Mobile Ad hoc Networks
A General Perspective

Abstract

An ad hoc network is a collection of wireless mobile hosts forming a dynamic, network without the aid of any centralized administration or fixed network infrastructure. In such an environment, mobile hosts cooperate to perform as hosts as well as routers, and forward packets to each other in order to communicate. Such networks have fluid, rapidly changing and multi-hop topologies composed of bandwidth-constrained wireless links. Hosts enter and leave the ad hoc network as they desire, according to their transmission capabilities. The ad hoc network hence continuously adapts and modifies its configuration over time. Such ad hoc networks have tremendous potential in commercial, military and domestic applications. They can enable connectivity between mobile nodes when there is little or no infrastructure available, or it is inconvenient to use. When integrated with the Internet, they can provide roaming net connectivity to mobile nodes.

This paper provides an introduction into the fast developing area of ad hoc networks and the inspiration behind it. It presents a general overview of the technologies and methodologies relating to ad hoc networks, and compares it to related mobile technologies like Mobile IP. Characteristic features and design considerations in ad hoc networks are elucidated. The paper also covers the interesting area of routing in ad hoc networks. In this regard, the various routing algorithms developed for ad hoc networks are described and compared. The range of constraints imposed on performance such networks due to low power limitations, and capability of current day transmission media are also considered. As a glimpse into future, it ventures upon the possible applications of ad hoc networks and provides a brief overview of the challenges facing the implementation of ad hoc networks.

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