

CNSM Welcome Messages

Dear Participants of the 9th CNSM 2013!

Over the past eight years the CNSM history took off with the 1st International Week on Management of Networks and Services (MANWEEK 2005), which had been composed out of a set of technically related and previously run separate workshops and conferences, especially IEEE/IFIP DSOM, IEEE/IFIP MMSN, and IEEE IPOM. While MANWEEK took place as a joint week with those workshops as separate tracks in 2005 in Barcelona, Spain, 2006 in Dublin, Ireland, 2007 in San Jose, U.S.A., 2008 in Samos Island, Greece, and 2009 in Venice, Italy, the first and fully integrated program of the 6th Conference on Network and Service Management (CNSM 2010) was hosted in Niagara Falls, Canada, followed by Paris, France in 2011, by Las Vegas, U.S.A. in 2012, and now in the 9th CNSM instance in Zürich, Switzerland. Thus, it is my pleasure to welcome you in my position as the CNSM 2013 General Chair and Local Arrangements Chair—and on behalf of the entire CNSM Organizing Committee and Local Arrangements Team—to the 9th CNSM!

Since you are already holding this program in your hands, you have arrived by now safely to the beautiful location of Zürich, either by plane, train, or even car. Therefore, please find this program now at your hands as a guideline to your technical session planning for CNSM 2013 and its collocated workshops (ICQT 2013, SVM 2013, and SETM 2013), the conference venue, information on the social event and its excursions, conferences services, and last but not least on lots of activities in and around Zürich.

As you will have noted, the public transport toward the Swissôtel in Zürich-Oerlikon is most likely the very shortest one you may have ever seen for any conference you may participate in! The 8 minutes travel by train or S-Bahn (so called fast, short distance trains in Switzerland) from the train station of the Zürich Unique Airport (ZRH) to the Oerlikon Bahnhof (station) and only an additional 60 m footpath from there to the hotel's entrance is not only a great coincidence, it is Zürich's dedication to offer a frequent, timely, and efficient public transport, running besides trains, S-Bahn, and tram lines also buses and boats on the same ticket! And you will learn during CNSM 2013 that this public transport is also working for CNSM's social program, supported by CNSM's provision of sponsored local transport tickets, separate ones for workshops and the main CNSM conference. Besides for its use within CNSM 2013 check out these tickets' wide travel options within Zürich's travel zone 110; main details are available on the route map provided in your participants' welcome package. And for sure, do not hesitate to talk to the Zürich local arrangements team and the CNSM 2013 reception desk for more detailed inquiries.

During CNSM 2013 and its collocated workshops you can enjoy as a registered participant (please wear always your badge for room access) welcome and key note sessions, technical sessions, poster sessions, a round table and a panel, a modern hotel of up-to-date conference facilities, complimentary WLAN access, and a perfect setting for work, coffee breaks, and joint lunches. Note that meeting attendees may see a slightly different setting.

Last but not least it is my pleasure to address many thanks to the sponsors of CNSM and its collocated workshops ICQT 2013, SVM 2013, and SETM 2013, especially the Communication Systems Group CSG of the University of Zürich UZH, DMTF, Orange, MAKI, IBM, Intracom Telecom, the Canton of Zürich, and the City of Zürich, who help to make your experience of CNSM 2013 a unique one! Also, CNSM 2013 is pleased to acknowledge the support by IFIP, the technical co-sponsoring by the IEEE Computer Society, the in-cooperation with ACM SIGCOMM, and the University of Zürich UZH.

Thus again, the entire Zürich local arrangements team wishes you a very warm welcome, a highly successful conference and workshops, productive meetings, new contacts and ideas, and some great days out in and around the city of Zürich!

CNSM General Chair

Burkhard Stiller, University of Zürich, Switzerland

Dear Attendees!

The International Conference on Network and Service Management (CNSM) is a premier venue for the presentation of innovative results and experience reports in all aspects of management of networks, pervasive systems, enterprise and cloud computing environments. CNSM 2013 which takes place in Zurich, Switzerland is organized in a single track, highly-selective conference format attended by foremost experts in this area from academia, industry, and government. In addition to the main conference, the program also includes workshops for focused discussions.

CNSM continues to be a very selective conference. The Technical Program Committee was tasked with selecting the top papers submitted to the CNSM review process. Out of the 116 submissions, 21 papers were selected as "Full Papers" to be included in the main conference track, and a further 23 were included as "Short Papers", to be presented in the poster session. All papers went through a rigorous review process where each paper was assigned at least 3 reviewers from the network and service management community.

The program is composed out of seven technical sessions, one poster session, and three keynotes, addressing challenging topics in cloud computing, information-centric networking, and measurements in large scale. The proceedings of CNSM 2013 are published by IFIP and will be available through IEEE Xplore.

Preparing a top quality program was hard work which without the help of many would not have been possible. First of all, we want to thank the authors of submitted papers. Next, we would like to thank our Technical Program Committee members, delegated reviewers, and the Munich Network Management Team for their hard work during the reviewing process.

We are sure you will enjoy the program and are looking forward to seeing you in Zurich, Switzerland!

CNSM TPC Co-chairs

Gabi Dreo Rodosek, Universität der Bundeswehr München, Germany

Metin Feridun, IBM Research – Zürich, Switzerland

ICQT Welcome Message

Dear Participants of the 8th ICQT 2013!

With the appearance of new technologies and new services, the nature of the economic stakes in the ICT (Information and Communication Technologies) sector is continually evolving. An illustration is the increasing number of providers who base their business models not purely on bandwidth selling but on publicity as well. Following the same tendency, the power relationships have radically changed in the last decade, between the providers offering connectivity, and those managing services and user identities (content providers, cloud computing providers, social networks). While future business models and regulatory frameworks are still under discussion, the design of efficient charging methods for the variety of upcoming network technologies, including fixed networks, wireless access networks, and mobile user support, has become of paramount importance for realizing the economic potential of future convergent architectures and services. The resulting combination of technical and economic perspectives drives many relevant research topics for application developers, business architects, network and service providers, and customers.

Therefore, the 8th International Workshop on Internet Charging and QoS Technologies (ICQT 2013) is devoted to discuss most recent approaches, models, and mechanisms in a highly important research area of network economics. The present proceedings include papers presented at ICQT 2013—collocated this year with the 8th International Conference on Network and Service Management—taking place on October 14th, 2013 in Zurich, Switzerland, and hosted by University of Zürich.

The identification of novel service charging solutions, the investigation and evaluation of their technical feasibility, and the consolidation of technical and economic mechanisms for enabling a fast, guaranteed, and efficient charging of services is of fundamental importance for the future evolution of the Internet and the telecommunications business. In particular, the economics of inter-domain services and charging strategies for content delivery and Internet access are of utmost urgency. All contributions included in this volume fit perfectly into the general scope of the international ICQT workshop series.

This year's ICQT followed the already established tradition of a vivid workshop series on charging and QoS technology issues, which started back in 2001 with the first ICQT workshop in the framework of the Annual Meeting of the German Society for Computer Science (GI) and the Austrian Computer Society 2001 in Vienna, Austria. In 2002, ICQT was colocated with the QofIS 2002 workshop in Zurich, Switzerland, in 2003 with the NGC 2003 workshop in Munich, Germany, and in 2004 again with QofIS 2004 in Barcelona, Spain. In 2006, ICQT was hosted by the University Institute of Technology (IUT), St. Malo, France together with ACM SIGMETRICS 2006, and in 2009 by the Rheinisch-Westfälische Technische Hochschule (RWTH) in Aachen, Germany, together with the IFIP Networking conference. In 2011, ICQT was hosted by Paris Descartes University, Paris, France, together with CNSM 2011.

As in the past, ICQT 2013 brought together researchers from the areas of technology and economics in both industry and academia to discuss key advances in these fields. The combination of micro-economic models, auctions, game theory (cooperative and non-cooperative), peer-provided services, QoE influenced charging strategies and content selection, content charging strategies addressed important aspects at the intersection of networking research and business modeling. Thus, ICQT 2013 provided a truly interdisciplinary forum for analysing topics at the overlap of those areas.

Like all of its predecessors, ICQT 2013 consisted of a single-track one-day event, which has proved to be especially suitable for stimulating the interaction among and the active participation of the workshop audience. In summary, the workshop started with a keynote presentation delivered by Claude de Jacquilot, who is internationally recognized as a distinguished research fellow in the area. Claude de Jacquilot was the former head of the ICT sector at PIDA and now working as an individual expert for the world bank. His talk provides a political view on investments in the telecommunications sector with a focus on African countries. The following two technical sessions, namely Inter-domain Quality of Service and Charging Strategies for Content Delivery session and Internet Access session, include a total of six full papers, which were selected after a thorough review process. The accepted papers represent a right mix of the latest results from both academy, research institutions, and industry.

Furthermore, the editors would like to express their thanks to Peter Reichl for helping in hosting the ICQT 2013 website, and to Christos Tsirias, the CNSM 2013 webmaster for his excellent work. Special thanks go to the organizers, in particular Burkhard Stiller as general chair, of the CNSM 2013 conference for enabling the colocation of ICQT 2013 with their renowned event, as well as to the local organizers for smooth cooperation and efficient support. Finally, all the editors would like to address their thanks to IEEE Explore for a very smooth cooperation on finalizing these proceedings.

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ICQT General Co-chairs

Peter Reichl, University of Vienna, Austria

Bruno Tuffin, INRIA Rennes, France

ICQT TPC Co-chairs

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SETM Preface

In the current Internet, important new overlay and cloud applications significantly influence volume and patterns of Internet traffic. While overlay applications such as Content Delivery and P2P store and circulate information among each other with no awareness of the topology and state of the underlying transport network infrastructure, cloud applications delegate storage and computation to the network, which is valuable for devices with limited resources and access. These overlay applications demand a coherent and integrated control in the underlying heterogeneous networks in a scalable, resilient, and energy-efficient manner. A tighter integration of network management and overlay service functionality can lead to cross-layer optimization of operations and management, thus, being a promising approach to offer a large business potential in operational perspectives for all players involved.

In parallel, Online Social Networks (OSNs) have become today's most popular Internet application. The widespread adoption of OSNs has drastically changed the way content is consumed in the Internet, as content consumption is nowadays highly impacted by the information shared by users through OSNs and the popularity of a given content is most often dictated by its "social" success.

With such a "social-content revolution", operators need to evolve and optimize their network to avoid being overwhelmed by the ever growing traffic volumes resulting from this paradigm change. In turn, the adoption of socially-aware traffic management mechanisms as a new management approach allows for a tighter integration of network management and overlay service functionality which can lead to cross-layer optimization of operations and management, thus, being a promising approach to offer a large business potential.

The CNSM Workshop on Social-aware Economic Traffic Management for Overlay and Cloud Applications "SETM 2013" aims to bridge this gap, by addressing social-aware and incentive-compatible network management mechanisms in support of overlay and cloud applications in an integrated and thus efficient manner. SETM 2013, which is organized in conjunction with this year's CNSM 2013 conference, is a continuation of three successful workshops entitled "Workshop on Economic Traffic Management (ETM)". The last event organized in 2010 was collocated with ITC22. The workshop title has been changed to better reflect the scope of the workshop that basing on economic perspectives in network management extends its scope towards social awareness, cloud computing, content awareness and CDNs. That way the workshop is following current trends in that area.

Following these intentions, SETM 2013 provides a single-track and one-day program, including keynotes, three technical sessions, and a poster session. The keynotes are given by Bruce Maggs (Professor, Department of Computer Science, Duke University and Vice President, Research Akamai Technologies, USA) and Volker Hilt (Head of Networked Services Research, Alcatel-Lucent Bell Labs, Germany). The SETM 2013 workshop is financially sponsored by Orange and Intracom Telecom. Overall, a total of 15 papers were registered. Out of those, 14 papers were finally submitted and one paper was withdrawn. Before the papers entered the review process, the TPC chairs fast-rejected four papers, including plagiarized papers and papers which were completely out of scope.

Each of the remaining 10 papers received in total 3-4 reviews. Based on the thorough reviews, seven papers were finally selected for the workshop program, with two papers being accepted as full papers and 5 papers being accepted as short papers, which are presented during SETM 2013. Additionally, the poster session that is organized jointly with the SVM workshop includes seven invited posters from SETM.

With respect to the technical sessions, one focus lies on video services in the Internet responsible for the majority of Internet traffic, as discussed in Session 1. The proposed approaches for improving video delivery ranges from concrete algorithmic solutions (*Multi-source Cooperative Adaptation for QoE-aware Video Multicast Rate control*) to social-aware concepts for recommendation system and content distribution networks (*Determining leaders and clusters in video consumption*), while also economic aspects and business interests are analyzed (*Video Delivery over Next Generation Cellular Networks*). Network traffic management solutions are considered in Session 2 with a focus on the federation of clouds and available bandwidth provisioning systems for offering reliable network transfer services to the cloud systems (Networking solutions in the federation of clouds) and the problem of cost-optimal distribution of inevitable inter-domain traffic on multiple links dynamic solutions (*Dynamic Traffic Management mechanism for active optimization of ISP costs*). Session 3 considers user involved approaches to realize a socially-aware traffic management solution which targets three popular use cases: data offloading to WiFi, content caching/prefetching, and content delivery (*HORST - Home Router Sharing based on Trust*) but also to optimize energy and upload bandwidth of smartphones by proper incentive and collaboration schemes (*Reciprocity with Virtual Nodes: Supporting Mobile Peers in Peer-to-Peer Content Distribution*).

The SETM 2013 workshop would not be a success without the excellent work that has been performed by the members of the technical program committee as well as those reviewers who have spent a considerable amount of their time providing highly qualified reviews.

As organizers of the workshop we thank all members of the Technical Program Committee and all reviewers. We express our sincere appreciation to the organizers of CNSM 2013, in Zurich, in particular Burkhard Stiller and his team at the University of Zurich, and the CNSM 2013 workshop chair Rui L. Aguiar, Universidade de Aveiro, Portugal. Furthermore, we thank Peter Hillmann and Dennis Kergl, Universität der Bundeswehr München, Germany as well as Christos Tsiaras and Andri Lareida, University of Zurich, Switzerland for their technical support.

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