CHAPTER I INTRODUCTION

I.1 Background

In this modern era, the use of internet technology to access information in the form of text, images, and videos is needed by the community to interact in cyberspace. The development of the network used to use a Local Area Network (LAN) using cables, now it has switched to a wireless network. Wireless networks make it easier for people to use them by using wireless networks to reach a large area.

(IEEE) Institute of Electrical and Electronics Engineers is a standards organization for information technology. Each standard has a different code. One of them is the standardization of wireless networks which has the code 802.11. The first generation of 802.11b standardization runs using a frequency of 2.4 GHz but this standard can only use a maximum bandwidth of 11 Mbps. The second generation of standardization is 802.11a which is a standard that already supports bandwidth up to 54 Mbps and uses a frequency of 5 GHz. The third generation of standardization is 802.11g operating at a frequency of 2.4 GHz which has a transfer rate of up to 54 Mbps this generation is the most used generation of wireless devices. The fourth generation of standardization is 802.11n operating at a frequency of 2.4 GHz which has a transfer rate of up to 300 Mbps. The fifth generation uses dual-band wireless technology that can support simultaneous frequency connections at 2.4 GHz and 5 GHz and bandwidth that can reach 1300 Mbps at 5 GHz and 450 Mbps at 2.4 GHz, this standard can enable previously inaccessible uses such as streaming HD video or playing games with low latency.

Telkom University Landmark Tower (TULT) is a building built by Telkom University. This building has 20 floors which are used to support student academic activities. The TULT Building uses a Wireless network to help connect to the Internet. This wireless is used by the entire Telkom University community, each floor at TULT has two switches and access points that differ in the number of each floor. Observations that will be made at the TULT Building are carried out on floors

4, 5, 6 and 7. There are channel repetitions on each floor and the placement of the wrong access point, this can trigger interference with the access point.

Interference is the interaction between waves in an area. Interference can be constructive and destructive, interference can make the performance of the access point lose power when receiving and transmitting signals, and can cause some databases to be lost, resulting in errors in the bits of information that are being sent, the receiving client finds the error and causes a delay even though it will retransmit the data that occurred in the error.

If interference occurs, it will certainly reduce the Quality of Service at the access point. This research uses several measurements such as throughput, packet loss, and delay measurements. These measurements are taken to detect problems found on the wireless network.

I.2 Problem Statement

Based on the above background, several problem formulations are obtained as follows:

1. What causes interference on the 5Ghz frequency?
2. How does interference QOS affect channeling on WI-FI?
3. How to reduce interference in the TULT building floors 4-7?

I.3 Research Objectives

The objectives of writing this final project are as follows:

1. Analyzing the effect of QoS interference of Wi-Fi 5 GHz band on TULT Building (Telkom university landmark tower).
2. Simulating the calculation of interference distance between access points with Ekahau software.
3. Using the PPDIOO (prepare, plan, design, implement, operate, optimize) method for network development analysis.

I.4 Research Scopes

The research limitations used in writing this final project are as follows:

1. This study is for the purpose of defining and analyzing Telkom University's Landmark Tower network design only and does not configure any network device.
2. This research will help in analyzing the QOS of 5Ghz wireless networks on TULT.
3. This research will use the PPDIOO method as a network design method, but this method will only at design phase.

I.5 Research Benefits

The benefits of this research include.

1. For Telkom University, this research is useful in improving the efficiency of its business processes so that students and lecturers can be more productive in academic activities.
2. For other researchers working in higher education information systems, this research is useful in explaining the most appropriate approach to building digitalization efforts of academic activities.

I.6 Report Systematic

This research is described with systematics as follows.

Chapter I. Introduction

Chapter I explains the context of the problem, research background, problem statement, research objectives, research scopes, research benefits, and report systematics.

Chapter II. Literature Review

Chapter II, it describes the study of literature related to the problems studied and discussed by previous research.

Chapter III. Methods

Chapter III describes the methods used in solving problems in the problem statement.

Chapter IV. Existing Analysis

Chapter IV explains the results of the existing 5Ghz network conditions in the TULT Building.

Chapter V. QoS Analysis Result and Recommendation

Chapter V describes the results of data processing and analysis, discussing the results of the research and research recommendations.

Chapter VI. Conclusion and Suggestion

Chapter VI explains the conclusions from the research and research suggestions that answer questions from the problem statement.