Special Issue on IP Communication Services

Guest Editorial

Internet telephony, by some measures, is now 15 years old. In the last 15 years, it has emerged from academic and commercial laboratories to become the mainstream method of communications today. The success of Internet telephony applications has demonstrated the feasibility of IP communications to support millions of concurrent users. What started initially as a technology for toll-bypass in the switched telephone network has now grown to subsume the switched telephone network. However, creating scalable innovative services for Internet telephony in a rapid manner is still a work in progress.

The web service creation model served as an initial model of creating services in Internet telephony and, to a great extent, still continues in the same role. As web mashups proliferated, voice mashups gained currency; as RSS feeds lead to innovative web services, the voice market capitalized with voice-enabled RSS feeds. Added to this mix are more recent technological advances such as virtualization, virtual worlds, IMS and mobile technologies, and capable personal digital assistants -- all enabling a variety of new communication protocols, services and architectures.

It is our great pleasure to bring you this special issue on IP Communication Services. The special issue contains five papers that explore innovative and significant research on recent advances in architecture, system, protocol, and modeling, as well as emerging applications and standards related to IP Communication Services.

The first two papers are invited survey papers. The Session Initiation Protocol (SIP): An Evolutionary Study by Baset et al. reviews the history and key contributions of the Session Initiation Protocol (SIP), a fundamental protocol for IP communication services. As SIP has matured, operational issues have taken to the forefront. The paper explores the genesis of SIP, touches upon the many ways in which the protocol is deployed in today's networks, looks at operational issues and more importantly, takes a critical look at where SIP succeeded and where it did not. The second invited paper, Service Program Mobility: A New Paradigm for Mobile Operators' Service Delivery by Lundqvist et al. describes an approach for service mobility for roaming users. As the society becomes more mobile and personal devices proliferate, the services associated with the users must migrate to be closer to them for a good quality of experience. The authors describe a mechanism for global service provisioning called Service Program Mobility that enables such migration.

In the third paper, Enhancing Unified Communication Services with Communication Context by K. Dhara et al., the authors present an existing system which automatically determines context in a unified communications environment, and uses this context to provide important new services to users. The authors discuss several novel services and the specific algorithms to enable such services.

Internet telephony fraud is a recurring topic in the news. One way to combat such fraud is to have strong forensics tools and processes that allow collaborative exchange of forensics information between regional security centers. The fourth paper, A Novel Protocol Design and Collaborative Forensics Mechanism for VoIP Services by Hsu et al. outlines a novel application-layer protocol for collecting forensics information needed by law enforcement and allowing the regional VoIP forensics collection centers coordinate activities to diffuse VoIP fraud.

The problem of QoS provisioning in network virtualization is addressed in the fifth paper, Analysis on Quality of Service Provisioning for Communication Services in Network Virtualization by Q. Duan. Using Service Oriented Architecture (SOA) as the basis for the provisioning architecture, the paper provides an analytical model for SOA-based communication service delivery in network virtualization, an analysis technique for performance evaluation of SOA-based service delivery systems, and an approach to analyzing resource allocation for QoS provisioning of communication services in network virtualization.

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He is co-author (with H. Yu and E. K. Lua) of "P2P Networking and Applications" (Morgan Kaufmann, 2008), co-editor (with S. Shen, H. Yu., and M. Akon) of "Handbook of Peer-to-Peer Networking" (Springer-Verlag, 2009), and co-editor (with A. Prasad and V. Gurbani) of "Advances in Next Generation Services and Service Architectures" and "Future Internet Services and Service Architectures" (Aalborg, Denmark: River Publ., 2011), and Multimedia Systems (ACM Press, 1994).

He has co-authored 120 technical publications. He is on the editoral boards of Journal of Communications and Journal of Peer-to-Peer Networking. He was guest co-editor of an IEEE Communications Magazine feature topic published in 2010, and guest co-editor of a special issue in Journal of Communications (forthcoming). He was TPC Chair or Co-chair of more than 10 conferences and workshops. He regularly serves on many conference technical program committees. He holds four patents and twenty are pending.

Vijay K. Gurbani works for the Security Technology Research Group at Bell Laboratories, the research arm of Alcatel-Lucent. He holds a B.Sc. in Computer Science with a minor in Mathematics, a M.Sc. in Computer Science, both from Bradley University; and a Ph.D. in Computer Science from Illinois Institute of Technology. Vijay's current work focuses on security aspects of Internet multimedia session protocols and peer-to- peer (P2P) networks. He is the author of over 45 journal papers and conference proceedings, five books, and 12 Internet Engineering Task Force (IETF) RFCs. He is currently the co-chair of the Application Layer Traffic Optimization (ALTO) Working Group in the IETF, which is designing a protocol to enable efficient communications between peers in a peer-to-peer system. Vijay's research interests are Internet telephony services, Internet telephony signaling protocols, security of Internet telephony protocols and services, and P2P networks and their application to various domains. Vijay holds four patents and has nine applications pending with the US Patent Office. He is a senior member of the ACM and a member of the IEEE Computer Society.

Anand R. Prasad, Ph.D. & Ir. (MScEngg), Delft University of Technology, The Netherlands, Certified Information Systems Security Professional (CISSP), Senior Member IEEE and Member ACM, is a NEC Certified Professional (NCP) and works as a Senior Expert at NEC Corporation, Japan, where he leads mobile communications related security activity. Anand is an active member of 3GPP SA3 (security standards) and a vice-chairman of the working group. He is Member of the governing body of Global ICT Standardisation Forum for India (GISFI) where he also chairs the Green ICT working group and is the founding chair of the Security working group. Before joining NEC Anand led the network security team in DoCoMo Euro-Labs, Munich, Germany, as a manager. He started his career as a researcher developing embedded solutions like MAC and ARQ for WLANs and later project leader of software modem team at Uniden Corporation, Japan. Subsequently he worked as systems architect (as distinguished member of technical staff) for IEEE 802.11 based WLANs (WaveLAN and ORiNOCO) in Lucent Technologies, The Netherlands, and as technical director at Genista Corporation, Japan, with the focus on perceptual QoS. Anand has also provided business and technical consultancy to start-ups, developed cost effective offshoring models and does business development in new markets. Anand has applied for over 30 patents, published 6 books (recent 3 books published in 2011 by River Publishers) and authored over 50 peer reviewed papers in international journals and conferences. He is also active in several conferences as program committee member.