IoT Hands on Workshop

Introduction / Welcome

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Definition Group - OIC
Welcome

Thank You for attending the IoT Hands on Workshop
• 1:00pm - 2:00pm  Intro & Welcome: UPnP Forum and ZTE
• 2:00pm - 3:00pm  VidiPath Presentation
• 3:00pm - 3:30pm  Coffee Break
• 3:30pm - 4:30pm  OIC Presentation and Demo
• 4:30pm - 5:30pm  UPnP Presentation
  UPnP & HIT University Demo
• 5:30pm - 6:15pm  Q&A
• 6:30pm - 9:00pm  Evening Reception
  drinks, hors d'oeuvres, demos
Thank you our supporters

And all of you for attending!
Let’s step back to the PC in 2001

- PCs and home networking were in their early years, proprietary solutions and lack of standards were the way of life
  - 27% of US households still did not own a PC [2]
    - Poor usability & complexity were listed in the top 5 barriers to adoption, Historical problem areas still bad: e.g. Connecting to the Internet
  - At that time, New product areas presented even more complex problems - wireless home networking, mobile phone/PDA integration, consumer electronics integration, etc.

What were the effects in 2001

- Corporate purchase cycles had lengthened to between 3 to 6 years \(^3\)
  - Purchase price is not the key purchase barrier—total cost of ownership was
- Returns and post-sales call costs for PC OEMs were staggering
  - Approximately $1.48 billion or $95 per PC sold \(^4\)
    - Based on the 40.1 million PCs shipped on the year
- “No Defect Found” return rate runs as high as 90%+ (depending on product category)
- Consumer electronic returns costs are estimated at $10B annually \(^5\)

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\(^3\) Desktop Refresh Cycles: Three Years Is the Standard, But Not the Reality, Forrester Research, 2003
\(^4\) Ease of Use / PC Quality Roundtable Research on Returns and “No-Defect-Found” rates in the PC industry. 2003
\(^5\) eBrain Research conducted October, 2002 for Consumer Electronics Association (CEA)
What were the effects in 2001

- Retail return rates holding at 8% to 15% for past three years
  - Plateau reached after steady decline during last decade
  - Average of 13% for notebook PCs and 11% for desktop PCs
  - Only 2-5% of returns are found to be defective
  - 85% of people who return PCs within the first 8-9 days take the exact same model as a replacement

- High OEM NDF rates indicates HW/SW configuration issues
  - OEM1: 33% of all returns are perception based
  - OEM2: approximately 30% NDF rate on system returns
  - OEM3: 76% NDF on desktop returns, 67% on laptop returns

Consumers were frustrated – The Industry was frustrated – Cost of Ownership was high – Profits were tight

The Response

• Companies world wide were slow to react but eventually it was understood that vertical solutions would not allow the market to grow at a quick pace
  • Interoperability issues
  • Customer frustration
  • High support costs
The industry turned to Standards
  - To allow for interoperability across brands
  - To drive down support costs

UPnP
  - Started to allow for all devices on the home network to be able to automatically discover and control each other

DLNA
  - To ensure content could be moved from device to device within the home network

Many other standards efforts

The Home Networking / Content sharing ecosystem now has billions of connected devices working together!!
• It takes time to define and implement standards to assist with market growth – early identification of needs and efficient execution are vital

<table>
<thead>
<tr>
<th>SIG</th>
<th>Initial Development</th>
<th>First Product</th>
<th>Initial Market Adoption</th>
<th>Years from Initial development to Initial Market adoption</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPEG2</td>
<td>1988</td>
<td>1993</td>
<td>1998</td>
<td>10</td>
</tr>
<tr>
<td>802.11</td>
<td>1990</td>
<td>2000</td>
<td>2002</td>
<td>12*</td>
</tr>
<tr>
<td>MPEG4 – (Baseline of MPEG2)</td>
<td>1995</td>
<td>2001</td>
<td>2007</td>
<td>12</td>
</tr>
<tr>
<td>Bluetooth</td>
<td>1998</td>
<td>1999</td>
<td>2002</td>
<td>4</td>
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As you can see – it can take years to go from standardization start to mass market adoption
Now – Let’s Fast forward to today and IoT

• IoT is in the exact same situation
  • Many players – everyone wants a piece of the market
  • Fast growing market
  • Fragmented implementations
  • Interoperability is at a minimum
  • Consumer confusion on how to implement interoperable solutions
  • Multiple Verticals (e.g. healthcare, transportation, smart home, etc.)
Global shipment volume of Wi-Fi (Wireless-Fidelity) connected devices reached around 2.27 billion units in 2014, up 18% year-on-year.

Source: Market Intelligence & Consulting Institute, MIC, April 2015

As demand grows and prices fall, [Business Insider] anticipates that connected home device shipments will quadruple over the next five years, to hit 1.8 billion units shipped in 2019.

Source: Business Insider, Mar 2015

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Source: Market Intelligence & Consulting Institute, MIC, April 2015

Between 2014 and 2019, sensor shipments will surge with a CAGR of 11.4 percent, culminating in a total of 19.1 billion sensors by 2019. Revenues will rise 6 percent annually as a result.

Source: IC Insights, April 2015

“IoT (Internet of Things) market in China expected to grow at a CAGR of 32.15% over the period 2014-2019”

Source: TechNavio, March 2015

Global Revenue from Shipments of Residential Internet of Things Devices is Expected to Reach Nearly $70 Billion in 2025

Source: Navigant Research, June 2015

“The expectations for the Internet of Things are impressive. According to Cisco, the Internet of “Everything” is a $19 trillion opportunity, while companies like GE see markets like healthcare garnering an extra $63 billion in incremental value over the next 15 years.”

Source: UPnP Forum whitepaper, April 2015

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Source: UPnP Forum whitepaper, April 2015
The Challenge

- It is 2015 – the market in 2020 is forecasted to be 20 billion devices with 1.8 billion being shipped a year
- It takes about 8 years to take standards from start to mass market implementation

We are already late – We need to come together as an Industry to lessen fragmentation and enable standardization to ensure maximum market growth and interoperability
• You will hear from industry (and consortia) experts working together to solve the IoT interoperability issues
  • UPnP
    • Device discovery and control
      • Beyond the home network
  • DLNA
    • Display and content interoperability
  • OIC
    • IoT connectivity interoperability

These groups (and others) all have liaisons to work together for a holistic standards approach to IoT interoperability!!
Enjoy the Sessions and the Demonstrations!!