III’s Solutions to Energy Efficiency

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Institute for Information Industry
Goal – Transforming Energy Systems
Trend

- Top Trends for 2013 – Internet of Things (IoT) …

- Big Data – Variety, Volume, Velocity & Veracity

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**Volume**
- Data at Rest
  - Scale from terabytes to petabytes (1K TBs) to zettabytes (1B TBs)

**Velocity**
- Data in Motion
  - Streaming data, milliseconds to seconds to respond
  - Often time-sensitive, streaming data and large volume data movement

**Variety**
- Data in Many Forms
  - Structured, unstructured, text, multimedia

**Veracity**
- Data in Doubt
  - Uncertainty due to data inconsistency & incompleteness, ambiguities, latency, deception, model approximations
Strategy

• Matured, Simple, Cheap
• Digitization, Networking & Intelligence
• 3S’s : Software, System & Service
## Solution Stack

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- **Marshaling & Analysis**
- **Sensing & Acquisition**
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Applications

- Industrial Buildings
- Commercial Buildings
- Educational Buildings
- Government Buildings
- Agricultural Buildings
- Residential Buildings
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Demand Response:

Changes in electric use by demand-side resources from their normal consumption patterns in response to changes in the price of electricity, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized.

Source: OpenADR Alliance; Federal Energy Regulatory Commission; FERC
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Big Data – Vendors and Technologies

Data Acquisition
- IBM, SAP, TIBCO, Oracle, HP, TALEND, INFORMITICA, Synco...

VLDW and BI Appliances
- SAS, ORACLE, IBM, SAP, Kognitio, Actian, etc.

Analytics
- EMC, SAS, HP, Adobe, Teradata, Informatica, Kxen, etc.

BPM & Action
- Tibco, EMC, Oracle, Progress Software, Adobe, OpenText, etc.

Including Complex Event Processing (CEP) tools

Data Providers
- LexisNexis, ComScore, INRFX, Reuters, Nielsen, FactSet, IRI Group, etc.

No SQL
- Oracle, EMC, IBM, Google, HP, Amazon, etc.

Data Virtualization
- Composite Software, Denodo, Oracle, Informatica, etc.

BI Tools
- Oracle, Microsoft, IBM, SAP, Tableau, QlikView, etc.

And all your own data
And your partners data

Source: Manuel Sevilla

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Complex Event Processing

Data Collection/Sensing

Sensing (Stream) → Event input → Status transition → Call → Status → Rules → Navigation (Control)

Extracting useful information from Big Data

Offering useful information as appropriate

Big Data

Weather satellite
Stationary camera
Smart city
Mobile phone
Logistics center
Health device
Traffic

No intruders in house
Unanticipated downpour expected soon
Half-off coupon issued by store D
Street A is currently congested, we recommend street B
Your child detoured from usual route to and from school, and is now at park C

CEP
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AMI

Energy Measurement, Management and Analysis lie at the heart of Energy Efficiency Strategy
Advanced Meters:

Meters that measure and record usage data at hourly intervals or more frequently, and provide usage data to both consumers and energy companies at least once daily. Data are used for billing and other purposes. Advanced meters include basic hourly interval meters, meters with one-way communication, and real-time meters with built-in two-way communication capable of recording and transmitting instantaneous data.

Source: Federal Energy Regulatory Commission; FERC
Applications

- Taipower starts installing smart electricity meters with a goal of deploying 10,000 smart meters by 2013, 1M by 2015, and ultimately 6M ones in the long run.
III’s AMI Solution

- Router and Firewall
- DB Servers
- Application Servers
- Communication Servers
- Load Balancing Servers
- AMI Control Center
- WAN (GPRS / WCDMA / FTTx / WiMax)
- Residential metering solutions
- Industrial metering solutions
- MIU
- RS232/485
- PLC / Wireless
- Concentrator
Highlights

- Adaptable to a Variety of Local Area Networks
  - Power Line Communication
    - Broadband PLC
    - Narrowband PLC
  - IEEE 805.15.4 / Zigbee Wireless Communication
- III is the 1st organization in Asia with it’s product certified by Zigbee Alliance
- Rich Reports (next slide)
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III’s Sub-Metering Solution

InEnergy: Intelligent Energy Management System

R&D 2011 100
Application – Chain of Convenient Store

Read-Time Information for Power Consumption
Application – Lighting Control

Remote Maintenance & Administration

Street Lighting Control
On/Off/Dimming
Highlights

- Real-time monitoring of energy consumption
- Remote load/unload control (Socket and Strip)
- Support major communication interfaces: Zigbee, RS485/232, PLC, 3G, WiMAX, etc.
- Rich analysis reports
Summary

Application

Standardize
The interface between electricity markets and customers.

Automate
Customer response to fluctuating energy prices and grid instability.

Simplify
Your energy future & maximize the value of your DR capacity.

Action

Marshaling & Analysis

Data Modeling & Insight Finding

Sensing & Acquisition

Data Collection
Thanks for your attention!