

ABSTRACT

In recent years, the number of people using the Internet to access text, images, and videos has increased significantly. With the increase in data used, the traffic on the current host-centric or IP-based network becomes large and decreases service. Due to limitations in IP-based networks, a new paradigm is being developed in networks, namely Named Data Networking (NDN), which uses names as addresses. In contrast to IP-based networks, in this NDN each node or router can store information so that users do not have to request this information from the server. One of the essential parts of NDN is caching, which is closely related to what content or information should and needs to be stored.

One method to maximize the performance of caching on NDN is to predict content popularity using deep learning. This is used so that the content stored is popular content because users much request it. Besides using content popularity predictions, proactive caching is another method that can improve caching efficiency. Proactive caching is a caching method that stores content before the user requests it. The test parameters that will be used include model accuracy, Cache Hit Ratio, Cache Miss, and Round Trip Time.

From the results of the research that has been done, the method will be applied to the placement of edge-caching strategies that use proactive based on popular content to compare against other techniques such as traditional client-server and reactive edge-cache networks. The Cache Hit Ratio value obtained in the proposed model has increased by 15% compared to the previous method. Then the Round Trip Time value is efficient between 8% to 15%. Furthermore, the proposed method can reduce the Cache Miss value by 15%. The increase in the number of requests will be directly proportional to the service time of a node. The more requests, the longer it takes. The research results show that the placement of cache nodes using the degree method can increase the value of Cache Hit Ratio by 15% to 25% and Round Trip Time by 15%. Then reduce the weight of Cache Miss by 10%. The application of popular content prediction for proactive cache can improve the system's performance.

Keywords: Named Data Networking, Deep Learning, Proactive Caching, Popular Content, Cache Hit Ratio, Cache Miss, Round Trip Time