

Public safety and emergency services in future wireless communication

Douglas C. Sicker
Interdisciplinary Telecommunications Department
Department of Computer Science
University of Colorado at Boulder
303-735-4949 (phone)
303-492-1112 (fax)
douglas.sicker@colorado.edu

As various forms of wireless communications become more pervasive, the expectation for this communication to support public safety and emergency functionality will arise. The public switched telephone network presently supports many such functions. The most familiar of these functions is that of Enhanced 911 (E911), for the provision of emergency response capability. A lesser known function is that of Telecommunication Service Priority (TSP), for the prioritization of service provisioning and restoration for national security or emergency preparedness missions. Other functions, such as Government Emergency Telecommunication Service (GETS) and Wireless Service Priority (WSP) provide what the Federal Communications Commission refers to as Priority Access Service (PAS). GETS provides a means of increasing call completion probabilities during times of heavy congestion, which may result from natural or man-made disasters or other emergencies. Likewise, WSP is now being deployed in the wireless space to provide increased probability of accessing resources during times of congestion. WSP will serve to complement GETS for end-to-end connections from wireline or wireless environments. Together these services (and a few not mentioned) form the primary basis for public safety communications.

Most of these public safety services rely on traditional telephony technology. For example, Signaling System 7 (SS7) and Intelligent Network (IN) allow priority services, specialized routing and network management capabilities for such services as GETS and WSP. However, this type of approach may not apply to emerging wireless systems, in that there is a fundamental shift away from centralized control environments, such as SS7 and IN. In such an environment, an authority (e.g., the service provider) controls the network by monitoring and assigning resources to the end users. This approach is rather antithetic to many of the emerging wireless architectures, where control and resource assignment is decentralized. A question this raises is what problems this shift creates and whether such services can still be provided in a reasonably reliable manner? Maybe a more fundamental question to consider is if these networks should support public safety and emergency services?

In this paper, we begin by considering a number of existing public safety and emergency services. Next, we consider the technical problems and requirements associated with providing these services. We next examine an existing wireless technology with respect to these requirements. To end, we consider the applicability of such services.

Keywords: public safety, emergency services, wireless, E911, priority, GETS, WSP