ABSTRACT

The number of internet users worldwide increased from 3.9 billion in 2018 to 5.3 billion in 2023, according to the Cisco Annual Internet Report, which shows that the internet has a vital role in civilization. This illustrates the large amount of internet data traffic. The amount of data traffic on the internet today indicates the need for data classification to see the difference in classification in each class of internet data. However, TCP/IP as a standard data communication protocol has shortcomings. In the future, TCP/IP will be unable to solve the challenges related to data distribution and internet data addressing due to its end-to-end network infrastructure. Solving these challenges is done using the Named Data Networking architecture, which focuses on the name of the data content.

NDN is a distributed network paradigm with data communication using identity-based on the content name so that communication runs efficiently. An essential key in improving the performance of NDN is caching strategies such as cache placement policy and cache replacement policy, as they increase the availability of data in the network so that the distance and delay of content delivery can be reduced. This caching algorithm aims to set up a system scheme regarding the rules of the data replacement policy in the cache by considering the type of data class that is classified as a result of the increase in internet data traffic due to the increase in internet users. This replacement policy aims to select content to be deleted so that the cache space can be used to store new content based on the internet data classification system.

This research tests Priority-FIFO and LRU Replacement Caching Policies by considering four classes of internet data packets on the producer side and changing their value in content storage. The test uses 26 nodes of the Indonesian Digital Network topology on Mini-NDN as a network emulator, which provides research results and is close to real-world conditions. Based on the test results of three test parameters in five test scenario schemes, from the second to the fifth scenario scheme, the value of the results is significant to distinguish the data type in each class. In detail, the Priority-FIFO Replacement Policy caching algorithm performs better in scenario 3. Based on the data classification system performed in scenario scheme 3, there is a significant difference in each data class's results, and Priority-FIFO performs better than LRU. This indicates that the caching system affects the test parameters used in this study. On average, the internet data class in scenario three is set to 1,000 to 5,000 data when the content store hits value. Priority-FIFO is better than the LRU algorithm, respectively 54.684% for average RTT (ms), 31.563% for throughput (bytes/s) and 7.018% for cache hit ratio.

Keywords: Cache, Data Class, Data Packet, Named Data Network, Replacement Policy