

## **ABSTRACT**

The rapid development of the need for broadband internet Services with high speed and reliable quality encourages the development of serat optic-based broadband access network technology. There are two main architectural designs of serat optic networks that are widely implemented today, namely Fiber to the Home (FTTH) and Fiber to the Tower (FTTT). In the Fiber to the Home (FTTH) network, the internet connection from the operator's central office is channeled directly to the customer's home using serat optic cables. While in the Fiber to the Tower (FTTT) network, the serat optic connection is only built from the central office to the telecommunication tower, then uses wireless technology for the distribution of the last internet connection to the customer. The implementation of a hybrid network design that combines FTTH and FTTT architectures can be a smart solution to provide reliable broadband internet services at high speeds while still paying attention to the cost efficiency of network development. This paper specifically discusses the design of FTTH and FTTT hybrid networks for broadband services with OptiSystem software. Based on simulation results, the hybrid network design is proven to be able to provide broadband internet services with low latency and high throughput. In conclusion, the application of FTTH and FTTT hybrid network architecture can effectively provide broadband internet services with high performance and optimal infrastructure development costs.

**Keywords:** Optical Serat, FTTH, FTTT, Broadband.