

A Component Framework for Telecare and Home Automation

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Introduction



Resident

(comfort, safety, security)



Family

(peace of mind)



Caregiver

(care data, remote checks)



Friends

(contact)

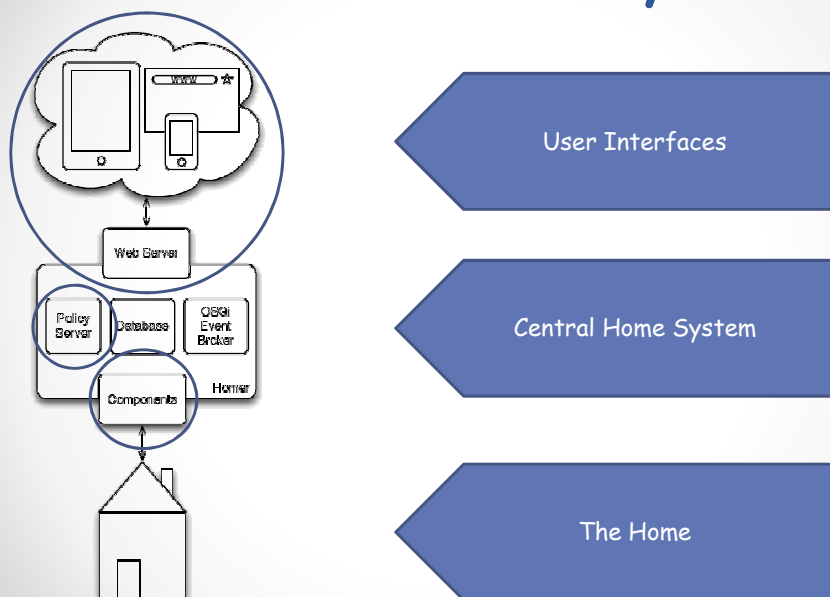
2

Home Care Challenges

- existing systems:
 - incompatible technologies and protocols
 - technical expertise needed to change functions
- users:
 - wish simple, easily installed technology
 - need unobtrusive collection of usage data
 - need easy home control and management

3

The Homer Home System



4

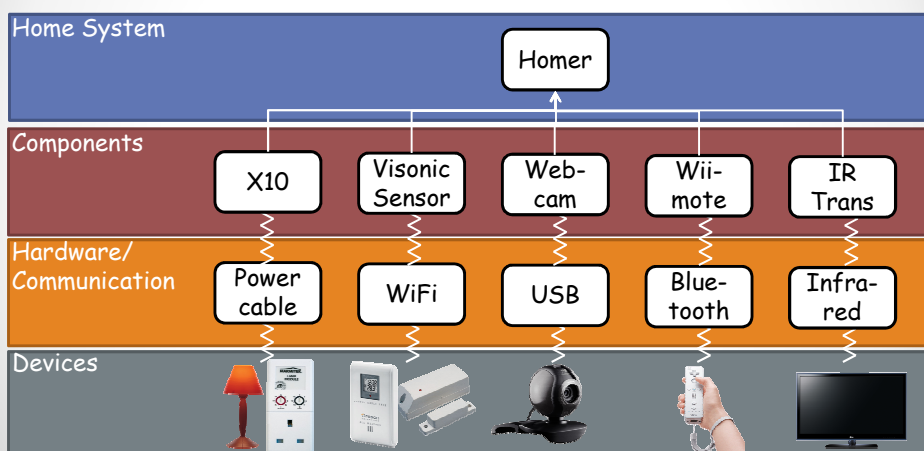
Example Components



5

Bridging Technologies

- examples of how technologies are unified:



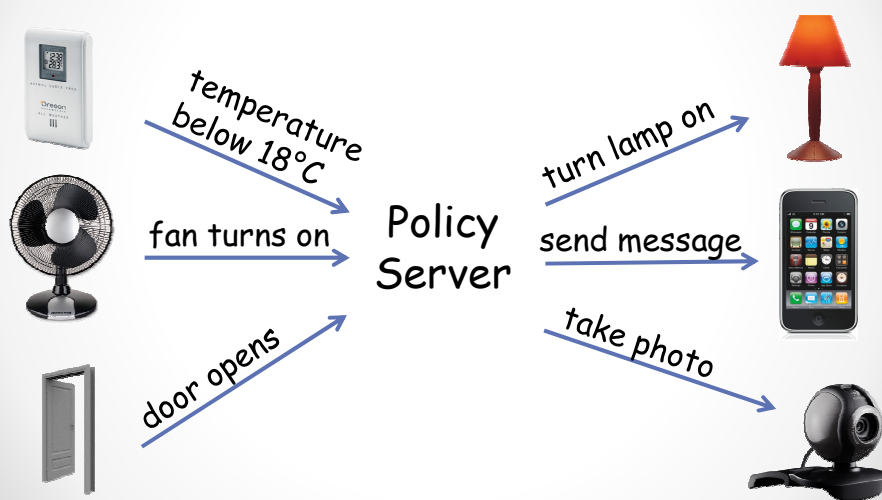
6

Component Architecture

- components:
 - OSGi bundles
 - support a particular type of hardware or protocol (e.g. X10, infrared)
 - can be modified and deployed at run-time
- use in Homer:
 - components can use shared Homer services
 - component services are provided to users
 - Homer is independent of particular components

7

Home Policy Triggers/Actions



8

Sample Home Policies

The diagram illustrates four sample home policies, each with a cartoon illustration and a speech bubble containing the policy text:

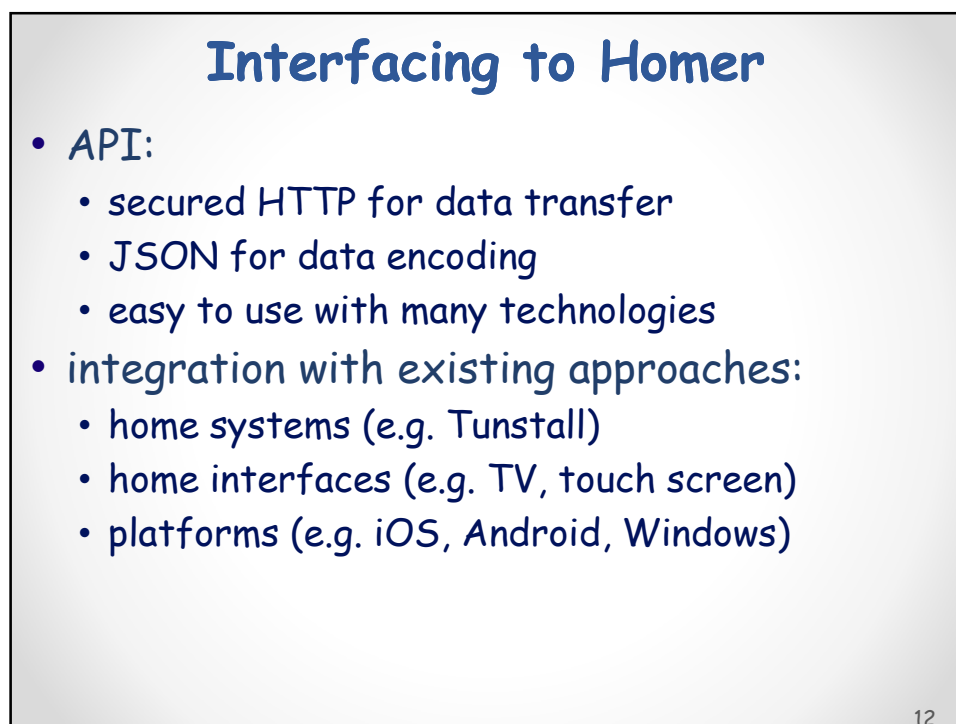
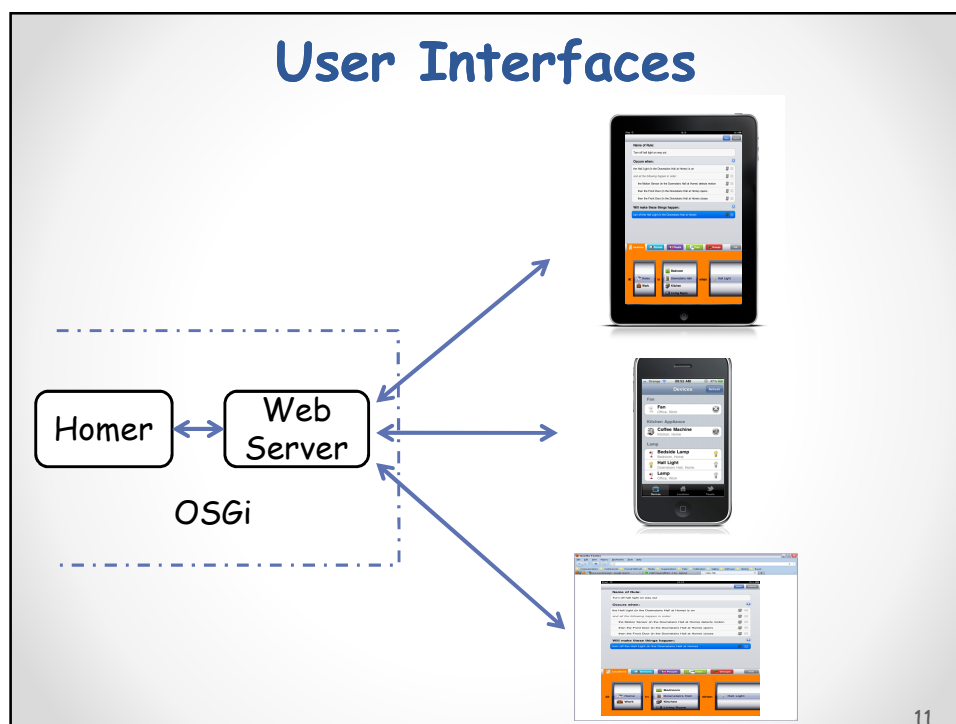
- Policy 1:** A nurse icon is associated with the policy: "when the resident misses medication do email me".
- Policy 2:** An elderly man with a cane is associated with the policy: "when the news starts and I am at home do set the TV to channel 3".
- Policy 3:** A family of four (father, mother, and two children) is associated with the policy: "when it is 10am do send text message 'Gran is up' if Gran is out of bed else send phone message 'Call Gran'".
- Policy 4:** An elderly couple is associated with the policy: "when Bob goes out from 11PM to 6AM do send phone message 'Bob may be night wandering'".

9

Policy Format

- **when:**
 - trigger/condition
 - optionally combined with **And, Or, Then**
 - optional time constraint
- **do:**
 - action
 - optionally combined with **And, If**
- **policies:**
 - defined by formal grammar
 - represented internally using JSON

10



Conclusion

- Homer offers unique benefits:
 - component/technology integration
 - user services
 - data collection, control and automation
 - open to a variety of user interfaces
- future developments:
 - support of further components
 - policy conflict handling and explanation
 - extended user evaluation

13