

TELECOMMUNICATIONS STANDARDS



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Telecommunications is driving what is perhaps the most significant social revolution that mankind has ever known, changing the way people live, work, interact, and socialize. Thus, telecommunications has been attracting ever increasing attention from researchers in both academia and industry. Although both communities have made great achievements and outstanding contributions to communications, these two domains are frequently unaware of the capacities, expertise, and challenges faced by the other.

As enablers of global systems interoperability, standards are at the heart of success of the communications industry. Since standardization is inherently a social enterprise, it is the perfect environment for promoting technologies that evolve an increasingly social world. On the other hand, all of the world's telecommunication systems have their roots in research. Academic research and findings have helped system designers to decide on the overall system architecture down to the smallest details.

Building on the success of the First IEEE Telecom Standards Workshop: From Research to Standards, which won the Best Workshop Award at IEEE ICC 2012, and as another attempt to bridge the gap between researchers, scientists, and standardization experts in both academia and industry, and promote standardization as an important vehicle for information sharing and cooperation between academia and industry, we have organized this feature topic on telecommunication standards. This feature topic was dedicated to research work that is already included in standards and shows how it is achieved; current research work focused to become part of a new standard or enhance an existing one, and work done to make adoption by the relevant standards body likely. Original contributions were solicited in relevant areas of different standardization bodies, such as the International Telecommunication Union — Telecommunication Standardization Sector (ITU-T), IEEE, Internet Engineering Task Force (IETF), Third Generation Partnership Project (3GPP), European Telecommunications Standards Institute (ETSI), Open Mobile Alliance (OMA), and Broadband Forum (BBF).

The feature topic attracted a great number of submissions, exceeding 50, out of which 11 papers were accepted. Part 1 of the feature topic consists of six articles, and five more articles will be published in Part 2 as a section of the August 2013 issue of *IEEE Communications Magazine*.

In the first article of the feature topic, Zuniga *et al.* discuss mobile networks' need for architectural flexibility to cope with the traffic growth. The authors introduce distributed mobility management as a potential and vital solution. They highlight relevant activities in the standards development organizations, in particular IETF and 3GPP. According to them, distributed mobility management can be introduced into 3GPP gradually, to either complement or replace existing functions.

The second article is also related to 3GPP standardization. Kim *et al.* explain how fixed mobile convergence can be achieved via a 3GPP-BBF interworking architecture using WLAN or femtocell access and ensuring policy, charging, and QoS convergence via both 3GPP and fixed broadband access. The article also covers the mechanisms to support evolved packet core routed traffic and non-seamless WLAN offloaded traffic in the new architecture.

In a further 3GPP-related article, Korhonen *et al.* present an overview of 3GPP-specified IP traffic offloading solutions and compared them to three variations of their Internet layer IETF protocols-based traffic offloading implementations. They indicate that the solutions using IETF-only technologies are feasible and lightweight enough to be deployed on mobile devices.

Harada *et al.*, in the fourth article, provide insights on the latest status and achievements of the IEEE Communication Society Standards for Dynamic Spectrum Access Networks, which develops standards in the areas of dynamic spectrum access, cognitive radio, interference management, coordination of wireless systems, advanced spectrum management, and policy languages.

In the fifth article, Matsubara *et al.* present four important ITU-T Recommendations that lay out the essential directions for future networks and highlight the main objectives. The four objectives identified by ITU-T are ser-

vice awareness, data awareness, environmental awareness, and social and economic awareness. The article also provides a detailed description of design goals for future networks.

In the last article of Part I, Scalise *et al.* present the S-band GEO satellite-oriented mobile interactive multimedia radio interface standardized by ETSI, stating the potential of its use in vehicular and machine-to-machine services. The authors also provide experimental results of the new standard.

As guest editors, we would like to thank all the authors for their submissions to this feature topic. The interest and quality of submissions were beyond our imagination. We are also grateful to the reviewers for the timely responses and their valuable comments to improve the quality of the articles. We appreciate the support from Dr. Steve Gorshe, Editor-in-Chief of *IEEE Communications Magazine*, and help from Joseph Milizzo, Catherine Kemelmacher, and Jennifer Porcello throughout the publication process. Finally, our hope is that the readers of *IEEE Communications Magazine* enjoy the articles of this feature topic.

BIOGRAPHIES

TARIK TALEB is currently working as a senior researcher at NEC Europe Ltd. Prior to his current position and until March 2009, he worked as an assistant professor at the Graduate School of Information Sciences (GSIS), Tohoku University, Japan. He received his B.E degree in information engineering with distinction, and his M.Sc. and Ph.D. degrees in information sciences from GSIS, Tohoku University, in 2001, 2003, and 2005, respectively. His research interests lie in the field of architectural enhancements to mobile core networks, mobile cloud networking, mobile multimedia streaming, congestion control protocols, handoff and mobility management, and intervehicular communications. He has also been directly engaged in the development and standardization of the Evolved Packet System as a member of 3GPP's System Architecture working group. He is/was on the editorial boards of many IEEE magazines and journals. He is

serving as Vice-Chair of the Wireless Communications Technical Committee. He is a recipient of many awards, including the 2009 IEEE ComSoc Asia-Pacific Best Young Researcher award and the 2008 TELECOM System Technology Award. Some of his research work has been also awarded best paper awards at prestigious conferences.

ROLF WINTER is a professor of data networks at the University of Applied Sciences Augsburg (HSA). He received his Ph.D. from the Freie University Berlin in 2006. Before joining the HSA, he was a senior researcher at NEC Laboratories Europe, where he was active in EU-funded research projects and standardization. His research interests are in the areas of routing and switching, energy management, transport protocols, and network measurement. He is very involved in the IETF, where he chaired the recently closed LEDBAT working group. He is also a member of the IETF transport area directorate and co-author of a number of standards documents.

TUNCER BAYKAS is a postdoctoral research fellow at Tohoku University, Japan. He received his B.A.Sc. degree in electrical and electronics engineering from Bogazici University, Istanbul, Turkey. He received his M.A.Sc. and Ph.D. degrees, both in electrical engineering, from the University of Ottawa, Canada. From 2007 to 2012, he worked as an expert researcher at the National Institute of Information and Communications Technology, Japan. He is heavily involved in IEEE standardization activities. He served as Secretary and Subeditor for the IEEE 802.15 WPAN Task Group 3c (802.15.3c) Millimeter Wave Alternative PHY group and as Chair of IEEE 802.19 Task Group 1, Wireless Coexistence in the TV White Space. He has made contributions to IEEE P802.11ad, P802.11af, Dyspan P1900.7, and 802.15.4k standardization projects. He received an IEEE-SA Standards Board award for his contributions to IEEE 802.15.3c. He served as TPC Vice Chair of PIMRC 2009. His research interests include 60 GHz systems, interference mitigation, and wireless sensor networks.

FAROOQ BARI [SM] (farooq.bari@att.com) is a Lead Member of Technical Staff with AT&T. He holds a Ph.D. in electrical and computer engineering from the University of British Columbia, Vancouver, Canada. His primary area of work and research is in developing standards for telecommunication systems. Over the years he has contributed to standards related work in 3GPP, IETF, IEEE, GSMA, NGMN, ATIS, and Onem2m. He is a long-time member and volunteer of IEEE and currently is a member of the IEEE SA Standards Board (and its ICCOM and NESCOM committees), a member and Treasurer of the IEEE Communication Society Standards Development Board, and a member of the IEEE SA Corporate Advisory Group. He also chairs the GSMA-WBA Joint Task Force on Wi-Fi Roaming. Before working in standards, he was a research engineer involved in R&D and new product development in the area of real-time embedded systems.