In-Home M2M Connectivity for Smart Meters, Plugs and Appliances

Hanadu

IoT for the Smart Home

Russell Haggar, Xsilon

CIR SGCP Conference
5 June 2013 Cambridge
www.cir-strategy.com/events

Synopsis

▶ Connectivity that works for large scale (mass market) roll-outs of M2M services into the home is challenging and requires more than mere off-the-shelf thinking.

▶ Hanadu has been designed for connecting appliances and machines to each other within the home: In-Home M2M.

▶ It is ideal for Smart Meter-to-IHD connectivity in the 30% of homes that cannot use ZigBee, as well as for connecting home energy management devices together into a network.

▶ Hanadu also supports other In-Home M2M applications, such as Assisted Living and E-Health.

▶ The Hanadu SIG is being launched to support the introduction of this technology into the global marketplace.
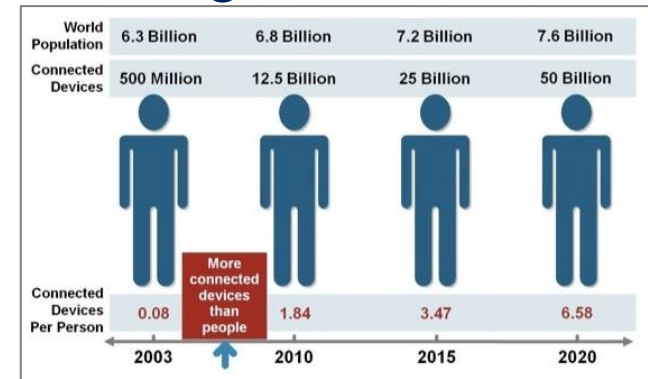
- ▶ First connectivity solution designed for In-Home M2M

- ▶ Uniquely meets the key criteria for mass market roll-out M2M and IoT appns into the home

- ▶ Full co-existence with all other in-home networking technologies

- ▶ Designed for interworking with ZigBee, Weightless and Bluetooth Low Energy

![Hanadu logo] ![Xsilon logo]

- First connectivity solution designed for In-Home M2M
- Uniquely meets the key criteria for mass market roll-out M2M and IoT appns into the home
- Full co-existence with all other in-home networking technologies
- Designed for interworking with ZigBee, Weightless and Bluetooth Low Energy

- UK-based comms tech biz
- Founded in 2008 by high-tech industry veterans
- Xsilon created Hanadu to meet the needs of M2M and IoT roll-outs into the home
- HAN9250 evaluation kits available Q4 2013
- Commercial trials expected in Q4 2013 and beyond
- Created Hanadu SIG to accelerate adoption

Whole Home, Every Home M2M™

Connecting the Internet of Things

Hanadu

▶ Forecasts for the Internet of Things assume huge amounts of future connectedness within our homes

World Population	6.3 Billion	6.8 Billion	7.2 Billion	7.6 Billion
Connected Devices	500 Million	12.5 Billion	25 Billion	50 Billion
Connected Devices Per Person	0.08	1.84	3.47	6.58
	2003	2010	2015	2020

More connected devices than people

▶ In-Home M2M capability is key
  ‣ 3G/4G does not reach far into the home
  ‣ WiFi limited by deadspots and price-points
  ‣ Has to connect everything, everywhere

▶ Connecting up "dumb" appliances requires different levels of cost and reliability compared to consumer electronics devices
  ‣ In-Home M2M needs near-perfect coverage & out-of-the-box usability
  ‣ Appliances are positioned for the owner's convenience, not connectivity

▶ Hanadu's In-Home M2M capability works for all M2M services
  ‣ Especially Smart Meter and Home Energy Management devices

Designed for In-Home M2M

Hanadu

- ► Applications in need of In-Home M2M:
  - ▸ Energy-Smart Homes
    - → Smart Meter-to-IHD connections
    - → Home energy management
    - → Micro-generation monitoring (FITS & Maintenance)
  - ▸ Assisted living
  - ▸ E-Health
  - ▸ Building automation (IoT-style)
  - ▸ Smart appliances
- ► Common needs
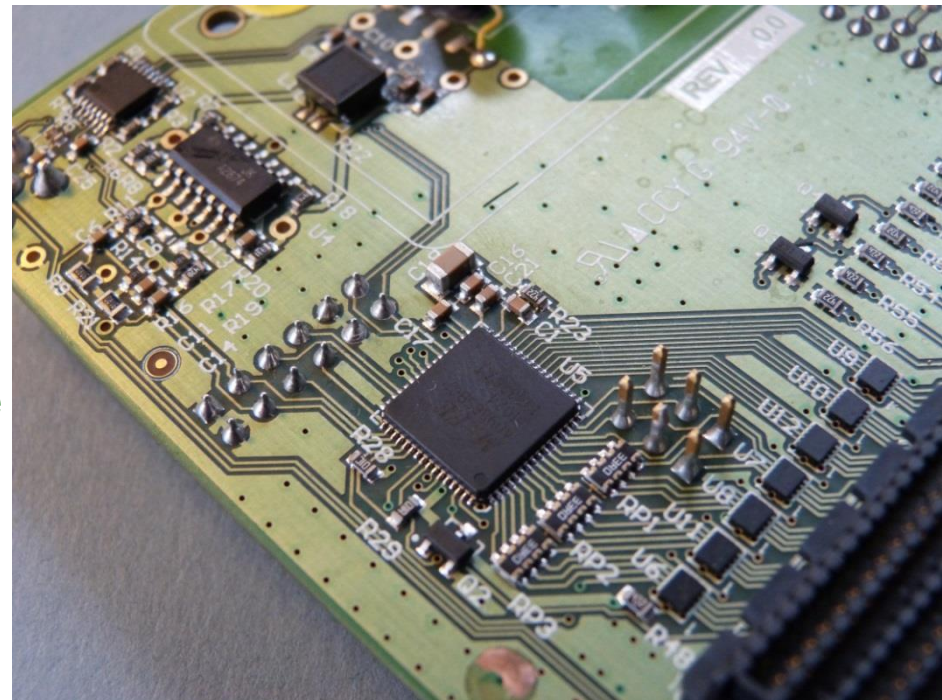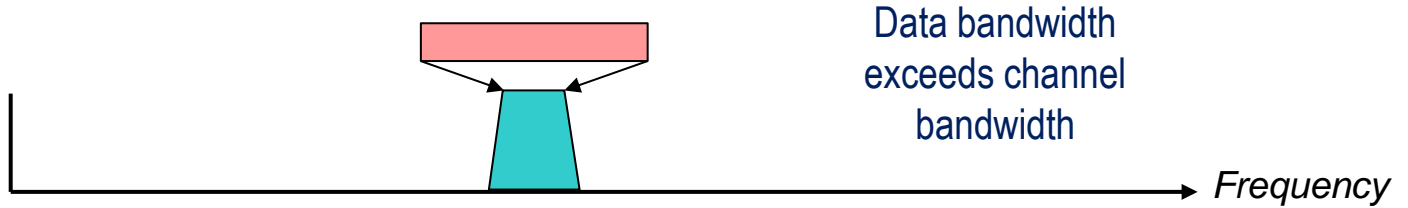 - ▸ Low cost, low maintenance, works everywhere, low power usage, zero configuration, unobtrusive, …

Hanadu™

- In development since 2008 – Greenfield approach, No legacy
- Powerline complement to ZigBee (supports all key ZigBee profiles)
- Proprietary open specification (like Weightless, ZigBee, Bluetooth, etc.)
- Full co-existence with all home networking technologies
- Designed for In-Home M2M
- Native IPv6/6LoWPAN support
- Small & Cool:
    - *Ultra-small physical form factor*
    - *Sub-500mW power usage, inc PSU*
    - → Fits inside a mains plug: retrofittable
- EMC "good citizen": unique
- Whole home coverage: unique
- Hanadu SIG → Standardisation
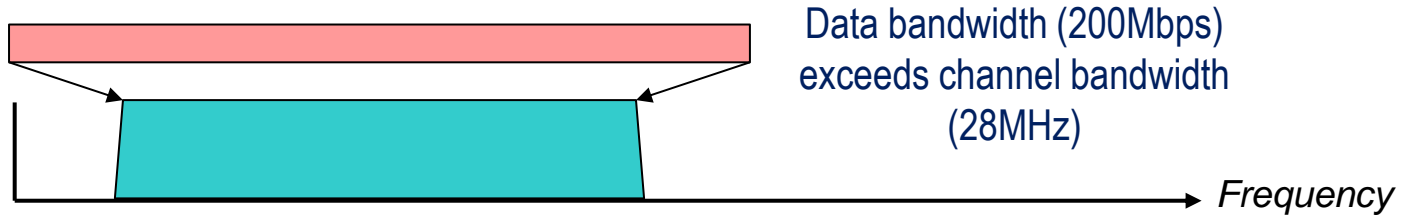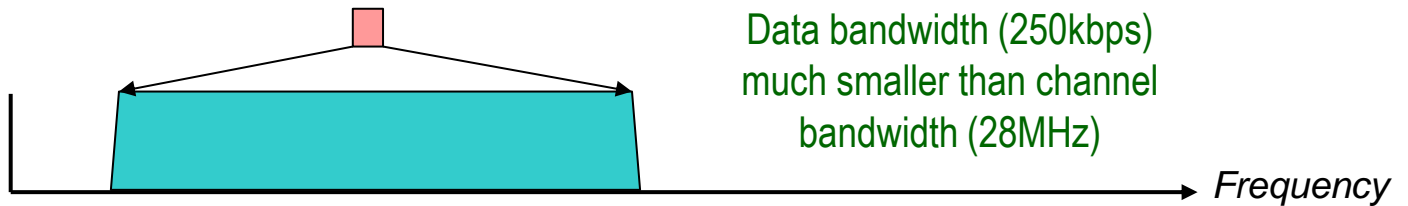

Whole Home, Every Home M2M™

Powerline Evolution for M2M

Hanadu

The typical data transmission problem for all new comms technologies

Data bandwidth exceeds channel bandwidth

Frequency

eg Broadband Powerline (HomePlug)

Data bandwidth (200Mbps) exceeds channel bandwidth (28MHz)

Frequency

But …

Hanadu

Data bandwidth (250kbps) much smaller than channel bandwidth (28MHz)
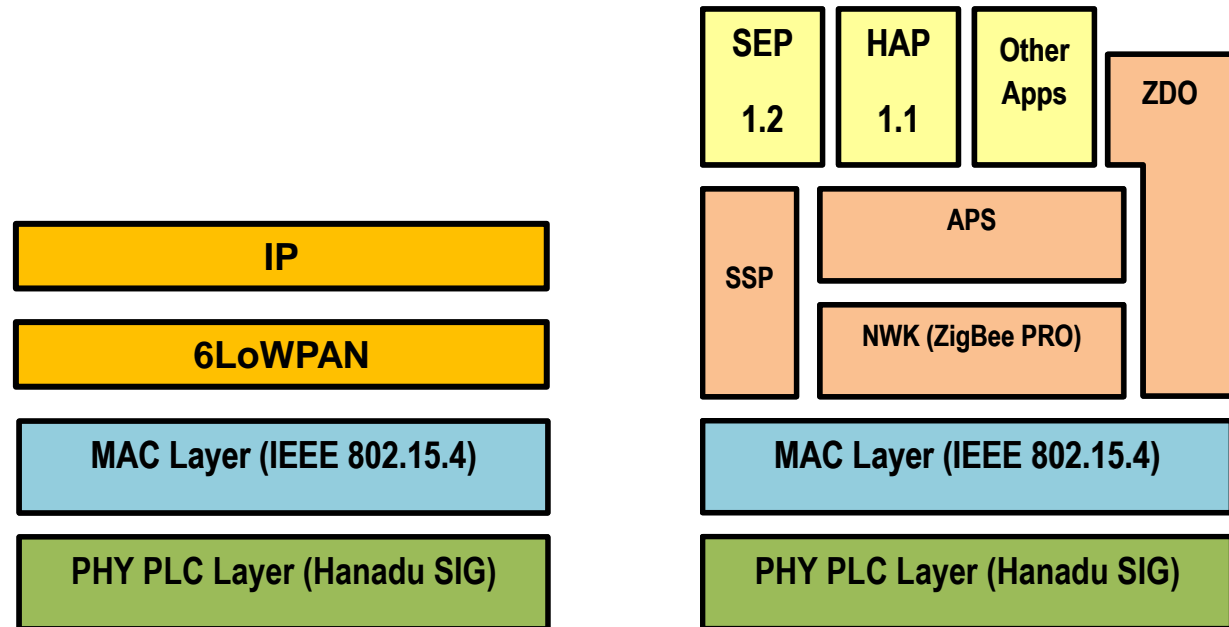
Frequency

Network Architecture

- **Hanadu is fully interoperable:**
  - ZigBee, Weightless and Bluetooth Low Energy
  - IPv6 and 6LoWPAN (IoT)

- **Architecture designed for seamless hybrid roll-out, especially with ZigBee & 6LoWPAN**
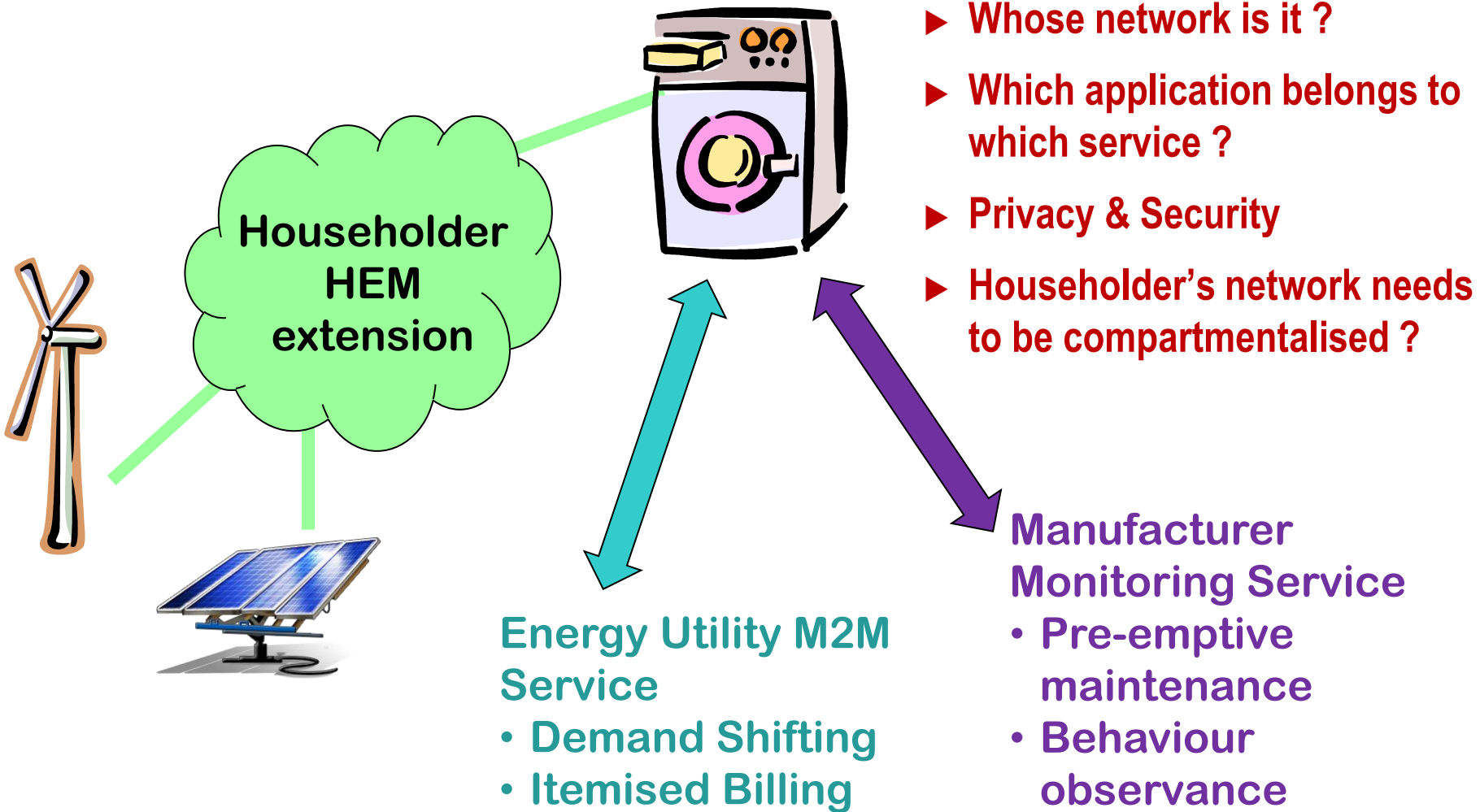 - The only In-Home M2M technology with native IPv6 support

Network Architecture

Hanadu

▶ Architecture designed for seamless hybrid roll-out, especially with ZigBee & 6LoWPAN

  ▸ Hanadu slots into protocol stack as a new PHY

  ▸ Single network for Service Providers and Hardware OEMs to manage

© Xsilon Ltd 2013

Resolving the "Internet of Silos"

Householder HEM extension

▶ **Whose network is it ?**

▶ **Which application belongs to which service ?**

▶ **Privacy & Security**

▶ **Householder's network needs to be compartmentalised ?**

Energy Utility M2M Service
• **Demand Shifting**
• **Itemised Billing**

Manufacturer Monitoring Service
• **Pre-emptive maintenance**
• **Behaviour observance**

Hanadu

Hanadu Special Interest Group

Launching 1st July

For Everyone:
Users, Supporters, Suppliers

www.hanadu.org

centrica
geo | Green Energy Options
ember
ofgem
SmartReach FOR A GREENER FUTURE
Imperial College London
ENERGY RETAIL Association
ONZO
vodafone
UNIVERSITY OF CAMBRIDGE
NAVETAS Energy Management
passivSYSTEMS
e·on
nest
bre

Energy-Smart SIG Working Group

Hanadu

▶ Working with ZigBee for ubiquitous connectivity

▶ Smart Meter-to-IHD connections
  ‣ DECC: ZigBee can't connect the Smart Meter to the IHD in 30% of GB homes
  ‣ Hanadu+ZigBee resolves this, even in apartment blocks

▶ Home energy management
  ‣ ZigBee meshing for end-to-end coverage gets costly
  ‣ Hanadu reaches further, avoids bandwidth crunch

▶ Micro-generation monitoring (FITS & Maintenance)
  ‣ ZigBee struggles with remote & external equipment
  ‣ Anticipates Future FITS

Thank You

www.xsilon.com

russell.haggar@xsilon.com

CEO, Xsilon