ABSTRACT

Named Data Networking (NDN) is a new network architecture proposed by Van Jacobson based on the name rather than the address on the IP. It has a cache mechanism to improve performance on the edge network. With increasing numbers of internet users, networks with better adaptability are preferred. Although implementing a Software Defined Network (SDN) to NDN can achieve higher adaptability, this approach can add more dependency and lead to higher complexity. To resolve these problems, we implement the centralization concept into NDN.

Similar approaches are used by Sarantis et al. in their proposed reactive routing mechanism that can adapt to network quality. Their implementation can still produce high complexity, considering using additional protocols outside NDN. The method proposed by Ilmi et al. addressed this problem by eliminating the additional protocols but still using hop-count calculation. To improve the performance, this thesis proposed a new Centralized Adaptive Routing (CARI) that utilizes NDN packets as control packets with passive network quality measurement to support adaptability.

This thesis used several scenarios and parameters to evaluate and compare the proposed method to the currently implemented method, such as NDN Link State State Routing (NLSR) and Centralized Routing, which were proposed by Ilmi et al.. As a result, CARI can provide up to 54% for RTT, 59% for Throughput, and up to 72% for Packet Loss in scenarios with network quality changes. Moreover, the adaptive capabilities of CARI do not exert a notable influence on CPU usage.

Keywords *: Named Data Networking (NDN), Centralized Adaptive Routing, Quality of Service (QoS)*

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