ITEA3

Project Results

ICARE

TV and home entertainment – anytime, anywhere out of the cloud

Executive summary

With current TV services evolving rapidly and TV and Internet converging, the way we all watch TV is set to be transformed. The ITEA ICARE project proposed using network cloud architecture to allow distributed, scalable and adaptive solutions: from anywhere in the cloud to any destination, irrespective of audio or video format, together with multi-screen data and entertainment services.

Project origins

Primary distribution in conventional TV production tends to be managed by production companies and content preparation by TV channels that aggregate all the contents, build a programme, insert advertising, news, talk shows and so on. The consumer side tends to be managed by operators that ultimately 'present' the picture on displays, whether mobiles, TV screens or tablets. The aim of this project was to develop innovative architecture whereby audiovisual components, sourced from various providers in the cloud and delivered separately, can be seamlessly reconstructed in a user device and rendered synchronously on one or more terminals with the guarantee of a given level of QoE – quality of entertainment.

Technology applied

ICARE set out to demonstrate cloud-based professional applications and user-centric entertainment across a non-proprietary and adaptive CDN (Content Delivery Network) infrastructure, with cost- and time-efficient processing and protection, including transparent caching and content watermarking, creating a multi-source framework for accurate media content synchronisation. Among the key innovations of the project are the application of cloud technologies for the complete audio-visual and entertainment chain, an ICARE platform as a service for

media and content applications, transparent caching combined with CDN and cloud services such as watermarking. The ICARE service framework components (for media operators) include a digital services registry, extension of encoding and segmenting solutions to both private and public clouds as well as support for various infrastructure as a service platform. A transparent caching prototype was developed to enable popularity management and network propagation while scalable watermarking supports ultra-high definition. By developing cloud provider agnostic software modules, ICARE makes multi-stream "frame-accurate" synchronisation possible and allows the delivery of personalised media content delivery through context awareness as well as a notification library that is compliant with a multitude of operating systems. Furthermore, through multi-screen management, interaction techniques are modelled as a service (through the ICARE services registry) and multi-screen content production, workflows and broadcast automation can be generated with second screen content synchronisation. Cloud forensic detection service for live events make end-to-end traceability of content feasible.
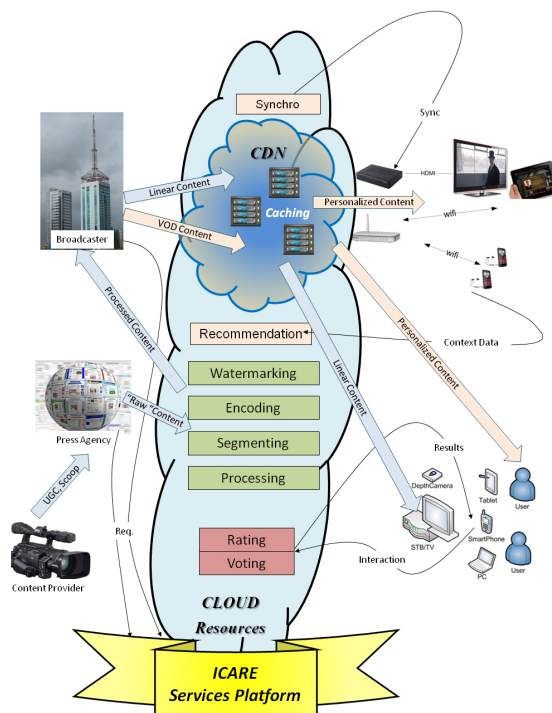
Innovative Cloud Architecture for Real Entertainment

These achievements were revealed in three demonstrations:

- Content watermarking adaptation, encoding and transport (with transparent caching)
- Home networks, synchronisation and content recommendation (innovative services in a cloud provider agnostic approach)
- Smart multi-screen TV services in the cloud (new approaches to personalisation)

Making the difference

More than 30 papers have been produced, video demonstrations shown, interviews given with magazines (Euromedia & TV Bay) and the the Multiscreen Salon at IBC 2014 co-hosted by Civolution – all of which has brought the project work into the limelight. There is one patent application pending and a proposed OCCI (emerging standard for IaaS) extension for encoding services along with a framework to generate OCCI compatible adapters on top of SOAP, XML-RPC or REST applications.

The project produced a wealth of exploitation opportunities (see Major project outcomes: Exploitation from the partners of the consortium, ALCATEL-LUCENT, AGM Lab, BASARI, RTL/BCE, BROADPEAK, CIVOLUTION, MAXISAT, MINES TELECOM, NEUSOFT, ARKENA, SILKAN, TECHNICOLOR, THALES, THOMSON VIDEO NETWORKS, VTT). To mention just a few representative examples, VTT intends to use the service platform as an integration Platform for other projects while Broadpeak/is currently working on a nanoCashing solution.

A collaboration in the making is that between Thomson and Civolution on watermarking. Furthermore, Thomson's Beyond Every Screen strategy announced at IBC 2014 aims at enhancing product architectures with virtual resources and a comprehensive control system. AGMLab will exploit the ICARE results to develop a context-aware recommendation system for B2B stakeholders of multi-media content distribution and Alcatel-Lucent will use session management and content personalisation in video-aware CDN technologies. Civolution also has plans to commercialise cloud video detection services early in 2015 for live events and audio watermarking for second screen synchronisation was sold to Kantar Media in December 2014, offering a further exploitation opportunity.

Future prospects

Quality of life will certainly be enhanced by personalised services and novel cloud-based applications while in the realm of cloud-based media business, the results of this project will help build a bridge between traditional media business and a new world of internet-based services.

Partners

Finland
ARKENA
Maxisat Yhtiöt Oy
Neusoft Mobile Solutions Oy
VTT Technical Research Centre of
   Finland Ltd.
France
Broadpeak
Civolution
Institut Mines-Télécom
Silkan
Technicolor
Thales Communications and Security
Thomson Video Networks SAS
Luxembourg
RTL BCE
Spain
Alcatel-Lucent
Technical University of Madrid (UPM)

Project start
June 2012
Project end
February 2015

Project leader
Eric Auffret, Thomson Video Networks

Project email
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Project website
www.icare-itea.org

Major project outcomes

Dissemination
- More than 30 publications
- Demos in professional exhibitions: IBC, NAB, Broadband World Forum, TV Connect Show

Exploitation (so far)
Several new services or system enhancements are foreseen to be exploited by the industrial partners in the near future.
- New services:
  - Multi-screen interactive application
  - Rating and voting interactive application
  - "Smart music" application with personalisation features
  - Watermarking and forensic services in the Cloud
  - Processing and distribution of content for OTT
- New systems:
  - Ground and Cloud based architectures for media contents
  - Enhanced CDN infrastructure with personalisation capabilities
  - Efficient caching for CDN management
  - Archiving and asset management in the Cloud
  - Management of content for OTT and secure CDN distribution

Standardisation
- Contributions to several standardisation bodies: MPEG-DASH, IETF, ITU-T and OneM2M

Patents
- 1 patent pending