Standardization in technologies for the audio-visual chain

Introduction

The ENTHRONE project has worked in the area of technologies for *Networked Audio-visual Systems and Home Platforms* (NAVSHP) in the European 6th Framework Programme during 2004 and 2005. The project has researched solutions for improving consumer's access to multimedia content by developing an integrated management solution harmonizing the functionality of the individual components in the audio-visual distribution chain.

ENTHROINE was established to develop or improve multimedia technologies for:

- Quality of Service (QoS) management
- Content management & protection
- Definition of metadata

The project deliverables facilitate managing an end-to-end QoS architecture over heterogeneous networks, thus improving seamless access to a variety of audio-visual services for customers, delivered through a wide range of devices.

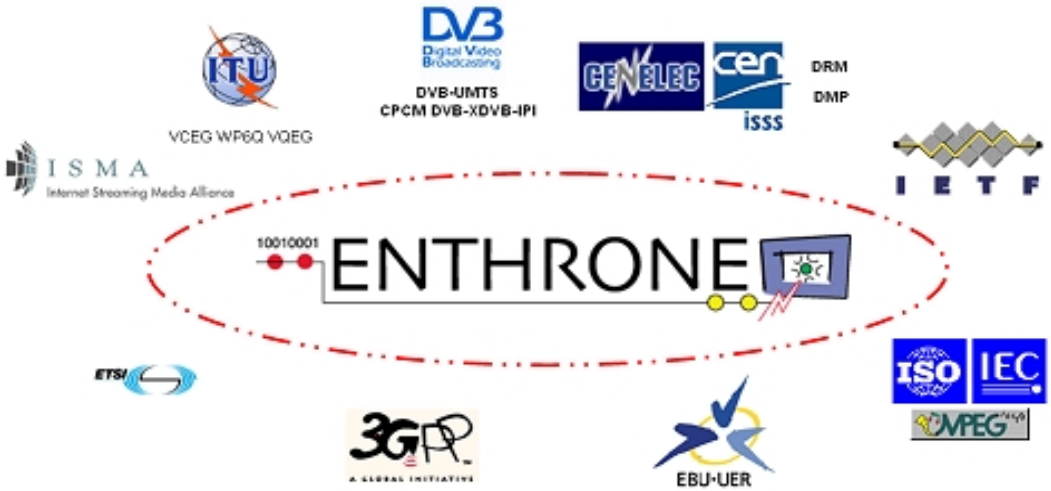
Standardization challenges

ENTHRONE was faced with a significant standardization challenge as the desired widespread adoption of the technologies developed in the project largely depend on the project being able to use a number of standardization resources and tools. These include compliance testing and labelling, integration of components and standards, and the ability to test interoperability, consistency and reliability between resources.

Moreover, commercial feasibility of the solutions ENTHRONE provides requires business models that enable various industry actors to collaborate and benefit on a mutual basis, which must be based on industry standards. Consequently, the project has made considerable contributions to improving the current European and International efforts for the establishment of standards in the technology areas the project is addressing, and to having these contributions adopted as widely as possible.

Standardization environment for the audio-visual content delivery chain

The number of standardization areas and standards organizations ENTHRONE addressed is significant. There are many different aspects of multimedia content management protection and distribution that must be dealt with within ongoing consensus processes across a wide range of different standards organizations. The diversity of these organisations is illustrated in the figure below.



Standardization Path

In order to strengthen its standardization activities, ENTHRONE decided to cooperate in the development of a Standardization Action Plan within a cluster of projects in the NAVSHP area, in parallel to developing its own strategy towards standardization. Within this clustered approach, ENTHRONE would be able to better structure its steps towards standardization deliverables and benefit from additional resources by coordinating actions in dissemination. In the context of the Standardization Action Plan, action steps concentrated on the development and implementation of a deployment model for an Integrated Management Supervisor.

Step 1: Descriptive phrase

ENTHRONE provides a proof of concept for the Integrated Management Supervisor concept by presenting a use case scenario with system requirements addressing the complete audio-visual delivery chain, while at the same time presenting the functional architecture for the ENTHRONE system.

Step 2: Descriptive phrase

ENTHRONE implements an MPEG-21 Integrated Management Supervisor deployment model, providing an overview of the use case model containing the use cases that are considered most important from the architectural point of view, thus providing the foundation for the Integrated Management Supervisor model.

Step 3: Submission to standardization

ENTHRONE delivers an Integrated Management Supervisor design specification proposal to ISO/IEC JTC1/SC29 WG11 (MPEG), based on the implementations described in Step 2. This will allow demonstration of the levels of compatibility brought by MPEG-21.

Interim results

At an early stage in the project, ENTHRONE presented the definition and description of the Integrated Management Supervisor architecture based on the use cases most relevant for the development of this architecture to the ISO/IEC Working Group. It provided an initial design description of the individual Management Supervisor components and demonstrated how these components operate together. Subsequently, in order to verify the architecture that was developed, ENTHRONE defined several deployment models that may be implemented at a later point in time. Later in the project, ENTHRONE presented a Proof of Concept for the Integrated Management Supervisor, describing a prototype implementation of the Integrated Management Supervisor architecture specified earlier by the project, and illustrating the use of the MPEG-21 framework for ensuring end-to-end QoS. In the description, the workings of the different Integrated Management Supervisor subsystems is explained, showing their interactions and specific usage in view of ENTHRONE's overall objectives.

Representatives from several ENTHRONE consortium partners have been participating in several different standardization process throughout the first two years of the project. Among these has also been a continuous effort towards passing the specifications related to the Integrated Management Supervisor concept through the relevant ISO processes. Tangible results in this area are foreseen for the project's second period of activities in the 2006-2007 timeframe.

Key Learning Points

Insights gained from the experiences of ENTHRONE that might help other projects include the following:

- ENTHRONE allocated a substantial amount of resources to standards related activities, and participated in many different standardization processes. This put the project in a good starting position to pass its essential deliverables through standardization as planned.
- Experience shows that synchronizing a research project's standards activities with ongoing standardization processes requires permanent attention, specifically because more time and resources than originally expected may be required for communicating the market requirements for the proposed specifications, and for building the required constituency to support it.
- Even within the project itself, interdependencies between deliverables may occur that initially were not anticipated, but appear to be relevant where standardization is concerned. When projects are on a tight schedule, this may eventually lead to abandoning or downgrading standardization goals.