

T-110.5190 Seminar on Internetworking

Home Networking

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Topics

- Meeting Household Expectations of a Future Intelligent Home
- Wiring Devices and Technologies in a Home Environment
- Multi-Layered Mobility Management in Next Generation Wireless Networks
- Network Architectures for the Home

T1. Meeting Household Expectations of a Future Intelligent Home

- More and more devices at homes and in the offices are combined into networks.
- *What do people anticipate from such networking environments?*
- What researchers and manufacturers should take into account while modeling the products and services for home networks?
- *How to develop a network which would satisfy users at most?*

Key Issues

- ***Types of products***

- ✓ What the family members may benefit from while networking together their household appliances?
- ✓ How, in your opinion, an intelligent home should look like?

- ***User interface***

- ✓ Easy installation, maintenance and use (consider different user experience and background; people of different age, with varying level of knowledge)
- ✓ A technology must simplify users life, not stress them

- ***Compatibility***

- Devices from different manufacturers. Old and new models. Standardized solutions
- Wiring the devices

Key Issues (2)

- ***Customizable products***

- ✓ Different needs of services by user, country, culture, year season, time of the day etc.

- ***Smart technologies***

- ✓ context-aware networks, applications which require almost no user input
- ✓ multi-function but robust devices

- ***Smooth integration***

- ✓ How to fit harmoniously into people's life?
- ✓ Positive impact on family member's relationship
- ✓ Making life convenient but not to be excessive
- ✓ Privacy is important

References

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- Carsten Röcker, Maddy D. Janse, Nathalie Portolan & Norbert Streit. User requirements for Intelligent Home Environments: A Scenario-Driven Approach and Empirical Cross-Cultural Study, October 2005, SOC-EUSAI 2005.

T2. Wiring Devices and Technologies in a Home Environment

- Homes are initially harder to interconnect
- “no-new-wires” solutions are being developed
 - ✓ built-in home cables
 - ✓ wireless technologies etc
- What are the main factors that reflect users preference for a certain technology?
 - ✓ cost
 - ✓ performance (speed, range limit, power consumption etc)
 - ✓ compatibility and interoperability
 - ✓ security, reliability
- Study the existing technologies such as Ethernet, WLAN, coaxial cables, electrical wiring, phone lines etc, find out the advantages and disadvantages of each, suggest some solutions to the open research questions.

References

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- Rose, B. Home networks: a standards perspective. *IEEE Communication Magazine.* Rev. 39, 12 (Dec 2001), 78-85. DOI=10.1109/35.968816

T3. Multi-Layered Mobility Management in Next Generation Wireless Networks

- Next generation wireless networks based on all-IP technologies where coexisting of different standards will be essential
- A very few nodes are stationary, mobility becomes crucial
- There are a number of proposed approaches towards user and terminal mobility based on different protocols
- Each of those protocols has certain drawbacks and using only one approach is often not sufficient to fully handle mobility for all applications
- A number of factors are important: robustness, latency, packet loss, network overhead etc
- A combination of mobility protocols is expected to meet the challenges and reasonably improve the performance
- SIP+HIP and SIP+MIP schemes are especially of interest

References

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- Jung, J.-W.; Mudumbai, R.; Montgomery, D.; Hyun-Kook Kahng. Performance evaluation of two layered mobility management using mobile IP and session initiation protocol. Global Telecommunications Conference, 2003. GLOBECOM '03. IEEE Vol. 3, Page(s): 1190 – 1194, Dec. 2003. Digital Object Identifier 10.1109/GLOCOM.2003.1258427
- Related RFC and Internet-drafts

T4. Network Architectures for the Home

- Is it really straightforward for a user to choose the network architecture for its home to take the most advantage from it?
- P2P vs. Client-Server model
 - cost of the equipment, software
 - ease of setup, use and maintenance
 - control
 - security
 - network speed
 - scalability
- Other models?

References

- Michael Wolf. Home Networking: What Type Is Best? Sample chapter of the book. Speed!: Understanding and Installing Home Networks. ISBN-10: 0-672-32186-6; ISBN-13: 978-0-672-32186-3; Published: Oct 18, 2001; Copyright 2002; Dimensions 7-3/8" x 9-1/8"; Pages: 408; Edition: 1st.
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