Comparative Study of Dominant Routing Protocols in Ad Hoc Networks

Abstract

An ad hoc network is an autonomous self-organized wireless network. It consists of a collection of wireless nodes in which the communication paradigm is decentralized. The term "ad hoc" refers to the lack of any preexisting communication infrastructure such as routers in wired networks or access points in the traditional wireless networks. Instead, each node participates in routing by forwarding data for other nodes, so the determination of which nodes forward data is made dynamically on the basis of network connectivity. The ad hoc network is an autonomous system in which mobile hosts connected by wireless links are free to move randomly and often act as routers at the same time. As a result, the routing task in such type of networks introduces several types of challenges which were never apparent in the traditional infrastructure-based networks. The main objective of this study is to investigate the routing problem in wireless ad hoc networks. More specifically, the performance of the different ad hoc routing protocols which are dominantly adopted in such types of network environments will be examined. A simulation model with MAC and physical layer models, based on the simulation tool ns-2, was used in studying the behavior of two different protocols, namely, Ad Hoc On-Demand Distance Vector Routing (AODV), and Destination-Sequenced Distance-Vector Routing (DSDV). Two performance metrics were used to establish a comparison between these routing algorithms: Average End-to-End Delay, and Packet Delivery Ratio. Simulation results showed that On-Demand routing protocol, AODV, provides a higher Packet Delivery Ratio. However, Table-Driven routing protocol, DSDV outperformed AODV in minimizing the
End-to-End Delay.

References


Index Terms

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Keywords

Mobile Ad Hoc Networks Ad Hoc (MANET) On-Demand Distance Vector Routing (AODV) Destination-Sequenced
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End-to-End Delay

and Packet Delivery Ratio.