

ABSTRACT

Nowadays the use of information technology in Indonesia is growing very rapidly, for example, the use of internet connections on gadgets, computers and other devices. If in the past the internet connection was only accessible on certain devices and with limited mobility, now everywhere even with any device we can access various information content on the internet. For example, on some devices such as IPTV to access video streaming, computers to access data to the internet and smartphones that are at home are connected to the network or we can call Home Area Network (HAN), with the increasing number of devices connected to the network, the bitrate must be reach Gbit/s because of the many types of services run by the user.

In this study an analysis of the performance of the home area network network using Radio over Fiber network topology - Wavelength Division Multiplexing on three Wi-Fi standards, the IEEE 802.11n standard that uses a 2.4 GHz working frequency with a data speed of 300Mbit/s, the IEEE 802.11ac standard using a 5 GHz working frequency with a data speed of 1350Mbit/s, and the IEEE 802.15.3c standard that uses a 60 GHz working frequency with a data rate of 6000 Mbit/s, each of which is measured at a distance of 5 kilometers, 10 kilometers, 15 kilometers and the farthest distance of 20 kilometers according to the standard of access network.

The results obtained from the calculation of the three schemes are at the farthest distance of 20 km, in the IEEE 802.11n standard the BER value is $7,987 \times 10^{-44}$ and Q-factor is 13.834. In the IEEE 802.11ac standard, the BER value is $7,987 \times 10^{-44}$ and Q-factor is 13.834. And the IEEE 802.15.3c standard obtained results with a BER value of $4,154 \times 10^{-39}$ and Q-factor of 13.03. The three schemes that have been simulated have obtained parameter values that meet the BER standard of 10^{-9} and Q-factor of 6.

Keywords : Radio over Fiber, Wi-Fi, Fiber Optic, Radio Signal.