

# IP-based mobility and handover optimization

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Tutorial

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As mobile networks continue to grow and converge with the Internet, new wireless devices and their use are outnumbering the use of fixed network. Mobility management needs to meet the requirements of existing and emerging network technologies. It may be supported in different layers of the network protocol stack. At the IP layer, Mobile IP, an IP-based mobility management, has the advantage of being applicable in any IP-based network, but is faced with many deployment challenges. Numerous variants of Mobile IP have been proposed to address these challenges in different network environments. The real test however is in deployment. Both 3GPP and WiMAX have adopted only network-based mobility management, which does not require changes to the IP stack of the mobile hosts. Research in mobility management has become more active, especially with the mobile networks continuing to evolve from hierarchical towards more flattened network. This tutorial presents the basics, recent advances, and future directions for mobility protocols at various layers (e.g., network, transport and application). It provides a taxonomy of mobility protocols. It illustrates a few scenarios to describe applicability of mobility protocols to various network environments. It goes through the best practices, and then provides the research directions.

**Biographies:**

Ashutosh Dutta is a senior member of the IEEE and the ACM. He obtained BS in EE from NIT

Rourkela, India, MS in Computer Science from NJIT, M. Phil. and Ph.D. in Electrical Engineering from Columbia University, New York. Ashutosh currently works as a senior scientist at Nixsun Innovation Center in Princeton, New Jersey. He is the past Chair of IEEE's Princeton / Central Jersey Section and currently serves as the Industry Relations Chair for IEEE Region 1 and IEEE MGA (Membership Geographic Activities), and is the public visibility chair for the IEEE Communication Society. Ashutosh has published more than 70 conference and journal papers in the area of multimedia and mobile networking. Ashutosh has served as TPC co-chair and general co-chair for IEEE Sarnoff Symposium, IEEE IMSAA and organizing committee member for ACM Multimedia, ACM Mobicom and served as TPC member for many IEEE and ACM conferences. He serves as the associate technical editor for IEEE Communication Magazine. In the past, Ashutosh has given mobility related tutorials in Sarnoff Symposium, Globecom, and WCNC. Ashutosh was awarded 2005 PCJS leadership award, 2009 IEEE Region 1 award and prestigious IEEE MGA award for 2009.

H. Anthony Chan received his PhD in physics at University of Maryland, College Park in 1982 and then continued post-doctorate research there in basic science. After joining the former AT&T Bell Labs in 1986, his work moved to industry-oriented research in areas of interconnection, electronic packaging, reliability, and assembly in manufacturing, and then moved again to network management, network architecture and standards for both wireless and wireline networks. He was the AT&T delegate in several standards work groups under 3GPP. He was visiting Endowed Pinson Chair Professor in Networking at San Jose State University during 2001-2003 and was professor at University of Cape Town during 2004-2007. His current research in Huawei Technologies is in 4G wireless network, and is involved in various standards activities. Anthony is Fellow of IEEE. He is distinguished speaker of IEEE CPMT Society and of IEEE Reliability Society.

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