

Legacy Device Interoperability in the Smart Grid

December 7th, 2011

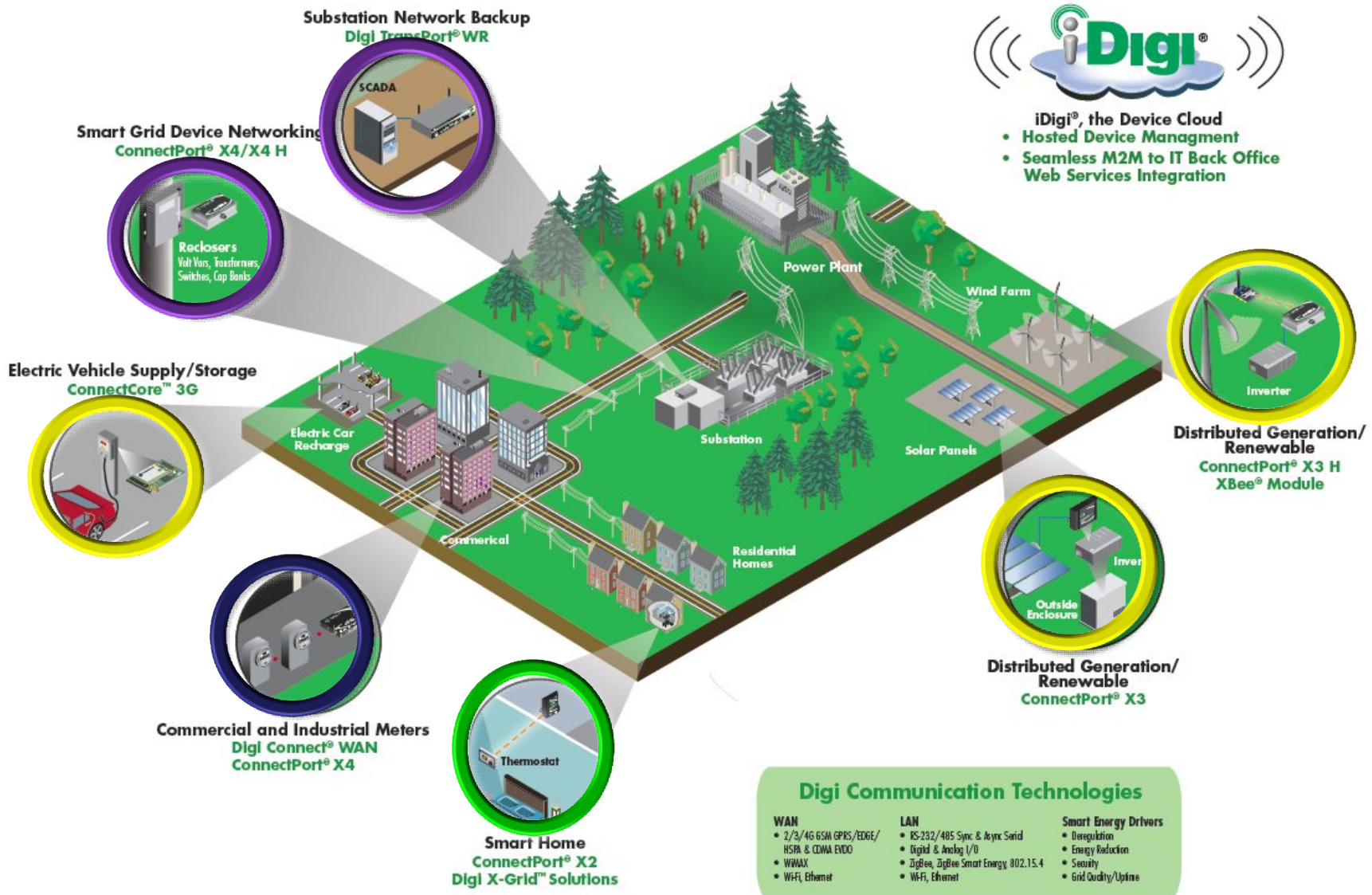
Presented by:

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Digi International
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- Headquartered in Minnesota
 - Founded in 1985 as DigiBoard
 - \$204M in revenue in 2011
 - Profitable for 34 quarters straight
 - Strong balance sheet, no debt
 - Traded on NASDAQ since 1989 as DGII
 - World-wide presence with over 600+ employees
- Leader in M2M device connectivity
 - Products known for ease-of-use, quality, reliability
 - Commercial Grade, Enterprise-class products designed for harsh environments
- Technical expertise in
 - Ethernet, Serial, USB & Wireless- Cellular, WiFi, ZigBee/Mesh

- Over 50 utilities in test, pilot, or production with Digi X-Grid offerings
- Reseller and partnership agreements with a broad range of leading providers to the utility market
 - Itron, Comverge, Cooper Power, Calico Energy, PowerDash, E2 America, Incenergy, Ecofactor, and More
- Over 45,000 Energy gateways deployed to date
- Nearly 150,000 Energy Gateway commitments
- Over 200 utilities have purchased Digi products
- Strong partnerships with Carriers (AT&T, Verizon, Sprint)

Digi Energy Distribution/Automation Solutions Ecosystem



- Embedded Communications, Monitoring, and Control
- Cellular Communications with local serial and RF connectivity
- ZigBee HAN Solutions with Smart Meter and AMR support
- Cellular and AMR meter communications over IP networks

Digi Communication Technologies

WAN	LAN	Smart Energy Drivers
<ul style="list-style-type: none"> • 2/3/4G GSM GPRS/EDGE/HSR & CDMA EVDO • WWAN • Wi-Fi, Ethernet 	<ul style="list-style-type: none"> • RS-232/485 Sync & Async Serial • Digital & Analog I/O • ZigBee, ZigBee Smart Energy 402.15.4 • Wi-Fi, Ethernet 	<ul style="list-style-type: none"> • Deregulation • Energy Reduction • Security • Grid Quality/Uptime

APPLICATIONS AND SERVICES DRIVE TECHNOLOGY DECISIONS

- Six Generations of iPods in a drawer at the Mayne household
- My latest (from 04/2011) is a generation behind
- **All devices still work – and can access my media content**



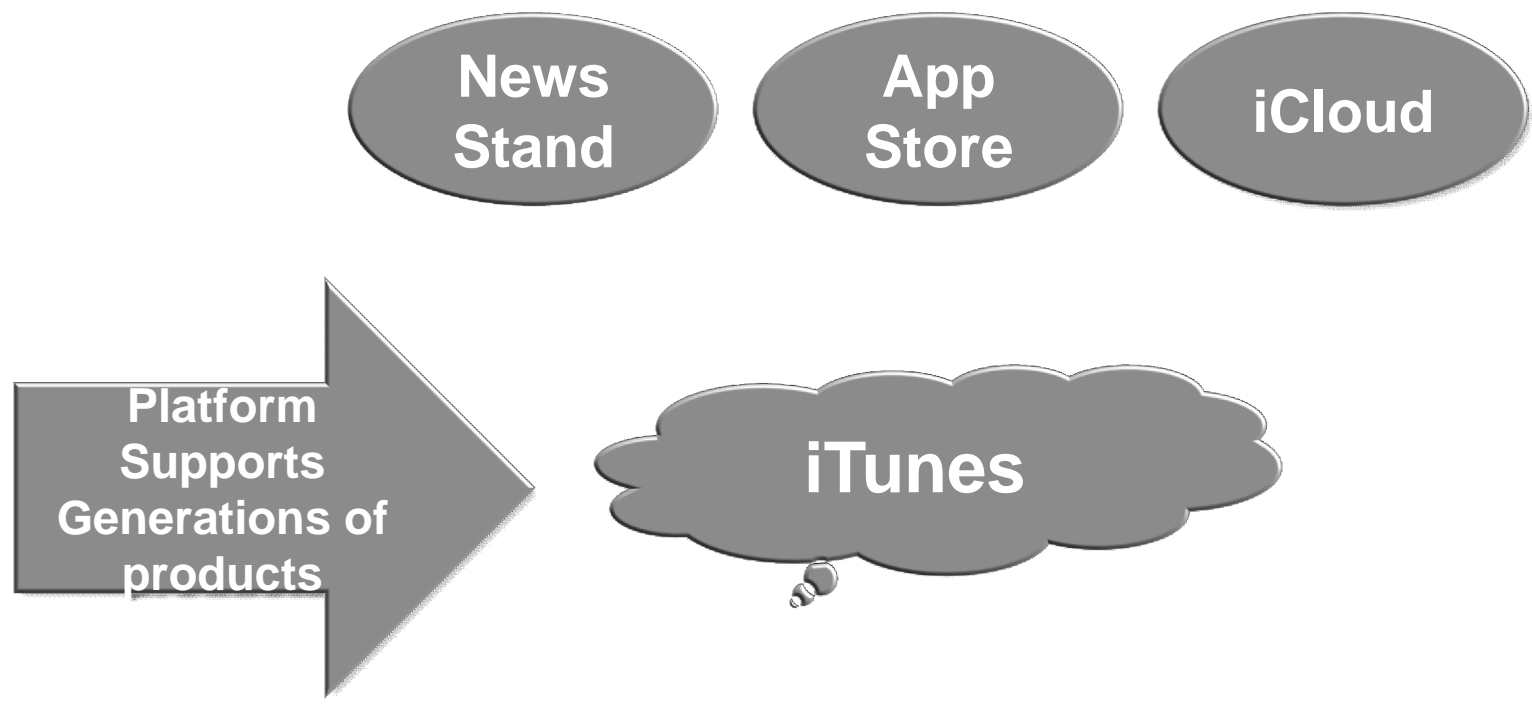
2002

Through

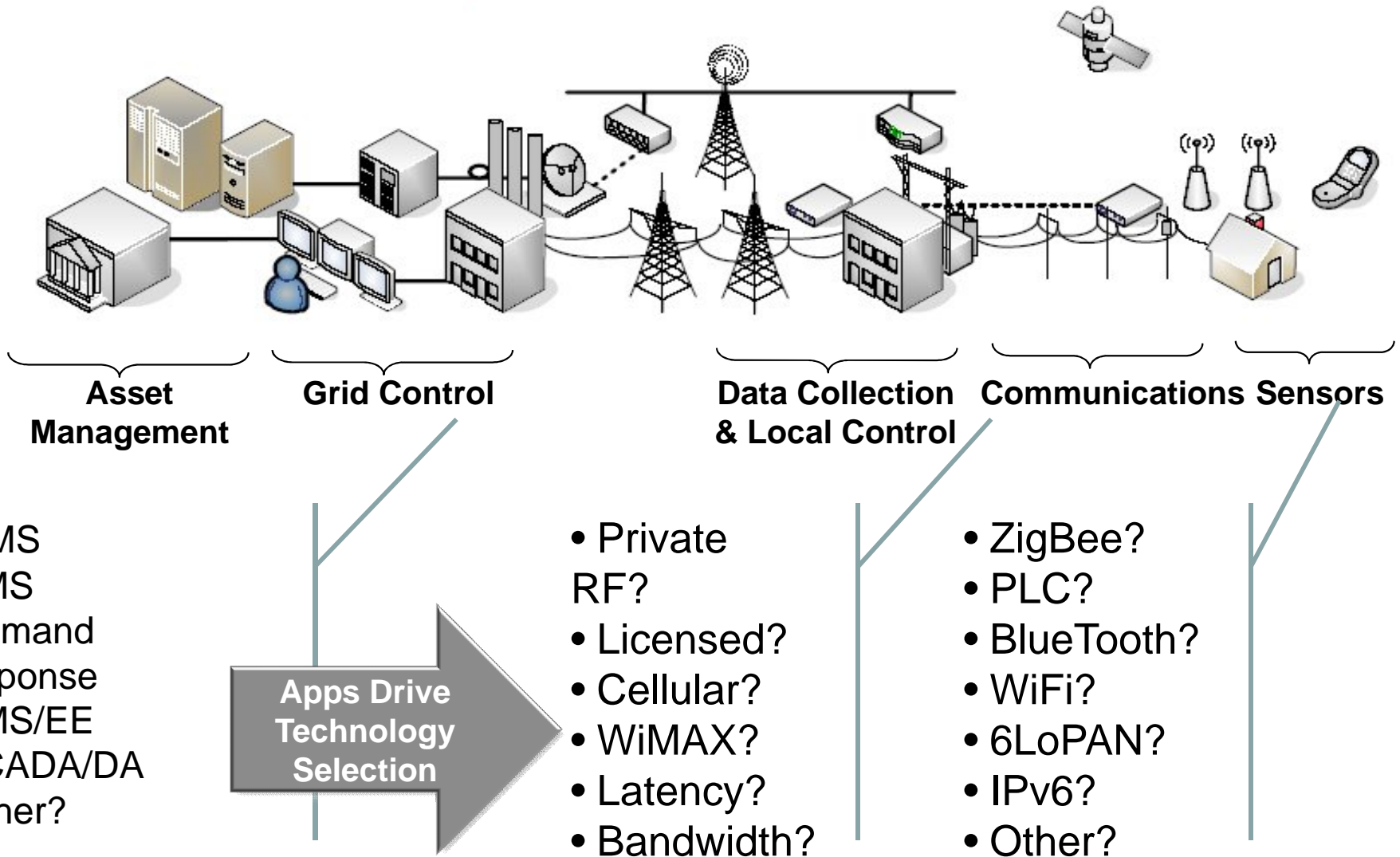
2009

New Versions Every 12-18 months

Utility equipment is typically operational for 15+ years....



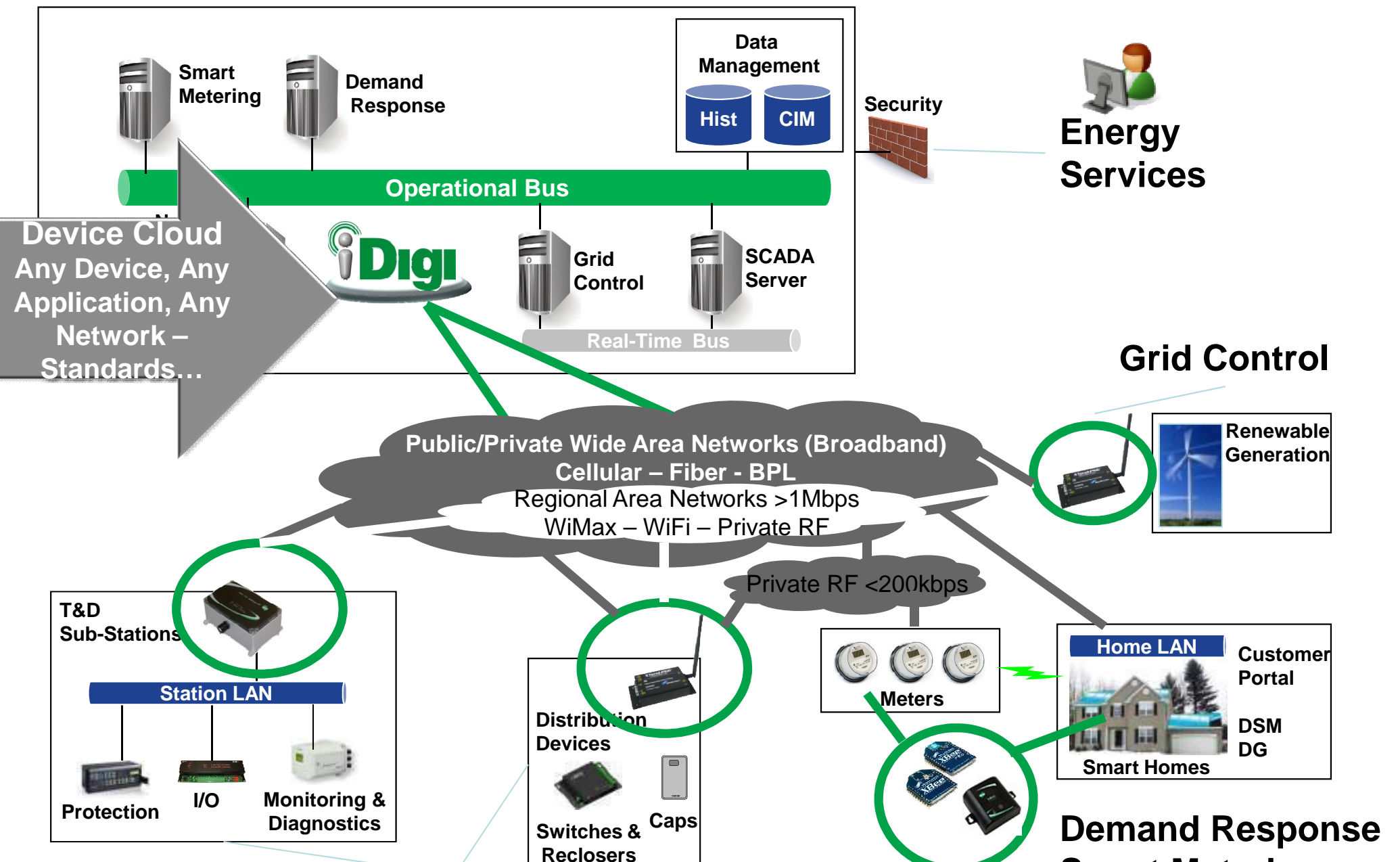
SMART GRID COMMUNICATIONS



Ideally, the selected technology should allow all of these questions to be answered with YES

- The SG will **not be built using only one network** technology or topology
 - Latency, Bandwidth, and other requirements will vary with the application
 - Two-way communication to devices will be required
- The SG will require **“software agility”**
 - Software services will evolve as consumers and businesses become more engaged in energy decisions
- The SG will require **“device agility”**
 - The Energy industry will be connecting to more devices than ever before
- **Surgical Deployment**
 - **Desired technology** at the **Right location** with **Field Programmability** and **Remote Management**

- Smart Grid
 - **Communication** and **control** to an increasing number of devices
- Smart Metering (AMI or AMR*Plus*)
 - Two-way **communication** and **control** to metering points
 - Two-way **communication** and **control** to devices inside a building
 - Determine **when** energy is consumed
- Communications, Control, and Data Integration
 - Ultimate Goal: **New Services, Analytics, and Automation**
 - **Utility Facing** and **Customer Facing** services
- Flexibility is key!



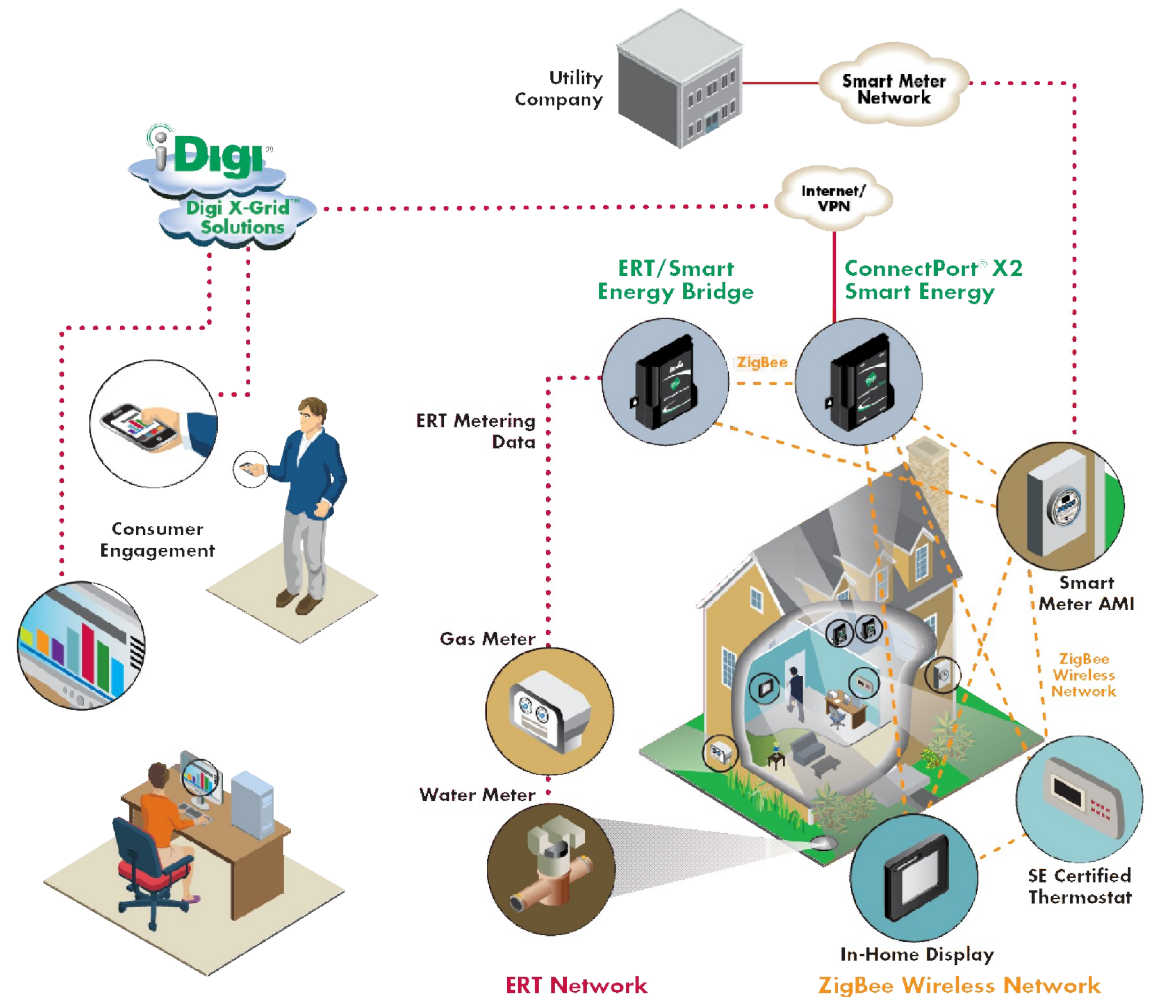
Why does this matter?

- The Smart Grid requires software/systems integration and communication to a broad range of devices
- The Smart Grid requires two way communications
- The Smart Grid is **NOT** requiring utilities to replace all meters, capacitor banks, commercial metering solutions or other systems immediately
- **View the Smart Grid solution from the applications out – not the device in**
- **Develop standards to ensure application interoperability and support for legacy systems... why we are here!**

Network independent **Device Management Solutions ARE** allowing utilities to automate and leverage existing assets today!

- AMI = “AMR” *plus* “Interval Data” *plus* “HAN” *plus* “Disconnect Relay”
 - Interval Data: Dynamic Pricing
 - HAN: Demand Side Services and Consumer Engagement
 - Disconnect: Reduction of truck rolls (i.e. Carbon Footprint)
- “AMR” *plus* “Broadband Gateway” = AMI *minus* “Disconnect Relay”

- Leverage a broadband gateway for consumer engagement and near real-time access to energy device data
- Surgically deployable HAN solutions



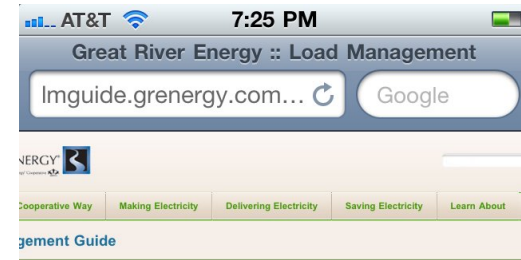
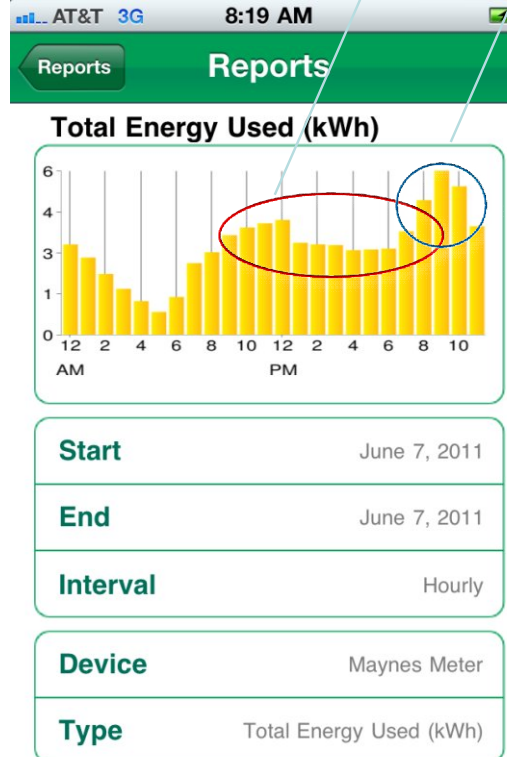
Temp Rise

Digi Energy Daytrader

Event

Recovery

G&T Web Site



Load Management Schedule

Tue Jun 07 19:10:28 CDT

Today	Program Type	Probability	Expected Time
CI	C&I with GenSet	Scheduled	12:30 PM - 08:30 PM
CI	Interruptible Irrigation	Scheduled	04:00 PM - 08:00 PM
CI	Interruptible Metered C&I	Scheduled	01:30 PM - 07:30 PM
CPP	Critical peak pricing	Scheduled	01:00 PM - 09:00 PM
Residential	Interruptible Water Heating	Scheduled	01:00 PM - 09:00 PM
Residential	Cycled Air Conditioning	Scheduled	01:30 PM - 07:30 PM
Residential	Interruptible Water Heating	Likely	Undetermined
Residential	Cycled Air Conditioning	Unlikely	Undetermined

Control times are subject to change as weather conditions and other variables affecting the load change.
All times are approximate.

- 103 Degrees in Minneapolis
- Broadband Gateway provided M&V for a Demand Response Event, and recorded temperature rise
- I have access to more information than my utility!

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