ABSTRACT

Over the last decade, there has been a growing interest in Mobile Ad Hoc Network (MANET). Ad hoc networks become popular since it can provide useful personal communication in certain applications such as the battlefield, academic, and business without any support from fixed infrastructure. The characteristics of ad hoc networks are that they are decentralized, self-organized, self-deployed, and they possess dynamic network topology. All mobile nodes in ad hoc network communicate with each other directly or through intermediate nodes by using routing protocols algorithm. The goal of using routing protocols in MANET is to discover and establish routes between two nodes in order to send data packets from the source to their destination. This research has mainly focussed on Dynamic Source Routing (DSR) protocol with regard on the link failure problem and cache staleness issue in the route cache. The main weakness of ad hoc networks is lost connectivity between mobile nodes. This is because whenever the link between source node and destination node is broken, intermediate node will try to find an alternative route from its route cache in order to divert data through stable connection. If an alternative route is not available, the source node will reinitiate route discovery process to find a new route, which may result in the decrease of the performance of DSR protocol. Therefore, to avoid this situation, we propose an extension of DSR protocol called Redirect Link Failure Protocol (RLFP) in order to solve link failure problem and update routes in the route cache of DSR protocol. RLFP consists of three parts. The first part is based on Link Prediction Algorithm, which utilises signal power strength from the received packets to predict the link before any break down happens. The second part is based on Link Solution Model, which contains sub-models that can solve and redirect link failure. Finally, the Enhanced Route Cache Model, which possesses a scheme that is called "Updating Route Scheme", to avoid stale routes.