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| Final Project  ETEC-224 |
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# Introduction

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| The raspberry pi is popular single board CPU, which can be used in various range of projects. One of its feature is temperature sensor that can be accessed using commands. In this project we aim to use raspberry pi 3 ‘s temperature sensor to generate information and it is uploaded to the AWS cloud. We are using online service in this project which is AMAZON WEB SERVICE(AWS) IOT.Problem StatementThe problem that we addressing in this project is need to monitor the temperature of a particular environment and store that information at one location. This information can be used for a variety of purposes, such as to monitor temperature of food storage, warehouses, server room etc. Tradition temperature monitoring methods can be expensive, time consuming and required specialized equipment but in this project we are using raspberry pi ,which has built-in temperature sensor and cloud computing features provides an affordable and accessible solution. |
| Proposed SolutionThe aim of this project was to use in built temperature sensor of raspberry pi to generate temperature data of particular room and device and upload it to amazon web services for analysis. The proposed solution involved the following steps:1.Connect raspberry pi >> open terminal >> install AWSIoTpythonSDK>>create python script which read data from temperature sensor of raspberry pi.2.create AWS account >> use service AWS IoT Core >>create things>>create policies and download certificate>>attach policies and certificate >>use mqttclient service>>use publish in mqttserverclient.3.observe temperature of area and deviceBlock Diagram and Implementation     Thermometer icon or temperature symbol, vector and illustration 5227483  Vector Art at Vecteezy  Raspberry pi In-buit temperature sensor  AWS IoT Data Ingestion Simplified 101: The Complete Guide How to create static IP for AWS IoT Core | Web3 News & Blogging Website —  2023  AWS IOT AMAZON WEB SERVICE MQTT TEST CLIENT    Flow chart demonstrating steps  IMPORTING  Libraries and functions    INITIALIZING VARIABLE  Message IN  Print received MQTT message and store in the message IN variable    GET temperature information from Raspberry Pi  Initializing The AWSIoTMQTTClient  Configuring AWSIoTMQTTClient  Endpoint certificates and other settings  Establishing connection with AWSIoT  Publishing information on AWSIotMQTTclient  END  In this project, Raspberry pi primary element which contain in built temperature sensor.by using python program on Raspberry pi read information from sensor. The python script also deliver information to AWS IoT service. AWS is cloud computing platform and IoT service use to analyze temperature of area and component by using mqtt test client  To communicate with aws IOT service, firstly install aws IOT software development kit by using python command then create things, policies ,and configure certificate in AWS web service. using Mqtt web client publish information and analyze information.     Work Done by {VAIBHAV PATEL-301213341} I have done configuration of AWS service, create AWS IoT things, configure encryption certificates and install AWS IoT software development kit for python. Work Done by {PRANAV PAGAR -301215775 } By practicing and using lab 8 materials, I create python script, which read data of temperature sensor and communicate with AWS IOT to publish. Screenshots and ResultsConclusionIn conclusion, we successfully used the temperature sensor on a raspberry Pi to generate temperature date and uploaded it to AWS IoT Core for analysis. Although we learnt many things, one of main benefits of this project is that it provides low-cost and easy-use solution for monitoring temperature data in real-time. This data can be used in variety of applications, such as monitoring temperature of room, warehouses, food industries.Lessons learnt and future work Background pattern  Description automatically generatedRaspberry pi During the course of this project, we learned several valuable lessons, including:1.How to use temperature sensor of Raspberry pi.2.How to read data from sensor using commands and upload it in web service called AWS(amazon web service)3.How to make python script and run it using commands3.How to use AWS web services and configure IOTFUTURE WORKThere are several areas where we can do future work to improve the solution. These areas are:1)By using GPIO pin of raspberry pi we can add additional sensors, such as humidity, air quality sensors, RFID object detection sensor, etc to the system.2)By using features of AWS services we can also get data on mobile applications and also implement data analysis by using various functions and toolsReference<https://www.raspberrypi.org/learn><https://www.aws.amazon.com/iot-Core/>https://www.github.com/aws/aws-iot-device-sdk-pyton |