

Editorial: Peer-to-Peer networking and applications, Volume 3, Issue 4

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In this issue of the Peer-to-Peer Networking and Applications, after the survey on Peer-to-Peer Session Initiation Protocol based Communication Systems, six original research works are presented to study the interesting and important problems on document preservation, video on demand, common standard model and development platform, service oriented architectures, and semantic networks.

Due to the simplicity, extensibility and flexibility, more and more applications are being developed on the top of Session Initiation Protocol (SIP). To facilitate robustness and fault tolerance, several P2P-based SIP solutions have been proposed. In the survey paper, “*A Survey on Peer-to-Peer SIP based Communication Systems*”, Zheng and Oleshchuk thoroughly investigate the development on P2P-based SIP by detailing P2PSIP requirements, Chord-based overlays, session initiation services, NAT traversal, and message routing. They also introduce different security problems in P2PSIP and provide possible solutions.

Computer and Internet technologies have been pushing our daily lives from paper-based documents to digital documents. In addition to contacts, photographs, movies, music, conversations, and Web-sites, publishers and libraries are also moving towards digital documents. Thus, long-term preservation of these digital documents are becoming crucial. A Peer-to-Peer

document preservation system, called LOCKSS (Lots of Copies Keep Stuff Safe), is developed and put in use by many libraries around the world. In the second paper of this issue, “*Stealth Modification versus Nuisance Attacks in the LOCKSS Peer-to-Peer Digital Preservation System*”, Roussopoulos et al. identify and characterize vulnerability of the system against adversaries attempting stealth modification of preserved contents. They propose a modification to the system protocol to handle threat arising from stealth modification, and at the same time, preserving the defense mechanism of the original protocol.

User dynamics, upload bandwidth capacity, state of firewall in between users and Internet, and network conditions play very important roles in determining performance of P2P video broadcast networks. In the third paper, “*On-Demand Waypoints for Live P2P Video Broadcasting*”, Ganjam et al. develop a new P2P-based video broadcast architecture which can adaptively utilize idle participants to increase performance of video broadcast networks.

For many computational/communication problems, agreements on functionality often result in reusable models and implementations, such as TCP stack, and CORBA. Though some efforts have been put to come up with similar solutions for P2P data management applications, they are limited to low level P2P services. In the paper “*A Conceptual Model for Data Management and Distribution in Peer-to-Peer Systems*”, Aygün et al. propose a high level conceptual model for data management and distribution in P2P systems. Various research techniques on data management and distribution are studied and classified according to the proposed model.

To support heterogeneity, distributed applications in general adapt service oriented computing architectures.

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A typical service oriented architecture (SOA) consists of centralized service registries and service brokers components which are prone to unreliability and poor performance. In the paper “*Decentralising a Service-Oriented Architecture*”, Sacha et al. introduce a P2P solution to decentralize these key components of SOA to increase reliability, scalability and performance.

Although empirical studies of P2P networks are important, very limited research has been done so far. In the paper “*An Experimental Analysis of Joost Peer-to-Peer VoD Service*”, Lei et al. present a comprehensive analytical and experimental study on Joost, a P2P video on demand (VoD) application. With the results in hand, they also propose potential ways to construct more efficient P2P VoD systems.

Availability of a reliable semantic Peer-to-Peer (SP2P) network is one of the fundamental requirements for many P2P systems. Most of the existing works on SP2P focus on reliability and scalability of the P2P networks, and ignore the disconnection failures arising from temporary mapping faults. In the last paper of this issue, “*From P2P to Reliable Semantic P2P Systems*”, Mawlood-Yunis et al. propose an adaptive query routing technique which sustains temporary mapping faults to resolve disconnection failures in SP2P networks.

In closing, we would like to acknowledge the contributions of the authors who submitted their works and the reviewers who provided their expert opinions and constructive and helpful comments. We would also like to extend our sincere thanks to Melissa Fearon, the Senior Editor, and Cristina Chua of Springer, for their support and help in bringing forward Volume 3, Issue 4 of this journal. We hope that you will enjoy the current issue and find the journal very useful.



Xuemin (Sherman) Shen (IEEE M'97–SM'02–F'09) received the B.Sc. (1982) degree from Dalian Maritime University (China) and the M.Sc. (1987) and Ph.D. degrees (1990) from Rutgers University, New Jersey (USA), all in Electrical Engineering. He is a Professor and University Research Chair, Department of Electrical and Computer Engineering, University of Waterloo, Canada. Dr. Shen's research focuses on mobility and resource

management in interconnected wireless/wired networks, UWB wireless communications networks, wireless network security, wireless body area networks and vehicular ad hoc and sensor networks. He is a co-author of three books, and has published more than 400 papers and book chapters in wireless communications and networks, control and filtering. Dr. Shen served as the Tutorial Chair for IEEE ICC'08, the Technical Program Committee Chair for IEEE Globecom'07, the General Co-Chair for Chinacom'07 and QShine'06, the Founding Chair for IEEE Communications Society Technical Committee on P2P Communications and Networking. He also serves as a Founding Area Editor for IEEE Transactions on Wireless Communications; Editor-in-Chief for Peer-to-Peer Networking and Application; Associate Editor for IEEE Transactions on Vehicular Technology; KICS/IEEE Journal of Communications and Networks, Computer Networks; ACM/Wireless Networks; and Wireless Communications and Mobile Computing (Wiley), etc. He has also served as Guest Editor for IEEE JSAC, IEEE Wireless Communications, IEEE Communications Magazine, and ACM Mobile Networks and Applications, etc. Dr. Shen received the Excellent Graduate Supervision Award in 2006, and the Outstanding Performance Award in 2004 and 2008 from the University of Waterloo, the Premier's Research Excellence Award (PREA) in 2003 from the Province of Ontario, Canada, and the Distinguished Performance Award in 2002 and 2007 from the Faculty of Engineering, University of Waterloo. Dr. Shen is a registered Professional Engineer of Ontario, Canada, and a Distinguished Lecturer of IEEE Communications Society.



Heather Yu received my Ph.D. in Electrical Engineering from Princeton University in 1998. From September 1998 to March 2007, she was with Panasonic Princeton Laboratory where her major focus was multimedia communication and multimedia security R&D. Currently she is the Senior Manager of Media Technologies at Huawei Technologies USA. One of her responsibilities is to lead the establishment of the multimedia content networking research team in New Jersey, USA. Her current research interests include human centric multimedia communications, IPTV, Peer-to-peer networking, mobile multimedia, etc. She is serving as the Associate Editor-in-Chief of the Journal of Peer-to-Peer Networking and Applications, Associate Editor of IEEE Multimedia Magazine and IEEE Communications Surveys and Tutorials, and Chair of the Human Centric Technical Subcommittee of IEEE ComSoc. She served as Technical Program Chair for several IEEE multimedia and communications conferences, the Chair of IEEE Multimedia Communications Technical Committee, and a voting member at ComSoc GITC, ComSoc SPC(strategic planning committee), etc. She has published 2 books, more than 60 technical papers and holds 23 US patents.