

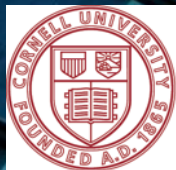


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Frankfurt 14. - 18.03.2016

# BACnet – Future Directions

*H. Michael Newman, Chair  
BACnet Committee  
1987-2000*



Cornell University

# Major Areas for Future BACnet Development

- Improved Integration/Convergence with IT networks
- Semantic Tag Definition and Implementation
- Smart Grid Implementation in Buildings
- Improved BACnet Analysis and Troubleshooting
- Improved Building Intelligence

# Improved Integration/Convergence with IT Networks

In shared IP infrastructures, some IT departments have problems with the deployment of BACnet:

- They are unfamiliar with the BACnet standard and how it works
- Data security may be considered unsuitable
- BACnet tends to use fixed IP addresses rather than dynamic ones
- Site-wide broadcasts are considered unacceptable
- BACnet routers and BBMDs are not managed by the IT department

Education can often help to eliminate these concerns but...

# Improved Integration/Convergence with IT Networks

...here is what the BACnet committee is doing to deal with them:

- Enable the use of BACnet/IP networks in a way that is suitable for highly managed IP infrastructures, not just for virtual LANs
- Enable the use of standard IP mechanisms for auto-configuration (DHCP), name resolution and device discovery (DNS), and information security (encryption)
- Enable the traversal of typical IP network hurdles, such as NATs and firewalls
- Enable the use of IP infrastructure that is built for, and shared with, office and other enterprise applications such as Smart Grid
- Enable the use of either IPv4 or IPv6, as required by the IT infrastructure

# Semantic Tag Definition and Implementation

"Tags" describe the meaning ("semantics") of data. A given object can have multiple tags. They can be a simple attribute or description

equipment

point

degrees-C

chiller

air-handler

or have values associated with them

supply-temp, 20

steam-flow, 300

static-pressure, 15

# Semantic Tag Definition and Implementation

Tags can be useful for both machine-to-machine and human-to-machine communication:

- Presentation and Visualization of data
- Reporting of status and functioning
- Grouping of related data
- Analysis and Operational Decision Making

Each of these functions is likely to have a huge impact on the building automation systems of the future, especially when the "Internet of Things" (IoT) takes off and the number of available data points grows exponentially!

# Semantic Tag Definition and Implementation

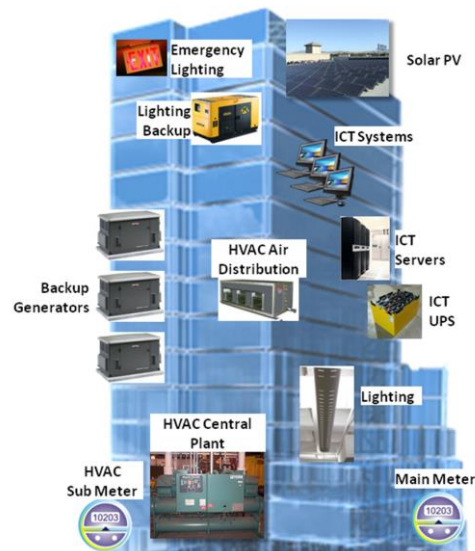
But someone still has to define the "dictionary" of tags and how they relate to each other in real systems. Many organizations are working on these problems.

The ASHRAE BACnet committee, with the help of other liaison organizations, is developing sets of domain-specific tags and "application interfaces", sometimes called "profiles", for different types of building equipment. Help is always wanted!

# Smart Grid Implementation in Buildings

BACnet's effort is based on the ASHRAE "Facility Smart Grid Information Model" or FSGIM

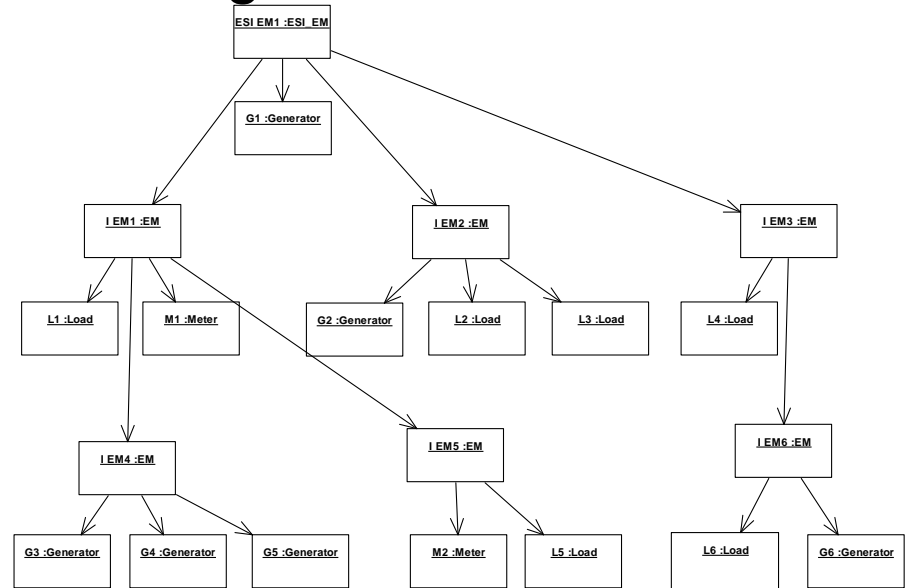
The FSGIM provides a way to take all of the electricity consuming or producing devices within a facility and model how they interact with the electrical grid.





# Smart Grid Implementation in Buildings

It does this by modeling the devices in a facility as a combination of conceptual *loads*, *generators*, *meters*, and *energy managers*



BACnet's Data Modeling WG is trying to represent the components' parameters using BACnet objects and structures

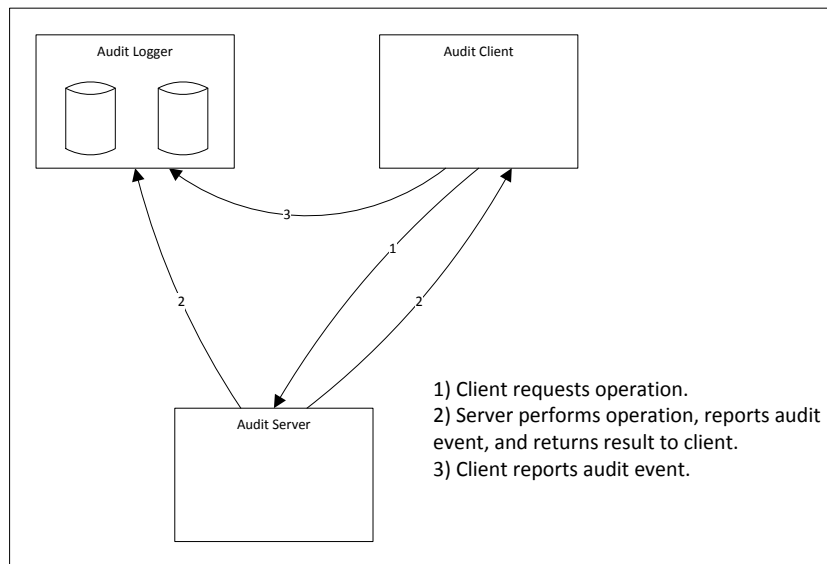
# Improved BACnet Analysis and Troubleshooting

It has long been desired to know where a particular command came from, i.e., why a BACnet device is in the state that it is in

- Addendum 135-2012*bi* adds an Audit Reporter object type and new audit notification services to report auditable actions
- An Audit Log object type and an audit query service are added to log and retrieve audit notifications
- Both clients and servers are allowed to report auditable actions. Servers report changes to local objects, clients report successful and attempted changes along with extra information such as reason for change. The consumer of the logs will be responsible for correlating the multiple entries for a single action.

# Improved BACnet Analysis and Troubleshooting

The general concept is shown here:



## Improved Building Intelligence

The combination of many more data points (as a result of the IoT) and the ability to more easily understand the role of each data point in specific systems (as a result of application interfaces) means that we will finally be able to:

- Operate systems more energy-efficiently
- Implement more effective Fault Detection and Diagnosis (FD&D)
- Better integrate HVAC and non-HVAC building systems
- Increase the market for building automation and control systems and BACnet!

To stay current with BACnet developments, please visit:

[WWW.BACNET.ORG](http://WWW.BACNET.ORG)



Vielen Dank für Ihre Aufmerksamkeit!