Developing an Open Network Platform
With the SmartServer as the Hub

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A FUNDAMENTAL SHIFT IS UNDERWAY

YESTERDAY:
• Single source, local
• Steady-state
• Captive consumer
• Ubiquitous, cheap
• Single business model

TODAY:
• Distributed energy sources, global
• Erratic demand
• Consumer choice and participation
• Key GDP component, price pressure
• New business models
NEW DEMANDS ON TODAY’S INFRASTRUCTURE

Making it More Difficult To:
- Integrate renewables and distributed sources
- Eliminate wasted energy
- Embrace the emergence of smart devices
- Let customers participate: control and choice

- Proprietary: difficult to add devices and apps, over time
- Single point of failure, breaks more often, can’t fix fast enough
- Struggling to centrally manage fluctuating demand and dynamic, non-dispatched loads
- Data deluge from customer participation and millions of smart devices

10% increase in customer sat in 1yr.
THE ANSWER: PUSH CONTROL TO THE EDGE

Energy Control Network

“Push Control to the Edge”

Sense and Act to Drive 100% Reliability

Analyze and Share Relevant Information

Local, Real-Time, Autonomous Decisions

Open Apps Platform to Add Smart Applications

RELIABLE

SUSTAINABLE

INSTANTANEOUS

OPEN

ECHELON®
ECHELON ENERGY CONTROL SYSTEM

Three-Tier Architecture

- 100% Reliable
- 100% Survivable
- 0 Latency

All Powered by Echelon Energy Control Software
Multiple vendors
Affordable and economical service and system expansion
Sub-system and device-level expansion at any time
Full choice of service providers
Facilitate interoperability with other vendors / systems
Plethora of choices
Flexible, expandable automation

Owners retain freedom of choice throughout the lifetime of the system!
Smart energy manager

- Interact with all your devices
- Provide interactive and timely information
- Interact with all your enterprise applications
  - Centralized management of energy use
  - Centralized monitoring and control
  - Grid-aware buildings, remote assets, and systems

Key enterprise energy management device
INTERACT WITH ALL YOUR DEVICES

- Digital I/O
- LONWORKS TP/FT-10 or PL-20
- Modbus TCP or RTU
- M-Bus
- Pulsecount

LONCOM
Americas-2011
Delivers and accepts information at two levels
- **Users** through a Web 2.0 interface
  - Built-in Web pages for built-in applications
  - Custom Web pages for data on any attached devices
- **Applications** through a Web-standard SOAP/XML interface
  - Enterprise and local applications

Provides built-in scheduling, alarming, and logging

Information is complete, timely, accurate, and open
- All information is available to all applications
WEB 2.0 USER INTERFACE

- Reduce costs for user training
  - Simple, intuitive built-in interface
  - Use Internet Explorer or Firefox
- Eliminate costly front ends
BUILT-IN MONITORING & CONTROL APPS

Scheduling
- Time, date, and event calendar
- Schedule events relative to:
  - Time-of-day
  - Sunset
  - Sunrise

Alarming
- Recognition of error and alarm states
- Notification of alarm conditions
- Acknowledgement of notification

Trending
- Data collection and storage
- Trend graph display
- Automatic log transfer
FAST AND LIGHTWEIGHT WEB PAGES

- **SmartServer Web pages based on HTML and Javascript**
  - Web 2.0 standard used by most modern Web sites
  - Lightweight and fast to load
  - Compatible with a variety of devices including mobile phones, pads, and tablets
  - Easy to enhance—for example to add custom Flash or SVG objects

- **Create your own Web pages using the included i.LON Vision Web authoring tool**
  - Or use any Web authoring tool such as Dreamweaver

- **Further customization possible with open source Javascript libraries such as jQuery**
  - jQuery and jQuery UI libraries included
INTERACT WITH ALL YOUR APPLICATIONS

SOAP/XML
DIME
XMPP
LNS®
IP-852 (optional)

LAN or WAN
LEVERAGING WEB STANDARDS

- **SmartServer uses standard Web technologies wherever possible**
  - SmartServer enterprise applications have access to the same services used by the Web UI and the AdminServer

- **Powerful, complete, and documented SOAP interface**
  - Example—SeriousEnergy quickly interfaced Web energy dashboard to the SmartServer using the SmartServer SOAP interface

- **Simple data log and alarm log transfer using the standard DIME protocol**
  - Allows data logs and alarm logs to be easily pushed through firewalls

- **Web-friendly peer-to-peer communication with XMPP**
  - Link enterprise applications to SmartServers without reconfiguring firewalls
  - Support full monitoring and control from enterprise applications
Simple Object Access Protocol (SOAP)
- Used for providing Web services

Supports distributed decision making
- SOAP interface provides access to all SmartServer services—not just limited data
- Can be simultaneously accessed by multiple UIs and applications
- Local applications can take over when remote applications fail
• Direct Internet Message Encapsulation (DIME)
  - Extension to SOAP for sending files with SOAP requests
• Simplifies pushing data through firewalls
• Provides a scalable solution for monitoring many sites
PEER-TO-PEER COMMUNICATION WITH XMPP

- Extensible Messaging and Presence Protocol
- Open Web standard with many available XMPP servers
Delivering End-User Value

- Energy savings of 10-25%
- ROI – 1 to 2 years
- Public dashboard
- Always the latest software

Integrator Value

- Simple deployment
- Predefined meter templates and automated meter setup
- < 1 hour install for SmartServer
- Recurring revenue stream
- New consulting services revenue stream
- No cost software updates
A shift is occurring, creating new demands from “plant-to-plug”

Creating a need to push control to the edge

The answer: Echelon Energy Control Network and SmartServer

Why ECHELON

- Smart, fast local decisions
- Bullet-proof reliability
- Orchestration and management

- Relevant information
- Infinite applications