



AALIANCE2

European Next Generation
Ambient Assisted Living
Innovation Alliance

Standards and middleware: challenges for AAL interoperability

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About OFFIS



- **Mission:**
 - Support of innovation through technology transfer
 - Strengthening of the IT location Oldenburg
 - Advancement the Metropolitan Region Bremen-Oldenburg
- **Members:**
 - State of Lower Saxony and University Oldenburg
 - 28 Professors of CS and related studies of Oldenburg and Jade University
- **Budget:**
 - Income in 2012: 13,4 million €
 - Basic funding from the state of Lower Saxony approx. 26%
 - Third party funding from international, national and regional projects approx. 74%
- **Performance:**
 - Currently about 273 employees from 17 nations
 - More than 400 cooperation partners regionally/nationally/internationally
 - More than 340 R&D projects only since 2001 carried out
 - European-wide interlinking science/economy/politics
 - Many spin-offs, participation in international standardisation



Application-Know-How
concentrated in R&D-Divisions

Energie
Energy

Gesundheit
Health

Verkehr
Transportation

ICT-Know-How

concentrated in interdisciplinary Competence Center

Ambient Health Technologies

Analytical Information Systems

Dependable Systems

Embedded Systems Design Automation

Human Machine Interaction

ICT for Smart Grids

R&D Division Health: Specific Areas of Research

- **Intelligent User Interfaces**

Creation of new forms of interaction for AAL
and for people with special needs

- **Data Management and Analysis**

Basic technologies for data integration and evaluation
Explorative / multi-dimensional analysis of integrated databases

- **Integration Technology**

Trans-sectoral communication
Interoperability
AAL

- **Medical Device Technologies**

Integration in the domestic environment
Support of clinical personnel
AAL



Cross sectoral theme: Ambient Assisted Living

Goals

- Improvement of quality of life at home
- Determination of user requirements
- Information and Communication Technologies (ICT) for independent living at home

Research Questions

- Design of human machine interfaces
- Integration in public health
- Creation of infrastructure at home

IDEAAL Home Lab

- Human centered development of realistic scenarios
- Laboratory for applications and new technologies
- Showroom for research results



AAL and Roadmapping Projects at OFFIS

OS@mi

SAPPHIRE

GAL

HaptiMap



PAGE

NavMem
Navigation Support for Older Travellers with Memory Decline

Health Navigator

H@H

Cicely

HEART AWARE

Mneme

RIDE

HITCH
Healthcare Interoperability Testing
and Conformance Harmonisation

RAALI



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About the project

- AALIANCE2: FP7 Coordination Action with the following aims:
 - Investigate the current state of the art and market developments in AAL in North America and Asia;
 - Identify standardisation requirements in the field of ICT and Wellbeing (including care and healthcare standards);
 - Provide recommendations for overcoming market barriers and effective regulations in AAL markets;
 - Revise and update the 2010 edition of the AALIANCE AAL Roadmap and Strategic Research Agenda;
 - Develop a long-term sustainable network of AAL related stakeholders in Europe aiming to be a reference in the AAL field;
 - Support the implementation of coherent strategies of the public and private sectors.

Background: Standards are Important!

- AAL systems are complex: products & components from multiple sectors & manufacturers
- Standardisation of functions and interfaces facilitate
 - Construction of complex systems from simpler components
 - Interchangeability of components
 - Price & quality comparisons
- Good for the user: More choice, more competition, lower prices
- Good for the vendor: no provider can offer a complete product range anytime soon
- Many standards exist, but they have not developed with AAL in mind and may need extensions. There are also gaps in the standards landscape.
- Key stakeholders:
 - European standardisation bodies (i.e. CEN, CENELEC, ETSI), but also
 - Industry-led platforms like Continua Health Alliance...

AAL Standards Repository

- The AALIANCE2 project has compiled a repository of standards of relevance for AAL.
 - Intended as a resource for AAL system developers
 - Wiki format for easy maintenance
 - Covers European and international standards, plus a few national standards where we could not find applicable international standards
 - No attempt to comprehensively explain each standard; reference to original standard, brief explanation and links to secondary material instead.
 - Available at:
 - <http://www.aaliance.eu/public/> (follow link)
 - <http://nero.offis.de/projects/aaliance2/start> (directly)
 - For read access please write to aaliance2@offis.de



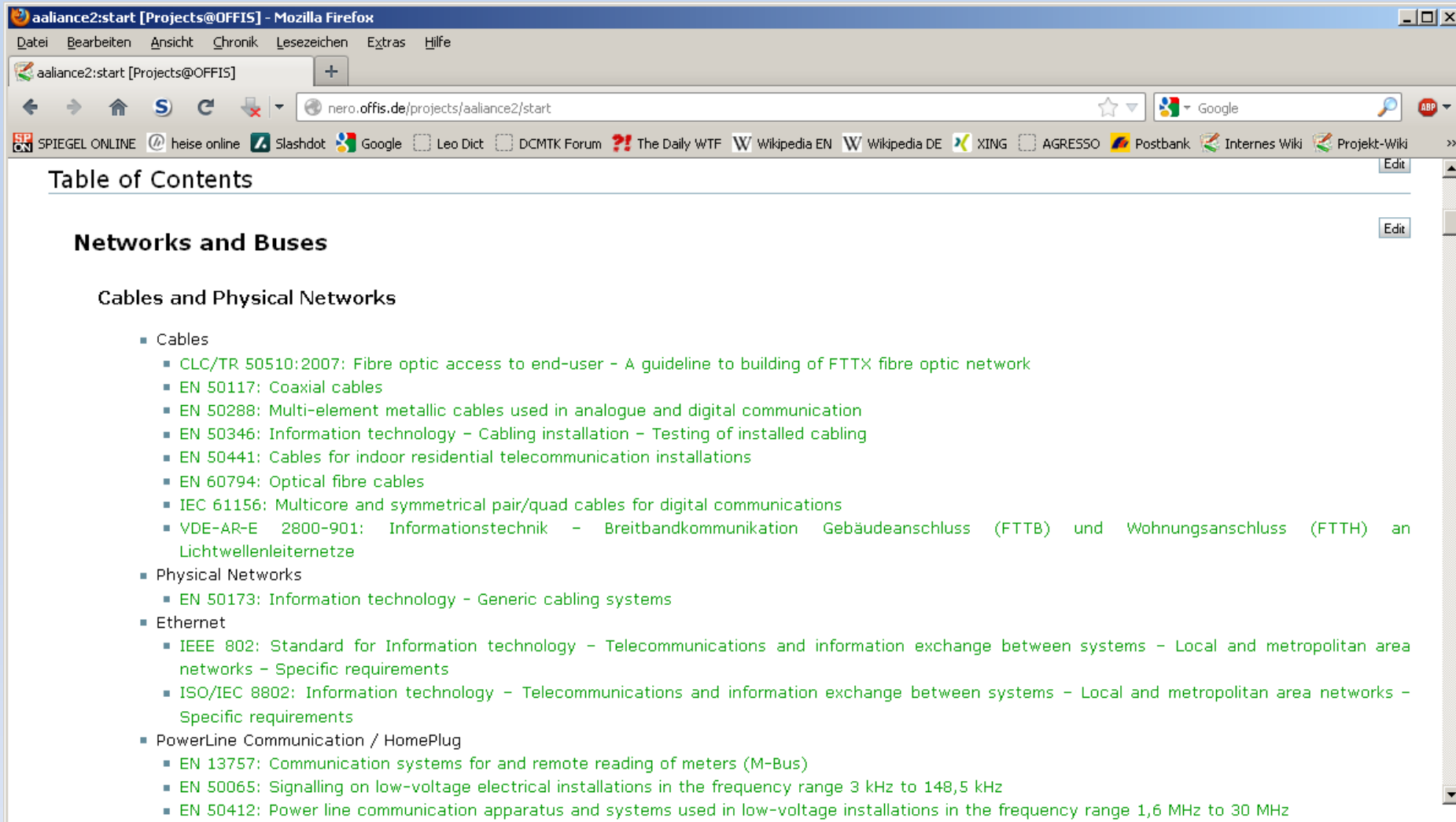


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Networks and Buses

Cables and Physical Networks

- Cables
 - CLC/TR 50510:2007: Fibre optic access to end-user - A guideline to building of FTTX fibre optic network
 - EN 50117: Coaxial cables
 - EN 50288: Multi-element metallic cables used in analogue and digital communication
 - EN 50346: Information technology - Cabling installation - Testing of installed cabling
 - EN 50441: Cables for indoor residential telecommunication installations
 - EN 60794: Optical fibre cables
 - IEC 61156: Multicore and symmetrical pair/quad cables for digital communications
 - VDE-AR-E 2800-901: Informationstechnik - Breitbandkommunikation Gebäudeanschluss (FTTB) und Wohnungsanschluss (FTTH) an Lichtwellenleiternetze
- Physical Networks
 - EN 50173: Information technology - Generic cabling systems
- Ethernet
 - IEEE 802: Standard for Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements
 - ISO/IEC 8802: Information technology - Telecommunications and information exchange between systems - Local and metropolitan area networks - Specific requirements
- PowerLine Communication / HomePlug
 - EN 13757: Communication systems for and remote reading of meters (M-Bus)
 - EN 50065: Signalling on low-voltage electrical installations in the frequency range 3 kHz to 148,5 kHz
 - EN 50412: Power line communication apparatus and systems used in low-voltage installations in the frequency range 1,6 MHz to 30 MHz

AAL Standards Repository: Lessons Learned

- The number of applicable standards is overwhelming
 - the PDF snapshot of the Wiki is almost 500 pages (and does not even include the Index)!
- However,
 - There are certainly relevant standards that are still missing.
 - There are gaps where no suitable standards exist, e.g.
 - Building plans (including doors, sensor location etc.) for indoor localisation
 - Remote maintenance of AAL systems “behind residential gateway”
 - Abstraction API for home automation buses
 - Web services for B2C order management
 - There are competing standards (e.g. building automation)
 - Standards were not developed with „AAL in mind“, and may need extension / adaption to make them useful for AAL

Two workshops

- Workshop on Standards
 - **Gaps:** Are there standards of relevance for AAL that are missing in the repository of standards?
 - **Shortcomings:** Which of these standards need to be adapted/extended for AAL, and in which form? Which ones should be simplified/ withdrawn?
 - **Outlook:** Which developments of relevance for standardization in this field are happening or do you foresee?
- Workshop on Middleware
 - Summarize the state of the art in AAL middleware
 - Discuss the future of AAL middleware
 - Functional requirements
 - Reference models and standardization
 - Sustainability and market



International Cooperation with Asia, US and Standardisation Bodies

- Visits to Japan in July 2013:
 - JTTA (Japanese Telemedicine and Telecare Association)
 - Panasonic/ PanaHome
 - Toshiba/ Echonet Consortium
 - Accessible Design Foundation of Japan together with IEC SG 5 “AAL” (Prof. Yamada), IEC/TC 100, ISO/TC 215
 - Hitachi
 - Omron
- Visits to US in March 2014
 - Stanford University
 - IEEE SA (NY)
- Contact with Standardisation Bodies
 - Liaison member of IEC Strategic Group 5 “AAL”, invited to join the systems committee (foundation process ongoing), several meetings
 - Contact with CENELEC/TC 100X “Audio, video and multimedia systems and equipment and related sub-systems” presentation of AALIANCE2 and WP4 during a teleconference on 2013-05-08
- AAL JP Action on Interoperability
 - Development of Integration Profiles
 - Conducted by OFFIS

Recommendations

- **Standardization Watch Initiative**
 - Installation of a neutral and independent future-orientated standardisation watch initiative for AAL
- **Standardized Reference Architecture**
 - support a preparatory action working towards a common understanding of the AAL domain, which may ultimately result in a commonly accepted reference model
- **Integration Profiles for AAL**
 - development of standards-based integration profiles for the most common AAL application scenarios
 - establish a European or international forum where all actors interested in AAL integration profiles can collaborate towards the establishment or commissioning of an organisation taking over the long-term responsibility for developing and maintaining integration profiles for AAL
- **Certification in AAL**
 - implementation of a European AAL certification initiative
- **AAL and the Medical Device Directive**
 - study group be established involving experts from the AAL domain and representatives of the MDD regulatory system
- **AAL and Data Protection Law**
 - study group be established involving experts from the AAL domain and representatives of the MDD regulatory system
 - European Commission initiates consultations with the member states about a renewed data protection law that is adapted to the technology challenges and opportunities of the 21st century

Recommendations

- **Large scale pilots**
 - ReAAL already started
 - such pilots are of critical importance to better understand these aspects of AAL
- **Reconfigurable user interfaces**
 - consider the principles of “design for all”
 - equip systems with a reconfigurable user interface
- **Middleware**
 - future AAL system developments should be based on AAL middleware
 - future AAL projects receiving public funding should be required to use an AAL middleware, but have the freedom of choosing the most appropriate one
- **Standards and Business Models**
 - lifting this standardisation work on a European and international level
- **Standardisation needs of Key Enabling Technologies**
- **Standards for AAL Service Robotics**
 - Researchers and developers should consider current developments in standardisation for robotics
- **Process Standards for Service Design and Technology Deployment**
 - the exchange of information of the user needs”, should be standardized and for each role the information derived (translation) should be meaningful for that actor

Recommendations

- **Gaps in the Standards Landscape**
 - **Standards for the remote maintenance of AAL system components “behind” the residential gateway**
 - **standard ontology for AAL**
 - **Standards for the delivery of alarms from an AAL system to a social care call centre**
 - **standardised abstraction layer for home automation field buses**
 - **Standards for the communication between AAL system and the IT systems of the professional health care sectors**
 - **Standards for the description of functions, roles and access rights across system boundaries**
 - **Standards for the reliable delivery of notifications and orders to service providers**
 - **Standards for the querying of services, products and prices and for online ordering**
 - **Standards for event suggestions**
 - **Standards for the exchange of maps for indoor navigation**
 - **Standards for the fault management of AAL systems**



So far

- **Results from WP 4 “Standardisation”**
- **Some current developments**
 - **Integration Profiles for AAL**
 - **Support Action for the AAL JP carried out by OFFIS**

AAL JP Action on Interoperability – Brief Overview

- In the first phase, the project collected use cases from many AAL projects and analysed them for common themes that seem suitable as a starting point for standardised AAL scenarios
 - Results: a collection of more than 300 use cases, an analysis thereof, and seven condensed “representative” use cases written by our team.
- In the second phase, we developed so-called Integration Profiles for each of the seven representative use cases, and worked out the standards to use in detail for four of the seven profiles.
 - Results: Seven high-level integration profiles, eleven transaction definitions

- Questions/ comments?
 - Thank you for your attention!
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