Universiti Teknologi MARA

Analysis of Distributed Hash Table (DHT)-Based Routing Protocol for a Scalable MANETS

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DECLARATION

I certify that this thesis and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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ABSTRACT

The development of wireless technologies rapidly grows which results in the increasing number of mobile users. Mobile Ad Hoc Network (MANET) is one of the technology used to fulfill the high demand from mobile users. As a result, researches on MANET focusing on improving the efficiency of routing increases as well, especially on scalability. The project objectives are to identify and analyze how 3D-RP routing protocol that works with DHT features in routing protocol for MANET and to simulate the network performance of 3D-RP and M-DART theoretically and execute the simulation of AODV; then do a comparison of the routing protocols. There are two types of simulation which are the real simulation for AODV and the theoretical simulation for 3D-RP, M-DART. The result of the simulation had been analyzed based on three performance metrics which are end-to-end delay, packet delivery ratio (PDR) and routing overhead. Theoretically, the results show 3D-RP capable to scale to more than 400 nodes compared to M-DART and AODV. In addition, all performance metrics shows coherent results. However, the results for AODV real simulation produced a reliable results on end-to-end delay where the value increased gradually (16% to 22%) when the number of nodes increases from 25 to 400 nodes. Results for PDR and routing overhead show an illogical values where by the PDR remain constant value at 100% and routing overhead slightly decreases from 18% to 13% when number of node increases. Thus, the results for PDR and routing overhead are inaccurate. This findings might be due to error in simulation setting, AWK scripting or TCL scripting. Moreover, this project provides some guideline in developing a DHT-based routing protocol using 3D-RP in NS2. The recommendation of future studies is the project will be continued in developing routing protocol using DHT paradigm and learn to improve the routing efficiency focusing on scalability. Furthermore, this design of routing protocol can be explored to other wireless technology such as Cognitive Radio Ad Hoc Networks (CRAHN); where CRAHN is a possible solution for improving current spectrum utilization.
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