International Journal of Computational Intelligence and Informatics, Vol. 3: No. 2, July - September 2013

A Novel Routing Scheme Based on Protection Mechanism to Discover Unconventional Disjoint Path in Ad Hoc Wireless Networks

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***Abstract*- The performances of the routing protocols are important since they compute the primary path between source and destination. In addition, routing protocols need to detect failure within a short period of time when nodes move to start updating the routing table in order to find a new primary path to the destination. Meantime, loss of packets and end-to- end delays will increase thereby reducing throughput and degrading the performance of the network. This paper proposes a new algorithm, DBRT (Determined Backup Routing Table), to improve the existing proactive protocols such as DSDV (Destination Sequenced Distance Vector) protocol by creating a backup routing table to provide multiple alternative routes. The DBRT algorithm identifies adjacent nodes for each node in the same range and then selects one of these as a backup next hop according to the available path to the destination. The results show that loss of data packets, throughput and end-to-end delay times between source and destination are improved. The results show that the new protocol does not degrade the network's performance despite sending extra messages to construct and update the new backup routing table. Simulations (using an NS2 simulator) are undertaken to demonstrate the difference between using a DSDV protocol with or without the proposed schema.**

Keywords- Network Protocols, DSDV, Wireless Network, Mobile Ad Hoc Network

I. INTRODUCTION

In Mobile Ad Hoc Networks (MANET) is unlike the wired networks, because there is no central infrastructure between the nodes. Each node can exchange data dynamically without the need to a fixed base station or a wired back- bone. Some limitations of the MANET network have been researched, such as, transmission power limitation and multiple hops. This is because MANET Uses intermediate nodes to exchange information to pass its traffic to its destination. Hence, route discovery and maintenance in MANET networks is an essential issue. The nodes in wireless ad hoc networks can move frequently and instantaneously from area to area without notification, which leads to various problems, such as, loss of connectivity and an increase in the holding time, during which a new shortest path between source and destination is computed for the routing table[1].

When a loss in connectivity occurs, not all the nodes on the topology will be informed. This will generate loops in the network, which degrade its performance and reduce throughput. IP recovery will discover a backup path within a short period to alleviate loss of packets, reduce end-to- end delay and avoid loop in the network [3]. In MANET ad hoc networks, there are various kinds of main routing protocol tables. In table-based protocols, each node constructs a routing table that includes all routes to all nodes on the topology. The routing protocol needs to send periodic messages that contain routing information to keep the routing table for each node up to date. In on demand-protocols, nodes compute routes when they are needed.

Ad hoc wireless networks are frequently affected by failures when nodes move in and out and of radio propagation range. It is, therefore, highly desirable to develop a recovery mechanism to improve the quality of service (QoS) of the network. In the meantime, loss of data packets and end-to-end delays will increase. Many different types of routing protocols have been used to solve this routing problem, including DSDV, Dynamic Source Routing (DSR) and Optimized Link State Routing (OLSR) protocols [4]. In wired networks, the routing protocol generally uses distance vectors or link state routing algorithms. Both are proactive mechanisms as they send extra messages to keep the nodes up-to-date in case any information on the network changes, such as, if a node joins the network or it fails.

ISSN: 2349 - 6363