

ABSTRACT

Wireless networks have become a vital aspect of modern communication, especially in heavily populated public facilities like college lecture halls. This thesis studies the current wireless network situation in a multi-floor public lecture facility at Telkom University and proposes optimizing the network configuration, specifically in the channel plan and transmit power settings. This study's literature review includes essential material on frequency reuse in cellular and Wi-Fi technology found in guidebooks for Certified Wireless Network Administrators (CWNA). In addition, the researcher reviewed theses on similar topics from other universities. The Network Development Life Cycle methodology was used, with a focus on the first three phases: Analyzing, Designing, and Simulation Prototyping. The findings of the study indicate the building's current wireless network uses a basic channel plan pattern, but some access points with the same channel are separated by only one cell or are placed next to each other, and the existing transmit power configuration is too high, resulting in signal bleed to other floors. The large open space in the center of the building also poses a challenge when configuring the channel plan and transmit power, since excessive transmit power can cause interference with other floors, while insufficient transmit power can reduce the coverage area for each floor. To address this issue, the study proposes optimizing beyond the channel plan and transmit power settings. The proposed optimizations include the following: decreasing the number of SSID in each AP to reduce network contention, installing physical insulation in each area that requires it, considering turning off 2.4 GHz capabilities in some access points, and adding more access points.

Keyword: *Wireless Network Optimization, Channel Plan, NDLC, Transmit Power, Channel Reuse*