# Perbandingan kinerja beberapa model mobilitas node terhadap stabilitas jaringan dan konsumsi energi pada manet dengan algoritma clustering DMP = Performance comparison of several node mobility models to the network stability and energy consumption in manet with DMP clustering algorithm

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Abstrak

Jaringan mobile ad hoc adalah jaringan wireless yang terdiri dari node-node bergerak yang berkomunikasi tanpa melalui access point atau pun server. Kinerja protokol dan aplikasi MANET sangat dipengaruhi oleh frekuensi perubahan topologi jaringan dan model mobilitas yang berbeda yang dapat menyebabkan rute terputus karena node keluar dari jangkauan sinyal transmisi. Penerapan algoritma clustering dapat mengatasi kekurangan pada MANET seperti skalabilitas, keterbatasan sumber daya serta topologi yang dinamis. Skripsi ini menggunakan algoritma DMP, sebuah algoritma clustering yang dapat beradaptasi dengan cepat terhadap perubahan topologi dan mengurangi pemilihan ulang cluster head sehingga stabilitas jaringan cluster dapat tercapai. Skripsi ini menganalisis perbandingan kinerja beberapa model mobilitas node terhadap stabilitas jaringan dan konsumsi energi pada MANET dengan algoritma clustering DMP. Stabilitas jaringan dinilai berdasarkan rata-rata jumlah cluster terhadap kecepatan maksimum node dan lama waktu simulasi, rata-rata jumlah anggota cluster terhadap kecepatan maksimum node dan waktu simulasi serta konsumsi energi terhadap waktu simulasi. Penelitian dilakukan menggunakan simulasi Network Simulator 2 (NS-2) versi 2.29 dan Bonnmotion versi 2.0 sebagai generator skenario mobilitasnya. Simulasi dijalankan pada sistem operasi Linux Ubuntu 12.04 LTS.
Dari hasil simulasi didapatkan bahwa model mobilitas RWP lebih stabil dari segi jumlah cluster untuk jumlah node 10, 40, dan 100 secara berturut-turut 5-6, 11-14,19-20 cluster. Dari segi jumlah anggota cluster, kestabilan jumlah anggota cluster menurun untuk ketiga model mobilitas. Dari segi total konsumsi energi, model mobilitas RWP lebih hemat dengan rata-rata total konsumsi energi pada jumlah node 10, 40 dan 100 secara berturut-turut 20, 43 dan 138 Joule.
.....Mobile ad hoc network is a wireless network which consists of mobile nodes that communicate without access point or server. Performance of MANET protocols and applications is strongly influenced by the frequency of changes in the network topology and the different mobility models that may lead to broken link because the nodes are out of signal transmission range. Implementation of clustering algorithms can solve the problems on MANET such as scalability, lack of resources and dynamic topology. In this work we use DMP algorithm, a clustering algorithm that can adapt quickly to the changes in topology and reduces re-election of the cluster head, so that stability of the cluster network can be achieved.
This work analyzes the performance comparison of several node mobility models to the network stability and energy consumption in MANET with DMP clustering algorithm. Network stability is assessed based on the average number of cluster to the maximum speed of the node and to the duration of the simulation, the average number of cluster member to the maximum speed of the node and to the duration of the simulation and the average number of energy consumption to the duration of the simulation. The study was conducted using simulation of Network Simulator 2 (NS-2) version 2.29 and Bonnmotion version 2.0 as mobility

scenario generator. The simulation is run on Linux Ubuntu 12.04 LTS operating system.
The simulation results shows that Random Waypoint mobility model is more stable in terms of cluster number for number of nodes 10, 40, and 100 respectively 5-6, 11-14,19-20 cluster. In terms of the number of cluster member , the stability number of cluster member decreases for all three mobility models. In terms of total energy consumption, Random Waypoint mobility model is more efficient to the average total energy consumption for the number of nodes of 10, 40 and 100 respectively 20, 43 and 138 Joule.