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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Executive Summary

IPTV provides telecommunication operators with the opportunity to better serve the video market and better address the industry transition to High Definition and Unicast video (e.g. Video on Demand), both creating challenges to the existing Cable TV and Satellite providers. One of the main challenges in IPTV is the limited bit rate of the access lines, which is predominantly ADSL.

OptiBand focused on optimising the used bandwidth of IPTV for the delivery of multiple HD streams over a single ADSL line, while preserving the Quality of Experience (QoE) for the end user. By doing so, OptiBand made possible viewing of multiple HD channels per household.

The OptiBand consortium gathered leading operator, vendors and research entities in order to consider the entire IPTV network, including economic aspects, of delivering premium video content over existing installed infrastructure. Overall, OptiBand is expected to have a wide market opportunity and hence carry a significant exploitation impact to its project partners, thanks to the huge penetration and massive deployment of DSL as the most popular access technology.

In order to make the OptiBand results widely available, a number of dissemination activities have been initiated throughout the project's duration, with the overall objective to target all levels of IPTV stakeholders and end users, all along the value chain represented by the OptiBand partners.

This document (deliverable D9.2.3) is the project's final dissemination report, and as such it provides a comprehensive summary of the project's accomplishments related to dissemination activities and scientific publications. It provides an overview of the dissemination activities carried out during the OptiBand project, and reports the consolidated results of the partners' combined communication and dissemination strategy for the diffusion of the project intermediate and final results.

A complementary deliverable, D9.3 Final Plan for the Use and Dissemination of Foreground, separately lists the partners' exploitation plans.

Through its project lifetime, the OptiBand consortium had generated a total of at least:

- ➔ **11 scientific publications, plus several more in process and under work**
- ➔ **9 scientific conference presentations**
- ➔ **1 trade article**
- ➔ **9 convention exposure and event participation opportunities**
- ➔ **Over 11 FP7 ICT and NEM Events**
- ➔ **5 FP7 ICT and NEM actions and meetings**
- ➔ **4 standardisation initiatives**
- ➔ **Multiple generations of the project's poster, leaflet and website**
- ➔ **54 deliverables**

Most OptiBand deliverables were public, and as such uploaded to the project's public website. Large parts of the OptiBand results and achievements had thereby been made available to the public in a straightforward manner through the website.

The OptiBand presentation, brochure and poster, used widely to extend the project's dissemination reach, are presented as well in this document.

1. Introduction

Dissemination activities carried out during the first year of the project were relatively limited, as expected during the project's early stages of research. As the project progressed into its second year and further on in the project's final period, the OptiBand consortium had progressively accumulated – as had originally been expected – and disseminated its increasingly noteworthy results and achievements suitable for diffusion to continually wider research, business and public audiences.

This document follows the activities performed along the project's pre-defined five objectives of the dissemination:

- to raise awareness about IPTV and related scientific topics, such as QoE,
- to promote the advances of the OptiBand project,
- to make contact with other researchers in the field,
- to promote business, and
- to extend cooperation among partners.

The document further describes the different tools and methods used for dissemination during the project:

- The core of the deliverable is a chapter about the publications and presentations, aimed at documenting the amount of dissemination performed and to demonstrate that it fulfils the expected milestones and the goals set out in the DoW and in the D9.2 Dissemination Plan.
- The OptiBand web site, presentation, brochure and poster are described, including in general where the latter were distributed; also a set of references to OptiBand from other web sites of the project partners is shown.

2. OptiBand Dissemination Activities

The dissemination and communication activities carried out during the project's lifetime included scientific publications, scientific conference presentations, trade articles, event exposure and participation opportunities, cluster activities and concertation meetings, standardisation initiatives, and published deliverables. The majority of the main dissemination activities are highlighted in the following sub-sections.

Table 2-1 Dissemination Activities, by Organisation Type

Organisation type	Typical dissemination activities
Industry and SMEs: TVN, CSL, OCL, OPTEC, IRD, AIL, INTEROUD	Given their commercial oriented nature, industries and SMEs present in the consortium have disseminated OptiBand's concept and objectives, raising awareness on the innovation achieved and research carried out. As the OptiBand technology blocks will be incorporated into product and solution offerings in the coming periods, and their respective viable service and financial benefits (client ROI and CAPEX/OPEX) will be calculated, articulated and presented to customers and business partners, the industry and SME exploitation business plans will be put into action..
Academia and research institutes: VTT, UDC, FTW, HHI	Typically, the activities of this group included (but not limited to) publication of scientific papers and presentation in technical conferences. Cooperation and dissemination with similar projects, leading to cross-pollination have proven to also be an excellent way to link with related projects and to share results in view of increasing contributions to the foreground.
Telecommunication operator: TiS	The telecommunication operator involved in OptiBand provided great visibility to the project. Thanks to their key involvement in the project's proof of concept, the potential for greater exposure of the project's results into the existing ecosystem had been maximised.

2.1 Publications

2.1.1 Scientific Papers

OptiBand partners have issued a fair amount of scientific publications related to the project's research results and scientific findings. Most of those have been prominently published; some are in the pipeline in wait for (presumably positive) publication acceptance.

The summary table listing the OptiBand scientific papers is provided in Deliverable D9.3 as **Table 2-1 A1: List of Scientific (Peer-Reviewed) Publications**.

This section supplements the table referred above with a detailed description and the download link on the [OptiBand public website](#) for each of the OptiBand scientific publications.

HHI has submitted a paper on Adaptive HTTP streaming (related to OptiBand's WP6) to the VCIP 2012 conference. The paper is in review status and it is a blind review, so more information about title, content, etc. is not possible until the decision on its acceptance is made.

Additionally, publications related to possible extensions to the HHI work in the OptiBand project are under consideration. In particular work related to SVC to AVC rewriting to make the video stream output of the PDD decodable for all STB types and work on techniques for increasing robustness against losses in IPTV systems. This work is being performed by HHI, and although publication commitment is not ensured until the outcome of the research is satisfactory, a couple of publications should be expected. Those publications will likely be finished past the end of the OptiBand project.

11. Extending IPTV environment with Internet TV services

Authors	D. Jarnikov, E. Westerveld
OptiBand Partner/s	IRD
Scientific Paper's Title	Extending IPTV environment with Internet TV services
Publication, Periodical or Series Name	TBD
Publisher	TBD
Brief Description	The paper describes the way to modify architecture of an IPTV system to accommodate Internet TV service delivered with adaptive streaming protocol.
Download Link	Will be on the OptiBand public website
Date of Publication	TBD
Identification	Not available yet

10. Investigating the Effects of Test Clip Quality Distribution in HD Video Quality-of-Experience Studies

Authors	Fröhlich, P., Ries, M., Masuch, K., Schatz, R.
OptiBand Partner/s	FTW
Scientific Paper's Title	Investigating the Effects of Test Clip Quality Distribution in HD Video Quality-of-Experience Studies
Publication, Periodical or Series Name	Proc. QoMEX 2012: International Workshop on Quality of Multimedia Experience
Publisher	IEEE
Brief Description	A common guideline for Quality of Experience (QoE) testing is to present the whole range of low and high quality test clips in order to avoid rating biases. We present a comparative empirical study in the context of HD IPTV services, in which one group of participants exclusively viewed high-quality video clips, and the other group additionally were confronted with low-quality clips. We only found a very weak effect of clip quality distribution on rating behaviour and thus cannot confirm the recommendation for including low-quality clips in HD video QoE evaluations.
Download Link	On the OptiBand public website
Date of Publication	2012
Identification	Not available yet

9. QoE in 10 seconds: are short video clip lengths sufficient for Quality of Experience assessment?

Authors	Fröhlich, P., Egger, S., Schatz, R., Mühlegger, M., Masuch, K., Gardlo, B.
OptiBand Partner/s	FTW
Scientific Paper's Title	QoE in 10 seconds: are short video clip lengths sufficient for Quality of Experience assessment?
Publication, Periodical or Series Name	Proc. QoMEX 2012: International Workshop on Quality of Multimedia Experience
Publisher	IEEE
Brief Description	Standard methodologies for subjective video quality testing are based on very short test clips of 10 seconds. But is this duration sufficient for Quality of Experience assessment? In this paper, we present the results of a comparative user study that tests whether quality perception and rating behaviour may be different if video clip durations are longer. We did not find strong overall MOS differences between clip durations, but the three longer clips (60, 120 and 240 seconds) were rated slightly more positively than the three shorter durations under comparison (10, 15 and 30 seconds). This difference was most apparent when high quality videos were presented. However, we did not find an interaction between content class and the duration effect itself. Furthermore, methodological implications of these results are discussed.
Download Link	On the OptiBand public website
Date of Publication	2012
Identification	Not available yet

8. Microworkers vs. Facebook: The Impact of Crowdsourcing Platform Choice on Experimental Results

Authors	Bruno Gardlo, Michal Ries, Tobias Hoßfeld, Raimund Schatz
OptiBand Partner/s	FTW
Scientific Paper's Title	Microworkers vs. Facebook: The Impact of Crowdsourcing Platform Choice on Experimental Results
Publication, Periodical or Series Name	Proc. QoMEX 2012: International Workshop on Quality of Multimedia Experience
Publisher	IEEE
Brief Description	Subjective laboratory tests represent a proven, reliable approach towards multimedia quality assessment. Nonetheless, in certain cases novel progressive quality of experience (QoE) assessment methods can lead to better results or enable test execution in more cost-effective ways. In this respect, crowdsourcing can be considered an emerging method enabling researchers to better explore end-user quality perception when requiring a large panel of subjects, particularly for Web application usage scenarios. However, the crowdsourcing platform chosen for recruiting participants can have an impact on the experimental results. In this paper, we examine the platform's influence on QoE results by comparing MOS scores of two otherwise identical subjective HD video quality experiments executed on one paid and one non-paid crowdsourcing platform.
Download Link	On the OptiBand public website
Date of Publication	2012
Identification	Not available yet

7. Impact of screening technique on crowdsourcing QoE assessments

Authors	Gardlo, B., Ries, M., Hoßfeld, T.
OptiBand Partner/s	FTW
Scientific Paper's Title	Impact of screening technique on crowdsourcing QoE assessments
Publication, Periodical or Series Name	IEEE Proceedings of Radioelektronika 2012
Publisher	IEEE
Brief Description	Evaluation of quality as perceived by the user in his natural environment is a difficult and strenuous task. Simulation of real world conditions in the laboratory is often inefficient and expensive. Recently, crowdsourcing as a novel methodology for testing Quality of Experience (QoE) at the end user side has been proposed. In this paper we discuss (a) the challenges of performing subjective assessments in the crowdsourcing domain and (b) highlight the importance of proper filtering of unreliable users from the overall results. In particular, we introduce various ways for detecting unreliable users and compare results from two similar QoE studies applying different screening techniques.
Download Link	On the OptiBand public website
Date of Publication	April 17, 2012
Identification	Print ISBN: 978-80-214-4468-3 INSPEC Accession Number: 12770537

6. DASH-based Approach for Delivery of Automatic Video Summaries

Authors	Janne Vehkaperä, Onni Ojutkangas, Mikko Myllyniemi, Seppo Tomperi
OptiBand Partner/s	VTT
Scientific Paper's Title	DASH-based Approach for Delivery of Automatic Video Summaries
Publication, Periodical or Series Name	The 19th International Conference on Systems, Signals and Image Processing, IWSSIP 2012
Publisher	IWSSIP
Brief Description	This paper proposes a novel lightweight approach for creation and delivery of video summaries utilizing recently developed DASH technology.
Download Link	On the OptiBand public website
Date of Publication	April 11-13, 2012
Identification	Print ISBN: 978-3-200-02588-2

5. Session-based Watermarking in Live IPTV Environment

Authors	Dmitri Jarnikov, Egbert Westerveld, Jeroen Doumen
OptiBand Partner/s	IRD
Scientific Paper's Title	Session-based Watermarking in Live IPTV Environment
Publication, Periodical or	IEEE ICCE 2012

Series Name	
Publisher	IEEE
Brief Description	Protecting content, distributed over IPTV networks, from being illegally redistributed by legal subscribers requires methods beyond traditional conditional access and digital rights management systems. Adding watermarking techniques allows one to trace the user, in case an infringement occurred. In this paper we describe a practical way to uniquely watermark content for each receiving device in a live IPTV environment. Special focus is given to finding a solution that fits into existing IPTV infrastructures.
Download Link	On the OptiBand public website
Date of Publication	13-16 Jan. 2012
Identification	On page(s): 650 ISSN: 2158-3994 Print ISBN: 978-1-4577-0230-3 INSPEC Accession Number: 12589395 Digital Object Identifier: 10.1109/ICCE.2012.6162014

4. QoE Evaluation of High-Definition IPTV Services

Authors	Ries, M., Fröhlich, P., Schatz, R.
OptiBand Partner/s	FTW
Scientific Paper's Title	QoE Evaluation of High-Definition IPTV Services
Publication, Periodical or Series Name	IEEE Proceedings of Radioelektronika 2011
Publisher	IEEE
Brief Description	Quality of Experience (QoE) in the context of high definition IPTV represents a purely subjective measure from the user's perspective of the overall value of the service provided. QoE cannot be taken simply as objective quality parameter of the service, but must also take into consideration every factor that contributes to overall user service perception. This paper introduces typical challenges and approaches for QoE testing of HD IPTV services. We provide an overview of influence factors, with a special focus on content types and characteristics, and we provide decision criteria for selecting subjective testing methods for IPTV research studies. We furthermore highlight related key results and learnings from the on-going European research project.
Download Link	On the OptiBand public website
Date of Publication	2011
Identification	Print ISBN: 978-1-61284-325-4 INSPEC Accession Number: 12086525 Digital Object Identifier: 10.1109/RADIOELEK.2011.5936485

3. User-centred Quality Assessment of HD IPTV Services

Authors	Fröhlich, P., Schatz, R.
OptiBand Partner/s	FTW
Scientific Paper's Title	User-centred Quality Assessment of HD IPTV Services:

	Results from the FP7 Project OptiBand
Publication, Periodical or Series Name	Proceedings of Joint ITG and Euro-NF EuroView 2011
Publisher	EuroView
Brief Description	This paper presents the QoE research approach developed for the OptiBand project. It comprises an introduction into the goals and challenges of the project, describes FTW's QoE research facilities, the developed measurement methodology, and highlights main results and conclusions from the first testing iteration.
Download Link	On the OptiBand public website and the EuroView website: http://www.euroview2011.com/fileadmin/content/euroview2011/poster/poster_froehlich.pdf
Date of Publication	2011
Identification	N/A

2. SOS: The MOS is not enough!

Authors	Tobias Hoßfeld, Raimund Schatz, Sebastian Egger
OptiBand Partner/s	FTW
Scientific Paper's Title	SOS: The MOS is not enough!
Publication, Periodical or Series Name	Proc. QoMEX 2011: International Workshop on Quality of Multimedia Experience
Publisher	IEEE
Brief Description	When it comes to analysis and interpretation of the results of subjective QoE studies, one often witnesses a lack of attention to the diversity in subjective user ratings. In extreme cases, solely Mean Opinion Scores (MOS) are reported, causing the loss of important information on the user rating diversity. In this paper, we emphasize the importance of considering the Standard deviation of Opinion Scores (SOS) and analyse important characteristics of this measure. As a result, we formulate the SOS hypothesis which postulates a square relationship between the MOS and the SOS. We demonstrate the validity and applicability of the SOS hypothesis for a wide range of studies. The main benefit of the SOS hypothesis is that it allows for a compact, yet still comprehensive statistical summary of subjective user tests. Furthermore, it supports checking the reliability of test result data sets as well as their comparability across different QoE studies.
Download Link	On the OptiBand public website
Date of Publication	2011
Identification	Print ISBN: 978-1-4577-1333-0 INSPEC Accession Number: 12345973 Digital Object Identifier: 10.1109/QoMEX.2011.6065690

1. A QoE Evaluation Methodology for HD Video Streaming using Social Networking

Authors	B. Gardlo, M. Ries, M. Rupp, R. Jarina
OptiBand Partner/s	FTW
Scientific Paper's Title	A QoE Evaluation Methodology for HD Video Streaming using Social

	Networking
Publication, Periodical or Series Name	IEEE Proceedings of International Symposium of Multimedia
Publisher	IEEE
Brief Description	The emerging migration of multimedia services into instantaneous growing social networking community became reality. The availability of high definition video services in social network environment introduces new options for evaluation of the perceived audio-visual quality. This paper proposes a novel methodology for subjective QoE evaluation within the Facebook.com application environment. Finally, this work evaluates the statistical significance of obtained assessment.
Download Link	On the OptiBand public website
Date of Publication	Dec. 2011
Identification	Print ISBN: 978-1-4577-2015-4 INSPEC Accession Number: 12460750 Digital Object Identifier: 10.1109/ISM.2011.43

2.1.2 Trade Articles

A Way For Telcos To Move Beyond Bandwidth for IPTV

Authors	Sharon Mantin
OptiBand Partner/s	CSL
Trade Article's Title	A Way For Telcos To Move Beyond Bandwidth for IPTV
Publication's Name	Connect-World
Brief Description	For the traditional Telcos who have been staring in the face of the major Capex/Opex associated with extending IPTV within a network dominated by a huge installed-base of DSL equipment, OptiBand may offer the path to profitability and to a significant revenue opportunity. OptiBand can offer not only an alternative approach for solving the IPTV challenge, but also the means to accomplish it at a high level, given that a multiplier of two to three concurrent HD channels per household is what the industry is expecting service providers to offer next.
Download Link	On the OptiBand public website ; On http://www.connect-world.com .
Date of Publication	August 2012
Comments	The issue will be widely distributed to the Connect-World reader base, as well as at shows where they are one of the main media partners such as: * IBC, Amsterdam, 6-11 September, 2012 * Carriers World, London, 25-27 September 2012 * Broadband World Forum, Amsterdam, 16-18 October 2012

2.2 Conferences and Events

2.2.1 Scientific Conference Presentations

2.2.1.1 QoMEX 2012, 2011

QoMEX 2012, 5-7 July 2012, Yarra Valley, Australia

Three publications were presented by FTW at the 2012 QoMEX workshop, resulting from work within the project OptiBand.

Participant / Presenter	Raimund Schatz, Sebastian Egger
Papers presented	• Fröhlich, P., Ries, M., Masuch, K., Schatz, R. (FTW) <i>Investigating the Effects of Test Clip Quality Distribution in HD Video Quality-of-Experience Studies</i> • Fröhlich, P., Egger, S., Schatz, R., Mühlegger, M., Masuch, K., Gardlo, B. (FTW) <i>QoE in 10 seconds: are short video clip lengths sufficient for Quality of Experience assessment?</i> • Bruno Gardlo, Michal Ries, Tobias Hoßfeld, Raimund Schatz (FTW) <i>Microworkers vs. Facebook: The Impact of Crowdsourcing Platform Choice on Experimental Results.</i>
Type and size of audience	100 participants
Countries addressed	Worldwide
Impact observed	Conference took place in July 2012; Impact will be reported in next report.
Connections made	Will be reported in next report.

QoMEX 2011, 7-9 September 2011, Mechelen, Belgium

One presentation, resulting from work within the project OptiBand, was given by FTW within the 2011 Third International Workshop on Quality of Multimedia Experience (QoMEX) meeting in Mechelen, Belgium, on 7-9 September 2011: “SOS: *The MOS is not enough!*”.

Participant / Presenter	Raimund Schatz
Paper presented	Tobias Hoßfeld, Raimund Schatz, Sebastian Egger: SOS: The MOS is not enough! QoMEX 2011: 131-136
Type and size of audience	Industry and academia, ~100-120 participants
Countries addressed	EU countries, USA, Japan
Impact observed	Informal conversations with researchers from industrial and research institutions worldwide
Connections made	At the presentation, 40 people from research and academic field participated. Contacts with Dialogic Research (USA), IRCCyN (Patrick Le Callet, FR), and Alinari (Andrea de Polo, IT) intensified.

2.2.1.2 Radioelektronika 2012, 2011**The 22nd International Conference Radioelektronika 2012, 17-18 April 2012, Brno, Czech Republic**

Participant / Presenter	B. Gardlo, M. Ries, and T. Hoßfeld, FTW
Paper presented	B. Gardlo, M. Ries, and T. Hoßfeld, "Impact of screening technique on crowdsourcing QoE assessments," Proc. Radioelektronika 2012
Presentation description	Crowdsourcing QoE assessments
Type and size of audience	Both industrial and academic representatives participated. The OptiBand project results were optimally presented.
Countries addressed	Germany, Poland, Hungary, Slovakia, Czech republic
Impact observed	100 research and academic professionals participated in the tutorial.
Connections made	Informal conversations with researchers from industrial and research institutions worldwide

The 21st International Conference Radioelektronika 2011, 19-20 April 2011, Brno, Czech Republic

Participant / Presenter	Michal Ries, FTW
Paper presented	Ries, M., Fröhlich, P., Schatz, R., "QoE Evaluation of High-Definition IPTV Services," Proc. Radioelektronika 2011
Presentation description	Tutorial on QoE of high definition IPTV services
Type and size of audience	At the tutorial both industrial and academic representatives participated. The OptiBand project results were presented.
Countries addressed	Germany, Poland, Hungary, Slovakia, Czech republic
Impact observed	~ 30 research and academic professionals participated in the tutorial.
Connections made	Informal conversations with researchers from industrial and research institutions worldwide

2.2.1.3 IWSSIP 2012**The 19th International Conference on Systems, Signals and Image Processing, IWSSIP 2012, Vienna, Austria, April 2012**

Participant / Presenter	Janne Vehkaperä, VTT
Paper presented	DASH-based Approach for Delivery of Automatic Video Summaries
Presentation description	Presentation of the proposed approach, with evaluation results.
Type and size of audience	Industry and academia
Countries addressed	EU, USA, China, Japan
Impact observed	Informal conversations with researchers from industrial and research institutions worldwide
Connections made	At the presentation, 20 people from research and academic field participated.

2.2.1.4 NOSSDAV 2011

NOSSDAV (Network and Operating System Support for Digital Audio and Video), 1-3 June 2011, Vancouver, Canada

Participant / Presenter	Javier Taibo, UDC
Paper presented	GPU-based Fast Motion Estimation for on-the-fly Encoding of Computer-Generated Video Streams
Presentation description	In the presentation, explicit mention to OptiBand project (and EU funding) was done as the project addressed problems that may appear in the scenario explored in the paper. OptiBand brochures (25) were delivered to the audience and informal conversation with some researchers about OptiBand approaches were hold
Type and size of audience	Mainly Scientific/Academia audience. About 50 people
Countries addressed	Worldwide
Impact observed	Some researchers commented with Javier Taibo about OptiBand; they will look for more information on project's webpage.
Connections made	Informal conversations with researchers worldwide
Comments	NOSSDAV 2011 is the 21st anniversary of SIGMM's (ACM special interest group on Multimedia) leading workshop on network and operating systems support for digital audio and video. Core A in conference rankings.

2.2.1.5 EuroView 2011

11th Würzburg Workshop on IP: Joint ITG and Euro-NF Workshop "Visions of Future Generation Networks" (EuroView 2011), 1-2 August 2011, Würzburg, Germany

Participant / Presenter	Raimund Schatz, FTW
Paper presented	User-centred Quality Assessment of HD IPTV Services - Results from the FP7 Project OptiBand
Presentation description	Poster describing the OptiBand project, selected results of the first QoE testing campaign and lab facilities used.
Type and size of audience	Academia and industry, approx. 150 participants
Countries addressed	Europe, USA
Impact observed	Strong interest in test results and methodology for HD-IPTV Quality testing
Connections made	University of Würzburg (Prof. Tran-Gia), Tlabs Berlin, NTT Docomo Eurolabs (Dr. Wolfgang Kellerer)

2.2.1.6 IEEE ISM 2011**IEEE International Symposium on Multimedia 2011, 5-7 December 2011, Dana Point, CA, USA**

Participant / Presenter	Michal Ries, FTW
Paper presented	Bruno Gardlo, Michal Ries, Markus Rupp and Roman Jarina, "On QoE Evaluation Methodology Using Social Networking for HD Video Streaming," in proc. of ISM 2011
Presentation description	Presentation of obtained results
Type and size of audience	Industry and academia.
Countries addressed	EU, USA, China, Japan
Impact observed	Informal conversations with researchers from industrial and research institutions worldwide
Connections made	At the presentation, 30 people from research and academic field participated.
Comments	ISM 2011 provided the opportunity to present ideas related to future project proposal and meet US and China research and industrial community working in field of multimedia.

2.2.1.7 COST 2011 TMA**COST TMA, 27 January 2011, Zagreb**

Three presentations were given at a special session organised by FTW within the COST TMA meeting in Zagreb, on 27 January 2011, resulting from work within the project OptiBand:

- Peter Fröhlich, Raimund Schatz, Michal Ries (FTW) *HD Video QoE assessment in the context of packet dropping*
- Raimund Schatz, (FTW) *Estimating the influence of user fatigue on QoE rating quality*
- Felipe Mata (UAM, having spent a short-time scientific mission within the COST TMA at FTW in summer 2010.) *Sliding-window based automated assessment of HD Video QoE*

Conference Link: <http://www.tma-portal.eu/cost-tma-action/meetings/zagreb/zagreb-meeting-program/#qoe>:

2.2.2 Trade Shows and Business Events

IRD has presented the OptiBand work (in a form of a poster and flyers) at International Broadcasting Convention (IBC) 2010, IBC 2011 and is committed to do so at IBC 2012. The IBC exhibition showcases the latest technology and foremost business ideas in broadcasting and media, and acts as a platform allowing stakeholders involved in the creation, management and delivery of video content to meet and exchange ideas, as well as to offer and to explore collaboration opportunities.

INTEROUD will conduct a commercial presentation to its main distribution channel about how to ensure the Quality of Experience (QoE) over xDSL IP networks when several clients with several set-top-boxes are connected to the platform service from the same household. As will be presented, in order to accomplish that, it will be explained how the OptiBand solution could be integrated with the INTEROUD solution. This information will also be available on the INTEROUD web site <http://www.interoud.com>.

OPTEC presented the OptiBand solution internally to its worldwide marketing staff. Plans for integration into the OPTEC products and solutions, within the framework of a set of adaptive streaming solutions for various customer communities, including Telco and Enterprise (for business, government or military applications), were further discussed internally. Adaptive streaming solutions are at present being deliberated with leading customers, initially to be provided based on an interim solution, and in the longer term based on OptiBand results integrated into OPTEC products.

TVN likewise presented the OptiBand solution internally to its marketing department. TVN demonstrated also its OTT encoders at numerous exhibitions during the first semester of 2012:

- Cabsat Dubai, CCBN Beijing, IPTV WF London, Convergence India in March
- NAB in April
- CDN WF London, Anga Köln, Broadcast Asia Singapore, Digital TV Prague in June

Moreover the TVN encoders have been tested during field trials worldwide in customer locations during the first semester of 2012. Some modules developed in the framework of the OptiBand project were implemented in these encoders for adaptive streaming solutions.

UDC are in conversations with Casacom Solutions AG (Switzerland) since September 2011, in order to start a project focused on development of media equipment for the digital home. UDC's experience in the OptiBand project has been a very good reference to the interlocutor, though the resulting technologies will need to be further developed in order to become directly applicable.

In April 2012, UDC has also initiated contact with a regional telecommunications operator to collaborate on embedded development for home media devices. UDC's expertise as endorsed by participation in OptiBand and similar projects has been of interest to them. It remains to be seen which OptiBand results end up to be applicable in this case.

In May 2012, UDC participated in a regional event, "Telecom Galicia", together with UDC's most recent technological spin-off, Syntheractive S.L. The OptiBand project had been presented to the attendees, in conjunction with a synthetic video generation system.

From the beginning of 2012, UDC has begun participation in the "Coruña Smart City" project, to bring innovation to various aspects of regular life in the city. As part of UDC's portfolio of experiences and capabilities, OptiBand has been presented.

From the beginning of 2012, UDC has been on local TV twice, in two different science and technology-related TV programs, where the activities of several research groups at UDC were presented. The OptiBand project was mentioned as an example of research which is applied to very specific, very real research assignments which are of particular interest to Industry.

2.2.2.1 2012 Adaptive Media Transport Workshop, Cisco

HHI participated in Cisco's June 2012 Adaptive Media Transport Workshop and presented its OptiBand work as part of HHI's research on resource allocation for mobile (LTE) video services.

Cisco Adaptive Media Transport Workshop, 14-15 June 2012, San Jose, California, USA

Participant / Presenter	HHI
Paper presented	Content-aware LTE Radio Resource Allocation for fair resource sharing
Presentation description	Similar to PDD, in mobile networks there are base stations (eNodeB), which have to allocate the resources to the users efficiently to give a good QoE to the users, thereby affecting the video quality that clients are receiving.
Type and size of audience	Various prominent industry players such as Cisco, Microsoft, etc.
Countries addressed	Worldwide
Impact observed	The base OptiBand solution for IPTV was introduced to the numerous industry players in addition to the presented work during the workshop.
Connections made	Conversations with industry professionals worldwide

2.2.2.2 INFOCOMM 2012

HHI presented the OptiBand solution in the "INFOCOMM 2012" Information Communication Marketplace (<http://www.infocommshow.org/>). Flyers of the project were distributed during the event and although a Demonstration was not possible, a presentation was prepared and given to inform the visitors about the main benefits of using the OptiBand solution for HD IPTV.

INFOCOMM 2012 Information Communication Marketplace, 13-15 June 2012, Las Vegas, Nevada, USA

Participant / Presenter	HHI
Paper presented	N/A
Presentation description	N/A
Type and size of audience	Professionals on audiovisual communications
Countries addressed	Worldwide
Impact observed	Flyers were available and the project was presented.
Connections made	Conversations with industry professionals worldwide
Comments	INFOCOMM-2012 provided an opportunity to meet professionals on audio-visual communications and explain them the OptiBand solutions.

2.2.2.3 IBC (International Broadcasting Convention) 2012, 2011, 2010

Several OptiBand partners, including CSL, IRD and OPTEC, are planning to participate at IBC 2012, and take the opportunity to present and to discuss with customers the OptiBand results and how they can be utilised.

Tentative: IBC 2012, 7-11 September 2012, Amsterdam, the Netherlands

Participant / Presenter	Tentatively: CSL, IRD, HHI, UDC and/or OPTEC
Paper presented	N/A
Presentation description	N/A
Type and size of audience	Broadcasting media professionals
Countries addressed	Worldwide
Impact observed	Project poster and flyers will be available.
Connections made	Conversations with industry professionals worldwide
Comments	IBC-2012 is expected to provide an opportunity to meet professionals working in the area of broadcasting services.

IBC 2011, 7-11 September 2011, Amsterdam, the Netherlands

CSL, IRD, HHI and OPTEC participated at NAB 2012, IBC 2011 and NAB 2011.

OPTEC's participation had been within the VITEC group booth. There were several discussions with customers and people from the industry about adaptive streaming solutions for various applications, where OptiBand results can be used.

Participant / Presenter	CSL, Dmitri Jarnikov – IRD, OPTEC, HHI
Paper presented	N/A
Presentation description	N/A
Type and size of audience	Broadcasting media professionals
Countries addressed	Worldwide
Impact observed	Hundreds of visitors visited the exhibition booth over the five day period. Project poster and flyers were available.
Connections made	Informal conversations with industry professionals worldwide
Comments	IBC 2011 provided an opportunity to meet professionals working in the field of broadcasting services.

IBC 2010, 9-13 September 2010, Amsterdam, the Netherlands

OptiBand's coordinator at the start of the project, Gal Mor, along with representatives from several OptiBand partners participated at IBC 2010, meeting potential customers and partners to promote the project's planned innovations.

Participant / Presenter	Gal Mor – CSL Sphend Mirta – HHI Dmitri Jarnikov – IRD Miguel Barreiro – UDC
Paper presented	N/A
Presentation description	N/A
Type and size of audience	Broadcasting media professionals

Countries addressed	Worldwide
Impact observed	Hundreds of visitors visited the exhibition booth over the five day period. Project poster and flyers were available.
Connections made	Informal conversations with industry professionals worldwide
Comments	IBC 2010 provided an opportunity to meet professionals working in field of broadcasting services.

2.2.2.4 NAB (National Association of Broadcasters) 2012, 2011, 2010

NAB 2012, April 2012, Las Vegas, Nevada, USA

CSL and OPTEC participated at NAB 2012.

OPTEC's participation had been within the VITEC group booth. There were several discussions with customers and people from the industry about adaptive streaming solutions for various applications, where OptiBand technology can be used.

Participant / Presenter	CSL, OPTEC
Paper presented	N/A
Presentation description	N/A
Type and size of audience	Broadcasting media professionals
Countries addressed	Worldwide
Impact observed	Project poster and flyers will be available.
Connections made	Conversations with industry professionals worldwide
Comments	NAB 2012 provided ample opportunity to meet non-European and European professionals working in broadcast services.

NAB 2011, April 2011, Las Vegas, Nevada, USA

CSL and OPTEC participated at NAB 2011.

Participant / Presenter	CSL, OPTEC
Paper presented	N/A
Presentation description	N/A
Type and size of audience	Broadcasting media professionals
Countries addressed	Worldwide
Impact observed	Hundreds of visitors visited the exhibition booth over the five day period. Project poster and flyers were available.
Connections made	Informal conversations with industry professionals worldwide
Comments	NAB 2011 provided an opportunity to meet professionals internationally developing and working with broadcasting technology

NAB 2010, April 2010, Las Vegas, Nevada, USA

CSL's Sharon Martin participated at NAB 2010 for 3 days advancing OptiBand technology ideas with prospective partners, operators and clients.

Participant / Presenter	Sharon Martin – CSL
Paper presented	N/A
Presentation description	N/A
Type and size of audience	Broadcasting media professionals
Countries addressed	Worldwide
Impact observed	Hundreds of visitors visited the exhibition booth over the five day period. Project poster and flyers were available.
Connections made	Informal conversations with industry professionals worldwide
Comments	NAB 2010 provided an opportunity to meet professionals developing technologies for video broadcast services worldwide.

2.2.2.5 GSMA 2011**Mobile World Congress - GSMA 2011, 14-17 February 2011, Barcelona, Spain**

HHI participated in this event and contributed to the dissemination of the OptiBand project by displaying the project poster and distributing project flyers.

Participant / Presenter	HHI
Paper presented	N/A
Presentation description	N/A
Type and size of audience	Professionals on Mobile Communications
Countries addressed	Worldwide
Impact observed	OptiBand's Poster was presented and Flyers were available.
Connections made	Conversations with industry professionals worldwide
Comments	GSMA provided the opportunity to meet professionals and big industry players related Mobile TV and IPTV and explain them the OptiBand solutions.

2.2.3 FP7 ICT and NEM Events

2.2.3.1 Future Internet Events

3rd European Summit on the Future Internet, Espoo, Finland, May-June 2012

Participant / Presenter	Janne Vehkaperä, VTT
Type and size of audience	200 participants from industry and academia.
Countries addressed	EU, USA, China, Japan
Impact observed	Informal conversations with researchers from industrial and research institutions worldwide
Connections made	Informal conversations with industrial partners related to Future Internet with special emphasis on future media solutions and applications.
Comments	The 3rd European Summit on the Future Internet focused on some of the most relevant topics to boost international collaboration. What is the future of Internet and its many applications? How to combine the interests of platform developers, apps and service providers and future customers? Which of the applications, such as cloud computing, future media, and e-commerce, the customers are most willing to adapt? Which applications will generate new business opportunities? How Internet can be utilised in solving grand challenges, like environmental change, health care and aging, and transportation?

Future Network & Mobile Summit 2011, 15-17 June 2011, Warsaw, Poland

Participant / Presenter	Michal Ries, FTW
Type and size of audience	Discussion related to dissemination of project results with industrial and academic participants. The project related information materials were distributed.
Countries addressed	Germany, Spain, Holland, Hungary, Slovakia, Poland, Czech republic, other
Impact observed	specific connections with potential of future collaborations were identified
Connections made	Informal conversations with researchers from industrial and research institutions worldwide
Comments	Future Network & Mobile Summit 2011 provided perfect opportunity to meet European research and industrial community working in field of telecommunication services.

Future Internet Assembly (FIA), 18-19 May 2011, Budapest, Hungary

Participant / Presenter	Michal Ries, FTW
Type and size of audience	Discussion related to dissemination of project results with industrial and academic participants. The project related information materials were distributed.

Countries addressed	Germany, Holland, Hungary, Slovakia, Czech republic, other
Impact observed	Several connections with potential of future collaborations were identified.
Connections made	Informal conversations with researchers from industrial and research institutions worldwide
Comments	FIA provided opportunity to present ideas related to future project proposal based on OptiBand project and meet European research and industrial community working in field of telecommunication services.

2.2.3.2 NEM Summits

NEM Summit 2011 - European Technology Platform on Networked and Electronic Media, 27-29 September 2011, Torino, Italy

The OptiBand project was one of several European projects selected for presenting its work and results at the NEM Summit of 2011. A booth was set up for OptiBand, where dissemination material was distributed and a demonstration of the SVC solution was given by HHI.

Participant / Presenter	HHI, TIS: Claudio Franco, Salvatore Lazzara, Petr Verbitskiy
Type and size of audience	Exhibition and Conference: 300 participants, 50 exhibitors. Discussion related to dissemination of project results with industrial and academic participants. The OptiBand project related information materials were distributed. HHI presented a demo of their SVC based IPTV solution, showing the impacts of encoding at progressively reduced bandwidth on video quality.
Countries addressed	Austria, Belgium, Finland, France, Germany, Italy, Netherlands, Spain, Turkey, UK, other
Impact observed	Specific connections with potential of future collaborations were identified
Connections made	Exchange of information with members of other EU projects. The OPTIBAND booth was also visited by the EU Project Officer for this project Informal conversations with researchers from industrial and research institutions worldwide
Comments	The NEM Summit 2011 provided an opportunity to meet European research and industrial community working in field of telecommunication services.

NEM Summit 2010 - European Technology Platform on Networked and Electronic Media, 13 October 2010, Barcelona, Spain

Participant / Presenter	VTT
Type and size of audience	The OptiBand project poster was made available in the summit.
Countries addressed	Austria, Belgium, Finland, France, Germany, Italy, Netherlands, Spain, Turkey, UK, other
Impact observed	Exchange of information with members of other EU projects. The OptiBand booth was also visited by the EU Project Officer for this project.

2.2.3.3 FP7 ICT Events**ICT 2011 proposers' day, 19-20 May 2011, Budapest, Hungary**

Participant / Presenter	Michal Ries, FTW
Type and size of audience	Discussion related to dissemination of project results with industrial and academic participants. The project related information materials were distributed.
Countries addressed	Germany, Finland, Sweden, Holland, Hungary, Slovakia, Czech republic, other
Impact observed	specific connections with potential of future collaborations were identified
Connections made	Informal conversations with researchers from industrial and research institutions worldwide
Comments	ICT 2011 proposers' day provided opportunity to present ideas related to future project proposal based on OptiBand project and meet European research and industrial community working in field of telecommunication services.

2.2.4 DG INFSO Cluster and Concertation Meetings**Cooperation with Related Cluster Projects, 2010 to 2012**

The first Concertation meeting following the start of the OptiBand project took place in Brussels in February 2010. During the meeting, which was attended by the project Coordinator Yossi Barsheshet, the OptiBand project joined the Future Network Media Cluster (FNM Cluster), together with the following projects:

- ADAMANTIUM
- NAPA-WINE
- INEM4U
- NOTUBE
- MYMEDIA
- ENVISION
- NextMEDIA
- FutureNEM
- MUSCADE
- Optimix
- P2P-Next.

FMN Cluster Activities, 2010 to 2012

As the Coordinator OCL has been the main participant to the cluster events throughout the project, replaced by AIL in case of inability to participate. In addition, AIL has continuously been following up on the Future Media Network cluster activities, and operating the liaison between the cluster chairman and the OptiBand partners. Relevant information, news and invitations to events have continually been transferred to the project partners, and their participation and collaboration with other cluster project always strongly encouraged.

Select activities:

Future Media Networks research challenges 2012

Future Media Networks research challenges 2011

Future Media Networks research challenges 2010

Networked Media - Current Research, Results and Future Trends (Paper) - August 2010.

Concertation Meeting, 13-14 December 2011

OCL/CSL participated on behalf of the consortium in the Concertation meeting held in Brussels, Belgium on 13-14 December 2011. Mr. Sharon Martin, vice president of marketing, and Yossi Barsheshet, the coordinator and vice president of R&D, participated in the event.

A presentation regarding the project itself and the intermediate results were presented at the cluster meeting (at the FMN meeting). The results caused some questions which were all answered satisfactorily and overall indications were very positive.

During the event there were some discussions with other projects representatives who were explained about the project and the real results that were achieved during the integrations. Such projects came from the gaming world and from multimedia through the internet.

Concertation Meeting, 14-15 April 2011

AIL participated on behalf of the consortium in the Concertation meeting held in Trento, Italy on 14-15 April 2011, since the project Coordinator was unable to travel to the meeting. A brief presentation was prepared by AIL in collaboration with the Coordinator and the other partners, and presented during the meeting. In addition flyers and contact details were distributed to the other participants.

AIL has continuously been following up on the Future Media Network cluster activities, and operating the liaison between the cluster chairman and the OptiBand partners.

Concertation Meeting, 3-4 February 2010

The project coordinator Yossi Barsheshet (OCL) participated on behalf of the consortium in the first concertation meeting during the project, held in Brussels, Belgium on 3-4 February 2010. During the meeting an overview of the OptiBand project was given to the other project representatives, in order to identify potential opportunities for collaboration. In addition, as mentioned above, OptiBand joined the FNM cluster at this meeting.

2.3 Standardisation

2.3.1 3GPP

The 3rd Generation Partnership Project (3GPP) is producing Technical Specification and Technical Reports for a 3G mobile system based on GSM networks: <http://en.wikipedia.org/wiki/3GPP> and <http://www.3gpp.org/>.

Two contributions in relation to the OptiBand project have been provided to the 3GPP "S4-110024" and "S4-110149" with the title "Rate adaptation with SVC MGS scalability" and presented during the 3GPP meeting in Berlin. These documents introduce also how several reasonable Operation Points (OP) within the same SVC encoded bit stream are defined and describe in detail the MGS based rate adaptation approach. These two contributions were approved by 3GPP partners and added into the technical report **TR 26.904 V1.0.2**. This technical report is the outcome of the study item IVCS "Improved Video Coding Support" within the SA4 subgroup in 3GPP under Release 10. The documents are available on the website <http://ftp.3gpp.org/Specs/html-info/TDocExMtq--S4-62--28867.htm>.

Table 2-2 3GPP Standards Activity

No	Type	Description	Date	Location	Impact observed	Partners involved
1	3GPP	3GPP SA4#62, TDoc S4- 110024 , "Rate adaptation with SVC MGS scalability", Fraunhofer Gesellschaft	10-14 Jan. 2011	3GPP meeting Berlin, Germany	Added to TR 26.904 V1.0.2	HHI
2	3GPP	3GPP SA4#62, TDoc S4- 110149 , "Rate adaptation with SVC MGS scalability", Fraunhofer Gesellschaft	10-14 Jan. 2011	3GPP meeting Berlin, Germany	Added to TR 26.904 V1.0.2	HHI

2.3.2 DVB

Table 2-3 DVB Standards Activity

No	Type	Description	Dates	Impact observed	Partners involved
1	DVB CM-IPTV	Promoting the principle of multistream-based bit-rate adaptation; Contributing to commercial requirements for Hybrid IPTV/Internet delivery.	Plenary meetings in 2011-2012, face-to-face meetings and teleconferences for DSM task force	Since the OptiBand solution represents a particular implementation of a bit-rate adaptation technique, whereas the DVB aims at producing standards that do not specify or mandate any specific implementation, the solution has no direct impact on the work item.	IRD
2	DVB TM-IPI	Extending the interface of the DVB-IPTV specification for Dynamic Stream Management (DSM) to enable more effective usage of the limited access network bandwidth. Contributing to the technical work on dynamic stream management for DVB-IPTV networks.			

3. OptiBand Dissemination Material

3.1 Poster

The OptiBand project poster offers a broad overview of the project's solution concept, expected impact and beneficiaries, and is intended to increase the visibility of the OptiBand project at the various events attended by project partners.

Figure 3-1 below shows a snapshot of the Project's poster in its current version:

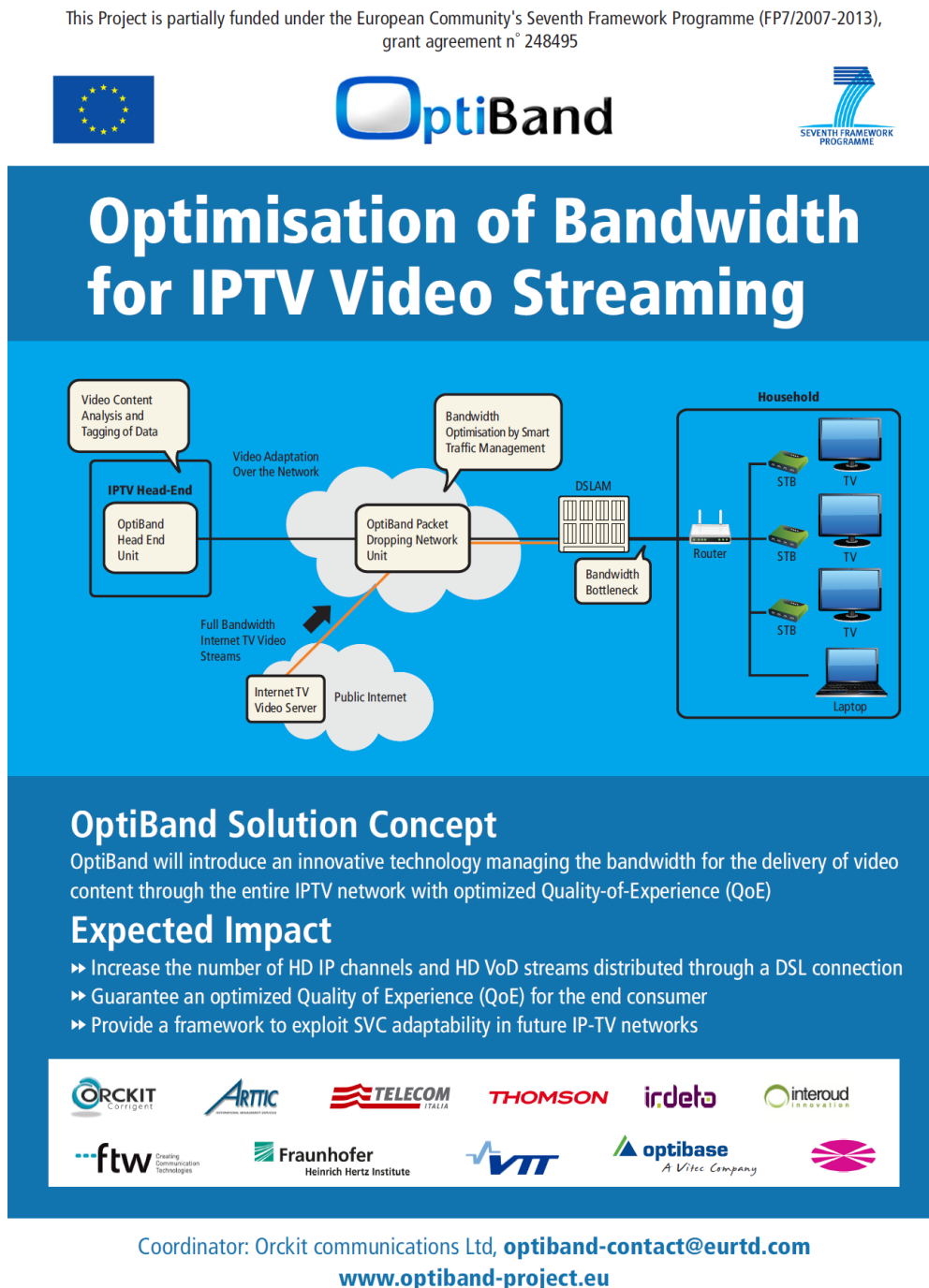


Figure 3-1: The OptiBand Poster

3.2 Leaflet

The main intention of the leaflet is to direct the recipients towards the OptiBand website, where more in-depth information can be found, and where the latest achievements and public deliverables of the project are available.

The figures below show the current version of the OptiBand leaflet. Note that the leaflet is a 3-fold flyer, which means that Figure 3-2 shows the front and the back page, while Figure 3-3 shows the internal page.

OptiBand Objectives

IPTV provides telecommunication operators with the opportunity to better serve the video market and better address the industry transition to High Definition and Unicast video (e.g. Video on Demand), both creating challenges to the existing Cable TV and Satellite providers. One of the main challenges in IPTV is the limited bit rate of the access lines, which is predominantly ADSL.

OptiBand will focus on reducing the bandwidth of IPTV for the delivery of multiple HD streams over a single ADSL line, while optimizing the Quality of Experience (QoE) for the end user. By that, viewing of multiple HD channels per household will be possible.

Project Coordinator

Orckit Communications Ltd (IL)

Email: optiband-contact@eurtd.com

OptiBand Consortium:

Telecom Italia S.p.A (IT)
Irdeto B.V. (NL)
FTW Forschungszentrum Telekommunikation
Wien GmbH (AU)
Fraunhofer HHI (DE)
VTT Technical Research Centre of Finland (FI)
Universidade da Coruña (ES)
Corrigent Systems Ltd (IL)
ARTTIC Israel International Management
Services 2009 LTD (IL)
Optibase Technologies Ltd (IL)
Thomson Video Networks (FR)
Interud Innovation SL (ES)

Website: www.optiband-project.eu

Starting date: 01/01/2010

Duration: 30 months

Total cost: € 4 539 492
EC contribution: € 3 038 395

Grant Agreement Number: 248495



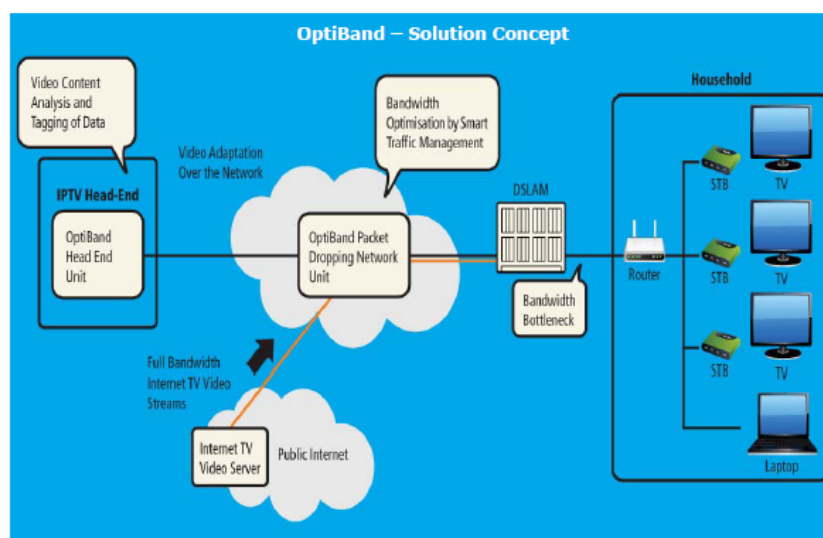
Optimization of Bandwidth for IPTV Video Streaming

OptiBand will introduce an innovative technology managing the bandwidth for the delivery of video content through the entire IPTV network with optimized Quality-of-Experience (QoE)



This Project is partially funded under the European Community's Seventh Framework Programme (FP7/2007-2013), Grant Agreement n° 248495

Figure 3-2: The OptiBand Leaflet – Front and Back



Currently, the ADSL access network creates a bandwidth bottleneck which does not allow for satisfactory perceived quality of personalized High Definition video content to the subscriber.

OptiBand will research and develop algorithms for data dropping which will be based on the research of user-perceived quality. These algorithms will be implemented in two units: The "OptiBand Head End Unit" and the "OptiBand Network Unit".

OptiBand Expected Impact:

Overall, OptiBand is expected to have a **wide market opportunity, thanks to the huge penetration and massive deployment of DSL** as the most popular access technology.

By lowering the cost of IPTV systems while still maintaining acceptable end-user Quality of Experience (QoE), **OptiBand will enable public institutions (e.g. schools) with budget constraints to use IPTV technology for educational purposes.**

This will make IPTV services much less expensive than today's video services, therefore demands for Video will increase and more content will be produced.

Besides, and although OptiBand focuses on IPTV application, it proposes a technology that can be used in the future as the platform for delivering high-consumption 3D media internet through bottlenecks networks.

The OptiBand solution is aimed to become a commercial technology, and by that **OptiBand will help strengthen the European industry in multimedia, enabling HDTV and IPTV to become a very common service in Europe and globally.** By taking the lead on this technology, the European industry will reinforce its leading position in delivery of multimedia content.

Figure 3-3: The OptiBand Leaflet – Internal Page

3.3 Website

The project web site is the most direct public communication channel, providing the most updated information about the project. The site has been set-up at www.optiband-project.eu.

Some part of the information that it contains is consolidated: it describes the project, its objectives and the consortium. The site contains also dynamic information about documentation and public project deliverables; it provides training material, publishes news about the project main events, and proposes contacts to the visitors with the project partners.



Figure 3-4: OptiBand's Website Homepage

3.3.1 Website Map

- Home
 - News & Events
 - Project at a glance
 - Welcome
- The OptiBand Project
 - Project objectives
 - Technical data
 - Project results
 - Project coordination
 - 7th framework programme
- Publications
 - Public deliverables

- Dissemination material
 - Scientific publications & Presentations
- Collaborations
 - Cluster activities
 - Related projects
 - Other collaborations
- Contact

3.3.2 Website Content

All project partners helped make sure that related information generated by their organisations and information regarding their dissemination efforts and publications was added to the website in a timely manner.

The OptiBand public website had been maintained by AIL, who was in charge of creating, administrating and updating the website content and changing its structure (additional pages) as required by the consortium, in line with the project dissemination activities.

Most OptiBand deliverables were public, and as such uploaded to the project's public website. Large parts of the OptiBand results and achievements had thereby been made available to the public in a straight-forward manner through the website.

4. Conclusion

This document provides a comprehensive description which illustrates the consortium's effort to fulfil the project's DoW as well as the subsequent PO's and reviewers' requests and comments at both project reviews. According to those highlights this document aims to report "what" we have disseminated (technical content of the dissemination), as well as the impact observed of the dissemination activities.

Following a fairly slow start the project dissemination has increased significantly year by year, maintaining track with respect to what was planned in the original DoW. Several comments and useful suggestions were received at the first project review, and these were taken into account by the partners who made considerable efforts during the second and third project year. Efforts both to increase the amount of activities and to ensure focus on the most relevant ones were made, resulting in a number of publications and presentations at key events.