



INDONESIA INTERNET SERVICE PROVIDER ASSOCIATION

Asosiasi  
Penyelenggara  
Jasa  
Internet  
Indonesia

# Pelatihan Internet of Things

Di dukung oleh:





# Tentang Saya



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# Pembahasan

- **Trend Revolusi industri 4.0**
- **Potensi Aplikasi IoT**
- **Contoh penggunaan teknologi IoT**
- **Komponen IoT**
- **Instalasi Server IoT**
- **Praktik dengan ESP8266**



# Trend Revolusi Industri 4.0

- **Revolusi industri 4.0** memiliki ciri adanya **transformasi digital** yang merubah cara organisasi beroperasi dan bekerja.
- **Transformasi digital** ini didukung teknologi:
  - Cloud Computing,
  - Artificial Intelligence (AI),
  - Internet of Things,
  - Machine Learning.

# Potensi digitalisasi di berbagai sektor di Indonesia

Across key sectors, Indonesia could harness digitization to realize total productivity impact of USD 120 billion by 2025.

USD billion

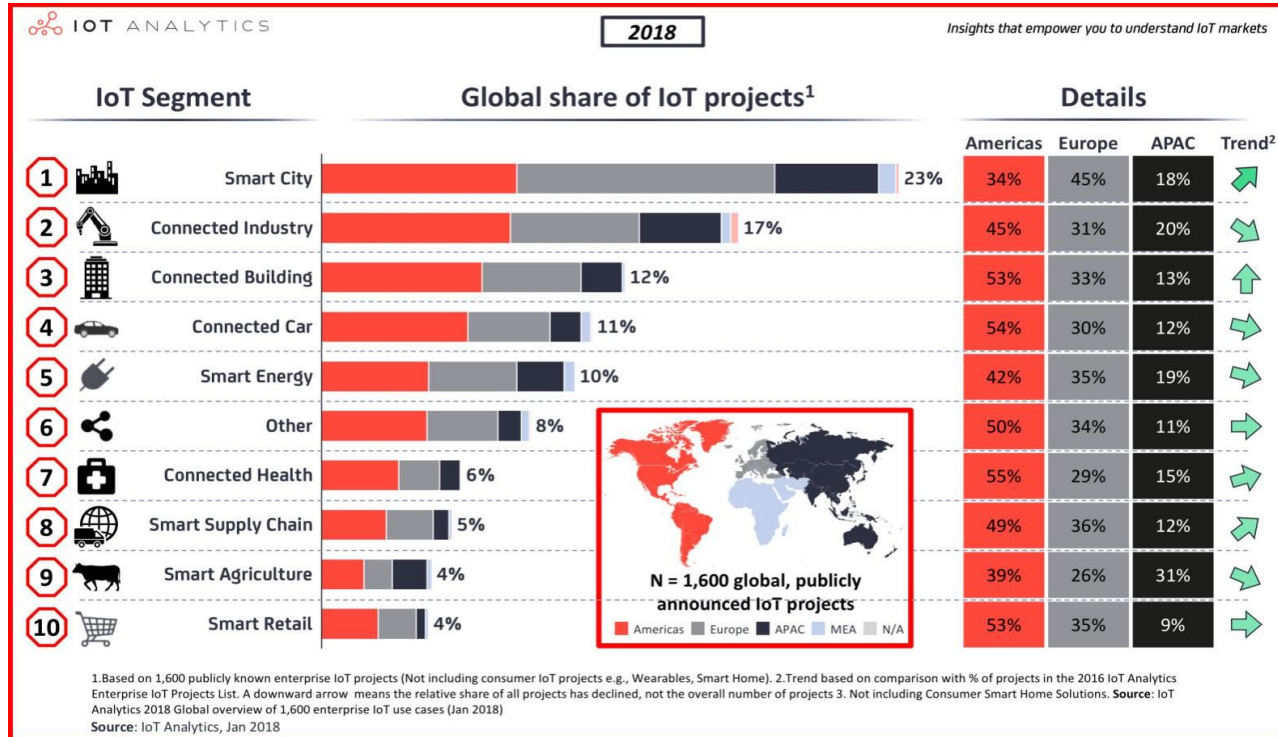
Sector	Estimated 2025 GDP base impact	Operation optimization	Human health and productivity	Product and sales development
Manufacturing	34.4	29.4	3.0	2.0
Retail	24.5	12.5	6.7	5.3
Transport	15.5	13.6	1.9	0.0
Mining	14.8	14.0	0.5	0.3
Agriculture	11.0	10.6	0.3	0.0
Telecom and media	7.9	5.7	1.7	0.5
Healthcare	6.6	2.2	4.3	0.0
Public sector and utilities	4.8	4.7	0.1	0.0
Financial	1.8	1.1	0.1	0.6
<b>Total</b>	<b>121.4</b>	<b>93.8</b>	<b>18.7</b>	<b>8.9</b>

Source: Based on McKinsey Global Institute Study "Unlocking the potential of the Internet of Things," Team analysis adjusting figures for Indonesian context

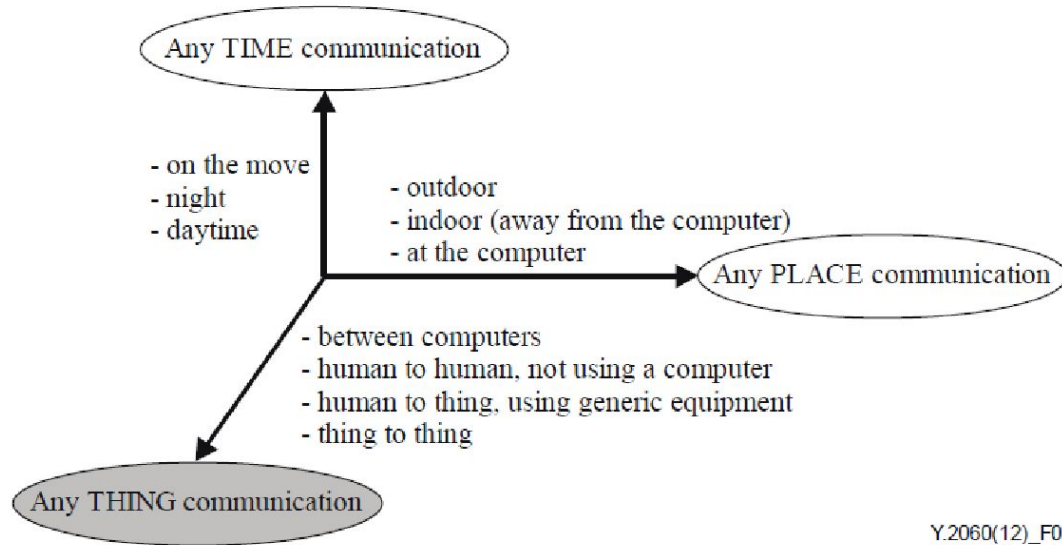
- Manufaktur
- Ritel
- Transportasi
- Tambang
- Pertanian
- Media dan Telekomunikasi
- Kesehatan
- Pelayanan Umum
- finansial



# Peringkat Segmentasi IoT



# Konsep IoT



Y.2060(12)\_F01

**Figure 1 – The new dimension introduced in the Internet of things [b-ITU Report]**

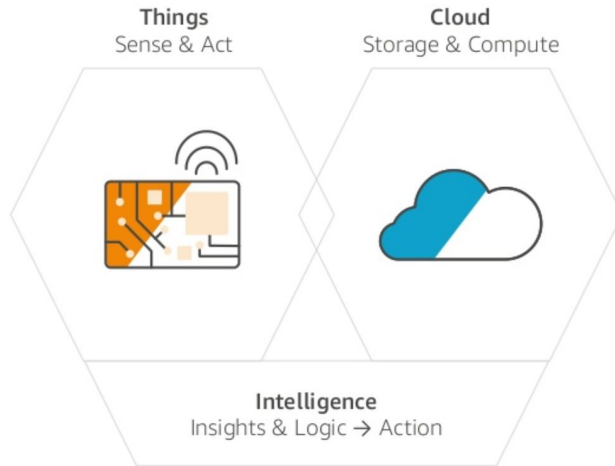
(sumber: ITU-T Y.4000/Y.2060 (06/2012))





# Komponen Penyusun IoT

## Concept of IoT



**AWS**  
**re:Invent**

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### **Things:**

Perangkat komputasi kecil untuk penginderaan dan aksi.

### **Cloud:**

Server untuk komputasi dan penyimpanan

### **Intelligence:**

Algoritma analisis data dan pengambilan keputusan dari data

(sumber: <https://aws.amazon.com/iot/>)



# Contoh IoT - Smart Home

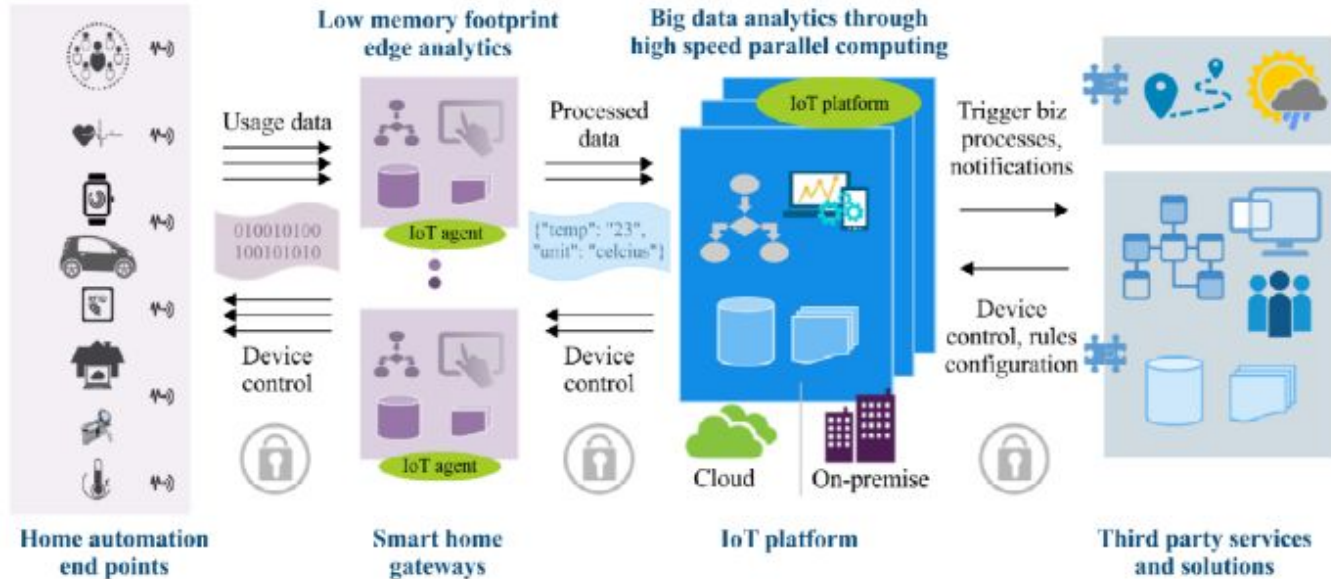
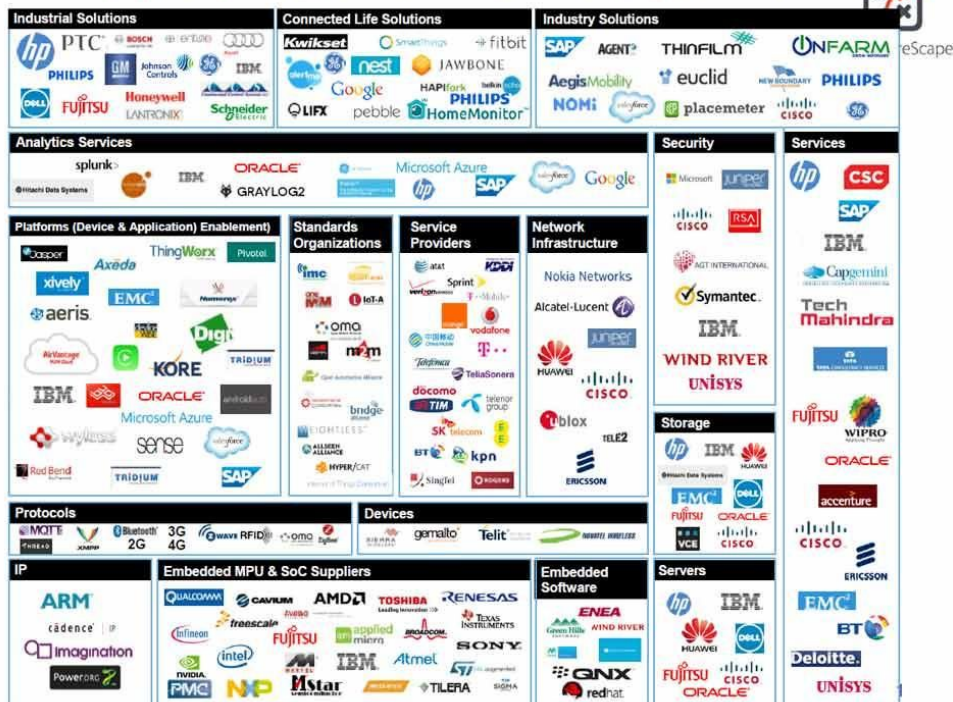


Figure 8-16 – Home automation system contextual description

# Premain IoT



## INTERNET OF THINGS

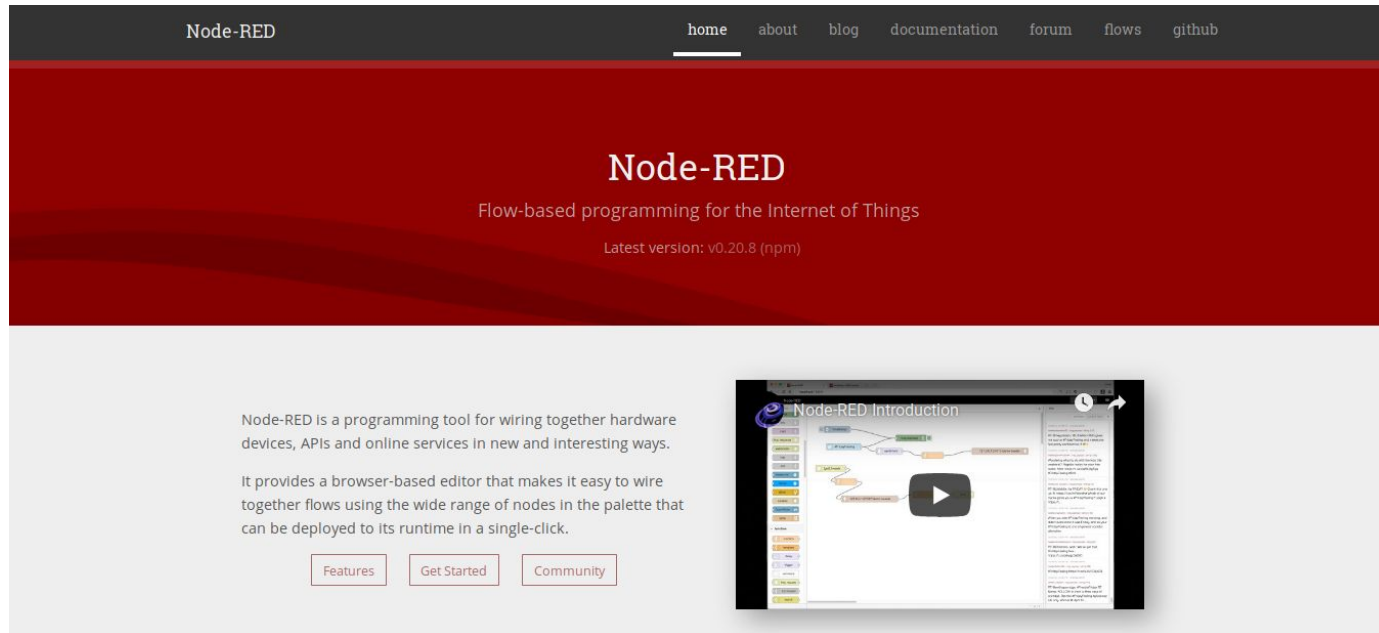


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# Instalasi Server

# Node-RED



The screenshot shows the Node-RED website homepage. At the top is a dark navigation bar with the 'Node-RED' logo on the left and a menu of links (home, about, blog, documentation, forum, flows, github) on the right. The 'home' link is underlined. Below the navigation bar is a large red banner with the 'Node-RED' logo in white, the tagline 'Flow-based programming for the Internet of Things', and the text 'Latest version: v0.20.8 (npm)'. Underneath the banner, on a light gray background, is a text block describing Node-RED as a programming tool for wiring together hardware devices, APIs, and online services. It mentions a browser-based editor and a palette of nodes. Below this text are three buttons: 'Features', 'Get Started', and 'Community'. To the right of the text is a video player titled 'Node-RED Introduction' showing a flow diagram with a play button in the center.

Node-RED

home about blog documentation forum flows github

## Node-RED

Flow-based programming for the Internet of Things

Latest version: v0.20.8 (npm)

Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.

It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single-click.

[Features](#) [Get Started](#) [Community](#)

Node-RED Introduction



# Instalasi Node-RED

- **Install Node.js**
- **Install npm**
- **Install Node-RED - Ubuntu**
- **Install Node-RED - Docker**



# Instalasi Node-RED

- **Install Node.js**
  - `sudo apt-get install nodejs`
  - `node -v`

```
dwp@project: ~  
File Edit View Search Terminal Help  
dwp@project:~$ node -v  
v10.16.3  
dwp@project:~$
```



# Instalasi Node-RED

- **Install npm**
  - `sudo apt-get install npm`
  - `npm -v`

```
dwp@project: ~  
File Edit View Search Terminal Help  
dwp@project:~$ npm -v  
6.9.0  
dwp@project:~$
```





# Instalasi Node-RED

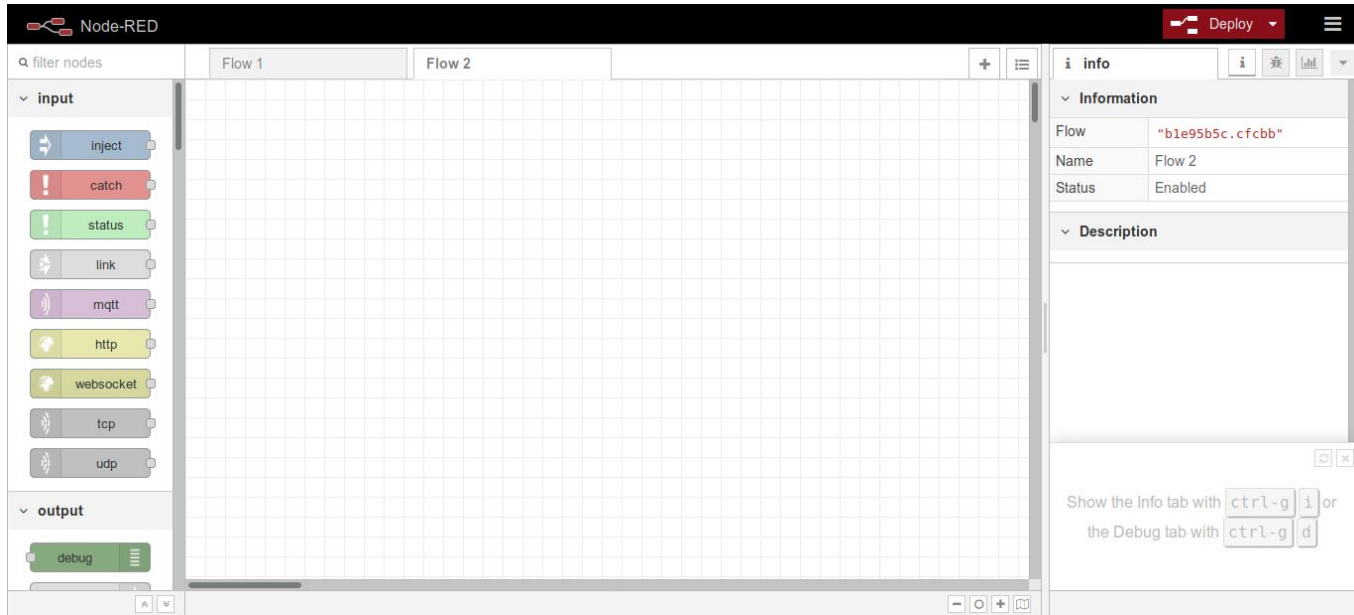
- **Install Node-RED - Ubuntu**
  - `sudo npm install -g --unsafe-perm node-red`
- **Menjalankan Node-RED**

○

```
dw@project: ~  
File Edit View Search Terminal Help  
-----  
16 Sep 12:10:30 - [info] Server now running at http://127.0.0.1:1880/  
16 Sep 12:10:30 - [info] Starting flows  
16 Sep 12:10:30 - [info] Started flows
```



# Instalasi Node-RED



# Instalasi Node-RED

- **Install Node-RED - Docker**

- `docker run -it -p 1880:1880 --name iot-klas davidwah/node-red-dwp`



# Instalasi Node-RED

- 



# Praktik dengan ESP8266

Komponen yang perlu disiapkan:

- Software Arduino IDE
- Library :
  - esp8266
  - PubSubClient
  - blynk
- 



# Praktik dengan ESP8266

Menambahkan paket **Board Manager ESP8266**

**File -> Preferences -> Additional Board Manager URLs**

`http://arduino.esp8266.com/stable/package\_esp8266com\_index.json`

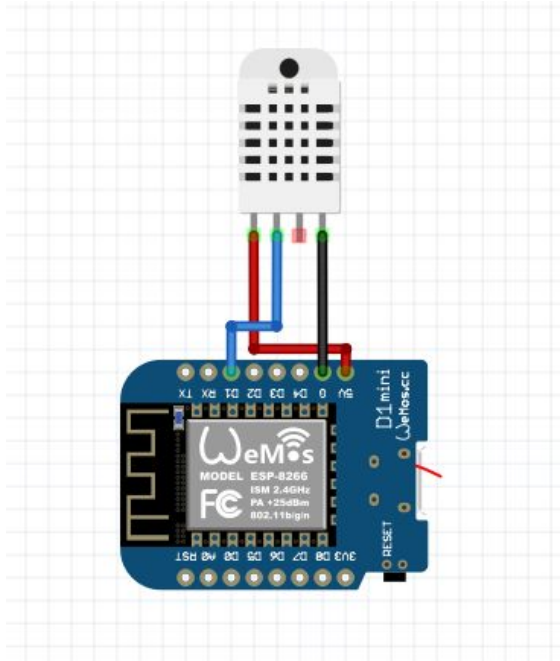
Menambahkan paket **PubSubClient**

**Sketch -> Include Library -> Manage Libraries**

Ketik pada kolom pencarian `PubSubClient` (Nick O'Leary)



# Praktik dengan ESP8266 dan DHT11



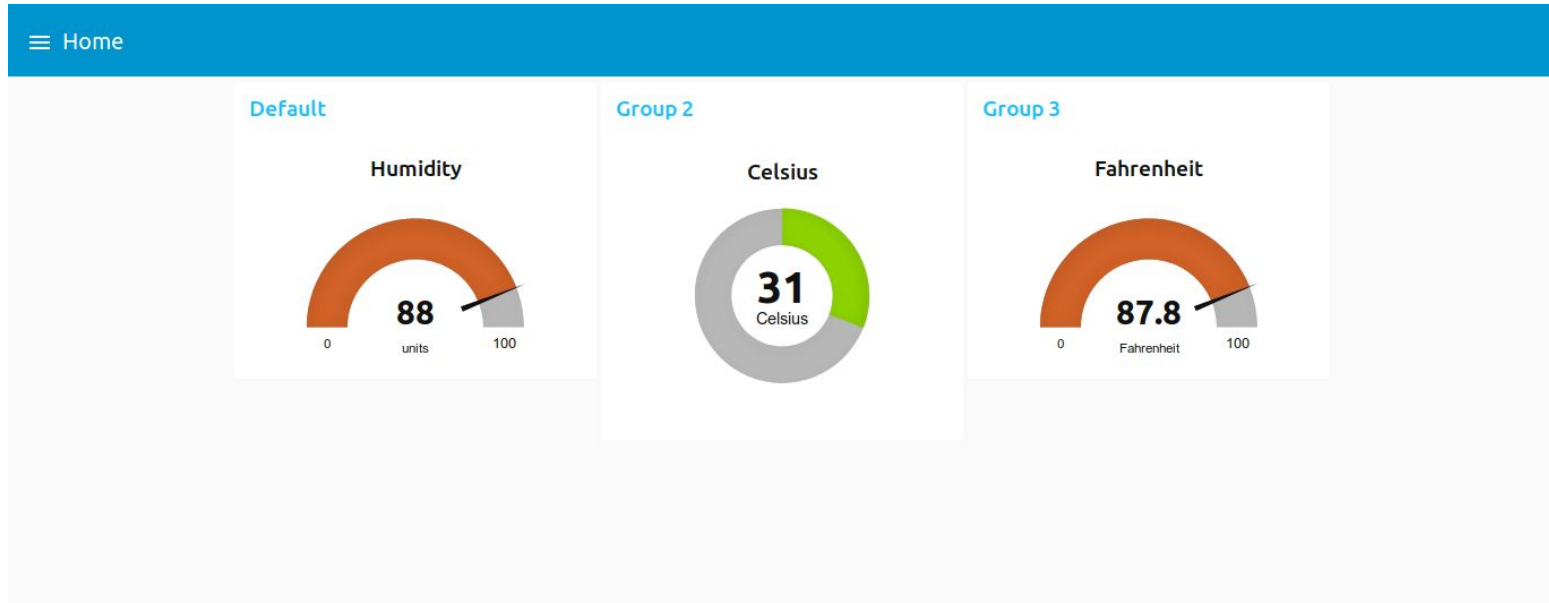
## NodeMCU => DHT 11

- Pin VCC DHT11 ke Pin 5V
- Pin GND DHT11 ke Pin G (Ground)
- Pin Data DHT 11 ke Pin D1(Digital 1)

Kode program:

[Wemos DHT11 MQTT](#)

# Praktik dengan ESP8266 dan DHT11





# Praktik dengan ESP8266 dan DHT11

The screenshot displays the Node-RED web interface. On the left, the 'input' tab is active, showing various nodes like inject, catch, status, link, mqtt, http, websocket, tcp, and udp. The main workspace shows a flow for a DHT11 sensor. Three sensor nodes (sensor/humidity, sensor/temp\_celsius, and sensor/temp\_fahrenheit) are connected to three display nodes (Humidity, Celsius, and Fahrenheit) and a single chart node. The right sidebar shows the 'info' panel for the 'ui\_chart' node, displaying its node ID, type, and description.

**Node-RED Interface Details:**

- Filter nodes:** DHT11
- Input Nodes:** inject, catch, status, link, mqtt, http, websocket, tcp, udp
- Sensor Nodes:** sensor/humidity, sensor/temp\_celsius, sensor/temp\_fahrenheit
- Display Nodes:** Humidity, Celsius, Fahrenheit
- Chart Node:** chart

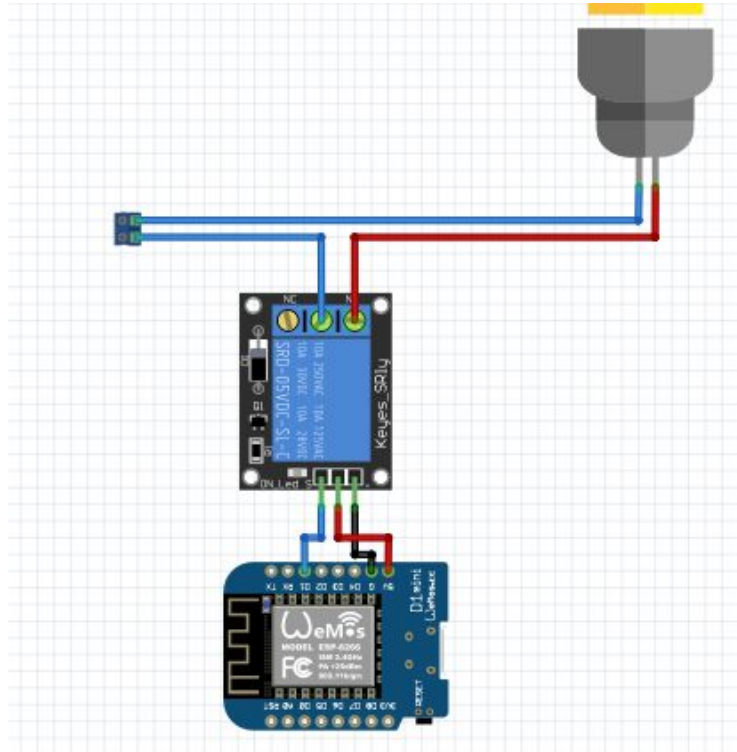
**Node-RED Info Panel (ui\_chart):**

- Information:**
  - Node: "a921e1d0.c11768"
  - Type: ui\_chart
- Description:**

Plots the input values on a chart. This can either be a time based line chart, a bar chart (vertical or horizontal), or a pie chart.
- Node Help:**

Each input `msg.payload` value will be converted to a number. If the conversion fails, the message is ignored.

# Praktik dengan ESP8266 dan Relay



## NodeMCU => Relay

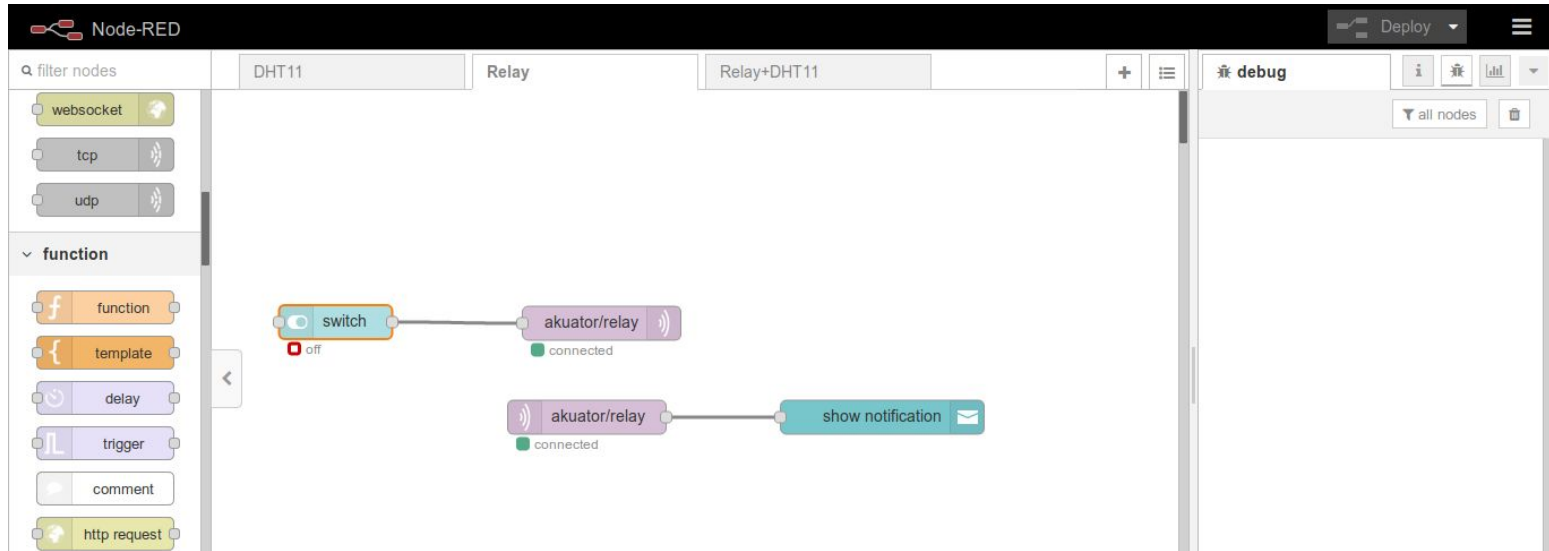
- Pin VCC relay ke 5V
- Pin GND Relay ke Pin G (Ground)
- Pin Data Relay ke pin D1 (Digital 1)

Kode program:

[Wemos Relay MQTT](#)



# Praktik dengan ESP8266 dan Relay





Finish

Thank You