Modular Interface for Residential Devices

SGIP / H2G DEWG
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Brian K. Seal
Sr Project Manager, Power Delivery & Utilization
Electric Power Research Institute (EPRI)

Jon Rappaport, Chairman
Jon@USNAP.org
704-905-5852
Lessons Learned From The Computer Industry

Universal Smart Grid Device Connectivity!
USNAP Timeline

- Research: via California Energy Commission PIER
- USNAP Alliance Formed
- USNAP 2.0 Spec Released
- SDO Hand-Off & Ratification

**2007**
- Radio Thermostat
- CEC reference design implemented by Radio Thermostat

**2008**
- USNAP 1.0 Spec Released

**2009**
- 1st Retail Products Available

**2010**
- USNAP & EPRI Merge

**2011**
- USNAP Compliance Program

**2012**

**2013**

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A Standard for a Modular Utility Interface

- A Simple Interface for Demand Response of Residential Devices
- Accelerates Availability of DR-Ready Devices for both HAN and DLC Programs
- One Appliance (SGD) Works with any Communication Device (UCM)
- One Communication Device Works with any Appliance
- Low Cost Impact on Appliances, Owner Installation Made Possible
- Communication systems can evolve without obsoleting the end device
Specification Merger

NIST/SGIP
H2G DEWG

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H2G DEWG: Merge the Two Specifications

**Research Interest**

**Open Industry Collaborative**
- End Device Manufacturers
- Communication System Providers
- Utilities

2 year activity

Use-cases → Requirements → Specification

- Established Industry Organization
- Completed Collaborative 2.0 Specification Dec 2010
- Existing Products in Market and on Retail Shelves
- Focus: Brand Marketing, Conformance & Specification Evolution
Demand Response Communication Architectures

Reaching the Home

- Powerline Based
- Wireless
- Wired / Fiber

Entering the Home

- Meter
- Via Energy Management Console
- Pass-Through
- Non-Meter Gateway Device

Inside the Home

- Direct to Devices
Key Merged-Interface Characteristic: Leveraging of Existing Industry Standards

Allows for lower layer diversity for pass-through of standard protocols:

- Internet Protocol
- Smart Energy Profile
- OpenADR
- ClimateTalk
- Etc.
Key Merged-Interface Characteristic: Interoperability

When any universal communication module (UCM) is connected to any end device (SCM), “it just works”, in the sense that at least basic demand responsiveness is enabled

• Achieved through the definition of a minimized set of basic commands that all devices fall-back on if standard pass-through commands are not supported by the device they are connected to
Key Merged-Interface Characteristic: Both AC and DC Form Factors

DC Form Factor
Smaller, supports battery powered devices

AC Form Factor
Supports PLC communication modules, keeps power supply cost in the module, enables local voltage and frequency monitoring by DR modules

Interest in Other Form Factors
New form factors might be more optimized, more rugged, more reliable, etc.
Project Timeline

• Dec Request from H2G DEWG
• Jan Formal project launch
• March Basic message format & commands
• April Complete method for transport of upper level “pass through” messaging
• May-June Draft new harmonized spec document
• June 1-14 Final committee review and edits
• June 15-20 Spec complete and ready for presentation
• June-July H2G DEWG review process
• August Official handoff to SDO – (CEA, IEEE, NEMA)