Lab of Things - A Research Platform for Connected Devices

The Lab of Things Team
Breakdown

What is the Lab of Things? - Arjmand

Quick demo – AJ

Design overview – Ratul

Wrap up and questions - Arjmand
Research Using Connected Devices in Homes

Field studies in homes

Connected devices in homes

Challenges

Interconnection of devices
Scale and diversity
Engineering effort
Challenges - Interconnection of Devices

Does your research involve deploying devices in homes of participants?

Multiple kinds of devices – cameras, presence detectors, custom sensors, etc.
Different devices use different protocols
One study may require multiple kinds of devices
Challenges – Scale and Diversity of Studies

Do you limit the size of your study because of maintenance, monitoring and data collection overhead?

Maintain
- Core platform elements
- Drivers and study executable

Collect
- Data generated from experiments

Monitor
- Platform
- Study executable
Challenges – Significant Engineering Effort

How can this effort be shared?

Share
- Expertise
- Software (drivers, study apps, platform)
- Collaborative deployments
- Participants
With the Lab of Things

Conduct your field studies easily by

• Interconnecting devices and implementing application scenarios using HomeOS
• Scaling your studies through automated monitoring, updates, and data collection
• Sharing data, code, and participants with fellow researchers

Lab of Things: Lowering the barrier for conducting field studies that use connected devices in homes
Demo

Deploy your study to a large number of homes
Monitor status and progress
Analyze your data
Collaborate with fellow researchers

Field study

HomeOS

Deploy diverse devices in homes using HomeOS
Design overview
Role:Sensor
OnTrigger

Role:Camera
GetImage
OnImage
Remote Management Portal

**Hubs Deployed**

<table>
<thead>
<tr>
<th>Home ID</th>
<th>Last Heartbeat</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brush</td>
<td>0 Days 0 Hrs 34 Mins</td>
<td></td>
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<tr>
<td>BrushHome</td>
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<tr>
<td>bbb</td>
<td>0 Days 0 Hrs 0 Mins</td>
<td></td>
</tr>
</tbody>
</table>

**Hub Status Details**

- **Org ID**
- **Home ID**
- **Study ID**
- **Status**
- **Heartbeat Received (UTC)**: 7/15/2013 3:13
- **Heartbeat Sent (UTC)**: 7/15/2013 4:14
- **Last Heartbeat Seq Num**: 6195
- **Expected Heartbeat Interval (mins)**: 1
- **Current Heartbeat Interval (mins)**: 2.01
- **Memory (Bytes)**: 10209280
- **CPU %**: 57.55

**Module**

zwavezerosys
Call to action

Demo tomorrow at 10:30 AM in McKinley

Download Beta 1: Lab-of-things.com

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Feedback/suggestions: lab-of-things@microsoft.com