Designing Smarter Gateways for the Internet of Everything

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Todd Antes - Qualcomm
Tom Kerber - Parks Associates
Audio Recording

- To replay the webcast, click here: https://attendee.gotowebinar.com/recording/6790775492144739330
Presenters

Todd Antes  
*Vice President of Product Management*  
Qualcomm

Tom Kerber  
*Director of Research, Home Controls and Energy*  
Parks Associates
Role of the Gateway

• The User Experience
• Value to Manufacturers, Service Providers
• Data and Value Added Services
• Privacy and Security
• Interoperability

Qualcomm’s Perspective

Q&A
Role of the Home Gateway

Average Number of Connected Devices Owned (2010 - 2014)

(Among BB HHs, Outliers Excluded)

*Note: Parks Associates uses a different methodology to do the calculations by including more CE devices.
Source: Multiple Surveys: American Broadband Households and Their Technologies
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Smart Product Adoption

Adoption of At Least 1 of the Listed Smart Home Devices (Q2/14)

- Lights: 6%
- Programmable thermostat: 6%
- Smoke detectors: 6%
- Security camera: 6%
- Door locks: 6%
- Garage door openers: 5%
- Carbon monoxide detectors: 5%
- Outlet/plug: 5%
- Door bells: 5%
- Power strip: 4%
- Home or Kitchen appliances: 4%
- Combination sensor: 4%
- Blinds or drapes: 4%
- Sprinkler system: 3%
- Water leak detectors: 3%

Source: American Broadband Households and Their Technologies Q2 2014
N=10,000 broadband households, ±0.98%
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Device Setup Problems (Q3/14)
"T8220. Which of the following problems did you experience when setting up the [Device]?"
(Among Respondents Setting Up a Device, n=3,036, ±1.78%)

- Difficulty configuring settings: 13%
- Difficulty learning how to use it: 13%
- Difficulty connecting it to the Internet/router: 10%
- Difficulty connecting it to interact with other devices: 8%
- Did not have all the required cables: 4%
- It was broken or defective: 3%
- It did not work as advertised: 2%
- None of the above: 65%

Source: American Broadband Households and Their Technologies Q3 2014
N=10,000 broadband households, ±0.98%
© 2014 Parks Associates
Smart Product Performance

Frequency of Device Problems (Q4/12)
"How often do you experience problems with the following devices?" (Among BB HHs Owning Specified Devices)

- Electronic door locks: 5% (3 Times a Month), 16% (3 Times a Week), 9% (Daily/Almost Daily)
- IP security cameras: 6% (3 Times a Month), 15% (3 Times a Week), 9% (Daily/Almost Daily)
- Smart thermostat: 6% (3 Times a Month), 9% (3 Times a Week), 12% (Daily/Almost Daily)
- Automatic lighting controls: 5% (3 Times a Month), 5% (3 Times a Week), 8% (Daily/Almost Daily)

Smart Home - Two Paths to Market

**Products**

- ecobee
- Nest
- Chamberlain
- Whirlpool
- Hunter
- Honeywell

**Systems**

- Vivint
- ADT Pulse
- Verizon
- Comcast
- Time Warner Cable
- Iris
- Nexia
- Staples
Architecture for Smart Products

Connected Device

Gateway

Virtual Device

Device Monitoring and Control

Device Analytics, Modeling and Control

Data Services
Data from Smart Products Unlocks Value for Partners

The Internet of Everything

Industry Partners

Security  Health Care  Energy  Media  Insurance  Electronics  Retail

Smart Products

www.qualcomm.com  www.parksassociates.com
Business Objectives Not Aligned

<table>
<thead>
<tr>
<th>Product</th>
<th>Manufacturer</th>
<th>Retailer</th>
<th>Service Provider</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Differentiate Products</td>
<td>Sell More Products</td>
<td>Commoditize Products</td>
</tr>
<tr>
<td>Platform</td>
<td>Add Value to Product</td>
<td>Add Value through Integration</td>
<td>Centralize Value Creation in Platform</td>
</tr>
<tr>
<td>Data</td>
<td>Control Data and Extend Customer Relationship</td>
<td>Control Data and Maintain Customer Relationship</td>
<td>Control Data and Customer Relationship</td>
</tr>
</tbody>
</table>
### Privacy and Security Concerns

#### Smart Home Privacy Concerns (Q2/14)

<table>
<thead>
<tr>
<th>Concern</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concern over unauthorized access</td>
<td>39%</td>
</tr>
<tr>
<td>Concern over historical data</td>
<td>38%</td>
</tr>
</tbody>
</table>

- **Concerned (Rating 5):** 24%
- **Very concerned (Rating 6-7):** 20%

**Source:** *American Broadband Households and Their Technologies Q2 2014 | N=10,000 broadband households, ±0.98% | © 2014 Parks Associates*
Top 3 General Concerns About Smart Home Devices (Q4/14)

Among All BB HHs, n=4,991, ±1.39%

- Private information is stolen by hackers: 73%
- Installation of the devices is expensive: 57%
- Doors are accidentally locked or unlocked because the lock or associated app malfunctions: 57%
- Installation of the devices is difficult: 34%
- Electricity is wasted because automated settings are not optimal: 29%
- Garage door unexpectedly closes because the garage door or associated app malfunctions: 28%
- Pipes freeze because the thermostat or associated app malfunctions and turns the heat down too much: 22%

"Q2911. What are your greatest concerns about connecting these types of devices to the Internet?" | Source: American Broadband Households and Their Technologies Q4 2014 | N=10,000, ±0.98% | © 2015 Parks Associates
Architecture for Smart Products

Connected Device

Gateway

Virtual Device

Device Monitoring and Control

Device Analytics, Modeling and Control

Data Services
Importance of Interoperability by Order of Purchase (Q2/14)

"S2710. When you purchased the following device(s), how important was it for the device(s) to work together with other devices as part of a system?"

(Among BB HHs Purchasing Device in Specified Order)

<table>
<thead>
<tr>
<th>% Reporting &quot;Very Important&quot; (Rating 6/7 with 7=&quot;Extremely Important&quot;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st device purchased (n=736, ±3.61%)</td>
</tr>
<tr>
<td>2nd device purchased (n=573, ±4.09%)</td>
</tr>
<tr>
<td>3rd device purchased (n=520, ±4.3%)</td>
</tr>
</tbody>
</table>

Source: American Broadband Households and Their Technologies Q2 2014 | N=10,000 broadband households, ±0.98% © 2014 Parks Associates
Competing Approaches to Interoperability

Peer to Peer Networks

Cloud Based Interoperability

App Mash ups

Gateway

API

Cloud

Lights
Water Heater
Media Player

TV

Gateway

API

Cloud

Lights
Water Heater
Media Player

TV

Gateway

API

Cloud

Lights
Water Heater
Media Player

TV

Gateway

API

Cloud

Lights
Water Heater
Media Player

TV
Designing Smarter Gateways for the Internet of Everything

Role of the Gateway

• Value to Manufacturers, Service Providers
• The User Experience
• Data and Value Added Services
• Privacy and Security
• Interoperability

Qualcomm’s Perspective

Q&A
Designing Smarter Gateways
The role of the home gateway is evolving
Challenges: the connected home and the Internet of Everything

Connectivity | User Experience | Security | Interoperability
Connectivity: whole home coverage
Connectivity: adding new physical layers

Wi-Fi
Bluetooth Low Energy
ZigBee
Powerline
802.15.4
Z-Wave
Proprietary
Optimizing the network: Qualcomm® StreamBoost™ technology

Intelligent traffic Management

Automatic

Simple GUI

Cloud-based Updates

Qualcomm StreamBoost is a product of Qualcomm Atheros, Inc.
Analytics

The gateway is uniquely positioned to collect data

Analytics per geography and total subscription base
- Device and application data
- Websites visited
- Duration (per device/app)
- Time of day
- Oversubscription
- User performance data (good experience vs. bad)
- Total bytes
- Network diagnostics
- Detection of streams being starved by the content server

Application and device info (time based)
Security
Gateway as the traffic cop

Network  Content/Devices  Application
Interoperability: Today’s reality: one app per device or brand

Applications are an excellent solution for enabling the consumer-facing IoE
Interoperability: Vertical solutions will not support a complex ecosystem
Market is shifting from purpose-built solutions to frameworks promoting an ecosystem

Horizontal apps will be play a critical role in the evolution of the connected home
A single platform for devices in the Internet of Everything

Easy, reliable, and secure. Across bearers and operating systems

AllJoyn™ is a collaborative open source project of the AllSeen Alliance.
Thank you

For more information on Qualcomm Atheros, visit us at: www.qca.qualcomm.com

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Qualcomm Atheros, Inc., 1700 Technology Drive, San Jose, CA 95110
Questions?

Todd Antes  
Vice President of Product Management  
Qualcomm

Tom Kerber  
Director of Research, Home Controls and Energy  
Parks Associates
Upcoming Connected Home Event!

The Premier Connected Home Conference

May 19-21  San Francisco
Thank You!

Tom Kerber
Director, Research, Home Controls & Energy
972.490.1113
tom.kerber@parksassociates.com

Todd Antes
Vice President of Product Management