Keeping Options Open using Open Systems

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Topics For Discussion

- Agenda

  – Value of open technology

  – Value APOGEE Open System Solution

  – APOGEE Open System Solution

Value of an open system

1 - **Freedom** - add onto your system with other vendor products

- Don't have to be locked into a single vendor for all control needs

2 - **Operational Efficiency** - centralized workstation

- Improved alarm management
- Better Diagnostic capabilities
- Lower Training

Value of an APOGEE Open System

1 - **Freedom**

2 - **Operational Efficiency**

3 - **Investment Protection** - plan for an unknown future

- Implement current standards with flexibility for unknown future technologies and systems
- Don't be locked into year 2000's technology

4 - **Minimize Costs of Freedom** - apply technology for its benefits while avoiding some of the traps

- Add on with new technology rather than replacing existing system
- Don't change system (and add cost) if there is no technological benefit
- Don't get locked into a full system replacement

What's the APOGEE advantage?

1 - **Open means options** - providing a system that uses only a single standard protocol doesn't provide options

2 - APOGEE methodology adds backwards compatibility and **investment protection** to "open"

3 - Having options provides a system with the flexibility to provide **solutions to specific** customer needs

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Creating the APOGEE Open System

Use the best of all technologies:

☑ Leverage Technology Standards

☑ Leverage Industry Standards
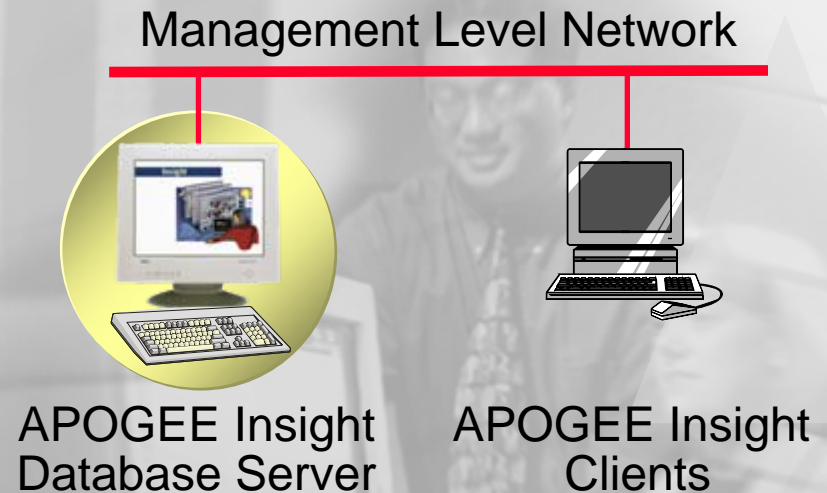
☑ Leverage Alliances and Partnerships

APOGEE Leverages Technology Standards

- Why?
  - Robust and reliable system platform and applications
  - Rapid technology advancements
  - Tangible benefits

- Examples
  - Computer Industry
    - Windows NT, SQL/ODBC, Web/HTML
  - Communication Industry
    - Ethernet, Internet, Wireless / Cell / Paging

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Windows NT

Evaluation of NT:

- most common operating platform in world

- robust security features

- client/server networking capabilities

- business application integration

Management Level Network

APOGEE Insight
Database Server

APOGEE Insight
Clients

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Ethernet

Evaluation of Ethernet:

- most common data transfer media

- can be shared with many different systems and applications so commonly used in campuses

- effective at transferring large files quickly

Management Level Network

AEM

Building Level Network
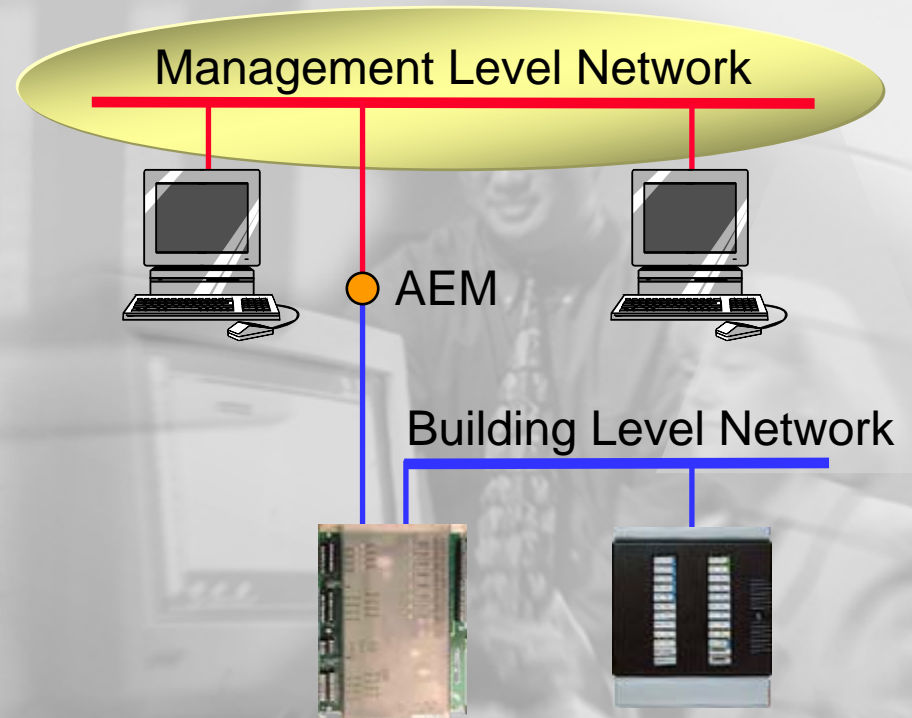
Internet

Evaluation of Internet:

- most rapidly expanding technology in business world

- enhances user access to information

Internet/Intranet

APOGEE *GO*

Web Browser

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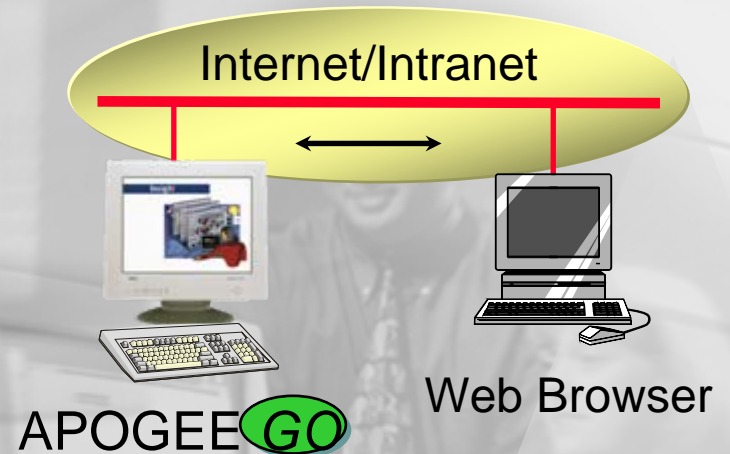
# APOGEE Leverages Industry Standards

- Why?
  - Communication with other systems without customized gateways

- Examples
  - OPC, BACnet, Modbus, LonWorks

OPC

Evaluation of OPC:

- based on Microsoft technology

- used between Windows applications to transfer present value and alarm data directly from one database to another

- "Interoperability Workshop" which allows members to test their OPC products with other vendors

OPC over Ethernet

APOGEE Insight
w/ OPC

3rd Party
Workstation
w/ OPC
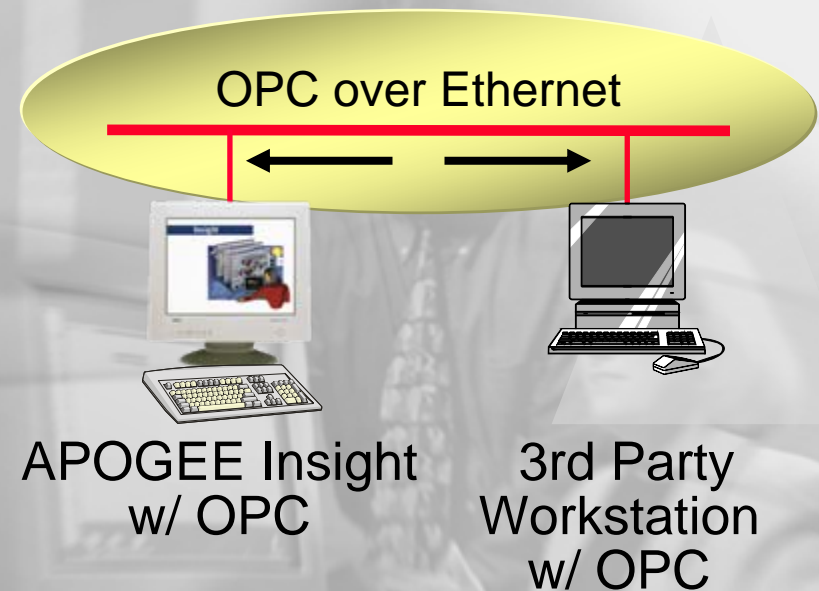
Evaluation of BACnet:

- Available from most BMS and HVAC equipment vendors

- Allows for flexibility in implementation

- BACnet Manufacturers Association addressing interoperability testing

- Does not include tools, programming, or network management

BACnet over Ethernet

3rd Party
BACnet Devices

BMA™
BACnet
MANUFACTURERS
ASSOCIATION
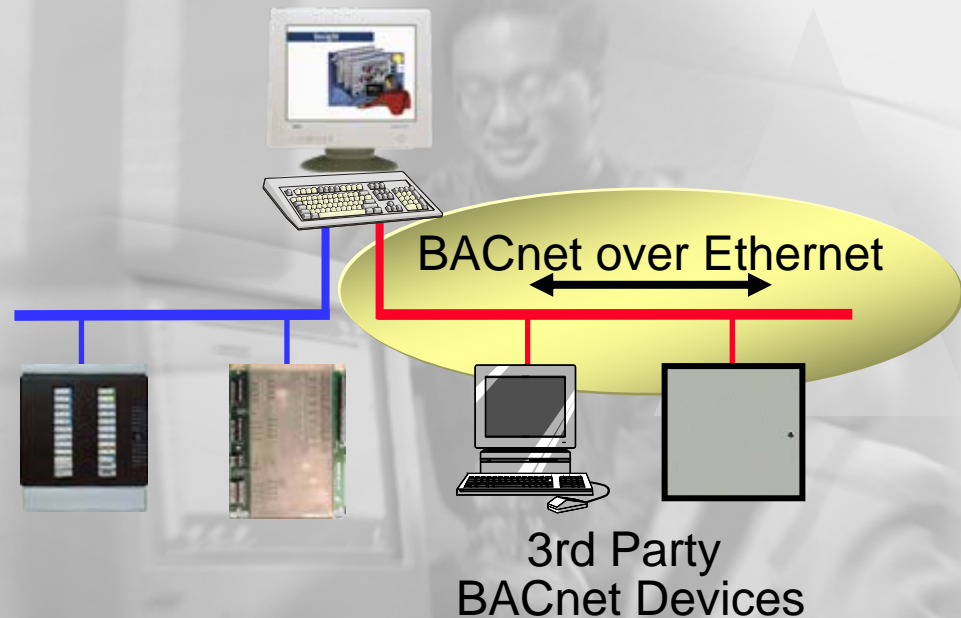
Realities of an open system using BACnet

- BACnet does not necessarily improve a system (BACnet does not make a system better, it allows potential communication between vendors)

- BACnet does not make devices interchangeable (No programming language, no configuration tools, no hardware standardization, no training)

- BACnet cannot guaranteed communication

- BACnet is a language, not a complete system (Many applications of system not defined (such as diagnostics & trend file) so they will not be consistent across vendors even with Native BACnet)

- BACnet will not lower overall cost (Maintenance costs of multiple vendors raises long term costs)

Why have we implemented BACnet at Insight?

- **Minimize cost to customers**
  - doesn't require upgrade or replacement of entire system

- **Receive benefits of technology**
  - add BACnet systems and maintain some day to day functions from one software package

- **Provide customers with options**
  - don't have to use BACnet if it doesn't provide a particular customer with benefits
  - system and strategy is flexible to add future technologies

Modbus

Evaluation of Modbus:

- Used for many different types of floor level devices

- Simple protocol has lead to wide implementation in many building systems including: process controls, power meters, chillers, boilers, and BMS.

Modbus Devices
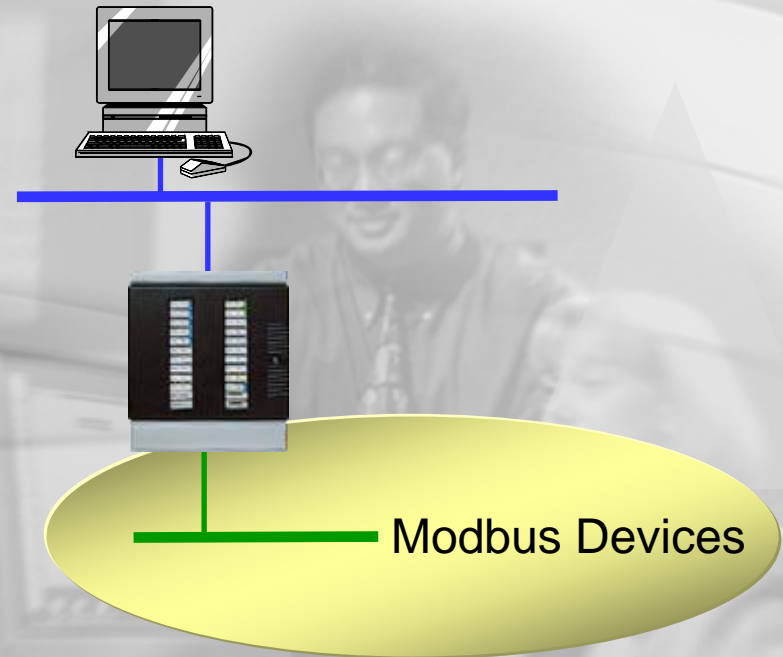
LonWorks

Evaluation of LonWorks:

- Used for many different types of floor level devices

- Useful for integrating devices

- System applications and tool sets become vendor specific

LMEC

LTEC
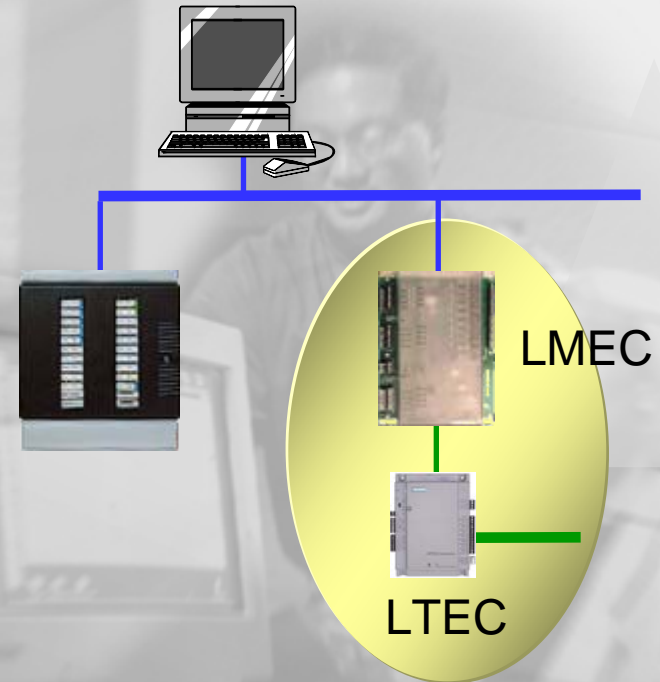
Realities of an open system using LonWorks

- LonWorks does not provide vendor independence
  - integration of floor level devices from multiple vendors still requires higher level system capabilities from some single vendor (alarming, trending, scheduling, network mgmt as well as tools), these system level applications are vendor-specific extensions to the protocol
  - Technology controlled by a single company - Echelon
- LonWorks does not lower costs
  - Device components (Neuron, transceivers)are more expensive but competition may keep device costs low
  - Network Integrators estimate that installing and staring up a Lon project is 30% more labor than a proprietary system
- LonWorks allows for integration but does not make devices interchangeable
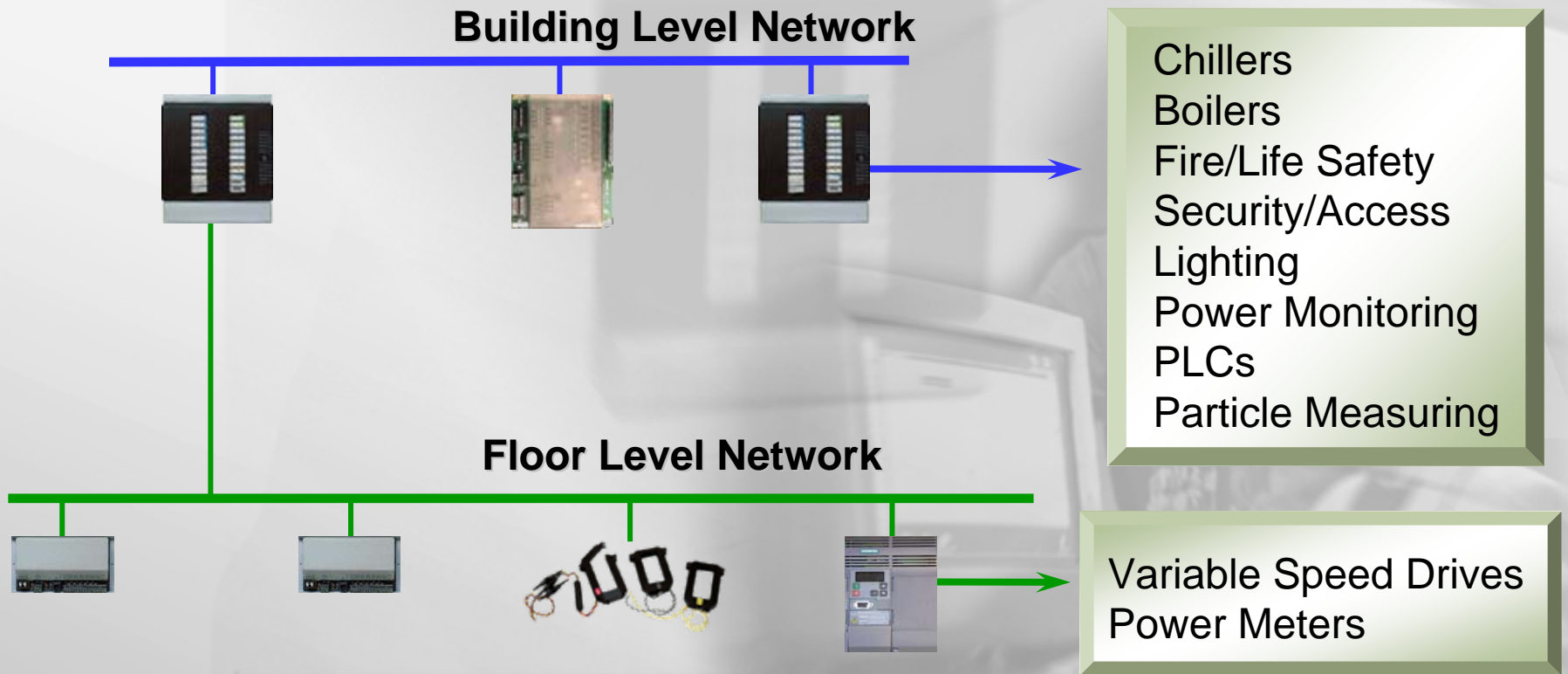
Why have we implemented LonWorks as an option?

- **Minimize cost to customers**
  - doesn't require upgrade or replacement of entire system
  - option for APOGEE

- **Receive benefits of technology**
  - add LonWorks devices to system and receive integration benefits

- **Provide customers with options**
  - don't have to use LonWorks if it doesn't provide a customer with benefits
  - system and strategy is flexible to add future technologies

Open Systems are created by: Alliances & Partnerships
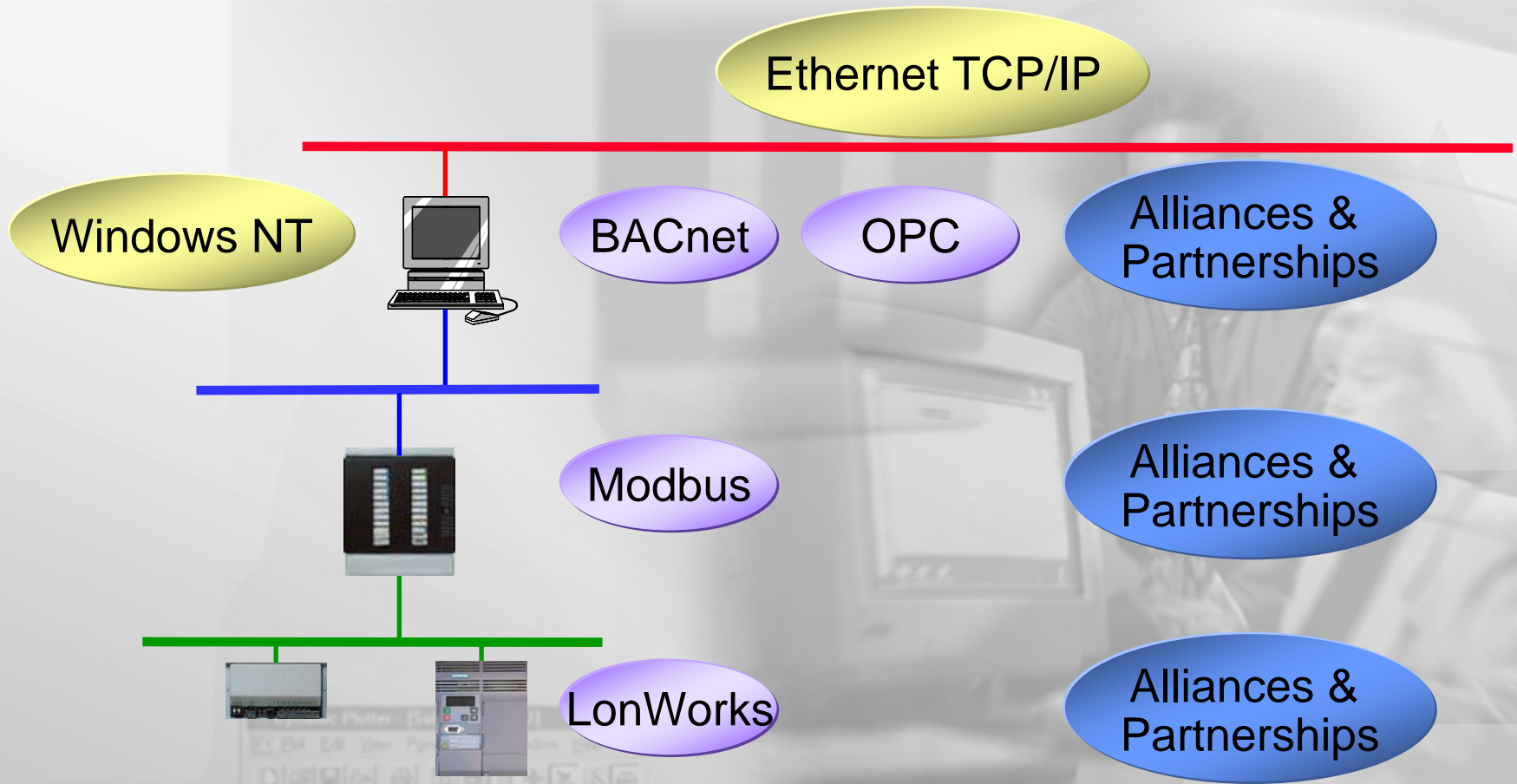
- Why?
  - communication with other systems that don't support standards

- Examples:
  - Legacy systems
  - Critical operation systems

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Alliance & Partnerships

Building Level Network

Chillers
Boilers
Fire/Life Safety
Security/Access
Lighting
Power Monitoring
PLCs
Particle Measuring

Floor Level Network

Variable Speed Drives
Power Meters

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APOGEE leverages all the best technology developments to meet facility needs

Ethernet TCP/IP

Windows NT

BACnet

OPC

Alliances & Partnerships

Modbus

Alliances & Partnerships

LonWorks

Alliances & Partnerships

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What's the APOGEE advantage?

1. <u>Open means options</u> - providing a system that uses only a single standard protocol doesn't provide options

2. <u>Investment protection</u> -APOGEE methodology adds backwards compatibility and future additions to "open"

3. <u>Flexibility</u> to provide solutions to specific customer needs – by having multiple options

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Realities of Multi-vendor systems

- APOGEE is an open system, but not every customers should integrate

- Adding vendors always complicates the operation of a facility.

- Unless a customer has a specific tangible goal in mind, the costs may outweigh the benefits of bringing more vendors on site.

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Questions ???