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Assignment Name: ECE 4564, Assignment1

Introduction

Assignment 1 is constructed to build a text-based question and answer system by using two Rpi's and three APIs. The client Rpi captures question uploaded on Twitter through Twitter API and then send it to the server Rpi. Once the server receives the question, it will send it to the IBM watson API and create a .mp3 file which read the whole text. Then, the text-based question will be sent to the Wolframalpha API, searching for the answer, and send the answer back from server to the client. Client, after receiving the answer, will also communicate with the IBM Watson API to create a .mp3 file which read the answer.

Design Document

In order to communicate with Twitter and capture real-timing messages, we use a python library called **Tweepy**. A function called "*tweetsStreamListener*" is used to capture the specific messages sent on twitter by giving a track signal (e.g., "#ECE4564T20"). After messages have been successfully captured, we use **Fernet (symmetric encryption)** library to encrypt the message that will be sent to the server, and **Hashlib** library to generate a checksum. Then we send a payload that includes the encrypted message, key and the checksum to the server. After server received the payload, we first check the checksum in order to make sure the integrity of the message and then decrypt the message with given key. Then we send the message to IBM text to speech API and Wolfram AlphaAPI. The Wolfram Alpha API will return an answer to us and we encrypt and hash the answer in order to form a payload. Last we send the payload to client and the client will extract information from the payload and decrypt the answer then send the answer to IBM text to speech API.

Result

The whole system is successfully implemented between two Rpi's. It starts with sending a tweet which is a question asked by user (e.g., 1 + 1 = ?) on the twitter. The client will capture this question tweet and send it to the server. The question will be sent to the Wolframalpha and the answer (e.g., 2) from that website will be sent back from the server to the client. The answer will be read aloud by the IBM watson.