**IoT Gateway encryption on a Raspberry Pi 3 and Raspberry Pi Zero**

**Abstract**

The research conducted on how different types of encryption perform between both the raspberry pi 3 and the raspberry pi zero micro-computers. One of the primary methods we used was to determine what types of libraries already exist that could be utilized in the encryption of the data being tested. The open source library we found most helpful was “paho” which supported MQTT, SSL, and TLS which gave us the encryption needed to perform the desired tests.

**Introduction**

It is extremely necessary that any form of personal and private data be properly secured when being stored, sent, or received anywhere over the internet. Another important thing is the speed and efficiency of the data transfer, thus bringing us to the primary purpose of this research project which is to compare how 2-3 different types of encryptions perform on the Raspberry pi 3 and zero micro-computers. The data that is being transferred between the two devices is done through Bluetooth using the open source java library, “paho”, and another java library “kura”. The tests are being done using a single type of code, which means data results could differ between other researches already done on this topic.

**Literature Survey**

**Methods**

The project was started with the idea of using the Raspberry Pi3 and some other device to encrypt data on, and then transfer to the Pi 3. Our first methods were doing some research on what that secondary device would be, in which we settled on the Raspberry Pi Zero. Following this, we needed to find a way to encrypt and transfer the data, and it was decided that the most efficient way for us to do this was to research multiple existing libraries to determine what would allow us to use 2-3 different types of encryption and use Bluetooth to transfer the data. After the libraries and devices were definite, we began implementing the code and connecting the devices to create the IoT gateway for our testing purposes. Our method of testing is to create 25 different test cases using different sizes of data and different time gaps between each transfer. Finally, the data needed to be compared, so we created a table inside of excel to house and compare the results of the 2-3 different algorithms.