Editorial Preface

Debashis Saha, MIS Group, Indian Institute of Management-Calcutta, Joka, Kolkata, Calcutta, India

Varadharajan Sridhar, Sasken Communication Technologies, Domlur, Bangalore, India

Welcome to the first issue of IJBDCN of the year 2013. This is the fifth year that we took over as editors and we thank all the Associate Editors and the Editorial Review Board members for their unstinted, diligent support to the journal. We continue our momentum to explore new domains of research in the technology, business and regulation of data communications and networking. In this issue, we present one research essay, two research papers and one practice paper. All the three papers are on wireless networking – an area where the buzz is still continuing.

In the Research Essay, we explore the critical question: What will be the future network to work with and do business with? Looking for a concrete answer to this poser is important not only for the researchers but also for the business leaders as well. If the business can get it right, it can reap a lot of benefit out of this correct guess. It will surely provide any business with the desired competitive edge it is forever craving for. But this million dollar question is still left as unanswered or answered only vaguely in the literature. Indeed it represents a really complicated scenario – very difficult to fathom. We propose a platform-based model to understand the nature of future networks. Analyzing the platform model of networks is not very common now, but we feel it is worth taking a dip into it in 2013. We dare to touch this issue in this inaugural article because we do not want to bypass it in 2013 volume of the IJBDCN. There will be a number of articles to be published in this journal this year, which will touch one or other aspect of this burning topic. So we thought we should begin the year with an article on this teaser and leave a number of questions in the readers' mind so that they are interested to read the upcoming papers in the IJBDCN. Though we are not in a position to answer it decisively – neither we have the expertise to analyse this critical problem nor we have the power to predict the future – we shall try to share our mind on the topic so that the readers may get a peek into what is there in store for them.

As data traffic increases, performance of both Local and Wide Area Networks become important to provide enhanced user experience. In the first research article, Sarkar analyzes design and evaluation of a class of Cross-Layer Design (CLD) framework for improving the performance of 802.11-based wireless local

area network. To overcome the performance problems of 802.11, the author proposes a CLD framework which is based on a cross-layer Medium Access Control (MAC) protocol called the channel-aware buffer unit multiple access (C-BUMA). In the framework, the radio propagation is combined with the MAC sub-layer to develop a robust cross-layer communication. By sharing channel information with the MAC protocol, the approach reduced unnecessary packet transmissions, and hence reduced bandwidth wastage and significantly improved the system performance. Simulations carried out on C-BUMA indicate superior performance over other 802.11 standards and CLD methods.

In the second research article, Sardar analyzes the wireless link related issues in Network Mobility (NEMO) at both mobile Base Station (BS) and Mobile Router (MR). The onboard Transmission Control Protocol (obTCP) is one of the better methods to detect and recover wireless losses locally. The author investigates the associated buffer requirement at MR using a markov model to keep track of the packet transmission process of MR. The buffer size for each TCP connection is represented as a function of loss probability of the wireless links. The numerical results indicate that the buffer size requirement at MR is significantly low for each TCP connections. This observation makes possible implementation of obTCP in NEMO for better network performance.

Most of the developed countries have already adopted Internet Protocol version 6 (IPv6). However, developing countries are still trying to catch up on migration from IPv4 to IPv6 due to crunch in the address space and the ubiquity of mobile devices that connect to the Internet. In the concluding practice paper, Sarkar and Soorty discuss an experimental study on the performance of IPv4 versus IPv6 in a peer-to-peer Gigabit Ethernet implemented over two widely used operating systems (i.e. Windows and Linux). The experimental results are analyzed with respect to (i) throughput (ii) packet delay (iii) jitter and (iv) CPU utilization. The study indicates that though optimized for IPv4, the modern operating systems might not give best performance, especially with respect to throughput, delay and jitter for IP v6 implementations.

The study has important implications for deploying IPv6 in organizations.

We hope that you enjoy this issue as much as you have done the previous issues of IJBDCN.

Debashis Saha
Varadharajan Sridhar
Editors-in-Chief
IJBDCN

Debashis Saha is a full professor with the MIS Group, Indian Institute of Management (IIM)-Calcutta. Previously, he was assistant and then associate professor with the CSE Department at Jadavpur University (Kolkata, India). He received his BE (Hons) degree from Jadavpur University (Kolkata, India), and the MTech and PhD degrees from the Indian Institute of Technology (IIT-Kharagpur, India) all in electronics and telecommunications engineering. His research interests include telecom network design and analysis, pervasive communication and computing, network operations and management, wireless networking and mobile computing, ICT for development, and network economics. He has supervised thirteen doctoral theses, several master's theses, published about 280 research papers in various conferences and journals, couple of case studies, and directed 4 funded research projects on networking. He has co-authored several book chapters, a monograph, and five books including Networking Infrastructure for Pervasive Computing: Enabling Technologies and Systems *(Norwell, MA: Kluwer, 2002) and* Location Management and Routing in Mobile Wireless Networks *(Boston, MA: Artech House, 2003). Dr. Saha is the recipient of the prestigious career award for Young Teachers from AICTE, Government of India, and is a SERC Visiting Fellow with the Department of Science and Technology (DST), Government of India. He is a Fellow of West Bengal Academy of Science and Technology (WAST), Senior Life Member of Computer Society of India (CSI), Senior Member of IEEE, member of ACM, member of AIS, and member of the International Federation of Information Processing Working Group's 6.8 and 6.10. He was the founding Chair of Calcutta Chapter of IEEE Communications Society (2003-2008).*

Varadharajan Sridhar is a Research Fellow at Sasken Communication Technologies (Bangalore, India). He received his BE (Honors) from the University of Madras (India), Post Graduate Diploma in industrial engineering from the National Institute for Training in Industrial Engineering (Mumbai, India), and PhD in MIS from the University of Iowa (USA). He had taught at Ohio University and American University in the US; at the Management Development Institute (India) and Indian Institute of Management (Lucknow, India). He was a visiting Professor at the University of Auckland, New Zealand and at Aalto University, Finland. Dr. Sridhar's primary research interests are in the area of telecommunication management and policy and global software development. He has published many research articles, business cases, and chapters in edited books in his area of research. His latest book titled The Telecom Revolution in India: Technology, Regulation and Policy *has been published by the Oxford University Press India. Dr. Sridhar is a member of various committees relating to telecommunications and IT set up by the Indian government. He is on the editorial board of the* Journal of Global Information Management *and is a member of ACM and AIS.*