I. INTRODUCTION

There are many different inventions in IoT. It is always improving as time passes by. One of the inventions is wireless sensor network. Wireless Sensor Network (WSN) consists of many sensors called nodes which work automatically. Sensor will deliver the data to the other node which consists of id and data from the sensor. There can be some delay when the sensor communicates. The delay will affect message delivery. Clock synchronization in WSNs can be regarded as the process of removing the effects of random delays from the timing message transmissions sent across wireless channels [11]. Some iteration is needed when synchronizing the clock until all clocks from each node have the same value. When communicating, the node will make some network called topology.

There are many different types of topology in wireless sensor networks. The examples are star, mesh, cluster tree, etc [3]. This can affect the synchronization because the clock from each node can be different. The data will be delivered faster or slower depending on the topology and the speed of the node when synchronizing clock. Therefore, analyzing which topology is better in synchronizing the clock is important. This will make things effective and efficient. There is also a protocol when communicating. There are many types of protocol used in WSN such as Average TimeSync Protocol [1], [4]. Average TimeSync Protocol is a protocol which synchronizes the clock speed and clock offset. This protocol can be used in every topology. The protocol is fully distributed and asynchronous [4]. It will synchronize the clock from each node in each topology. It will determine which topology is faster, effective and efficient.

Wireless Sensor Network will be implemented in Matlab. Matlab is a numerical computation which can be used to analyze data. The data that will be analyzed in Matlab are clock synchronization and clock speed. The data will be presented with graphs. The graphs will show each time or iteration for each data. The project will take 50 iterations with several topologies. The topology that will be used are ring, star, cluster tree, glasses, and mesh. There will be 10 nodes for each topology and have their own clock. Analyzing the data will conclude which topology is affected and make the clock not synchronized.

The following are the sections for this paper. Section 2 described the literature review. Section 3 introduces the method used in this paper. Section 4 is the result and discussion which talked about the data analyzed. Finally, Section 5 summarized the information given by this paper.