



Device Networks and the Internet

Lawrence Chan

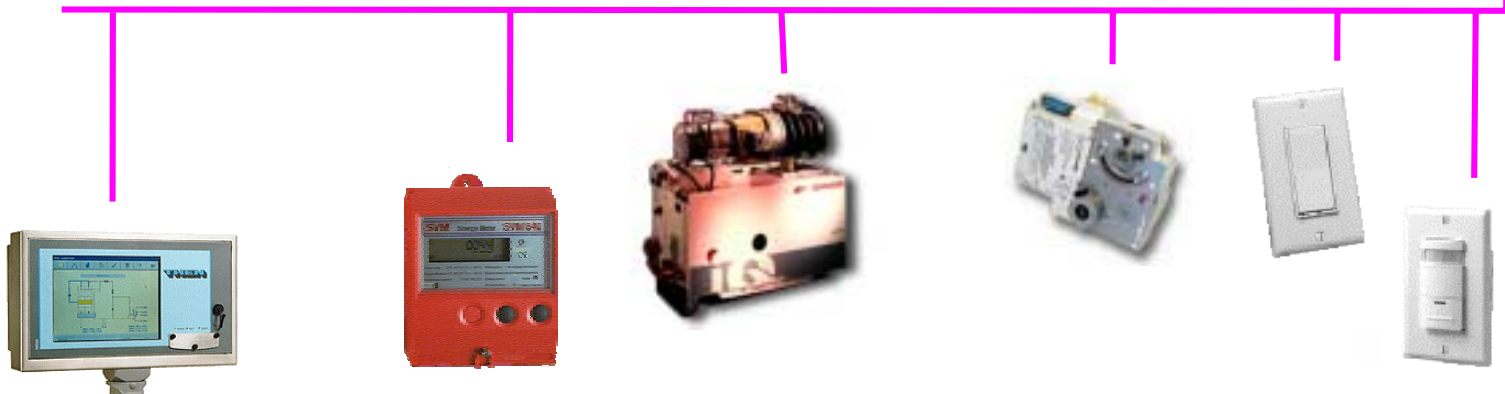


Imagine a world where everything is smart

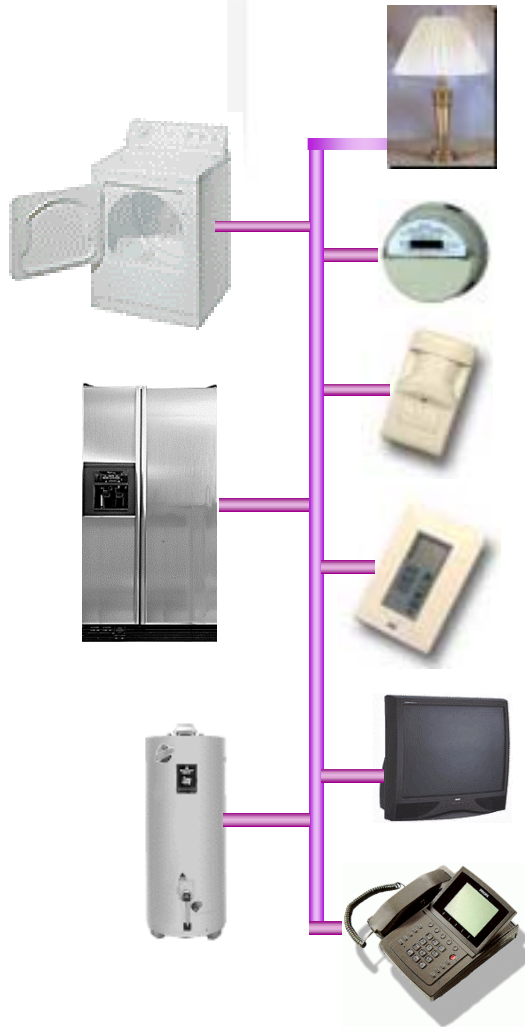




where everything is connected

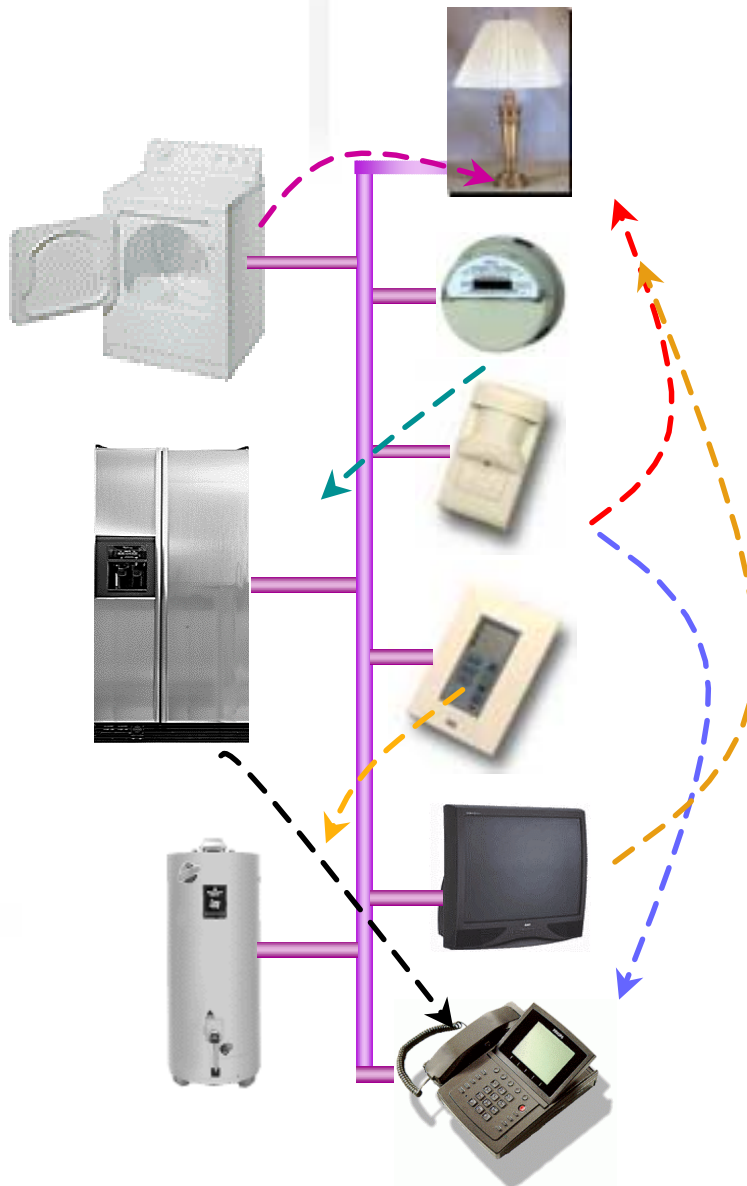


All Kinds of Everyday Devices



- 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

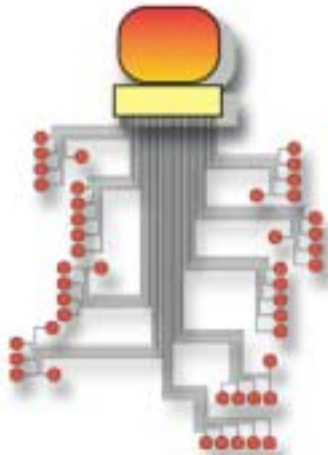


Networks

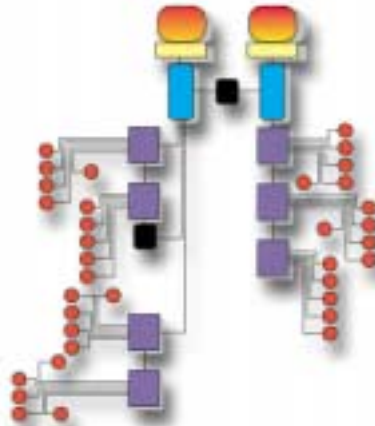
Closed, single-vendor



Open, multi-vendor



Centralized
Home-run Wired



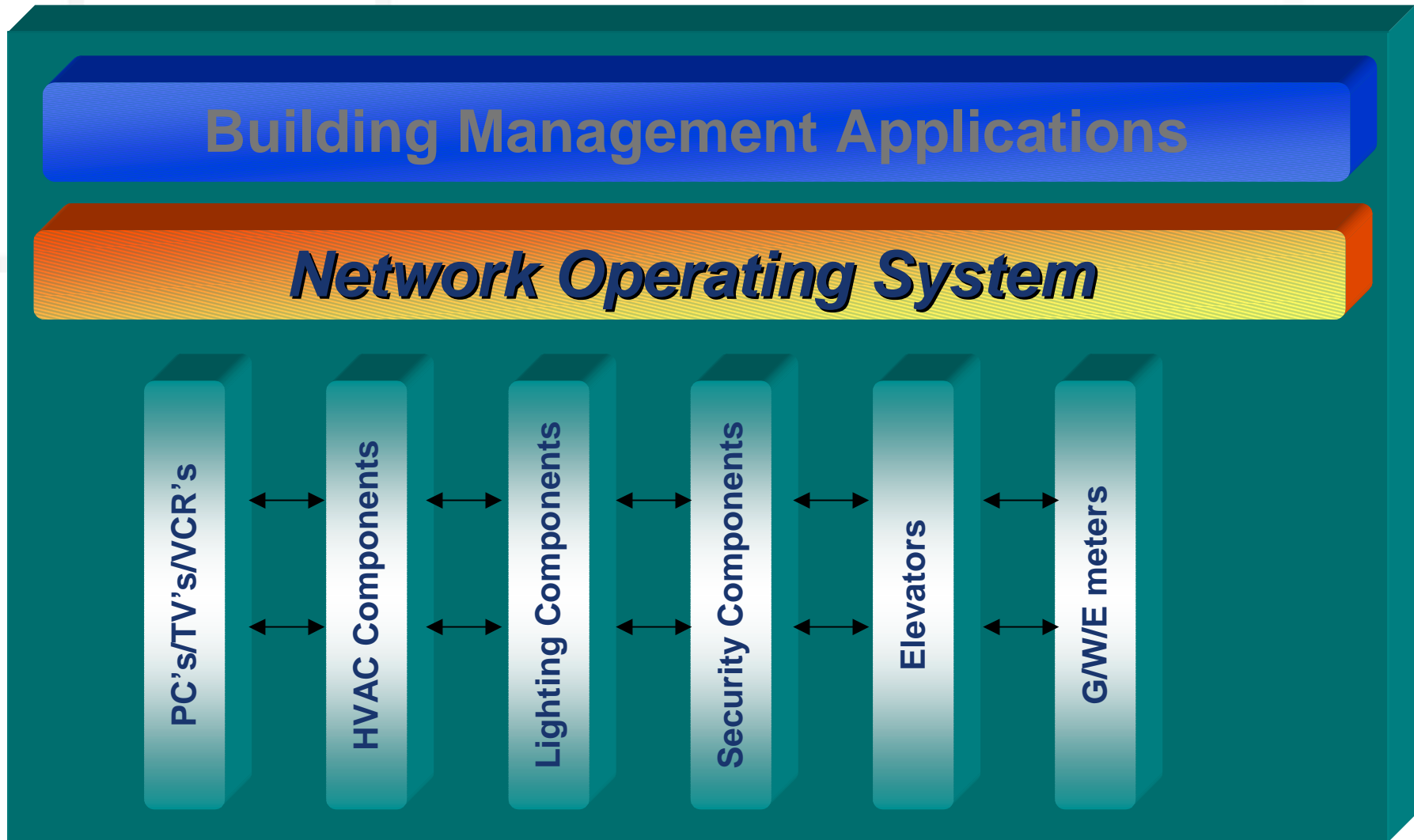
Tiered Islands of
Proprietary Sub-systems



Flat, open,
multi-vender

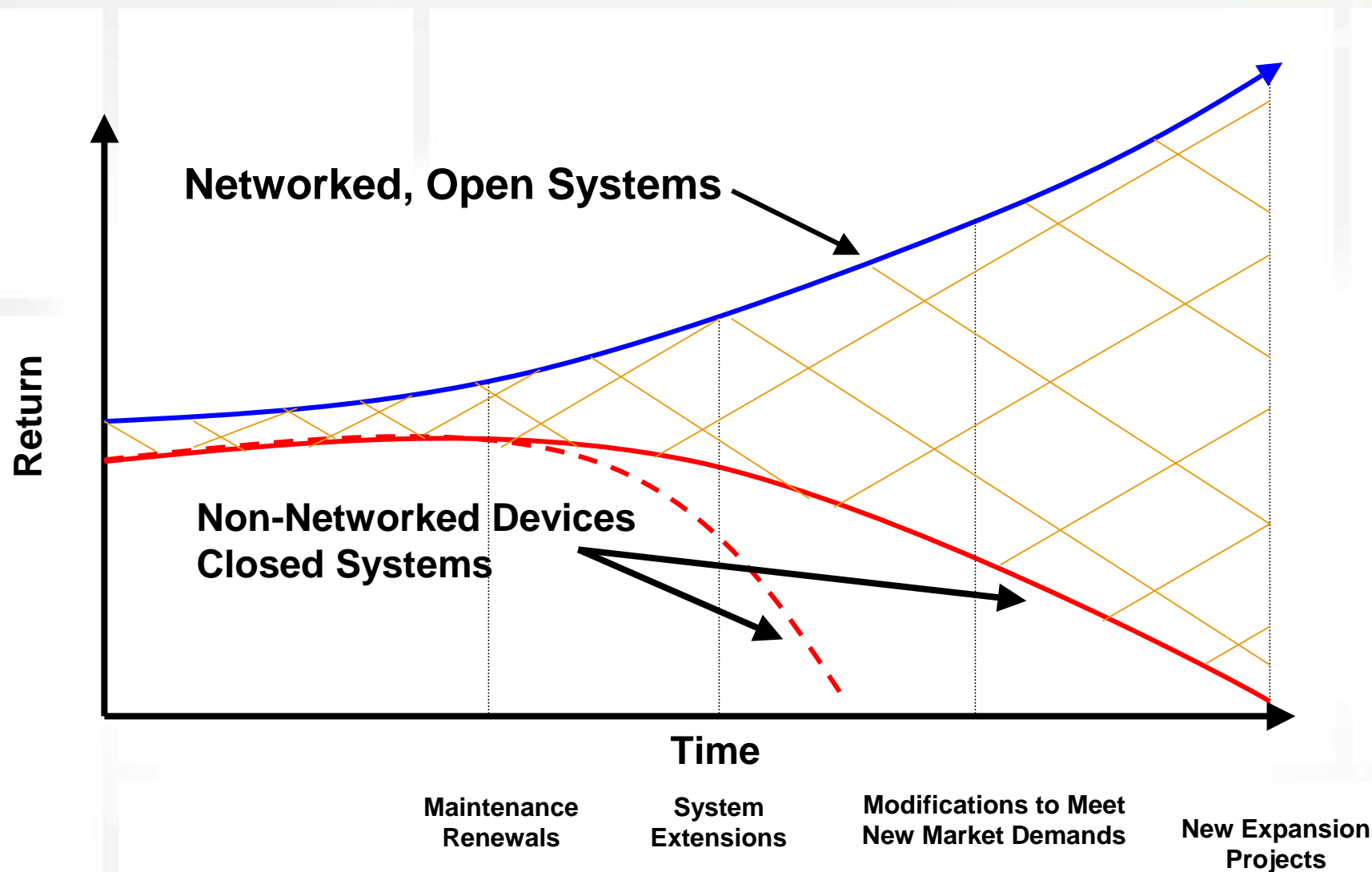
Open Systems Architecture

A Better Building Control Model



Open BAS

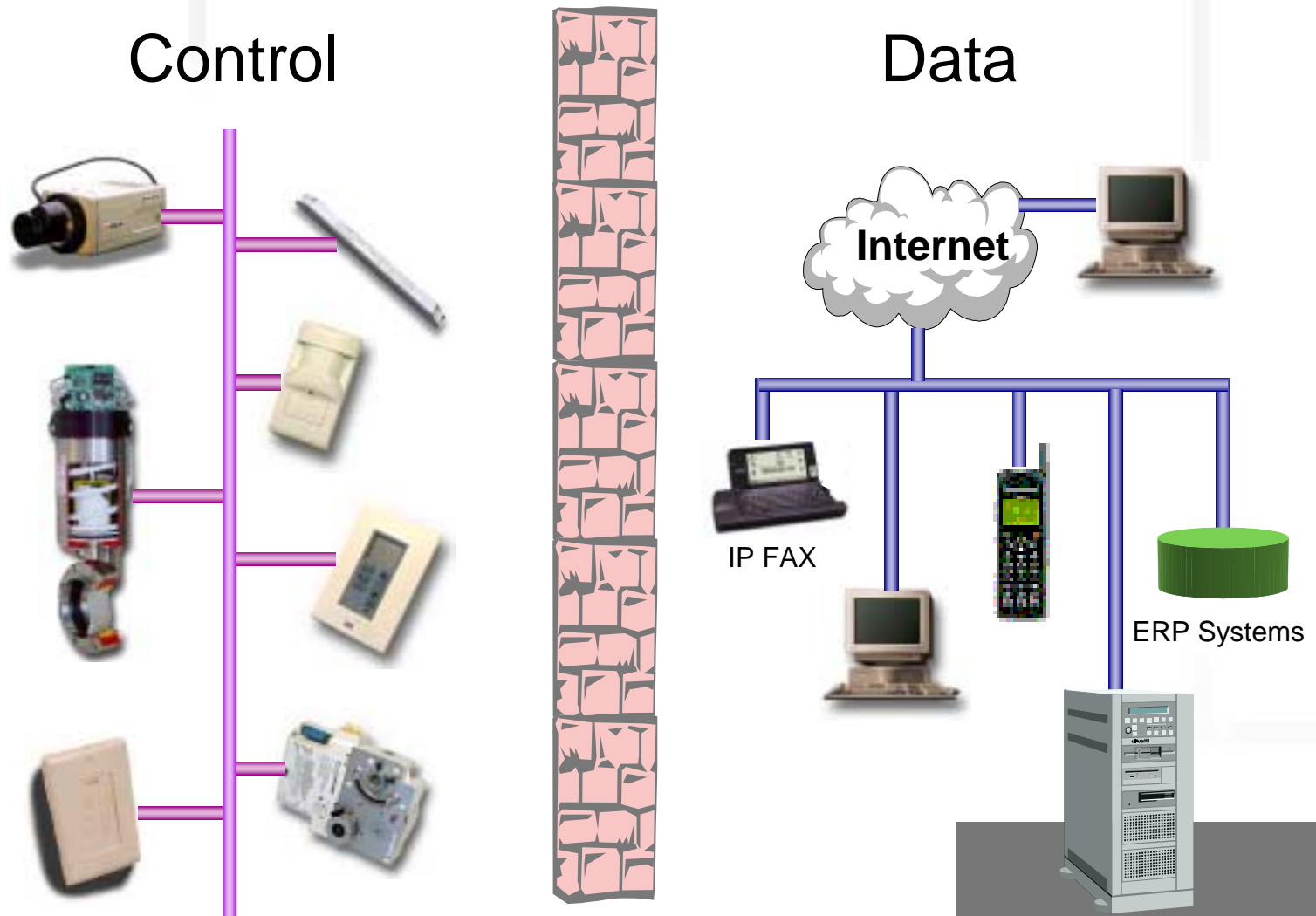
Networked Devices Delivers Results



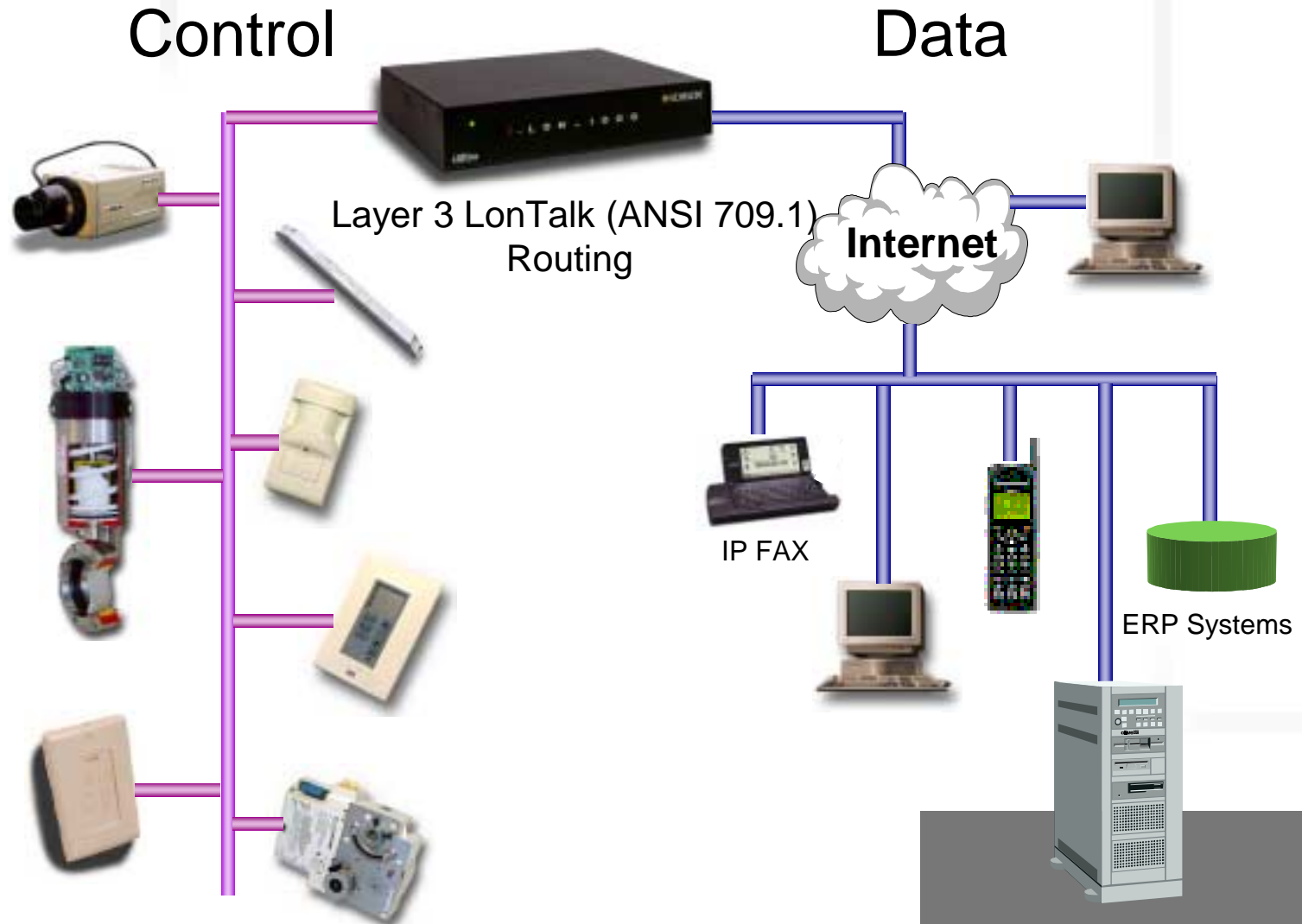
Open Systems *Create Opportunity by ...*

- 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

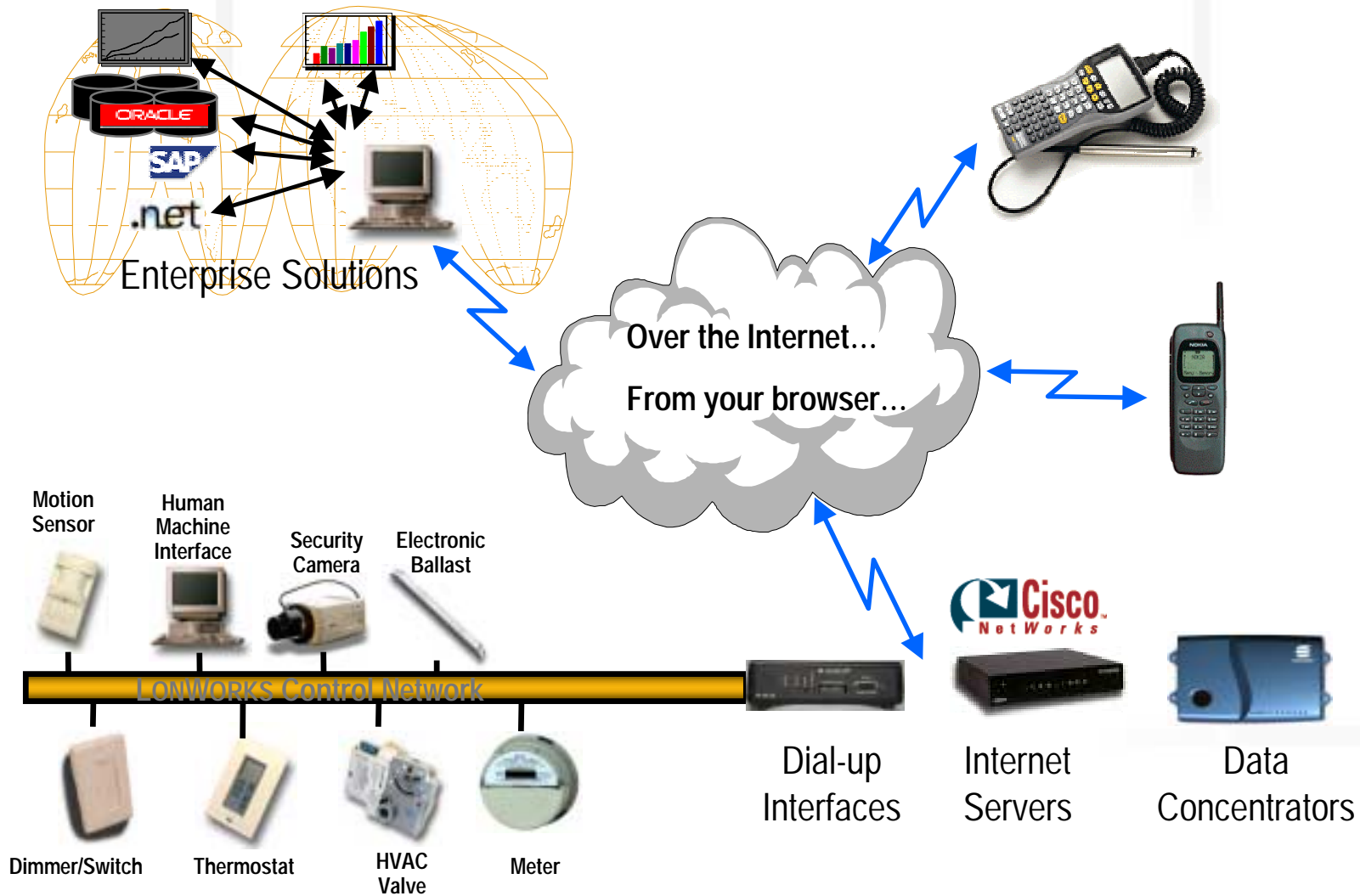
Two Separate Worlds In Old Days



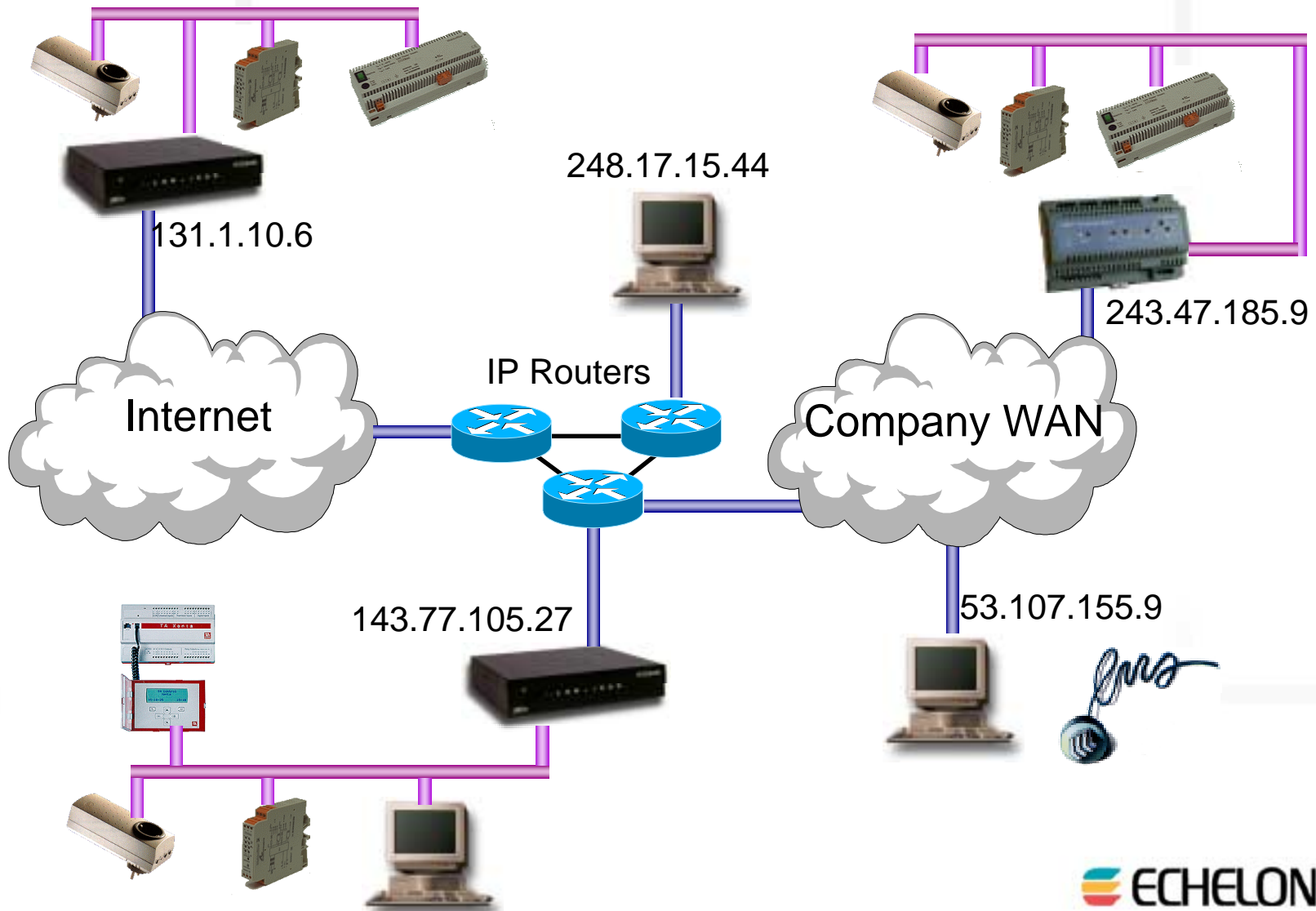
Integrated Networks



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

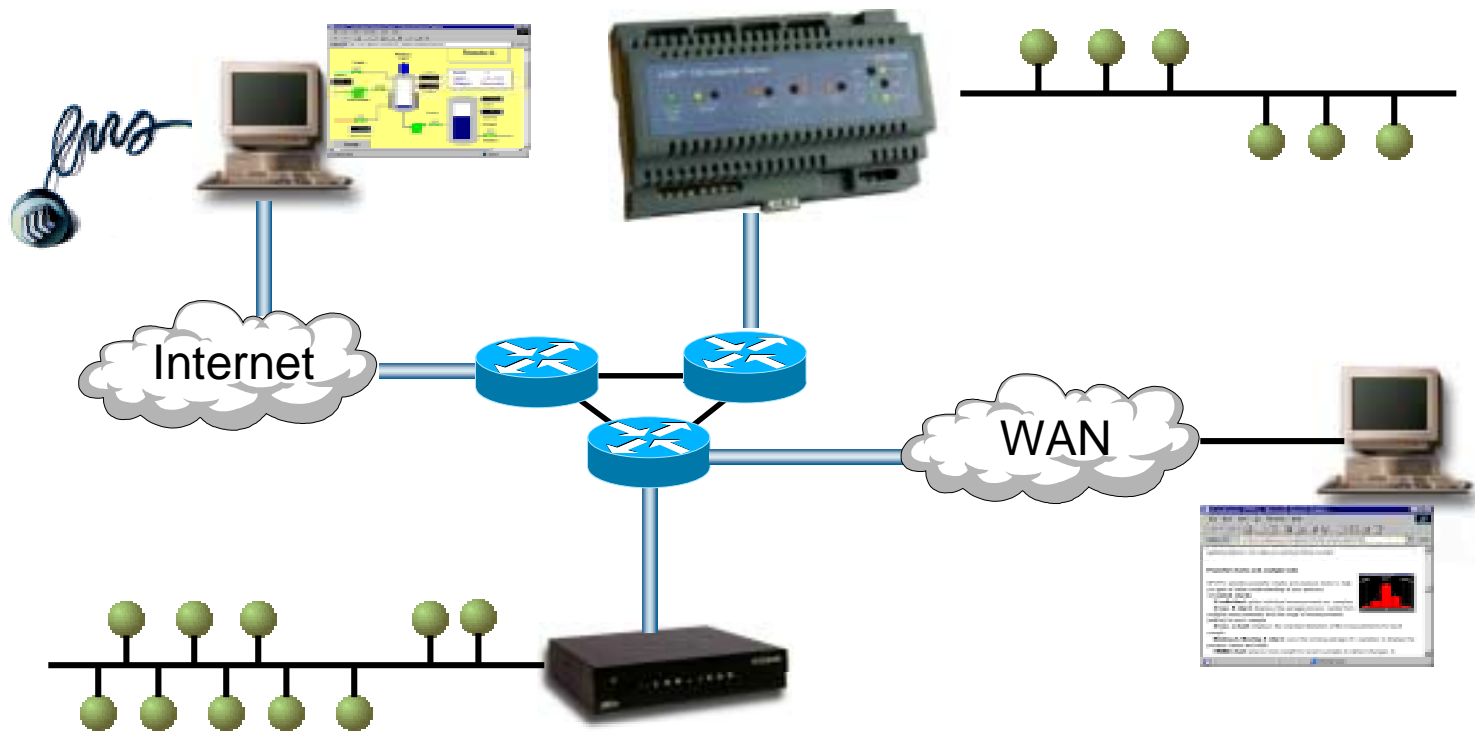


A Single Cohesive Network



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

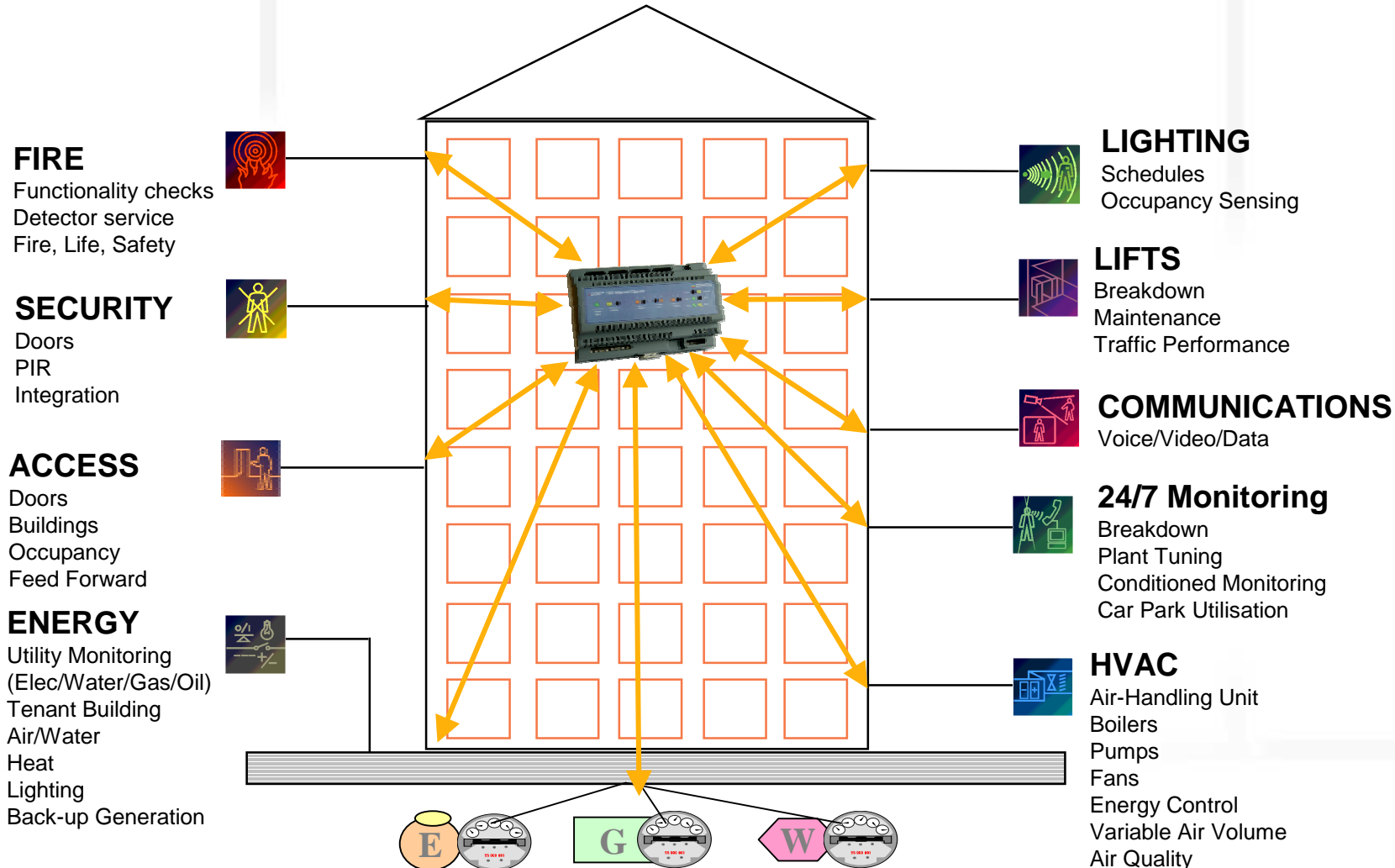
- Drive down costs
 - Centralized management (Enterprise Management)
 - Direct sales (E-Business)
- Increase efficiencies
 - Streamlined supply and distribution (Supply Chain Management)
 - Integrated business operations (Enterprise Resource Planning)
- Increase customer satisfaction, revenues
 - Personalized 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

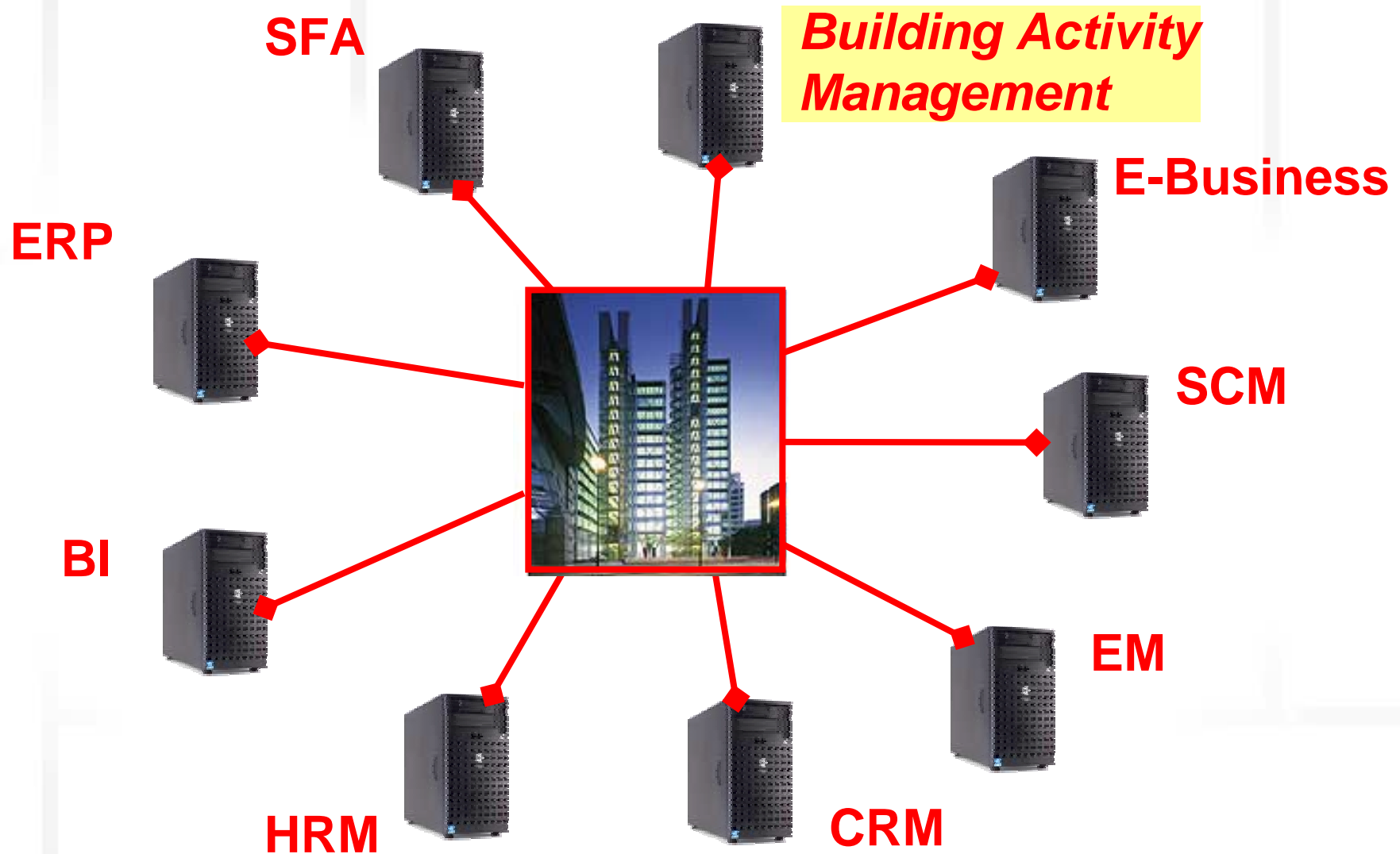
Managing a Single Facility



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



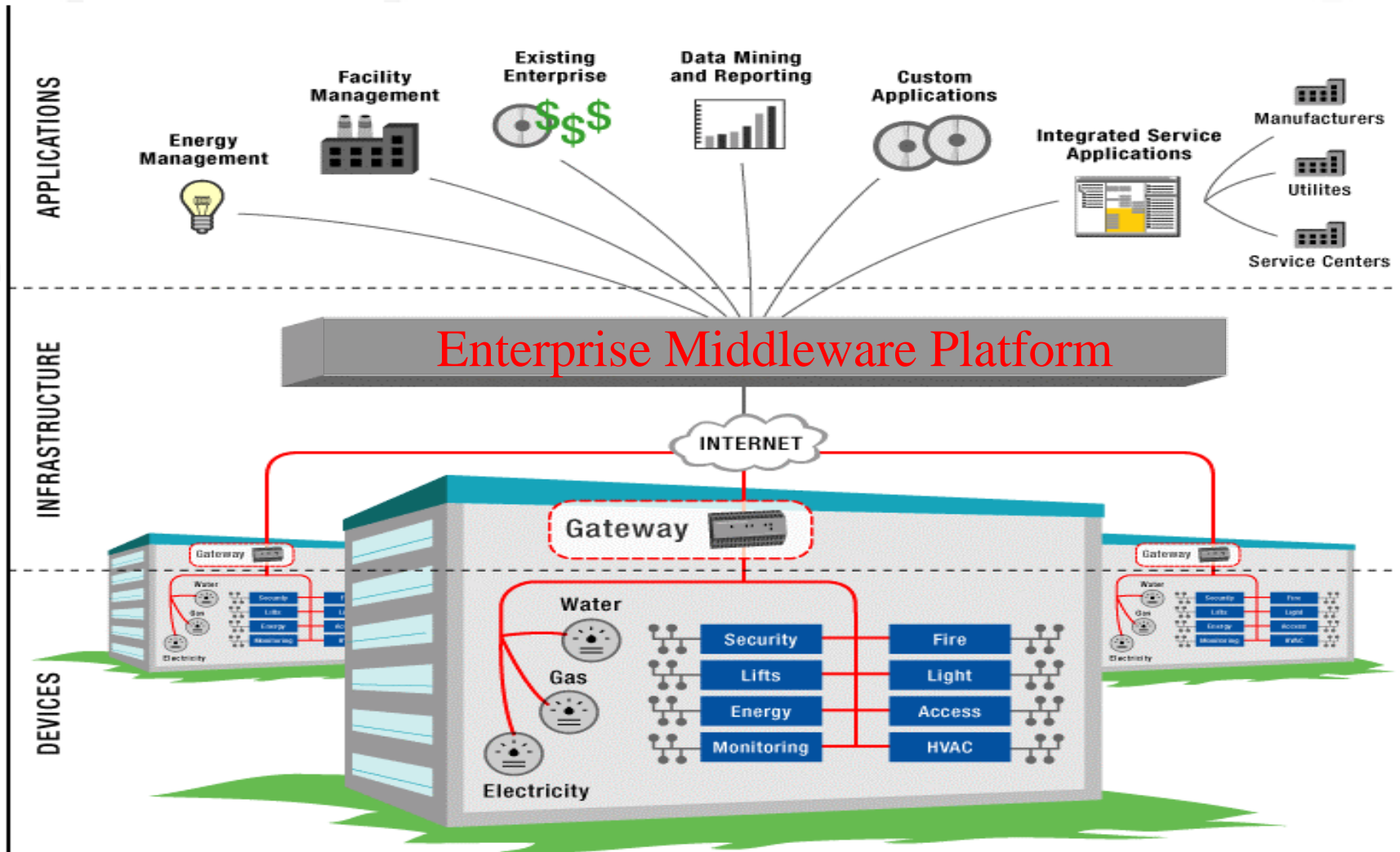
Benefits of Integrating Your *Entire* Enterprise

- **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



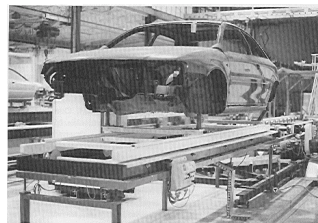
Mass General
Boston, MA



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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