**Mobile Ad Hoc Networks: An Upgrade Over Cellular Networks**

According to Hoebeke (2006), a Mobile Ad Hoc Network (MANET) consists of several autonomous mobile devices which use wireless links to both communicate and build a functional network in the absence of a fixed network infrastructure. That is, the mobile devices themselves can create a network with each other without the need for or intervention of other equipment. This means that the network at large, not just the individual devices, is mobile. Having entire networks able to move anywhere, anytime provides freedom that was not previously possible and is at the heart of new technological innovations. Hoebeke (2006) describes several cutting edge applications of MANETs.

The first historical application for MANETs comes from military tactical networking to improve communication on the battlefield and increase soldier survivability (Chlamtac, 2003). This makes sense because military operations are necessarily dynamic and may not be able to rely on fixed network technology. Unlike cellular networks, MANETs create a multi-hop wireless network that moves as the users move. Moreover, the MANETs can be more secure than cellular networks. Although MANETs were traditionally used in military applications early on, their utility and usage has grown in civilian areas as well.

A civilian application of MANETs, for example, is for emergency services (Chlamtac, 2003). In the case of a natural disasters, a MANET can replace a damaged or otherwise unavailable wired network. They can also be useful in search and rescue operations. For example, an emergency responder can gain access to a patient’s medical records in addition to being able to transmit his or her status or diagnosis to the hospital or other nearby services.

Moreover, MANETs can be useful in Educational applications (Chlamtac, 2003). Virtual classrooms or conference rooms could be easily set up without wiring or much user interference. Indeed, conferences, meetings, or lectures could be held anywhere, even outdoors!

Similarly, MANETs can be used in mobile business applications (Chlamtac, 2003). The most obvious application is the mobile office itself. That is, a mobile employee would be able to access customer files, make real time changes to those files. In addition, the employee can have access to e-commerce at a customer’s remote location. This way, the customer can make payments immediately upon delivery of service, in the convenience of his or her own home.

A final application discussed herein is to simplify both enterprise and home networks (Chlamtac, 2003). All devices including printers and whiteboards can be networked and shared wirelessly. And in the home, consumer electronics can have smart sensors embedded in them and be networked. This would give consumers the capability to automate tasks as well as promote green initiatives.

Mobile Ad Hoc Networks provides the flexibility that Cellular Networks cannot because of their ability to provide internet service anywhere, anytime. As such, MANETs are the preferred solution for many applications where a fixed infrastructure is either “ not available, not trusted, too expensive, or unreliable” (Hoebeke, 2006). Their deployment is simple and does not require much planning, wiring, or user intervention. Also, since MANETs can be integrated with standard cellular networks, they can extend coverage and interconnectivity to a broader area than previously possible. Because of their numerous benefits and applications, MANETs will prove to be a growing part of future telecommunications architecture.

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