Project Achievements

Scalable Video Coding impact on Networks - Scalnet

The Scalnet project is focused on the impact of Scalable Video Coding technology on core, access and home networks, concentrating on management and efficiency. Scalnet has also studied the control interface between networks and video processing equipment. Ultimately, the project has acted as a test & demonstration laboratory for advancement and deployment of this technology.

Main focus

The Scalnet project has focused on the impact of SVC techniques on:

- Core, access and home networks
- Related management of Quality of Service and user experience
- Video processing (transcoding, transrating, filtering) and video server equipment
- Related management, control and provisioning tools for video services

Scalnet has demonstrated the interest in and potential of using SVC technology over various networks. Scalnet is also aimed at helping the deployment of the SVC technology inside the networks.

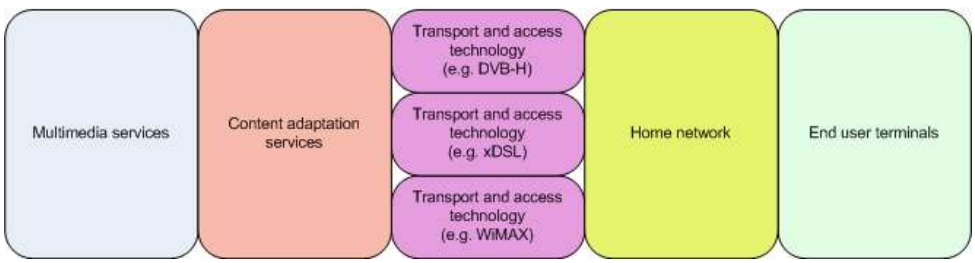
Parties who benefit from this work are:

- The network operators and content providers, in terms of bandwidth optimization, downsizing of storage servers and lower computational needs for video processing within the networks.
- The end users, with the ability to seamlessly obtain new multimedia services, tailored to their personal usage, access and devices, with the potential to switch between different networks and terminals whilst seamlessly watching the same content.

Approach

The Scalnet project developed a general architecture for SVC video delivery, which is presented in the following figure:

- Video services. This area represents services that act as source of video information, or as management mechanisms of user and terminal profiles.
  - IPTV, video broadcasting, Video-on-demand (VOD), mobile video services, User-/Device-/Session Management etc.
- Content adaptation services. These services implement the procedures of adaptation of the scalable video transmission.
  - Transcoding, transrating, filtering, rate control, simulcast/bitstream switching etc.
- Transport and access technologies. This area includes the network technologies used in the backbone and access networks to transfer the scalable video to the user's home.
  - Broadcast (DVB-x), wireless access networks (Wi-Fi, WiMAX), fixed access networks (xDSL, cable, power line).
- Home network. This area represents the set of network technologies that can be used inside the user's home.



SCALNET

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Project ID: CP5-022

Start Date: 1 August 2008

Closure date: 1 October 2010

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Klagenfurt University, Austria

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www.celtic-initiative.org/projects/scalnet

- Power line network, wireless and wired home networks

- End-user terminals. These are the heterogeneous set of devices that the user will employ to render the scalable video.
  - Mobile phone, PDA, laptop, personal multimedia player, set-top box, HDTV etc.

Achieved results

Scalnet gave a good understanding of potential of SVC technology both technically and for the advancement of business goals. The major result of the project was an architecture which is optimised for the transport of SVC content, along with mechanisms to fully exploit the advantages of SVC when dealing with network issues, session mobility and continuity. Prototypes and demonstrators were the main visible results, and those utilize software components developed in the project. Amongst others, the following scenarios were demonstrated:

- Session Mobility with Adaptation: A consumer returns to home while looking at VoD content on his laptop. When arriving in his living room, he swaps watching the content from his laptop computer to the TV set with no disruption, getting enhanced resolution and quality which are suitable for the TV display.

- Technical and visual advantages of SVC within congested access and home networks: Several use cases fall under this demonstrator, in particular:

- Adaptation to Network QoS: A user is watching an SVC high-definition stream over IP, when his son starts a P2P file transfer which congests the home's DSL line. When congestion is detected, the SVC stream can gracefully degrade to a lower resolution, whereas a normal AVC (Advanced Video Coding) stream would have unacceptable quality.

- Adaptation in Network Mobility: When a user moves physically from one point to another, she passes through different access networks, possibly using different technologies (such as WiFi, WiMAX and 3G). The use of SVC allows for the stream to adapt to the access network as needed, providing acceptable user quality throughout the whole time the user is in movement.

Demonstrators were used in several exhibitions and conferences promoting the project and its results. Scalnet has published its results in conferences, and journals.

Impact

The impact of Scalnet has been a good understanding of the current market situation, together with a clear architecture and working software allowing delivery of SVC content. Scalnet has also analysed in detail potential customers and clients as well as the possible competitors to the technology.

The past video over IP services and solutions were used mainly over DSL networks. Today more and more consumers are using video from mobile devices, or over mobile networks. New mobile devices are creating a growing demand to deliver videos in different formats and bandwidth. Video content has to be encoded and archived several times.

Providing video services over IP is therefore today time consuming, complex and inefficient. The solution developed in Scalnet shows that content can be encoded, stored and distributed in one single scalable format using less bandwidth, time and storage. Scalnet makes video services over the Internet not only more efficient - it also provides new solutions to manage heterogeneous networks and devices.

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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