Editorial Preface

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Welcome to this second issue of the year 2012 of IJBDCN. We have brought about significant changes in the Editorial Review Board (ERB). Both geographical and domain diversities of our new ERB members will enable us to address evolving research themes in the area of data communications and networking better.

In this issue, we bring to you one research paper, one practice paper, one case study and one research essay. This is in line with our vision of making IJBDCN addressing cutting edge research issues as well as the applications of it in a rapidly changing technology environment.

It is reported that the global mobile data traffic grew by more than 133% in 2011 to about 597 petabytes, which is about eight times larger than the byte consumption of the entire global Internet in 2000. The type of transactions that are carried through handhelds and mobile devices are becoming complex and hence involves access and retrievals from many different servers interconnected across different networks. Mobile transactions are constrained by small screen size, high communication cost, and high memory consumption. The transactions also have high security requirements as they are transmitted over the air. Existing techniques from traditional query processing in distributed environments cannot be directly applied to mobile environments. In the first paper by Lim and Wong, the authors propose techniques for processing mobile queries that address the issue of high memory consumption. A set of walkthrough examples is provided and performances of various techniques are examined. The results show that the technique of first downloading primary keys only from one server and then sending a query to the second server using these primary keys before processing for qualified match in the second server gives the best performance.

The second paper is on practical computer education at tertiary institutions in Asia Pacific regions. The laboratories in these educational institutes need to be cost-effective, agile and easy to manage, as they typically cater for a wide range of needs. And the technology that comes to mind for these types of constraints is *virtualization*. But the question is can the tertiary educational house capitalize on this upcoming technology at their scale? This article titled "A Virtual Laboratory Environment for Tertiary Educational Institutions" by Eduardo Correia et al. describes how such an institution can leverage a virtual laboratory environment employing server-based virtualization. It first underlines some of the major technical challenges of implementing one particular hypervisor and

associated management software, specifically to deploy a set of virtual machines that form part of a particular course. Then, the paper suggests several solution approaches, including two scripts that can serve as templates for automating the creation and removal of sets of students' virtual machines.

Third, we present a case study titled "The Sachet Telecom Architecture for Off Grid Locations: An Indian Case Study" authored by Prasad and Mehrotra. The telecom market in developing countries such as India is quite different from that in developed countries. Most emerging countries have failed in promoting universal service using the traditional fixed lines. With the exponential adoption associated with the reduced cost and increased competition, there is some hope in promoting universal service using mobile services. Many countries including India have started providing Universal Service Obligation Fund support for mobile and currently broadband data services in rural and remote areas of the country. However, the traditional macro cellular architecture do not yield business value to the large mobile operators that own the license and associated spectrum for providing services in the rural areas of the country. In this case study, a new telecom architecture tailored to the needs of rural areas, referred to as the "Sachet Telecom" is proposed. The case study presents the telecom architecture, and an economic model for making it a viable business and environment and energy efficient solution in rural areas. Results of implementation in select rural areas of the country are also given.

As more electronic devices get used and the networks become ubiquitous, the contributions of Information Technology and Telecom sectors to e-waste, energy consumption, and environmental pollution have been increasing. Realizing the dire needs to promote energy and environmental friendly products and services corporates have been investing on Green IT initiatives. Green IT implies the practice of environmentally preferable IT purchasing. This involves adoption of sourcing practices such as analysis of the environmental footprint of an IT hardware supply chain, evaluation of the green track record of software and IT services providers, incorporating green issues such as recyclable design and packaging in vendor evaluation, and inclusion of social concerns such as use of child labor and presence of harmful materials in IT supply chain in IT procurement decisions. In this forward looking Research Essay titled "The Many faces of Green IT," the authors Cai, Chen, and Bose, look at the benefits of Green IT and potential barriers to adoption in organizations. Recommendations on improving adoption of Green IT practices are also elaborated.

We hope that you enjoy reading this issue as much as we do in compiling the interesting articles in it.

ACKNOWLEDGMENTS

The book edited by Dr. Saha and Dr. Sridhar titled *Recent Advances in Broadband Integrated Network Operations and Services Management* (Hershey, PA, USA: IGI Global) is now available.

A new title on *Web-Based Multimedia Advancements in Data Communications and Networking Technologies* edited by Dr. Saha and Dr. Sridhar are scheduled to be released by IGI Global in 2013.

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Debashis Saha is a full professor with the MIS Group, Indian Institute of Management (IIM)-Calcutta. Previously, he was with 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 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, published about 280 research papers in various conferences and journals, and directed four 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, 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).*

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