

ABSTRACT

Wireless is a technology that connects two or more devices without using cables. The use of wireless networks supports daily work activities, both in offices and other institutions. With wireless networks, it becomes easy to rearrange without the need for new network installations, saving time and costs. In this research, the Network Development Life Cycle (NDLC) method is utilized as the process flow for conducting the study. Data collection on the research subject is carried out using Wireless Site Survey, employing Ekahau software with IEEE 802.11 standardization. The research results include an analysis of the performance of wireless network access in the research subject. The site survey findings in the faculty room indicate a dominant signal strength not exceeding -65 dBm at a frequency of 2.4 GHz, while at 5 GHz, the dominant signal strength surpasses -65 dBm. This discrepancy is due to the shorter range of the 5 GHz frequency compared to 2.4 GHz. Another factor involves the placement of access points in the corridor in front of the faculty room, leading to suboptimal range due to obstacles like doors and walls. On the second floor, the signal strength is below -55 dBm at a frequency of 2.4 GHz, while at 5 GHz, the dominant signal strength is above -65 dBm. This is not a concern since the access point is located in a room without computer devices. As a result, the coverage area and signal strength in said room do not exceed -55 dBm for both frequencies. Based on the Site Survey results, a recommendation is proposed in the form of a simulated access point placement design and access point renewal, particularly on the first floor. The initial placement of the access point outside the faculty room is moved indoors to reduce signal propagation obstacles emitted by the access point. With this recommendation, a better coverage area is achieved, and the dominant signal strength in the faculty room does not exceed -55 dBm for both frequencies. In addition to the suggested placement of access points, device updates are also recommended to maintain network quality in the research area. The access points currently in use were manufactured in 2014 and will reach the end of their service life in 2024. Therefore, an update is advised. The recommended device is the Cisco Catalyst 9100 series access point. This access point offers stronger power capabilities, especially on the 5 GHz frequency,

supporting up to 400 milliwatts. Additionally, this device provides Smart AP features, which adjust the power usage based on connected users, optimizing power consumption.

Keyword—*wireless, coverage area, network development life cycle, wireless site survey*