

T4. Mobility Management in Future Wireless Networks: Past, Present, and Future

Abstract:

Wireless and cellular network technologies continue to grow and converge with the Internet. Mobility support is required in any types of wireless devices for session continuity. In this tutorial, the basics and recent advances of mobility management are provided while recent emerging issues such as Distributed Mobility Management (DMM) in Flat Architectures and Mobility Management in Information Centric Networks (ICNs) are fully discussed. With increasing usage of mobile devices like tablets and smartphones, we have been witnessing an explosion of mobile Internet traffic. In order to cope with recent traffic growth, current mobile network architectures are being flattened and IP mobility support protocols are thus required to be adopted in the evolution of mobile network architectures. Existing IP mobility support protocols developed by the IETF are all relying on centralized mobility anchors that suffer from inefficient routing and scalability issues due to rapidly increasing traffic volumes over mobile networks. In that vein, DMM is a new approach attracting attention from telecommunication and Internet communities, as it is more appropriate for the recent explosion of mobile Internet traffic. Current activities of the IETF standardization and possible two different approaches are presented with comparison results showing features of DMM against the existing mobility support protocols.

ICNs introduce revolutionary network architectures that focus on contents access rather than end-point communications. ICNs leverage in-network caching and contents replication for fast access. To realize ICNs, different projects (e.g., data-oriented network architecture (DONA), content-centric networking (CCN), publish-subscribe Internet routing paradigm (PRISP), Network of Information (NetInf)) are being conducted. Moreover, the Internet Research Task Force (IRTF) has established the Information-Centric Networking Research Group (ICNRG) in 2012. Although mobility management in ICNs has not been extensively investigated in the literature, it is obvious that mobility support is one of the most important requirements in ICNs since mobile hosts will dominate fixed hosts in future ICNs. In this tutorial, the state of the art on ICNs is first surveyed and mobility-related issues in ICNs are identified. Also, design considerations and the proposed approaches for mobility management of contents consumer and provider will be presented.

Speaker's Biography:

Jong-Hyoun Lee, Telecom Bretagne, France

Sangheon Park, Korea University, Korea

Jong-Hyoun Lee received his B.S. degree in Information System Engineering from Daejeon University in 2004. He carried his M.S. and Ph.D. work in Computer Engineering at Sungkyunkwan University, Korea (M.S., 2007; Ph.D., 2010). He started his academic profession at the Network,

Security, and Multimedia Department of TELECOM Bretagne, France in 2012 as an Assistant Professor. Before joining TELECOM Bretagne, he worked at INRIA, France from 2009. He is involved in standardization activities at the ISO TC204 WG16, ETSI TC ITS, and IETF. He twice received Excellent Research Awards from Department of Electrical and Computer Engineering, Sungkyunkwan University, Korea. He won the Best Paper Award at the IEEE WiMob 2012. He is an associate editor of Wiley Security and Communication Networks and a member of the editorial board of IEEE Transactions on Consumer Electronics. Dr. Lee is a senior member of the IEEE. His research interests include authentication, privacy, mobility management, and protocol operation based performance analysis.

Sangheon Park received the B.S. (magna cum laude) and Ph.D. degrees from Seoul National University, Seoul, Korea, in 2000 and 2005, respectively, both in computer engineering. Since March 2007, he has been an assistant professor with the School of Electrical Engineering, Korea University, Seoul, and he is currently an associate professor. From 2005 to 2006, he was a postdoctoral fellow with the Broadband Communications Research Group, University of Waterloo, Waterloo, ON, Canada (Advisor: Xuemin Sherman Shen and Jon W. Mark). From 2002 to 2005, he was a recipient of the Korea Foundation for Advanced Studies Computer Science and Information Technology Scholarship. In 2003, he was a visiting researcher at Fraunhofer Institute for Open Communication Systems (FOKUS), Berlin, Germany. He was the recipient of IEEE ComSoc APB Outstanding Young Research Award in 2009 and a Student Travel Grant Award at the 2003 IFIP Personal Wireless Conference (PWC). He was a track co-chair for IEEE VTC 2010 Fall and a publicity co-chair for IEEE SECON 2012. He was a TPC chair secretary for ICTC 2012 and a TPC vice-chair for ICOIN 2013. He is an editor of Journal of Communications Networks (JCN) and a senior member of the IEEE. His research interests include mobility management, Future Internet, information centric networks, vehicular networks, and opportunistic networking.