

Random and Linear Address Allocation for Mobile Ad Hoc Networks

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Abstract

To join an IP network and communicate with others, a node needs to be configured either manually by an administrator or automatically through a DHCP server. However, the former method is impractical for large networks, while the latter is infeasible in the case of a mobile ad hoc network due to the mobility of the nodes. This paper introduces two distributed IP address auto-configuration mechanisms for mobile ad hoc networks, namely (a) *RADA* (Random Address Allocation) and (b) *LiA* (Linear Allocation). *RADA* is based on random IP address selection, while *LiA* linearly assigns new addresses by utilizing the current maximum IP address value. We have also introduced an improved version of *LiA*, known as *LiACR* (Linear Allocation with Collision Resolution), which reduces control overhead. Then, we discuss extensions of these mechanisms capable of handling network partitioning and merging. Performance evaluations of *RADA*, *LiA* and *LiACR* were conducted through simulation. The results related to address allocation time and control overhead are presented and compared.

Index Terms

IP Address Auto-Configuration; Ad Hoc Address Acquisition; Address Conflicts; Resolution Schemes;