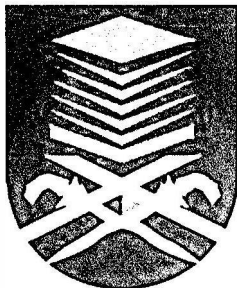# PERFORMANCE ANALYSIS OF SLOTTED ALOHA IN RFID SYSTEM

This thesis is presented in partial fulfillment for the award of the Bachelor of

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"Why do we fall? So we can learn to pick ourselves up. Its not who we are underneath but its what we do that defines us."

ABSTRACT

ALOHAnet or simply ALOHA is a pioneered computer networking system that is developed at the University of Hawaii. The function of ALOHA is to broadcast packets from outbound channel to inbound channel by tackling packet collisions between two clients. In this paper, pure and slotted ALOHA is being simulated to evaluate the performance of both. This study adds the understanding on how a mathematical modeling applied to RFID system. The throughput displays the rate of transmission attempts multiplied by the probability of success scaling the higher the better. The simulation is done using the OPNET Modeller 16.0 and the results show that slotted ALOHA has better throughput performance than pure ALOHA.

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CHAPTER 1

INTRODUCTION

1.1   BACKGROUND

Radio Frequency Identification (RFID) is a technology to identify and collect data through radio frequency digital signals. The system consists of only two devices which are the reader or the receiver and the transponder or transmitter. The transmitter or tag has a microchip build inside consists of unique identifier and an inductive coupling element or antenna use to transfer power from the reader to the transponder. The tag is a passive element whereby it must be energize by the power source or reader before it can sends the data stored. The power energized by inductive coupling is very low and dependent upon the range between the transponder and reader, thus the reader will only receive the data from the transponders located within the interrogation zone of the reader which is an area around the reader where the transponder is energized for transmitting data[1].

The significance of an RFID could increase the reliability and quality of data. Plus it overcomes the limitations of other automatic identification such as bar codes and magnetic cards. It has many advantages such as fast identifying speed, data encryption, longevity and does not affect by the surrounding environment.

The tags use their unique identifier to transmit to the reader for initial authentication and data transmission. When several tags simultaneously enter into a reader's interrogation zone, they start to transmit the stored data, each tag trying to access to the channel. As a result, the signals interfere with each other and the so-called collision happens[2]. Thus, ALOHA was introduced as a wireless packet data network