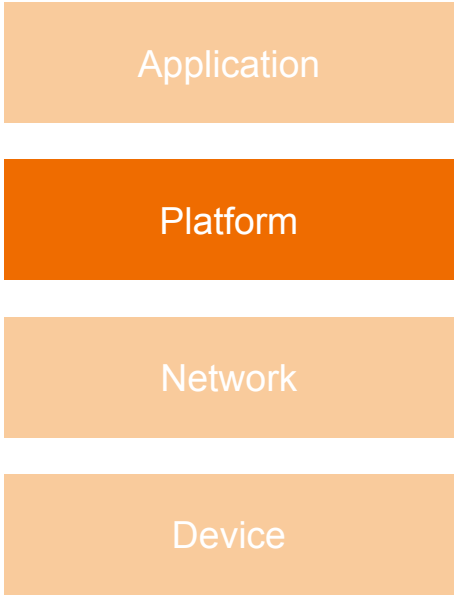
Edspert.id
powered by widyaedu

ANTARES

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

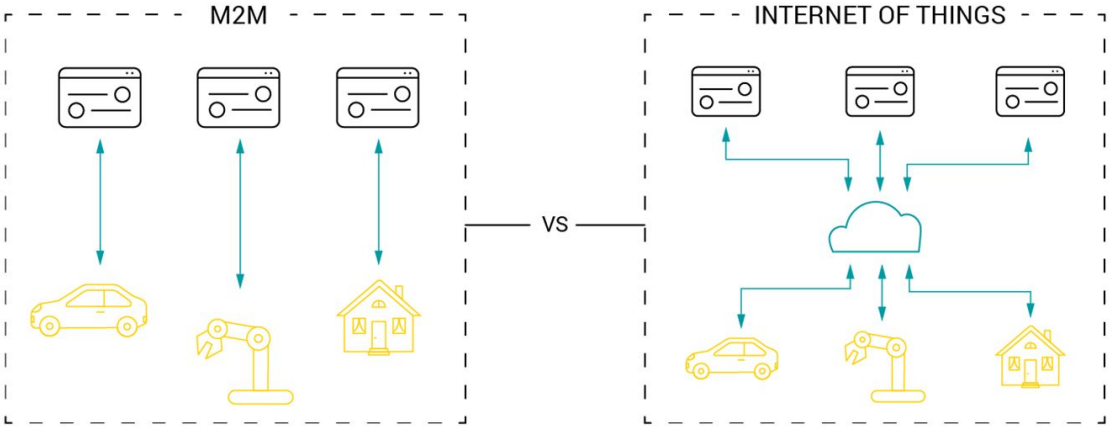
Device Management

Interoperability

Data Management

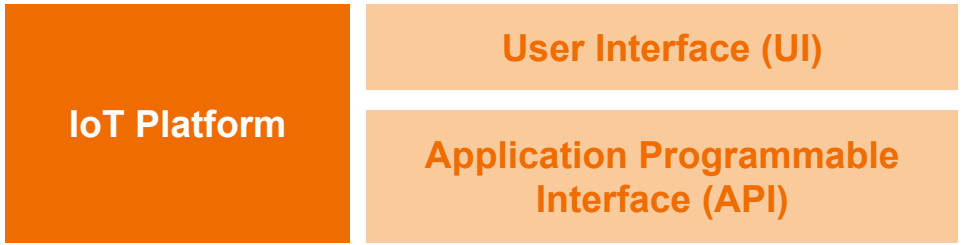
Mengapa IoT Platform dibutuhkan?

IoT Platform vs M2M

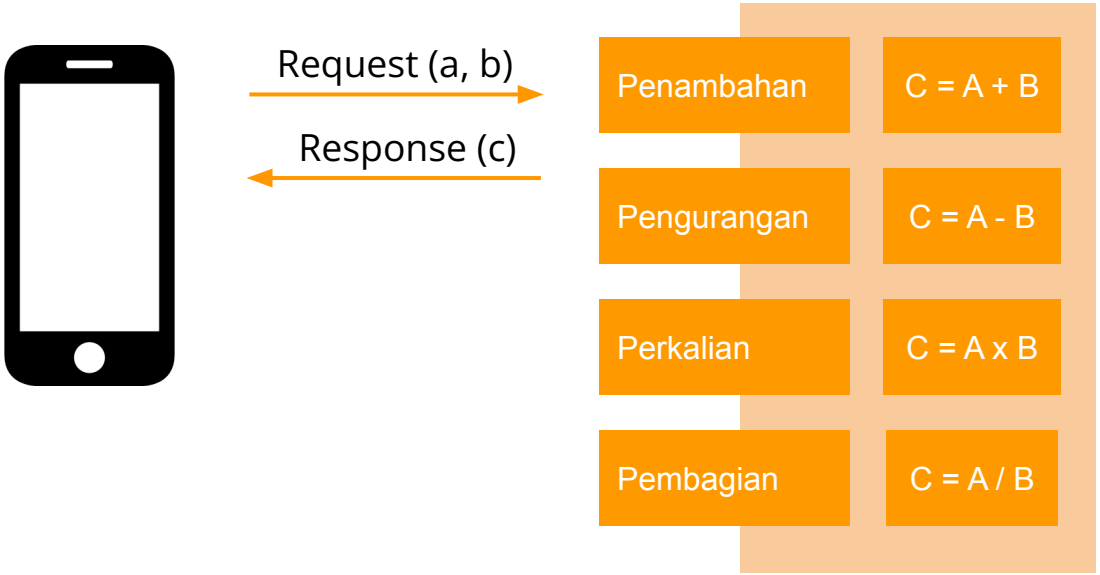


IoT memiliki penekanan pada sharing data agar menghasilkan nilai tambah kepada pelanggan. Kombinasi data dari seluruh komponen memungkinkan system yang lebih efektif dan efisien.

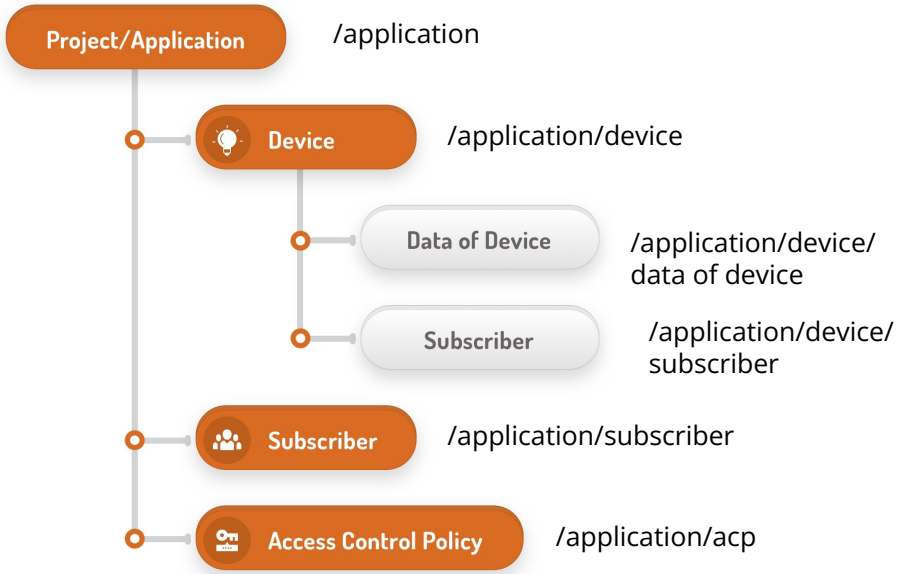
IoT Platform Interfaces



API (Application Programmable Interface)



HTTP API Antares



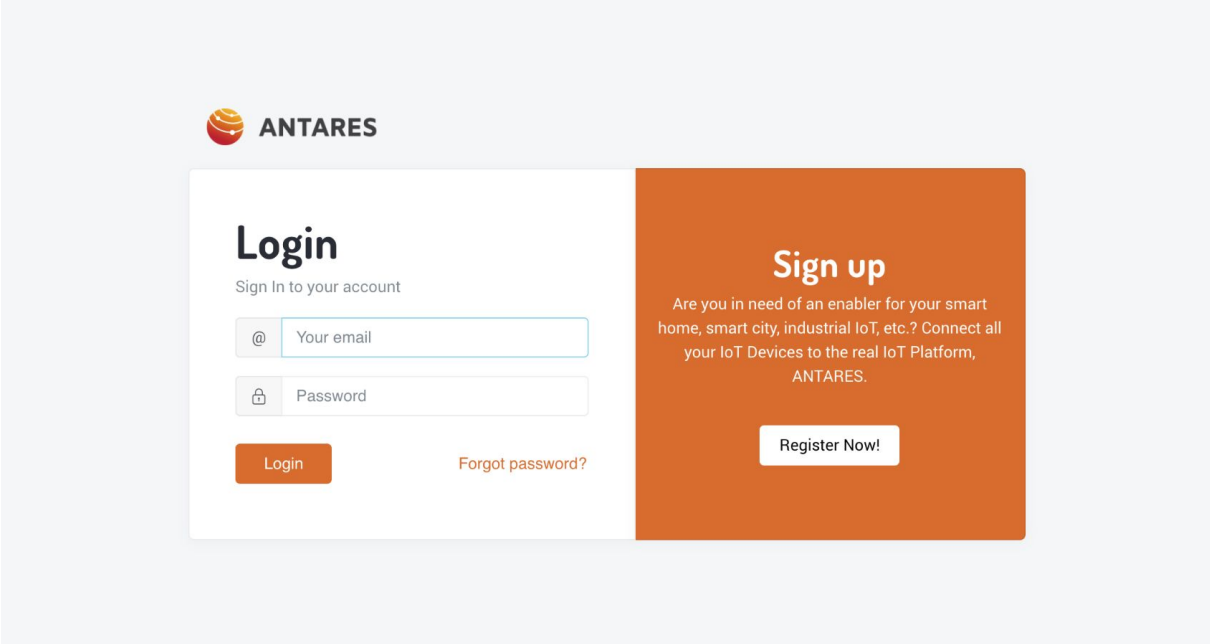
- Application
  - Retrieve
- Device
  - Create
  - Retrieve
  - Update
  - Delete
- Data of Device
  - Create
  - Retrieve
- Subscriber
  - Create
  - Retrieve
  - Update
  - Delete
- Grouping
  - Create
  - Retrieve

Edspert.id
powered by widyaedu

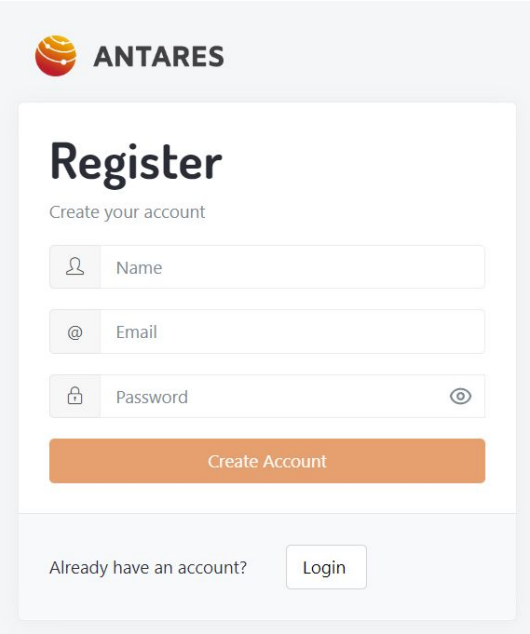
ANTARES

Registrasi Akun

Register Account



Register Account

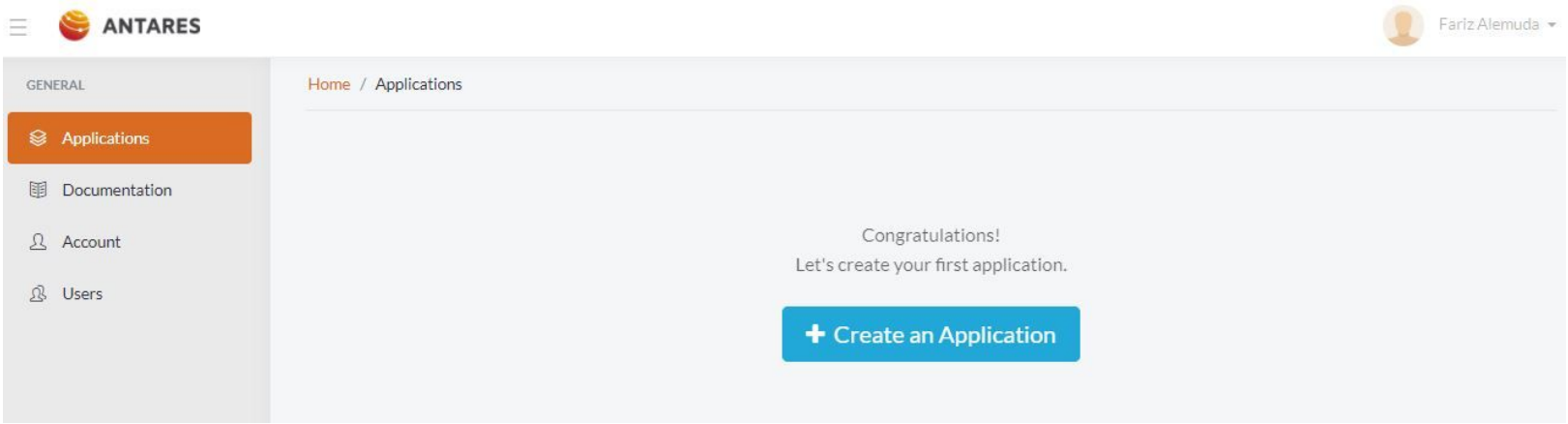


Edspert.id
powered by widyaedu

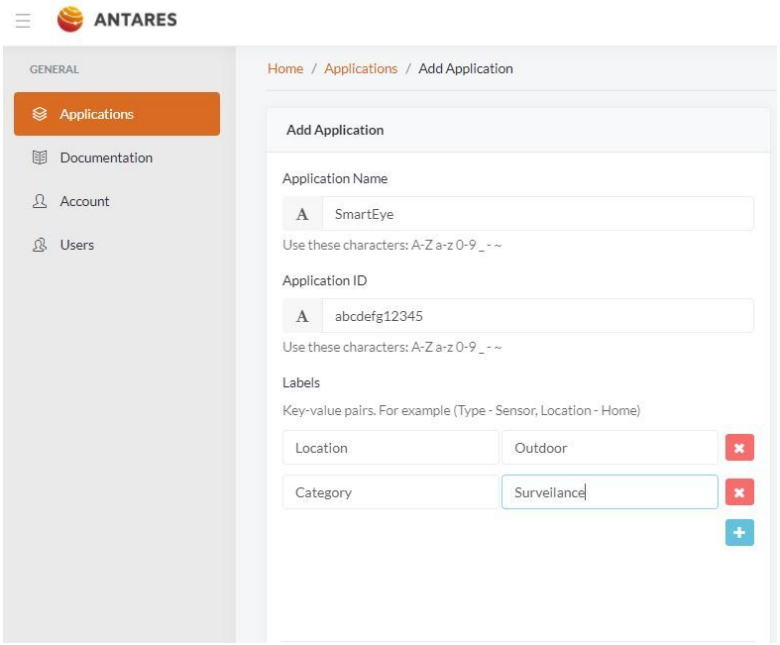
ANTARES

Provisioning

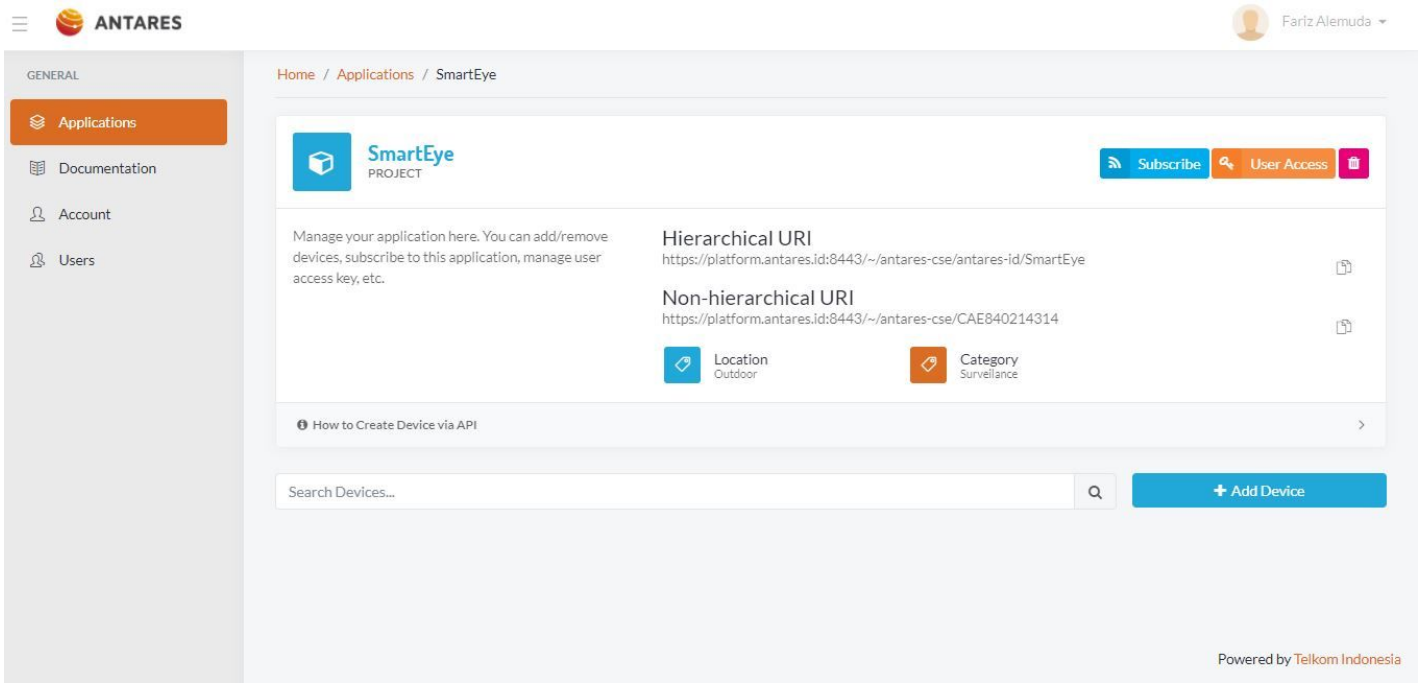
Membuat Application



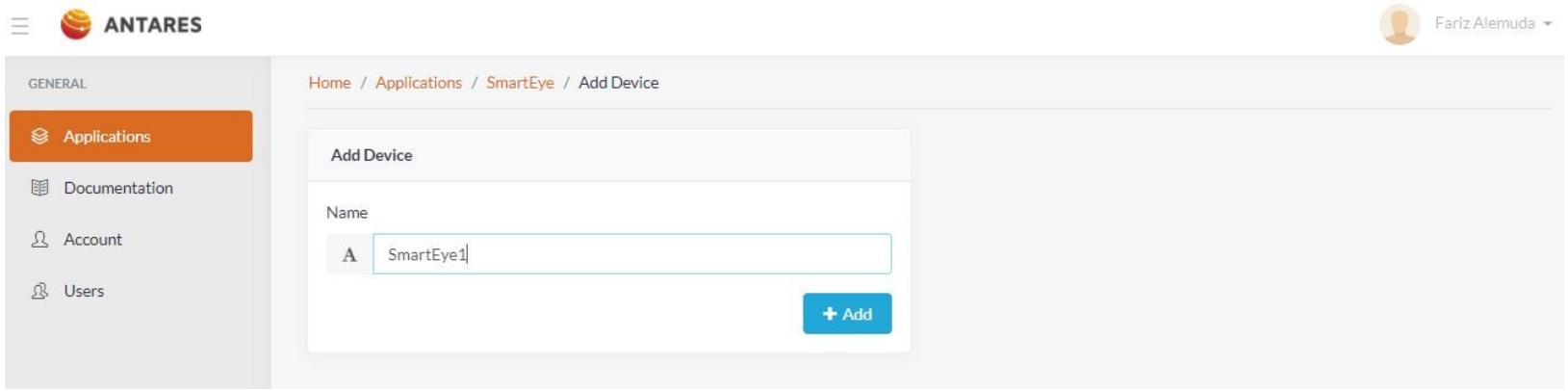
Membuat Application



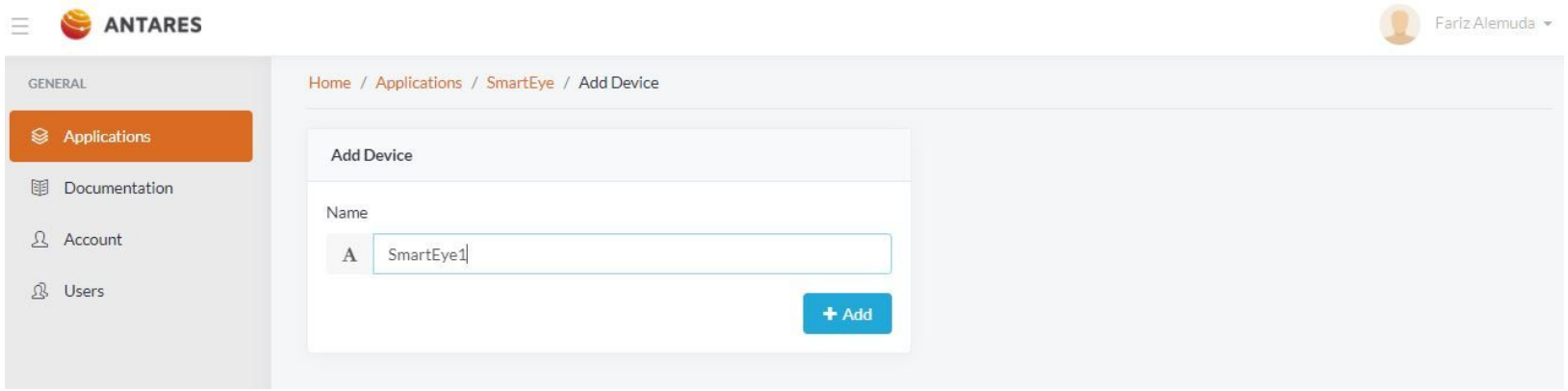
Membuat Application



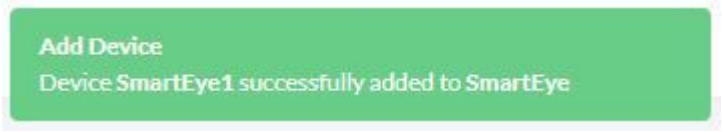
Menambahkan Device



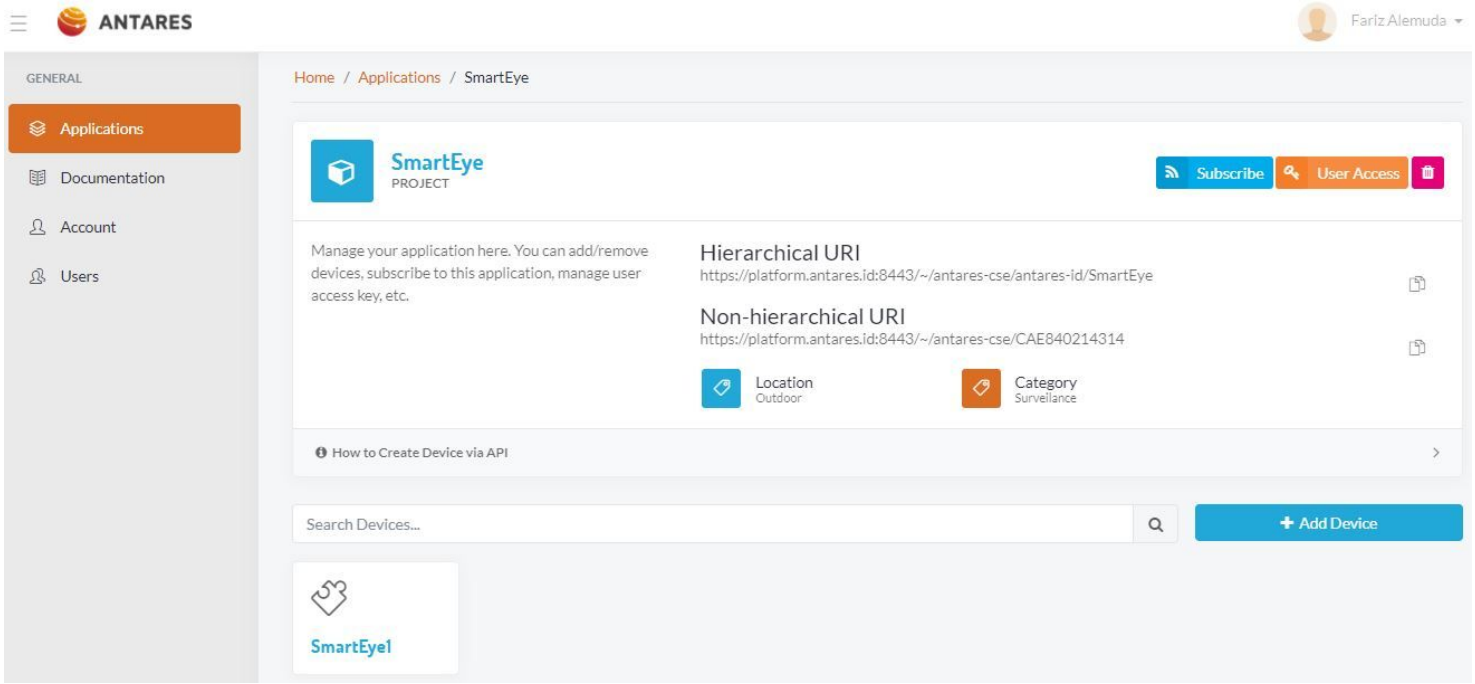
Menambahkan Device



Menambahkan Device



Menambahkan Device



ANTARES

Let’s Do Some Hands-On

Sesi Hands-On

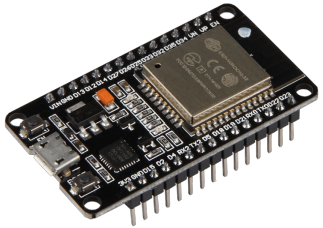
1. Kirim Data Dummy ke ANTARES
2. Kirim Data Sensor Environment ke ANTARES
3. Ambil Data Terakhir Sensor Environment di ANTARES

Edspert.id
powered by widyaedu

ANTARES

1 Mengirimkan Data Dummy

Mengirimkan Data Dummy



POST

ANTARES

Mengirimkan Data ke ANTARES

Store Data of a Particular Device

- **Request**

XML | JSON

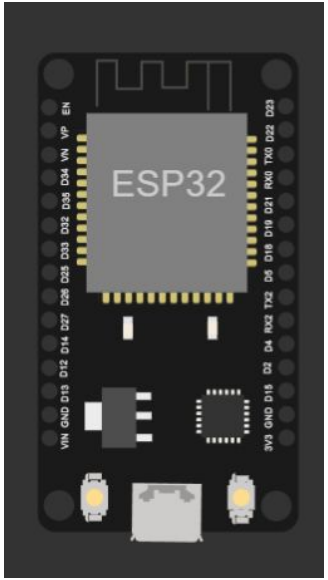
Field	Value	

URL	`https://platform.antares.id:8443/~/antares-cse/antares-id/your-application-name/your-device-name`
	or
	`https://platform.antares.id:8443/~/antares-cse/your-device-ID`
	
	Note: `your-device-ID` must be starting with `CNT` . e.g. `CNT-842419289`	

Method	`POST`	
Header	**Key**	**Value**
	X-M2M-Origin	`access-id:access-password`
	Content-Type	`application/json;ty=4`
	Accept	`application/json`
Body		

```
{
    "m2m:cin": {
    "con": "{\"key1\":integer-value, \"key2\":\"string-value\", \"keyN\":\"valueN\"}"
    }
}
```

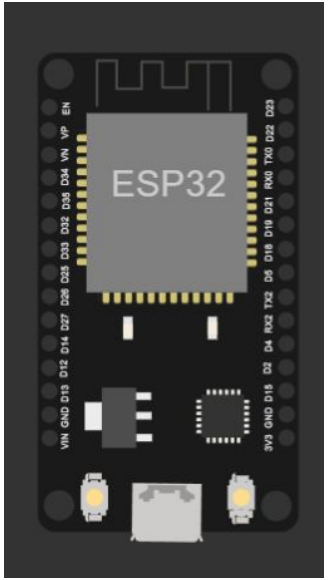
Mengirimkan Data Dummy




```
#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.");
}
```

ANTARES

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();
  }
}
```

Edspert.id
powered by widyaedu

ANTARES

Output Mengirimkan Data Dummy

2022-07-22 10:52:50 /antares-cse/cin-Kg8NG8hITSK5Yobd


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

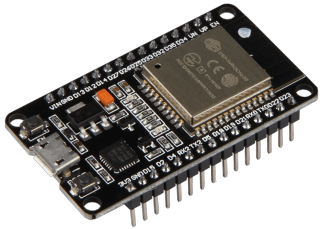
Edspert.id
powered by widyaedu

ANTARES

2

Mengirimkan Data Sensor Environment

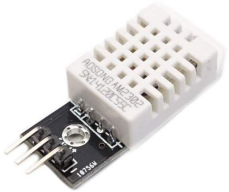
Mengirimkan Data DHT22



ESP32

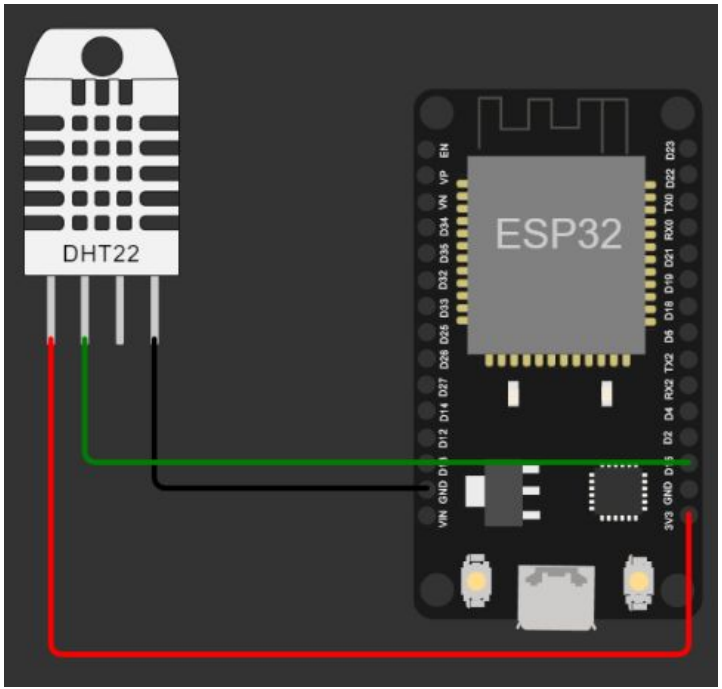
POST

ANTARES



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();
  }
}
```

Edspert
powered by widyaedu

ANTARES

Output Mengirimkan Data DHT22

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

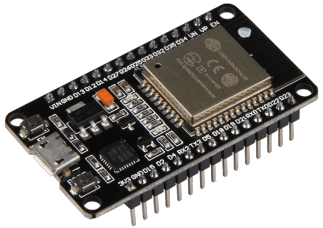
Edspert.id
powered by widyaedu

ANTARES

3

Mendapatkan Data Sensor Environment

Mendapatkan Data DHT22



GET

ANTARES

Mendapatkan Data DHT22

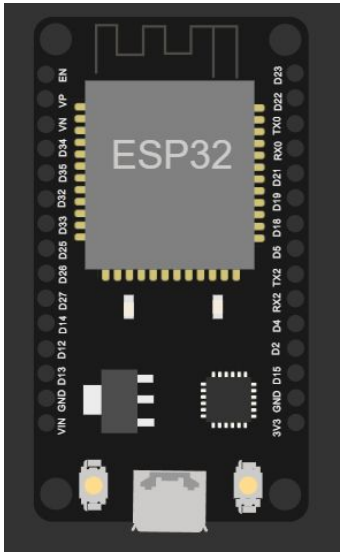
Retrieve Latest Data

- **Request**

XML | JSON

Field	Value	
URL	`https://platform.antares.id:8443/~/antares-cse/antares-id/your-application-name/your-device-name/la`	
Method	`GET`	
Header	**Key**	**Value**
	X-M2M-Origin	`access-id:access-password`
	Content-Type	`application/json;ty=4`
	Accept	`application/json`

Mendapatkan Data DHT22




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

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

const String url =
"http://platform.antares.id:8080/~/antares-cse/antares-id/app-name/device
-name/la";

void setup() {
  Serial.begin(115200);
  WiFi.begin(ssid, password);
}

void loop() {
  Serial.print("Connecting to WiFi");
  while (WiFi.status() != WL_CONNECTED) {
    delay(500);
    Serial.print(".");
  }

  Serial.print("OK! IP=");
  Serial.println(WiFi.localIP());

  Serial.print("Fetching " + url + "... ");
```

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 >40C, 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