

## Guest Editorial

# Selected Papers From 7<sup>th</sup> NEW2AN Conference

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This special issue presents extended versions of the best papers published in the proceedings of the 7th NEW2AN (Next Generation Teletraffic and Wired/Wireless Advanced Networking) held in St.Petersburg, Russia, on September 10 – 14, 2007. The extended versions of ten original papers went through a tough evaluation and only seven have been accepted for this special issue. The conference itself attracted 113 papers from 29 countries. With the help of excellent Technical Program Committee and a number of associated reviewers, the best 40 high-quality papers were selected for publication, resulting in acceptance ratio of 35%.

The conference proceedings contain contributions to next generation teletraffic with focus on traffic characterization, estimation of traffic parameters, and modelling of new services based on real data and experiments. New methods for designing dynamic optimal systems were presented. In particular, issues of Quality of Service (QoS) in wireless and IP-based multi-service networks are dealt with, as well as economical aspects of future networks. The presentations in the scientific program provided also new contributions to various aspects of networking, with strong emphasis on wireless networks, including cellular networks, wireless local area networks, personal area networks, mobile ad hoc networks, and sensor networks. New and innovative developments for enhanced signaling protocols, QoS mechanisms, and cross-layer optimization were also well represented within the program of the NEW2AN 2007.

This special issue presents eight papers addressing three areas of research: protocol analysis, traffic modeling, and network performance evaluation.

The first set of papers addresses protocol analysis in wired and wireless networks. The paper “A Forwarding Cooperation Protocol for Plain and Cluster-based Ad Hoc Networks” by H. Rifa et al. addresses the area of ad hoc networks co-operative operation. A novel protocol FURES (Forwarding Spurring Protocol for Multihop Ad Hoc Networks) has been developed in the paper; it provides incentives to selfish mobile nodes to cooperate.

In “Performance analysis of general backoff protocols” by A. Lukyanenko et al. the authors present an analytical framework on backoff protocols behavior in Ethernet. The paper delivers results on stability conditions for the steady

state models of backoff protocols. These conditions have been obtained both for the bounded and for the unbounded retry limit models. The optimality conditions have been also derived. The question of the optimality is still open, but for the model developed model (unbounded retry limit) it is proved that exponential function is the best choice for the backoff function.

In the next paper “Implementation of modified AQM mechanisms in IP routers” by J. Domanska et al. considers active queue management RED/DSRED in IP routers and investigates the correspondence between the way packets are chosen to be dropped and system performance. Results have been obtained using the analytical framework presented in this paper as well.

The paper “Analysis and Performance Evaluation of the IEEE 802.16 ARQ Mechanism” by V. Tykhomyrov et al. deals with performance analysis in IEEE 802.16 networks. The authors have analyzed the key features and parameters of the 802.16 ARQ mechanism. In particular, they consider a choice for the ARQ feedback type, an algorithm to build block sequences, a scheduling of the ARQ feedbacks and retransmissions, the ARQ block rearrangement, ARQ transmission window and ARQ block size. The simulation results show that the ARQ mechanism and its correct configuration play a key role in transmitting data over wireless channels in the IEEE 802.16 networks.

The next three papers address the area of traffic and data modeling. In “Modeling local stationary behavior of Internet traffic” by D. Moltchanov, a novel model for aggregated IP traffic modeling has been proposed. Using change-point statistical test as a basic tool of the algorithm it is proposed to divide traffic observations into covariance stationary parts. This procedure is fairly simple and can be implemented in real-time and the resulted model is inherently on-line in nature. The proposed approach may potentially find a number of applications in many areas of modern QoS-aware networks; this includes but not limited to establishment of SLAs between network operators, dynamic bandwidth allocation in DiffServ networks, routing with bandwidth guarantees in MPLS or MPLS/DiffServ networks, etc.

The paper “Empirical Data from Mobile and IP Telephony” by P.E. Heegaard has practical flavor. It provides recent

empirical traffic data and observations of telephony traffic patterns in mobile and IP telephony. These are compared with well known old telephony patterns from Public Switched Telephone Networks (PSTN) dated back to 1975, to investigate potential evolution and impact on traffic characterizations due to recent technology changes from fixed to mobile phones, and correspondent changes in quality, tariffs and appearance of alternative message based communication means.

The last three papers are from networks performance evaluation area. The first paper "Network Simulation and Performance Evaluation of WiMAX Extensions for Isolated Research Data Networks" by T.M. Bohnert et al. simulates WiMAX architecture and practical services developed on the course of IST FP6 WEIRD (WiMAX Extensions for Remote and Isolated Research Data Networks). The simulation framework has been based on ns2, on the module known as NDSL.

In the last paper of this special issue, "Packet dropping characteristics in a queue with autocorrelated arrivals" by A. Chydzinski et al. The paper provides detailed description of the packet dropping process connected with the buffer overflows in a network node. The development of analytical framework resulted the formulas for the most important loss characteristics, both in the transient and the stationary regime and then illustrate them via numerical examples.

Finally, the editors hope that this special issue provides an interesting selection of high quality papers originated from the NEW2AN 2007 conference. We would like to thank all the authors of the NEW2AN 2007 conference and thank all reviewers for their efforts and valuable contributions. The proceedings of the NEW2AN 2007 are available from Springer publishing house, LNCS 4712.



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