

Autonomic Home Networking

The AUTHONE project is developing an autonomic system for the management of home networks, and the provision of community services. The architecture of this new system will be based on autonomous network principles, and composed of four planes: data, control, knowledge and management. The project also studies the use of knowledge planes to control and manage home networks.

Main focus

The AUTHONE project develops a network architecture based on autonomous equipments and software, which enables the automated management of home networks and the provision of community services using home networks. The knowledge plane is the main architectural innovation. It is used to enhance the level of automation of management, using a knowledge system that provides detailed information on the proper functioning of home networks. The knowledge plane allows implementing advanced "self-functions":

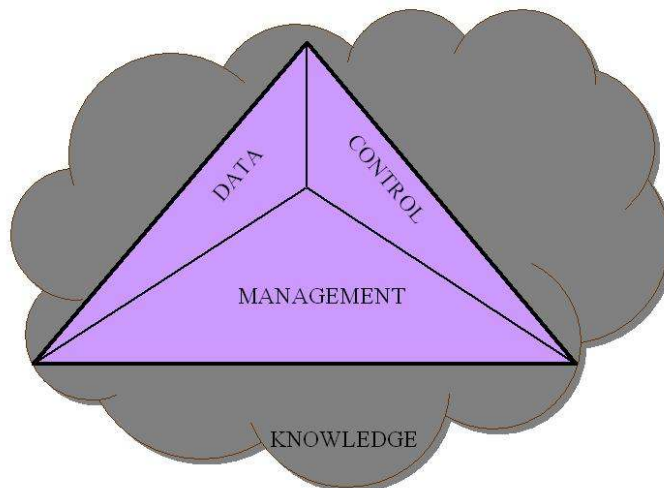
- ◆ self-configuration,
- ◆ self-healing,
- ◆ self-optimization and
- ◆ self-protection.

The general context of this project is the automated management of networks, a complex process that will have a major impact on the deployment and operations of future ICT infrastructures. The ability to automate the management of home networks will en-

able the provision of novel communication and information services to residential clients, taking advantage of the proliferation, the diversity and the sophistication of home equipments. AUTHONE will also provide elements of communication infrastructure that allows network operators to control and manage customer's home networks.

Approach

The project develops an innovative communication architecture for home networks, with autonomous components that enable realizing "self-"properties. Services provided by the four planes will allow self-management in nearly real-time so that the operations of home networks are always optimized with information provided by the knowledge plane. AUTHONE investigates the key concept of a knowledge plane to enable the automated control and management of home networks, which consist of electronic home devices, sensors, and others connected by domestic LANs, accessible via home gateways.



AUTHONE

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30 September 2008

Partners:

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Ginkgo Networks, France

Hirschmann Automation and Control GmbH, Germany

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www.celtic-initiative.org/projects/authone

Actions undertaken are the following:

- ◆ Develop a network architecture composed of four planes, the knowledge plane representing the key innovative feature. The knowledge plane can collect information available in the home domain in order to control QoS, secure the network and provide access to resources. Reactive agents are included in the control plane with goals defined by the knowledge plane. The latter is typically realized with components included in different network elements, and meta-components distributed on servers. In order to operate in a dynamic environment, these components must have autonomic properties and be able to communicate.
- ◆ Allow self-adaptation of home network components: terminals, sensors, actuators, fire-walls, middle-boxes, routers, switches, etc.
- ◆ Allow self-configuration, self-securing, self-optimisation and self-adjustment in real-time, so that home networks are always optimized with information from the knowledge plane.
- ◆ Enable self-learning to allow control interactions between home network elements. Connected devices should be able to recognize their environment, to adapt their configuration. The network

should be able to detect connected devices, perform configurations and integrated these devices in complex services.

- ◆ Ensure continuous services towards the outside world, which allows home networks to span over their usual physical limits.

Main results

AUTHONE will lead to new network control and management techniques, which will enable new solutions to security, mobility, QoS, and the optimisation of home network resources. The use of distributed techniques will also impact network flexibility and scalability. The control of wireless communications, which is particularly important for home networks, will be realized by autonomic functions. The project ambitions to achieve important technological advancements in the home networking domain, and to strengthen R&D competencies in home networks. The following actions will develop the potential of home networks:

- ◆ Demonstrations of knowledge-based autonomic management functions, to show the added-value of R&D in this domain.

- ◆ Development of strong competences to allow Europe to play a leading role in autonomic networking and the home network industry.

- ◆ Accelerate the adoption of a new generation of architectures and standards.

- ◆ Help SMEs to develop new networks and services, which in term will add value to European R&D in autonomic and home networking as well as in ICT research.

Impact

The use of the solution proposed by AUTHONE should radically transform the way communications happen through home networks, the way we do business the way these networks are managed. The project should considerably help accelerating this transition to the general use of home networks. This will bring substantial economic and social advantages. It is crucial that the different home networks are interoperable to fully address the required autonomic characteristics. The AUTHONE project, through partnership and collaboration at the European and international level, allows consensus building in the definition of autonomic network architectures. AUTHONE will contribute to the definition of communication standards that will keep the various autonomic home networks interoperable.

About Celtic

Celtic is a European research and development programme, designed to strengthen Europe's competitiveness in telecommunications through short and medium term collaborative R&D projects. Celtic is currently the only European R&D programme fully dedicated to end-to-end telecommunication solutions.

Timeframe: 8 years, from 2004 to 2011

Clusterbudget: in the range of 1 billion euro, shared between governments and private participants

Participants: small, medium and large companies from telecommunications industry, universities, research institutes, and local authorities from all 35 Eureka countries.

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