

## ABSTRACT

Industrial developments led to the evolution of electricity and telecommunication systems. The industrial sector that is not environmentally sound contributes to increasing carbon emissions and causing climate change. One of the methods to deal with climate change is to use electricity from new and renewable energy sources. In using renewable energy, an intelligent control and control system must deal with intermittent & non-dispatchable renewable generator problems. Generating systems with intelligent control (smart grid) need to be supported by a reliable communication system to fulfill the capability in monitoring, operational, and control needs on the grid.

The increasing number of devices on the internet network raises the problem of running out of IP address allocations. A transition from IPv4 to IPv6 was carried out to overcome these problems, and a new paradigm was introduced as a Named Data Network (NDN). NDN networks that change the paradigm from 'host-centric' to 'data-centric' offer better performance than IP networks through more efficient routing, forwarding & caching mechanisms.

In general, grid systems require a reliable communication system with low packet loss & latency characteristics. The use of named data networks is expected to meet QoS requirements according to the type of traffic on the grid system. In this thesis, a mechanism for classifying traffic by type is used to support the different characteristics of each packet, especially in a grid distribution network (Field Area Network).

Based on the simulation results, FAN traffic meets the QoS requirements to be passed through the NDN network. Using queues with traffic grouping can improve the value of packet drop on the network. However, using a queuing mechanism can cause increased delays in traffic with a lower priority class.

**Keywords:** Named Data Networking, Field Area Network, Grid Communication, QoS