Autonomic Home Networking

Autonomic Home Networks in the BMBF project AutHoNe

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The Project and the Partners

AutHoNe

- ❑ BMBF funded
- ❑ started in October 2007 with a planned duration of 36 month
- ❑ Partners
  - ▪ Fraunhofer FOKUS
  - ▪ Hirschmann AC
  - ▪ Siemens CT
  - ▪ TU Munich (at project start University of Tübingen)
- ❑ As part of the CELTIC cluster within the EUREKA initiative
  - ▪ Partners from France (Ginkgo Networks, France Telecom, Université Pierre et Marie Curie) and Sweden (Sony-Ericsson, Lunds Universitet)
- ❑ Website
  - ***www.authone.de***

Project

Goal

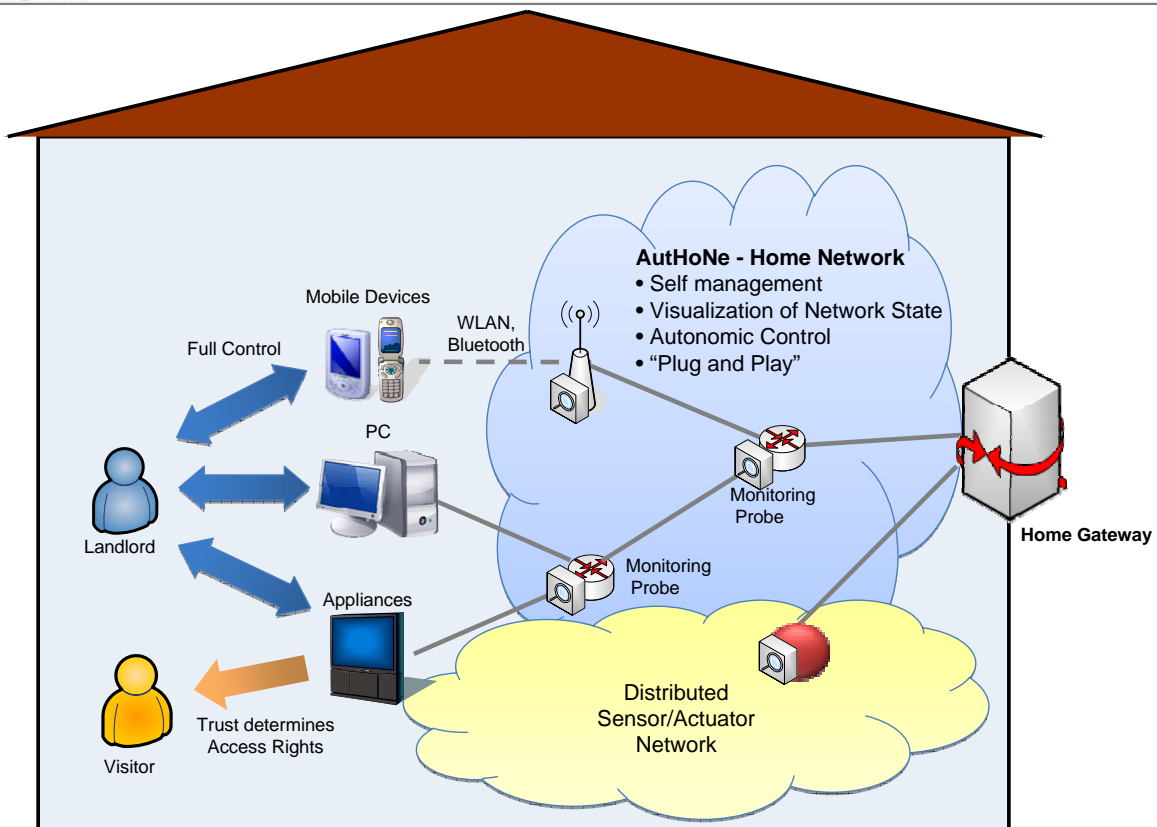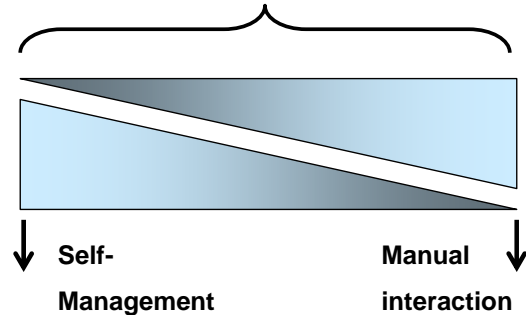- Advance in the field of autonomic networks for home areas

Today,

- Social and technical barriers
- No interconnection of mobile devices and other technical equipment
- Users are no experts in the field of networking (will not change)
- → Introduction of autonomic behavior important

AutHoNe

- self-management and manual interaction
- adaption to users and environment

Degree of freedom for the

Autonomic Network Control

Self-Management

Manual interaction

Vision of an Autonomic & Secure Home Network

Mobile Devices

WLAN, Bluetooth

AutHoNe - Home Network
- Self management
- Visualization of Network State
- Autonomic Control
- "Plug and Play"

Full Control

PC

Monitoring Probe

Home Gateway

Landlord

Monitoring Probe

Appliances

Trust determines Access Rights

Distributed Sensor/Actuator Network

Visitor

Home Networks of Tomorrow

Future home networks

- A home gateway
  - connected to the Internet or service provider network.
- Multimedia devices
  - video, CD, DVD players, TVs, amplifiers, …
- Computers and peripherals
- Communication devices
- Body area devices
- Home appliances
  - lighting, heating, oven, …
- Networked sensors
  - temperature, acoustic, optical
- Networked actuators

AutHoNe

AutHoNe supports

- User interaction through a Multi Client System to be developed.
  - with a variety of devices
- Autonomous self-configuration and operation
  - in accordance with policies and defined objectives
- Autonomous self-protection and self-healing
- Security according to user needs
- Local / remote access to the resources
 - legitimate traversal of middleboxes (NAT, firewall)

Additional Benefit

- Similar structures can be found in industrial networks ➔ broadening the applicability of AutHoNe results

Architecture

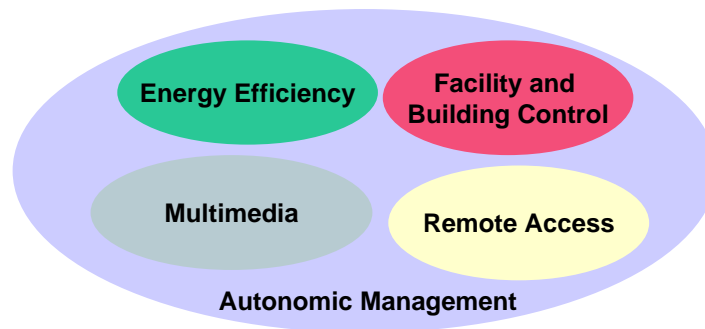**Planes**

- Knowledge Plane
  - Collect Information, Derive Knowledge
  - Autonomic Functions
  - Global Decision
- Control Plane
  - Control Agents
  - QoS, Security, Mobility
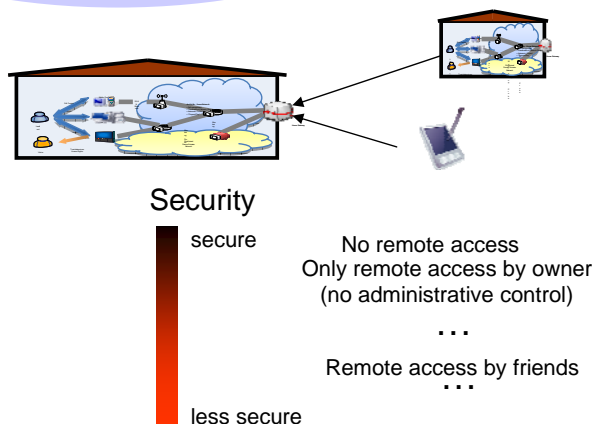- Data Plane
  - Network Services and Elements

Intelligence

Information → Knowledge
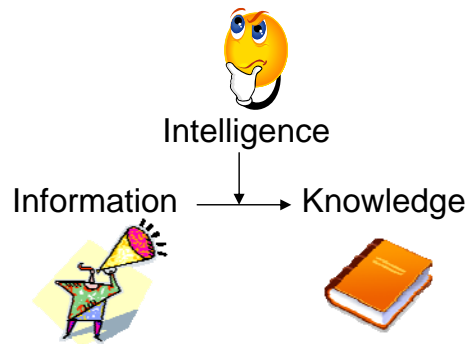
Sensor Network

- Autonomic Home Appliances need sensor input to observe non-network parameters.
- *Service Platform* to easily introduce new sensor applications.
- *Sensor Description Language* to describe capabilites and policies.

Scenarios

Energy Efficiency

Facility and Building Control

Multimedia

Remote Access

Autonomic Management

Example Remote Access

- Access from Outside
- Allowed?
  - By whom?
    - Only owner?
    - Also friends?
- Issues
  - Firewall, NAT, etc.

Security

secure

No remote access
Only remote access by owner
(no administrative control)
...
Remote access by friends
...

less secure

In Use

□ How it may look like…

Conclusions

AutHoNe

□ Project, still 1st year

□ Autonomic Home Networks

□ Some User Interaction

□ Knowledge Plane and Architecture

□ Scenarios and Application

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