ABSTRACT

In the current network architecture, IP addresses are used in the data transmission process, and issues such as scalability, security, and efficiency in content retrieval can arise. To overcome these problems, Named Data Networking (NDN) emerged as a new paradigm that aims to develop internet architecture in networks that were previously host-centric to data-centric. However, NDN needs to improve its operation in the two strategies used: congestion on the interface in sending data in the Forwarding strategy and limitations in storing cached data in the Caching strategy.

Intelligent NDN using Reinforcement Learning is designed to solve the problems described. In the simulation run, an environment will be created in the Reinforcement Learning system with scenarios from the Forwarding and Caching strategies in the NDN network. To measure the system's success, testing uses the value of the learning rate and discount factor to achieve maximum results. The process carried out in Reinforcement Learning uses components in the training process with exploration and exploitation (trial and error), namely agent, action, policy, and reward.

The type of data used in this research is quantitative data, taken from Mini-NDN in the form of reference data presented in tabular form. From the data obtained, there are parameters used in the data transmission process, namely SRTT for Forwarding strategies and RTT for Caching strategies. Based on the research results, for the Forwarding strategy with a learning rate value of 0.8 and a discount factor value of 0.3, the optimal result is to get a reward of 5 as many as 62. In the Caching strategy with a learning rate value of 0.7 and a discount factor value of 0.5, the optimal result is to get a reward of 3 as many as 88.

Keywords: NDN, Reinforcement Learning, Forwarding, Caching.