



A Context-Adaptive Content Ecosystem Under Uncertainty

D6.1

Year 1 Project Dissemination Report

Dissemination level:	Public
Contractual date of delivery:	Month 12, December 2014
Actual date of delivery:	2015-01-19
Workpackage:	WP6 – Scientific Impact, Dissemination and Exploitation
Task:	T6.1 (Scientific Impact and Dissemination)
Type:	Report
Workpackage Leader:	AAU
Contact:	Hermann.Hellwagner@itec.aau.at
Authors:	[AAU] Benjamin Rainer, Christian Kreuzberger, and Hermann Hellwagner [UCL] Wei Koong Chai, George Pavlou [EPFL] Laura Toni, Pascal Frossard [UniS] George Kamel, Ning Wang
Approval Status:	Final – approved by all partners
Version:	1.0
Number of pages:	8
Filename:	CONCERT_Deliverable.D61_v1.pdf

Abstract:

This deliverable gives an overview of dissemination material produced and activities undertaken (exhaustive list of all the papers, presentations, publications and demonstrations published or performed) within the first year of the CONCERT project). It also documents the standardisation activities performed by the project partners.

History:

Version	Date	Reason	Revised by
0.1	03-12-2014	Initial texts	Benjamin Rainer
0.2	15-12-2014	Input from partners	all partners
0.3	09-01-2015	Minor updates	Benjamin Rainer
0.9	19-01-2015	Minor corrections, layout changes	B. Rainer & C. Kreuzberger
1.0	19-01-2015	Final Version	all partners

January 2015

Contents

1	Introduction	4
2	Publications, Press, and Standardisation	5
2.1	Scientific Publications	5
2.2	Press Releases	6
2.3	Standardisation	6
2.4	CONCERT Website	6
3	Events	7
3.1	Organized Events	7
3.2	Attended Events	7
4	References	8

1 Introduction

This deliverable documents the dissemination activities of CONCERT. During the first year, the CONCERT project and project partners published five peer-reviewed publications in top-tier conference proceeding or journals. In addition, one press-release was published for use by the popular press. Furthermore, the project partners are eager to contribute to the standardisation in the field of Information Centric Networking (ICN). The Internet Engineering Task Force (IETF) and the Internet Research Task Force (IRTF) are taking the first steps towards protocol standardisation in ICN; they have published a first research draft on ICN to which the project partners contributed with their expertise. Detailed information on the publications and standardisation efforts are provided in the following chapters.

2 Publications, Press, and Standardisation

2.1 Scientific Publications

The following publications (conferences, journals) related to the CONCERT project were produced and published by the project consortium:

- P.1** Daniel Posch, Christian Kreuzberger, Benjamin Rainer, Hermann Hellwagner, “Using In-Network Adaptation to Tackle Inefficiencies Caused by DASH in Information-Centric Networks,” in *Proceedings of the 10th International Conference on Emerging Networking Experiments and Technologies, VideoNext Workshop*, Sydney, Australia, December 2014.
- P.2** Daniel Posch, Christian Kreuzberger, Benjamin Rainer, Hermann Hellwagner, “Client Starvation: A Shortcoming of Client-driven Adaptive Streaming in Named Data Networking,” in *Proceedings of the 1st ACM Conference on Information-Centric Networking*, Paris, France, September 2014.
- P.3** Xu Zhang, Ning Wang, Vassilios G. Vassilakis, and Michael P. Howarth, “Decision-Making for In-Network Caching of Peer-to-Peer Content Chunks - An Analytical Modelling Study,” in *Proceedings of the 5th International Conference on Network of the Future (NoF 2014)*, Paris, France, December 2014.
- P.4** L. Toni, R. Aparicio-Pardo, K. Pires, G. Simon and A. Blanc et al., “Optimal Selection of Adaptive Streaming Representations”, accepted for publication in *ACM Transactions on Multimedia Computing, Communications and Applications*, 2014.
- P.5** Christian Kreuzberger, Daniel Posch, Hermann Hellwagner, “A Scalable Video Coding Dataset and Toolchain for Dynamic Adaptive Streaming over HTTP,” accepted for publication in *Proceedings of the 6th ACM Multimedia Systems Conference (MMSyS’15)*, Portland (OR), 2015.

Papers **P.1** and **P.2** mainly deal with the problem of overcoming the problems of Dynamic Adaptive Streaming over HTTP [4] in ICN with a focus on in-network adaptation of the multimedia content. The goal of the published research is to decrease the stalling times of the multimedia playback of users that request multimedia content according to a given content popularity. We have shown that our approach that uses in-network adaptation can significantly decrease the stalling times for unpopular content.

Paper **P.3** looks at P2P-based content traffic load and improving content distribution performance using holistic decision-making logic that takes into account context information on the P2P characteristics such as chunk availability and popularity. The paper analyses the benefit of coordination between neighbouring content routers when making caching decisions in order to avoid duplicated nearby P2P chunk caching. We have shown that the proposed strategised caching policy can achieve desirable caching performance and, at the same time, significantly reduce traffic and cache redundancy, and in turn alleviate the access load from source peers.

Paper **P.4** deals with the optimization of coding parameters for Dynamic Adaptive Streaming over HTTP (DASH) systems. The work proposes solutions to improve user satisfaction by optimizing the encoding rates of the video sequences to be stored at the server side. The proposed solution shows that video content information as well as network constraints and users’ statistics play a crucial role in selecting proper encoding parameters to provide fairness among users and to reduce network resource usage.

Paper **P.5** provides a Scalable Video Coding (SVC) dataset and toolchain for Dynamic Adaptive Streaming over HTTP (DASH). The dataset covers a gap in video coding datasets, and enables researchers to carry out experimentation on SVC and DASH. Furthermore, it will facilitate further research on in-network adaptation within the CONCERT project.

2.2 Press Releases

The award of the CONCERT project via the CHIST-ERA 2012 call under the Context- and Content-Adaptive Communication Networks (C3N) topic has been published at the UCL website as a news item [3].

2.3 Standardisation

AAU actively contributed to the ICNRG Draft *Adaptive Video Streaming over ICN* [2], which is under active leadership of Huawei. This IRTF draft deals with the challenge of enabling adaptive multimedia streaming in ICN. AAU provides extensive research about the integration of DASH in the ICN context by highlighting similarities in these concepts. Emerging difficulties of introducing DASH in ICN, which have their origin in pure client-driven adaptation and ICN's inherent caching, are discussed. Finally, AAU also contributed to the topic of digital rights management in multimedia streaming use cases by investigating the potentials of Broadcast Encryption in the ICN world.

2.4 CONCERT Website

The CONCERT project website was created and is online since February 2014. It is employed as the gateway to promote the CONCERT project and its output and results. The website contains information regarding the project consortium, overview of the project and acknowledgement to all the funding bodies providing the funds under CHIST-ERA. It is also constantly being updated with an up-to-date list of publications and deliverables produced by the project consortium [1].

3 Events

In the first year of the CONCERT project, the consortium was eager to organise and attend events, especially, events that match the project's domain and goals. A workshop proposal has been submitted and got accepted at the ICME 2015 conference. Furthermore, the consortium mainly attended top-tier international events directly related to the research conducted during the first year of the project.

3.1 Organized Events

The project consortium submitted a workshop proposal to the International Conference on Multimedia and Expo (ICME) 2015 in Torino, Italy. The workshop entitled **Multimedia Streaming in Information-Centric Networks** (MuSIC) is to provide researchers in the field of Information Centric Networks (ICN) a platform for presenting novel research with a focus on improving and enabling efficient multimedia streaming in ICN and to strengthen the communication and interaction between ICN and multimedia systems researchers. The workshop got **accepted**, as one of 13 workshops out of 22 workshop submissions at ICME 2015.

3.2 Attended Events

On 4-5 March 2014, Wei Koong Chai of UCL attended the CHIST-ERA event in Istanbul during which he represented the CONCERT consortium and presented an overview of the project. Possibilities of cross-project collaborations with projects (DISEDAN and MOCACO) funded under the same topic (i.e., C3N) have been discussed whereby all agreed that such initiatives can benefit the projects and are possible at a later stage in the projects.

On 24-27 September 2014, Christian Kreuzberger and Daniel Posch of AAU attended the 1st ACM Conference on Information-Centric Networking (ICN-2014) in Paris, during which they presented a paper (cf. Section 2 **P.1**) in the context of Multimedia and ICN. While many interesting papers in the ICN context were presented, almost nobody recognized multimedia as a service of the network. Co-located to the conference was the IRTF *ICN Research Group* (ICNRG) meeting, during which multimedia topics were discussed to some extent, but not in detail. The conference and the research group meeting made clear that there is a huge gap between the ICN and multimedia communities. The ICN community looks at multimedia just as files that will benefit from ICN's characteristics such as inherent caching.

On 2nd Decemeber 2014, Benjamin Rainer of AAU attended the 1st International Workshop VideoNext in Sydney, Australia. He presented a paper (cf. Section 2 **P.2**) in the context of Multimedia and ICN. The VideoNext workshop focuses in general on how to provide efficient multimedia streaming in the Future Internet. The workshop had a very interesting keynote held by Vinod Chandramouli from Akamai Technologies with the title *Why the Internet Future Scares Me and How Scalability is the Only Survivor*.

4 References

- [1] CONCERT Website. <http://www.concert-project.org>.
- [2] IRTF/ICNRG Draft - Adaptive Video Streaming over ICN. <https://tools.ietf.org/html/draft-irtf-icnrg-videostreaming-00>.
- [3] Press Release UCL. <http://www.ee.ucl.ac.uk/research/new-epsrc-fet-project-on-context-adaptive-content-networking>.
- [4] I. Sodagar. The MPEG-DASH Standard for Multimedia Streaming Over the Internet. *IEEE MultiMedia*, 18(4):62–67, 2011.