Safety Operator Interfaces |
| BACnet Life-Safety Workstation (B-LSWS) | |
| BACnet Life-Safety Annunciator Panel (B-LSAP) | |
| BACnet Advanced Life-Safety Controller (B-ALSC) | |
| BACnet Life-Safety Controller (B-LSC) | |

ACCESS CONTROL

| BACnet Advanced Access Control Workstation (B-AACWS) | Access Control Operator Interfaces |
| BACnet Access Control Workstation (B-ACWS) | |
| BACnet Access Control Security Display (B-ACSD) | |
| BACnet Advanced Access Control Controller (B-AACC) | |
| BACnet Access Control Controller (B-ACC) | |

ELEVATOR

| BACnet Advanced Elevator Workstation (B-AEWS) | Elevator Operator Interfaces |
| BACnet Elevator Workstation (B-EWS) | |
| BACnet Elevator Display (B-ED) | |
| BACnet Advanced Elevator Controller (B-AEC) | |
| BACnet Elevator Controller (B-EC) | |
| BACnet Elevator Monitoring Controller (B-EMC) | |

MISCELLANEOUS

| BACnet Router (B-RTR) | |
| BACnet Gateway (B-GW) | |
| BACnet Broadcast Management Device (B-BBMD) | |
| BACnet Access Control Door Controller (B-ACDC) | |
| BACnet Access Control Credential Reader (B-ACCR) | |
Industry Specific BIBBs

**LIGHTING**

(Addendum be)
- Data Sharing-Lighting Output-A (DS-LO-A)
- Data Sharing-Advanced Lighting Output-A (DS-ALO-A)
- Data Sharing-Lighting Output-B (DS-LO-B)
- Data Sharing-Binary Lighting Output-B (DS-BLO-B)
- Device Management-Lighting Output Management-A (DM-LOM-A)
- Data Sharing-Lighting View-A (DS-LV-A)
- Data Sharing-Lighting Advanced View-A (DS-LAV-A)
- Data Sharing-Lighting Modify-A (DS-LM-A)
- Data Sharing-Lighting Advanced Modify-A (DS-LAM-A)

**ELEVATOR**

(Addendum bs)
- Data Sharing-Elevator View-A (DS-EV-A)
- Data Sharing-Elevator Advanced View-A (DS-EAV-A)
- Data Sharing-Elevator Modify-A (DS-EM-A)
- Data Sharing-Elevator Advanced Modify-A (DS-EAM-A)
- Alarm and Event Management-Elevator View Notifications-A (AE-EVN-A)
- Alarm and Event Management-Elevator Advanced View Notifications-A (AE-EAVN-A)
- Alarm and Event Management-Elevator View and Modify-A (AE-EVM-A)
- Alarm and Event Management-Elevator Advanced View and Modify-A (AE-EAVM-A)

**ACCESS CONTROL**

(Addendum bc)
- Data Sharing-Access Control Advanced View-A (DS-ACAV-A)
- Data Sharing-Access Control Modify-A (DS-ACM-A)
- Data Sharing-Access Control Advanced Modify-A (DS-ACAM-A)
- Data Sharing-Access Control User Configuration-A (DS-ACUC-A)
- Data Sharing-Access Control User Configuration-B (DS-ACUC-B)
- Data Sharing-Access Control Site Configuration-A (DS-ACSC-A)
- Data Sharing-Access Control Site Configuration-B (DS-ACSC-B)
- Data Sharing-Access Control Access Door-A (DS-ACAD-A)
- Data Sharing-Access Control Access Door-B (DS-ACAD-B)
- Data Sharing-Access Control Credential Data Input-A (DS-ACCDI-A)
- Data Sharing-Access Control Credential Data Input-B (DS-ACCDI-B)
- Alarm and Event Management-Notification-A (AE-N-A)
- Alarm and Event Management-Notification Internal-A (AE-N-I-A)
- Alarm and Event Management-Notification External-B (AE-N-E-B)
- Alarm and Event Management-Access Control-A (AE-AC-A)
- Alarm and Event Management-Access Control-B (AE-AC-B)
- Alarm and Event Management-Access Control Advanced View Notifications-A (AE-ACAVN-A)
- Alarm and Event Management-Access Control View and Modify-A (AE-ACVM-A)
- Alarm and Event Management-Access Control Advanced View and Modify-A (AE-ACAVM-A)

**LIFE SAFETY**

(Addendum bc)
- Data Sharing - Life Safety View-A (DS-LSV-A)
- Data Sharing-Life Safety Advanced View-A (DS-LSAV-A)
- Data Sharing-Life Safety Modify-A (DS-LSM-A)
- Data Sharing-Life Safety Advanced Modify-A (DS-LSAM-A)
- Alarm and Event Management-Life Safety View Notifications-A (AE-LSVN-A)
- Alarm and Event Management-Life Safety Advanced View Notifications-A (AE-LSAVN-A)
- Alarm and Event Management-Life Safety View and Modify-A (AE-LSVM-A)
- Alarm and Event Management-Life Safety Advanced View and Modify-A (AE-LSAVM-A)
Building IoT with BACnet
BACnet/IPv6

BACnet/IP

4,294,967,295 ≈ 4 BILLION

IPv6 SUPPORT

BACnet /IPv6

340,282,366,920,938,463,463,374,607,431,768,211,456

≈ 3 HUNDRED UNDECILLION

BROADCAST
BACnet Web Services

- REST style API to BACS Information
- HTTPS (TLS) and OAuth 2.0
- JSON or XML Representation Formats

JSON Example
Request:
GET /{prefix}/.trees/path/to/great-thing

XML Example
Request:
GET /{prefix}/.trees/path/to/great-thing?alt=xml
BACnet Device Descriptions

Profile_Name and Profile_Location (URI) properties in all BACnet objects
(Addendum 135-2012ba, now Annex X in BACnet 2016)

EXtended Data Definition (XDD) Files

- Machine-readable description (XML representation) of the device, objects and properties
- XDD files located in device itself, or on a remote web server
- Files contain:
  - Instantiated Data and Metadata
  - Type Definitions
  - Semantic Tags using various dictionaries
  - Virtual Views (no corresponding Structured View object on the device)
Semantic Tags ASHRAE 223P

Designation and Classification of Semantic Tags for Building Data

Simplified Example Query:
“List all the rooms (HVAC zones) that are occupied and have a temperature above 74F (23.3C)”
BACnet Secure Connect

The Traditional BACnet Stack!

- IT managed infrastructures and clouds
- Use of IT grade network security (TLS)
- Robust against IP network configuration changes
- Simple migration of BACnet applications

Security and Transportation Uses Standard IT protocols!
BACnet/SC Topology

Physical Connection

Logical Connection
What you are here for!

FOR THE EXPERTS