

Aim :-

IoT using cloud

Theory :-

IoT in cloud offers cloud services can easily help the IoT area by providing third party access to the information. Hence the integration can help IoT data or computational components operating over the IoT devices.

Because activities like storage and data processing takes place in the cloud rather than on the device itself, that has had significant implications for IoT.

Many IoT sensors make large number of components to collect and then make intelligent decision. Using cloud is important for aggregating data and drawing insights from the data. For instance a smooth agriculture company would be able to compose soil moisture sensors from and colors after planting the same seeds. Without the cloud comparing the data across wider area would be way more difficult.

Using cloud also allows for highly scalability . When you have hundreds or thousands of sensors, putting large amount of computational power on each a would be very expensive and energy intensive. Instead all these sensors and possesed there in data can be passed to cloud in aaggregate.

For much of IoT ,the head rather, the brain of the system is cloud .Sensor and device collect data and perform action but the processing /commondng/analytics catch the "smart"stuff ,typically happens in the cloud.

Benefit:

- Decrease cost ,both upfront and infrastive
- Pay as needed for storage and compating
- High system scalability and oroitablity

Concerns:

- Data ownership
- Potensial cashes
- Latency

Conclusion:-

Hence we have succesfully implemented IoT using cloud.

Program:

```
#include "DHT.h"
#include <ESP8266WiFi.h>
#include <WiFiClient.h>

const char* server = "api.thingspeak.com";
#define WIFI_SSID "Sanika" // Change the name of your WIFI
#define WIFI_PASSWORD "12345sorry1234" // Change the password of your WIFI

#define DHTPIN 14 // Data Pin of DHT 11 , for NodeMCU D5 GPIO no. is 14
unsigned long myChannelNumber = 851800;
String myWriteAPIKey = "78DDESNIQ6C90RX4";
#define DHTTYPE DHT11 // DHT 11
DHT dht(DHTPIN, DHTTYPE);
WiFiClient client;

void setup() {
  Serial.begin(9600);
  WiFi.begin (WIFI_SSID, WIFI_PASSWORD);
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  dht.begin();
  Serial.println("");
  Serial.println ("WiFi Connected!");
}

void loop() {
  static boolean data_state = false;
  float h = dht.readHumidity();

  float t = dht.readTemperature(); // Reading temperature as Celsius (the default)
  if (isnan(h) || isnan(t))
  {
    Serial.println("Failed to read from DHT sensor!");
    return;
  }
}
```

```

    if (client.connect(server,80)) // "184.106.153.149" or api.thingspeak.com
    {

        String postStr = myWriteAPIKey;
        postStr += "&field1=";
        postStr += String(t);
        postStr += "&field2=";
        postStr += String(h);
        postStr += "\r\n\r\n";

        client.print("POST /update HTTP/1.1\r\n");
        client.print("Host: api.thingspeak.com\r\n");
        client.print("Connection: close\r\n");
        client.print("X-THINGSPEAKAPIKEY: "+myWriteAPIKey+"\r\n");
        client.print("Content-Type: application/x-www-form-urlencoded\r\n");
        client.print("Content-Length: ");
        client.print(postStr.length());
        client.print("\r\n\r\n");
        client.print(postStr);

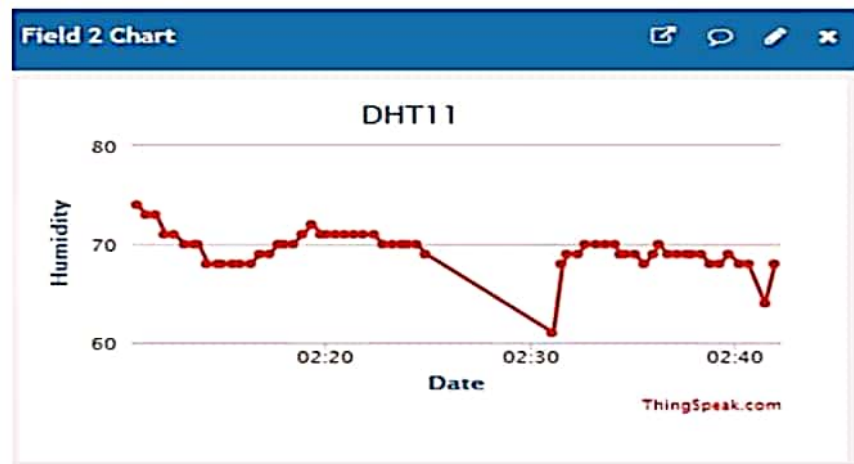
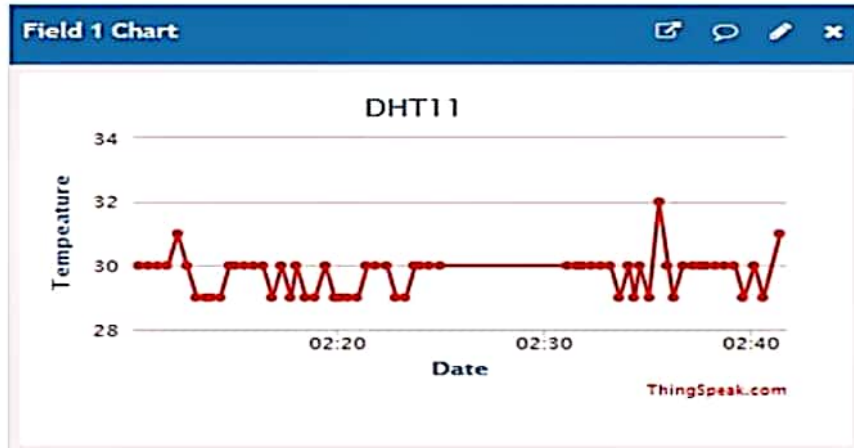
        Serial.print("Temperature: ");
        Serial.print(t);
        Serial.print(" degrees Celcius, Humidity: ");
        Serial.print(h);
        Serial.println("%". Send to Thingspeak.");
    }
    client.stop();

    Serial.println("Waiting...");

    // thingspeak needs minimum 15 sec delay between updates
    delay(3000);
}

```

Output:



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WiFi connected

Temperature: 31.00 degrees Celcius, Humidity: 64.00%. Send to Thingspeak.

Waiting...

Temperature: 30.00 degrees Celcius, Humidity: 67.00%. Send to Thingspeak.

Waiting...

Temperature: 30.00 degrees Celcius, Humidity: 68.00%. Send to Thingspeak.

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