ACEMIND

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Advanced Convergent and Easily Manageable Innovative Network Design

The ACEMIND project intends to provide a set of consistent solutions for enhancing the management of local networks in home and small enterprises typically constituted of some tens of devices connected to each other via a set of wired and wireless technologies. The deployment of such networks has been intensive in Europe in the last decade and will continue in the future. However common end-users may still suffer from complicated installation, operation or maintenance.

Main focus

The expansion of ICT technologies in the last decades has been accompanied by an increase of technical complexity for the installation and use of various technologies and services, which becomes problematic at home where non experts are deploying networks. The diversity in the connectivity offer, with new devices and services, becomes potentially more confusing. The customer has the feeling of being a bit lost in the choice of appropriate technology for a given service.

Recent progress has been made to integrate heterogeneous connectivity into a single network (FP7 OMEGA project); this has been realised with the insertion of a convergence sub-layer below IP and above the MAC layers of underlying transmission technologies (Wi-Fi, PLC, Ethernet …). In this document these networks are named "hybrid networks" due to the use of different networking technologies. Hybrid networks with such a convergence mechanism at layer 2.5 are now addressed by standardisation bodies, e.g. IEEE 1905.1 standard certified as nVoy™ (http://www.nvoy.org/) with available commercial products around end of 2014.

Though self-mechanisms have been introduced into hybrid home networks, user friendliness still needs to be improved.

Approach

The goal of the ACEMIND project is to enrich this initial concept with new features and services such as green network (the reduction of power consumption and

ACEMIND: The connected home of tomorrow
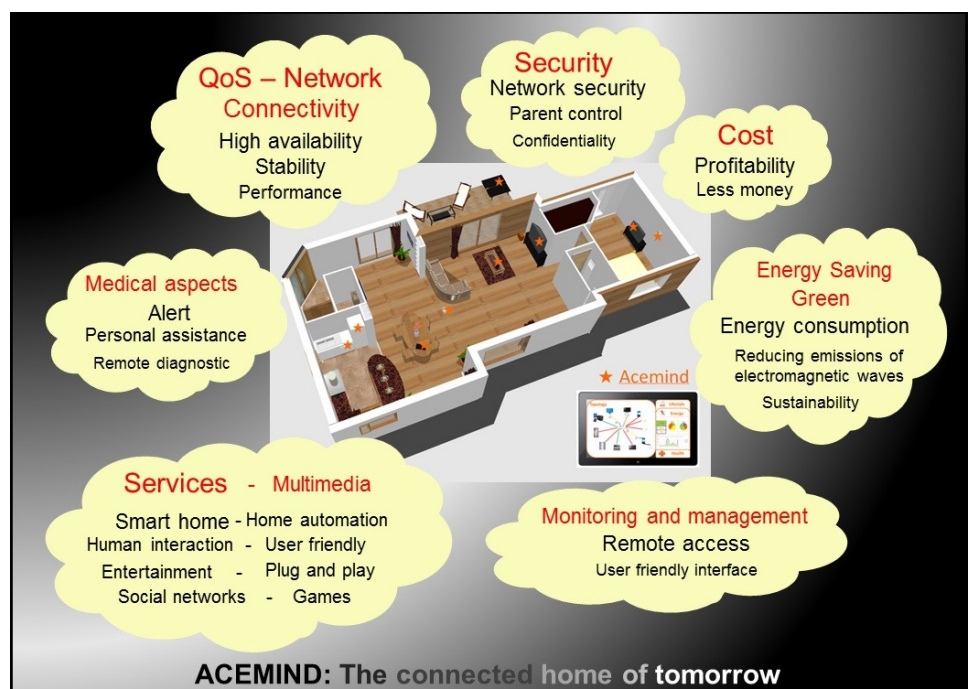
the number of radio emission devices), packets load balancing or anomaly detection. Another target is to propose new products using new link-technologies, for instance Wi-Fi 802.11ah or LiFi (http://www.lificonsortium.org/) for hybrid network. Then, with a user friendly GUI (Graphical User Interface) it will be possible to manage a large range of services such as energy management, HD videoconference or health care.

The ACEMIND project aims to demonstrate a user-friendly hybrid network based on such a convergence mechanism at layer 2.5, which is able to provide a wide range of services based on multimedia but also on sensor/actuator devices. In addition, ACEMIND will contribute to the increase of the robustness and coverage, to provide self-management capabilities and to improve remote management by network operators. For the reduction of power consumption and the number of radio emission devices, new routing protocol will be defined for this hybrid network.

Main results

The ACEMIND project will offer the following main results:

♦ A single, standardised network infrastructure enabling the customer to have a choice in the purchase of equipment and benefit from lower costs.

♦ To offer multimedia and smart home products and services on a single network.

♦ To propose simple solutions for monitoring and management of home network, locally for the user or remotely for the after-sale support service.

Achieving these objectives will be done through several demonstrators, proofs of concept, allowing additional communication technologies integration outside the perimeter tackled today by IEEE 1905.1 standard e.g. Wi-Fi 802.11ad/ah, LiFi or ZigBee/Bluetooth, also to increase the list of convergence layer features (lowest energy path selection, intrusion detection ...) with home automation solutions integrated On top of this network will be developed a single user interface, able to monitor and manage the whole home network and devices. Some of these elements will be proposed in standardisation (eg. IEEE P1905.2) during the lifetime of the project.

Finally, at the start as well as during the project, the final user view will be taken into account through interviews, questionnaires or field tests. The objective is to provide a user-friendly interface driving a robust hybrid network with self-management capabilities and to improve securely remote management by network operators.

Impact

The ACEMIND consortium gathers major European industrial actors in the local networks market as well as leading universities and institutes. A successful project will provide significant progress on the Quality of Service for hybrid network users. This will boost market opportunities for European actors in the communication industry.

The commercial success of the ACEMIND technology goes through international standards. IEEE P1905 has been presented as a key group in which the ACEMIND foreground can be promoted. Furthermore, any existing or future standardisation group related to local/hybrid networks may be targeted as well. The ACEMIND consortium has been built in such a way that partners have delegates in relevant standardisation groups and can therefore promote the project innovation quickly and efficiently.

An important condition for the success of the project is to move from standards and project demonstrators to real products. The plan for exploitation of the research achievements will be defined up to the development of new products. It is an ambition of ACEMIND manufacturers and operators to introduce project innovations to the market.

About Celtic–Plus

Celtic-Plus is an industry-driven European research initiative to define, perform and finance through public and private funding common research projects in the area of telecommunications, new media, future Internet, and applications & services focusing on a new „Smart Connected World" paradigm. Celtic-Plus is a EUREKA ICT cluster and belongs to the intergovernmental EUREKA network. Celtic-Plus is open to any type of company covering the Celtic-Plus research areas, large industry as well as small companies

or universities and research organisations. Even companies outside the EUREKA countries may get some possibilities to joine a Celtic-Plus project under certain conditions.

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