What is a HAN and how does it work?

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for SMIP HAN Workshop
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What is the purpose of a Home Area Network?

• Part of the Smart Metering System

• Home Area Networks enable:
  – communication between smart meters in customer premises, and from meters to smart metering hub/gateway;
  – communication of real-time information from smart meters to an in-home display; and
  – other devices to link to the metering system
    • Microgeneration
    • Load control.
“The HAN is where the rubber hits the road in terms of enabling Smart Grid applications for the consumer. It allows multiple devices to cooperate with each other to fulfill complex functionality such as whole house energy management. In addition, it can provide a means to deliver utility prices to home devices so they use energy when it is least expensive”.

(SmartGridNews, May 6, 2008)
Where does the HAN fit?

HAN connects devices in the home or business to the smart metering system

(Smart Metering Implementation Programme: Prospectus, Ofgem/DECC, 2010, p25)
The Basic HAN

- Smart Metering Hub / Gateway
  - Connects HAN to WAN/Metering System
- Electric Meter
- Gas Meter
- In-Home Display
What makes up a HAN?

1. Wired or wireless technology to provide medium for communications
2. Networking protocols to ensure robustness of communications
3. Security mechanisms to protect consumer data and protect the metering system
4. Application protocols to ensure interoperability of networked devices
5. Gateway(s) to smart metering WAN(s)
Wireless HAN Technology
HAN Expansion

- Real-time data to In-Home Display
- Meter usage data to WAN
- Demand response/ load control
- Microgeneration
- Electric Vehicles
Data requirements for HAN (from Statement of Design Requirements)

- Time of use tariffs
- Load management / demand side management (incl. smart appliances)
- Switch from credit to prepay
- Communicate with measurement device within microgenerator

All implemented in application protocols
The Smart Home Vision

- Solar Panels
- Smart Meters
- Heating Control
- Security
- Window Blinds
- Lights
- Smart Plugs
- In-home Display
- White Goods
- Electric Vehicles
- In
-home Display
The HAN and Smart Homes

- Metering System (WAN)
- Electric and Gas Meters
- Programmable Communicating Thermostat (PCT)
- HAN
- Electric Vehicle
- Load Control Device
- In-Home Display
- Smart Metering Hub
- Heating System

Internet Services
- Broadband Gateway
- Security

Home Security Monitoring Automation
- Thermostats
- Remote Controls
- Smart Lighting
- Lighting Control
Broad HAN Requirements

• Open Standards-based protocols
  – Interoperability, competition, multiple vendors

• Robust networking

• Security
  – Protect consumer data and metering system

• Commissioning
  – Ease of installation for supplier or DIY

• Future expansion to new services
  – Upgradability in the field, Market attractiveness
HAN Architecture questions

(Independent of technology choice)

• Who owns the HAN?
  – Consumer, Energy Supplier, DCC?
  – Who authorises devices on the HAN?

• Is there one HAN or more than one HAN
  – Consumer network vs Smart Metering System
  – Smart Metering services vs Other services

• How secure to make the HAN
  – Ease of use/installation vs security
Breakout Session: HAN Basics

- 14:00-15:00: Q&A Session
- Explore how HANs work
  - Security, Commissioning, messaging
  - Meters, displays, other devices
  - Demand response, microgeneration
  - Wireless networks
  - UK requirements
End.

Comments, Questions?