BACnet – A Deeper Look
A brief insight to BACnet development

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Learning Objectives

• Identify the BACnet layers
• Identify common BACnet services
• Identify common BACnet LAN types
• How to combine different BACnet LAN types into one common internetwork
• How to combine BACnet networks with non-BACnet networks.
What is BACnet?

- **Building Automation Control network**
- A book, developed by expert volunteers
- Not software, not hardware, but a collection of methods for BAS communication.
- Over 850 vendors.
- Not HVAC specific.
What is BACnet?

- BACnet provides a universal model for creating BAS which can interoperate using common:
  - Object Model for conveying data
  - Services for requesting data
  - LANs and physical media for transferring data
The Two Parts of BACnet

Application Layer

Physical Layer
## BACnet Physical Media

<table>
<thead>
<tr>
<th>Media</th>
<th>BACnet LAN Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232</td>
<td>Point-To-Point (&quot;PTP&quot;)</td>
</tr>
<tr>
<td>EIA-485</td>
<td>Master/Slave Token Passing (&quot;MS/TP&quot;)</td>
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<tr>
<td>ATA 878.1</td>
<td>ARCnet</td>
</tr>
<tr>
<td>EIA/CEA-709.1</td>
<td>LonTalk (&quot;LON&quot;)</td>
</tr>
<tr>
<td>Ethernet</td>
<td>8802-3 (&quot;BACnet over Ethernet&quot;)</td>
</tr>
<tr>
<td>IPv4</td>
<td>BACnet/IP</td>
</tr>
<tr>
<td>IPv6</td>
<td>BACnet/IPv6</td>
</tr>
</tbody>
</table>
Which to Use?

Factors:
• Is it expensive?
• How fast is it?
• Easy to install?
• Easy to integrate?
• Interoperable?
• Will it work on existing wiring?
• Is it hard to fix or replace?
Speed & Cost Tradeoffs

BACnet Speed vs. Cost

- PTP
- MS/TP
- Zigbee
- ARCnet
- LonTalk
- Ethernet
- BACnet/IP
- BACnet/IPv6

- Speed
- Cost
Deployment Tradeoffs

BACnet Cost vs. Deployment Difficulty

Ethernet | BACnet/IP | BACnet/IPv6 | LonTalk | ARCnet | Zigbee | PTP | MS/TP
---|---|---|---|---|---|---|---

Deployment | Cost
---|---
Ethernet Based
Ethernet

- Ethernet Segment
- BACnet Device
BACnet/IP

Single Subnet
BACnet/IP

Multiple Subnet
BACnet/IP
BACnet/IPv6

BACnet/IPv6 Network (2001:DB8::/48)

IPv6 Link (2001:DB8::/64)

2001:DB8::/48
Link Local – FE80::/64
Default Gateway – 2001:DB8::/64

2001:DB8::/64
Link Local – FE80::/64
Default Gateway – 2001:DB8::/64
Serial Based
Internetworking
Combining BACnet Networks

BACnet Router

- MS/TP
- Ethernet
- BACnet/IP
Combining BACnet Networks with non-BACnet Networks
Questions?