MANET Performance in the Real World

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Are MANETs, or mobile ad-hoc networks, ready for the real world? This poster presents the results of field trials conducted to measure the performance of MANETs created using commercially available devices and software, in scenarios typical of suggested applications.

A MANET is a collection of wireless nodes that can dynamically form a network to exchange information without using any pre-existing fixed network infrastructure. MANETs have long been of interest to the military, as they can be created quickly where no fixed network exists, such as rural areas or developing countries, or where the fixed network has been disabled, such as an urban area damaged by natural disaster or conflict. However, civilian use has been limited due to the perceived expense and complexity of the technology.

In recent years, however, there has been a revival of interest in MANETS from the research community, inspired by the arrival of wireless networking standards and increasingly powerful mobile devices. Proponents of MANETs have suggested, and in some cases developed, civilian applications ranging from instant networks among people at lectures, business meetings and sports events, to inter-vehicle networks communicating traffic conditions and accidents, to city-wide networks, to continent-sized networks made up of everyday objects capable of ad-hoc, wireless communication. The widespread adoption of technologies such as mobile phones, instant messaging, and peer-to-peer computing illustrate the value placed by various groups of people on low-cost, real-time exchange of information, via personal devices, within informal groups and between individuals. Today MANETs offer this functionality, anywhere, anytime, and without any monthly charges. However, there remain doubts over MANET performance when faced with large distances, walls and other obstacles, radio interference, node movement, and devices with limited resources.

This poster shows the results of field trials of MANETs created using Wi-Fi enabled pocket PCs and laptop PCs running Colligo software. Performance was measured in various scenarios typical of suggested applications, with the expected performance inhibitors identified and controlled as far as possible in each case. The results suggest that wireless communication drains battery power too quickly to make some applications practical. Performance was also affected to varying degrees by activating security features, transmitting over distances more than 100 meters, and the presence of landscape and structural features. Conversely, node movement seems to have very little effect. Overall, current MANET technology appears ready for small scale applications. City and continent sized networks, however, aren't yet technically viable.