

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Internet of Things (IoT) era consist of million of user addressed to the network in the same time IEEE 802.11ah working group released new Wifi standardization its called Wifi Hallow and it work in sub band 1GHz. The communication research technology currently used for M2M applications can be classified into two categories. First is Wireless Sensor networks (WSNs) using for interconnecting multiple sensor nodes spread over a particular area and second is regular mobile network, for isolated nodes to allow the gateway of WSN to reach internet[2]. Example for WSN with different system is example: Zigbee, Bluetooth, LoWPAN, 802.15.4 have been considered for transmitting data in M2M system.

IEEE 802.11ah working group (TGah) was created in 2010 released new standardization of Wifi and called Wifi Halow to support M2M wireless communication to cover gap between existing 3GPP (3rd Generation Partnership Project) mobile network and Wireless Sensor Network(2). TGah result with IEEE 802.11ah specification of unlicenced sub 1 GHz worldwide wireless local area network (WLAN) standard for future M2M communicationa supporting a wide set of scenarios based on a large number of devices until 8.191 devided connected in one access point (AP), efficient energy consumption, and long range coverage until 1 kilometer indoor coverage , data rates until 100 kbps and high thoughput[2]. 802.11ah is a wireless communication PHY and MAC layer protocol. In MAC layer, 802.11ah introduces mechanism such how to organize system, sort MAC header, fast accosiation, restricted access windor (RAW) system, traffic indication map (TIM) segmentasion and target to wake up (TWT) to support smooth energy consumption [5, 19, 22]. This study aims to provided simulation of 802.11ah with Network Simulator 3 to choose MCS scheme in Indonesia with good QOS performance (throughput, Delay and Power Consumption) and used 802.11ah to fulfill blank coverage in sampling area and assess its feasibility by conducting cost and benefit analysis.