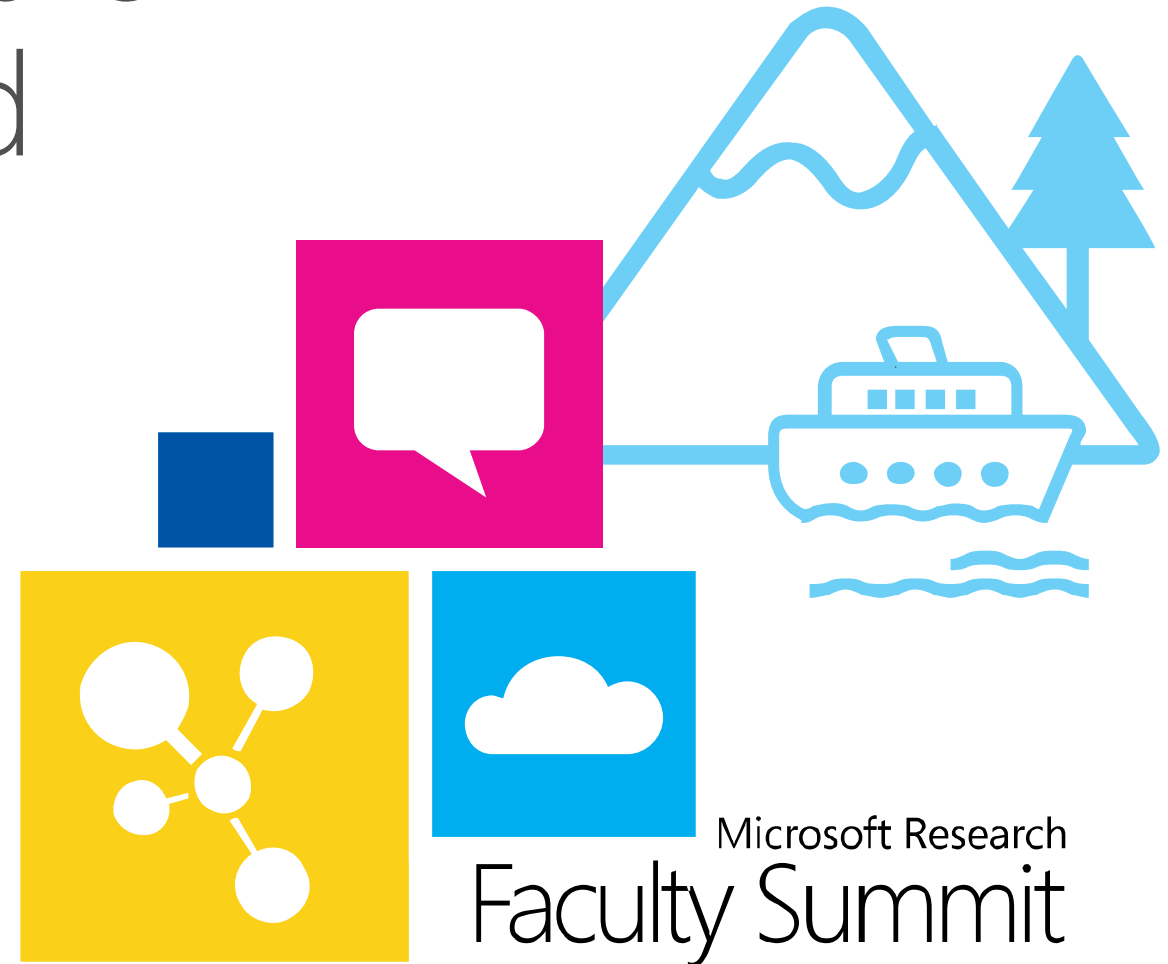


Microsoft Research
Faculty
Summit
2013



Lab of Things - A Research Platform for Connected Devices

The Lab of Things Team



People



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Trinabh Gupta



Zheng Dong



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



www-edc.eng.cam.ac.uk/projects/homeusedevices/



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



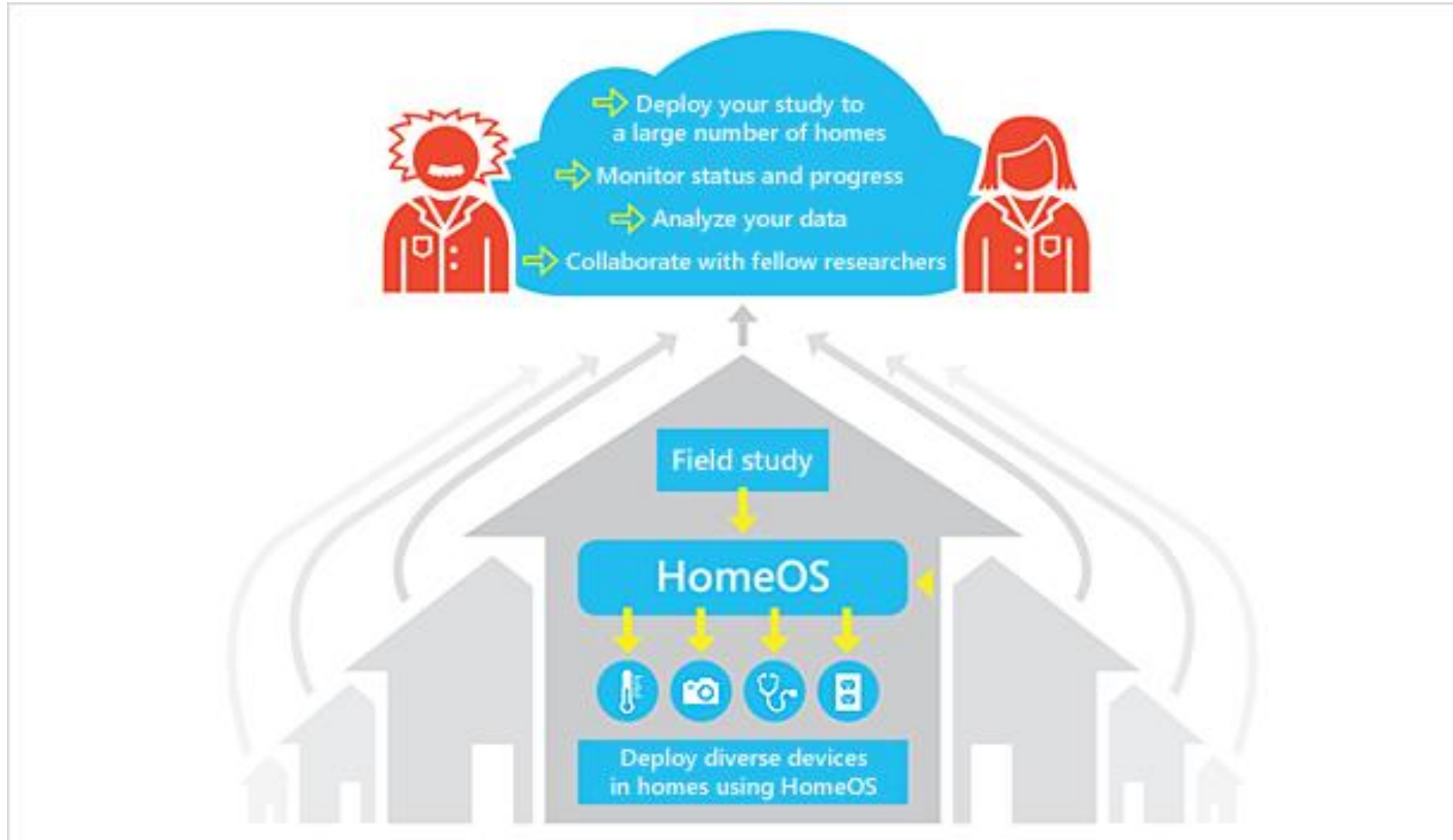
Conduct your field studies easily by

- 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

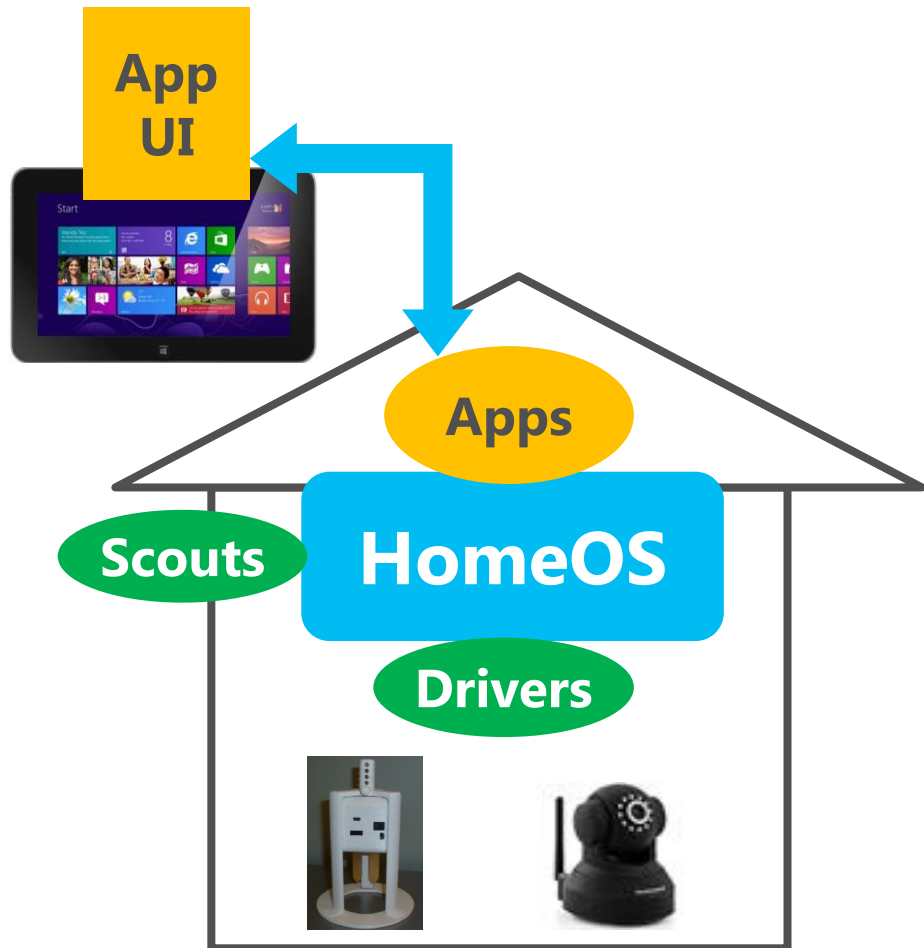


Demo



Design overview

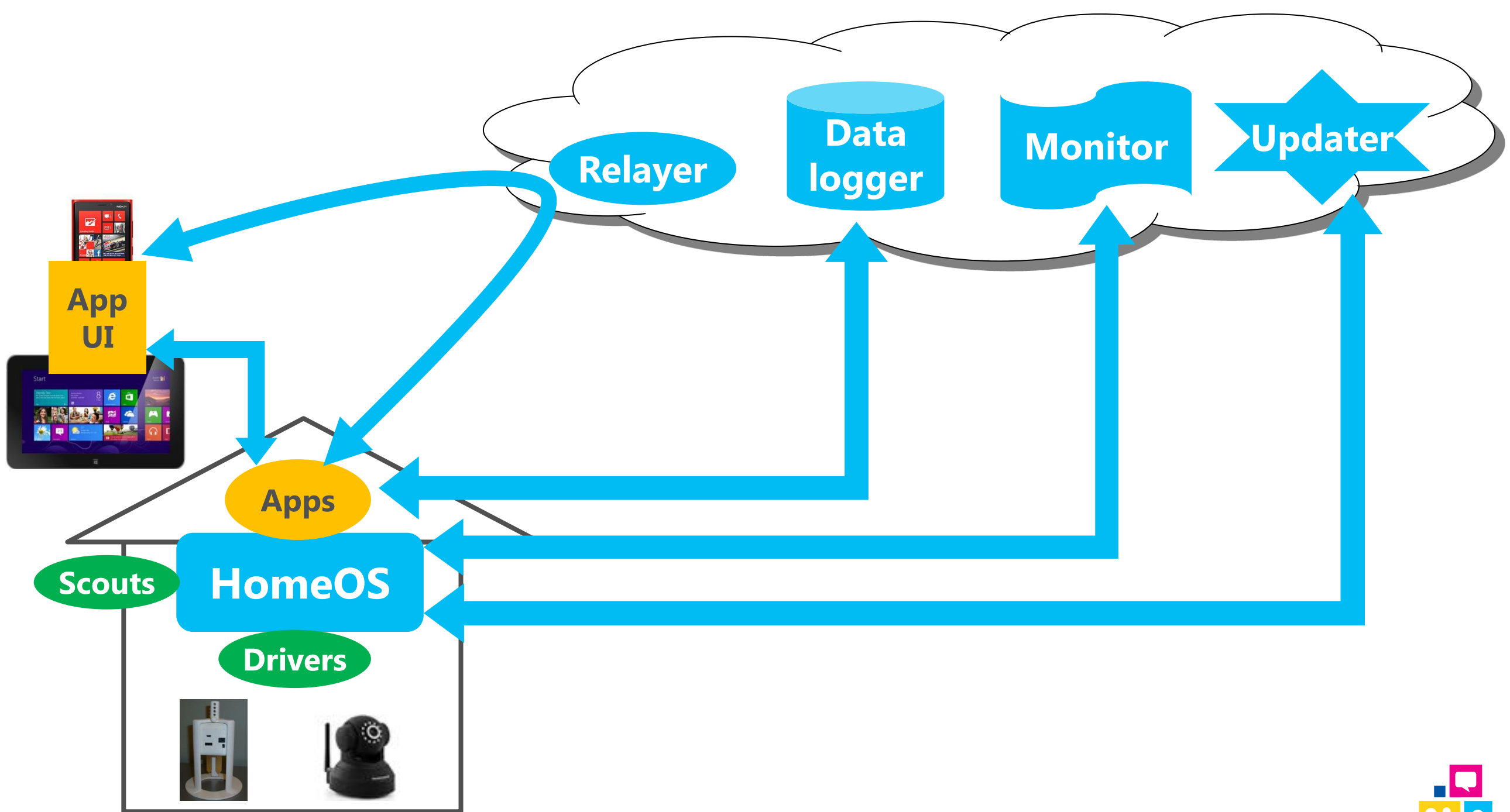


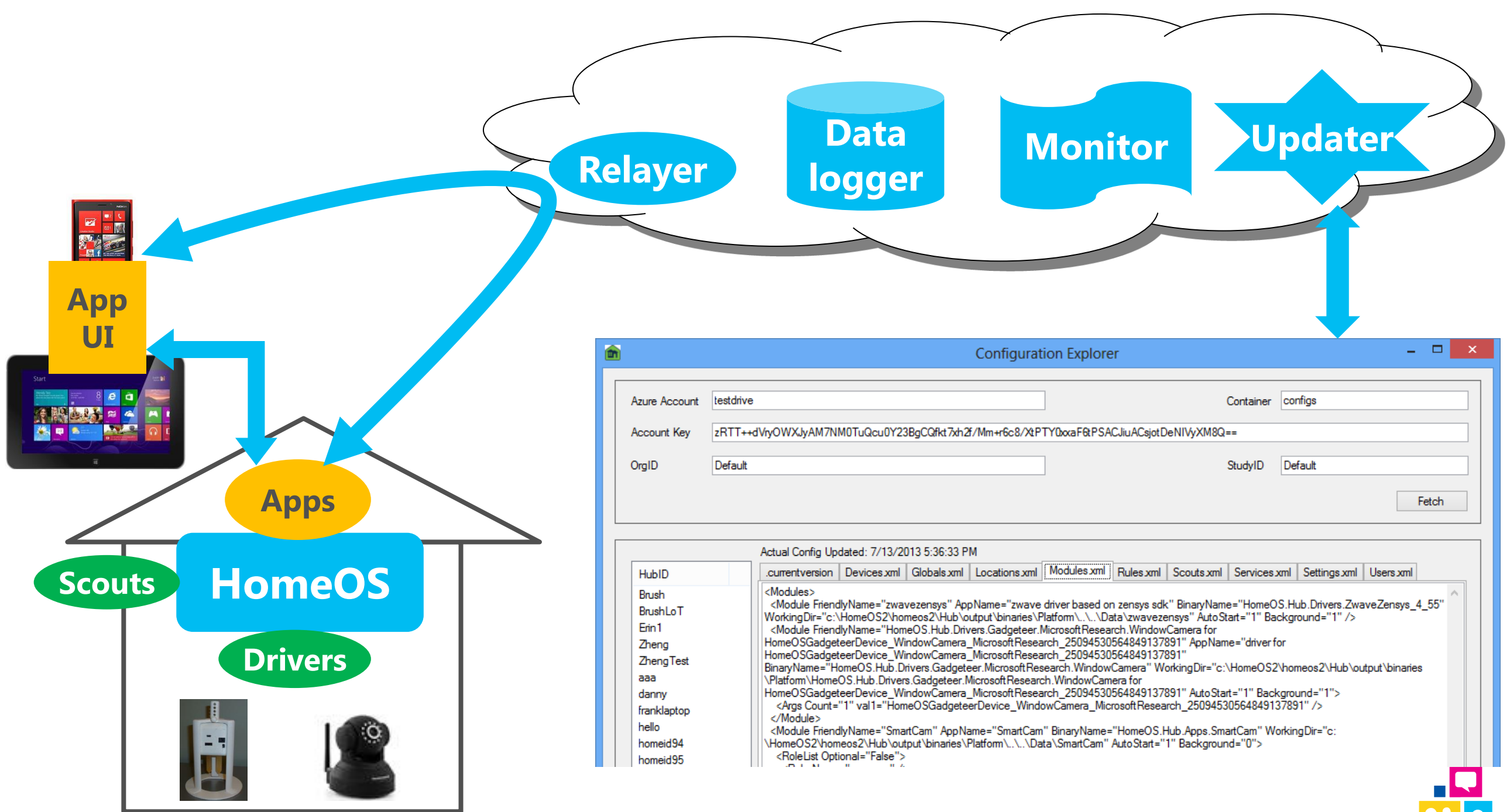


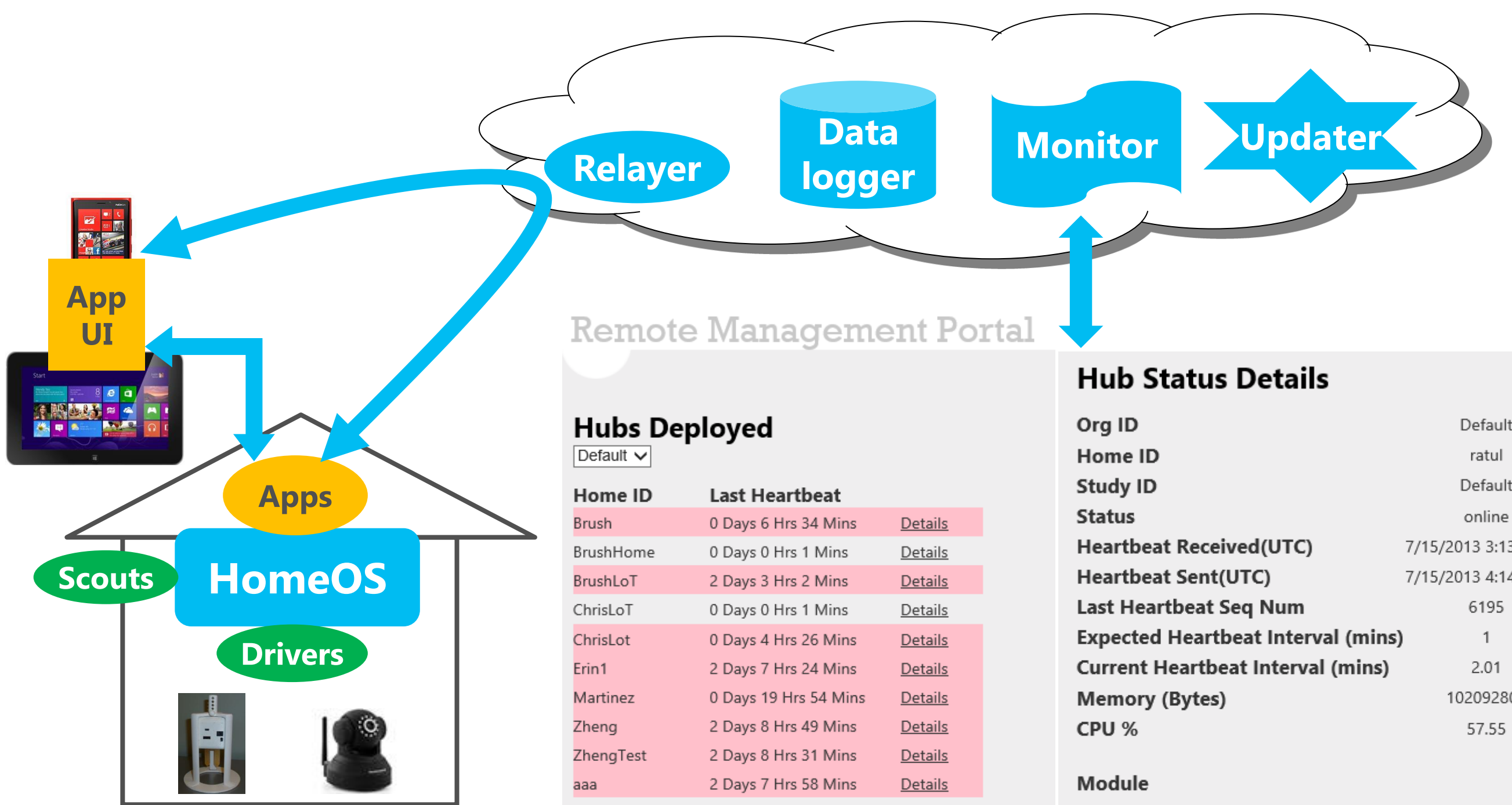
Role:Sensor
OnTrigger

Role:Camera
GetImage
OnImage









Remote Management Portal

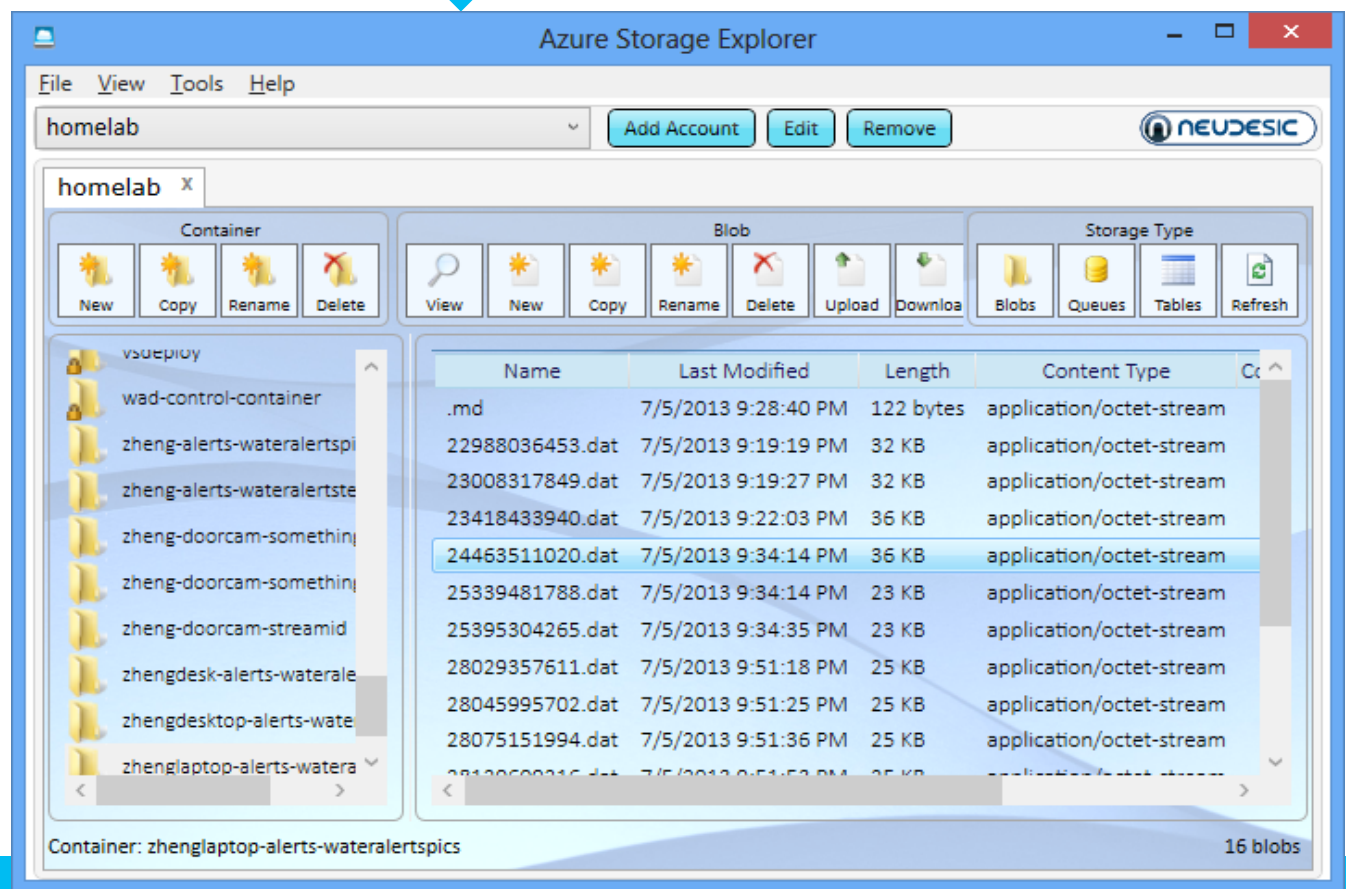
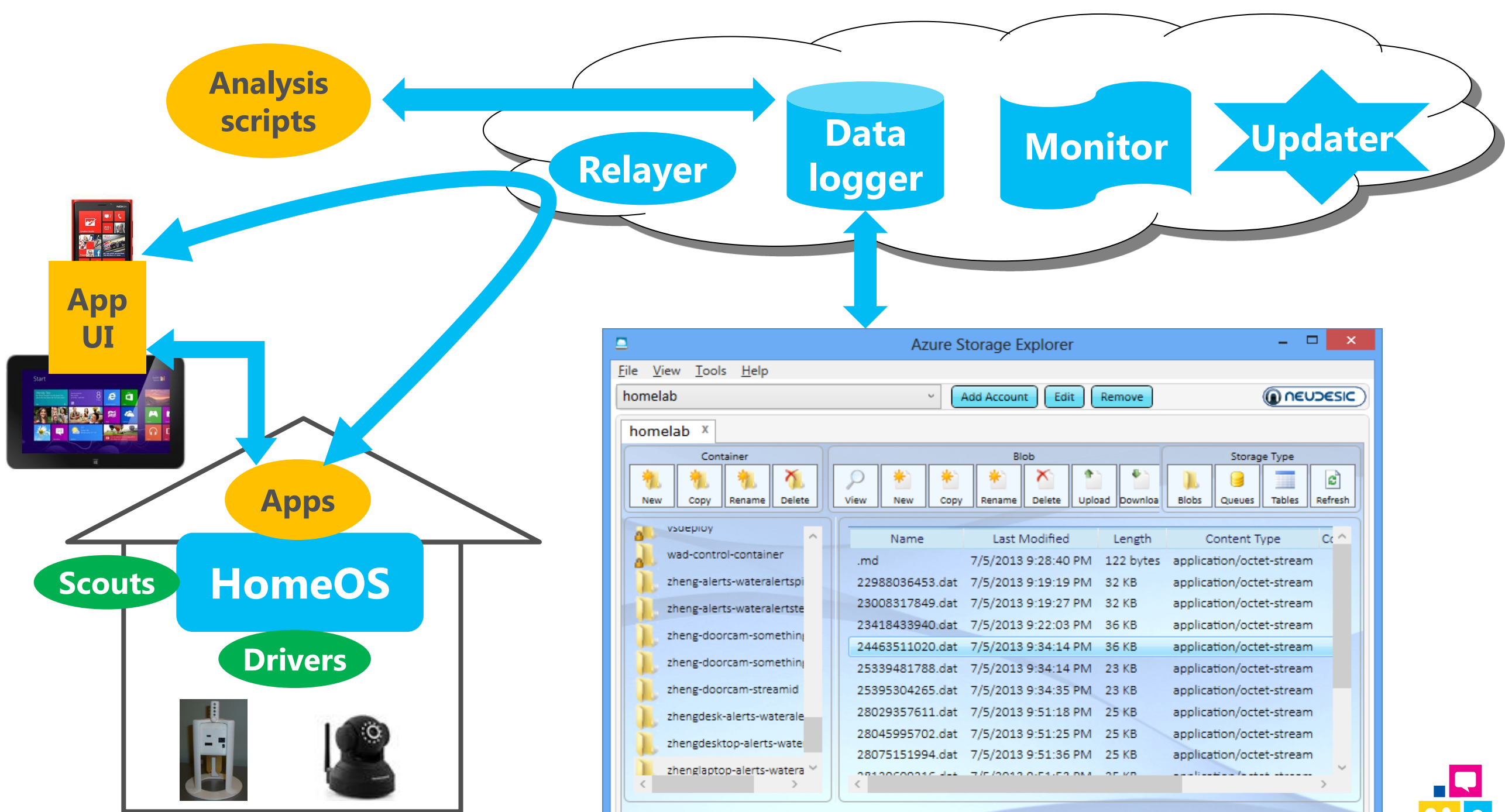
Hubs Deployed

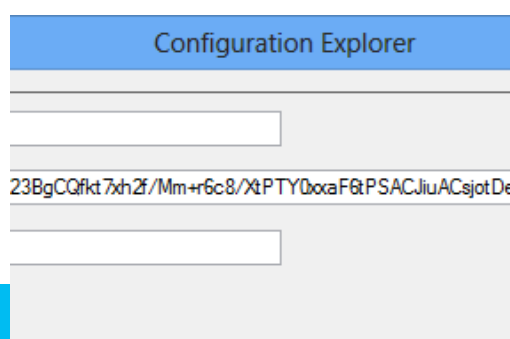
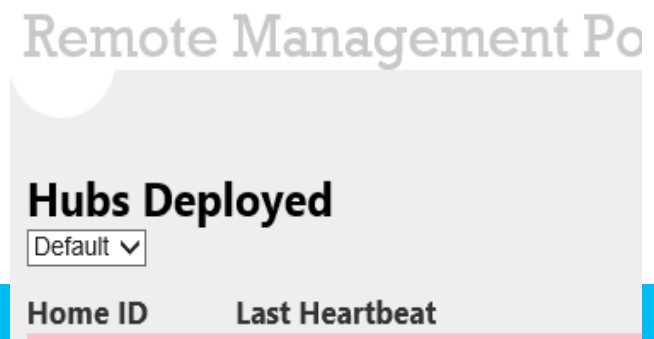
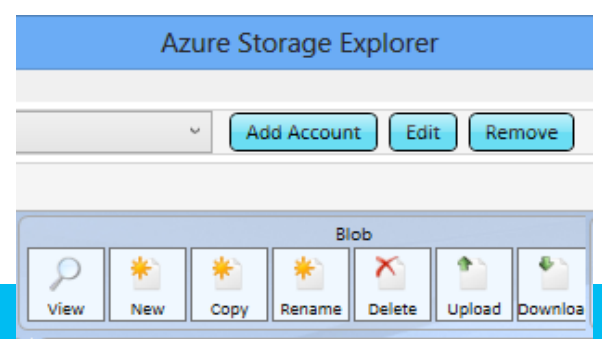
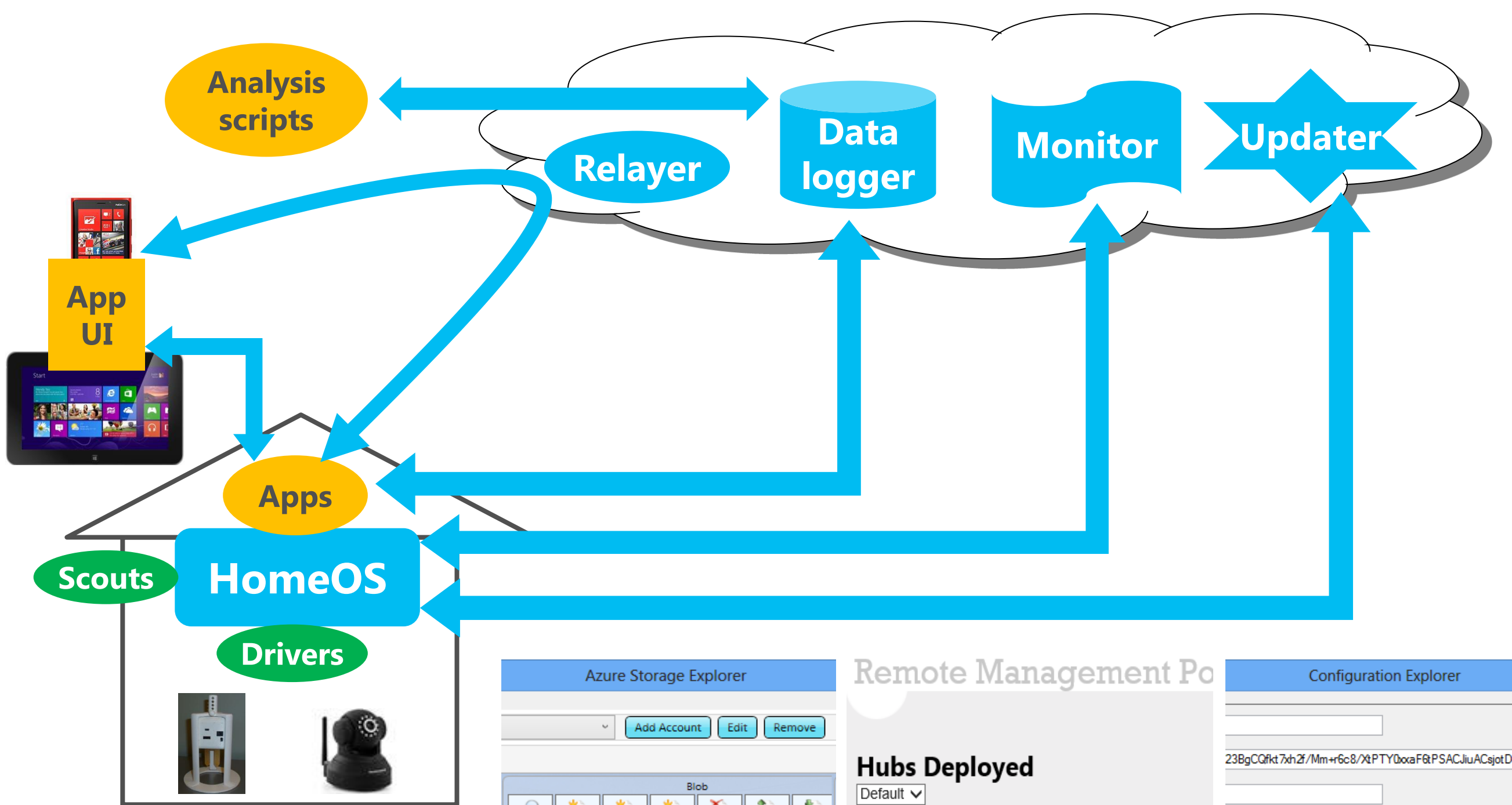
Default ▾

Home ID	Last Heartbeat	
Brush	0 Days 6 Hrs 34 Mins	Details
BrushHome	0 Days 0 Hrs 1 Mins	Details
BrushLoT	2 Days 3 Hrs 2 Mins	Details
ChrisLoT	0 Days 0 Hrs 1 Mins	Details
ChrisLot	0 Days 4 Hrs 26 Mins	Details
Erin1	2 Days 7 Hrs 24 Mins	Details
Martinez	0 Days 19 Hrs 54 Mins	Details
Zheng	2 Days 8 Hrs 49 Mins	Details
ZhengTest	2 Days 8 Hrs 31 Mins	Details
aaa	2 Days 7 Hrs 58 Mins	Details
bbb	0 Days 0 Hrs 0 Mins	Details

Hub Status Details

Org ID	Default
Home ID	ratul
Study ID	Default
Status	online
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	zwavezensys





Call to action

Demo tomorrow at 10:30 AM in McKinley

Download Beta 1: Lab-of-things.com

Join www.facebook.com/groups/labofthings/

Join mailing list send email: lab-of-things@microsoft.com

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



