

Cellular Networking Perspectives

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Introducing ...

Cellular Network Perspectives has been created to explain, in plain language and in small doses, developments in the arcane world of cellular networking. It will focus on cellular network issues in markets using the North American cellular model (AMPS). It is aimed at people that need to stay current in the field of cellular roaming, but do not have the time to filter through the mass of documents produced by standards committees and other organizations.

The cellular network is the "wires behind the wireless". More than hardware though, the cellular network is the intelligence that will allow cellular phone users of the future to perceive North America and other AMPS markets as an extension of their home system. Some see this cellular network eventually providing the services required for the Personal Communications, Network of the future.

Appropriately for a Telecommunications newsletter, this newsletter will not be mailed, but faxed, to its subscribers

Act I, Scene I

When AT&T invented AMPS (Advanced Mobile Phone Service) it was just seen as yet another IMTS (Improved Mobile Telephone Service). It was certainly not seen as an alternative to wired phones. Nobody expected cellular to be so wildly successful in North America. So successful, that within a few years most people in the US and Canada would live in areas covered by cellular. So successful, that soon 10,000,000 Americans will be subscribing.

Now, AMPS cellular is suffering from its own success. Nobody foresaw the immense possibilities for fraud that cellular would create. Nobody knew how to provide nationwide seamless roaming. Nobody thought that the cellular system would exhaust its allocated spectrum so quickly.

This newsletter will be addressing these issues, particularly from the perspective of the emerging North American cellular network

The Directors

The two groups giving the most direction to standardization of "AMPS" cellular are the

Telecommunications Industry Association (TIA) and the Cellular Telecommunications Industry Association. The TIA is basically an association of equipment manufacturers, but membership is open to any organization with an interest in telecommunications. The CTIA is an association of cellular service providers. In this organization, unlike the TIA, full membership is not available to other types of companies.

The CTIA, representing the business interests of those running cellular phone systems, decides when further standardization is necessary and provides a list of requirements to the TIA committee on cellular; TR45. This committee then assigns the work to one of its sub-committees

A Play on Five Stages

The Analog Cellular Air Interface sub-committee; TR45.1, was created with a mandate to turn AMPS into an industry standard. They did this, producing Interim Standard IS-3 which was later elevated to a full TIA standard for analog cellular; TIA/EIA-553. TR45.1 still maintains this standard, and is currently adding better fraud protection for future analog mobiles into TIA/EIA-553 Revision A.

Roaming sub-committee TR45.2 was created shortly after TR45.1, with a mandate to study issues associated with roaming. It started with a very low profile, but has grown in importance as the industry has recognized the problems with roaming today, and, more importantly, the revenue they could gain (or, in the case of fraud, the revenue they could stop losing!) by providing seamless cellular service.

Digital Cellular sub-committee TR45.3 was created to solve a radio capacity problem perceived by the CTIA. They created a standard, IS-54, based on a TDMA (Time Division Multiple Access) air interface that provides triple the capacity of analog cellular. Base stations and terminals conforming to IS-54 are just now reaching commercial trials. This committee is still very active.

Personal Communications sub-committee TR45.4 was created in 1991 to give the cellular industry a chance to participate in the definition of the future Personal Communications Network (PCN). This committee is currently attempting to define its

role, especially its relationship with other companies, organizations and standards committees attempting to define PCN in their own image.

Broadband Cellular sub-committee TR45.5 was created in 1992 by those that felt that broadband cellular would provide greater capacity than TDMA. The committee has been offered a standard by a vendor, Qualcomm, but has not decided whether to use it, write its own, or to use a standard written by another vendor

Handoff to Scene II

Future editions of this newsletter will expand on the topics mentioned in this issue, starting with the role of TIA sub-committee TR45.2 and its most important product - Interim Standard IS-41. Other topics will include seamless roaming, billing, fraud control and interpretations of current events.

We will try to be informative, combining historical, market and technical issues to illustrate the current challenges in the cellular industry. We will also try to be brief and direct, not shying away from controversial opinions.

Comments on this newsletter or ideas for future issues are welcome, please fax or phone them to the editor

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