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Cloud Computing Weather Monitoring System Using Iot

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ABSTRACT
In this paper, we have proposed an IOT and cloud based Weather Monitoring System. The aim of weather monitoring system is to detect, record and display various weather parameters such as temperature, humidity. This system makes use of sensors for detecting and monitoring weather parameters and then this collected information is sent to the cloud which can be accessed using the internet. The data displayed as an output can be observed and forecasted. The system engages an Arduino UNO board, sensors, WIFI Module which sends data to cloud computing services. A web page is also created which exhibits the data and displays it to users.

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I. INTRODUCTION

A weather station is a technology that collects data related to the weather & environment using different electronics sensors. There are two types of weather station, one who is having their sensors and the second type of weather station is where we pull data from the weather station servers. In this project, we are designed by our weather station. We all know that a weather station is not a single device, but it is a combination of many small tools to form a larger system. It contains various sensors and gadgets that work together but in specific ways to transmit proper and accurate data of the weather parameters.

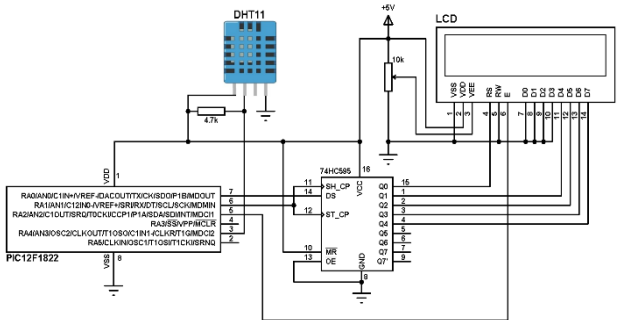

Figure1: Block Diagram for Weather Forecasting System

It is quite tricky to uses of WEB server based weather station to non-technical peoples, so we are providing web server-based user interface as well as Android application. We are well known today most mobile units running on Android OS, and many peoples are well known to use the android phone. So, our application is beneficial for such purpose. This device is all about IoT based Live Weather Data Monitoring Using NodemCU ESP8266. We will interface DHT11 Humidity & Temperature Sensor, BMP180 Barometric Pressure Sensor and FC37 Rain Sensor with NodeMCU ESP8266-12E wi-fi Module.

II. LITERATURE SURVEYS

There are possible to make the user-friendly live weather monitoring system using IoT technology. IoT is an Internet of things which capable of transferring data over a network without requiring human interaction [1] With the development of a cloud-based system, the cloud platform can give better weather availability of data anywhere and anytime. The weather needs easy ways and new techniques for surveillance and management. Monitoring the weather parameter is required to assess the live condition of the weather to takes the right life action according to fetched data from the device. [2] It is an embedded system which consists of web enabled smart such as processors, sensors and communication hardware, to fetch, transmit and work on available data they obtained from their weather. The IoT devices sent this processed data to the network

gateway, and from there, it will be available to within network. But by designing such a system which also available on public Internet also is make more advantage to human life. [3] Previously many of IoT based weather monitoring system design used third parties IoT platform such as Thing Speak. But we have designed our cloud-based server because of that anyone can easily access our web-based service or through android app [4].

III. WORKING

It Assemble all system as per circuit diagram. Program the NodeMCU using Arduino IDE. You will get confirmation on your screen once The NodeMCU is a programable controller which has inbuilt wi-fi module We connect three sensors 1) BMP180 2) DHT11 and 3) Rain Sensor to NodeMCU. By using these three sensors, we can collect the required weather data for monitoring purpose. This pooled data is stream over the Internet to display it or read it from anywhere. After the successfully programmed hardware.

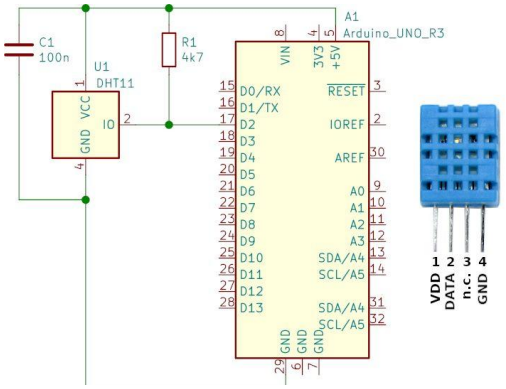

Figure2: Circuit Diagram for Dht11.

the NodeMCU get one IP address. We can browse this IP address from any of WEB browser like Chrome, Firefox, Internet Explorer etc.so we display the required live data which fetched by sensors in beautiful Graphical User Interface format. The weather parameters that we monitor are Temperature, Pressure, Humidity and Rain. Also, you can check whether data through anywhere using Internet as we hosted this server publicly. We developed an android application for easy access to our weather monitoring system.

IV. HARDWARE AND SOFTWARE REQUIREMENTS

The things needed for this project are given below. 1. Nodemcu ESP8266 12E Board 2.BMP180 Pressure Sensor 3. DHT11 Humidity Temperature Sensor 4. Rain Sensor FC37 5.4.7K Resistors - 2 6.PCB Software Requirement: 1.HTML File Library. 2.Arduino IDE 3. Pressure Sensor BMP180 Library 4. Humidity Temperature Sensor DHT11 ESP Library. WIFI MODULE The Arduino Uno which we have used is integrated with a WiFi module called Arduino Uno WiFi. The board is based on the ATmega328P with an ESP8266 WiFi module consolidated TCP/IP protocol stack.In order to establish communication with the ESP8266 WiFi module, microcontroller needs to use some AT commands. Fig.2 Wifi Module SENSORS The system consists of a temperature and humidity sensor (DHT 11) and Barometric Pressure Sensor (BMP180). These 2 sensors will measure the primary environmental parameters like temperature, humidity and the CO levels. These sensors will give the Analog voltage as an input to the microcontroller board as each analog voltage corresponds to a particular weather factor,then the microcontroller will convert this Analog voltage into digital data. TEMPERATURE AND HUMIDITY SENSOR (DHT 11) The DHT11 is a sensor used for measuring humidity and temperature. It gives temperature and humidity as serial data output. It can work on 3.5 to 5.5V operating voltage. It can have 5% accuracy for humidity readings and ±2°C accuracy for temperature readings. It contains 4 pins and is factory.

V. RESULTS

We have expressed their concerns in the communication protocol used for interaction within the smart farms, these protocols were effective for only short distance coverage areas. It has been observed in [5], [6] that some of the intelligent devices have been operated using batteries, this has reduced the operational hours of the edge nodes devices since they stop transmitting data once they run out of power. There is a need for effective trust, privacy, and security of these data. It has been. 1) Data are available on the android app. 2) Prior weather

alert or weather data can be possible. 3) Useful for the agriculture sector as a system is very cheaper, it can be affordable to Farmer. 4)By making an extensive network of this device, we can fetch real-time data of weather from a different location that can be available for free help purpose.

VI. CONCLUSION

To make this idea, genuine need to take help of electronic sensor devices which are needed to place in the environment. By using this sensor, we can stream real-time data over the web server using ESP8266. We also required one dedicated public IP to available this server over the open Internet. The excellent and low-cost weather are monitoring real-time system presented in this paper.

VII. FUTURE SCOPE

The proposed IoT and cloud based weather monitoring system can be further modified to many more features. We can also add a GPS device in the design so that the location of the surrounding will also be mailed or messaged to the user along with the surrounding parameters, like temperature, humidity, pressure, light intensity etc. We can add various other sensors for measuring various other weather parameters like solar radiation, visibility etc. The system can also be modified such that whenever a message is sent from a particular phone number or email id to the server, all the environmental parameters can be sent as notification or as a message to mobile phone or email ideals, this weather monitoring system can be used in smart city projects and many other automation projects.

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