

## ABSTRACT

Routing is a path determination process in packet passing on a network. An ideal routing algorithm used must be able to find optimal path to transmit packet in specified time.

Genetic algorithm itself is a searching algorithm based on natural selection and genetic mechanism that can be utilized to solve the multi-criteria and multi-objective optimization problem. Here, genetic algorithm is simulated in Network Simulator 2 to determine the optimal path in the computer network routing process.

In the beginning of process, it is possible to have many path solutions offered. The most optimal path will be saved first using *elitism* method, to staunch the best current solution. Then those paths (called *parents*) will be included in a selection process using *Tournament Selection*. After the selection, the selected solutions will be brought to the *crossover* and mutation process and then the result of process is the path selected for packet routing.

From the computation time, djikstra can achieve shorter time on topology of 6, 10, and 20 nodes, while genetic algorithm take shorter computation time on 40 and 60 nodes with different path determined. These variations on path determination lead to the different value of delay and packet loss. From convergency aspect, changing the routing algorithm does not affect very much because the ability of convergence is depended on how the routing protocol works on updating its information.

**Keywords :** Genetic algorithm, routing, *tournament*, *parents*, *crossover*, mutation, Link State.