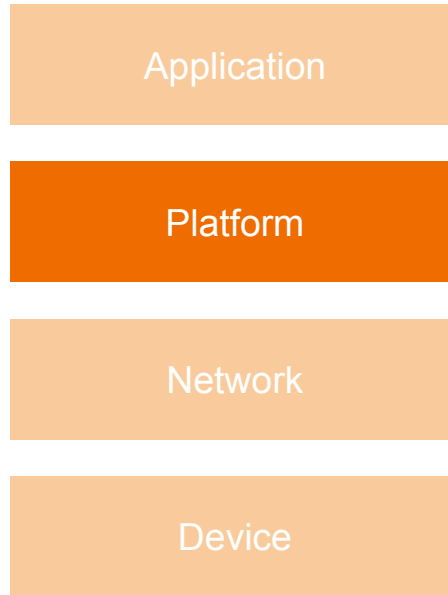

IoT Platform

— Fariz Alemuda —

IoT Stack



Apa itu IoT Platform?

IoT Platform merupakan jembatan antara Device ke Application

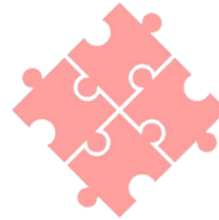
IoT Platform memiliki fitur-fitur dan fungsi umum seperti:



Secure



Device Management



Interoperability

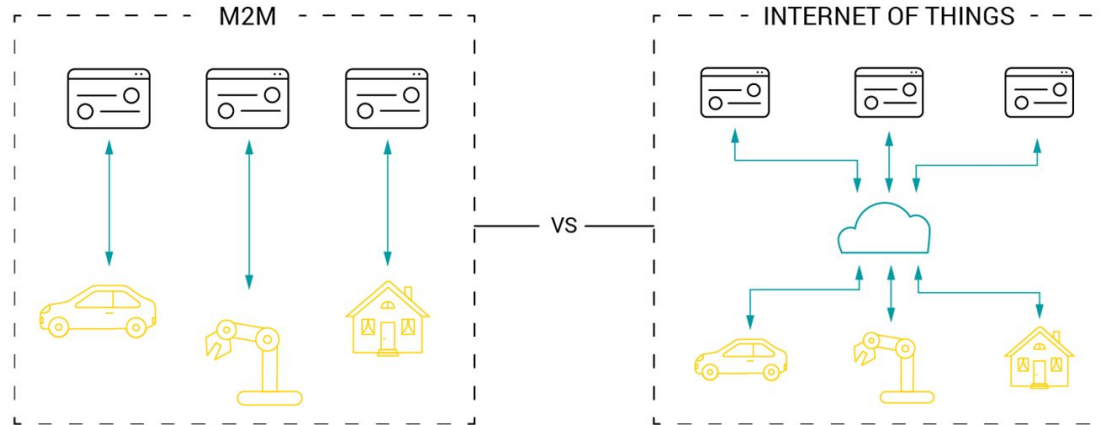


Data Management

Mengapa IoT Platform dibutuhkan?



IoT Platform vs M2M

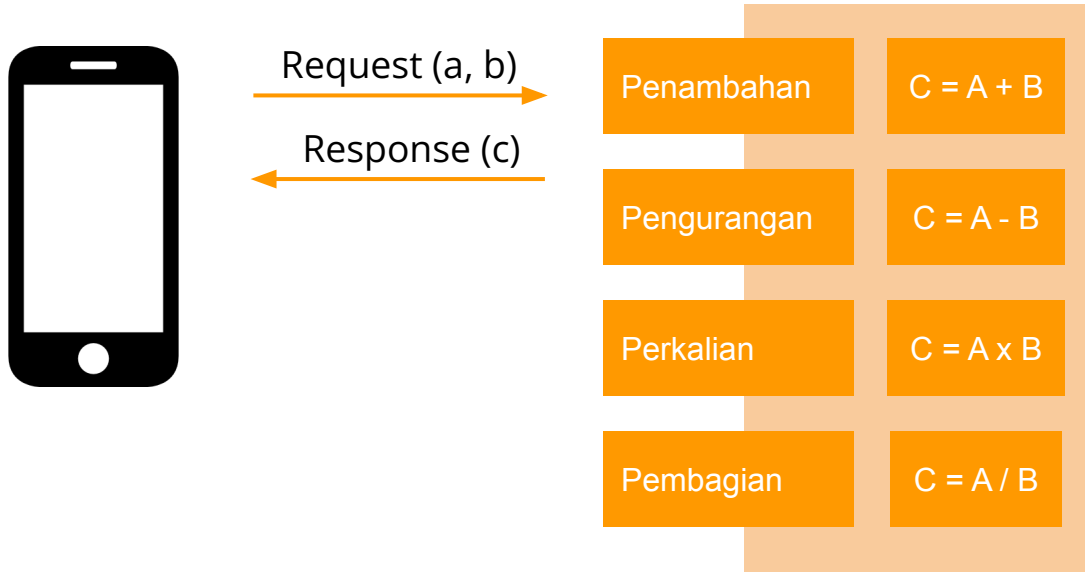


IoT memiliki penekanan pada sharing data agar menghasilkan nilai tambah kepada pelanggan. Kombinasi data dari seluruh komponen memungkinkan system yang lebih efektif dan efisien.

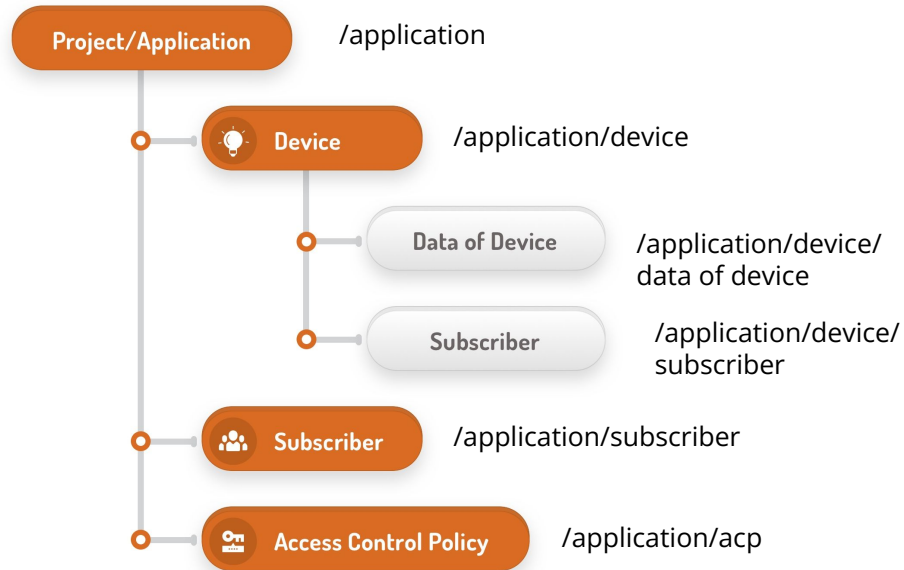
IoT Platform Interfaces



API (Application Programmable Interface)




HTTP API Antares



- Application
 - Retrieve
- Device
 - Create
 - Retrieve
 - Update
 - Delete
- Data of Device
 - Create
 - Retrieve
- Subscriber
 - Create
 - Retrieve
 - Update
 - Delete
- Grouping
 - Create
 - Retrieve

Registrasi Akun

Register Account

 **ANTARES**

Login

Sign In to your account

@

🔒

Login


[Forgot password?](#)

Sign up

Are you in need of an enabler for your smart home, smart city, industrial IoT, etc.? Connect all your IoT Devices to the real IoT Platform, ANTARES.

Register Now!

Register Account

 **ANTARES**

Register

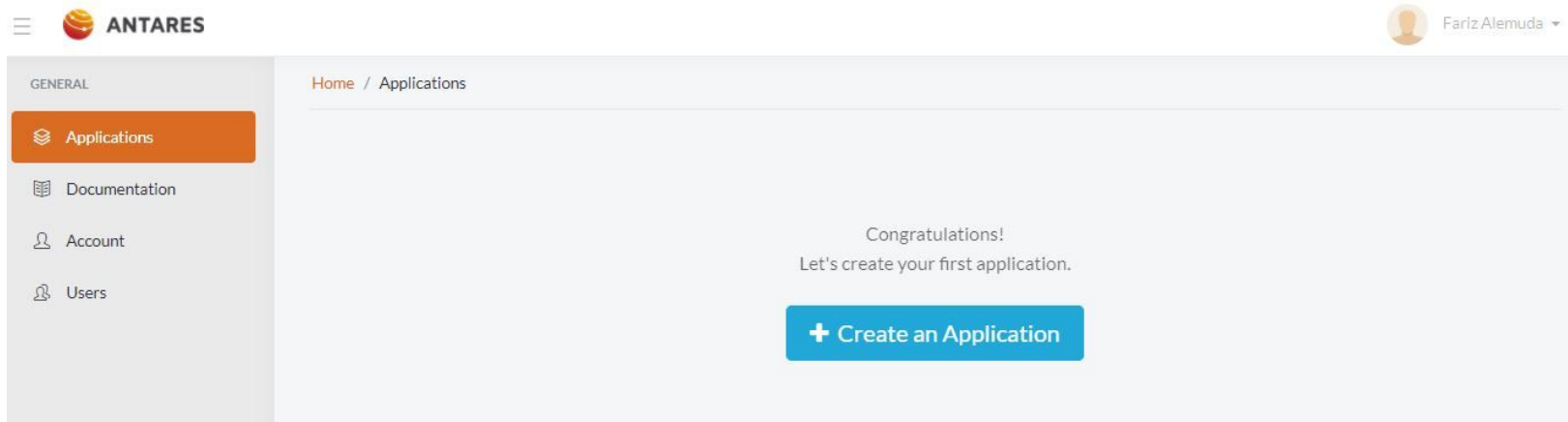
Create your account

Create Account

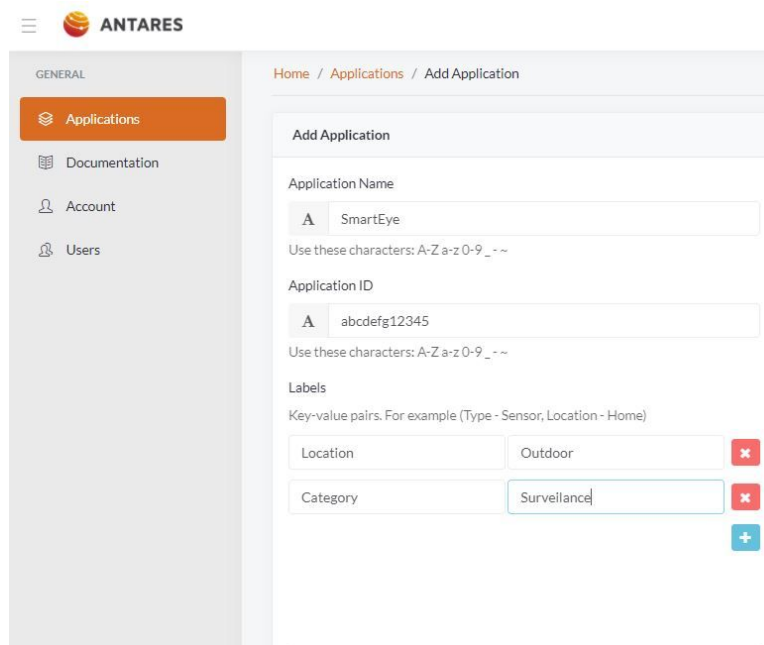
Already have an account? [Login](#)

Provisioning

Membuat Application



Membuat Application



The screenshot displays the ANTARES web application interface. On the left is a sidebar with a 'GENERAL' section containing links for 'Applications' (highlighted in orange), 'Documentation', 'Account', and 'Users'. The main content area shows a breadcrumb trail 'Home / Applications / Add Application' and a form titled 'Add Application'. The form includes two text input fields: 'Application Name' with the value 'SmartEye' and 'Application ID' with the value 'abcdefg12345'. Below each field is a note: 'Use these characters: A-Z a-z 0-9 _ - ~'. The 'Labels' section, described as 'Key-value pairs. For example (Type - Sensor; Location - Home)', contains two rows. The first row has 'Location' and 'Outdoor', and the second row has 'Category' and 'Surveillance'. Each row has a red 'X' button to its right. A blue '+' button is located at the bottom right of the labels section.

ANTARES

GENERAL

- Applications
- Documentation
- Account
- Users

Home / Applications / Add Application

Add Application

Application Name

A SmartEye

Use these characters: A-Z a-z 0-9 _ - ~

Application ID

A abcdefg12345

Use these characters: A-Z a-z 0-9 _ - ~

Labels

Key-value pairs. For example (Type - Sensor; Location - Home)

Location	Outdoor	X
Category	Surveillance	X

+

Membuat Application

The screenshot displays the ANTARES web application interface. At the top, the ANTARES logo is on the left, and a user profile 'Fariz Alemuda' is on the right. A left sidebar contains navigation links: GENERAL, Applications (highlighted), Documentation, Account, and Users. The main content area shows the breadcrumb 'Home / Applications / SmartEye'. The 'SmartEye PROJECT' header includes 'Subscribe', 'User Access', and a trash icon. Below this, a text block explains application management. Two URI types are listed: 'Hierarchical URI' with the URL 'https://platform.antares.id:8443/~/-/antares-cse/antares-id/SmartEye' and 'Non-hierarchical URI' with 'https://platform.antares.id:8443/~/-/antares-cse/CAE840214314'. Each URI has a copy icon. Below the URIs are two tags: 'Location Outdoor' and 'Category Surveillance'. A link 'How to Create Device via API' is at the bottom of the main content area. A search bar 'Search Devices...' and a '+ Add Device' button are at the bottom. The footer states 'Powered by Telkom Indonesia'.

ANTARES

Fariz Alemuda

GENERAL

Applications

Documentation

Account

Users

Home / Applications / SmartEye

SmartEye PROJECT

Subscribe User Access

Manage your application here. You can add/remove devices, subscribe to this application, manage user access key, etc.

Hierarchical URI
https://platform.antares.id:8443/~/-/antares-cse/antares-id/SmartEye

Non-hierarchical URI
https://platform.antares.id:8443/~/-/antares-cse/CAE840214314

Location Outdoor

Category Surveillance


How to Create Device via API

Search Devices...

+ Add Device

Powered by Telkom Indonesia

Menambahkan Device

☰  **ANTARES**

Home / Applications / SmartEye / Add Device

Fariz Alemuda ▾

GENERAL

- Applications
- Documentation
- Account
- Users


Add Device

Name

A SmartEye1

+ Add

Menambahkan Device

☰  **ANTARES**

Home / Applications / SmartEye / Add Device

Fariz Alemuda ▾

GENERAL

- Applications
- Documentation
- Account
- Users

Add Device

Name

A SmartEye1

+ Add

Menambahkan Device

Add Device

Device SmartEye1 successfully added to SmartEye

Menambahkan Device

The screenshot displays the ANTARES web application interface. On the left is a sidebar with a 'GENERAL' section containing links for 'Applications', 'Documentation', 'Account', and 'Users'. The 'Applications' link is highlighted. The main content area shows the 'SmartEye' project page. At the top right of this section are buttons for 'Subscribe', 'User Access', and a settings icon. Below these, there is a description of the application and two URIs: 'Hierarchical URI' and 'Non-hierarchical URI'. At the bottom of the main content area, there is a search bar labeled 'Search Devices...' and a blue button labeled '+ Add Device'. A small 'SmartEye1' device card is visible at the bottom left of the main content area.

Let's Do Some Hands-On

Sesi Hands-On

1

Kirim Data Dummy ke ANTARES

2

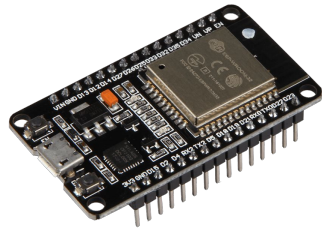
Kirim Data Sensor Environment ke ANTARES

3

Ambil Data Terakhir Sensor Environment di ANTARES

1 Mengirimkan Data Dummy

Mengirimkan Data Dummy



POST



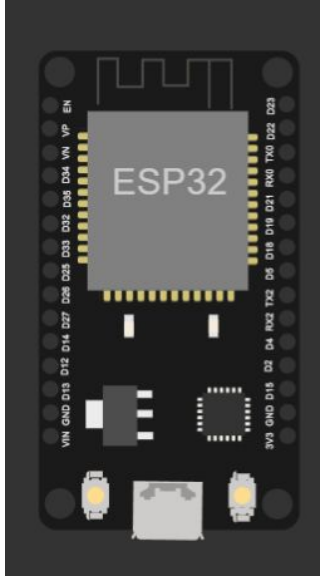
Mengirimkan Data ke ANTARES

Store Data of a Particular Device

• Request XML JSON

Field	Value								
URL	<code>https://platform.antares.id:8443/~/ antares-cse/ antares-id/ your-application-name/ your-device-name</code> or <code>https://platform.antares.id:8443/~/ antares-cse/ your-device-ID</code> <small>Note: your-device-ID must be starting with CNT . e.g. CNT-842419289</small>								
Method	POST								
Header	<table><thead><tr><th>Key</th><th>Value</th></tr></thead><tbody><tr><td>X-M2M-Origin</td><td><code>access-id:access-password</code></td></tr><tr><td>Content-Type</td><td><code>application/json;ty=4</code></td></tr><tr><td>Accept</td><td><code>application/json</code></td></tr></tbody></table>	Key	Value	X-M2M-Origin	<code>access-id:access-password</code>	Content-Type	<code>application/json;ty=4</code>	Accept	<code>application/json</code>
Key	Value								
X-M2M-Origin	<code>access-id:access-password</code>								
Content-Type	<code>application/json;ty=4</code>								
Accept	<code>application/json</code>								
Body	<pre>1 { 2 "m2m:cin": { 3 "con": "{ \"key1\":integer-value, \"key2\": \"string-value\", \"keyN\": \"valueN\" }" 4 } 5 }</pre>								

Mengirimkan Data Dummy



```
#include <WiFi.h>
#include <HTTPClient.h>

const char* ssid = "Wokwi-GUEST";
const char* password = "";

// url endpoint data of device
const char* serverName = "http://platform.antares.id:8080/~/antares-cse/antares-id/app-name/device-name";

// inisiasi variable
unsigned long lastTime = 0;
// Setting timer 5 detik
unsigned long timerDelay = 5000;

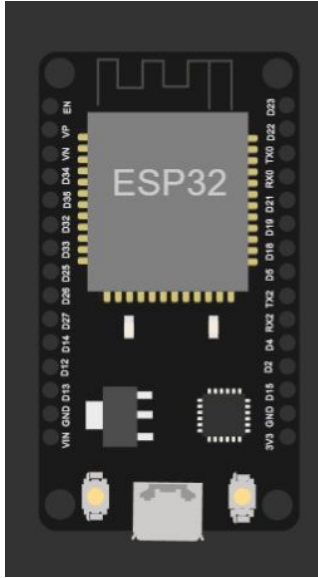
void setup() {
  // inisiasi serial port
  Serial.begin(115200);

  // inisiasi WiFi Client
  WiFi.begin(ssid, password);
  Serial.println("Connecting");
  while(WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.print("Connected to WiFi network with IP Address: ");
  Serial.println(WiFi.localIP());

  Serial.println("Timer set to 5 seconds (timerDelay variable), it will take 5 seconds before publishing the first reading.");
}
```



Mengirimkan Data Dummy



```
void loop() {  
    //rutin melakukan pengiriman data setiap waktu yang diset  
    if ((millis() - lastTime) > timerDelay) {  
        // mengecek koneksi wifi  
        if(WiFi.status()== WL_CONNECTED){  
            WiFiClient client;  
            HTTPClient http;  
  
            // inisiasi komunikasi http  
            http.begin(client, serverName);  
  
            // inisiasi http header  
            http.addHeader("X-M2M-Origin", "access-key-kamu-cek-di-antares-account");  
            http.addHeader("Content-Type", "application/json;ty=4");  
            http.addHeader("Accept", "application/json");  
            // inisiasi data yang dikirim di restful api  
            String httpRequestData = "{\"m2m:cin\": { \"con\": \"{{\\\"status\\\":\\\"\\\"0\\\"\\\"}}\"}";  
            // mengirimkan HTTP POST request  
            int httpResponseCode = http.POST(httpRequestData);  
  
            Serial.print("HTTP Response code: ");  
            Serial.println(httpResponseCode);  
  
            // menutup koneksi  
            http.end();  
        }  
        else {  
            Serial.println("WiFi Disconnected");  
        }  
        lastTime = millis();  
    }  
}
```

Output Mengirimkan Data Dummy

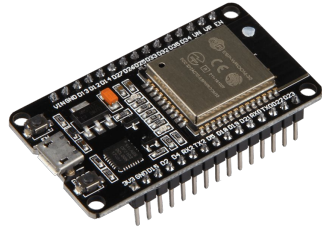
2022-07-22 10:52:50

/antares-cse/cin-Kg8NG8hITSK5Yobd

```
{  
  "status": "0"  
}
```

2 Mengirimkan Data Sensor Environment

Mengirimkan Data DHT22



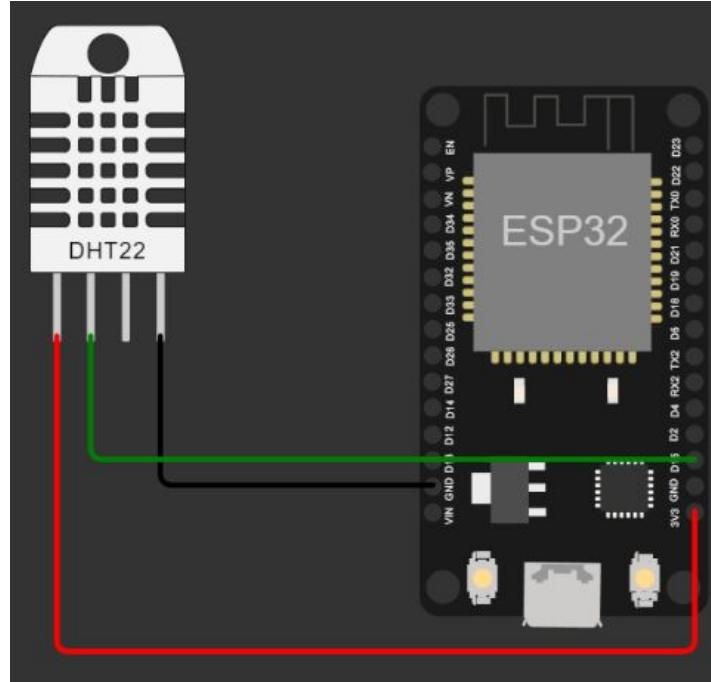
ESP32

POST →



DHT22

Mengirimkan Data DHT22



Mengirimkan Data DHT22

```
// proses include library
#include "DHTesp.h"
#include "WiFi.h"
#include "HTTPClient.h"

// deklarasi variable
// set pin yang digunakan
#define DHTPIN 15

const char* ssid = "Wokwi-GUEST";
const char* password = "";

// deklarasi object sensor
// set tipe DHT dan pin yang digunakan
DHTesp dht;

// url endpoint data of device
const char* serverName =
"http://platform.antares.id:8080/~/antares-cse/antares-id/app-name/dev-na
me";

// inisiasi variable
unsigned long lastTime = 0;
// Setting timer 5 detik
unsigned long timerDelay = 5000;
```

```
void setup() {
  // inisiasi interface serial
  Serial.begin(115200);

  Serial.println("EDSPERT - Akuisisi sensor DHT22 via ESP32");

  // inisiasi sensor DHT
  dht.setup(DHTPIN, DHTesp::DHT22);

  // inisiasi WiFi Client
  WiFi.begin(ssid, password);
  Serial.println("Connecting");
  while(WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }
  Serial.println("");
  Serial.print("Connected to WiFi network with IP Address: ");
  Serial.println(WiFi.localIP());

  Serial.println("Timer set to 5 seconds (timerDelay variable), it will
take 5 seconds before publishing the first reading.");
}
```

Mengirimkan Data DHT22

```
void loop() {  
  //rutin melakukan pengiriman data setiap waktu yang diset  
  if ((millis() - lastTime) > timerDelay) {  
    // deklarasi objek untuk menampung data  
    // temperatur dan kelembapan dari DHT22  
    TempAndHumidity data = dht.getTempAndHumidity();  
  
    // ekstrak data temperature  
    float temp = data.temperature;  
    // ekstrak data humidity  
    float hum = data.humidity;  
  
    // menampilkan data di serial  
    Serial.println("Suhu: " + String(temp, 2) + "°C");  
    Serial.println("Kelembaban: " + String(hum, 1) + "%");  
    Serial.println("----");  
  
    // waktu jeda sampling data  
    // minimal 2 detik  
    delay(5000);  
  
    // mengecek koneksi wifi  
    if(WiFi.status() == WL_CONNECTED){  
      WiFiClient client;  
      HTTPClient http;  
  
      // inisiasi komunikasi http  
      http.begin(client, serverName);
```

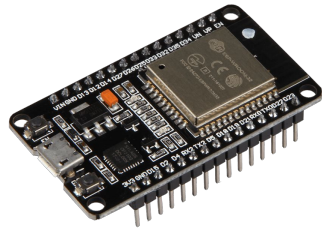
```
      // inisiasi http header  
      http.addHeader("X-M2M-Origin",  
        "access-key-kamu-cek-di-antares-account");  
      http.addHeader("Content-Type", "application/json;ty=4");  
      http.addHeader("Accept", "application/json");  
      // inisiasi data yang dikirim di restful api  
      String httpRequestData = "{\"m2m:cin\": { \"con\":  
        \"{\\\"temp\\\":\\\"\"";  
      httpRequestData = httpRequestData + String(temp, 2);  
      httpRequestData = httpRequestData + "\",\\\"hum\\\":\\\"\"";  
      httpRequestData = httpRequestData + String(hum,1);  
      httpRequestData = httpRequestData + "\"}\\\"}\"}";  
      // mengirimkan HTTP POST request  
      int httpResponseCode = http.POST(httpRequestData);  
  
      Serial.print("HTTP Response code: ");  
      Serial.println(httpResponseCode);  
  
      // menutup koneksi  
      http.end();  
    }  
    else {  
      Serial.println("WiFi Disconnected");  
    }  
    lastTime = millis();  
  }  
}
```


Output Mengirimkan Data DHT22

Time (WIB)	Resource Index (ri)	Data
2022-07-22 18:19:56	/antares-cse/cin-p21frdfhRVm5jAQg	<pre>{ "temp": "24.00", "hum": "40.0" }</pre>

3 Mendapatkan Data Sensor Environment

Mendapatkan Data DHT22



GET



Mendapatkan Data DHT22

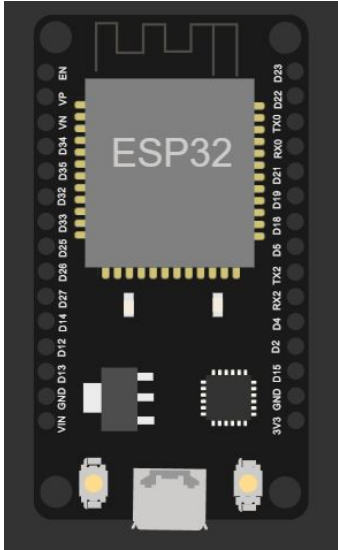
Retrieve Latest Data

• Request

XML JSON

Field	Value								
URL	<code>https://platform.antares.id:8443/~/{antares-cse/antares-id/your-application-name/your-device-name/la</code>								
Method	<code>GET</code>								
Header	<table><thead><tr><th>Key</th><th>Value</th></tr></thead><tbody><tr><td>X-M2M-Origin</td><td><code>access-id:access-password</code></td></tr><tr><td>Content-Type</td><td><code>application/json;ty=4</code></td></tr><tr><td>Accept</td><td><code>application/json</code></td></tr></tbody></table>	Key	Value	X-M2M-Origin	<code>access-id:access-password</code>	Content-Type	<code>application/json;ty=4</code>	Accept	<code>application/json</code>
Key	Value								
X-M2M-Origin	<code>access-id:access-password</code>								
Content-Type	<code>application/json;ty=4</code>								
Accept	<code>application/json</code>								

Mendapatkan Data DHT22



Mendapatkan Data DHT22

```
HTTPClient http;
http.begin(url);
http.addHeader("X-M2M-Origin",
"access-key-kamu-cek-di-antares-account");
http.addHeader("Content-Type", "application/json;ty=4");
http.addHeader("Accept", "application/json");

int httpResponseCode = http.GET();
if (httpResponseCode > 0) {
  Serial.print("HTTP ");
  Serial.println(httpResponseCode);
  String payload = http.getString();
  Serial.println();
  Serial.println(payload);
}
else {
  Serial.print("Error code: ");
  Serial.println(httpResponseCode);
  Serial.println(":-(");
}

delay(5000);
}
```

Output Mendapatkan Data DHT22

```
Fetching http://platform.antares.id:8080/~antares-cse/antares-id/workshop-widyaedu/dht22/la... HTTP 200
```

```
{
  "m2m:cin" : {
    "rn" : "cin_c3Qqh0PjTrWZI340",
    "ty" : 4,
    "ri" : "/antares-cse/cin-c3Qqh0PjTrWZI340",
    "pi" : "/antares-cse/cnt-vzQ19SSmSJmT1G2H",
    "ct" : "20220722T184110",
    "lt" : "20220722T184110",
    "st" : 0,
    "cnf" : "text/plain:0",
    "cs" : 29,
    "con" : "{\"temp\": \"24.00\", \"hum\": \"40.0\"}"
  }
}
```

TUGAS

Membuat sistem alarm suhu $>40^{\circ}\text{C}$, maka LED Merah menyala. Gunakan data yang tersimpan di Cloud ANTARES.

HINT

Latest Data of Device ANTARES

PERSIAPAN PERTEMUAN KE 7

- Instalasi [Driver Serial](#)
- Instalasi [Arduino IDE v1.8](#)
- Instalasi [Board ESP32](#)
- Instalasi [Library LoRaWAN Antares](#)