



# Device Networks and the Internet

Lawrence Chan

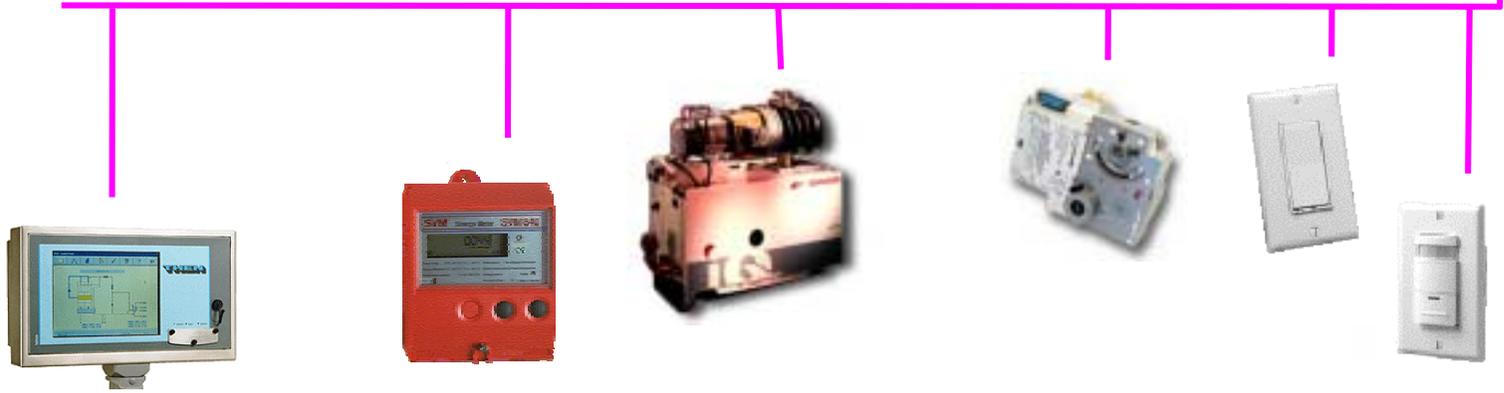


Imagine a world where everything is smart

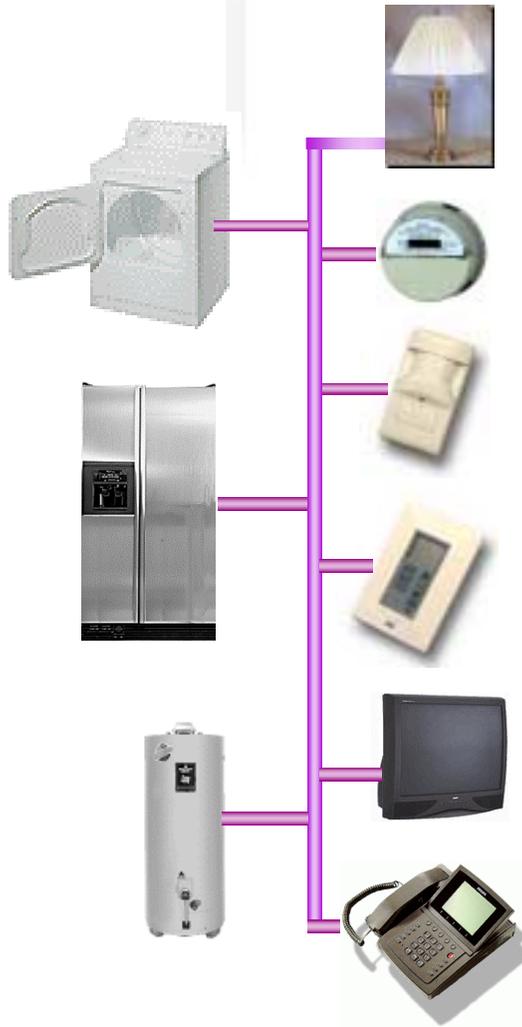




where everything is connected

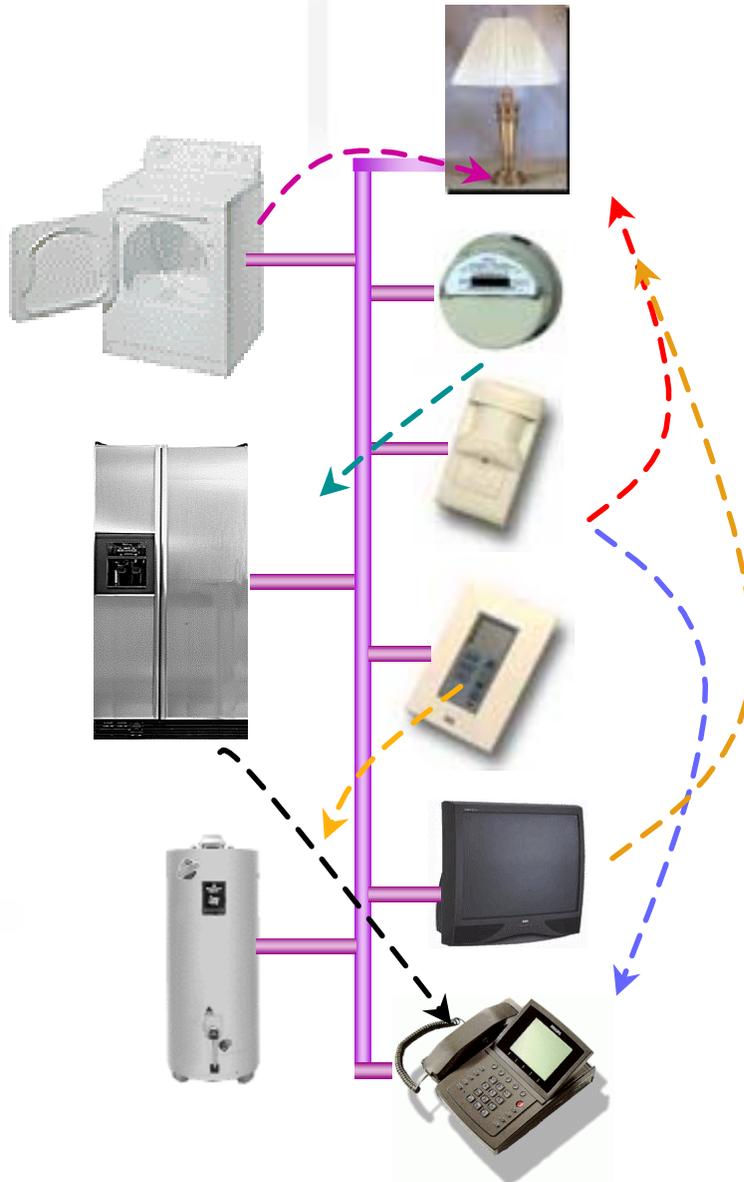


# All Kinds of Everyday Devices



- White goods
- Heaters and air conditioners
- Lights
- Pumps and motors
- Electricity meters
- Security systems
- Train brakes
- Gates and garage doors
- Conveyor belts
- Medical alarms
- Window shades
- Elevators
- ...

# That Interoperate to Lower Cost, Add Value, Increase Comfort



- Completion of drying cycle flashes lamp inside home
- Time of day pricing change changes defrost cycle
- Motion alarm triggers lamp and generates remote alarm message
- Away mode of thermostat changes hot water temperature to save energy
- Activation of TV lowers room lights
- ...

# Open Systems Promise



- Owners are attracted to the “Promise” of Open Systems
  - Better Value for the Entire Building Life Cycle
  - More and better choices
  - Faster Innovation

# Open Systems Defined

- **Open building systems are created using the products and systems from multiple vendors that, as a system, offer greater flexibility, easier management, higher levels of scalability, and lower life cycle costs**

# Open Systems

## A Control Systems Evolution

Master/slave



Distributed systems

Stand-alone controllers

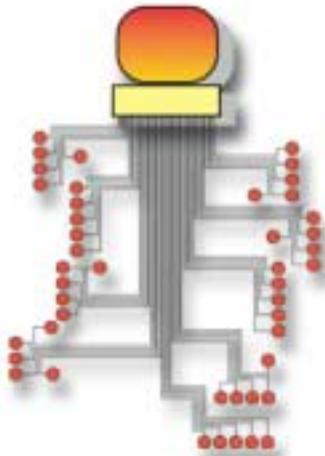


Networks

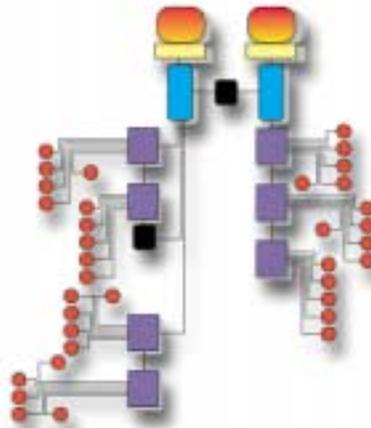
Closed, single-vendor



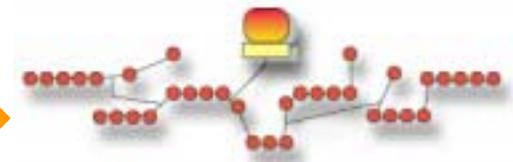
Open, multi-vendor



Centralized  
Home-run Wired



Tiered Islands of  
Proprietary Sub-systems



Flat, open,  
multi-vender

# Open Systems Architecture

## *A Better Building Control Model*

Building Management Applications

*Network Operating System*

PC's/TV's/VCR's



HVAC Components



Lighting Components



Security Components



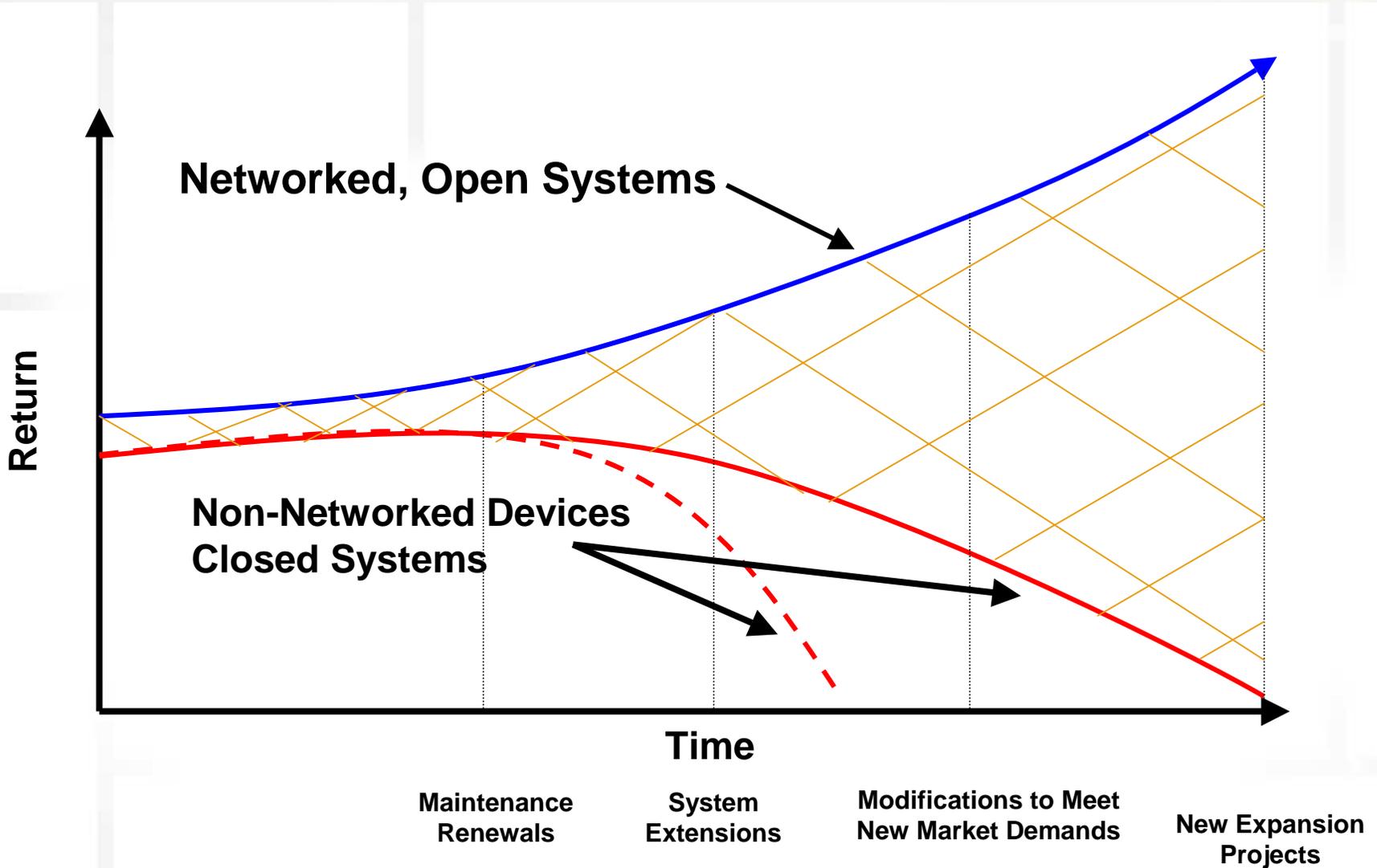
Elevators



G/W/E meters

Open BAS

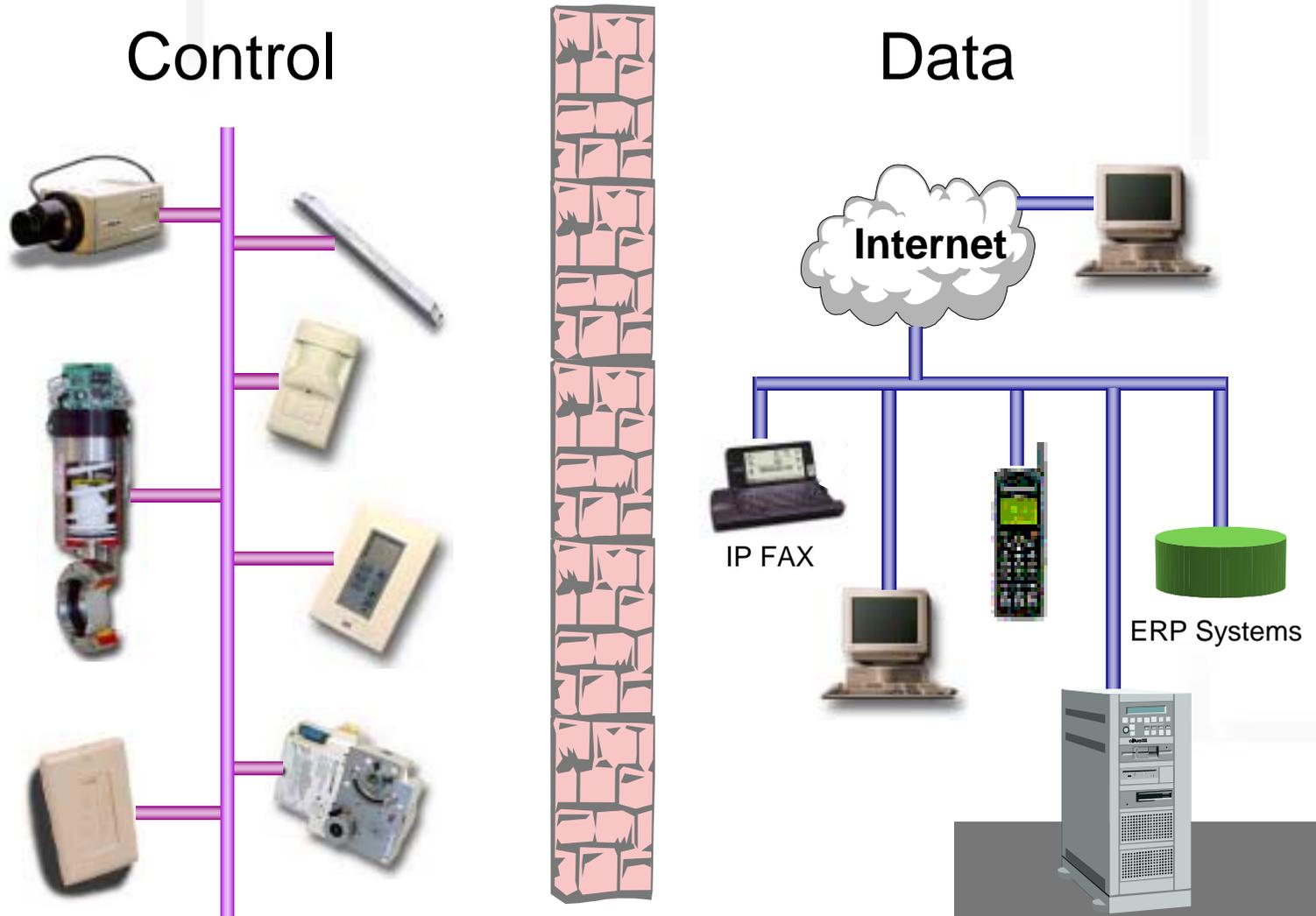
# Networked Devices Delivers Results



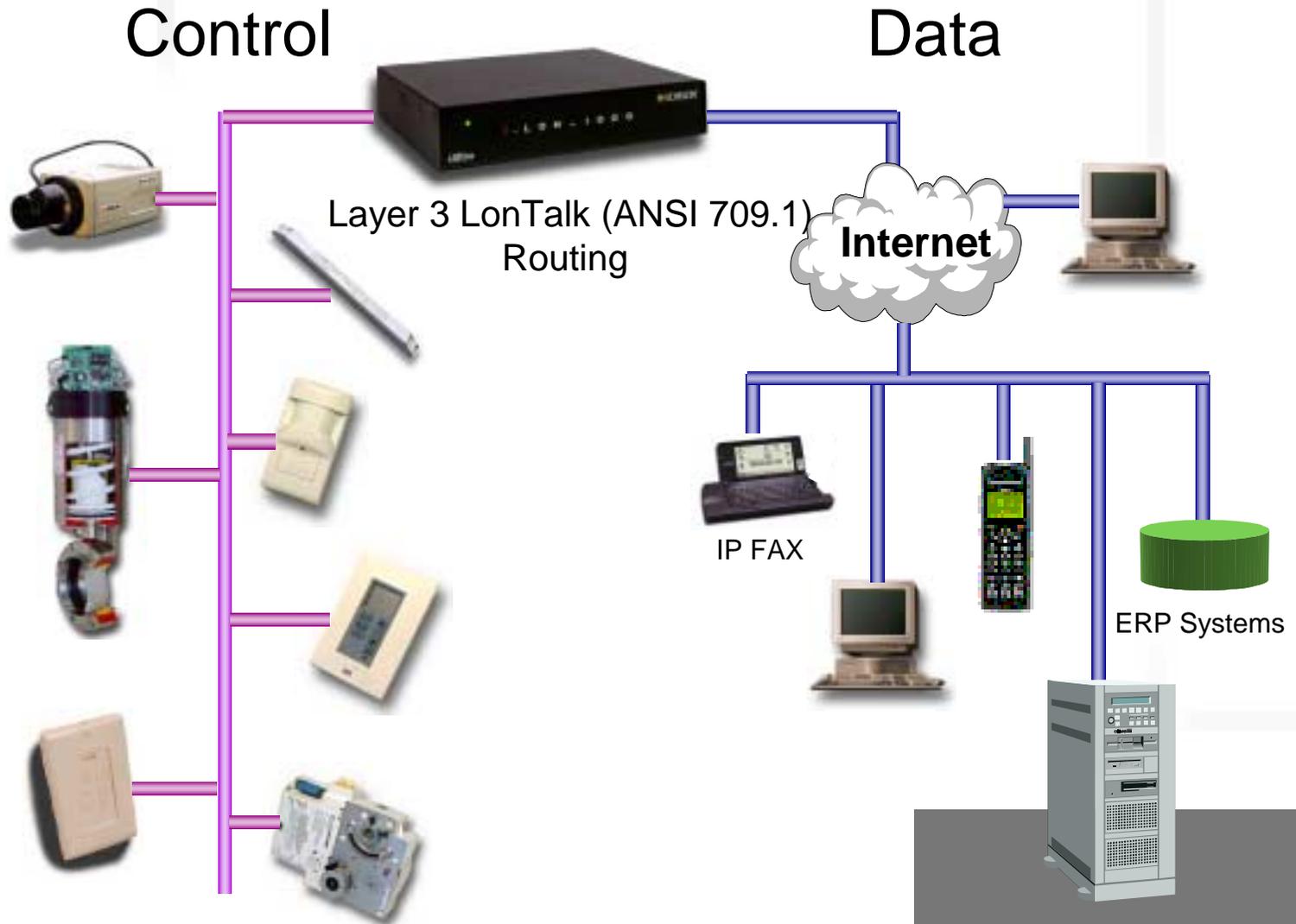
# Open Systems *Create Opportunity by ...*

- Providing a standard *system* architecture
- Allowing a comprehensive solution from Device to Enterprise Integration
- Creating a common tool platform across multiple manufacturers products
- Simplifying Adds/Moves/Changes as well as Monitoring, Control and Visualization
- Open Systems are
  - The basis for Innovation, Differentiation, and Competition
  - An opportunity for specifiers, integrators and end-users

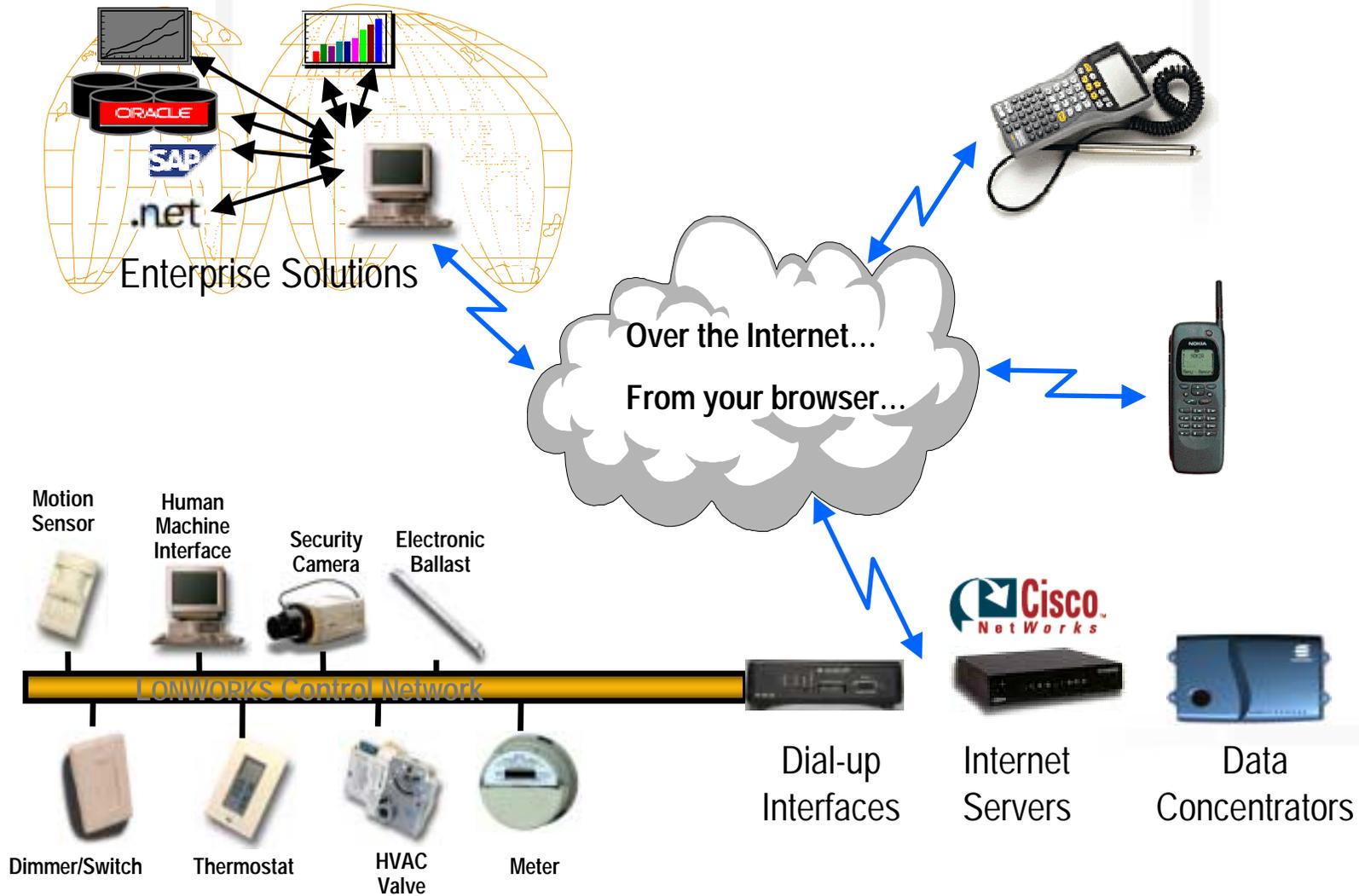
# Two Separate Worlds In Old Days



# Integrated Networks



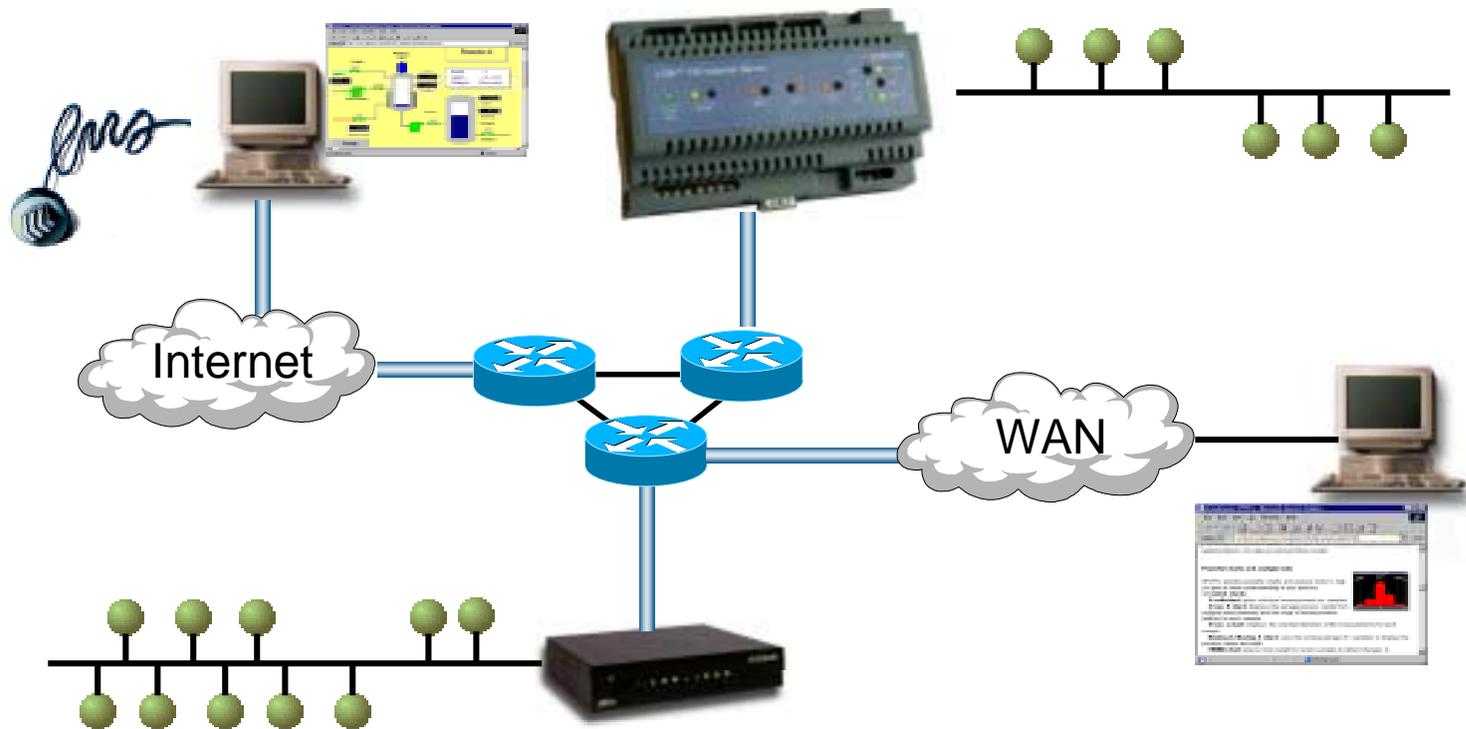
# Leverage the IP Infrastructure ... accessible from anywhere in the world





# Device Networking with Internet

- Bridge the gap between data and control to create a single, cohesive network



# Integrated Network Advantages

- **Complete access**
  - Seamlessly connects control networks to the IP infrastructure
  - Secure access to any device from every corporate desktop or from the Internet
- **All data are visible to higher level systems**
  - Accounting & billing services
  - Help desk & customer support
  - Network management, ...

# Value of Strategic Business Systems

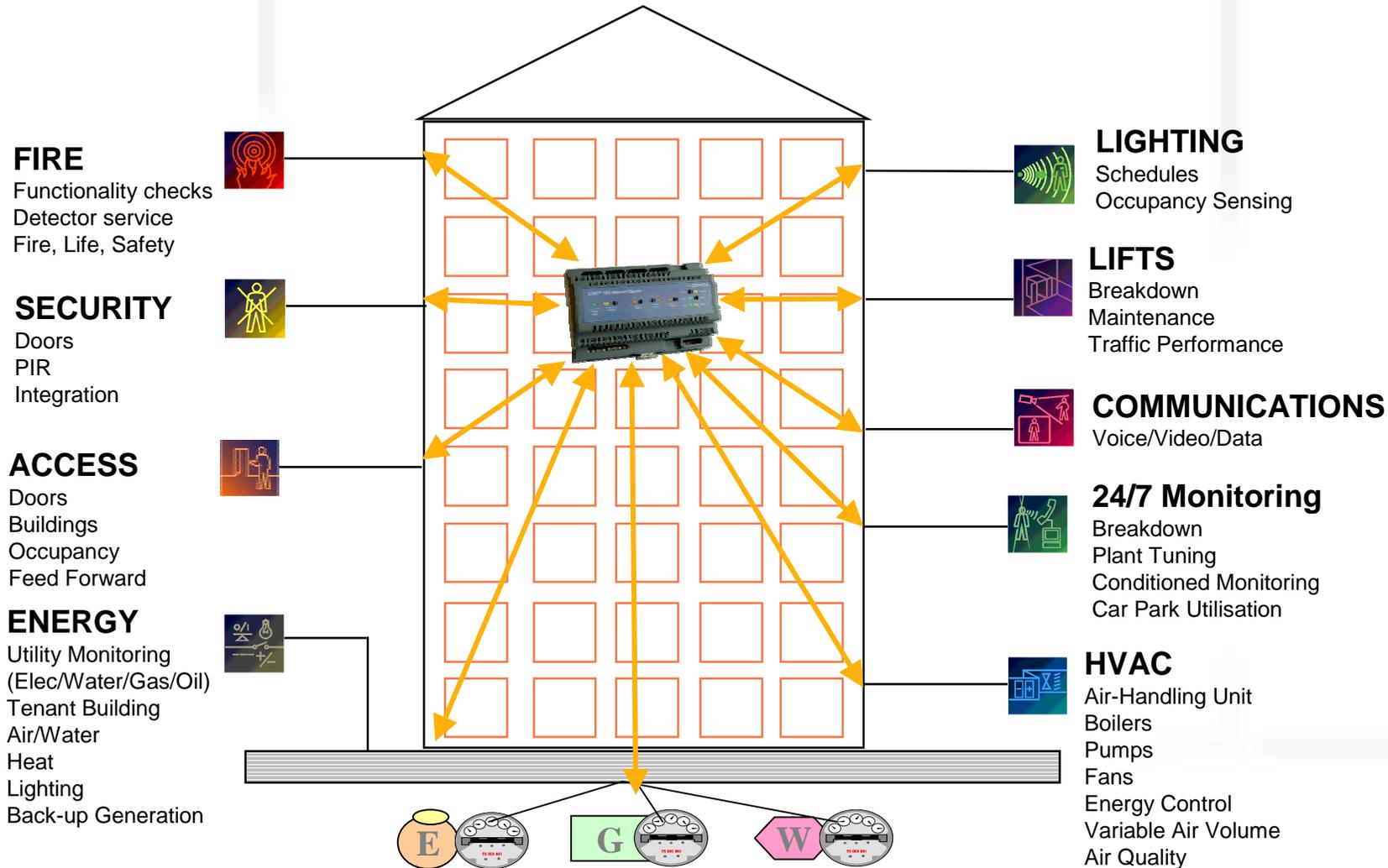
- **Drive down costs**
  - Centralized management (Enterprise Management)
  - Direct sales (E-Business)
- **Increase efficiencies**
  - Streamlined supply and distribution (Supply Chain Management)
  - Integrated business operations (Enterprise Resource Planning)
- **Increase customer satisfaction, revenues**
  - Personalized services (Customer Relationship Management)
  - Responsive, detail-oriented sales experience (Sales Force Automation)
- **Make informed, fact-based decisions**
  - Identify trends and potential problems (Business Intelligence)
  - Managing people resources (Human Resource Management)

# Are Your Facility Costs Significant?

## Costs within facilities

- Energy
- Repair
- Maintenance
- Lost opportunity

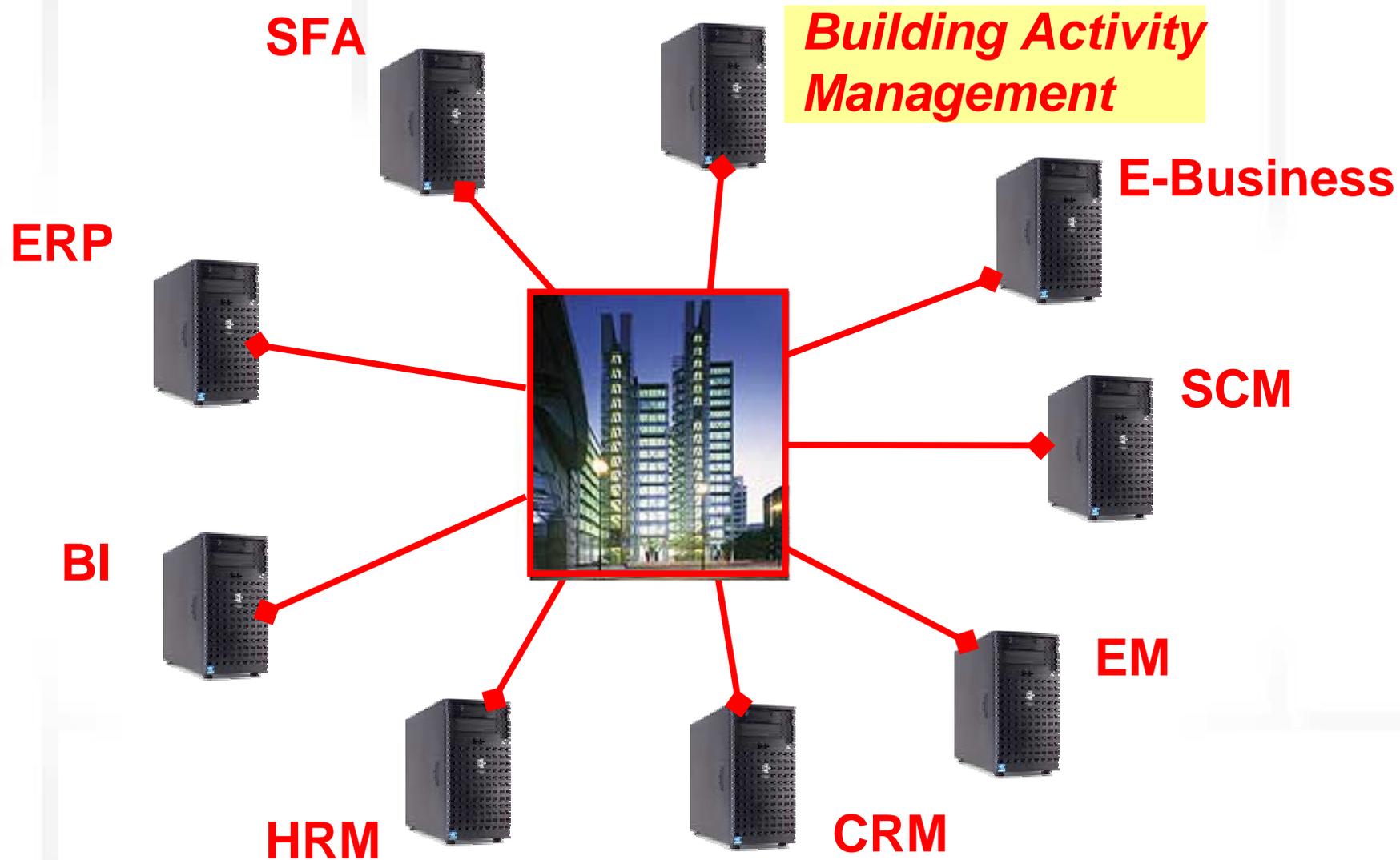
# Managing a Single Facility



# Benefits of Networking a Single Building

- Leverage a common infrastructure
- Energy management and conservation
- Automation of manual activities
- Monitoring and notification of certain conditions
- Preventative and predictive maintenance
- Interoperability among products from multiple OEMs

# Integrating Your Strategic Business Systems



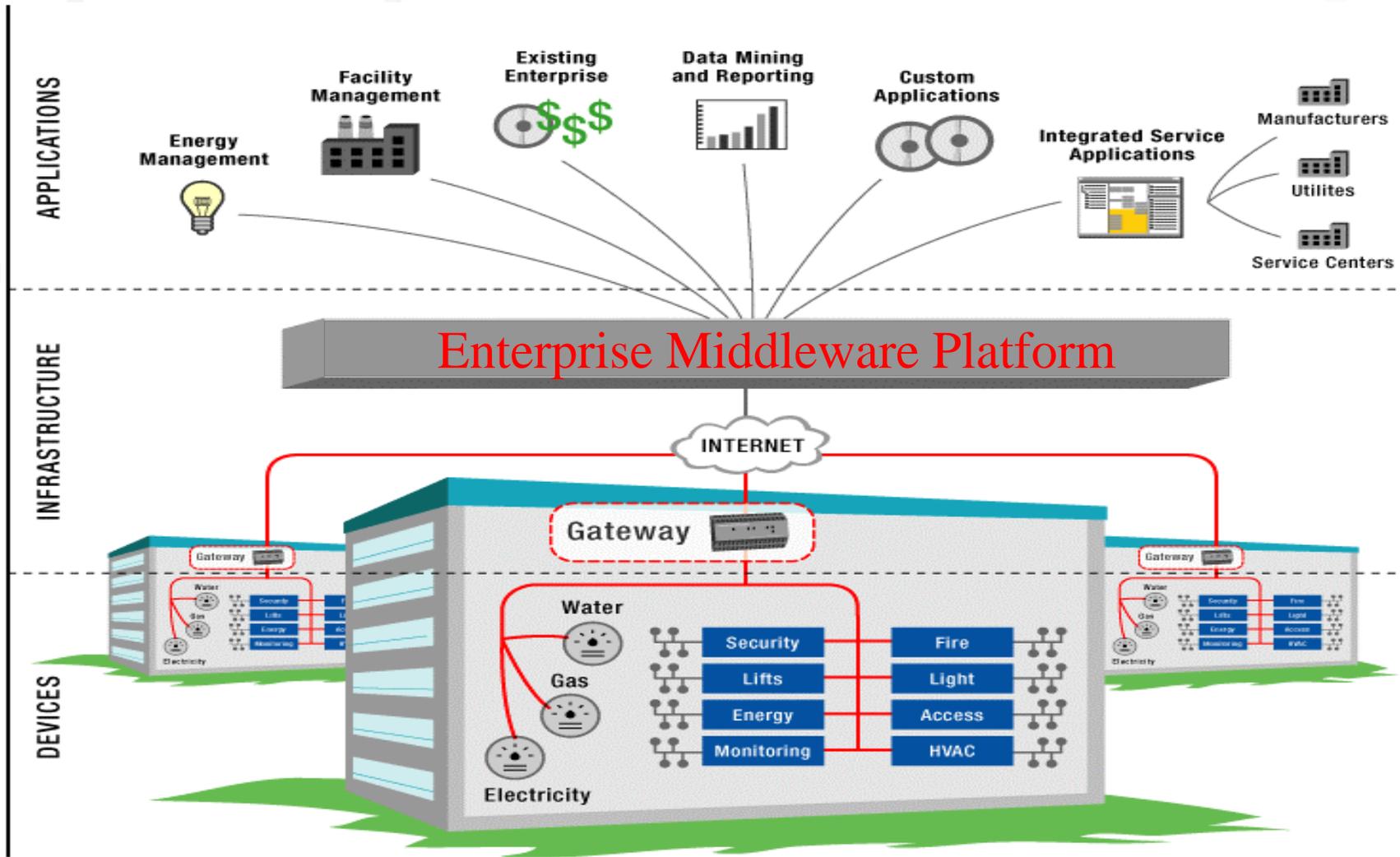
# Benefits of Integrating Your *Entire* Enterprise

- **Understand energy consumption**
  - Identify trends and benchmark operations
  - Uncover and replicate Best Practices
- **Manage energy consumption**
  - Lower total consumption via central management
  - Peak power demand management
  - Prevent inadvertent and undesirable local system overrides
- **Energy procurement**
  - Negotiate better pricing with your utility or utilities
  - Usage strategies

# Benefits of Integrating Your *Entire* Enterprise

- **Remote management**
  - Equipment monitoring and diagnostics
  - Complete management of remote assets from anywhere, anytime
- **Streamline business processes**
  - Integration with existing IT systems
  - Integration with service partners
  - Centralized notification and maintenance dispatch
- **Other things specific to your industry**
  - Verification of signage and lights turned on in a timely manner
  - Enterprise-wide security and access logging
  - Regulatory compliance

# The Infrastructure for Facility Networking



# Device Networking (ANSI 709.1) At Work



Le Musée du Louvre  
Paris, France



7-Eleven Stores  
Japan



Superdome  
Sydney Australia



New York City Transit



Bellagio Hotel  
Las Vegas, NV



Roppongi Hills  
Tokyo, Japan



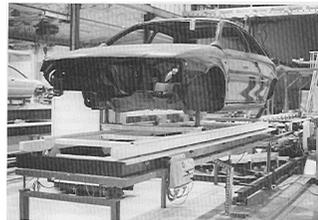
Mass General  
Boston, MA



Samsung Heavy Industry  
Ship Emergency



Edwards High Vacuum  
Semiconductor Pumps



Dürr  
Automotive Painting



ABB  
Motor Drives



Capitolo di S. Pietro,  
Vatican, Rome, Italy



**Thank You**

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