Abstract

Ad hoc networking is a research field that attracts more and more attention amongst researchers. It includes a variety of topics involving many challenges. In this thesis, we deal with security problems, and focus on one related to the energy constraint of the nodes forming the ad hoc network, namely node selfish misbehavior or node non-cooperation. This problem threatens the service availability, one of the security requirement. It consists of a misbehavior in which the node, anxious about its battery shortage, drops packets originated from other nodes it is assumed to route, while using them as routers to transmit its own packets toward remote nodes. We first provide a general review of some security problems, along with the current solutions, then we survey the selfish misbehavior in a separate chapter. Before attempting to mitigate the selfishness problem we first treat its cause, by tackling the power management, and proposing a power aware-routing protocol. However, although the power-aware routing protocols, such as the one we propose, help improving the battery life time, they are far from eliminating this challenging problem. Therefore, a solution that detects and isolates selfish nodes is mandatory for self-organized ad hoc networks. We then propose a new solution to monitor, detect, and isolate such nodes [1].

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