

A PERFORMANCE SIMULATION FOR STATIONARY END NODES IN AD HOC NETWORKS

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ABSTRACT. *In ad hoc mobile networks (MANET), the mobility of the nodes is a complicated factor that significantly affects the effectiveness and performance of ad hoc routing protocols. Mobility and traffic patterns for each node such as intermediate and end nodes are restrained to extract features of each routing protocol. In this paper, we focus on the performance of the routing protocols for stationary end nodes in ad hoc networks using a network simulator (NS-2). Our simulation results explore following two performance features for the AODV control packets. Firstly, route stability is more sensitive to the number of intermediate nodes than the speed of intermediate nodes. Secondly, the number of RREQ packets linearly increases in terms of the number of node. In addition, we observed the following two features of TCP performance. Firstly, the TCP throughput on AODV with mobile intermediate nodes degrades about 20 % compared to stationary intermediate nodes. Secondly the TCP throughput on DSR is sensitive to the node speed.*

Keywords: Ad hoc network, Routing protocol, AODV, Node density, Simulation

1. Introduction. The function of mobility for any devices has been common and enhanced to equip the communication ability. These mobile devices have been utilized not only in computer networks but also in diverse fields such as the medical field to communicate body vibration signals [1]. In addition, wireless communication technology is used in wireless network based on 802.11, 802.14 or 802.15, and in cellular phone based on CDMA standards. These variety and communication ability generate new research fields such as CDMA for underwater communication [2]. These technologies, however, has mainly developed in the Internet field, especially in the media access layer and network layer. Contrary to the wired network, MAC protocol directly affects the performance in wireless communication. To establish reliable communication in MAC layer, multi-slots and directional antennas are equipped in wireless communication component with new communication algorithm [3].

Ad hoc wireless networks provide the communication link between two mobile nodes without wired network and stationary station nodes, and cover wireless sensor networks and wireless mesh networks. This communication link is maintained by the routing protocol working on intermediate mobile nodes. The simplest way to establish communication link in ad hoc networks is to perform flooding. Several protocols have been proposed to avoid flooding. One approach tries to construct and dynamically update paths between