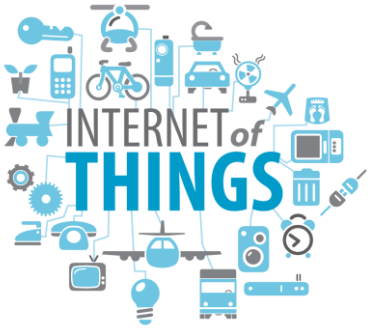
UNIVERSITY OF SCIENCE - VNUHCM
Faculty of Information Technology

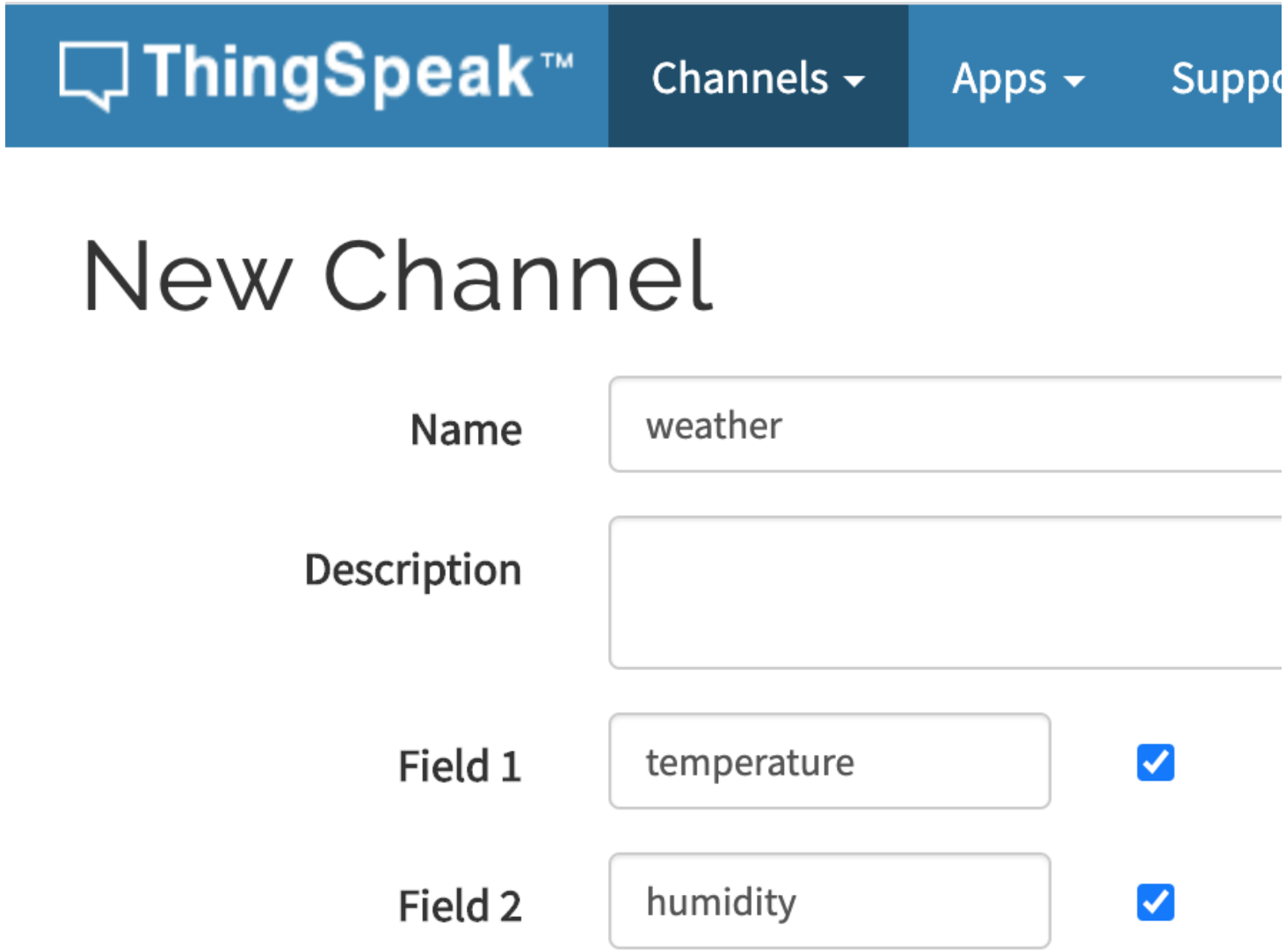
INTERNET OF THINGS

4.4

ESP32 STORE DATA IN CLOUD



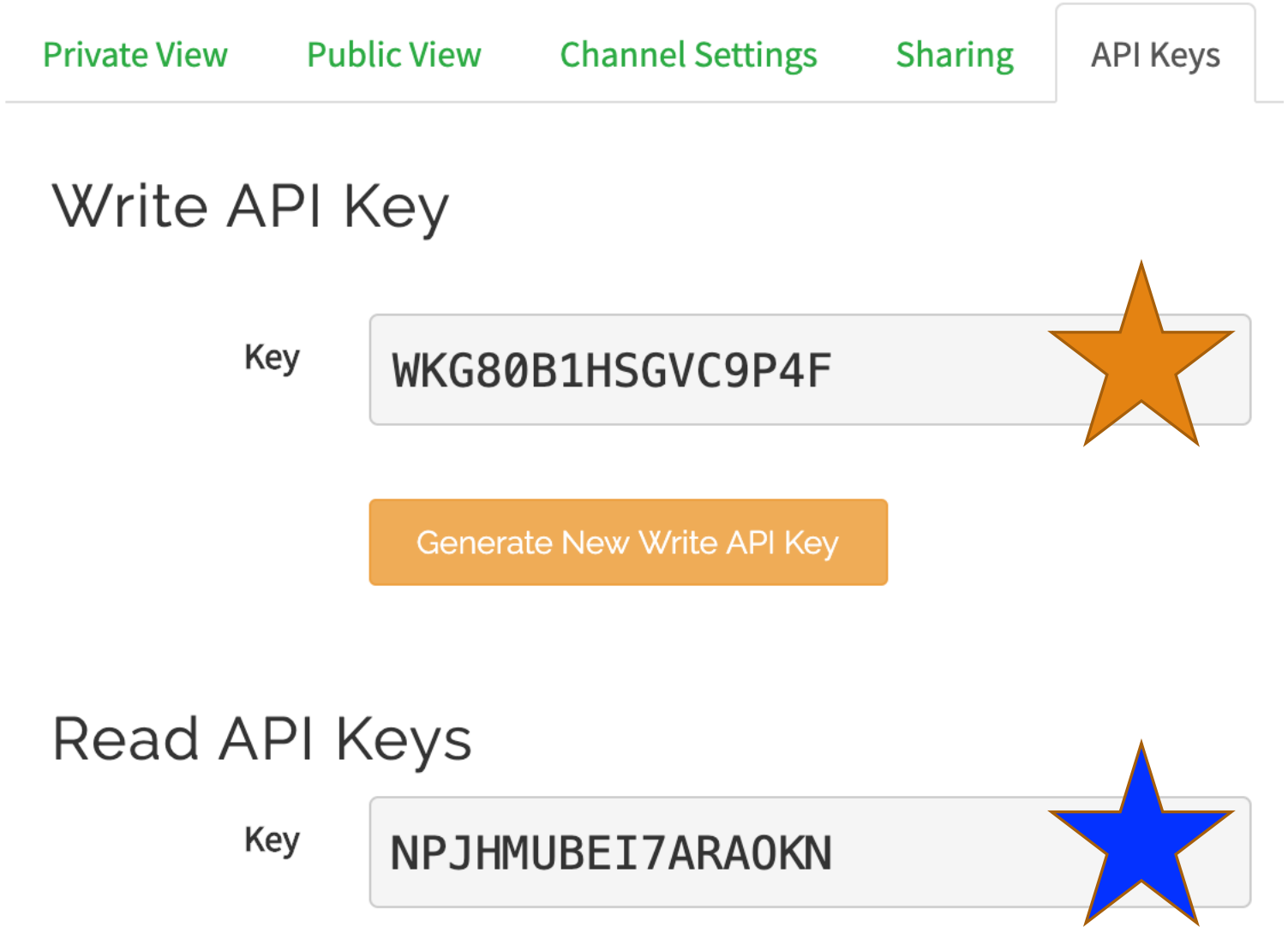
THINGSPEAK



Step 1: Sign up new account in **mathworks.com**

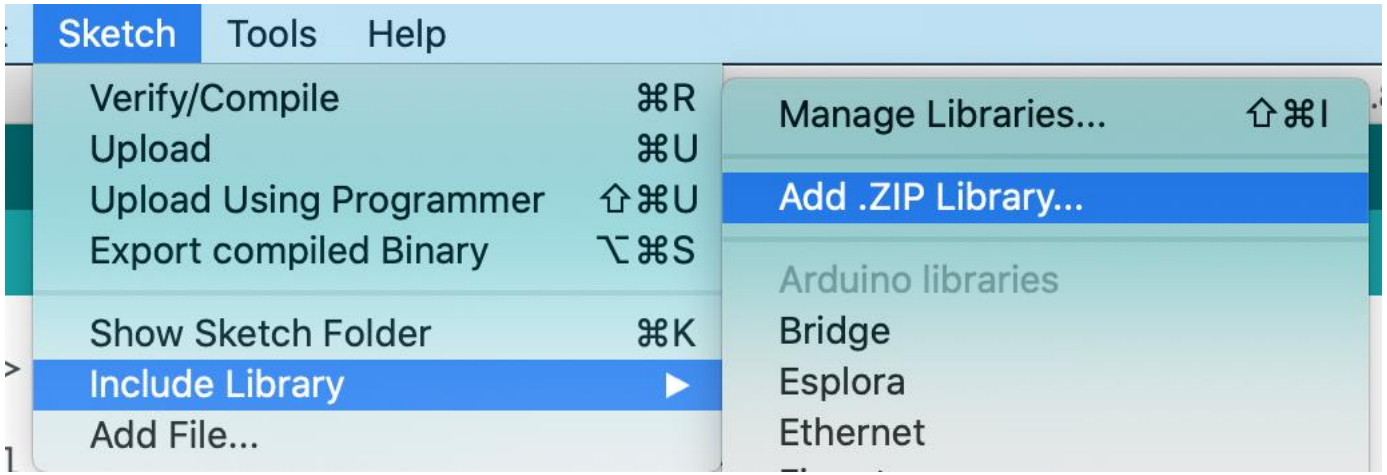
Step 2: Sign in with mathworks account in **thingspeak.com**

Step 3: Go to **Channels > New Channel > Input Fields > Save Channel**



Step 4: Select ***API Keys*** Tab.

Remember ***Write API Key***



Step 5: Download Zip file to your computer

https://github.com/mathworks/thingspeak-arduino

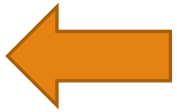
Step 6: In Arduino IDE, choose ***Sketch > Include Library > Add Zip Library > Select Zip file***

weather

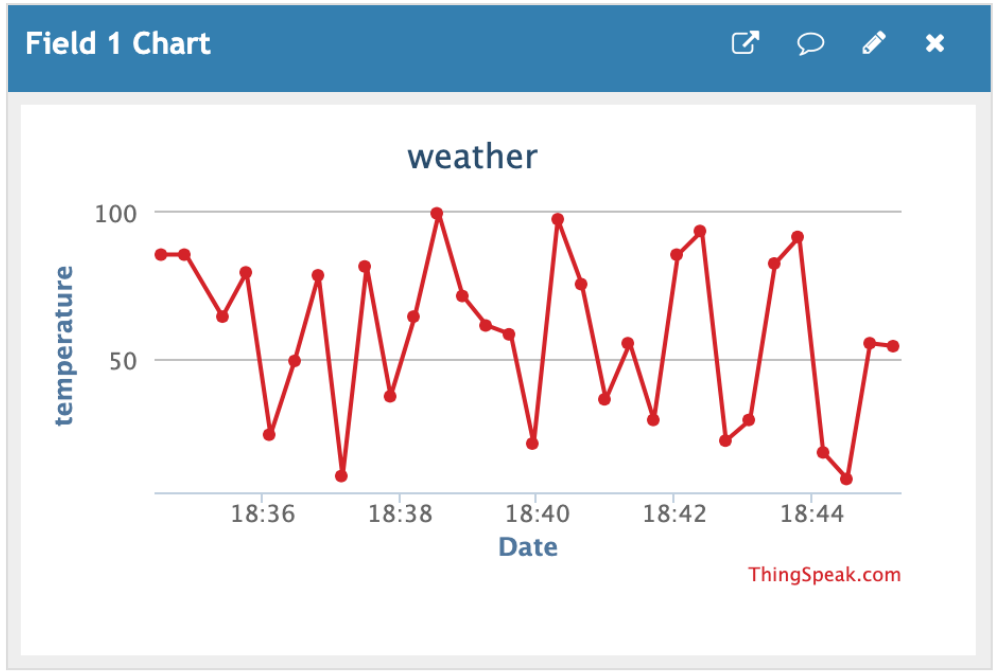
Channel ID: 1080479
Author: mwa0000018758431
Access: Private

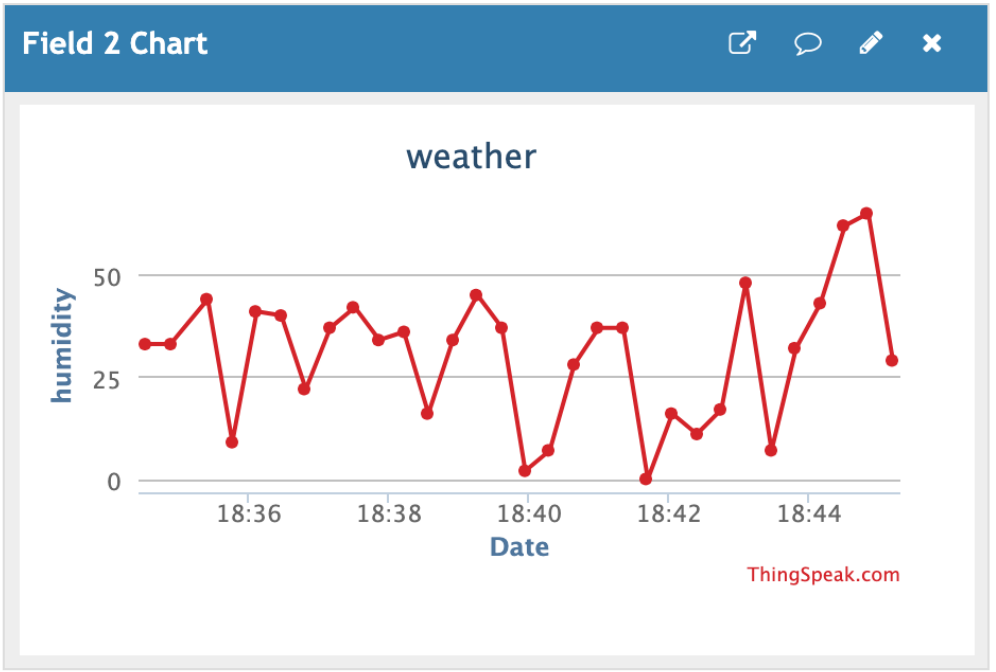
```
#include "ThingSpeak.h"
#include <ESP8266WiFi.h>

char ssid[] = "your wifi name";
char pass[] = "your wifi password";

unsigned long myChannelNumber = 0;  // Replace the 0 with your channel number
const char * myWriteAPIKey = "your Write API";    // Paste your ThingSpeak Write API Key

WiFiClient  client;

void setup() {
  //Connect to WiFi Network. DIY

  ThingSpeak.begin(client);
}
```

```
void loop() {
  int h = random(100);
  int t = random(70);
  // Write data to fields
  ThingSpeak.setField(1, h); //setField(field, value)
  ThingSpeak.setField(2, t); //setField(field, value)
  int returncode = ThingSpeak.writeFields(myChannelNumber, myWriteAPIKey);

  // Check return code
  if (returncode == 200) {
    Serial.println("Channel update successful.");
  }
  else {
    Serial.println("Problem updating channel. HTTP error code " + String(z));
  }

  delay(20000);
}
```



Random Data


Field 1 Chart
weather
100
50
temperature
18:36
18:38
18:40
18:42
18:44
Date
ThingSpeak.com

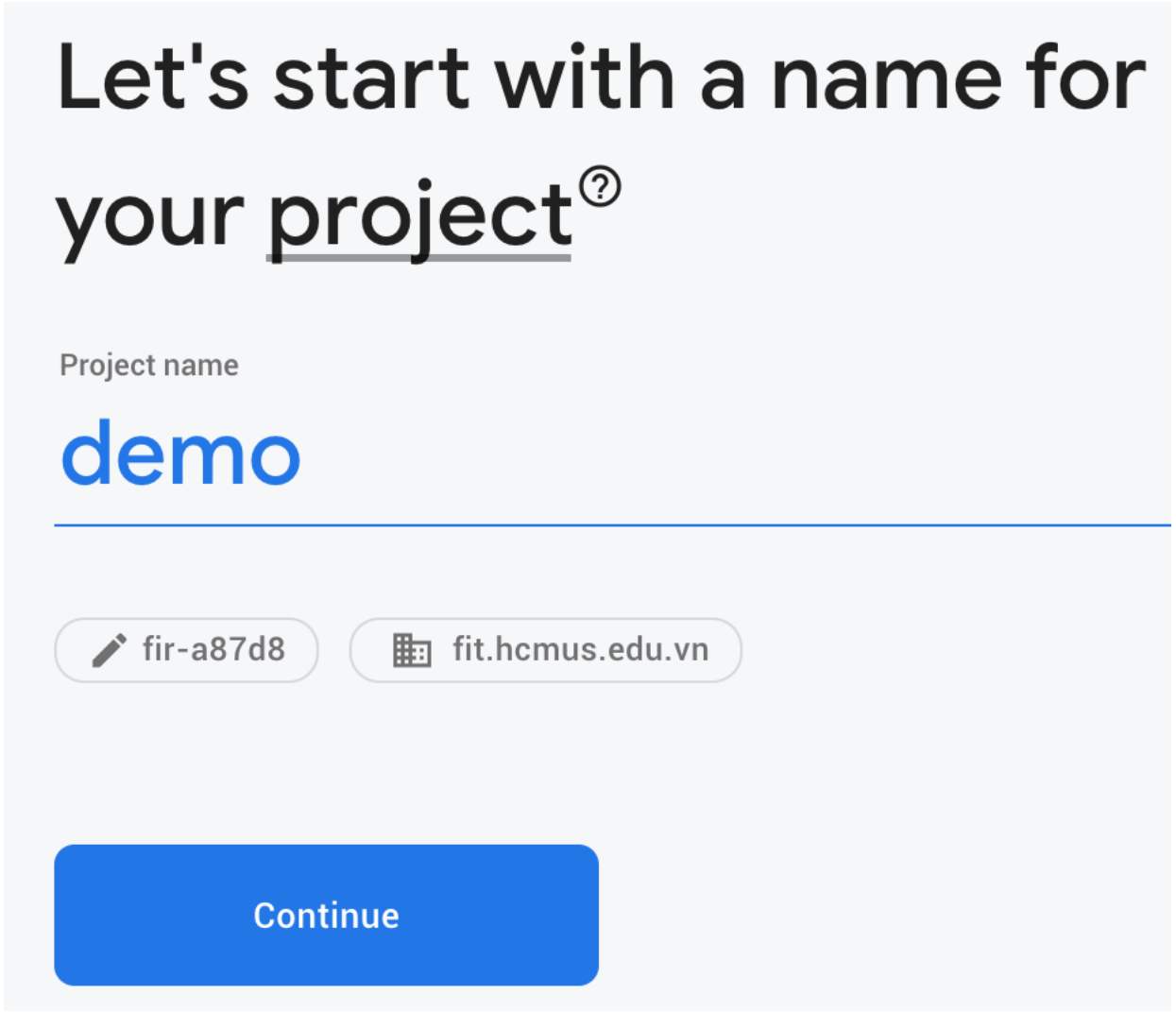

Field 2 Chart
weather
50
25
0
humidity
18:36
18:38
18:40
18:42
18:44
Date
ThingSpeak.com

```
// Paste your ThingSpeak Read API Key
const char * myReadAPIKey = "NPJHMUBEI7ARAOKN";
```

```
int t = ThingSpeak.readIntField(myChannelNumber, 1, myReadAPIKey);
int h = ThingSpeak.readIntField(myChannelNumber, 2, myReadAPIKey);
Serial.print("Temperature:");
Serial.println(t);
Serial.print("Humidity:");
Serial.println(h);
```

Read data from ThingSpeak

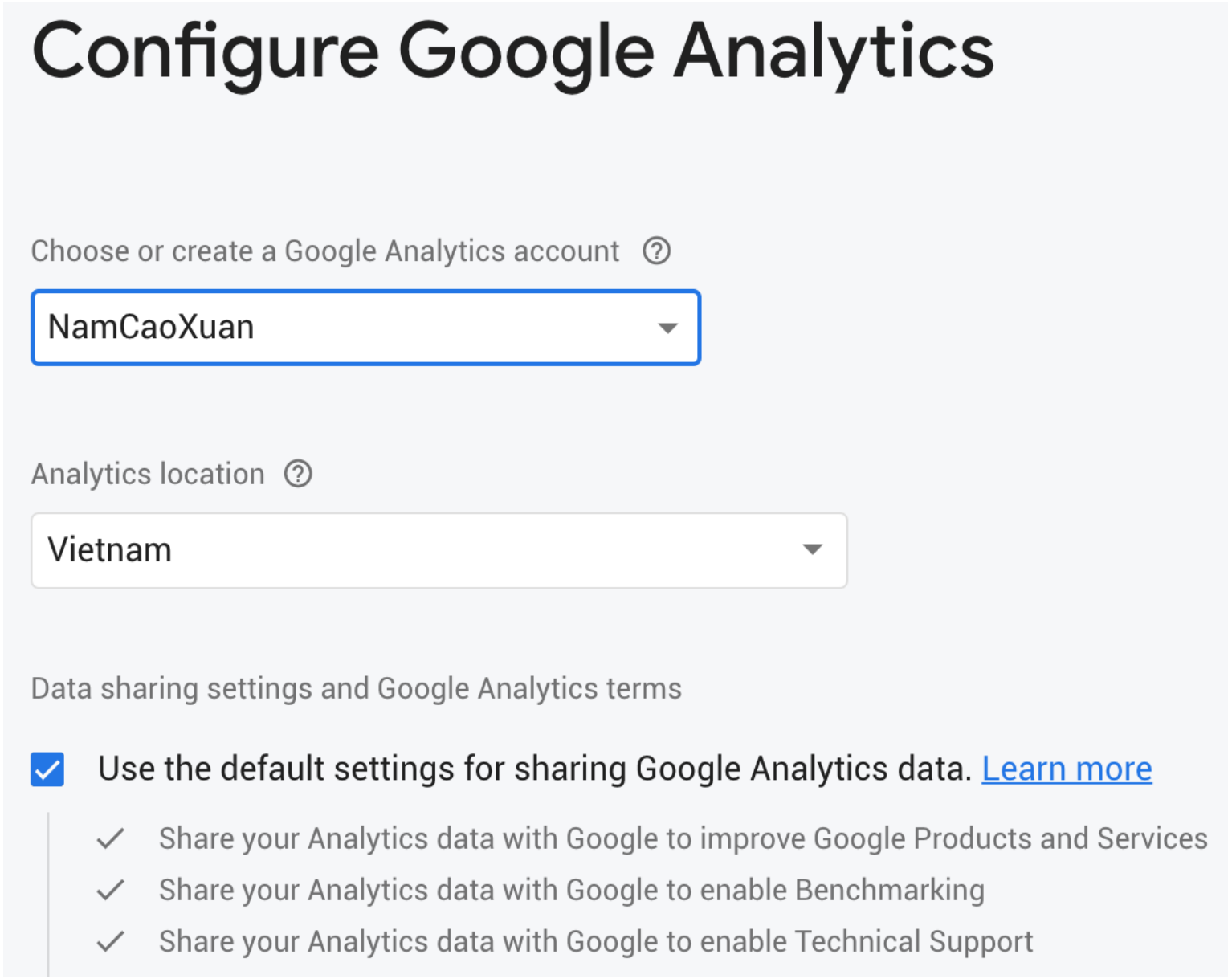
FIREBASE



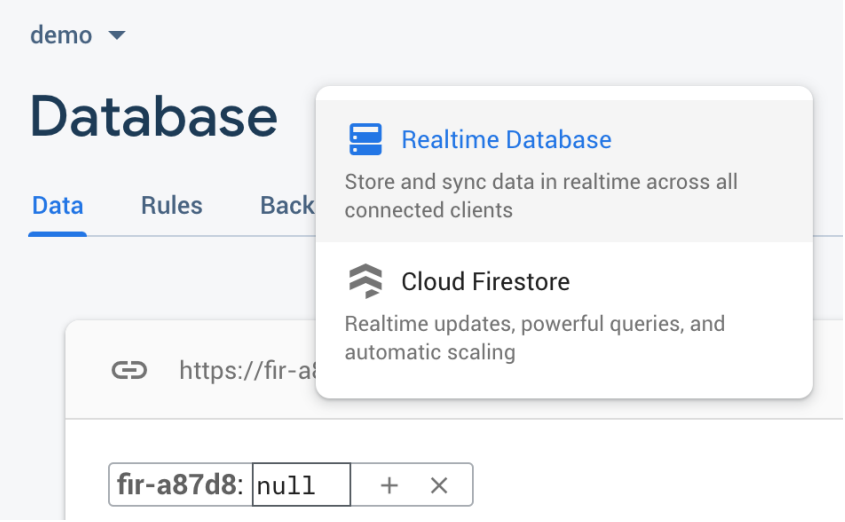
Step 1: Sign up/Sign in **firebase.google.com** using Google account

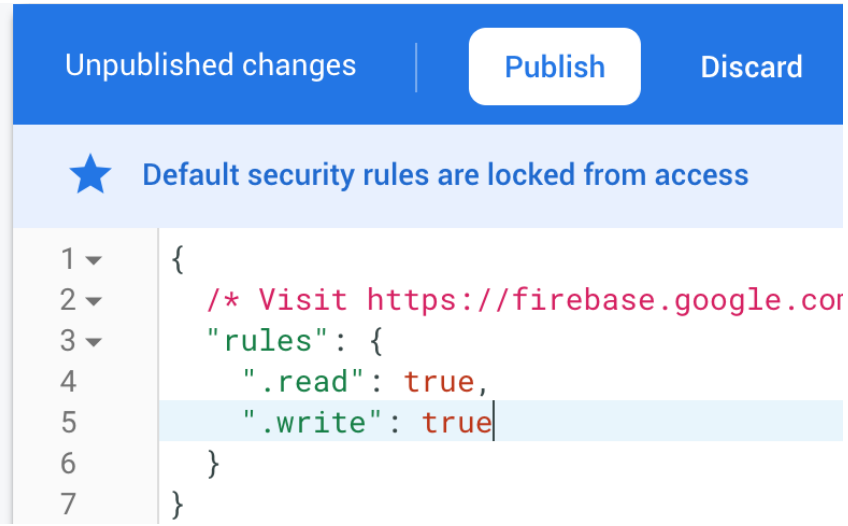
Step 2: Add new project

Step 3: Named for your project



Step 4: Configure Google Analytics (optional)

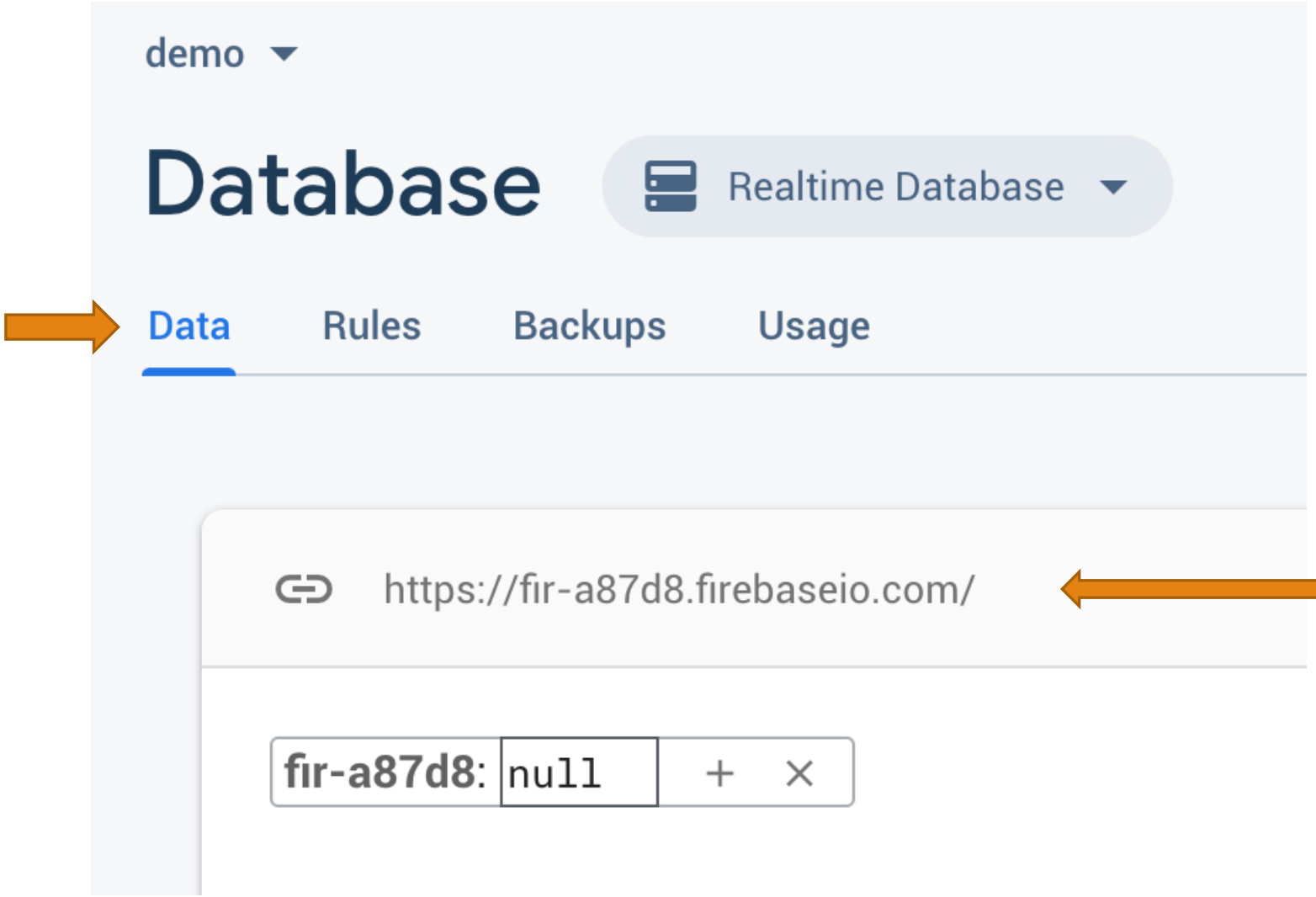




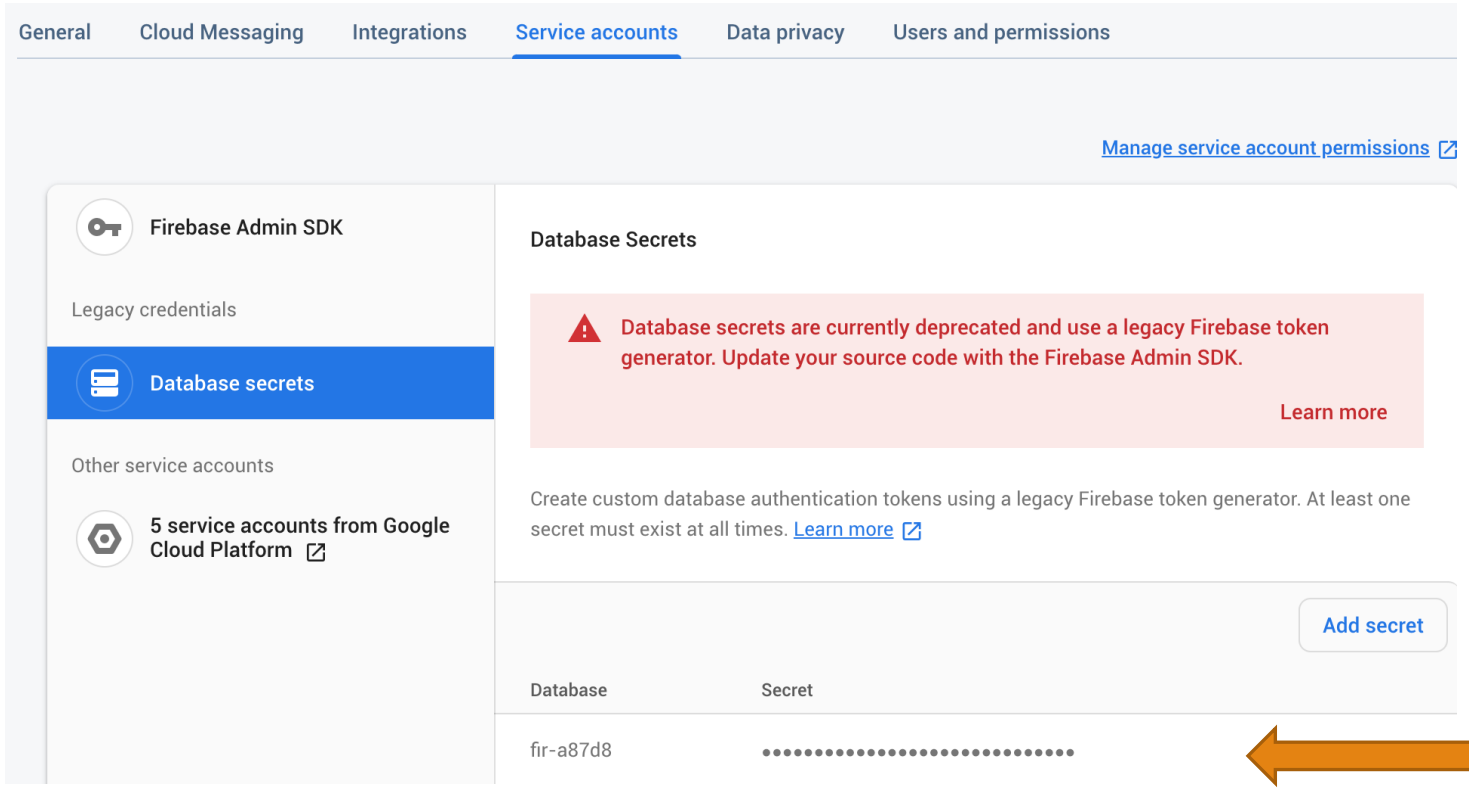
Step 5: Developer Menu > Database > Create database

Step 6: Change Database mode is **Realtime Database**

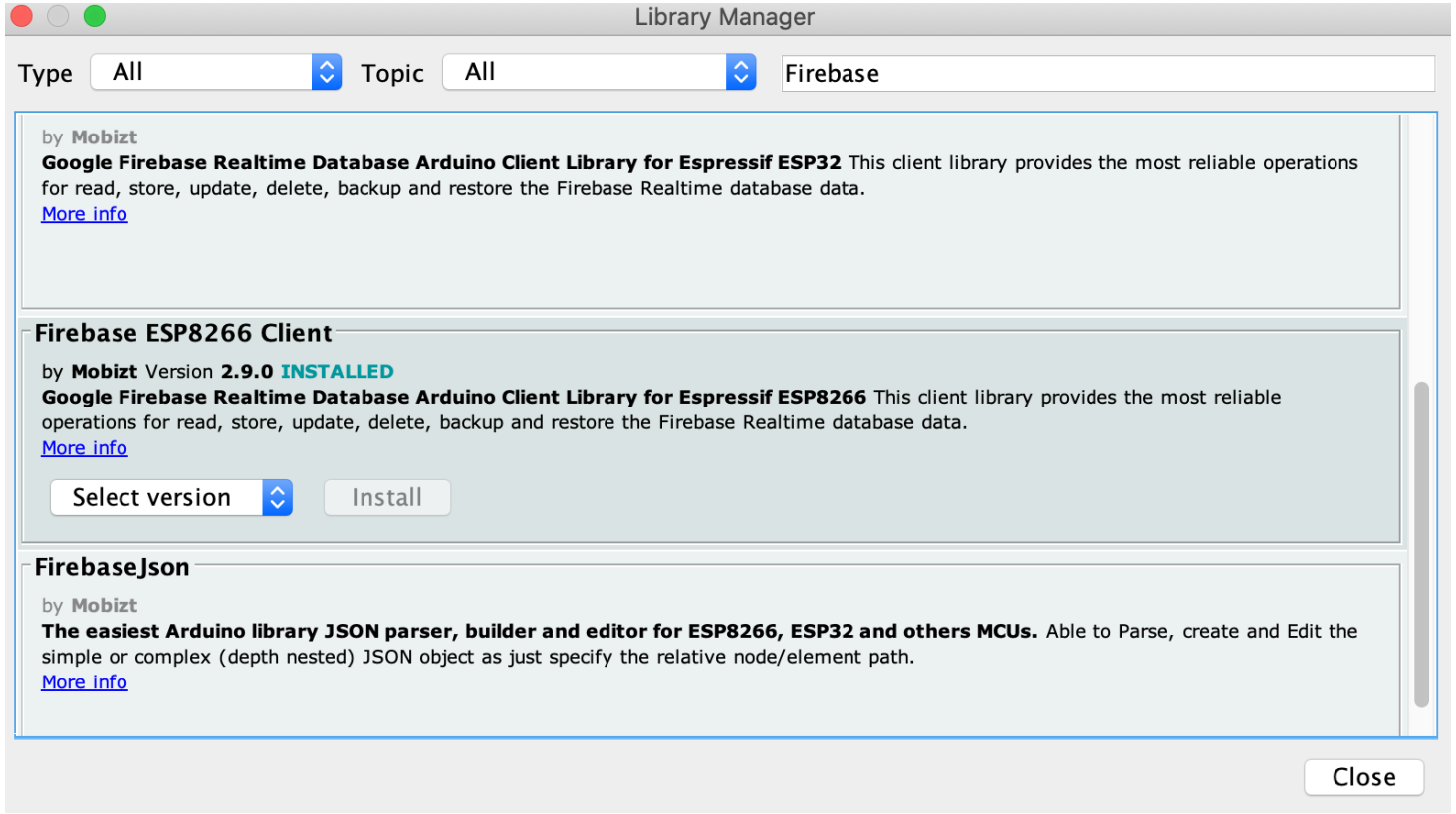
Step 7: Choose Rules tab > Edit rules > set “**true**” for read and write rule > Publish



Step 8: Copy your firebase host



Step 9: Select *Gear icon > Project Settings > Service accounts > Database secrets > Copy Secret key*



Step 10: In Arduino IDE, Sketch > Include Library > Manage Libraries…

Step 11: Search "**Firebase**" and install the latest version of "**Firebase ESP8266 Client**"

```
#include <ESP8266WiFi.h>
#include <FirebaseESP8266.h>

#define FIREBASE_HOST "your firebase host"
#define FIREBASE_AUTH "your database secret key"

#define ssid "your wifi network"
#define password "your wifi password"

FirebaseData firebaseData;
```

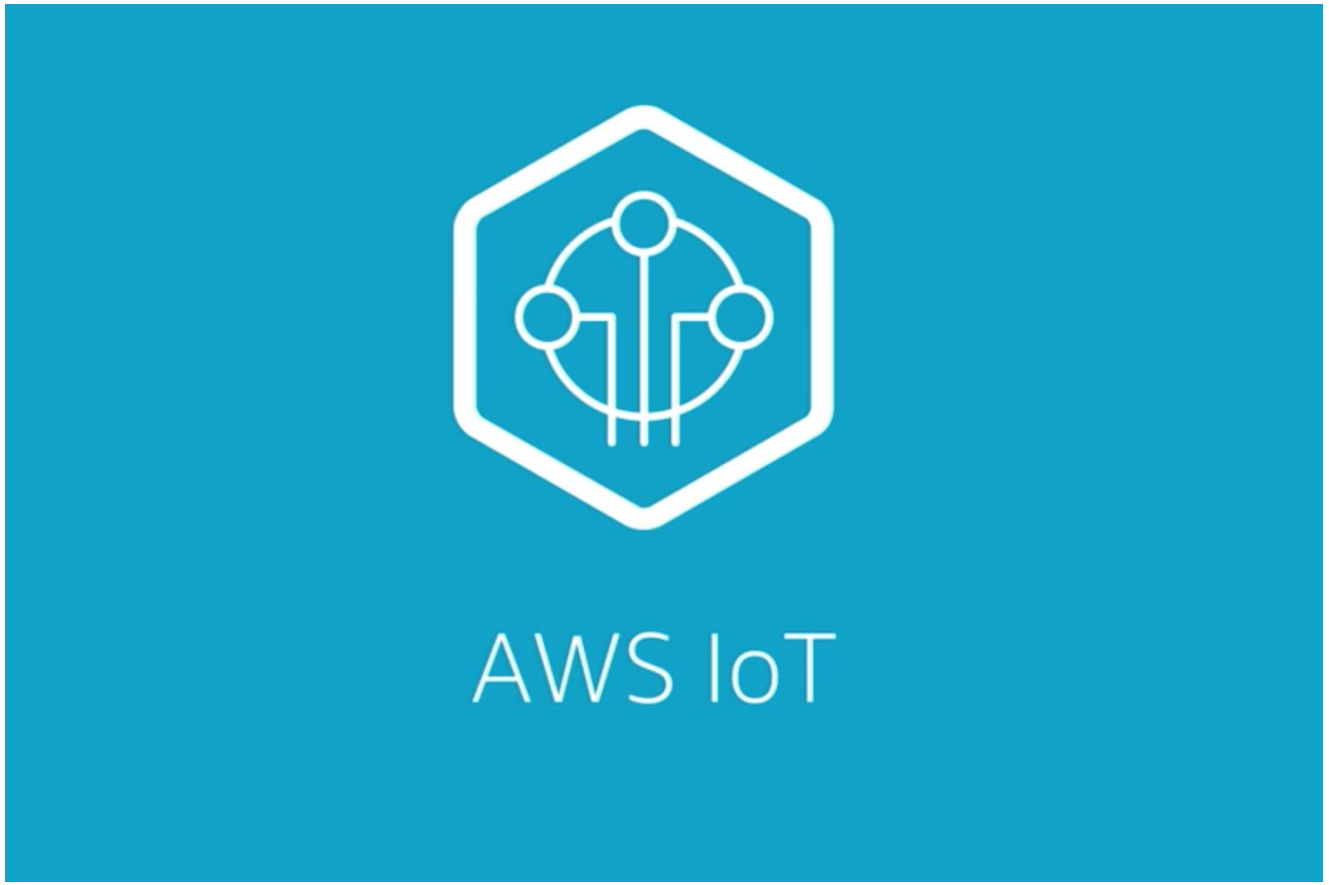
```
void setup() {
  //Connect to wifi network. DIY

  Firebase.begin(FIREBASE_HOST, FIREBASE_AUTH);
  Firebase.reconnectWiFi(true);

  if (!Firebase.beginStream(firebaseData, "/Nodes/led"))
  {
      Serial.println("Could not begin stream");
      Serial.println("REASON: " + firebaseData.errorReason());
      Serial.println();
  }
}
```

```
void loop() {
  for (int i= 0; i<10; i++) {
    Firebase.setInt(firebaseData, "/Nodes/led", i);
    delay(1000);
  }
}
```

Write data to Firebase

```
void loop() {
  if (Firebase.getInt(firebaseData, "/Nodes/led")) {
    if (firebaseData.dataType() == "int") {
      Serial.println(firebaseData.intData());
    }
  }
  delay(1000);
}
```

Read data from Firebase



AWS IoT