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Project N°: FP7-ICT- 214063

SEA



Deliverable D7.4

D7.4 - Dissemination, standardisation and project liaison plans

Author(s): K. Grüneberg (HHI), T. Schierl (HHI), Th. Zahariadis (Synelixis), L. Celetto (STM), O. Negru (TGV), G. Olmo (Polito), L. G. Valbuena (UPM)

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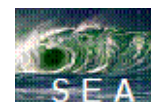
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Abstract:

This document details the dissemination and standardization activities of the project's first year and further planning. Moreover, the deliverable describes the project liaison activities at Networked Media concentration level and via participation in the Future Internet Assembly (FIA) activities.



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2	Synelixis Solutions	Synelixis	Contractor	Greece
3	Thomson Broadcast & Multimedia	Thomson	Contractor	France
4	Philips Consumer Electronics	Philips	Contractor	Netherlands
5	Vodafone Panafon AEET	Vodafone	Contractor	Greece
6	Nomor Research	Nomor	Contractor	Germany
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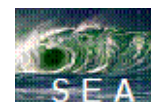


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Abbreviations

AVC	Advanced Video Coding
EC	European Commission
EU	European Union
FIA	Future Internet Assembly
FP7	Framework Programme 7
ICT	Information and Communication Technology
IEEE	Institute of Electrical & Electronics Engineers
IETF	Internet Engineering Task Force
IMS	Information Management System
IPTV	Internet Protocol TeleVision
IST	Information Society Technology
MDC	Multi Description Coding
MDP	Media Delivery Platform (cluster)
MVC	Multi-View Coding
P2P	Peer-to-Peer
PQoS	Perceived Quality of Service
RTP	Real-time Transport Protocol
STB	Set-Top Box
SVC	Scalable Video Coding
SW	SoftWare
URL	Uniform Resource Locator
WWW	World Wide Web



Executive Summary

The outcome of the project is spread in various ways, including different publication channels such as scientific journals and conferences. An overview on the strategic plans for the dissemination of the project results is given in the first section of this document. Details on past and future activities can be found in section 2. It includes details about the Internet presence as well as a comprehensive list of all journal papers and oral presentations including their abstracts.

Besides, some effort has been put into standardisation of techniques developed within the project. A list of all standardisation activities such as contributions to different standardization bodies and associated working documents is found in section 3.

Further, the project has set up liaisons to other European research projects. For each such activity, topics and form of cooperation are described in section 4 and its subsections.



1. Dissemination Strategy

Even from the project proposal phase, SEA had identified channels that the project will use to disseminate the results. These channels are summarized in the following:

a) Documentation: Both internal and public documents are foreseen. The former are circulated inside the project as soon as the involved partners, workpackage leaders and the technical manager have declared their consent. The public documents are made available to the public via the project web site.

b) EC Dissemination Mechanisms: SEA will pursue knowledge dissemination and maximum networking with other ongoing relating activities by making maximum use of the EC supported dissemination mechanisms, such as publication of project information on the official sites of EC.

c) EC Conferences & Cluster Meetings: SEA will participate to EC Conferences and the clustering meetings organised per thematic area.

d) Publications: SEA intent is clearly to enlarge awareness of the technology and applications being experimented to enlarge the potential recipients of the message and increase the number of interested people.

e) Access through WWW: An Internet WWW site has been developed from the very start of the project, which main objective is to diffuse the SEA's objectives and results as wider as possible, throughout the community and over.

f) Brochure: A brochure and a presentation for the project will be updated every six months to reflect the project's progress.

g) Access through events: This includes workshops, conferences, seminars, demonstrations and any other activity, which leads to the involvement of different spectrum of audiences from different backgrounds.

h) Social Networking: The project has initiated a LinkedIn to enable project information exchange and chats. The SEA LinkedIn site is: <http://www.linkedin.com/groups?gid=1736267>

As it is explained in the following sections SEA has successfully met the above plans. As more and more results become available in the second year of the project, further dissemination is foreseen.



2. Dissemination Workplan

2.1. SEA Web Site

The SEA web site has been developed and is regularly updated by Synelixix from the very start of the project. The web site main objective is to diffuse the SEA’s objectives and results as wider as possible, throughout the community and over and in parallel to operate as project’s repository. The project website has the following URL:

www.ist-sea.eu

The information hosted by the web site is organized in three sections shown in Figure 1. The larger section (*Project info*) contains project related information targeting the project web audience. It contains information about the project, its objectives and vision, standardization targeted groups/ organizations, contact details etc. In parallel, the *Community information* section contains information for the wider web site audience, who may not be so interested in the SEA project itself, but may want to find info (i.e. events, news, technical input) related to the EC Networked Media research area in general. The project info and the community info sections have an intersection, where public information related to the SEA project is located. This intersection contains the project standardization contributions, the published papers, project presentations and public project deliverables. Finally, the *consortium info* section is a private area repository, where internal documents, meeting information, presentations, software and technical input are stored.

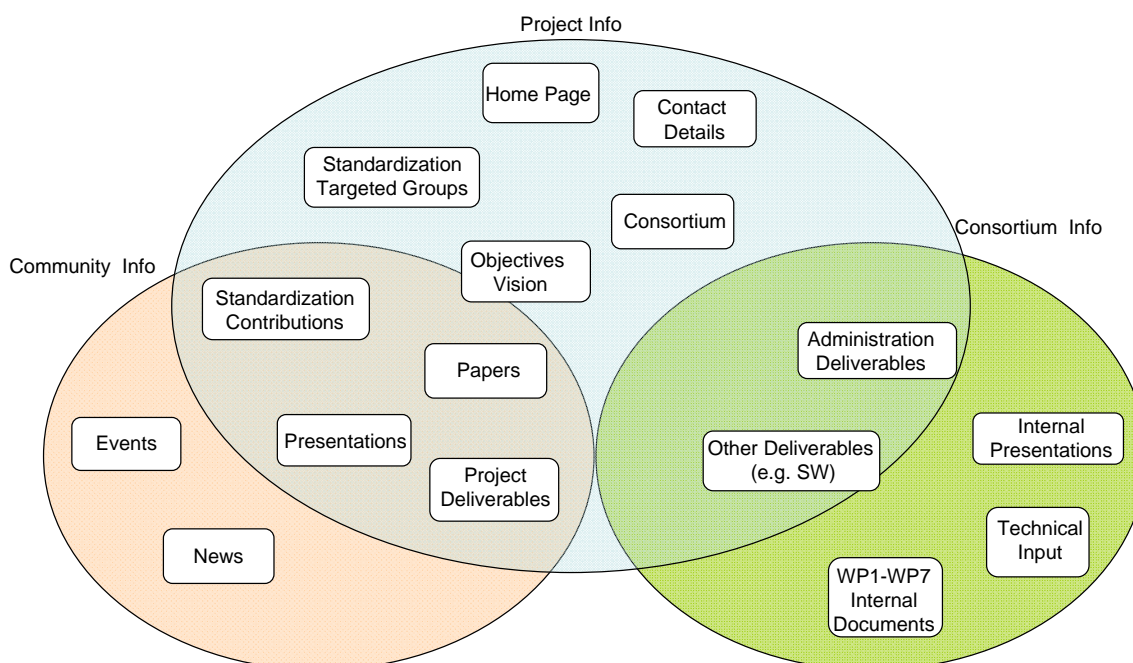


Figure 1: SEA website group organization

The project and community info sections have the tree structure shown in Figure 2. The home page is the first page of the project web site and has the larger number of hyperlink hits. Thus, it has to be attractive, useful and include the project position, events, news etc. The home page has links to the first layer hierarchy of web pages (Objectives, Deliverables, Dissemination, Standardization, Consortium, Contact Details).

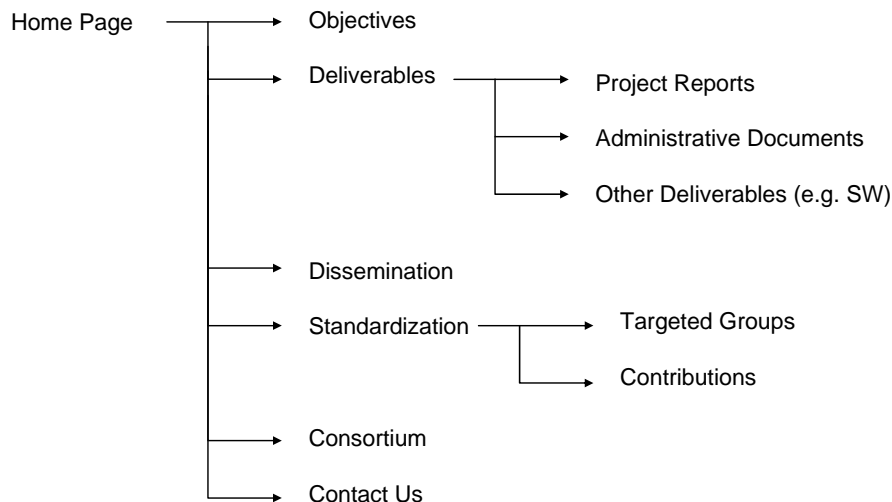


Figure 2: Public SEA website tree structure

The *Deliverables* web page contains the project report deliverables, which may be either public or password protected. All report deliverables for the whole project duration all listed, so the audience may have a complete view of the project, and even if some deliverables are scheduled latter in time to give them the stimulation to re-visit the project web site latter. In a lower layer hierarchy, the project administrative and SW deliverables are listed.

The *Dissemination* web page contains the public presentations, conference and magazines papers, white papers etc. and links to them in order to be directly downloadable.

The *Standardization* web page contains the targeted groups/bodies that the project aims to contribute. In a second hierarchy level, the actual contributions grouped per subject and standardization effort are located.

The *Consortium* web page describes the project consortium, while the Contact Us web page provides the contact details of the Project and Technical Manager.

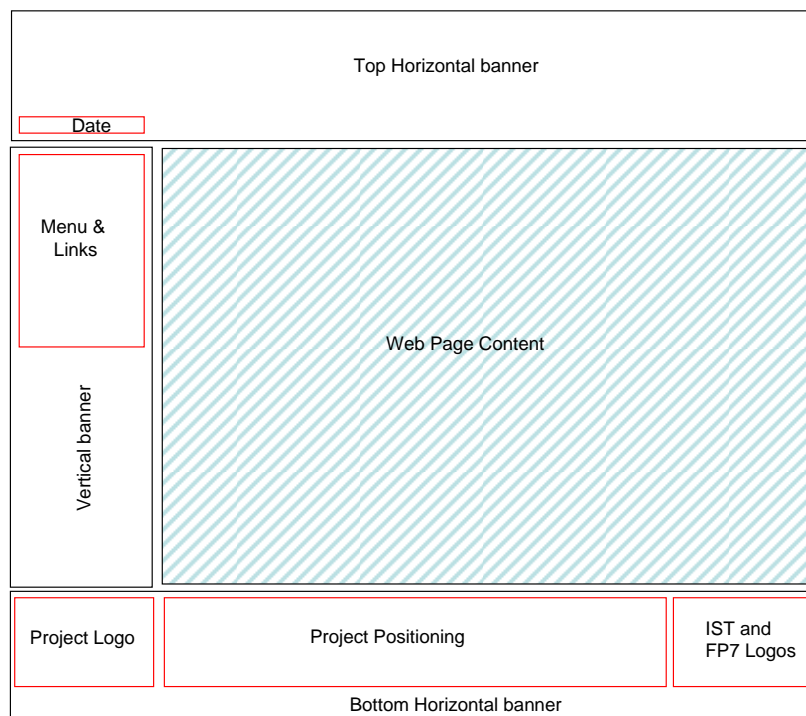


Figure 3: Web pages template



All web pages have the template shown in Figure 3. It has two horizontal banners and one vertical side pane. The Top horizontal banner contains the current date, the vertical banner contains a menu for accessing the project tree structure and the bottom horizontal banner contains info about the project (logo, positioning and IST/FP7 logos). The shadowed part contains the actual web page content.

An example of the Home Page structure is shown in Figure 4 containing the project description, events and news scrolling lists and a link to the project private area.

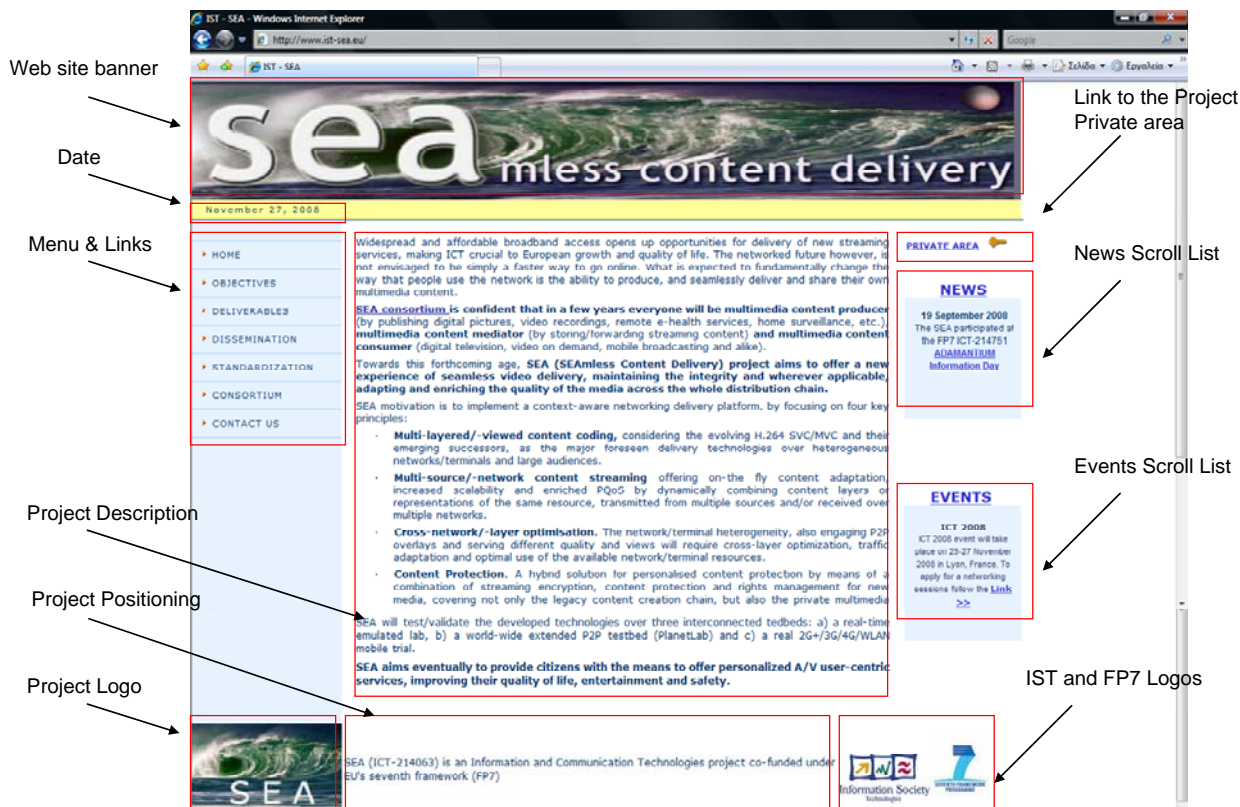
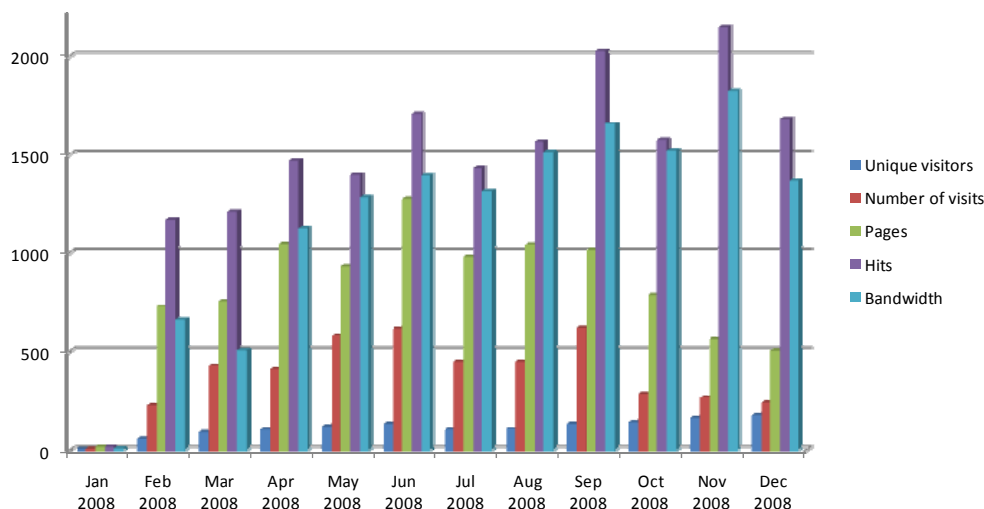


Figure 4: SEA website home page

2.1.1. Web site statistics

Since February 2008, overall the SEA web site has been visited by 1395 unique users (robots are not counted). The number of visits is 4573. The total number of downloaded pages is 9638 while the number of hits is 17388. Overall 14.8 GBytes of data have been downloaded from the web site.



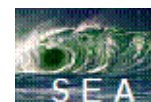


Figure 5: SEA website activity

As per averages values, each one of the 1395 users that visited the SEA web site, has revisited it 2.4 times (overall 3.4 visits per user), downloaded 2.1 pages per visit and downloaded 3.09 Mbytes per visit.

2.2. ICT Concertation Meetings

The project had a very active role in the Networked Media ICT concertation events. The project has been presented by the project Technical Manager, Dr. Theodore Zahariadis in the following events:

1. Fall 2007 Networked Media Concertation Meeting, 13-14 November 2007, Brussels, Belgium
2. Spring 2008 Networked Media Concertation Meeting, 16-17 April 2008, Algarve, Portugal
3. Fall 2008, Networked Media Concertation Meeting, 15-16 October 2008, St. Malo, France

In parallel, the project has leaded activities in the Media Delivery Platform (MDP) cluster and Future Internet Assembly (FIA) as it is further described in section 4.4 and 4.5.

2.3. Past dissemination activities

The following overview tables list the publications by their type (e.g., journal papers, conference papers). Each publication is described in more detail in the next chapters. Audience estimates for conference papers given in the tables include not only the direct audience (conference attendees) but also those persons who can have access to the conference proceedings in research institutes, libraries (or through the internet). Similarly, figures for journal papers and book chapters include not only the direct audience (journal subscribers, book buyers) but all those people who can potentially have access to these journals/books through libraries.

Table 1 — Website and project brochure

Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
Website	General public, Research, Industry	Worldwide	<i>cf. section 2.1</i>	Synelixis / all
Brochure	General public, Research, Industry	Worldwide		Synelixis

Table 2 — Journal papers

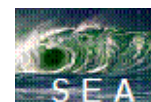
Ref	Title/Journal	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
(1)	Content Adaptation Issues in the Future Internet, EU Prague Book	Research, Industry	EU - Worldwide	~1000	Synelixis, HHI, STM
(2)	A Survey on P2P Overlay Streaming Clients, EU Prague Book	Research, Industry	EU - Worldwide	~1000	STM, UCLA, Synelixis



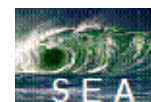
Ref	Title/Journal	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
(3)	Slice Sorting for Unequal Loss Protection of Video Streams," IEEE Signal Processing Letters	Research	Worldwide	~2000	POLITO
(4)	Personalized and scalable IPTV seamless content delivery using P2P overlay networks, submitted to IEEE Internet Computing	Research, Industry	Worldwide	~2000	POLITO, Synelixis, UPM
(5)	Multiple descriptions based on multi-rate coding for JPEG 2000 and H.264/AVC," IEEE Transactions on image processing	Research, Industry	Worldwide	~2000	POLITO
(6)	Unequal loss protection and slice skipping for resilient H.264/AVC video transmission, IEEE Transactions on image processing	Research, Industry	Worldwide	~2000	POLITO
(7)	A comparison between unequal loss protection and multiple description coding for image transmission over lossy packet networks, submitted to IEEE Signal processing letters	Research, Industry	Worldwide	~2000	POLITO

Table 3 — Conference presentations

Ref	Title/Journal	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
(8)	"SEA Project Presentation", Networked Media Concertation, Brussels, 13-14 November 2007	Research, Industry	EU	~60	Synelixis
(9)	"SEA Project Poster", Bled, Slovenia, 31 March - 2 April 2008	Research, Industry	EU - Worldwide	~400	Synelixis



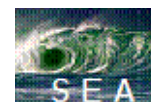
Ref	Title/Journal	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
(10)	“Seamless Content Delivery” Media Delivery Platforms Cluster, Vilamoura, Portugal, 16 April 2008	Research, Industry	EU	~100	Synelixis
(11)	“Considerations on Content Delivery over Future Internet”, Networked Media and 3D Internet Task Force, EC, 5-6 June 2008	Research, Industry	EU	~25	Synelixis
(12)	“Towards Future Media Internet,” Adamantium Information Day, Athens, Greece, 19 September 2008	Research, Industry	EU	~30	Synelixis
(13)	“Future Content Networks”, NEM Summit, St. Malo, France, 14 Oct. 08	Research, Industry	EU - Worldwide	~350	Synelixis
(14)	“Media Delivery Platforms Cluster”, St. Malo, France, 15 October 2008	Research, Industry	EU	~25	Synelixis
(15)	“Future Content Networks: Position Paper”, FIA Future Content Networks, Madrid, 9 Dec. 2008	Research, Industry	EU- Worldwide	~250	Synelixis
(16)	“The SEA use case in the FIRE testbed”, FIA Future Content Networks, Madrid, 9 Dec. 2008	Research, Industry	EU- Worldwide	~150	Synelixis
(17)	“Content Protection Issues,” FIA Identity and Trust Session, Madrid, 9 December 2008	Research, Industry	EU- Worldwide	~100	Synelixis



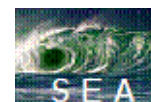
Ref	Title/Journal	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
(18)	“Seamless Content Delivery over the FIRE,” FIA, FIRE Session, Madrid, 10 December 2008	Research, Industry	EU- Worldwide	~100	Synelixis

Table 4 — Conference and workshop papers

Ref	Title/Journal	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
(19)	“Scalable Content Delivery over P2P convergent networks,” IEEE Intern. Symposium on Consumer Electronics, Portugal, 14-16 April 2008	Research, Industry	EU- Worldwide	~150	Synelixis, Thomson, UPM
(20)	“Concealment driven smart slice reordering for robust video transmission,” IEEE International Conference on Multimedia and Expo (ICME08), Germany, June 23-26, 2008	Research, Industry	EU- Worldwide	~120	POLITO
(21)	“Seamless Content Delivery over the Future Internet” TEMU 2008, 16-18 July 2008	Research, Industry	EU- Worldwide	~120	Synelixis, Thomson, STM, UPM
(22)	“A complexity scalable H.264/AVC encoder for mobile terminals,” EUSIPCO, Switzerland, August 2008	Research, Industry	EU- Worldwide	~80	POLITO, STM



Ref	Title/Journal	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
(23)	“Robust video communication for peer-to-peer streaming using slice reordering and error protection codes,” ST Microelectronics STreaming Day 2008, Parma (PR), September 2, 2008	Research, Industry	EU- Worldwide	~50	POLITO, STM
(24)	“Decoder driven adaptive distributed arithmetic coding,” IEEE International Conference on Image Processing, San Diego, USA, Oct. 2008	Research, Industry	EU- Worldwide	~120	POLITO
(25)	“Error Resilient JPEG2000 Decoding For Wireless Applications,” IEEE International Conference on Image Processing, San Diego, Oct. 2008	Research, Industry	EU- Worldwide	~120	POLITO
(26)	“Towards Future 3D Media Internet,” NEM Summit 2008, St. Malo, 13-15 October 2008	Research, Industry	EU- Worldwide	~350	Synelixis
(27)	“Seamless Content Delivery”, ACM WICON 2008, USA, 17-19 Nov. 2008	Research, Industry	EU- Worldwide	~50	Synelixis, HHI
(28)	“A Survey on P2P Streaming Clients: Looking at the End-User,” ACM WICON 2008, USA, 17-19 Nov. 2008	Research, Industry (STB Manufacturers)	EU- Worldwide	~50	STM, UCLA



Ref	Title/Journal	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
(29)	“Lightweight management of scalable and personalised media in mobile IPTV networks,” ACM WICON, USA, 17-19 Nov. 2008	Research, Industry	EU- Worldwide	~50	UPM
(30)	“SVC/MVC Content Protection over P2P Delivery Networks,” ICCE2009 January 2009	Research, Industry	EU- Worldwide	~150	UPM, Synelixis
(31)	"SEAcast: Seamless video streaming using P2P overlay networks," ICIP09 special session on Encoding, Transmission and Adaptation of Scalable Media Resources	Research, Industry	Worldwide	~150	POLITO, STM

2.3.1. Publications in journals and magazines

The SEA project, represented by Th. Zahariadis, L. Celetto and G. Pau, has organized the special session entitled “Seamless Content Delivery in the Future Mobile Internet” to be published in October 2009 in the IEEE Wireless Communications magazine.

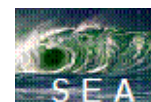
The following papers have been submitted:

- (1) Theodore Zahariadis, Catherine Lamy-Bergot, Thomas Schierl, Karsten Grüneberg, Luca Celetto, Christian Timmerer, “Content Adaptation Issues in the Future Internet,” accepted to the EC Future Internet Assembly book

Abstract: Future Media Internet is envisaged to provide the means to share and distribute (new) multimedia content and services with superior quality and striking flexibility, in a trusted and personalized way, improving citizens’ quality of life, working conditions, edutainment and safety. Based on work that has taken place in project SEA and the Medial Delivery Platforms Cluster of projects, we try to provide the challenges and the way ahead in the area of Content Adaptation.

- (2) Alexandro Sentinelli, Luca Celetto, Damien Lefol, Claudio Palazzi, Giovanni Pau, Theodore Zahariadis, Ahola Jari, “A Survey on P2P Overlay Streaming Clients”, accepted to the EC Future Internet Assembly book

Abstract: Peer-to-peer (P2P) streaming systems grow in numbers and potential and several commercial products are already competing. Internet home users — through the diffusion of xDSL connections — represent the potential market of IPTV channels that Content Generators



may distribute at reduced costs. This work describes the state of the art of P2P streaming clients and poses some questions about the end-user perspective which is still a non-trivial problem: expectations, content popularity, system's responsiveness and requirements. To this aim, a representative set of experiments has been performed on a popular P2P system. The client offers live streaming content from some European broadcasters, the start-up delay is just a few seconds and the user satisfaction rank is pretty good (resolution choice, good responsiveness, some popular channel). The new trend is to investigate flexible solutions in order to get closer to the user's needs and requirements. Unexpected cross-layer optimisations may overcome, like the synergic effect integrating video encoding techniques in a P2P environment. This work is aimed at helping the research community in getting a better comprehension of the issues and metrics that have to be considered in the design of P2P streaming applications.

- (3) E. Baccaglini, T. Tillo, Member, G. Olmo “Slice Sorting for Unequal Loss Protection of Video Streams,” IEEE Signal Processing Letters, Vol. 15, 2008

Abstract: In this letter we propose a novel unequal loss protection scheme, which allocates FEC codes to video slices according to their impact on the GOP distortion. This is evaluated taking the concealment procedure and the drift effect into account. Simulation results show that the proposed algorithm outperforms state-of-the-art approaches, reducing the gap with the error-free performance curve. Moreover, the complexity of the additional stage required to pilot the protection allocation stage is negligible with respect to traditional ULP schemes.

- (4) F. Alvarez, T. Zahariadis, G. Olmo, M. Grangetto “Personalized and scalable IPTV seamless content delivery using P2P overlay networks,” submitted to IEEE Internet Computing, Oct. 2008.

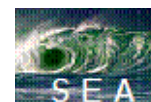
Abstract: Delivering seamless IPTV services over the Internet should be solidly sustained on top of computer architectures which can offer support for guaranteed quality delivery according to the consumer requirements, personalized, scalable, seamless and trusted multimedia content delivery, while protecting adequately the content. Moreover, aims to keep bandwidth requirements low and increase the perceived Quality of Service (PQoS). The paper describes novel forms of delivering IPTV over P2P networks using multi-layered/multi-viewed content coding using advanced coding techniques such as SVC/MVC, multi-source/multi network streaming, adaptation and content protection and lightweight asset.

- (5) T. Tillo, E. Baccaglini, G. Olmo, “Multiple descriptions based on multi-rate coding for JPEG 2000 and H.264/AVC,” submitted to IEEE Transactions on image processing, Nov. 2008.

Abstract: Multiple description coding makes use of redundant representations of the multimedia data to face link failures. Descriptions should be generated so that the quality obtained when decoding a subset of them only depends on their number and not on the particular received subset. In this paper, we propose a method based on the principle of encoding the source at several rates, and properly blending data encoded at different rates to generate the descriptions. The aim of this strategy is to achieve efficient redundancy exploitation, and easy adaptation to different network scenarios, by means of fine tuning of the encoder parameters. We apply the algorithm to both JPEG 2000 images and H.264/AVC video data. The experimental results reveal that our method favorably compares with state-of-art MDC techniques.

- (6) T. Tillo, E. Baccaglini, G. Olmo, “Unequal loss protection and slice skipping for resilient H.264/AVC video transmission,” submitted to IEEE Transactions on image processing, Dec. 2008.

Abstract: In this paper, we devise a procedure that mimics the behavior of a progressive video stream starting from a non progressive one such as H.264/AVC encoded video. This allows one to unequally protect the video data in an efficient way, according to their importance and to the network state. The reported results demonstrate the superior performance of the



proposed approach with respect to state of the art methods for resilient transmission of H.264 data. Moreover, the flexibility of the proposed scheme, in terms of redundancy insertion and achieved quality levels, permits to span different applications, including P2P video streaming.

- (7) E. Baccaglini, G. Olmo, "A comparison between unequal loss protection and multiple description coding for image transmission over lossy packet networks, submitted to IEEE Signal processing letters, August 2008.

Abstract: We propose a performance comparison between rate-distortion-based multiple description (MD) coding and state-of-the-art layered coding/unequal loss protection algorithms based on Reed Solomon FEC allocation. We point out that both schemes allocate the same total redundancy, but the MD algorithm, besides being usually computationally less intensive, may achieve a smoother performance degradation as the packet loss rate increases. The comparison is performed using JPEG 2000 as test-bed and complexity issues are also addressed.

2.3.2. Presentations/Posters

Within the 1st year of the project, the following presentations have been taken place:

- (8) Th. Zahariadis, "SEA Project Presentation", Networked Media Concertation Meeting, Brussels, 13-14 November 2007
- (9) Th. Zahariadis, "SEA Project Poster", Bled, Slovenia, 31 March -2 April 2008
- (10) Th. Zahariadis, "Seamless Content Delivery" Media Delivery Platforms Cluster, Vilamoura, Portugal, 16 April 2008
- (11) Th. Zahariadis, "Considerations on Content Delivery over Future Internet", Networked Media and 3D Internet Task Force, EC, 5-6 June 2008
- (12) Th. Zahariadis, "Towards Future Media Internet," Adamantium Information Day, Athens, Greece, 19 September 2008
- (13) Th. Zahariadis, "Future Content Networks", NEM Summit ,St. Malo, France, 14 October 2008.
- (14) Th. Zahariadis, "Media Delivery Platforms Cluster", St. Malo, France, 15 October 2008
- (15) Th. Zahariadis, "Future Content Networks: Position Paper", Future Internet Assembly (FIA), Future Content Networks (FCN) Session, Madrid, 9 December 2008
- (16) Th. Zahariadis, "The SEA use case in the FIRE testbed," Future Internet Assembly (FIA), Future Content Networks (FCN) Session, Madrid, 9 December 2008
- (17) Th. Zahariadis, "Content Protection Issues," Future Internet Assembly (FIA), Identity and Trust Session, Madrid, 9 December 2008
- (18) Th. Zahariadis, "Seamless Content Delivery over the FIRE," Future Internet Assembly (FIA), FIRE Session, Madrid, 10 December 2008

2.3.3. Conference Papers

Within the 1st year of the project, the following conference papers have been published and presented.

- (19) Th. Zahariadis, O. Negru, F. Álvarez, "Scalable Content Delivery over P2P convergent networks," 12th IEEE International Symposium on Consumer Electronics, (ISCE 2008), Vilamoura, Portugal, 14-16 April 2008

Abstract: An innovative system and its architecture to offer media scalable content delivery, increasing the robustness and resiliency, enriching the PQoS both within the network and/or at the end-user terminal, while protecting the content from unauthorized access over heterogeneous physical architecture and P2P logical overlay network topologies is described.



The system described is focused on different convergent networks including broadcasting, interactive/on demand bidirectional networks and mobile networks, and mesh P2P logical overlay topologies. Three technology pillars in which the system is based are described: Multi-layered/Multi-viewed content coding, Multi-source/multi-network streaming & adaptation, content protection and lightweight asset management. In addition the application to IPTV over P2P convergent networks is described to demonstrate the system usefulness to commercial services.

- (20) Enrico Baccaglini, Tammam Tillo, Gabriella Olmo, “Concealment driven smart slice reordering for robust video transmission,” 2008 IEEE International Conference on Multimedia and Expo (ICME08), Hanover, Germany, 23-26 June 2008

Abstract: In this paper we address a novel scheme to protect video sequences according to slice importance based on slice reordering, ULP and error-concealment techniques. The approach does not require the modification to the video decoder although an application-layer channel coding is required. Simulation results show that the proposed algorithm outperforms state-of-the-art approaches, reducing the gap with the upper-bound error-free performance curve. Moreover, the complexity of the additional stage required to pilot the protection allocation stage is negligible with respect to traditional ULP schemes.

- (21) Th. Zahariadis, O. Negru, F. Rovati, F. Álvarez, “Seamless Content Delivery over the Future Internet”, International Conference on Telecommunications and Multimedia (TEMU 2008), 16-18 July 2008

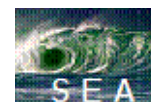
Abstract: The Future Internet of things and services is not envisaged to be simply a faster way to go online. What is expected to fundamentally change the way that people use the Internet is the ability to produce, and seamlessly deliver and share their own multimedia content. In this paper, we introduce and analyse innovative architecture components to offer media scalable content delivery, increasing the robustness, enriching the PQoS and protecting the content from unauthorized access over heterogeneous physical architecture and P2P logical overlay network topologies. Technology pillars in which the system is based are described: i.e. Multi-layered/Multi-viewed content coding, Multi-source/multi-network streaming & adaptation, content protection and lightweight asset management.

- (22) Amit Kumar, Daniele Alfonso, Luca Pezzoni and Gabriella Olmo, “A complexity scalable H.264/AVC encoder for mobile terminals,” 16th European Signal Processing Conference (EUSIPCO 2008), Lausanne, Switzerland, 25-29 August 2008

Abstract: Video encoding is one of the most appealing features of modern mobile terminals, but also one of the most demanding for what concerns power consumption. We propose an H.264/AVC encoder able to adaptively self-adjust the accuracy of the motion-compensated prediction on the basis of the available power resources to achieve a progressive reduction of the computational requirements with graceful degradation of the rate-distortion performance.

- (23) Enrico Baccaglini, Tammam Tillo, Gabriella Olmo, “Robust video communication for peer-to-peer streaming using slice reordering and error protection codes,” ST Microelectronics STreaming Day 2008, Parma (PR), September 2, 2008

Abstract: In this paper we address a novel scheme to protect video sequences according to slice importance based on slice reordering, ULP and error-concealment techniques. The approach does not require the modification to the video decoder although an application-layer channel coding is required. Simulation results show that the proposed algorithm outperforms state-of-the-art approaches, reducing the gap with the upper-bound error-free performance



curve. Moreover, the complexity of the additional stage required to pilot the protection allocation stage is negligible with respect to traditional ULP schemes.

- (24) Marco Grangetto, Enrico Magli, Gabriella Olmo, “Decoder driven adaptive distributed arithmetic coding,” IEEE International Conference on Image Processing 2008 (ICIP 2008), San Diego, USA, 12-15 Oct. 2008

Abstract: We propose a distributed source coding system for data collected by sensor networks. It uses a feedback channel between the sensors and the gateway node (i.e., the joint decoder) but, unlike previous systems, the encoding process is driven by the decoder. Compression is performed using distributed arithmetic coding, which is extended to adaptively estimate the source probabilities. Specifically, the decoder estimates marginal and conditional probabilities, and sends them back to the sensors to drive the distributed arithmetic coding process. This reduces the decoding delay, and potentially eliminates the need of rate-compatible Slepian-Wolf codes.

- (25) Simone Zezza, Maurizio Martina, Guido Masera, Saeid Nooshabadi, "Error Resilient JPEG2000 Decoding For Wireless Applications," IEEE International Conference on Image Processing 2008 (ICIP 2008), San Diego, USA, 12-15 Oct. 2008

Abstract: To improve the JPEG2000 compression standard error resiliency in the wireless environment, the use of ternary MQ arithmetic coders/decoders that are based on the concept of forbidden symbol has been proposed. This paper presents two ternary MQ based techniques to reduce both the computational complexity and the memory requirement during the decoding process, with no or little degradation in the PSNR.

- (26) Theodore Zahariadis, Petros Daras, Isidro Laso-Ballesteros, “Towards Future 3D Media Internet,” NEM Summit 2008, St. Malo, 13-15 October 2008

Abstract: The Internet is incontrovertibly a great success that has changed our social and economic world. However, Internet was designed for purposes that bear little resemblance to today's usage scenarios and related traffic patterns. In the longer term, the exponential increase of the user generated multimedia content and the number of mobile users will raise many new challenges. Based on work from the Future Internet Assembly and the Networked Media Task Force, we present some of the major issues and barriers towards the Future 3D Media Internet.

- (27) Theodore Zahariadis, George Leoleis, Thomas Schierl, Karsten Grüneberg, “Seamless Content Delivery”, ACM WICON 2008, Maui, USA, 17-19 November 2008

Abstract: Widespread and affordable broadband access opens up opportunities for delivery of new streaming services. However, what is expected to fundamentally change the way that people use the network is the ability to produce, and seamlessly deliver and share their own multimedia content. SEA consortium is confident that in a few years everyone will be multimedia content producer, mediator and consumer, and aims to provide the means to distribute A/V user-centric services, with superior quality and flexibility, in a trusted and personalized way.

- (28) Alexandro Sentinelli, Luca Celetto, Damien Lefol, Claudio Palazzi, Giovanni Pau, “A Survey on P2P Streaming Clients: Looking at the End-User,” ACM WICON 2008, Maui, USA, 17-19 November 2008



Abstract: Peer-to-peer (P2P) streaming systems grow in numbers and potential and several commercial products are already competing. Internet home users – through the diffusion of xDSL connections – represent the potential market of IPTV channels that Content Generators may distribute at reduced costs. This work describes the state of the art of P2P streaming clients and poses some questions about the end-user perspective which is still a non-trivial problem: expectations, content popularity, system's responsiveness and requirements. To this aim, a representative set of experiments has been performed on a popular p2p system. The client offers live streaming content from some European broadcasters, the start-up delay is just a few seconds and the user satisfaction rank is pretty good (resolution choice, good responsiveness, some popular channel). In general, the new trend is a flexible system getting closer to the user's needs and requirements. A promising approach is to look for cross-layer optimisation integrating particular video encoding techniques and, sometimes, unexpected synergy may overcome, like the use of Scalable Video Coding in heterogeneous P2P environments. This work is aimed at helping the research community in getting a better comprehension of the issues and metrics that have to be considered in the design of p2p streaming applications.

- (29) Laura Arnaiz, José Menéndez, Lara García, Guillermo Cisneros, Federico Álvarez, “Lightweight management of scalable and personalised media in mobile IPTV networks,” ACM WICON 2008, Maui, USA, 17-19 November 2008

Abstract: In the present paper a novel system for scalable and personalised media management and its architecture is presented. The proposed solution is based on the creation of a secure and adaptable content delivery architecture and the underlying mechanisms to ensure the correct content management which, along with the content protection mechanisms, can be useful for, on one hand, ensuring user privacy and, on the other hand, enabling the possibility of offering commercial IPTV services over a mobile environment. The aim of the system is to enable personalised view, scalable, seamless and trusted multimedia content delivery, while protecting content from unauthorized access.

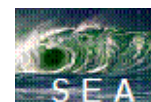
The following papers have already been submitted in the reporting period, but will be presented during 2009.

- (30) Lara García, Laura Arnaiz, Federico Álvarez, Theodore Zahariadis, “SVC/MVC Content Protection over P2P Delivery Networks,” International Conference on Consumer electronics (ICCE 2009) 12-14 January 2009

Abstract: In the present paper a novel system and its architecture is presented. The aim of this system is to enable personalized view, scalable, seamless and trusted multimedia content delivery, while protecting content from unauthorized access. Moreover, the system aims to keep bandwidth requirements low and increase the Perceived Quality of Service (PQoS). This content delivery is done through multiple kinds of networks. Special attention to content protection and license management and the possibilities of the system to provide adaptable content to the user thanks to the scalable and multi view video coding is made..

- (31) S. Zezza, M. Grangetto, G. Olmo, “SEAcast: Seamless video streaming using P2P overlay networks,” submitted for possible inclusion in ICIP09 special session entitled “Encoding, Transmission and Adaptation of Scalable Media Resources”, Dec. 2008.

Abstract: Nowadays, P2P overlay networks, running at the application layer, perform scheduling and routing without any knowledge of the underlying physical network. Besides the high scalability, flexibility and cost effectiveness promised by such solutions, the lack of coordination and control may result in poor performance and limited exploitation of their technological advantages. It is now clear that the theoretical gains promised by such system can be achieved on the one hand by a more rigorous design taking into account all the network layers, on the other hand by promoting collaborations and agreements among all the



parts involved in the video entertainment production and delivery chain. In this paper, first of all we describe the network architecture proposed within the EU SEA project, which represents one of the first attempts to take into account P2P applications while placing the first stone of the complex communication system infrastructure. Then, we present the P2P streaming protocol developed within the SEA project, which enables P2P IPTV making use of scalable video coding and multiple description coding (SVC and MDC) on the P2P overlay. Finally, we present the technical solutions leading to a P2P application that takes part to the cross-layer mechanisms, so that control and quality of services policies can be extended to P2P overlay. The possible benefits, and the requirements this configuration imposes on the network architecture, are discussed in detail.

2.3.4. White Paper

SEA has actively contributed in the Media Delivery Platforms Cluster white paper entitled: "[Multimedia Delivery in the Future Internet A Converged Network Perspective](#)", October 2008.

Moreover SEA has contributed to the Future Media and 3D Internet Task Force and the Future Internet Assembly position paper.



2.4. Future dissemination activities

In the second year of the project's lifetime, the project will continue to publish its results through all appropriate channels. Some publications that have already been submitted are listed in the tables above, and further articles and presentations will follow. Table 5 lists publications in preparation.

Table 5 — Planned publications

Ref	Type	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
	Website	General public, Research, Industry	Worldwide		Synelixis / all
	Brochure (2009 edition)	General public, Research, Industry	Worldwide		Synelixis
	EU Prague Book	Research, Industry	EU - Worldwide	~1000	STM, UPM, UCLA, Synelixis
	IEEE Wireless Communication, Oct 2009	Research, Industry	Worldwide	~2000	Synelixis, STM, UCLA
(32)	Open IPTV Overlay Multicast using Scalable Video Coding with FEC, IEEE Wireless Communications Magazine	Research, Industry	Worldwide	~2000	HHI

The consortium has already selected a number of conferences for further dissemination. These will include the events listed in Table 6, but project activities are not strictly limited to these occasions.

Table 6 — Targeted conferences

Date	Conference / location	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
May 11-12 2009	International Packet Video Workshop (PV2009), Seattle, WA, USA	Research, Industry	Worldwide	~150	Nomor, HHI
12-14 May 2009	EU Future Internet Assembly, Prague, Czech Republic	Research, Industry	EU-Worldwide	~150	Synelixis
27-28 May 2009	Spring Networked Media Concertation Meeting, Antwerp	Research, Industry	EU-Worldwide	~100	Synelixis



Date	Conference / location	Type of audience	Countries addressed	Size of audience	Partner responsible / involved
14-18 June 2009	IEEE International Conference on Communications (ICC '09)	Research, Industry	EU-Worldwide	~250	UCLA
18-20 June 2009	International Workshop on Systems, Signal and Image Processing 2009, Chalkida, Greece	Research, Industry	EU-Worldwide	~150	Synelixis
20 June 2009	SEA Special Session (in parallel to IWSSIP'09)	Research, Industry	EU-Worldwide	~100	Synelixis
21-24 June 2009	International Wireless Communications and Mobile Computing Conference 2009, Leipzig, Germany	Research, Industry	Worldwide	~200	Nomor
13-16 July 2009	International Conference on Wireless Networks (ICWN'09), Las Vegas, Nevada, USA	Research, Industry	Worldwide	~200	Nomor
24-28 Aug. 2009	17 th EUSIPCO, Glasgow, Scotland,	Research, Industry	EU-Worldwide	~80	Polito
	Fall Networked Media Concertation Meeting, Antwerp	Research, Industry	EU-Worldwide	~100	Synelixis

2.4.1. Web Site

Though the web site layout and structure is not foreseen to change, the web site content will be updated regularly with events, project related and general interest news, deliverables, papers and presentations.

2.4.2. Workshop

In parallel to the **International Workshop of Systems, Signal and Image Processing (IWSSIP 2009)**, Synelixis will organize a special session on "Media Streaming over Content Aware Networks". IWSSIP is technical co-sponsored by IEEE, ACM and EURASIP communities. It will take place in Chalkida, Greece on 18-20 June 2009 and the SEA Special Session will take place on 20 June 2009.

2.4.3. Journal papers to be published

Further papers will be submitted to journals during 2009, including the following:

- (32) Thomas Schierl, Cornelius Hellge, Shpend Mirta, Heiko Schwarz, Thomas Wiegand, "Open IPTV Overlay Multicast using Scalable Video Coding with FEC", planned for publication in IEEE Wireless Communications Magazine.

2.4.4. Conferences

The project consortium intends to present the results of the project in selected conferences worldwide. Planned contributions include the following:



- (33) Alexandro Sentinelli, Luca Celetto, Damien Lefol, Claudio Palazzi, Giovanni Pau, Theodore, Zahariadis, Ahola Jari, "A Survey on P2P Overlay Streaming Clients", Future of the Internet, Prague, May 2009

Abstract: Peer-to-peer (P2P) streaming systems grow in numbers and potential and several commercial products are already competing. Internet home users — through the diffusion of xDSL connections — represent the potential market of IPTV channels that Content Generators may distribute at reduced costs. This work describes the state of the art of P2P streaming clients and poses some questions about the end-user perspective which is still a non-trivial problem: expectations, content popularity, system's responsiveness and requirements. To this aim, a representative set of experiments has been performed on a popular P2P system. The client offers live streaming content from some European broadcasters, the start-up delay is just a few seconds and the user satisfaction rank is pretty good (resolution choice, good responsiveness, some popular channel). The new trend is to investigate flexible solutions in order to get closer to the user's needs and requirements. Unexpected cross-layer optimisations may overcome, like the synergic effect integrating video encoding techniques in a P2P environment. This work is aimed at helping the research community in getting a better comprehension of the issues and metrics that have to be considered in the design of P2P streaming applications.

- (34) Ktawut T.Pijarn, "Adaptive Video Streaming over Mobile Networks with TCP-Friendly Rate Control," The International Wireless Communications and Mobile Computing Conference, Leipzig, Germany, 21-24 June 2009

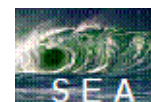
Abstract: This paper investigates and analyses the performances of using the TCP-Friendly Rate Control (TFRC) to control the transmission rate of an adaptive video stream in a mobile network. The stream is encoded based on the Scalable Video Coding (SVC) extension of the H.264/AVC standard comprising of several video layers. Adding and removing the layers is controlled during streaming from the TFRC based on varying channel conditions of the mobile network in real time. We conducted simulations on various realistic use cases in a mobile network, evaluated and compared the performances with and without adaptation from the TFRC. The results show significant improvements in all areas.

- (35) Ktawut T.Pijarn, T. Schierl: "Seamless Content Delivery over LTE and WiMAX Using Scalable Video Coding", International Packet Video Workshop, Seattle, WA, USA., 11-12 May 2009

Abstract: Multimedia content delivery seems to become a key feature for the future internet services. Delivering high quality content over the Internet Protocol to mobile devices is still a tough objective. Due to the typically fast changing network conditions of mobile channels and possibly occurring handovers between cells of cellular-based mobile networks, real time content delivery becomes inherently challenging. In this work, we show techniques for enhancing the delivery of video content over mobile networks using Scalable Video Coding (SVC) and on-the-fly in-network adaptation for 3GPP networks based on High Speed Packet Access (HSPA), WiMax or Long Term Evolution (LTE). The network adaptation is applied seamless for the user with respect to the user's location as well as to its network connectivity. We show selected results for a specific adaptation case for LTE as an example for a future mobile network.

2.4.5. Trade fairs and exhibitions

Nomor will have an exhibit at the GSMA Mobile World Congress from 6 - 19 February 2009 in Barcelona and will spread the project brochure to the interested audience.



3. Contribution to Standardisation

In the first year, a significant number of contributions to different standardisation bodies have been issued by SEA consortium members. In the following subsections, these contributions are listed sorted by the targeted standardisation body.

3.1. Contributions to MPEG

As already foreseen in the proposal, there has been a need for standardisation regarding MVC storage. Clearly, MPEG has been regarded as the standardisation body responsible for such a file format as this would extend the already existing specification for AVC storage. In detail, the following proposals have been sent to MPEG:

- (1) K. Grüneberg, T. Schierl, "On MVC File Format", 84th MPEG Meeting - ISO/IEC JTC1/SC29/WG11, Archamps, France, MPEG84/M15356, April 2008
- (2) K. Grüneberg, T. Schierl, "On MVC File Format", 85th MPEG Meeting - ISO/IEC JTC1/SC29/WG11, Hanover, Germany, MPEG85/M15600, July 2008
- (3) K. Grüneberg, T. Schierl, "On MVC File Format", 86th MPEG Meeting - ISO/IEC JTC1/SC29/WG11, Busan, Korea, MPEG86/M15874, October 2008

With slight modifications, the first proposal had been adopted by MPEG as Working Draft 1.0 for the Amendment 3 (MVC File Format) to the MPEG-4 Part 15 — AVC File Format.

- (4) K. Grüneberg, T. Schierl, D. Singer, "Working Draft 1.0 for the Amendment 3 (MVC File Format) to 14496-15 (2004) (AVC File Format)", MPEG Meeting - ISO/IEC JTC1/SC29/WG11, Archamps, France, MPEG85/N9827, April 2008.

Including the second proposal amongst others, MPEG has issued Working Draft 2.0 for the Amendment 3 (MVC File Format) to the MPEG-4 Part 15 — AVC File Format.

- (5) K. Grüneberg, T. Schierl, M. Hannuksela, Y.-K. Wang, Y. Chen, D. Singer, "Working Draft 2.0 for the Amendment 3 (MVC File Format) to 14496-15 (2004) (AVC File Format)", MPEG Meeting - ISO/IEC JTC1/SC29/WG11, Hanover, Germany, MPEG85/N10062, July 2008.

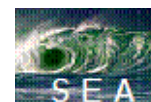
Meanwhile, Working Draft 2.0, amongst others extended by the SEA proposal, has been adopted by MPEG as Proposed Draft Amendment (PDAM) to the MPEG-4 Part 15 — AVC File Format [1]. More details on the proposed format for MVC storage within MP4 files can be found in [2].

Additionally, MVC transport over MPEG-2 systems has been targeted because there seems to be an industrial interest for the transport of MVC of existing broadcast channels. This proposal has directly been adopted by MPEG as Proposed Draft Amendment (PDAM) to the MPEG-2 Systems standard.

- (6) T. Schierl, K. Grüneberg, "Proposal for the Amendment to ISO/IEC 13818-1:2007 - Transport of MVC in MPEG-2 Systems", MPEG Meeting - ISO/IEC JTC1/SC29/WG11, Busan, Korea, MPEG86/M15869, October 2008

3.2. Contributions to IETF

As anticipated, some effort has been put into standardisation of SVC and MVC transport through the Internet using the Real-time Transport Protocol (RTP). Clearly, the IETF is the responsible standardisation body for this as it owns the specification of RTP payload formats for all kinds of contents.



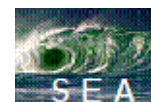
The RTP Payload Format for SVC Video is now in the last stage before being published as an RFC. Many draft versions on the SVC payload format have been contributed to the IETF (see list below), and finally a Working Group Last Call until 19 January 2009 has been issued for this item.

Two drafts have been issued on the MVC payload format which is still in the state of an individual internet draft. More details on the RTP payload format for SVC and MVC will be found in the project Deliverable D3.3 — Integrated SVC/MVC/MDC transport, due end of February 2009.

In addition to the RTP payload format, specific signalling has to be specified for layered and multi-description codecs in order to enable a Media Aware Network Element (MANE) to do adaptation such as "thinning" on media streams which contain SVC, MVC or MDC contents. This has been tackled by further contributions included in the list below.

In detail, the following IETF drafts have been co-authored:

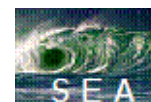
- (7) Y.-K. Wang, T. Schierl, "RTP Payload Format for MVC Video", 25 Feb 2008, Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 25 February 2008, <http://tools.ietf.org/html/draft-wang-avt-rtp-mvc-01.txt> .
- (8) Y.-K. Wang, T. Schierl, "RTP Payload Format for MVC Video", 21 Aug 2008, Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 21 August 2008, <http://tools.ietf.org/html/draft-wang-avt-rtp-mvc-02.txt>.
- (9) S. Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 2 January 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-05>
- (10) S. Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 21 January 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-06>
- (11) S. Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 1 February 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-07>
- (12) S. Wenger, Y.-K. Wang, T. Schierl, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 25 February 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-08>
- (13) S. Wenger, Y.-K. Wang, T. Schierl, A. Eleftheriadis, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 15 May 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-09>
- (14) S. Wenger, Y.-K. Wang, T. Schierl, A. Eleftheriadis, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 3 June 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-10>
- (15) S. Wenger, Y.-K. Wang, T. Schierl, A. Eleftheriadis, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 17 June 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-11>
- (16) S. Wenger, Y.-K. Wang, T. Schierl, A. Eleftheriadis, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 30 June 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-12>
- (17) S. Wenger, Y.-K. Wang, T. Schierl, A. Eleftheriadis, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 14 July 2008 <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-13>
- (18) S. Wenger, Y.-K. Wang, T. Schierl, A. Eleftheriadis, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 26 September 2008, <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-14>



- (19) S. Wenger, Y.-K. Wang, T. Schierl, A. Eleftheriadis, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 3 November 2008, <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-15>
- (20) S. Wenger, Y.-K. Wang, T. Schierl, A. Eleftheriadis, "RTP Payload Format for SVC Video", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 16 December 2008, <http://tools.ietf.org/html/draft-ietf-avt-rtp-svc-16>
- (21) T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Engineering Task Force (IETF), Multiparty Multimedia Session Control (mmusic), 25 February 2008, <http://tools.ietf.org/html/draft-ietf-mmusic-decoding-dependency-01>
- (22) T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Engineering Task Force (IETF), Multiparty Multimedia Session Control (mmusic), 25 May 2008, <http://tools.ietf.org/html/draft-ietf-mmusic-decoding-dependency-02>
- (23) T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Engineering Task Force (IETF), Multiparty Multimedia Session Control (mmusic), 25 Sep 2008, <http://tools.ietf.org/html/draft-ietf-mmusic-decoding-dependency-03>
- (24) T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Engineering Task Force (IETF), Multiparty Multimedia Session Control (mmusic), 21 Oct 2008, <http://tools.ietf.org/html/draft-ietf-mmusic-decoding-dependency-04>
- (25) T. Schierl, S. Wenger, "Signaling media decoding dependency in Session Description Protocol (SDP)", Internet Engineering Task Force (IETF), Multiparty Multimedia Session Control (mmusic), 20 Nov 2008, <http://tools.ietf.org/html/draft-ietf-mmusic-decoding-dependency-05>

Last but not least, synchronisation becomes an issue if layered media are transported through different RTP sessions. In general, this issue had been regarded as solved, but during implementation some obstacles have been found which make the re-assembly of the original bitstream from different RTP sessions rather difficult. Consequently, the following draft has been issued which discusses problems related to multi-session and multi-source transmission using the Real-Time Transport Protocol.

- (26) T. Schierl, J. Lennox, "Multi-Session and Multi-Source Transmission in the Real-Time Transport Protocol (RTP)", Internet Engineering Task Force (IETF), Audio Video Transport Group (avt), 27 October 2008, <http://tools.ietf.org/html/draft-schierl-avt-rtp-multi-session-transmission-00>



4. Project liaisons & Social Networking

Though SEA is a rather small STREP project, the project consortium has managed to gain high visibility within the EC, the NEM platform and the industrial and academic worlds. This has been achieved via a targeted list of activities where SEA has played a key role. In more details:

4.1. Social Networking

The project has initiated a LinkedIn to enable project information exchange and chats. The SEA LinkedIn site is:

<http://www.linkedin.com/groups?gid=1736267>

4.2. Bilateral project liaisons

The SEA project has set up liaison activities with a number of projects. We may highlight some of them:

4.2.1. Adamantium

The key objective of ADAMANTIUM (Adaptive Management of media distribution based on satisfaction oriented User Modelling) is the implementation of PQoS-aware management mechanisms that enable for maximised user satisfaction during multimedia services access. This is also a key objective of SEA. Yet, SEA follows a lightweight approach based on distributed Adaptation Engines, while ADAMANTIUM is based on a more centralized IMS Multimedia Content Management System (MCMS).

SEA (Synelixis) has been discussing with Adamantium (Demokritos) in order to find common approaches for content optimization measurements. Moreover, SEA represented by Th.Zahariadis participated at the Adamantium Information Day, in Athens, Greece, on 19 September 2008 and discussed the approaches towards a Future Media Internet.

4.2.2. OPTIMIX

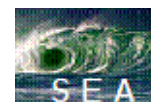
The main objective of OPTIMIX is to enable enhanced video streaming, based on cross layer adaptation of the whole transmission chain. OPTIMIX target goal is to increase the PQoS for the end user in a point to multi-point multimedia transmission context.

SEA (Synelixis) has been discussing with OPTIMIX (Thales Communications) in order to find common ways for content adaptation over wireless media/networks.

Moreover, a team from SEA (Theodore Zahariadis-Synelixis, Thomas Schierl-Fraunhofer HHI, Karsten Grüneberg-Fraunhofer HHI, Luca Celetto-STM) has co-authored with OPTIMIX project manager (Catherine Lamy-Bergot-Thales Communications) a paper on "Content Adaptation Issues in the Future Internet," submitted to the EC Future Internet Assembly book.

4.2.3. P2PNext

The main objective of P2PNext is to work on the P2P scenarios, trying to identify the limitation of current software systems. The project has started from the BitTorrent software and aims to extend it in order to support decoding of video stream before the whole chunk has been received. Moreover, porting on a STB is underway. As the P2P software system has increased processing power requirements, a new version of the STB will be available before the end of the year.



SEA (Synelixis, STM) has been discussing with P2PNext (VTT) in order to find common ways of optimizing P2P streaming. SEA is following a new way, adapting the VidTorrent approach, but common testing or comparisons are considered.

Moreover, a team from SEA (Alexandro Sentinelli-STM, Luca Celetto-STM, Claudio Palazzi-UCLA, Giovanni Pau-UCLA, Theodore Zahariadis-Synelixis) has co-authored with P2PNext (Ahola Jari-VTT) a paper on "A Survey on P2P Overlay Streaming Clients", submitted to the EC Future Internet Assembly book.

4.2.4. ENTHRONE

The ENTHRONE project proposes an integrated MPEG-21-based management solution that covers the entire audio-visual service distribution chain, including protected content handling, distribution across networks and reception at user terminals. The main project goal is to provide a dynamic QoS based MPEG-21 cross-layer media adaptation in a policy based management for end-to-end heterogeneous delivery chain.

SEA (Synelixis, STM) has been discussing with ENTHRONE (Thomson, Demokritos, Labri, Thales) in order to find common approaches for cross-layer media adaptation and management of the heterogeneous network configurations. Also, the protected content handling solutions (SVC, MVC, IPMP, OMA) provided by the two projects were compared and checked for interoperability.

4.3. The FIRE initiative

The FIRE initiative aims to offer facilities for testing and evaluation by building a pan-European testbed, integrating a number of LAN, GRID and mobile testbeds (PanLab, One Lab, G-Lab) and interfacing PlanetLab.

SEA has even from the proposal phase foreseen a complete testing environment with:

- a) a real-time simulated, controlled lab testbed in Nomor, Germany,
- b) a world-wide P2P network via access to PlanetLab via UCLA and STM and
- c) a real mobile network via Vodafone, Greece.

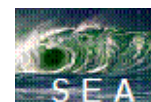
Yet, in order to evaluate the new opportunity of FIRE and liaison with FIRE infrastructure, it has submitted to FIRE a complete use case and has extensively explained the project testing requirements. So far, the technical manager of SEA, Theodore Zahariadis (Synelixis) and the technical manager of FIRE, Anastasius Gavra (Eurescom) have a very good co-operation and SEA was presented by FIRE in both ICT 2008, Lyon 2008 and FIA, Madrid 2008 as the model project, where FIRE may build his first real use-case.

4.4. Clusters and Task Force

SEA has actively participated in the Media Delivery Platforms Cluster and the Future Media and 3D Internet Task Force.

4.4.1. Medial Delivery Platforms Cluster

Since the fall 2007 concertation meeting, the SEA project has successfully led the Media Delivery Platforms (MDP) Cluster. The MDP cluster consists of 12 projects in Networked Media and has been active the last 2 years. The interaction with the MDP cluster and the Concertation meetings have given the opportunity to SEA, to exchange useful information and views with other Networked Media projects and formulate the issue of Content Aware Network.



Leaded by Theodore Zahariadis, who is the MDP cluster co-ordinator, MDP has produced a white paper entitled: "[Multimedia Delivery in the Future Internet A Converged Network Perspective](#)", which was published in October 2008 and presented in NEM Summit in St. Malo.

4.4.2. User Centric Media Cluster

SEA has also actively participated in the User Centric Media cluster. Federico Alvarez (UPM) has always followed the Concertation meeting (Fall 2007, Spring 2008, Fall 2008) and contributed actively in User Centric Media Cluster white papers.

4.4.3. FM3DI Task Force

SEA has actively contributed to the Future Media and 3D Internet Task Force. Th. Zahariadis has participated in the activities of the FM3DI task force in a meeting in Brussels, 5-6 June 2008. Moreover, Th. Zahariadis and F. Alvarez have actively contributed to the FM3DI white paper "Research on Future Media and 3D Internet"

4.5. Future Internet Assembly

SEA has been one of the first projects that have supported the **Future Internet Assembly (FIA) initiative**, formed and signed the **Future Internet Bled declaration**. Th. Zahariadis and F. Alvarez have participated in a number of preparation events in Brussels and a number of phone conferences, which have been organized by EC.

SEA had a dedicated poster stand in the FIA event in Bled, Slovenia. Moreover, **UPM has organized and sponsored the complete FIA event in Madrid, Spain in 9-10 December 2008.**

For his contribution to the FIA preparation, Th. Zahariadis was assigned by EC as the "Media Internet" breakout session caretaker in Bled, Slovenia on 31/3-2/4/2008. Moreover, Th. Zahariadis co-chaired the "Future Content Networks" breakout session in Madrid, Spain.

SEA made presentations in the following FIA events:

- 1) Th. Zahariadis, "SEA Project Poster", Bled, Slovenia, 31 March -2 April 2008
- 2) Th. Zahariadis, F. Alvarez, "Content Issues in the Future Internet," Brussels, 24 July 2008
- 3) F. Alvarez, "Preparation for the FIA event," Brussels, 15 September 2008
- 4) Th. Zahariadis, "Future Content Networks: Position Paper", Future Internet Assembly (FIA), Future Content Networks (FCN) Session, Madrid, 9 December 2008
- 5) Th. Zahariadis, "The SEA use case in the FIRE testbed," Future Internet Assembly (FIA), Future Content Networks (FCN) Session, Madrid, 9 December 2008
- 6) Th. Zahariadis, "Content Protection Issues," Future Internet Assembly (FIA), Identity and Trust Session, Madrid, 9 December 2008
- 7) Th. Zahariadis, "Seamless Content Delivery over the FIRE," Future Internet Assembly (FIA), FIRE Session, Madrid, 10 December 2008

SEA has also contributed to the **FIA Future Content Networks position paper**, having Th. Zahariadis (Synelixis) as the paper editor and F. Alvarez (UPM) and Guillermo Cisneros (UPM) among the main contributors.



SEA is also present in the preparation of the FIA event in Prague. Th. Zahariadis and F. Alvarez are member of the EC scientific committee, which is peer-reviewing the papers submitted for the FIA book. Moreover, Th. Zahariadis (Synelixis), Norbert Niebert (Ericsson) and Jean-Dominique Meunier (Thomson) have been assigned to author an **introductory chapter on Future Content Networks for the Prague book**. Finally, as detailed earlier, SEA has co-authored with other projects (OPTIMIX, P2PNext) two papers, which have been submitted for evaluation in the FIA scientific committee.



5. Conclusion

During the first year of the project's lifetime, the SEA project has started to spread its scientific results actively on different fields of publications, i.e., a number of articles have been submitted to journals and scientific conferences. Besides, liaisons have been established with other European research projects. Furthermore, it has made many contributions to different standardisation bodies.

A number of future activities is already planned, including a special session on “Media Streaming over Content Aware Networks” during IWSSIP 2009. SEA will also contribute to the Future Internet Assembly (FIA) initiative and participate actively in different clusters of the EC.



6. References

- [1] ISO/IEC 14496-15:2004 PDAM 3 (MVC File Format) to 14496-15 (2004) (AVC File Format)", MPEG Meeting - ISO/IEC JTC1/SC29/WG11, Busan, Korea, MPEG86/N10253, October 2008
- [2] SEA Deliverable D3.2 — MVC/SVC storage format, issued January 2009.