

ABSTRACT

The Named Data Network (NDN) is a future network concept that addresses some of the issues present in the current internet architecture. One of the main advantages of NDN is the use of content caching at each router, enabling faster and more efficient data access. As internet network technology develops, the demand for video content continues to increase every year. Therefore, video optimization and delivery require high access speeds so that clients can run content from the server without a hitch. Based on previous tests in the NDN-RG Laboratory, it was found that the data transfer speed in the NDN network only reached 0.8 MBps. This is far from the standard that is considered adequate when compared to the IP networks that are currently in use.

This final project involves exploring forwarder replacement using NDN-DPDK (Named Data Network Data Plane Development Kit) and YaNFD (Yet Another NDN Forwarding Daemon), both of which are designed to support multi-core and multi-thread processing. Meanwhile, the replacement of IP and UDP protocols with NDN-P4 uses the P4 programming language. The implementation and analysis of video streaming performance will use Quality of Service (QoS) parameters such as RTT, throughput, and startup delay to measure the quality of video streaming on the network side. In addition, CPU measurements are made on the router closest to the client to evaluate the traffic load required by the forwarder to transmit data.

The results of implementation and analysis in this final project can improve the quality of video streaming on the second accessor with RTT time below 1.1 s, throughput above 1.7 MBps, video startup delay below 1.8 s, and CPU usage below 7%. When compared to previous research, using YaNFD as a forwarder resulted in a 2-fold improvement. This shows the effectiveness and superiority of YaNFD in improving video streaming quality on NDN networks.

Keywords: Named Data Network, P4, NDN-DPDK, YaNFD, Video Streaming.