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ENHANCING THE LOOKUP PERFORMANCE AND POWER DETECTION OF KADEMLIA BY RANDOM LANDMARKING CLUSTER

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Abstract. *The KAdHoc, a modified mechanism from Kademlia, can successfully be applied to an ad-hoc peer-to-peer lookup system. KAdHoc not only has faster search time, but also higher success rates and lower overall traffic under conditions of high node density compared to Kademlia and Pastry. The success rates of KAdHoc are also higher when node velocity increases. We first group nodes which are physically close and then propose a new routing process and a new broadcast mechanism. We further improve KAdHoc by considering power status, to retain nodes with long uptimes and to delete nodes which are no longer reliable. Finally, mobility is considered in the KAdHoc scheme. Simulations confirm that the enhanced KAdHoc performs well in ad-hoc networks.*
Keywords: P2P, DHT, Random landmarking, XOR metric

1. **Introduction.** Mobile AdHoc networks (MANETs) will become key components in the next generation's wireless network system. The increasing popularity of Peer-to-Peer (P2P) applications poses many business chances. MANET and P2P networks share a number of similar characteristics, such as in self-organization, scalability, decentralized information dissemination and discovery. Both P2P and Mobile AdHoc networks produce synergies and create new possibilities. But many existing P2P structures do not seem suited for employment in MANETs without modification. How to improve the resource retrieval and discovery for P2P applications in wireless mobile networks is a critical issue. The possibilities and challenges between P2P and MANET motivate our research of enabling efficient P2P lookup system over MANET.

Recently, more and more research is directed toward the deployment of P2P networks in the MANETs. Much of the research focuses on P2P distributed hash tables (DHTs) [10,11], as those systems overcome the scalability problems. However, P2P networks do not consider the underlying physical topology in their construction. This often leads to two overlay neighbor nodes which do not have to be physical neighbor nodes. We find the combination of RLM and Kademlia may be a better solution. This is why we revisit this problem.

In our opinions, systems formerly deployed in wired networks applied to MANETs require some solutions of the following issues: Firstly, neighboring nodes in the P2P network may not be in physical proximity, and could actually be fairly distant from each