Home Appliance Vocabulary

Web of Things IG

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Beijing

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Web of Things – Web Scale Interoperability

- Interoperability based upon metadata for
  - **Application data models**
    - Properties, actions and events
  - **Semantics and domain models**
    - Sharing the same meaning (critically important)
  - **Communications and security**
    - Instructions for platform developers
- We now need to start work on semantic interoperability
  - Following on from the joint white paper across SDO's (in progress)
  - This means looking at real world use cases and testing our understanding with plug tests that stress semantic interoperability across a broad range of devices
  - Smart homes is a salient domain for this work

Scott Jenson's comments on 16 June 2016

As a UX designer, I'd like to make sure that we appreciate that Apple is doing much more than just "metadata description and discovery":

- A **limited** set of device categories
- Clear and **limited** functional schema for each category
- A fairly limited app to find and control these devices

If we truly expect these devices to work in in the home, we have to go beyond just the metadata description and discovery. We need to appreciate interoperability comes from hard decisions: by having a strong, if limited set of devices and functions. I realize this is a more business strategy comment than an engineering one. However, I'm fearful we're just going to recreate another "32 Bluetooth profiles" mess all over again.

Is there any proposal to have the concept of a required base set of functionality? There can also be an optional set but taking a hard stand on required, as Apple as done, goes a long way in providing interoperability.

Who is working on Smart Homes?

- Home Gateway Initiative
- AllSeen Alliance
- CENELEC
- Eclipse IoT Information Model Repository
- ETSI SmartM2M- Smart appliances ontology project
- OpenIOT
- Open Connectivity Foundation
- Apple, Google, Samsung, …
- … and more

Home Gateway Initiative
Smart Home Architecture & Abstraction Layer

- Provide unified APIs for application developers to command, control and query home appliances

- Independence of underlying home area network technologies so that an application developer doesn't need to know anything about Zigbee, Z-Wave, wireless m-bus etc.

- Enable applications to be portable across different HGI compliant devices

- Enable extendibility of the system to support additional HAN technology without service interruption

- Applications should be able to use a pass-through mechanism to use technology-specific functions

Google Smart Home*

Brings together a set of technologies that more easily enables the management of the home environment over a mobile device. This tight network includes the following primary technologies and their roles:

- Brillo allows for all devices to connect together using Bluetooth and/or a Wi-Fi adapter and pairs with Nest, Android M, and Chrome.
- Weave is an open-source language that all connected devices (including smartphones) use in order to communicate amongst themselves.

* http://www.dummies.com/how-to/content/what-is-the-google-smart-home-platform.html

Apple HomeKit

- HomeKit is a framework for communicating with and controlling connected accessories in a user's home.

- You can enable users to discover HomeKit accessories in their home and configure them, or you can create actions to control those devices.

- Users can group actions together and trigger them using Siri.

Samsung SmartThings
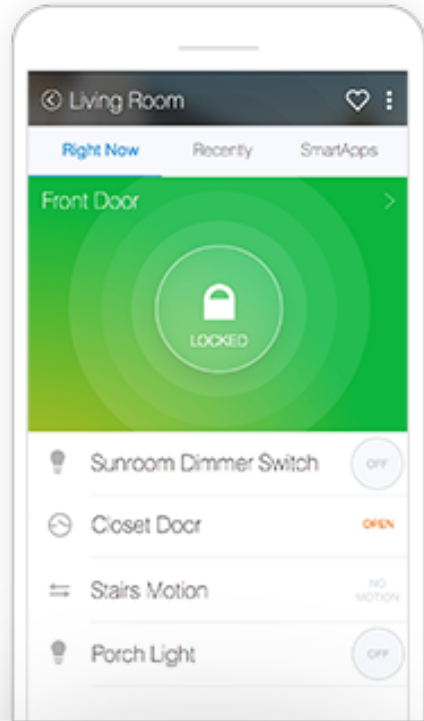
Smart Phone + Home Hub + Things

SmartThings consists of a hub, cloud platform, and client applications.

Francois Daoust's List

- Amazon Alexa:
  - https://www.amazon.com/smarthome-home-automation/b?ie=UTF8&node=6563140011
- Apple HomeKit   https://developer.apple.com/homekit/
- Crestron   http://www.crestron.com
- Google Nest   https://nest.com
- HomeSeer   http://homeseer.com
- Insteon   http://www.insteon.com
- LG HomeChat   http://www.lghomechat.com
- Samsung SmartThings   https://www.smartthings.com
- Wink   http://www.wink.com

Smart Home Appliances

- Very few people will want to be locked to a single platform provider
- **Goal**: standard way of modelling common home appliances
  - Enabling services that work across devices from different vendors
- How do we get there from here?
  - First survey existing devices to see how similar/different they are
  - Explore what kinds of data and semantic models are needed
  - Can we define abstractions that hide unimportant variations?
  - Build a suite of demos in collaboration with manufacturers
- We need to collaborate on this with other organisations

Francois says …

Some of them, such as Apple HomeKit, LG HomeChat or Google Nest seem to restrict support to a few device categories. Targeted categories are not the same in each case. For instance, LG HomeChat focuses on large home appliances, while others focus on smaller appliances. However, it may be possible to view a large appliance as a group of more atomic devices (e.g. a refrigerator might be viewed as a light, thermostat, door, and fan).

Other systems, such as Crestron, HomeSeer or Insteon, tend to be generic all-purpose home automation systems and by definition try to support a large number of device categories. That said, their Web sites usually feature similar restricted sets of device categories.

Common Device Categories

- Lighting
- Power outlets
- Doors
  - door status, door locks, garage doors
- Cameras
  - security cameras, front-door camera
- Thermostats / Weather systems
- Window Shades
- Home Hubs/Gateways

Common Characteristics

- Brightness
- Door state
- Temperature
- Pressure
- Lock state
- Power state

- Most systems incorporate some sort of grouping mechanism
  - e.g. zones, rooms, scenes, etc.

Summary

- Semantic models of devices and characteristics
  - Greater commonality at the level of characteristics
  - Great opportunity for practical work on semantic models
- Further work is needed to study the details
  - Please **volunteer** to help with this work
  - Collaborative work on analysis and synthesis
  - Aim for an Interest Group Note focused on smart homes
- How to work with other Industry Alliances/SDO's?
- Plugfest demos for services that work with devices using different platforms and from different vendors
  - What do we need to do to involve the vendors?
    - Help with information on their products
    - Direct involvement of vendor staff
    - Donations of devices
- Should the WoT WG charter scope enable standardisation of such models?

We Want **YOU** to volunteer for this important work!