Internet of Everything for Industry
SFO15-209

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Connected Devices BU, Cisco

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Cisco’s top down view of IoE/IoT (refined client server model)

- **People**
  - are increasingly connecting more devices and providing more data.

- **Data**
  - transforming raw data into more useful higher-level information.

- **Things**
  - such as sensors and actuators are becoming more sophisticated, smaller and longer battery life.

- **Process**
  - or infrastructure to ensure the right information is delivered at the right time to the right person in an appropriate way.

Source: Cisco IBSG, 2012
IoE Value at Stake $14.4 trillion 2012-2022

- Asset utilization ($2.5 trillion)
  - IoE reduces selling expenses and production cost.

- Employee productivity ($2.5 trillion)
  - IoE creates labor efficiencies.

- Supply Chain and logistics ($2.7 trillion)
  - IoE eliminates waste and improves efficiency.

- Customer experience ($3.7 trillion)
  - IoE increases customer lifetime value and grows market share.

- Innovation ($3.0 trillion)
  - IoE increases the return on R&D and creates additional revenue streams.

Source: Cisco IBSG, 2013
Top Challenges for IoE deployment for Production (why don’t we just do it?)

- Security, Trust, and Privacy
- Device Management, Standardization of protocols and data
- Data Analytics, Scalability, Rules Engines (local and global)
- Regulatory and compliance: Radios and Healthcare Data
- Extensibility and tailorability: adding new devices and functionality (SDKs and frameworks)
  - “One size does not fit All” – each vertical has its own distinct requirements.
- User Experience
- Business Model
Real World Use Case:
A Residential IoE Gateway and Platform
Partnerships are Necessary to Bring it All Together

- Remote Arm/Disarm
- Intrusion Alarms
- CO, Water, Fire Alarms
- Sirens, Control Panel
- Emergency Call, Service Dispatch

- HVAC/Thermostat control
- Supply/Demand
- Carbon Footprint
- Solar Panel Mgt
- EV Charger Mgt

- Control of Appliances, Lighting, Audio/Video
- Scene Management
  - Door open
  - Light turns on
  - Sleep mode of thermostat

- Assisted Living
- Heal@Home
- Motion Sensing
  - Bed monitor
  - Fitness tracking
  - Help pendants

- Health and Fitness

- Security and Life Safety

- Lifestyle

- Apps
Partnerships are Necessary to Bring it All Together
Cisco’s offerings with Connected Life

- A complete set of offerings and partnerships
- Open and Modular software, purpose built or multi-service Gateways, Management tools for Customer Service and Subscriber

**Service Application Framework**
- Open and Modular

**Service and Device Management**
- Comprehensive Device Management

**CPE Hardware**
- Purpose Built to Unified Gateway

**Consortium Participation**
- Partnering to Deploy Faster
CLG-820x - Platform Modularity

- The Cisco CLG architecture is based on a highly integrated SoC utilizing a scalable ARM Cortex A8 processor.

- It provides clock speeds from 800 MHz up to 1 GHz while retaining 100% software compatibility across the entire range.

- The Cisco CLG is designed to be modular. Cisco can deliver multiple product variants with different processor speeds, memory sizes, and interface types based on your performance requirements and cost constraints.
<table>
<thead>
<tr>
<th>Specifications</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host Processor</td>
<td>ARM Cortex A8 800 MHz up to 1 GHz (TI AM335x Sitara)</td>
</tr>
<tr>
<td>System Memory</td>
<td>CLG model variants DDR3 - 512 MB / 1 GB</td>
</tr>
<tr>
<td>Application Storage</td>
<td>NAND eMMC 4 GB (2 GB free allocatable for application and user data)</td>
</tr>
<tr>
<td>Embedded Security</td>
<td>Data protection Dedicated Secure Micro chip to encrypt / decrypt data</td>
</tr>
<tr>
<td>LAN/WAN Interfaces</td>
<td>Ethernet 2x Fast Ethernet 10 / 100 Mbps (RJ-45) with Auto MDi/MDx IEEE 802.11n 2.4 GHz (2 x 2 MIMO)</td>
</tr>
<tr>
<td></td>
<td>Wi-Fi IEEE 802.11b/g 2.4 GHz backwards compatible</td>
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</tbody>
</table>
## Specifications

<table>
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<td>Embedded Low Power HAN / PAN / device interfaces</td>
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</table>

### ZigBee
- Global ISM band 2.4 GHz

### Z-Wave
- Sub-1 GHz - Regional dependent frequencies (SKU variants) Global

### Bluetooth 4.0 / BLE
- ISM band 2.4 GHz

### NFC
- Global ISM Band 13.56 MHz
- Additional RF technologies can be supported via external USB dongles

### USB
- 2x USB 2.0 host ports

## Environment Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temp.</td>
<td>0 to +40 °C (32 to 104 °F)</td>
</tr>
<tr>
<td>Storage Temp.</td>
<td>-20 to +60 °C ( -4 to 140 °F)</td>
</tr>
<tr>
<td>Operating Humidity</td>
<td>0% to 95% non-condensing</td>
</tr>
<tr>
<td>Storage Humidity</td>
<td>0% to 99% non-condensing</td>
</tr>
<tr>
<td>Compliance</td>
<td>ETS 300 019</td>
</tr>
</tbody>
</table>
Connected Life Roadmap

DLC-100
Digital Life Platform
Home Security & Automation Platform for Lifestyle & Health Services
5 Radios [3G, Zwave, WiFi, 433 & 915 MHz]
24 Hour Battery Backup Modular Application FW [Java/OSGi]
3rd Party Developers Cisco Prime

EVOLUTION TO A PLATFORM STRATEGY

Leading Edge Radio & Mechanical Design
One Architecture, Multiple Performance Points
Integrated Multiple Radios [ZigBee/Z-Wave/BT/BLE/Wi-Fi/NFC]
Multi SW Support

CL HW Engg. Proto under eval now.
Lab Trials – Mar 14, Target FCS: Q4 2014

9202 with Cellular 3G Data
+9 Months to CLG-8202

Optional Module or USB Dongle
Support Radios in a module or plug-in architecture for Unified Gateways running RDK-B

RDK-B is the Industry Open-Source Residential Gateway Software Initiative.
Cisco’s RG Software (CCSP) served as the baseline for RDK-B.

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Take-away: IoT deployment is not always easy

- I hope that the newly formed Linaro for IoT group (Lite) will have some of these challenges on its charter:
  - Security, Trust, and Privacy
  - Device Management, Standardization of protocols and data
  - Data Analytics, Scalability, Rules Engines (local and global)
  - Regulatory and compliance: Radios and Healthcare Data
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Thank you.