

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

“Jnana Sangama”, Belgaum - 590 018



A COURSE PROJECT REPORT of CLOUD COMPUTING
on

“ROOM TEMPERATE AND HUMIDITY MONITORING”

Submitted in the Partial fulfillment of the requirements of Semester -7 of

**BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE & ENGINEERING**

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



CERTIFICATE

Certified that Course Project Work titled **“Room Temperature and Humidity Monitoring”**, carried out by **Prashant Shah (1NT16CS214), Ankit Prasad Gupta (1NT16CS216)**, bonafide students of **Nitte Meenakshi Institute of Technology** in partial fulfilment of Semester-7 of Bachelor of Technology Degree in Computer Science & Engineering under Visveswaraya Technological University, Belagavi during the year 2019-2020. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the Departmental Library. The Course Project Report has been approved as it satisfies the Academic requirements in respect of the Course Project Work prescribed for the said Degree.

Signature of Guide

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Ms. Mamatha Bai B G
Assistant Professor,
Dept. of CSE, NMIT.

Abstract

The project presents the implementation of wireless temperature and humidity monitoring on a Raspberry Pi. The purpose of this project is to design a monitoring temperature and humidity reading kit that has been applied to Raspberry Pi. The study focuses on the embedded project to realize temperature and humidity in the room. The method of analysis is based on the Raspberry Pi implementation with AWS, Presentation Dashboard that contains an API and posts and reviews data to the user. Raspberry Pi is encoded in Linux OS with DHT11 temperature and humidity sensor to retrieve Python language data. Therefore, the temperature and humidity applied to the raspberry pi have been designed and it can be concluded that an increase in temperature indicates a lowering of the humidity level depending on the collected result.

ACKNOWLEDGEMENT

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1. Introduction

Measuring temperature is one of the most common techniques used because it is important to monitor the temperature of our homes. When it comes to sensing temperature, a temperature sensor called as DHT11 is used, which is installed in a place that has a temperature sense. The temperature of the room can be seen through the dashboard using the Internet of Things, and cloud service provider i.e. AWS EC2.

To complete the project, a web-based temperature monitoring system that can be accessed anywhere and anytime via the Internet. And this can be done using the Amazon EC2, Raspberry Pi (as IoT gateway), and Presentation Dashboard (done using Bootstrap). With this system a user can monitor room temperature from anywhere which can save human expenses. IoT Web Based Temperature Monitoring is a type of temperature recorder that monitors a temperature in a room and stores the data in a database and displays the current temperature on the website through a web server. The system will continuously monitor the temperature of the room and data can be monitored anytime and anywhere from the Internet. The main purpose of this system model is to make it easy for the user to see the current temperature.

2. Amazon Web Server (AWS)

Amazon Web Services (AWS) is the world's most comprehensive and broadly adopted cloud platform, offering over 165 fully featured services from data centres globally. Millions of customers – including the fastest-growing start-ups, largest enterprises, and leading government agencies – trust AWS to power their infrastructure, become more agile, and lower costs.

Amazon EC2

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides the ability to secure, resizable compute in the cloud. It is designed to make web-scale cloud computing easier for developers.

Amazon EC2's simple web service interface allows you to receive and configure capabilities with minimal friction. It gives you complete control over your computing resources and lets you run on Amazon's proven computing environment. Amazon EC2 reduces the time it takes to receive and boot a new server instance by minutes, allowing you to change your computing requirements. The economics of Amazon EC2 computing allow you to pay only for the capacity that you actually use. Amazon EC2 provides developers with the tools to build failure resilient applications and differentiate them from common failure scenarios.

3. Internet of Things

The Internet of Things (IoT) is a computing concept that describes the inter-connection of everyday objects conveying information over the Internet. The increasing number of objects every day has promoted the Internet of Things protocol and technologies that are most commonly used in modern systems.

Raspberry Pi

The Raspberry Pi Foundation is a series of small single-board computers developed by the Raspberry Pi Foundation in the United Kingdom to promote the teaching of basic computer science in schools and in developing countries. The original model became more popular than anticipated by selling it outside of its target market for use such as robotic. It does not include peripherals (such as keyboards and mice) or cases. However, some goods are included in several official and informal bundles.

The project uses Raspberry Pi 3 Model B. It is a small credit card sized computer. Just add a keyboard, mouse, display, power supply, micro SD card with installed Linux distribution and you will have a fully computer that can run applications from word processors and spreadsheets to games.

Temperature and Humidity Sensor (DHT11)

DHT11 is a low-cost embedded sensor, which is used to measure temperature (with an accuracy of 0 to 50 ° C to + -2 C) and humidity (in the range of 20% to 80%). + -5%). It has a capacitive humidity sensor that measures moisture in the air. For temperature measurement, a thermometer is embedded in it, which is a resistive and wet NTC temperature measuring device. It works with both 3.3V and 5V microcontroller systems. This sensor has excellent quality, fast response time and anti-interference ability. In DHT11, the calibration coefficients are already stored in OTP program memory, all we have to do is call these calibration coefficients, while the internal sensors detect the signal in the process. It uses less power to transmit simple signals up to 20 meters. It comes in a single package which has 4 pins with 0.1 between spacing between them and special package can be provided as per user demand. It is quite accurate and accurate in its readings as compared to other expensive sensors i.e. SHT10, DS18B20 etc.

Postman

Postman is a Google Chrome app for interacting with HTTP APIs. It presents you with a friendly GUI for constructing requests and reading responses. The people behind Postman also offer an add-on package called Jetpacks, which includes some automation tools and, most crucially, a JavaScript testing library. It is used for the testing purpose.

4. Flow Diagram

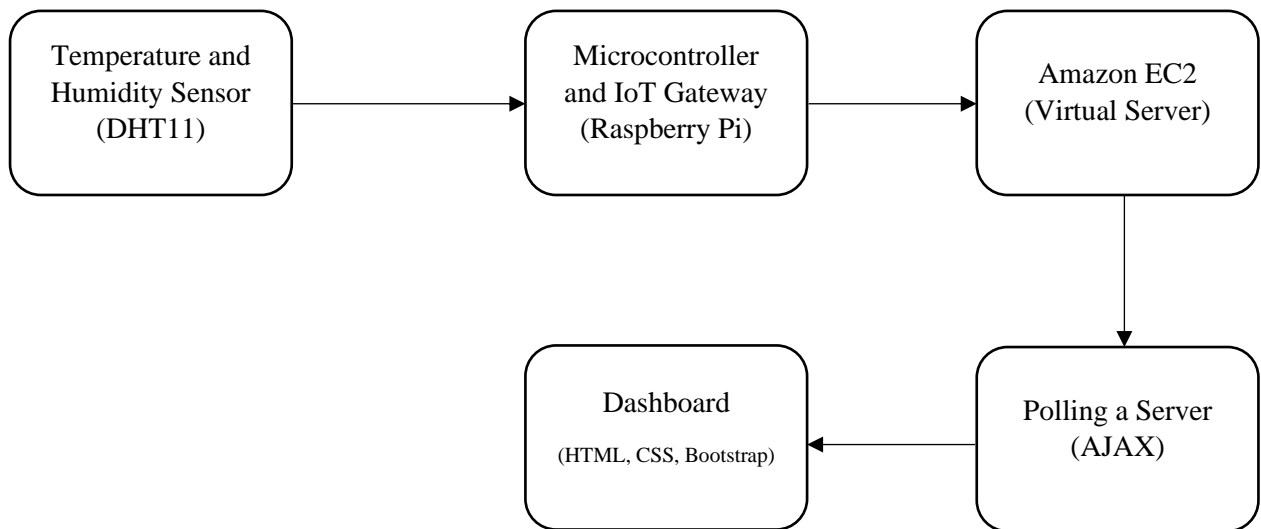


Fig 1: Flow diagram of the project

5. Source Code

1. Source Code Link: <https://github.com/ankit2003/Room-Temperature-and-Humidity-monitoring-system/tree/master>

6. Snapshots

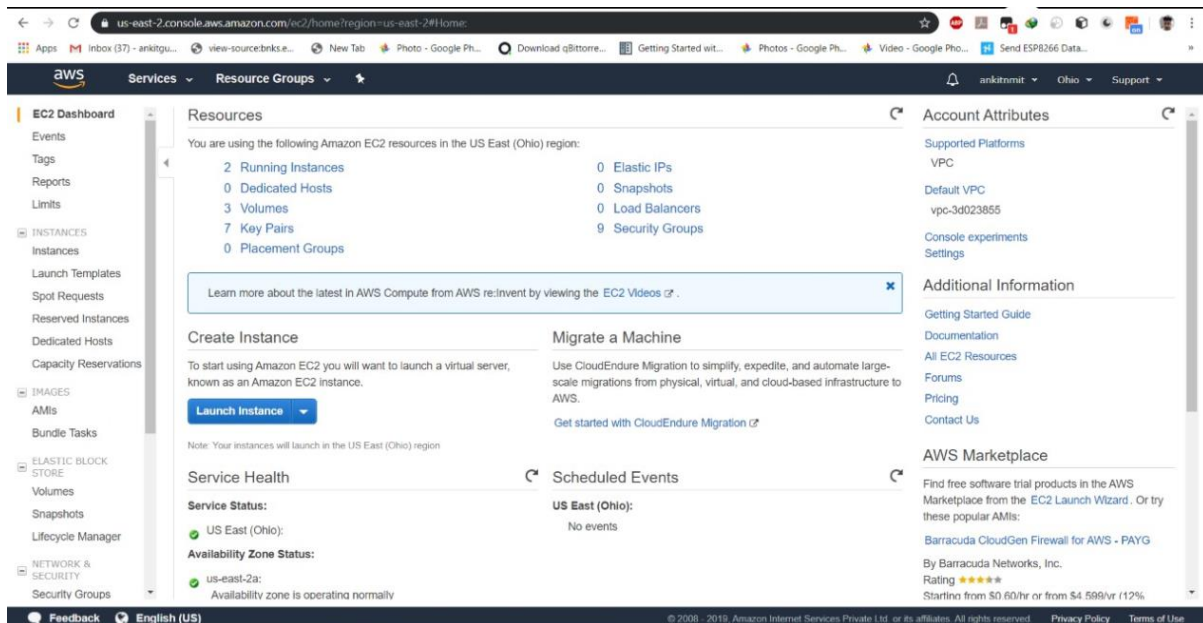


Fig 2: Launching Instances

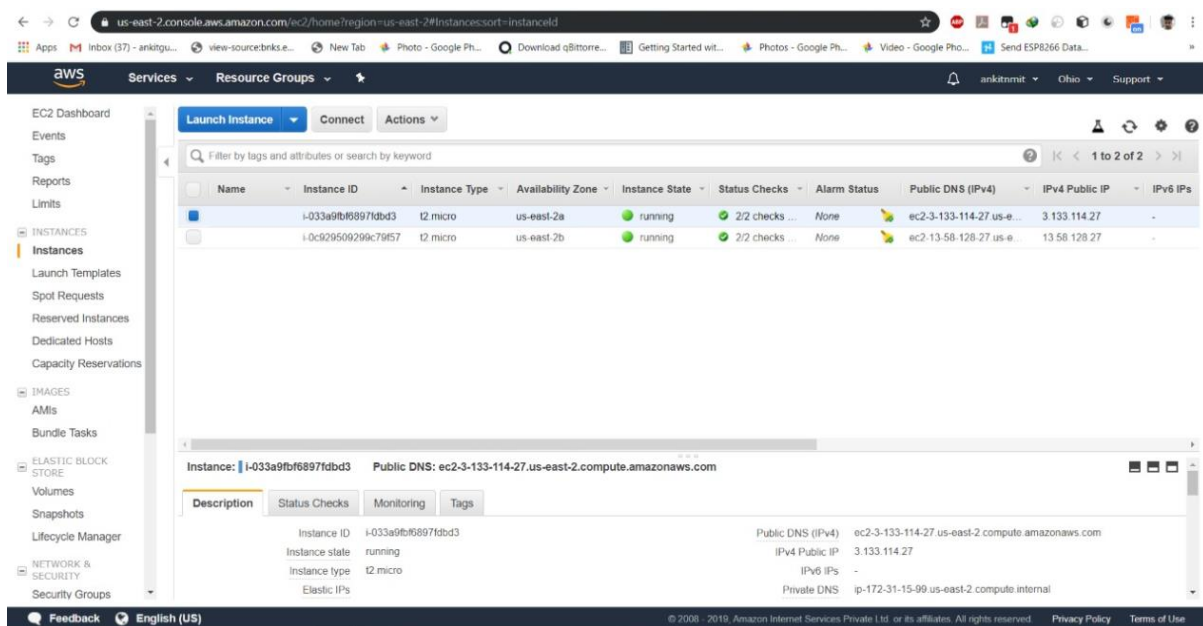


Fig 3: Fetching IP Address for Virtualization

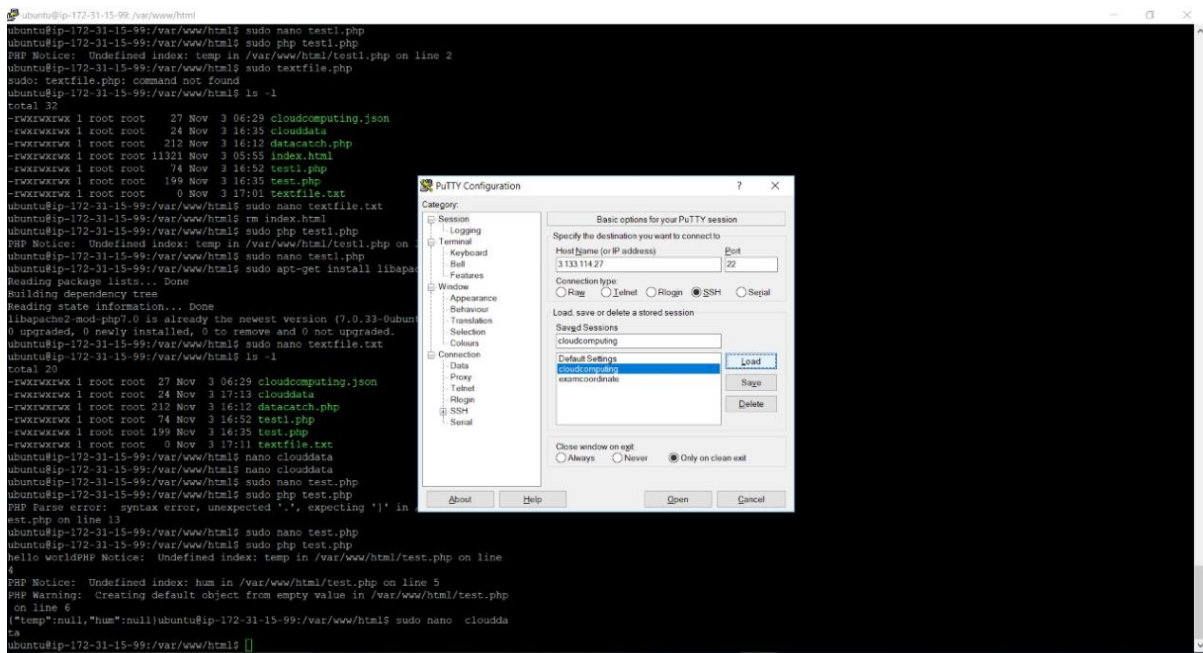


Fig 4: Virtualization of the Ubuntu OS using EC2 and putty

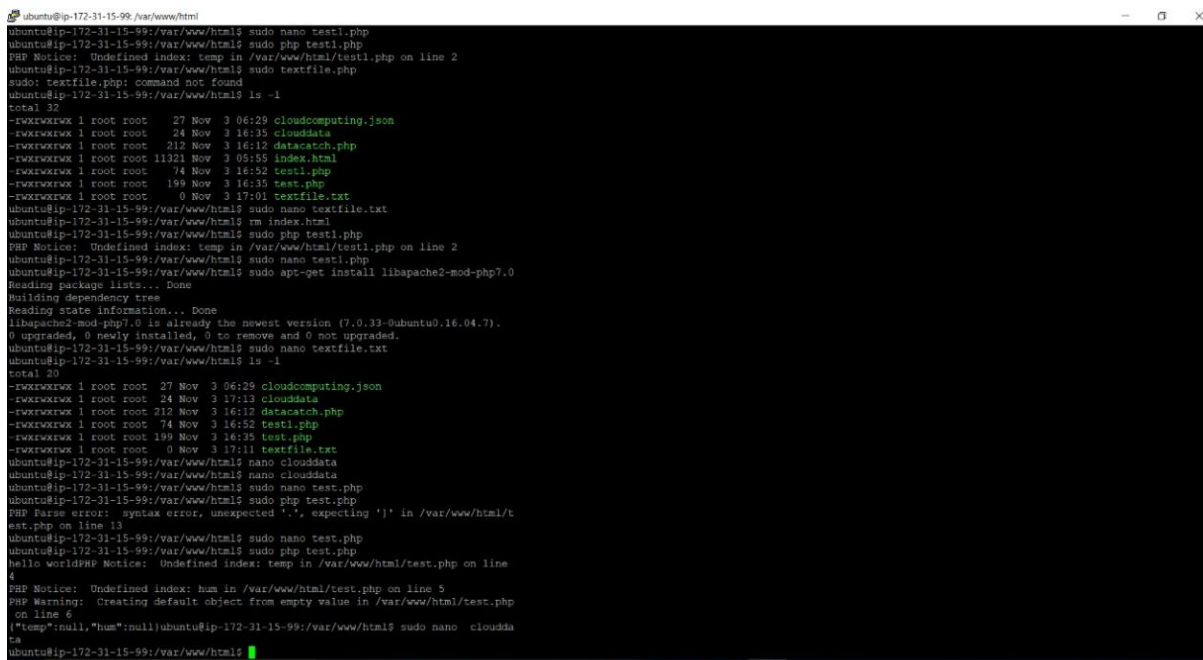


Fig 5: Running the code for Temperature and Humidity measurement

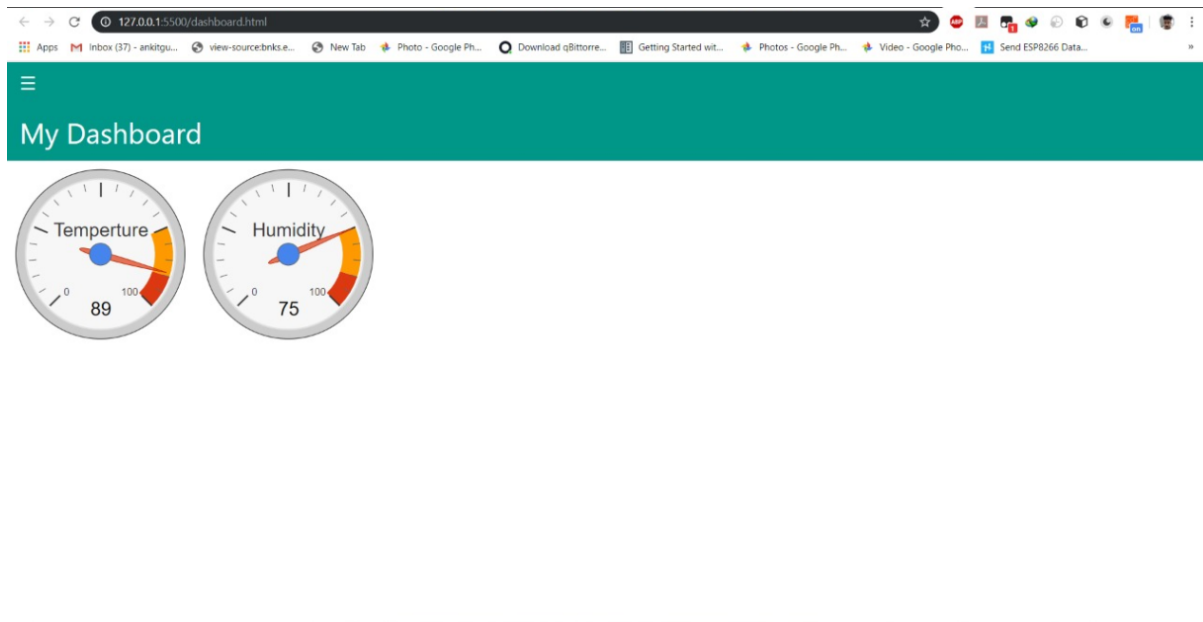


Fig 6: Displaying the result into the dashboard

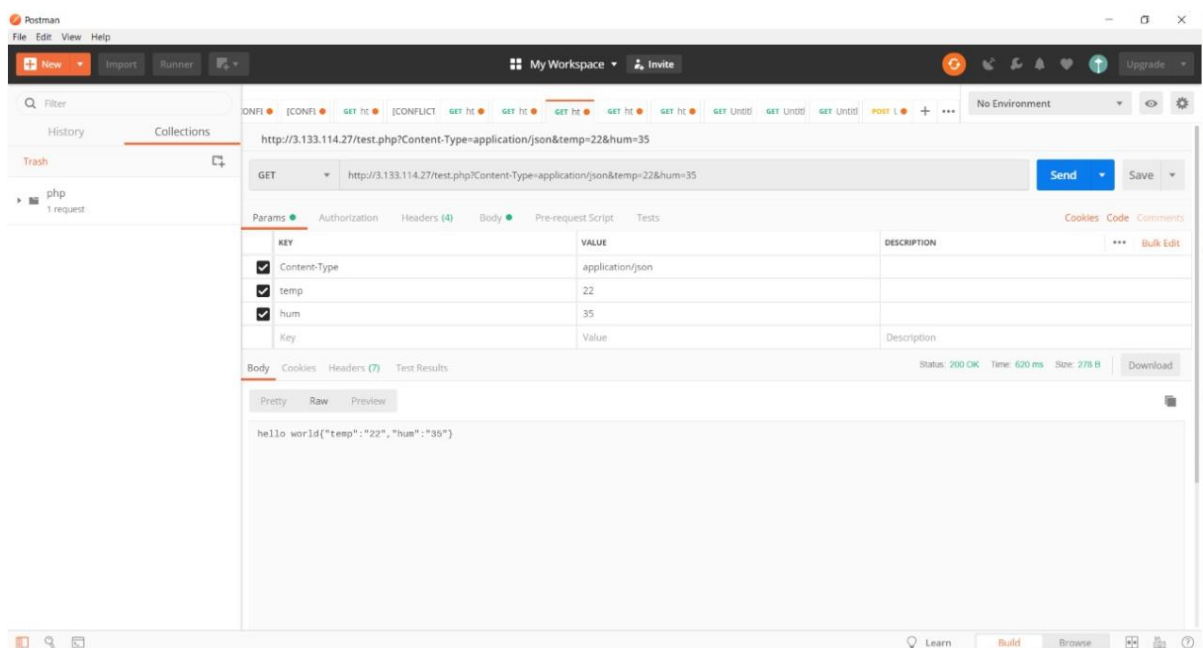


Fig 7: Postman used for the Testing purpose

Conclusion

The project has introduced a Raspberry Pi, AWS and dashboard as a way to wirelessly monitor temperature and humidity. It can be concluded that the monitoring method for temperature and humidity was developed. From the result obtained, it can be said that the day and night factor does not affect only the temperature and humidity levels. However, the analysis also indicates that the humidity level depends on the level of temperature where, the higher the temperature, the lower the humidity and vice versa.

For future work, it may be recommended that the project should involve industries on room temperature and humidity monitoring. This opinion would make every industry room like cold storage maintain a normal or required temperature and humidity.

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