Interconnecting standards for home appliances and audio-visual applications

Introduction

The European Application Home Alliance (TEAHA) project focused on networked home control applications and their interconnection to, and inter-working with, networked audio-visual applications. It set out to specify an open and secure home platform allowing interoperability between these different application segments in the home. Within this context, the project's aim was to develop technologies contributing to the seamless inter-working of the wide variety of low-end and high-end appliances found in a home environment, regardless of the networks these appliances use.

In this context, the project's research and innovation aim has been on an open middleware framework ensuring interoperability across heterogeneous networks, on low-cost RF components supporting this TEAHA middleware, on new network independent service discovery and security mechanisms, on low-cost power-line communication solutions, and on new residential gateway components.

Industrial deployment of the solutions the project developed was addressed through the validation of applications focusing on white goods control, on energy management, and on seamless integration with networked audio visual applications

The main goal for TEAHA's activities was to accelerate the development of networked products and services and to improve the environment for the promotion of these services through the various industrial sectors concerned, such as telecommunications, the audio-visual industry, and white & brown good equipment manufacturing.

Standardization challenges

One of the important goals for the project in the context of the availability and deployment of inter-working products and services has been to reinforce European competitiveness. This presented TEAHA with the challenge of providing open standards that would enable European industrial organisation to rapidly provide compliant applications and services.

Therefore, providing the necessary inter-working standards was identified as one of the main project goals and consequently a number of concrete standardization challenges relating to home gateways, home device communities, interoperability and taxonomies were defined.

The challenges included:

- Providing application profiles that are network independent;

- Integration of the TEAHA seamless inter-working approach into the OSGi (Open Services Gateway Initiative) framework;

- Defining profiles that allow for management of information exchange between applications in different clusters, i.e. application segments;

- Integrating security in existing service discovery protocols and defining an overall service discovery protocol.

the technology and standards pursued will contribute to more dependable home infrastructures and applications being developed, improving the security and privacy in the home environment, as well as trust in the knowledge society in general.

Standardization path

Standards bodies identified as primary interfacing targets for TEAHA's standardization objectives included the UPnP (Universal Plug 'n' Play) Forum, the Open Services Gateway initiative (OSGi) and the Home Gateway Initiative (HGI). In addition, the project set out to liaise with CECED, the European white goods appliance trade organization, and the relevant Technical Body in CENELEC (the European Electrotechnical Standards Committee), overseeing the developments in the Smart-House area.

Together with COPRAS, TEAHA developed a Standardization Action Plan, emphasizing the projects standardization challenges and pointing out the more concrete objectives, such as the contributions to a device taxonomy and contributions to an architecture for seamless inter-working between clusters and networked devices in a home environment. In this perspective, it envisaged submitting its results – or parts thereof – to organizations such as UPnP and OSGi. Also, cooperation with other FP6 projects in the audio-visual domain was foreseen, specifically focussing on the development of additional UPnP profiles.

During its lifespan, TEAHA developed a large number of activities to pursue its standardization objectives. It liaised with CENELEC, OSGi as well as with the UDEF (Universal Data Element Framework) Forum to discuss the possibilities for a generic device taxonomy.

In addition, it initiated discussions with other projects in the audio-visual domain, to jointly specify additional UPnP profiles that would ease inter-working between home networked appliances.

An assessment of TEAHA results in terms of their standardization potential led the project to make submissions and contributions to HGI, rather than to UPnP, as HGI was focusing on the aspects of requirements and architecture. Four contributions were made:

- A specification for a secure service discovery protocol
- Business clusters requirements
- Contribution on policy management
- A proposal to use UPnP to describe devices

The expectation is that the latter contribution will eventually lead to the necessary interfacing between HGI and UPnP.

Key Learning Points

During its standardization activities, TEAHA encountered a number of issues that could assist future projects or project consortia better planning their standards work. These may be taken into account by others when planning general measures aiming to improve the overall research/standards interfacing process.

- The perception whether technological developments are sufficiently mature in order for them to be submitted as standards can differ between various standards organizations, as well as between a project and the standards world in general. It is important to check with a targeted standards organization whether these perceptions match.

- In order to be able to make submissions to standardization, projects need to be represented in the targeted organizations. Usually this can be arranged through one of the project consortium partners, but – in case the relevant partner decides to abandon the project – a back-up scenario allowing a project also to carry out the standards work in direct communication with the targeted standards organization is sometimes necessary.

- Synchronizing a projects objectives and standardization intentions with the roadmap of a standards organization, as well as with the agenda of the individual project partners, is essential to the success of projects' standards work. This should preferably be done before standards processes are initiated, as a mismatch in either of these areas will make cooperation towards consensus based standards difficult.

- The specific problem addressed by TEAHA of seamless inter-working needed the setting-up of a discussion forum prior to standardisation. The reason is that stakeholders from different business clusters do not meet. This was one of the conclusions resulting from a TEAHA forum.

- The availability of the support of a project like COPRAS was very beneficial to the success of the projects standardization activities. It helped TEAHA focus on standards issues at an early point in time.

  As a project usually does not have someone dedicated to the management of standards work, COPRAS support contributed not only to getting the right procedures in place enabling it to contribute to standards processes, but also to creating a common understanding among project partners on how this should be pursued.