

Guest Editorial IP Unwired, Part 2

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This is the second of two special issues on “IP Unwired”, a sequence of articles providing an overview of evolving wireless standards and access network architectures that are driving the development of wide area support for IP mobility. These two issues also provide a snapshot of some research/pre-standards work underway on supporting mobility in future all IP-based cellular and hybrid access networks.

This issue begins with an article by Phil Karn on “IP Data Services over CDMA Digital Cellular”. The article gives a brief description of IS-95, a CDMA-based second generation digital cellular technology, and then describes two way data services are currently delivered over IS-95. It then goes on to describe High Data Rate (HDR), Qualcomm’s data-oriented cellular technology based on direct sequence spread spectrum. In contrast with wideband CDMA systems (the basis of ‘3G’ technology featured in the previous issue), HDR notably departs from the use of CDMA in the forward link, using it only on the reverse link. The article concludes with a discussion of TCP behavior over CDMA and wireless links in general.

The second article by Hongyi Li et al. describes new mobile routing framework based on IP routing for All-IP wireless networks called Wireless IP (WIP). WIP is essentially a distributed, link state-based approach to host (or prefix) routing. As mobiles move, host or prefix-specific routing entries are distributed in a minimally sufficient manner such that optimal (i.e. shortest path) routing can be maintained whilst simultaneously maintaining reasonable scalability properties.

The third article contributed by Andrew Campbell et al. presents a perspective on micro-mobility, discusses the motivation behind this emerging work area in the IETF, presents common characteristics that a number of proposals share and briefly describes some of the key items under discussion within the Mobile IP working group.

Finally, Alan O’Neill et al. describe an Edge Mobility Architecture (EMA), a future IP network architecture in which the core topology is fixed but where the hosts at the edge of the network may be mobile, as is the case in cellular networks. Within this architecture, Mobile-Enhanced Routing (MER) protocols are used to support the prefix-routed requirements of

the fixed Internet, along with the movement of IP addresses allocated to mobile nodes. He outlines specific components for the support of such edge mobility (EMA:MER) that offers fixed/mobile IP network convergence, homogeneous IP handoff across heterogeneous access technologies and inter-domain roaming across heterogeneous large-scale IP domains.

The four papers here, together with those in the preceding issue, hopefully provide reasonable insight into various IP mobility efforts underway in industry and academia. It is reasonably safe to say that a long term objective of these efforts is to make the wireless Internet experience as indistinguishable as possible from the wired one. Much work remains to realize this goal, both in terms of delivering adequate end user performance and in driving down the cost of mobile wireless Internet access. Increasingly, in the wireless arena it seems that the latter may be the most challenging task.



M. Scott Corson is a member of the technical staff at Flarion Technologies where he is involved in the design of all IP-based wireless access networks. He also currently serves as a co-chair of the IETF Manet Working Group. He is also a research faculty member in the Institute for Systems Research at the University of Maryland, where he works in the area of distributed algorithms for network control.