



Energy Management in Large Scale Enterprise Projects

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Agenda



- Addressing the need for advanced EM in modern FM
- Architectures to deliver open, distributed and competitive solutions for the connected real estate market

Echelon Overview



- Founded 1988
- 10 offices worldwide
- Invented the LONWORKS platform, now ISO/IEC 14908
- Over 80 million devices installed
- Multi-industry, multi-national standard



Enterprise Energy Management



- Distributed energy monitoring and management solutions for a wide range of devices and facilities
 - Banks, service stations, postal offices, retail chains, supermarkets, airports, etc.
- Systems based on open and standard technologies, contributing to reaching the **2020** EU program targets
- Demonstrated energy savings up to 25%

General BMS Requirements



Optimal user experience

- Maximum comfort by managing all the controls automatically (lighting, HVAC)

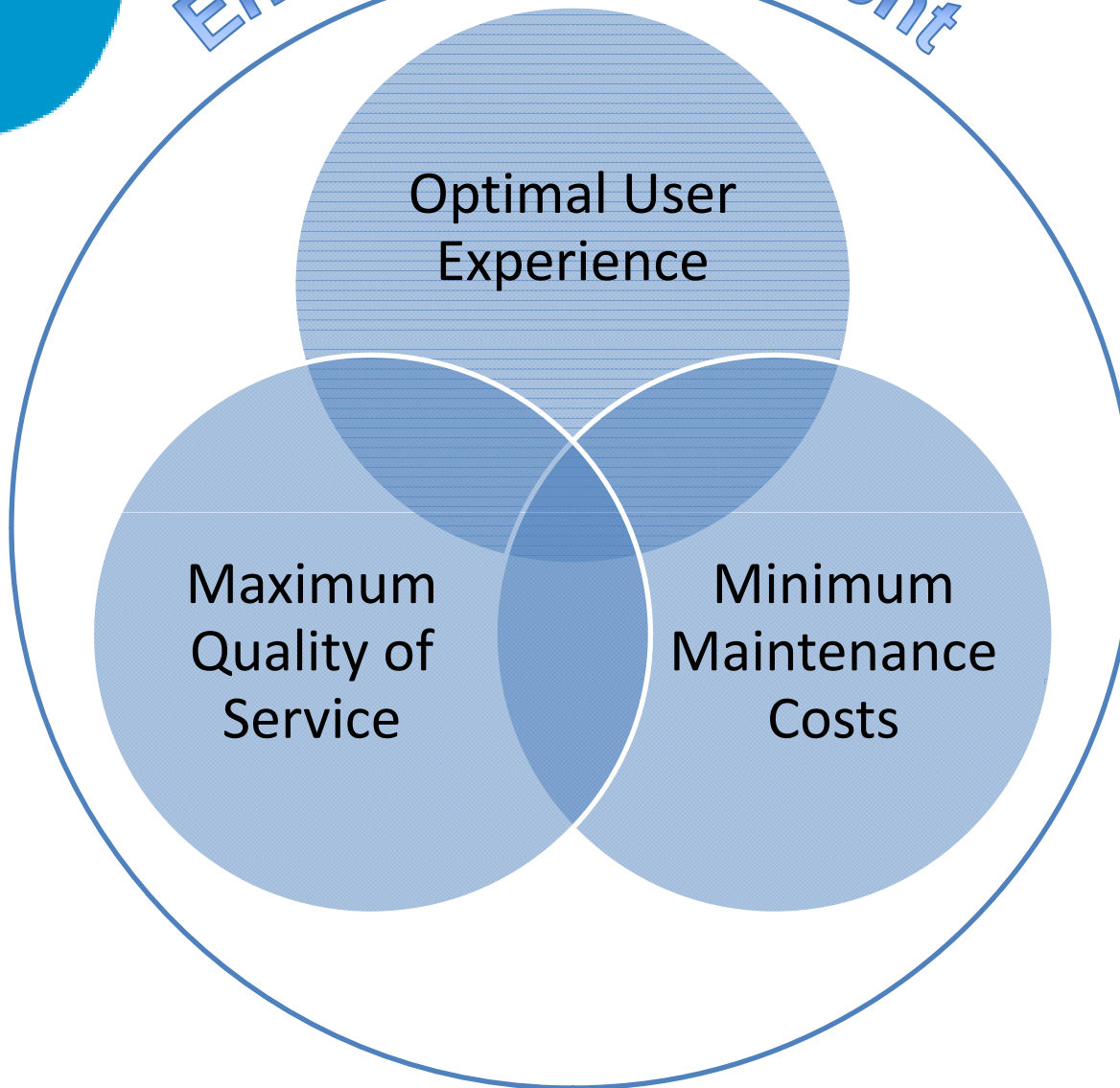
Maximum quality of service

- Remote diagnostics and repair (where possible)
- Preventive and faster maintenance (minimise system downtime)

Minimum maintenance costs

- Service equipment based upon usage rather than time
- Prevent unplanned equipment failures (less maintenance interventions)

Energy Management



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General BMS Requirements + EEM



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Minimum maintenance costs

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Reduction of energy consumption

- Lighting and HVAC off when not needed
- Control based on external environmental factors (temperature, light level, etc.)

EEM Site Requirements



- Energy consumption measurement
 - By single subsystem or for whole site
- Energy consumption control
 - Typically lighting and HVAC systems
- Remote connectivity
 - Visibility into field operations
 - Best practices implementation
 - Minimise energy wastes
 - Maintenance optimisation
 - Failures prevention
 - Notifications of unexpected failures

EEM Energy Services



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Scheduling of routine events

- Resetting thermostats
- Enabling / disabling the security system
- Automatic equipment shut-off and turn-on

Prevent local system mishandlings

- Improper thermostat settings
- Improper outdoor / parking lot lighting overrides
- Improper signage lighting

Peak power demand management

- Scheduled load shedding or peak shaving

Energy Services



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- Peak power demand management
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- Minimise impact on users

Four Steps to EEM



Choose what to control

- HVAC, Lighting, Power

Installation

- SmartServer automatic discovery and commissioning
- Simple replication

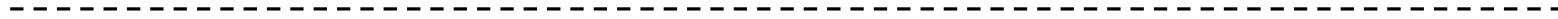
Local Management

- Embedded UI for instant access

Remote Management

- Web services integration
- Scheduling, trending, alarming

System Architecture



...

Site n

Site n+1

...

Local Devices

- HVAC
- Lighting
- Energy measurement modules
- Analog and Digital I/O modules

Local Devices



Locally manage

- Alarms
- Trends
- Schedules
- Control Logic
- Protocol conversion



(Meter)



LON

Temperature and Humidity sensors



Temperature Set-points



Ventilation

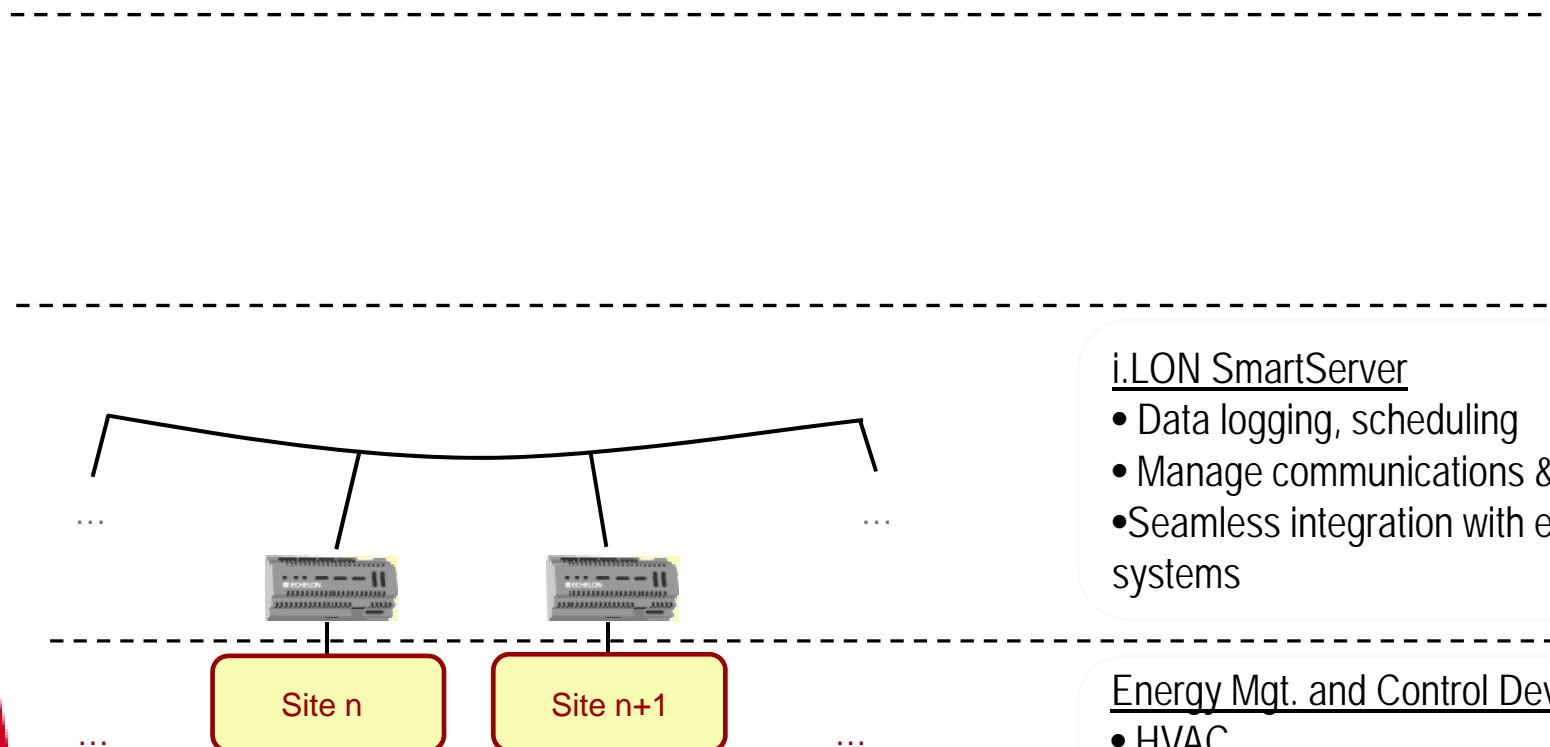


Lighting



Outdoor Lighting

System Architecture



i.LON SmartServer

- Data logging, scheduling
- Manage communications & alarms
- Seamless integration with existing IT systems

2

Energy Mgt. and Control Devices

- HVAC
- Lighting
- Energy measurement modules
- Analog and Digital I/O modules

1

i.LON SmartServer 2.0



- Built-in alarming, scheduling and trending
- Support for LonWorks, ModBus, M-Bus and RS-485 devices
- Easily extendible functionality
 - Programmable modules architecture



i.LON SmartServer

i.LON SmartServer 2.0

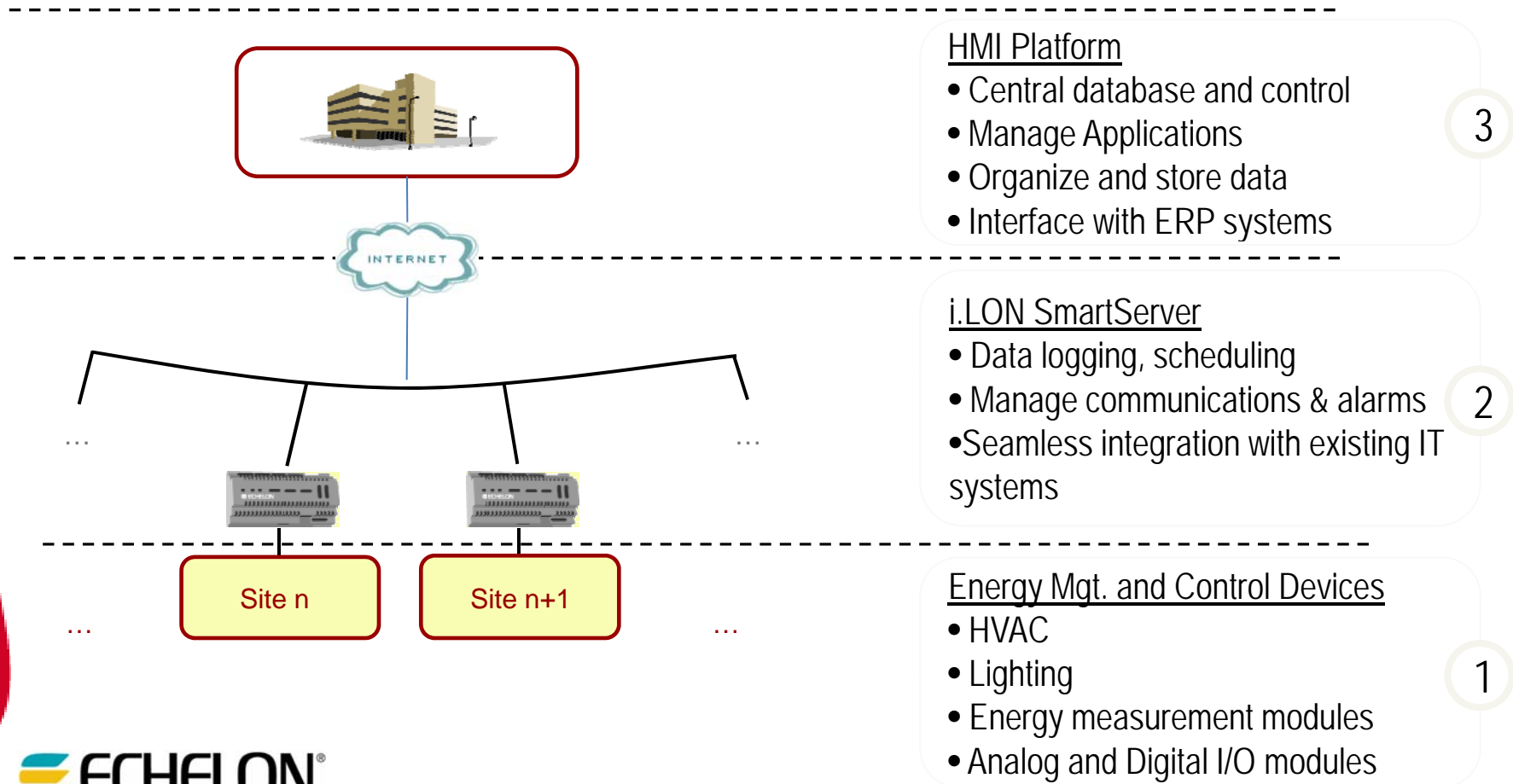


- Deployment services
 - Rapid, remote deployment of i.LON devices
 - Standards maintained with templates
 - Change management with automatic update capabilities
- High performance monitoring and control
- TCP/IP connectivity
 - Powerful SOAP/XML API

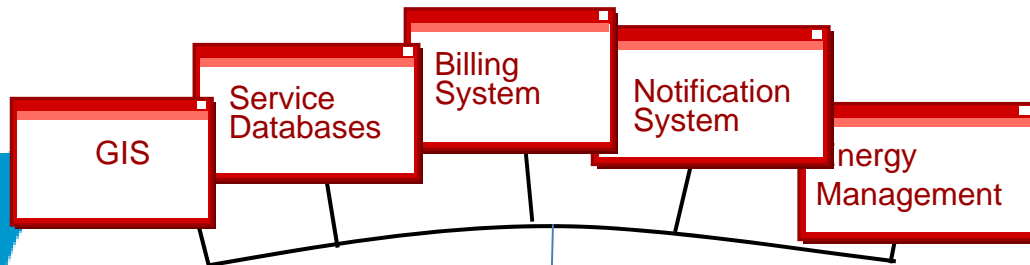


i.LON SmartServer

System Architecture



System Architecture



ERP System

- Energy management
- Maintenance systems
- Billing services
- ...

4



HMI Platform

- Central database and control
- Manage Applications
- Organize and store data
- Interface with ERP systems

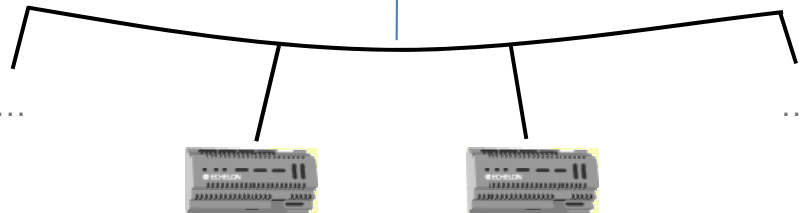
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i.LON SmartServer

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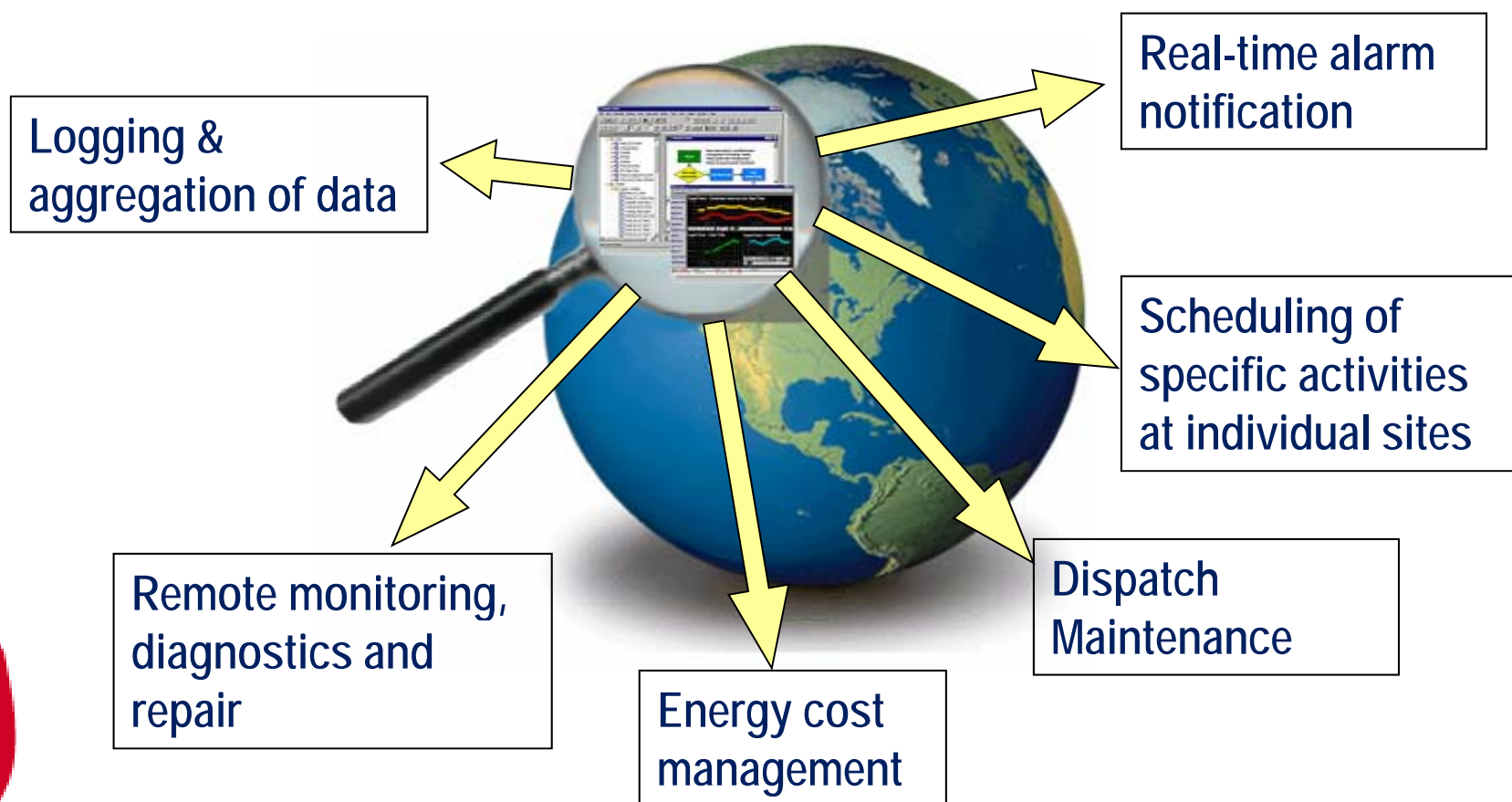


Remote Connectivity



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Efficiently manage a multi-area control network





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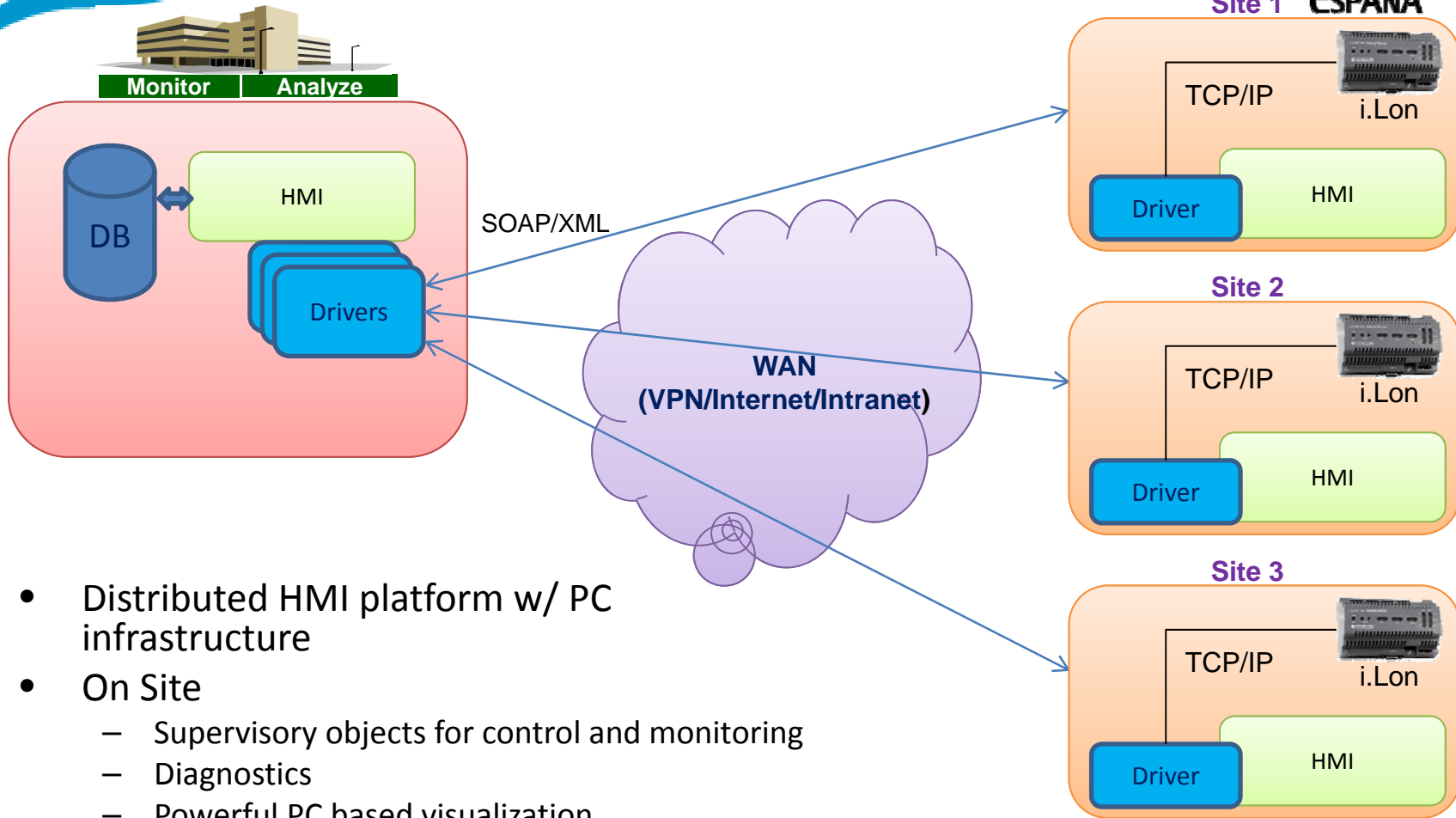
ARCHITECTURES

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Large Facilities



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Site 1 ESPAÑA

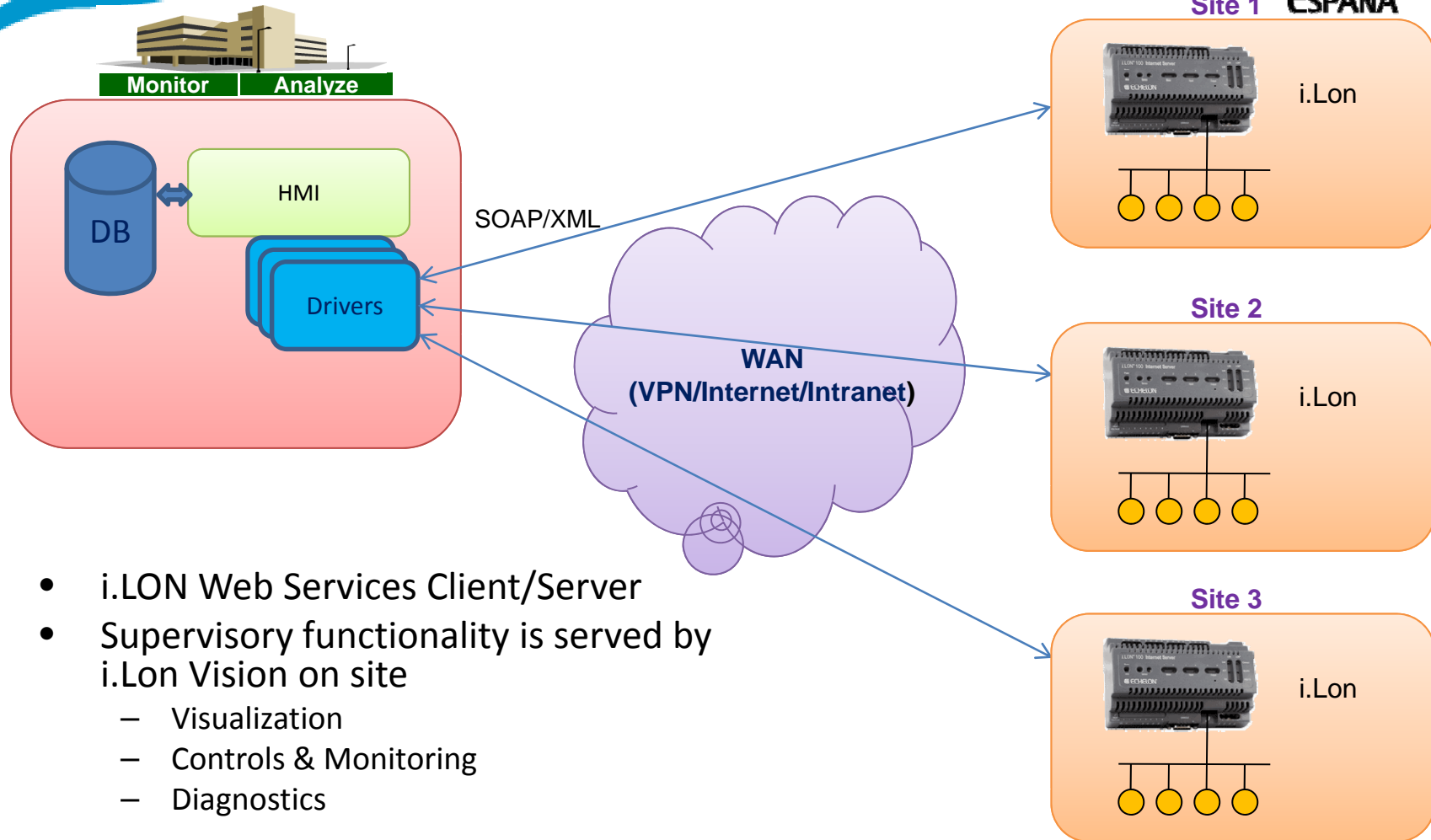


- Distributed HMI platform w/ PC infrastructure
- On Site
 - Supervisory objects for control and monitoring
 - Diagnostics
 - Powerful PC based visualization

Smaller Facilities – 1



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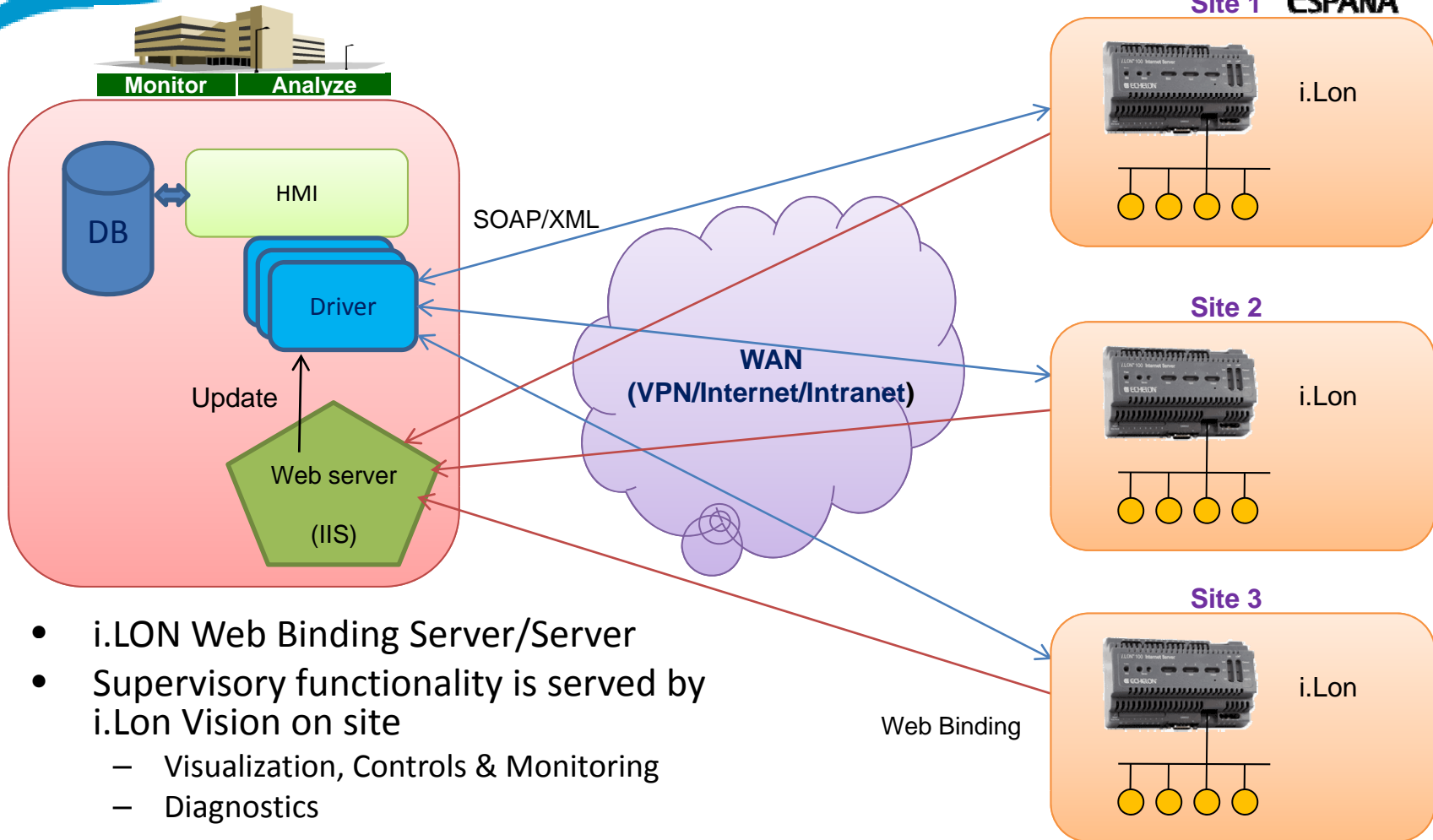


- i.LON Web Services Client/Server
- Supervisory functionality is served by i.Lon Vision on site
 - Visualization
 - Controls & Monitoring
 - Diagnostics

Smaller Facilities – 2



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- i.LON Web Binding Server/Server
- Supervisory functionality is served by i.Lon Vision on site
 - Visualization, Controls & Monitoring
 - Diagnostics

Excellent Value Proposition



- Deploy fully developed system – from A to Z
- Flexibility to customize solution
 - Fit a specific application
- Reduced time to market
 - Quick deployments
- Scalable solution
 - Small to large facilities
- Very cost effective solution – very attractive return on investment
- Supported world wide by two large corporations
 - Large network of system integrators
- Open and distributed solutions
 - More choice



Thank You

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Backup slides

i.Lon SmartServer – A Key Component



- Provides real-world business insight in real-time
- Makes energy management economical
 - Even for retrofits
- Ties existing equipment and networks together
- Bridges data and control networks
- Leverages the power and pervasiveness of LONWORKS® networks

Hardware Components for Solution



- Edge devices
 - Thermostat – PL/FT based, Power Monitoring Modules, Freezer Control modules, Analog modules, Digital modules, Lighting Controllers
- i.Lon SmartServers
- For small facilities
 - a PC with web browser capability
- For large facilities
 - XP or Server PC & IT infrastructure
- Corporate headquarter
 - XP or Server PC & IT infrastructure

Software Components for Solution



- At facility
 - Device Commissioning software
 - UI software based on i.LON Vision at small facility sites
- Corporate headquarter
 - HMI Platform