

Usable Privacy and Security in the home

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Outline

- Threats to privacy & security at home
- Challenges
- Key Design Guidelines
- Exercise on smart home models
- Readings for the week
- Stakes are high!!

Threats to Privacy & Security at Home

- Internal threats
 - Roommates/visitors accessing personal devices
 - Toddlers deleting important files from the computer or turning on the thermostat
- External threats
 - Remotely unlocking the doors
 - Spying through cameras
 - Targeting entire communities by coordinating their devices to overload power grid

Then why to use smart devices at home?

Challenges (1\2)

- Mixed ownership - family members, visitors, roommates, neighbors
 - Different preferences
 - Different visitors: Friends, close friends, neighbors, relatives
- Diverse devices implies different use model
 - Computers: Desktops, laptops, tablets, smartphones
 - Home Appliances: Washing machine, TV, thermostat
 - Safety devices: Alarms, smoke detectors, security cameras

Challenges (2\2)

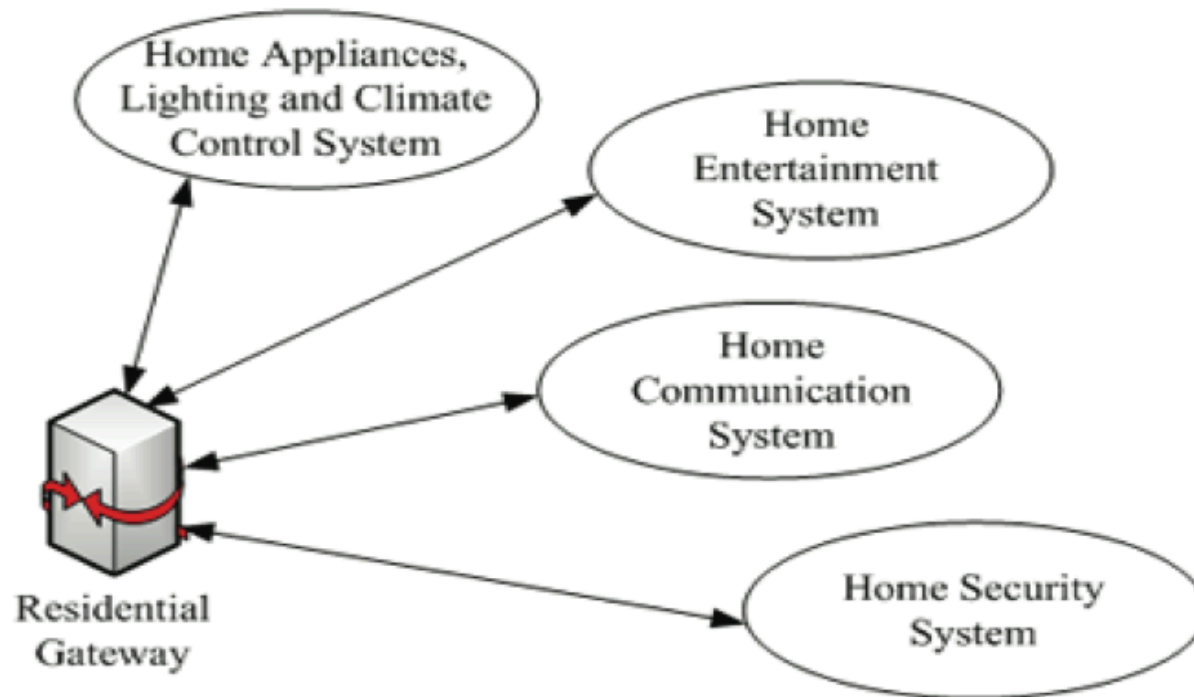
- Dealing with tradeoff between sensing vs. inference
- Naïve users
- Immersed devices
- Multidimensional policies
 - Identity and location of accessor
 - Device used for access
 - Duration of access

Key Design Guidelines

- Fine grained control
- Avoid upfront complexity
- Obscure/scrubbed data storage
- Provide feedback to users
- Replace denials with redirects
 - Helps in acknowledging social conventions
- Devices sensing the users

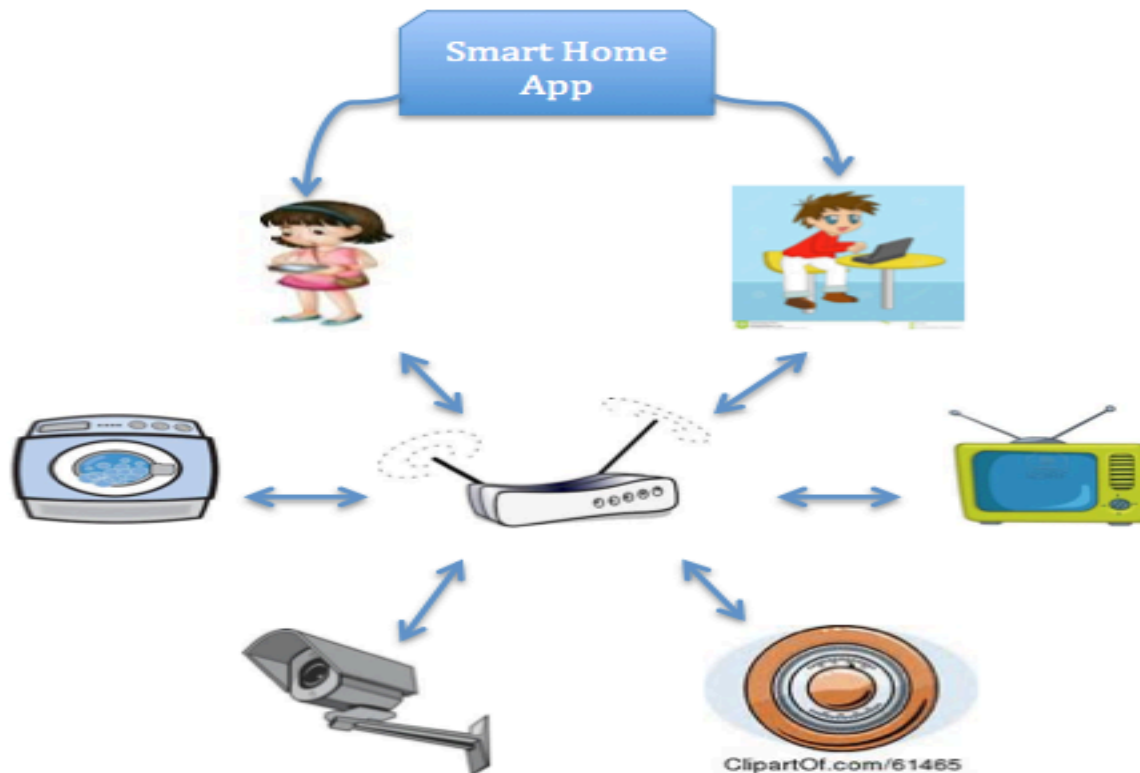
Model for Smart Home Environments(1/2)

Centralized Control Model



Model for Smart Home Environments(2/2)

Distributed Model



Exercise

- With respect to centralized and distributed architectures described in previous slides, analyze
 - Privacy & security vulnerabilities
 - Usability challenges

Readings for the week

Interesting things about the studies discussed in the reading

- “*Cultural probes*” in Choe et. al. Why?
- Interview study “*without hypothesis*” in Mazurek et. al. Why?

Stakes are high!!

- Benefits should compensate for privacy risks
- Privacy expectations of users may change
 - Educate them
- Don't design in isolation