



ZigBee[®]
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ZigBee: Solutions for Today, Building for Tomorrow

May 14, 2010

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Chairman, ZigBee Alliance
www.zigbee.org





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ZigBee Alliance Overview

- **Organized as an independent, neutral, nonprofit corporation in 2002 for WSN Standards Development**
- **Open and global**
 - Anyone can join and participate
 - Over 350 companies worldwide are members
 - Membership is global [approx. 40% Americas, 30% EMEA, 30% Asia]
- **Activities include:**
 - Open Standards for wireless sensor and control
 - Product Certification and compliance programs
 - Branding, market development and user education



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Typical ZigBee Markets

Security
HVAC
AMR
Lighting Control
Access Control



**BUILDING
AUTOMATION**

Demand Response
Net Metering
AMI, SCADA

**ENERGY MGT.
& EFFICIENCY**



**CONSUMER
ELECTRONICS**

TV
VCR
DVD/CD
Universal
Remotes

Patient
monitoring
Fitness
monitoring



**PERSONAL
HEALTH CARE**

Asset Mgt
Process Control
Environmental
Energy Mgt



**INDUSTRIAL
CONTROL**



**TELECOM
SERVICES**

M-commerce
Info Services
Object Interaction
(Internet of Things)



**PC &
PERIPHERALS**

Mouse
Keyboard
Joystick



**HOME
CONTROL**

Security
HVAC
Lighting Control
Access Control
Irrigation

Recent ZigBee Achievements

- **Momentum building rapidly:**
 - Continua Health Alliance adopts ZigBee as its Standard for LP LAN applications in Health Care
 - ZigBee Remote Control shipments begin
 - ZigBee Releases Telecom Services Profile
 - ZigBee embedded in over 40 million meters currently in deployment around the planet
 - The United States Department of Energy and NIST list ZigBee Smart Energy as one of the key standards for SmartGrids
- **New Member growth accelerating**

ZigBee in the News

- **ZigBee Member Companies receive \$500 Million for Smart Meter deployments**
- **ZigBee and Wi-Fi announce partnership**
- **ZigBee begins work on a comprehensive Retail Services Profile**
- **ZigBee developing an IP stack option for use with ZigBee Smart Energy based on IETF RFCs.**
- **ZigBee Green Power enhancement being added to the ZigBee/ZigBee PRO stack**



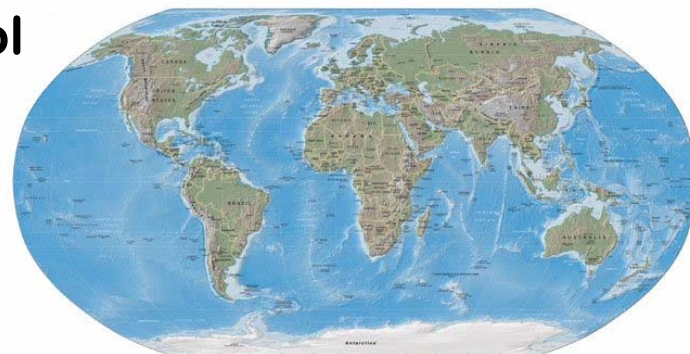
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ZigBee Adoption ---

- **Accelerating global adoption across a range of markets and applications**

- Building Automation and Control
- ZigBee Remote Control
- ZigBee Smart Energy
- ZigBee Health Care
- Telecom Services



- **Deployments underway around the world**

- Australia, Canada, Sweden, USA





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Current ZigBee Applications

- ZigBee Home Automation (ZHA)
- ZigBee Smart Energy (ZSE)
- Commercial Building Automation (CBA)
- ZigBee Health Care (ZHC)
- ZigBee Telecom Services (ZTS)
- ZigBee Remote Control (ZRC)



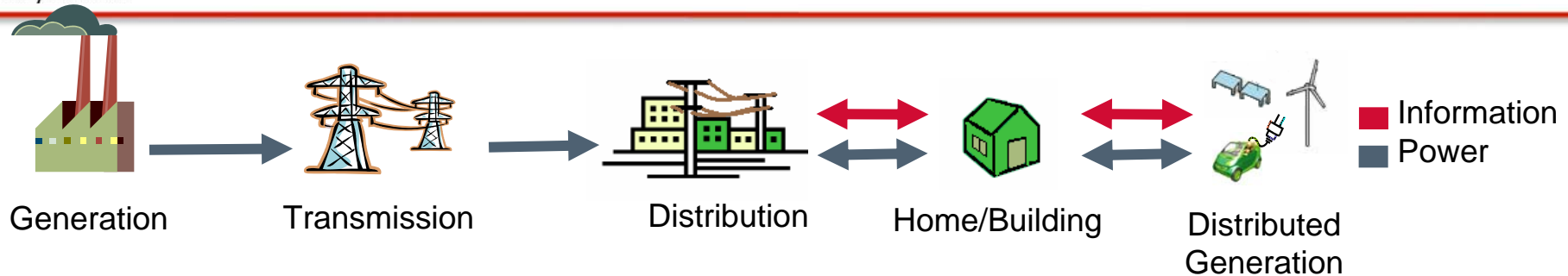
- +Future profiles proposed by member companies...



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The Challenge of the Smart Grid



Smart Grid consist of end-to-end, bi-directional flow of energy and communication capabilities from generation to consumption to:

- Improve power reliability and quality
- Increase resiliency of the grid
- Increase capacity through optimized generation efficiency
- Allow easier use of renewable energy and distributed generation, including load shifting
- Reduce consumption on a per user basis
- Increase consumer awareness and choice



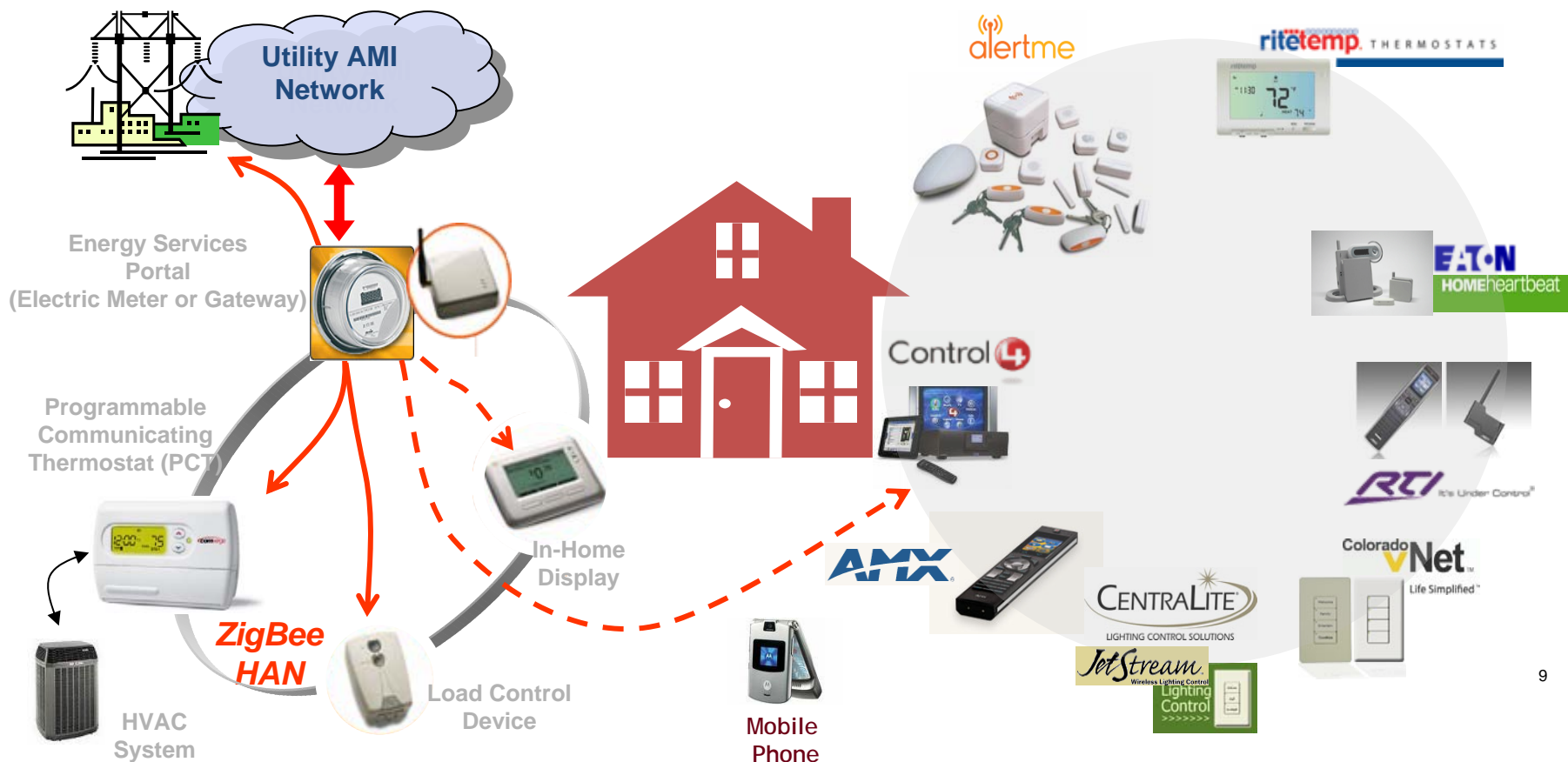
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Smart Energy & Home Automation



Urgent demand for Smart Energy + compatibility with mainstream Home Automation systems enables customer choice



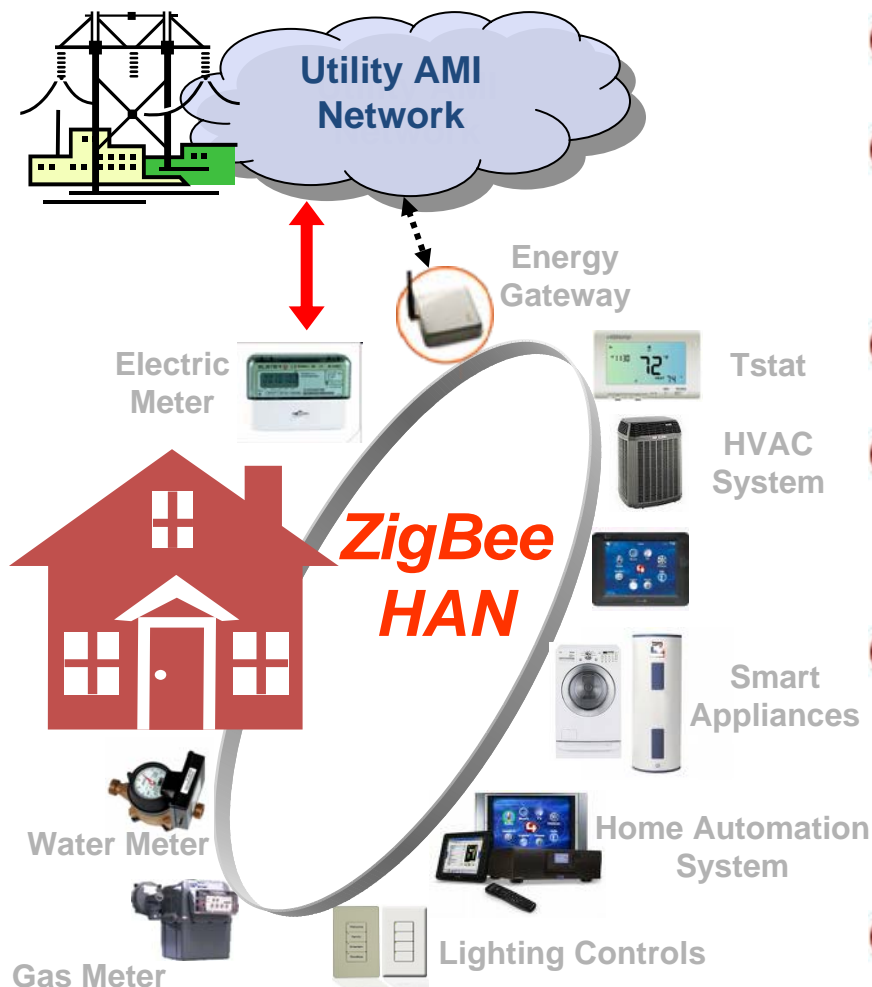


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Utility Requirements for HANs



- Retail products
- Competitive market/
No vendor lock-in
- Low cost
- Solutions for the
Global Market
- Large pool of people
who understand the
technology
- High levels of security

ZigBee Smart Energy Profile

● Supported Features Include:

- Basic metering [measurements, historical info, etc]
- Demand Response (DR) and Load Control
- Pricing [multiple units & currencies, price tiers, etc.]
- Text messages
- Device support for Programmable Communicating Thermostats (PCTs), Load Controllers, Energy Management Systems, In Home Displays (IHDs), etc.
- Security to allow consumer only, utility only, or shared networks
- Support for water and gas

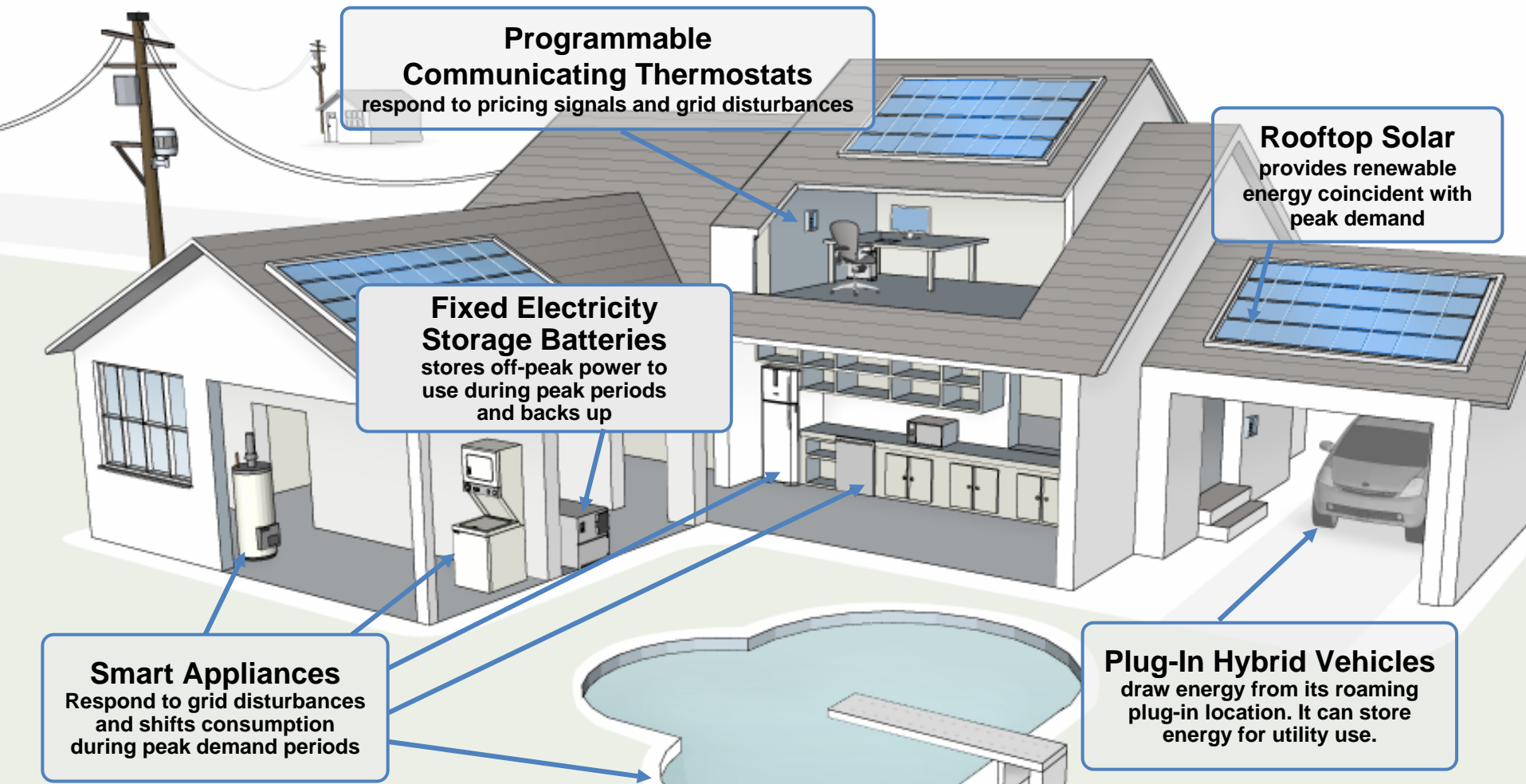




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Where does ZigBee Fit?

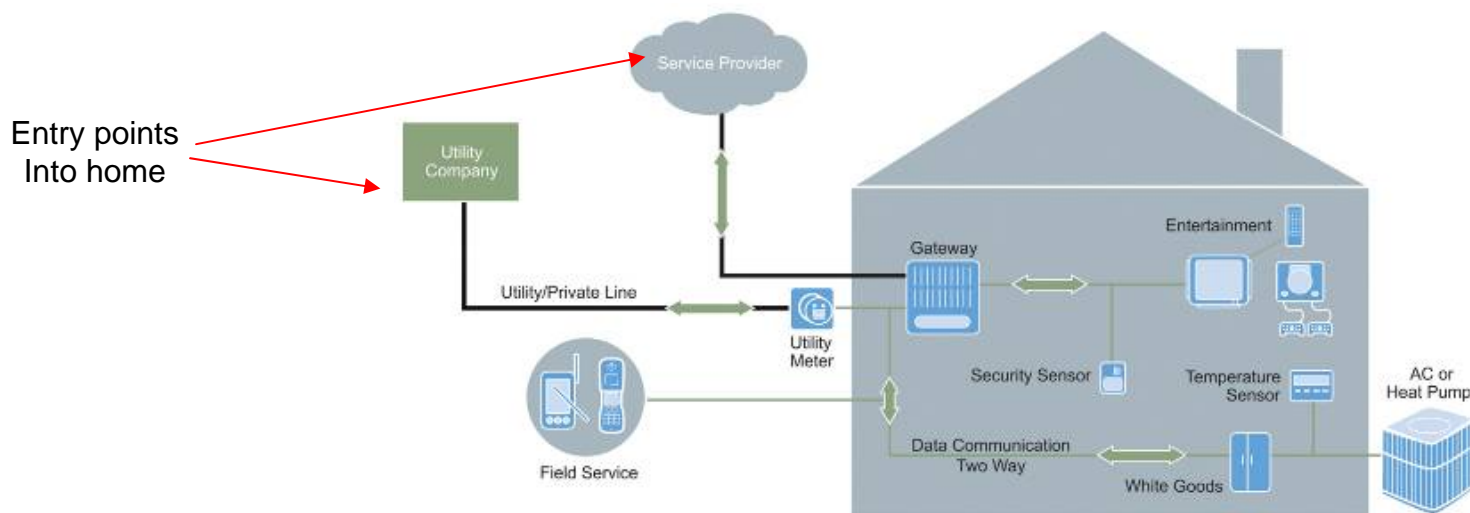


Source: wsj.com

ZigBee Smart Energy Use Cases

● User gets instant read of consumption data

- User requests meter data on In-Home Display, Set Top Box or PC
- ZigBee Smart Energy Devices display past & current use
- For legacy devices, user turns on device and sees change in meter data



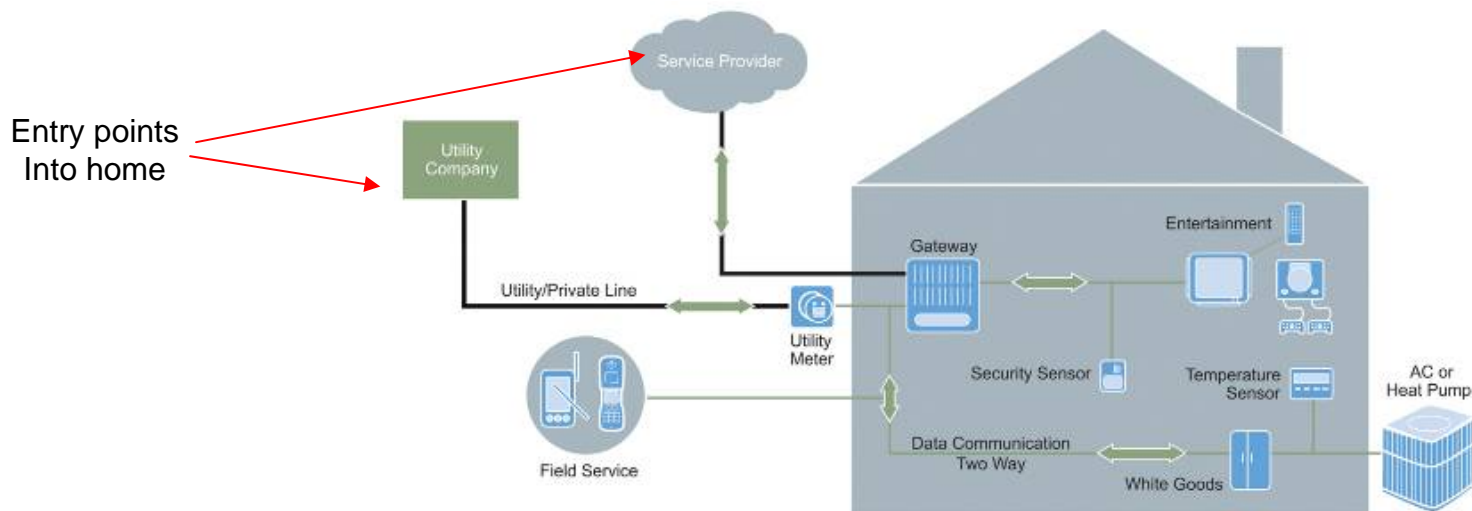


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ZigBee Smart Energy Use Cases

- **Program devices to respond to utility price signals**
 - Price sent from utility over their network to the meter
 - Meter sends the message out over the ZigBee HAN
 - Devices receive the message and automatically react
 - Dishwasher schedules start to correspond with best rates
 - Pool pumps schedule filter cycle for best rates
 - Comfort points (heating, etc) change set point to pre-heat/cool before event and reduce usage during high rates





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Growing Demand for ZigBee Smart Energy

- **ZigBee Smart Energy is bridging the gap between the power grid today and the Smart Grid of tomorrow**
 - Households with digital tools controlling temperature and price preferences saved on average 10% on utility bills
- **Large scale rollouts underway**
 - Technology is available today, field trials as well as large scale deployment is happening now
- **40+ million ZigBee electric meters being deployed by over 11 utility companies**
 - Major deployments in California, Texas, Michigan and Virginia
 - Total smart energy meter market in North America of 80 million beyond 2011 (from utility RFPs)



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Growing Demand for ZigBee Smart Energy

- **3.4 billion in US stimulus funds awarded for the Smart Grid**
 - ZigBee Smart Energy Profile widely used for Home Area Network
 - ~\$1 billion awarded to support Demand Response
- **Whirlpool stated all appliances will be Smart Grid compatible by 2015**
 - Plans to put 1 million Smart Energy clothes dryers on shelves by the end of 2011

Energy Projects Using ZigBee





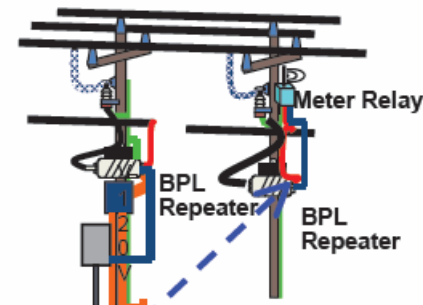
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Centerpoint Energy Vision



Water
Heater



Utility Price
Signals



Pool
Pump



Compressor



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Pepco Holdings Inc.



- **Demand Response program expected to save 200MWs**
- **Uses VHF to ZigBee bridge compatible with their existing system with full AMI upgrade path using ZigBee**
 - **Bridge relays VHF messages to ZigBee Programmable Communicating Thermostat (PCT)**
 - **ZigBee In-Home Display Manages energy usage in near real time**





TXU Energy Broadband Project



- **ZigBee enabled thermostats and gateways**
 - Active program launched in June 2008
 - Self installation by home owner
 - Plug and Play
- **Integrates ZigBee technology into home area networks**
- **Internet based demand response program**



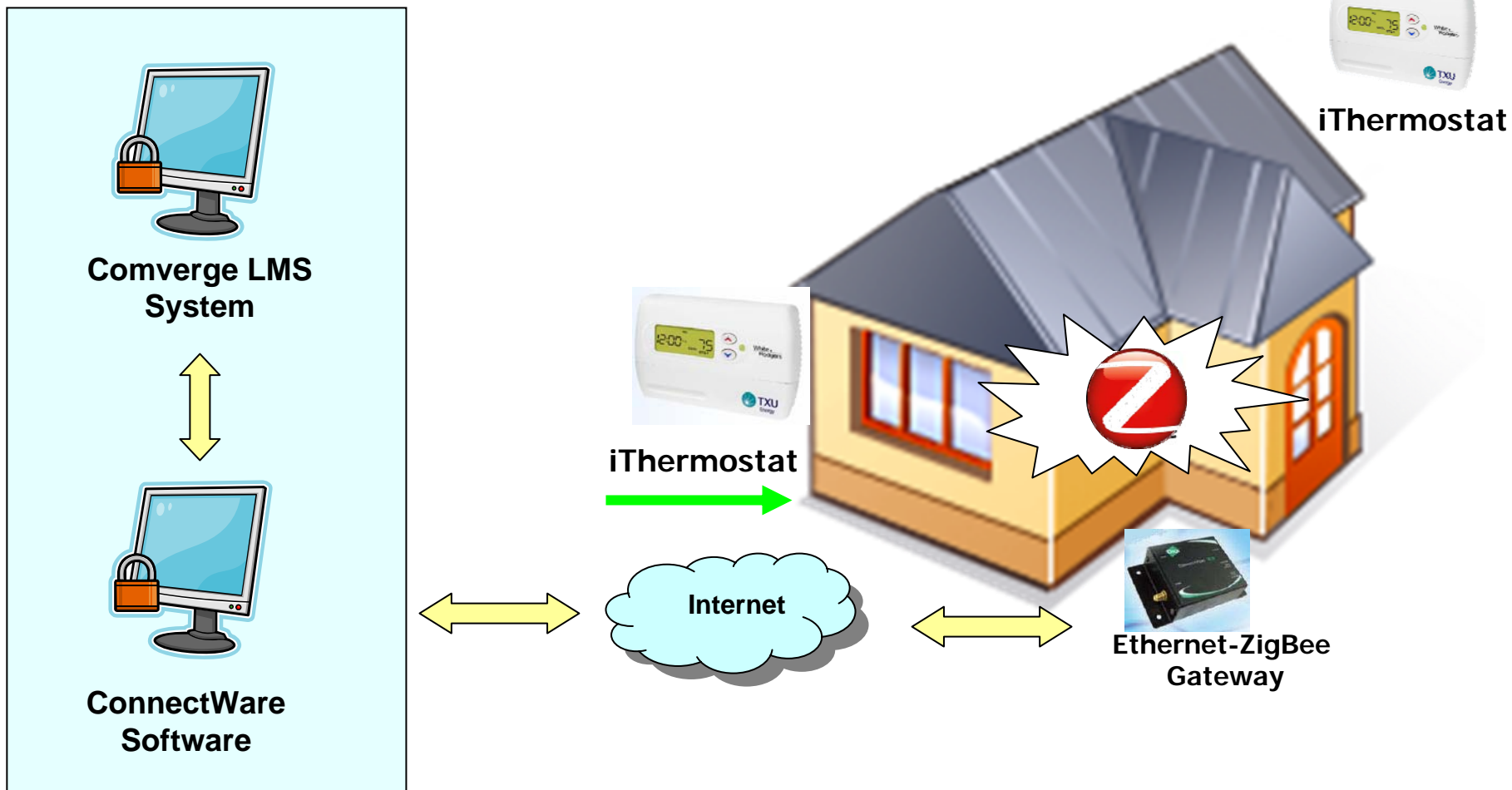


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TXU System Architecture





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TXU Energy iThermostat Website



TXU Energy iThermostat™

☎ Questions about iThermostat? Call us at 1-866-733-1807

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**At home, from the office, or on the road...
manage your home's heating & cooling from virtually anywhere.**

The new web-enabled TXU Energy iThermostat™ lets you manage your home's energy usage, save money and help the environment from virtually any computer.

[Learn More ▶](#)

Features & Benefits

Click here to
Watch Video



Home, work or on the road, manage your home's air conditioning use - anytime, anywhere - from any Internet-connected device.

[Learn more ▶](#)

Installation

Click here to
Watch Video



Learn how to install your iThermostat and gateway device.

[Learn more ▶](#)

iThermostat Virtual Tour

Take the
Virtual Tour



See a demonstration of the powerful capabilities of the TXU Energy iThermostat.

iThermostat Log In

Already participating in the Energy Conservation Program at TXU Energy?

Login below to access your energy management console:

Email Address:

Password:

[Log In](#)

● Immediate Focus:

- Power Quality and Failure alarms
 - Smart Grid foundation
- Multimetering – Gas, District Heating, Water
- Advanced Meter Management
 - implementation of processes

● New Services (among others)

- Individual metering (heat, water)
- Security Alarm
- ZigBee locks
- Control of street lamps





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ZigBee Technology-Performance

- **Proven excellent in-building coverage**
 - Inherently robust radio link
 - Mesh networking
 - Acknowledge oriented protocol
 - Now proven in major deployments in Australia, Sweden, & USA
- **Proven tolerance to interference**
 - Trade shows like CES-works when WiFi and Bluetooth fail
 - Montage Hotels and MGM City Center deployments
 - Products which implement multiple radio technologies
- **Proven coexistence**
 - Many multi-radio products and multi-radio deployments
- **Proven scalability**
 - MGM Aria at City Center has 85,000 plus radios
 - Montage Hotels at 4000 plus radios per property



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ZigBee-Building for Tomorrow



Continua Adopts ZigBee

On June 8, 2009 Rick Cnossen, President, Continua Health Alliance Board of Directors said:

- **"Continua's selection of ZigBee Health Care follows a rigorous technical review and seeing firsthand the ability of ZigBee Health Care to meet the requirements set forth by the Continua Health Alliance,"**
- **"ZigBee Health Care can be utilized around the world in a wide variety of settings and is particularly well suited for use in low-power LAN applications."**





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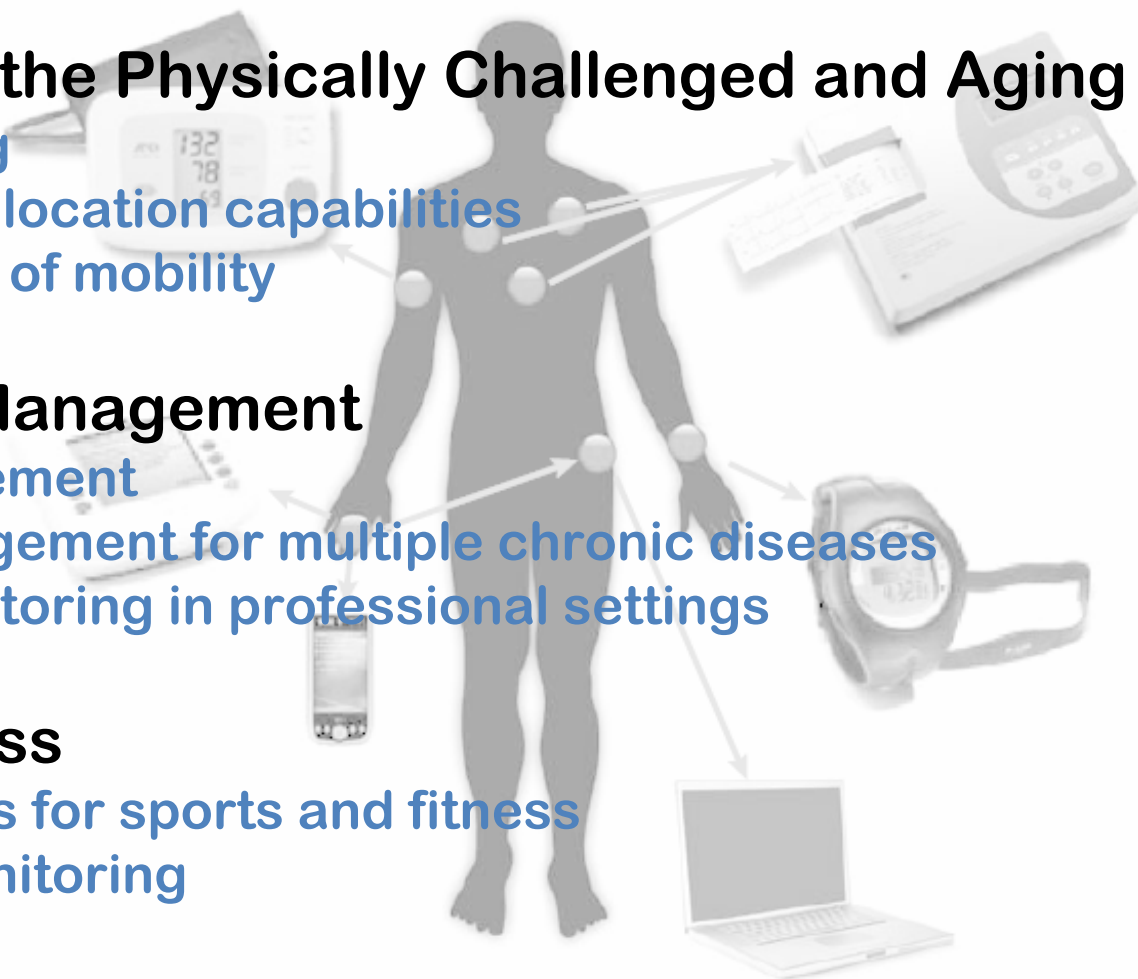
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ZigBee Health Care

Top Three Opportunities:

- **Independence for the Physically Challenged and Aging**
 - Remote monitoring
 - Provides real-time location capabilities
 - Maintains freedom of mobility
- **Chronic Disease Management**
 - Better self management
 - Multi device management for multiple chronic diseases
 - Improvement monitoring in professional settings
- **Health and Wellness**
 - Body-worn sensors for sports and fitness
 - High accuracy monitoring





ZigBee Green Power

A world with less batteries



- Energy consumption and battery operation are two of the most critical challenges for wireless sensor networking
- Combining energy harvesting and wireless communications allows for maintenance free control and monitoring
- There are huge market opportunities for batteryless, wireless solutions, in particular in the building/office/hotel segments



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What ZigBee Green Power Delivers

- **No maintenance, EVER!**
- **No battery waste (“green values”)**
- **Increasing pressures and incentives for energy savings, wherever they come from**
- **Can lead to easier, faster installation**
- **Can allow for different form factors, more compact devices**
- **Reduced fire risk in some industrial environments**

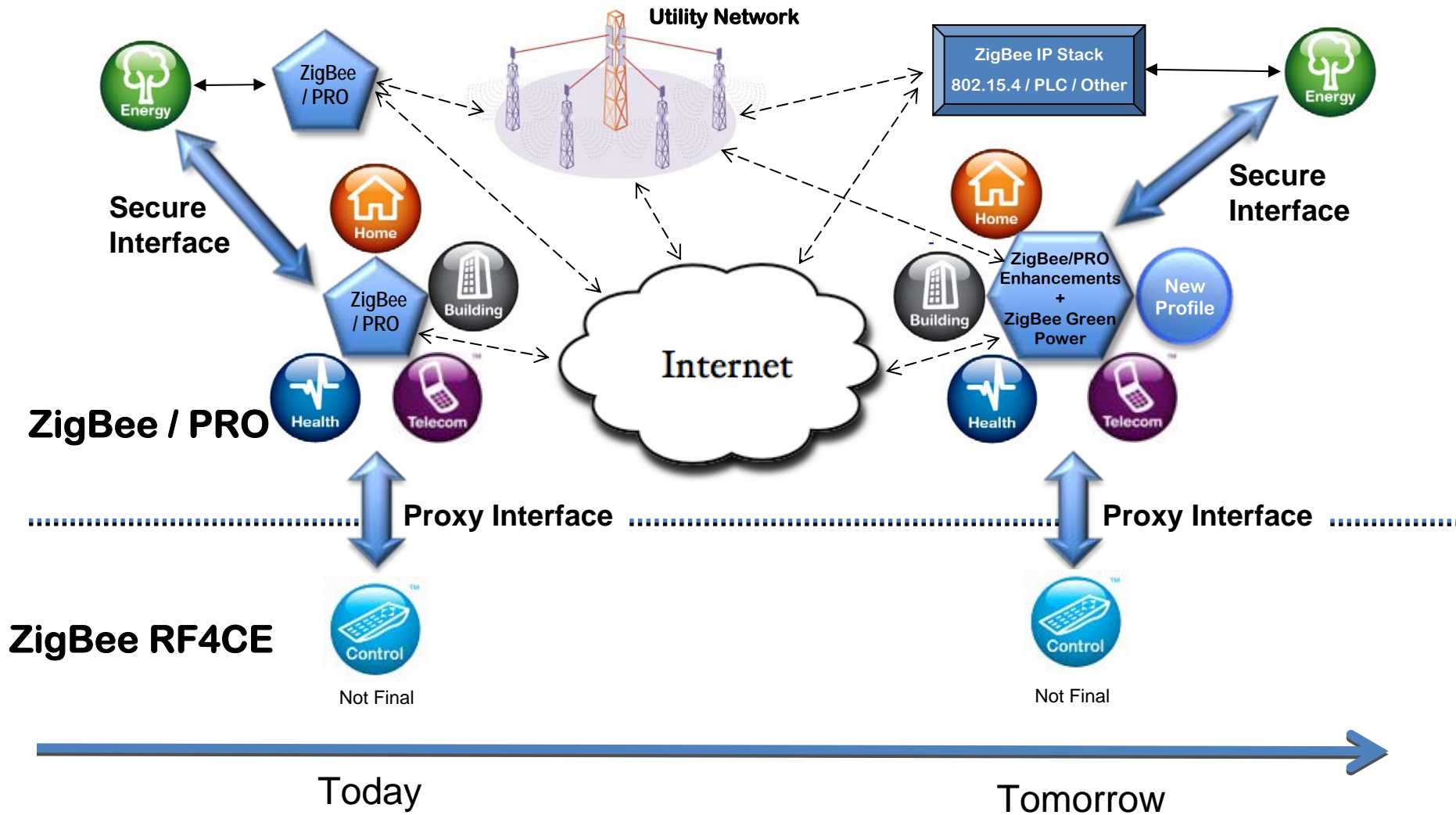




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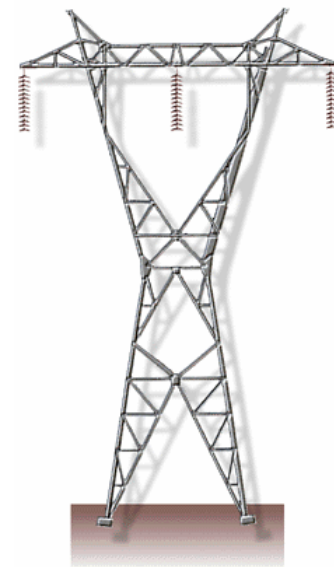
ZigBee Standards- Looking Forward



Enhanced ZigBee Smart Energy



- Integration with ZigBee IP stack and PLC
- Exploits the benefits of wireless and wired
- Support for Forward-Thinking Developments (PHEVs, Distributed Generation, etc.)
- Working closely with IEC, EPRI, AHAM, SAE, ESMIG, and others on requirements
- Other Improvements based on continuing feedback and Market needs
- Selected by US NIST as one of 16 consensus standards for the Smart Grid





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The Home and Beyond

from a Telecom perspective



Handset is the hub of the interaction between user and objects

ZigBee Smart Home

Home Automation & Control

- Lights, HVAC, Domestic appliances
- Entertainment (e.g. DTT)
- Healthcare, Tele-assistance
- Monitoring & Security (e.g. temperature, gas)

Mobile Terminal



Service Center

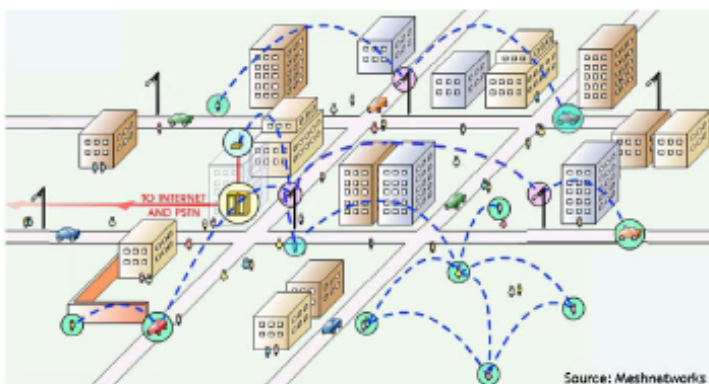
M-Commerce Services

- m-payments (bar, shops, supermarkets)
- m-ticketing (cinema, train, bus)



Digital Smart City

- Access Control
- Parking payment system
- Infomobility services (e.g. traffic control)
- Environmental Monitoring
- Localization



THANK-YOU!

For More Information:



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