Lecture Notes in Computer Science 6236

Commenced Publication in 1973
Founding and Former Series Editors:
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Incentives, Overlays, and Economic Traffic Control

Third International Workshop, ETM 2010
Amsterdam, The Netherlands, September 6, 2010
Proceedings

Springer

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Library of Congress Control Number: 2010933119

CR Subject Classification (1998): C.2, H.4, D.2, H.3, D.4, C.2.4

LNCS Sublibrary: SL 5 – Computer Communication Networks and Telecommunications

ISSN	0302-9743
ISBN-10	3-642-15484-0 Springer Berlin Heidelberg New York
ISBN-13	978-3-642-15484-3 Springer Berlin Heidelberg New York

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper 06/3180

Preface

Economic perspectives in network management have recently attracted a high level of attention. The Third Workshop on Economic Traffic Management (ETM 2010) was the continuation of two successful events that were held at the University of Zürich, Switzerland in 2008 and 2009. The main objective of ETM 2010 was to offer scientists, researchers, and operators the opportunity to present innovative research on ETM mechanisms, to discuss new related ideas and directions, and to strengthen the cooperation in the field of economics–technology interplay. Being co-located with the International Teletraffic Congress (ITC22), ETM 2010 brought together a new and fast-growing scientific community.

The concept of ETM has emerged due to the fact that a multitude of different self-interested players are simultaneously active in the Internet. While such players may either compete or complement each other in the value chain for service providers, each of them has his own incentives and interests. To enable a win–win situation for all players involved (basically end users, Internet Service Providers (ISP), telecommunication operators, and service providers), new incentive-based approaches have been recently developed, tested, and even commercially deployed, which fall under the domain termed Economic Traffic Management (ETM). ETM mechanisms aim at improving efficiency within the network, e.g., by reducing costs, while also improving Quality-of-Experience (QoE) for end users or applications. In view of the increase of overlay traffic, driven amongst others by overlay and peer-to-peer (P2P) applications, more traditional and global optimization approaches, e.g., route optimizations or network management, tend to be superseded by ETM solutions. Such solutions take into account interactions among various players and employ mechanisms that can lead the system into a viable equilibrium. That is, while each player reacts according to his own interests to the mechanism, e.g., in terms of traffic inserted, information disclosed, or Quality-of-Service (QoS) levels selected, the design of the latter is such that the system is led to a mutually beneficial situation, without having to assume any further coordination.

ETM is particularly applicable to cases involving thousands or even millions of individual users injecting traffic into networks of multiple interacting network service providers, possibly acting on different tiers and pursuing different incentives. Due to the decentralization of these players and due to the commercialization of service offerings, a scalable and economically driven approach offers a wider range of interesting alternatives for optimization, traffic management, and network management, and taking care of respective legal views. Finally, besides these advantages, ETM also serves the increasing importance of socio-economic studies in the Future Internet, since its ultimate goal is the improvement of QoE for end users, yet in a way that is economically sustainable for providers, too.

The increased interest in these topics is confirmed by the fact that this year 21 papers were submitted to the ETM workshop. The authors of the papers come from 17 countries, with 82% from Europe, 12% from Asia/Pacific, and 6% from the USA. Out of them six papers were selected as full papers, following a thorough peer-review

process. The acceptance rate was, thus, approximately at 29%, reflecting the very competitive nature of the workshop and the high quality of the work presented. In addition, ETM 2010 decided to accept four short papers on emerging ideas to stimulate fruitful discussions during the workshop.

The major focus of the papers submitted, according to the authors' selection of topics, is seen in the following topics, namely: (1) Economic management of traffic and its related economic implications, (2) ETM mechanisms and technologies, (3) ETM application scenarios, such as that of peer-to-peer applications, overlay networks, or virtual networks, (4) application-layer traffic optimization (ALTO), and (5) economically efficient bandwidth allocation. This was also reflected by this year's program of papers, organized in a session on "P2P and Overlay Management" and "Evaluations and Estimations" followed by the Short Paper session. The program was complemented by the keynote presentation on "Socio-economic Challenges for the Internet of the Future: The Case of Congestion Control" given by Costas Courcoubetis, Athens University of Economics and Business.

Many people contributed a great amount of their time to organize ETM 2010. Therfore, special thanks are addressed to the Technical Program Committee and all additional reviewers. Further thanks go to Rob van der Mei and Hans van den Berg, contacts to the ITC 22 hosting conference, to Cristian Morariu, Universität Zürich, for supporting the ETM 2010 website dynamics, to Evelyne Berger, Universität Zürich, for handling all registrations and pre-workshop matters, and to Thomas Zinner, University of Würzburg, for his support during the workshop.

Finally, the editors would like to address their thanks to Springer namely, Anna Kramer, for a smooth cooperation on finalizing these proceedings. Additionally, many thanks go to the support of the European FP7 STREP project "Simple Economic Management Approaches of Overlay Traffic in Heterogeneous Internet Topologies (SmoothIT)," No. 216259 and the FP7 NoE on "Anticipating the Network of the Future — From Theory to Design (Euro-nf)," No. 216366.

September 2010

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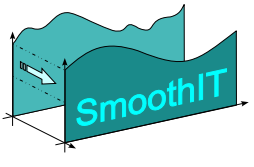

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A number of detailed and highly constructive reviews for papers submitted to ETM 2010 were made by all of our reviewers, comprising the Technical Program Committee (TPC) members as stated above and additionally George Exarchakos, Eindhoven University of Technology, Christian Groß, Technische Universität Darmstadt, Frank Lehrieder, University of Würzburg, Vlado Menkovski, Eindhoven University of Technology, Simon Oechsner, University of Würzburg, and Piotr Wydrych, AGH University of Science and Technology.

Therefore, it is of great pleasure to the Technical Program Co-chairs to thank all these reviewers for their important and valuable work.

Table of Contents