

Open, Interoperable Systems for Energy Savings

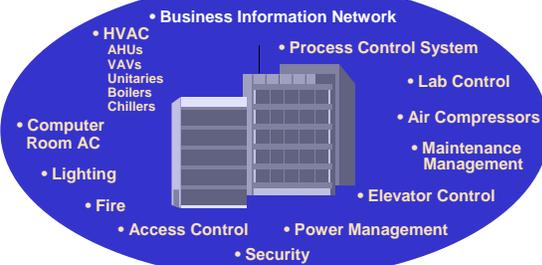
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What is an "Open, Interoperable System"?

- Integration of multiple building systems to improve operational, functional, or energy efficiency
- Uses products and components from different vendors
- Is not absolutely dependent on a single integrator's proprietary tools (long term)

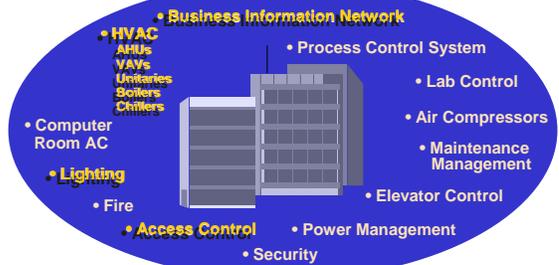
Building Control Systems

Multiple Systems - Multiple Vendors



Building Control Systems

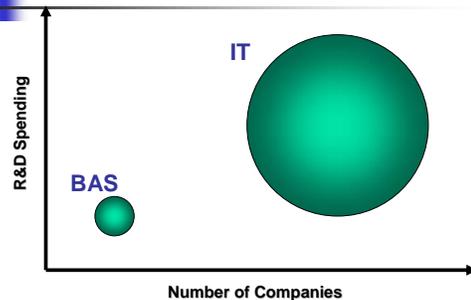
Interoperability for Energy Management

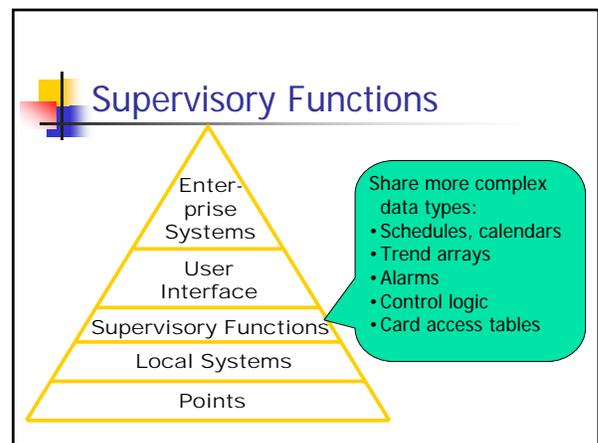
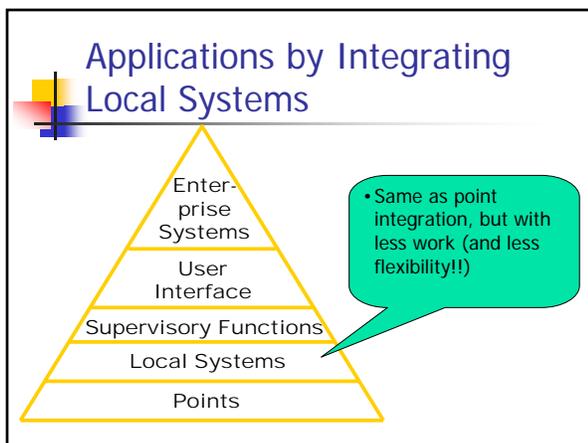
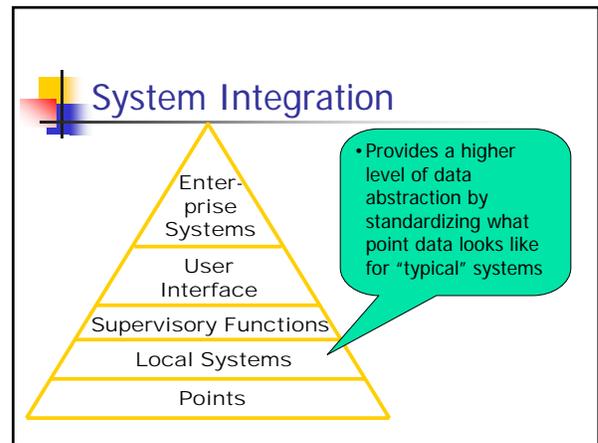
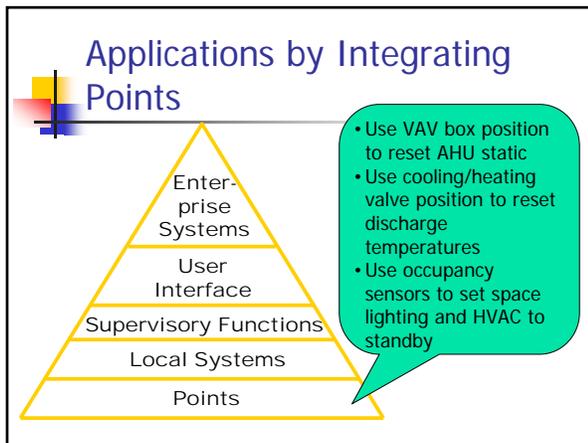
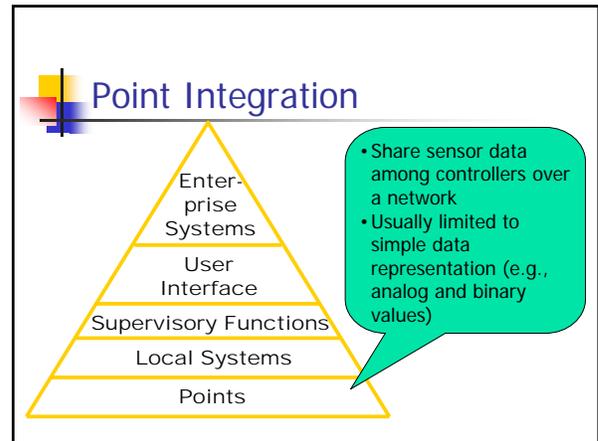
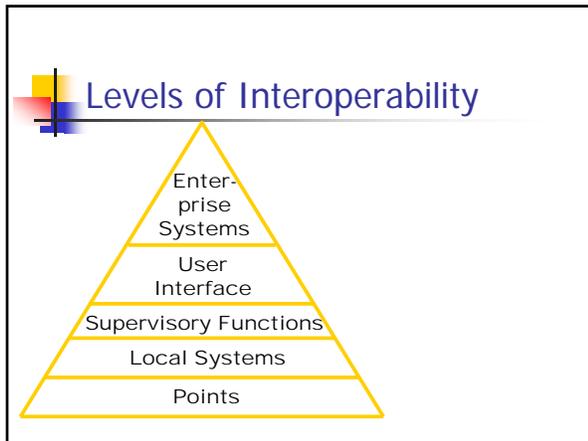


Technologies Available

- Building Automation System communication protocols
 - BACnet
 - LonTalk
 - Custom gateways
- TCP/IP communication protocols
 - HTTP/HTML (Browser interface)
 - XML/SOAP (Internet application programs)

IT vs BAS R&D Spending





Applications by Integrating Supervisory Functions

- Space, area, or building schedules for HVAC and lighting
- After-hours card access control of lighting/HVAC
- Demand control of lighting levels coordinated w/ mechanical cooling

User Interface Issues

- Use the same devices to interact with all systems
- Use the same presentation (look and feel)
- User productivity indirectly impacts energy savings

Enterprise Software Integration

Share real-time or historical facility information with other business systems:

- HR databases
- Tenant databases
- CMMS
- Budgets

Applications of Enterprise Software Integration

- Real-time energy rate data from utility
- Department/tenant after-hours billing
- Activity based scheduling

BACnet

- ☉ Standardizes data content and delivery
 - Point objects
 - Supervisory functions
- ☉ Products available from many vendors
 - www.bacnetassociation.org
- ☉ No central "integration tool" required (or available!)

LonMark

- ☉ Standardizes data content and delivery
 - Point objects
 - Functional Profiles
- ☉ Products available from many vendors
 - www.lonmark.org
- ☉ Standard network tools available

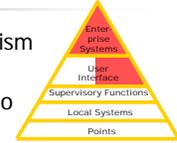
HTML

- ⊖ Provides a common mechanism for a user to access information
- ⊖ No standardization of the user presentation
- ⊖ No exchange of meaningful information between systems

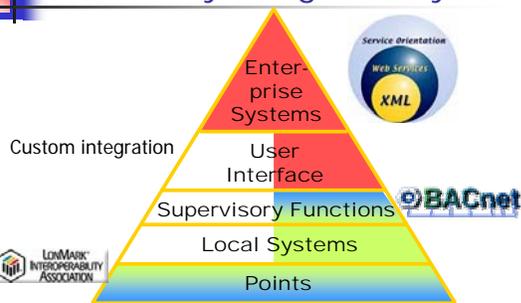


XML

- ⊖ Provides a common mechanism to access information
- ⊖ Defines a common method to exchange data with other business software applications
- ⊖ Much work required in the industry to define the standard data representation



The Totally Integrated System



Conclusions

- Open, interoperable systems that reduce energy consumption are feasible
- Multiple technologies and protocols are required
 - Alternative: lock into a single vendor for the higher levels of the network)
- Customization is needed to make it do something useful
 - Plug and play is a myth

Conclusions

- Somebody needs to play an ongoing role as the systems integrator

Questions?