

For Immediate Release

SVC4QoE Project Combines Scalable Video Coding and Quality of Experience Technologies for Robust Mobile Performance over DVB-T2

Rennes (France), April 24, 2012 - The SVC4QoE consortium has successfully concluded a project that demonstrates the potential of combined Scalable Video Coding (SVC) and Quality of Experience (QoE) technologies to improve mobile multi media services while reducing broadcasters' capital and operational costs. In the project's final phase, SVC4QoE conducted field trials in the Rennes area over an experimental DVB-T2 network, validating the theoretical concepts and gathering operational data.

The SVC4QoE project was initiated in October 2009, with the definition of a full multi media transmission chain combining SVC, DVB-T2 (broadcast transmission) and QoE technologies. The project partners provided all the technological components, and the integration phase culminated with the field trials performed during the last quarter of 2011.

The project demonstrated the benefits of the combination of these technologies for mobile reception on an efficient DVB-T2 transmission network. When receiving conditions deteriorate, the QoE monitoring probe embedded in the terminal prevents a complete loss of the picture by supplying the SVC decoder with the securely-received base layer, with or without the SVC enhancement layer.

The SVC4QoE consortium benefited from the skills of a multidisciplinary team composed of AccepTV, Degetel, IETR/INSA, INRIA, IRCCYN/Université de Nantes, TeamCast (project leader), Telecom Bretagne, TDF, and Thomson Video Networks.

The project's transmission chain assembled an off-line SVC encoder from IETR/INSA, a MANE splitter from Telecom Bretagne and a DVB-T2 multi PLP Gateway from Thomson Video Networks feeding two TeamCast DVB-T2 modulators. The DVB-T2 signal emitted from two TDF transmitter sites allowed the testing of MFN (Multi Frequency

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Network), SISO-SFN (Single Frequency Network) and even MISO-SFN broadcast operation.

The broadcast signals were received in a mobile van where the DVB-T2 demodulator supplied a MANE splitter from Telecom Bretagne, connected to an SVC decoder from INSA/IETR. The QoE (Quality of Experience) metric from AccepTV controlled the SVC decoder to ensure the display of the correctly decoded SVC layers. Coverage assessment was undertaken by TDF and closely matched the calculated coverage predictions. Degetel supplied complementary developments for the terminal, INRIA conducted propagation simulations, and IRCCyN provided QoE expertise for defining scenarios and performed subjective tests with the demonstrator.

The SVC4QoE project has contributed to a greater understanding of the benefits of combining SVC, QoE and the DVB-T2 multi-PLP transmission features instead of using them separately, and the project results have been disseminated through several publications and demonstrations, including a showcase at IBC 2011.

"SVC4QoE has been an exciting and challenging experience, associating expertise from nine organisations, in many video and broadcast domains," said Alain Untersee, project coordinator. "The experiments conducted both in laboratory and in the field confirmed the validity of the concepts, and highlighted that a lot of work remains necessary to turn them into a real consumer experience."

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About SVC4QoE

The SVC4QoE project is designed to meet the dual requirements of Video Broadcasting Operators: to lower broadcast costs (CAPEX and OPEX), and improve the end user Quality of Experience. The proposed solution is the combined use of both Scalable Encoding (SVC) and automatic QoE measurement. After a specification phase including the definition of system parameters (SVC, DVB-T2, QoE), the project partners developed prototypes that have been integrated at system level. Lab and field tests, and subjective experiments were successfully conducted in the final phase. The project started in September 2009 and concluded in December 2011. It was labelled by the "Pôle Images & Réseaux" and partially funded by the "Region Bretagne", the French Ministry of Industry and the "Région Pays de la Loire".

About AccepTV

AccepTV is a company providing state-of-the-art technologies, products and services to measure perceived video quality, for video quality optimization and automatic quality monitoring in broadcasting networks. AccepTV was founded in 2008 by three associates: Mathieu Carnec (Ph.D), Dominique Barba

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(Prof.) and the university of Nantes. AccepTV is a spin-off from the Images and Video Communications (IVC) research team, which belongs to the IRCCyN laboratory (Institute of Research in Communications and Cybernetics of Nantes). AccepTV and the IVC team are located on Nantes' technopole, at La Chantrerie.

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About Degetel

A specialist in innovative digital solutions consulting, Degetel was created by three senior executives from large French IT services companies. Denis Klenklé-Lallemand, Patrick Sayagh and Georges Klenklé share one and the same view as far as new technologies are concerned: convergence is the future. To manage to stand out as a leader in this field requires combining technical expertise, an understanding of customers' businesses, and a medium-scale company, respecting diversity and encouraging creativity. In little more than ten years, Degetel has thus imposed itself as the "multi-specialist" in innovative digital solutions consulting, providing services to a customer base of large accounts, in cutting-edge technology environments. Degetel created its own structure, entirely dedicated to R&D: Degetel Lab. This approach, so far unparalleled in this segment, gives it an undeniable competitive advantage. The Degetel Lab team participates in contests, publishes numerous projects, and has distinguished itself by winning trophies and prizes rewarding its outstanding capacity for innovation. Its one and only goal is to anticipate demand by elaborating innovative solutions beforehand. This project factory, which is constantly moving forward, has led to the creation of highly technical innovations that will ultimately be implemented for Degetel's customers. The company also actively takes part in research consortiums gathering industries, public labs and Engineering schools.

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About IETR

The Institut d'Electronique et de Télécommunications de Rennes (IETR) federates several laboratories of the University of Rennes 1, of INSA, of Supelec, of ENSSAT and of Saint-Cyr Coëtquidan schools. The institute (UMR CNRS 6164) has a hundred researchers or teacher-researchers and more than 100 PhD students. IETR consists of five groups including the "Image et Télédetection" group. This group is heavily involved in MPEG standardization as a member of the French delegation. It is specialized in video compression, image analysis and adequacy & architecture algorithms. IETR is the editor of MPEG reconfigurable video coding standard and is one of the main contributors to the standard.

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About INRIA

INRIA, the French national institute for research in computer science and control, operating under the joint authority of the Ministries of Research and of Industry, is dedicated to fundamental and applied research in information and communication science and technology (ICST). The institute also plays a major role in technology transfer by fostering training through research, diffusion of scientific and technical information, development, as well as providing expert advice and participating in international programs. By playing a leading role in the scientific community in the field and being in close contact with industry, INRIA is a major participant in the development of ICST in France. Throughout its eight research centers, INRIA has a workforce of 3800 (2,900 of whom are scientists from INRIA or from INRIAs partner organisations such as CNRS

(the French National Center for Scientific Research), universities and leading engineering schools). They work in 168 joint research project-teams. Many INRIA researchers are also professors who supervise around 1000 doctoral students, their theses work contributing to INRIA research projects. INRIA develops many partnerships with industry and fosters technology transfer and entrepreneurship in the field of ICST - some eighty companies have been founded. The team participating in SVC4QoE is Dionysos, belonging to the INRIA Unit in Brittany (formally, INRIA Rennes - Bretagne Atlantique). Dionysos works on networking, both from the design and the analysis points of view.

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About IRCCyN

The IRCCyN, « Institut de Recherche en Communications et Cybernétique de Nantes » is a Joint Research Unit, UMR CNRS 6597 (UMR, stands for « Unité Mixte de Recherche »), which has been recognized and granted by the CNRS the Ecole Centrale de Nantes, the Université de Nantes and the Ecole des Mines de Nantes. The Images and video-communications (IVC) research group focuses on digital multimedia processing and analysis. Most of the processes of digital multimedia processing are studied in our group, from the data acquisition to its visualization, including data transmission coding or storage. A wide range of research areas are covered around three main lines of work, namely perception, communication and representation. The position of IVC on these areas is unique in France and well known at international level. IVC is a member of the VQEG (Video Quality Expert Group) and the ILG (Independent Lab Group), active in normalisation activities on ITU and ISO for video quality. IVC has subjective quality test platforms according to ITU recommendations.

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About TDF

Working at the heart of the digital revolution, TDF is developing a multi-format and multisupport terrestrial platform for managing and distributing audio, video and data content to all types of receivers. As a dedicated broadcaster and designer of telecom networks, TDF is positioned at the nexus of the new digital, mobile and multimedia technologies by using all means of transmission: terrestrial, IP, satellite, etc. For years, TDF has been creating innovative solutions, to the point where it is now developing tomorrow's communications channels such as digital cinema, 3D, connected DTT, video on-demand, catch-up television, digital radio, web broadcasting, real-time traffic display and ultrahigh speed telecom networks. The singular goal here is to provide our customers and end users with media whenever, wherever, and however they wish.

For more information about TDF activities, please visit <http://www.tdf-group.com/>

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About TeamCast

TeamCast is a renowned and highly active member of the Digital TV ecosystem worldwide, with innovative technology offerings based on a solid expertise in both Digital TV and Mobile TV transmission. Created in 2003, and based at Rennes in France, TeamCast is deeply involved in the development, definition and verification of numerous broadcasting standards. Today, major clients in the broadcasting industry from 45 different countries invest their confidence in TeamCast and its products. TeamCast opened an

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office in Chicago (Illinois) to support the development of its business in North and South America, and to provide local sales and technical support services to its customers.

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About Telecom Bretagne

Founded in 1977, Telecom Bretagne is one of the most prestigious graduate engineering schools ("Grandes Ecoles") in France. It is a public institution, under the aegis of the Ministry for Industry and is a member of the Institut Telecom and the Université européenne de Bretagne (European University of Brittany). The college trains future professionals for careers in industry, services and research.

The degrees offered at Telecom Bretagne are internationally recognized and comply with the European Higher Education Area (EHEA): Master of Engineering (Diplôme d'Ingénieur), MSc in Telecom, in Computer Science, in Networks, in Biomedical Information, PhD.

Other education programmes such as Continuous Training (information in French) and Post-Master Professional certificates are available at Telecom Bretagne. Telecom Bretagne has two campuses (Brest and Rennes) with an excellent teaching record and internationally-renowned research activities. One of its greatest successes has been turbocodes for which Prof. C. Berrou won the Marconi Prize in 2005. It also has a large network of academic partners, in France and abroad.

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About Thomson Video Networks

From the very onset of digital TV broadcasting, the Thomson name has been synonymous with supplying expertise, quality, and reliability to the world's leading broadcasters. Since delivering the world's first large-scale direct-to-home satellite system, Thomson Video Networks has been a global leader in compression systems for satellite, terrestrial, cable, IPTV, mobile TV, and Web streaming. The company helps its customers deliver superior quality video to anything from small handheld devices to large 3D HD screens, with the lowest bandwidth to ensure a profitable business model. A trusted supplier to more than 20 percent of the active channels deployed worldwide, with a global support presence and a reputation for delivering quality at every stage, Thomson Video Networks offers the experience and range of products to meet every need, from hybrid multi-format compression systems to contribution links for content exchange networks.

For information about products from Thomson Video Networks, please visit www.thomson-networks.com.

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