

# Remote Controlling Devices Using Instant Messaging

Building an Intelligent Gateway in Erlang/OTP



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## Agenda For This Presentation

- Research questions
- Instant messaging
- Home automation
- Remote controlling home automation
- Issues involved in remote controlling
- Using Instant Messaging
- Suggestion on how it could be done
  - *System concept: the intelligent gateway*
  - *Using agents*
  - *The prototype system*
- Future work

## Research Questions

- What are today the main issues in the remote controlling of devices (in a home automation context)?
- Why use Instant Messaging technology for the remote controlling of devices and services?
- How could an intelligent instant messaging based solution for remote controlling be implemented?

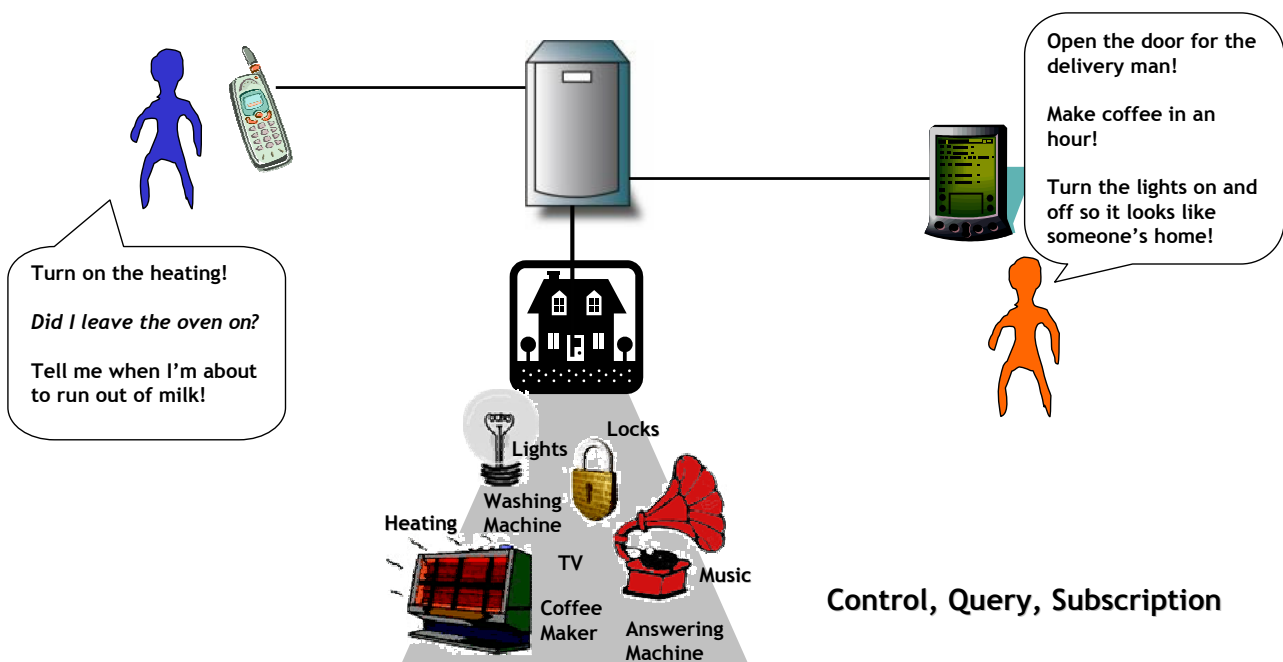
## Instant Messaging

- **Basic concepts of IM**
  - *Realtime dialogue*
  - *Buddy list*
  - *Presence/status*
  - *Subscription*
- **Widespread and growing use**
  - *Examples?*
- **Clients freely available for most platforms & devices**
- **Examples**
  - *MSN Messenger*
  - *ICQ*
  - *Jabber*

# Home Automation

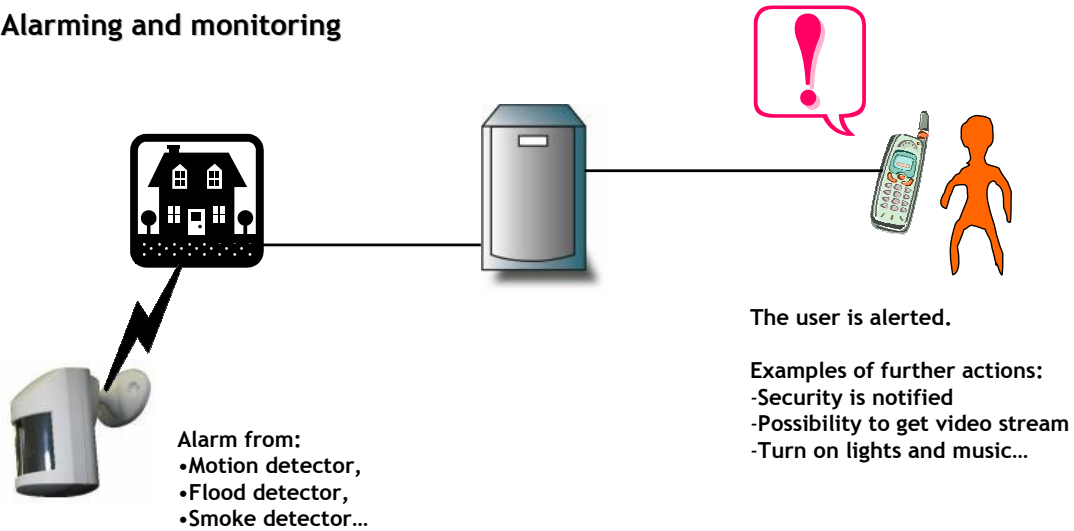
- Managing devices in the home
- Automating tasks
- Intelligent environment
- Utility, convenience, usability and accessibility
- The US market
- Security and entertainment
- Good candidate for remote controlling

# Remote Controlling Home Automation



# Remote Controlling Home Automation

## Alarming and monitoring



# Remote Controlling Issues

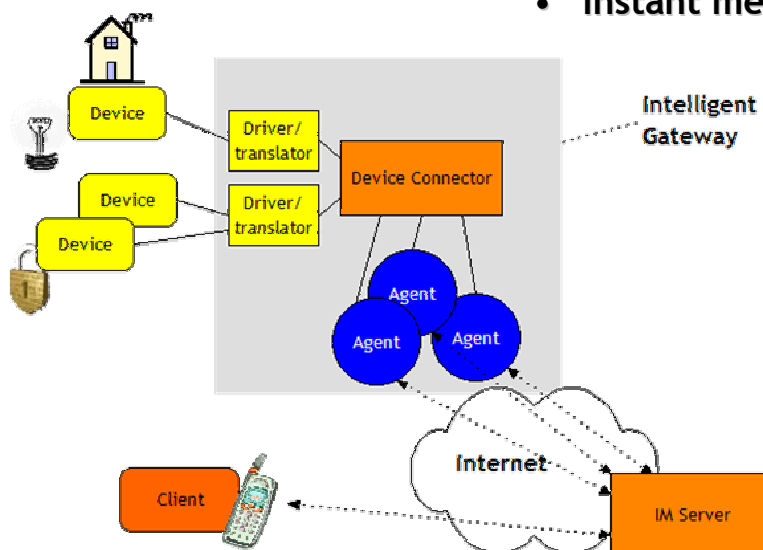
- **Security**
  - *Safety*
- **Scalability**
- **Usability**
  - *Different types of communication*
  - *Different types of devices*
  - *Small screens on mobile devices*
- **Accessibility**
- **Interoperability**
  - *Protocols*
  - *Standards*

# Using Instant Messaging For Remote Controlling

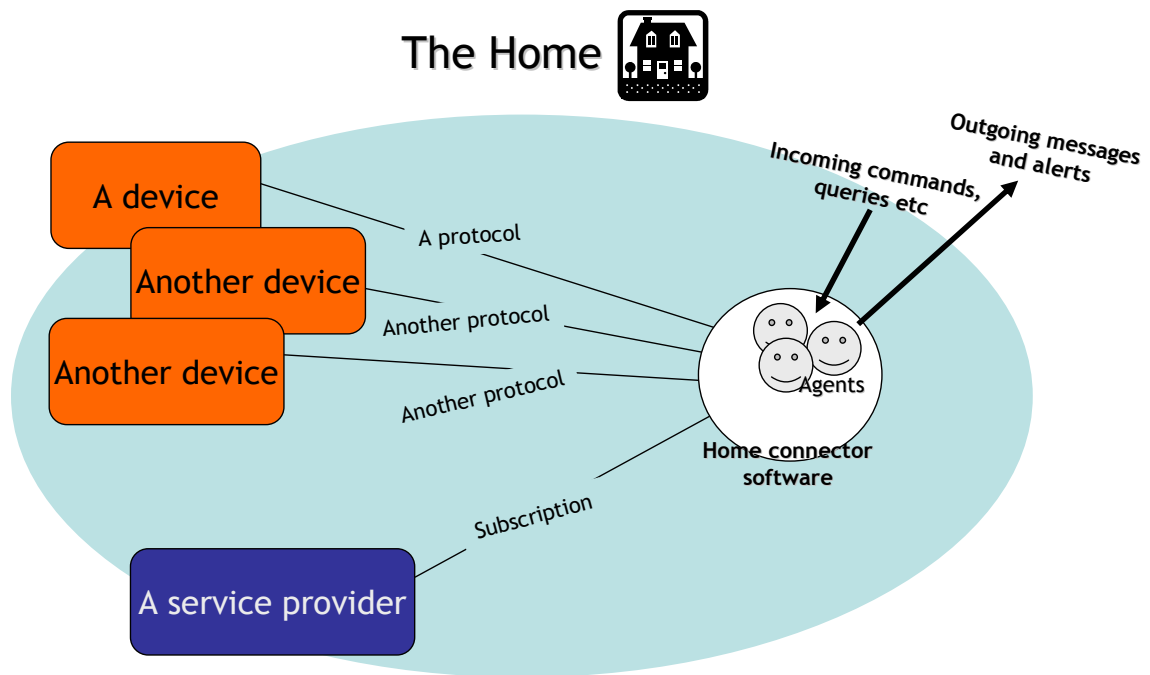
- **Types of communication**
  - *Control, Query, Subscription, Multimedia Session*
  - *Device Feedback and Status*
- **The IM concepts of dialogue, presence and buddy list**
- **Scalability**
- **High reuse**
- **Bandwidth Agnostic**

## System Concept

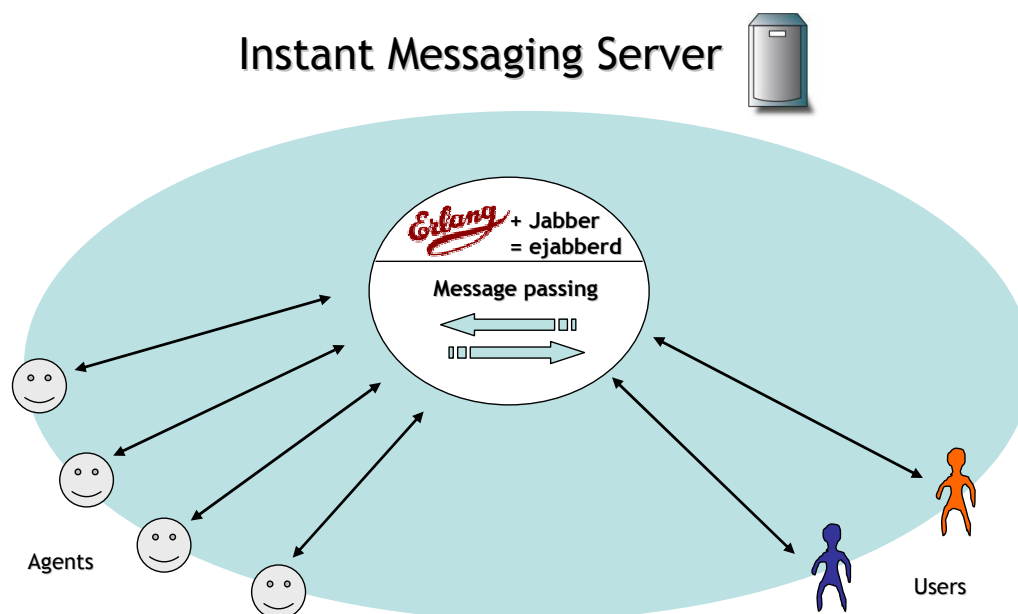
- **The intelligent gateway**
- **Agents**
- **Instant messaging server**



# The Gateway



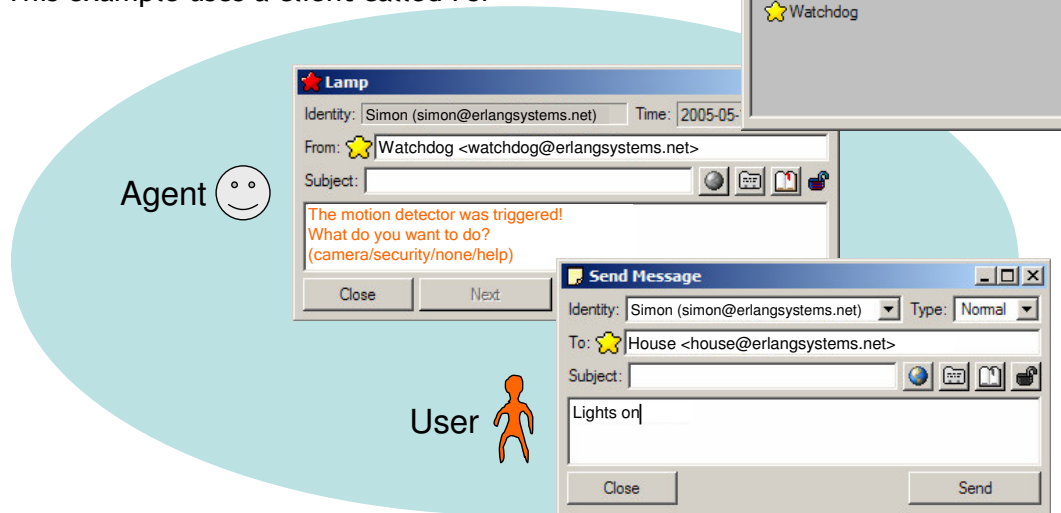
# The Server



# The Client

## An Example Client...

This example uses a client called Psi



# Benefits Of Using Erlang

- **Fast Prototyping**
  - *Declarative*
  - *High level*
  - *Compact code*
- **Robust Server**
  - *Robustness*
  - *Concurrency*
  - *Availability*

## Using Agents

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- **Adding a layer of intelligence**
  - *Making non-smart devices smart*
- **Information filters**
- **Decision making**
- **Making complex tasks transparent**

## Future Work

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- **Security**
  - *Encryption*
  - *Uniquely identifiable messages*
- **Complementing interfaces**
  - *Voice recognition interface*
    - Through voice IM client or by calling up the server
  - *SMS*
  - *E-mail*
- **Connecting to services, e.g. a bank, a music store...**

## Conclusion

- It is possible to remote control devices from an IM client
- We have shown a concept for remote controlling using IM and how intelligence can be added
- IM enables high scalability, usability, reuse
- Using existing open source components and Erlang for quick prototyping

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