

SISTEM KOMUNIKASI NIRKABEL
MODUL 2

SENSOR AKTUATOR INTERNET OF THINGS
BERBASIS PACKET TRACER

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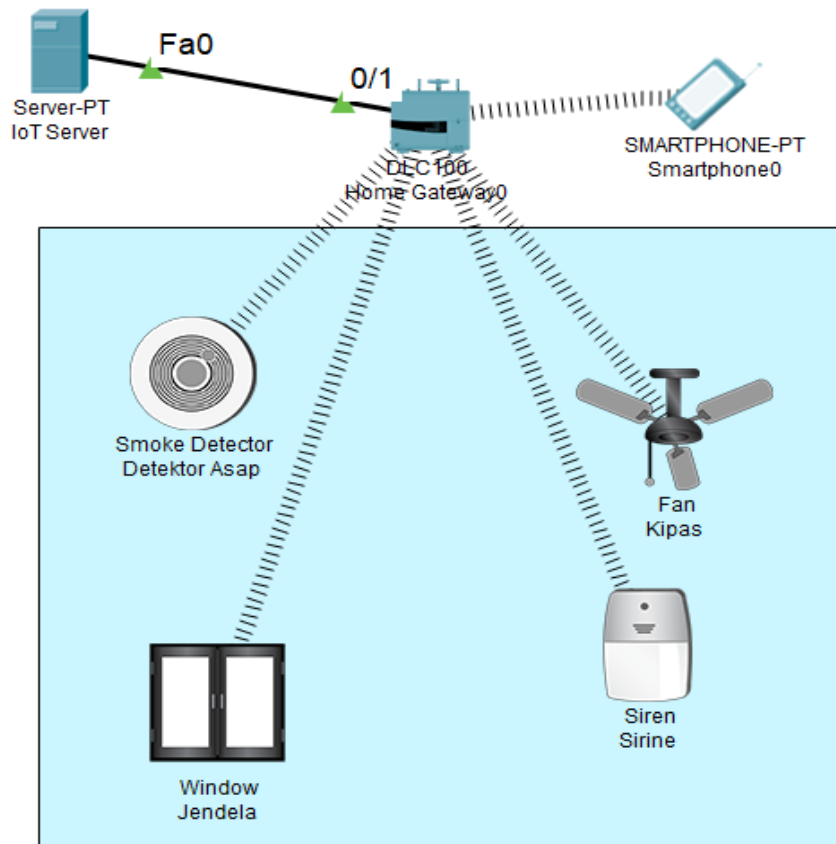
TOPIK BAHASAN

- Smoke Detector
- Motion Detector
- Trip Sensor
- Fire Monitor

SMOKE DETECTOR

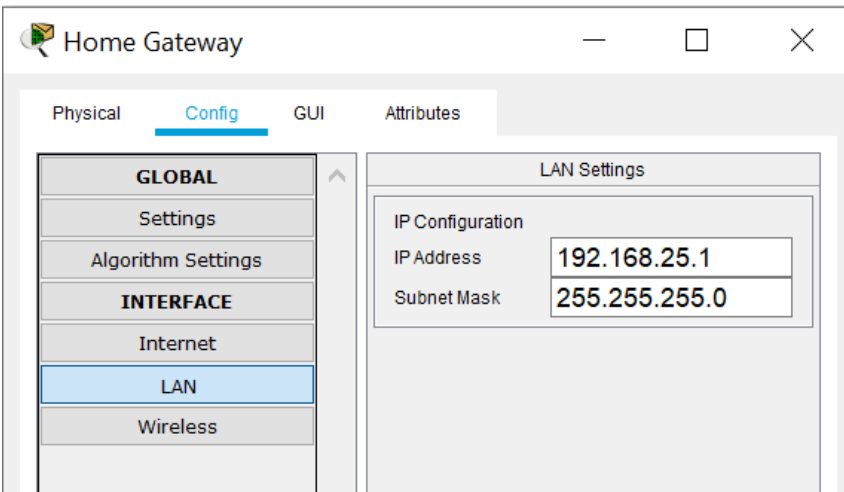
Topologi Jaringan

- Designlah jaringan seperti berikut:

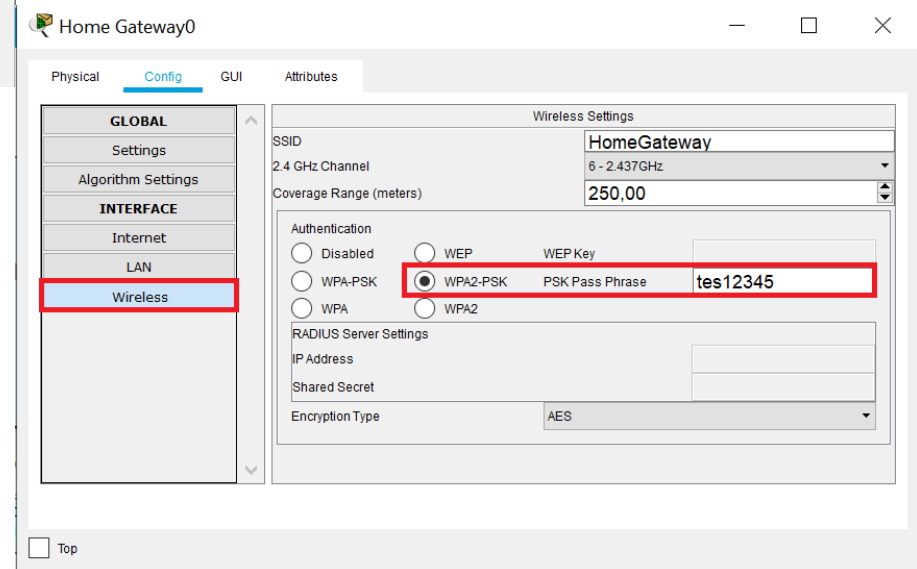


Setting pada HomeGateway

Setting IP Address (DHCP Server)

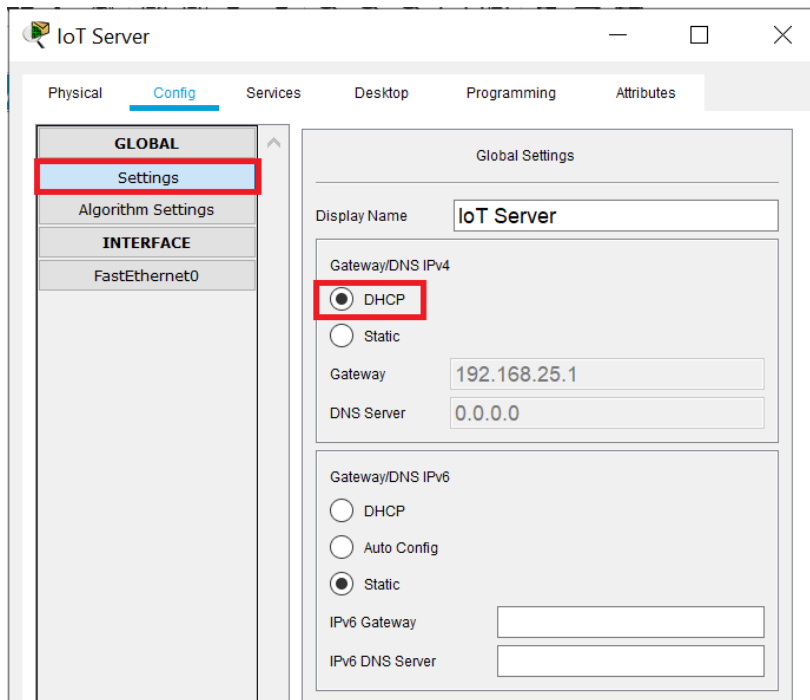


Setting WiFi & Security

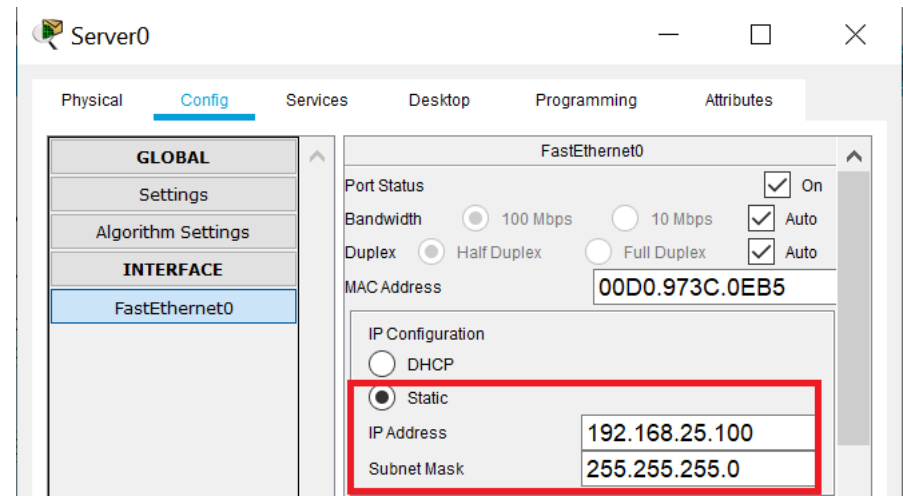


Setting pada IoT Server

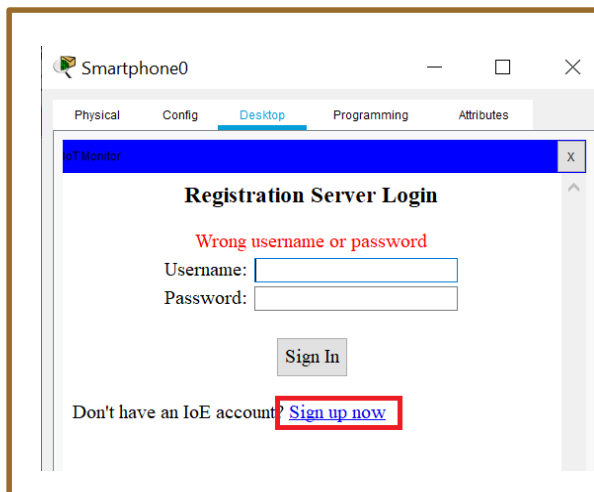
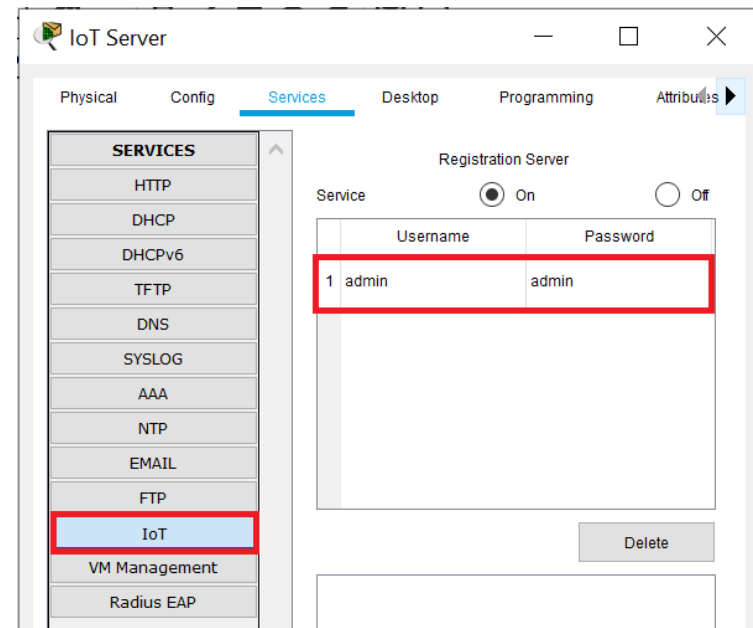
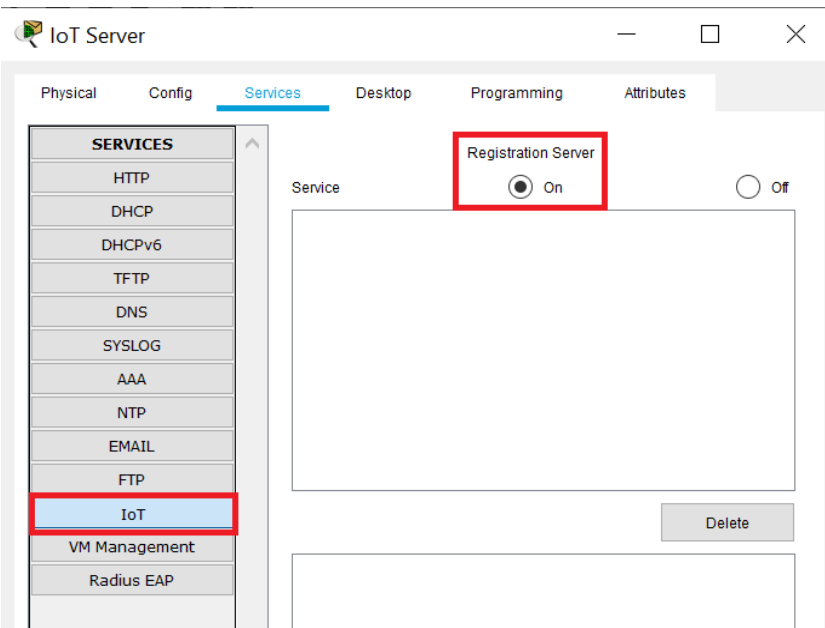
Setting IP Gateway



Setting IP Address



Setting Aplikasi IoT pada Server



Setting pada Perangkat Sensor IoT

Setting SSID dan passcode

Detektor Asap

Specifications I/O Config Physical **Config** Thing Editor Programming Attributes

GLOBAL

Settings

Algorithm Settings

Files

INTERFACE

Wireless0

Port Status On

Bandwidth 11 Mbps

MAC Address 000A.410A.76A7

SSID HomeGateway

Authentication

Disabled

WPA-PSK

WPA2-PSK

WPA

WPA2

802.1X

WEP Key

PSK Pass Phrase tes12345

User ID

Password

User Name

Method: MD5

Encryption Type AES

IP Configuration

DHCP

Static

IP Address 169.254.118.167

Subnet Mask 255.255.0.0

IPv6 Configuration

DHCP

Auto Config

Static

IPv6 Address

Link Local Address: FE80::20A:41FF:FE0A:76A7

Top Advanced

Setting DHCP dan koneksi ke IoT Server

Detektor Asap

Specifications I/O Config Physical **Config** Thing Editor Programming Attributes

GLOBAL

Settings

Algorithm Settings

Files

INTERFACE

Wireless0

Global Settings

Display Name Detektor Asap

Serial Number PTT0810NB26-

Gateway/DNS IPv4

DHCP

Static

Gateway 192.168.25.1

DNS Server

Gateway/DNS IPv6

DHCP

Auto Config

Static

IPv6 Gateway

IPv6 DNS Server

IoT Server

None

Home Gateway

Remote Server

Server Address 192.168.25.100

User Name admin

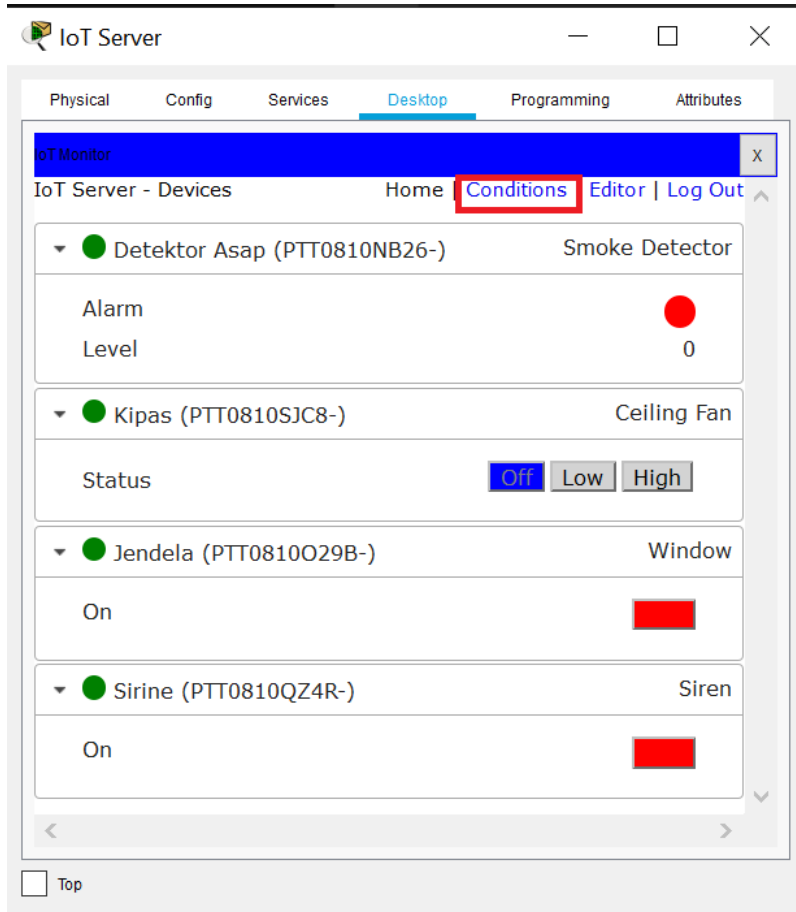
Password admin

Refresh

Top Advanced

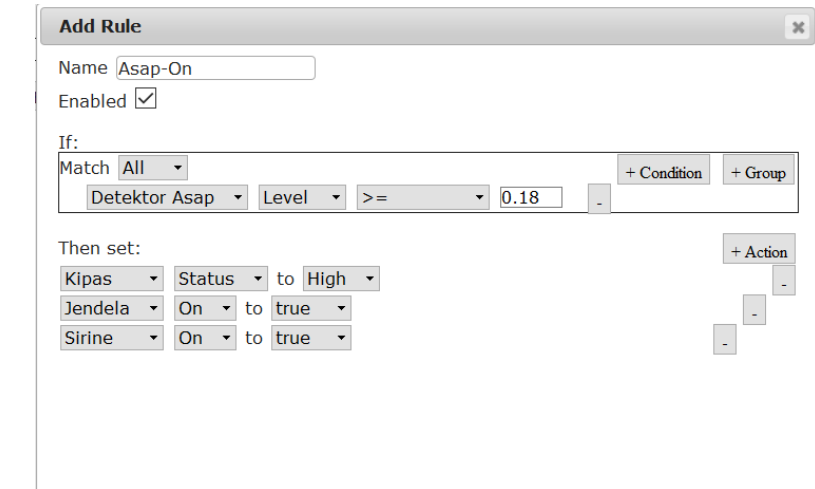
- Lakukan hal yang sama pada semua perangkat IoT

Setting Aktuator (Kontrol) Perangkat IoT



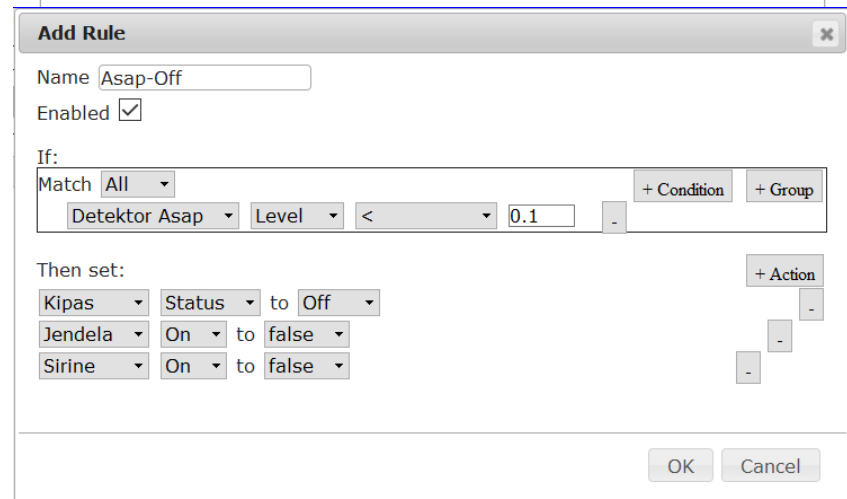
The screenshot shows the IoT Server Desktop interface. The 'Conditions' tab is selected and highlighted with a red box. The interface displays a list of IoT devices:

- Detektor Asap (PTT0810NB26-)** Smoke Detector: Alarm Level is 0.
- Kipas (PTT0810SJC8-)** Ceiling Fan: Status is Off.
- Jendela (PTT0810Q29B-)** Window: On.
- Sirine (PTT0810QZ4R-)** Siren: On.



The 'Add Rule' dialog box for 'Asap-On' is shown. It is enabled and configured as follows:

- Name:** Asap-On
- Enabled:**
- If:** Match All, Detektor Asap Level \geq 0.18
- Then set:** Kipas Status to High, Jendela On to true, Sirine On to true



The 'Add Rule' dialog box for 'Asap-Off' is shown. It is enabled and configured as follows:

- Name:** Asap-Off
- Enabled:**
- If:** Match All, Detektor Asap Level $<$ 0.1
- Then set:** Kipas Status to Off, Jendela On to false, Sirine On to false

Pengujian Kontrol Perangkat IoT

Mobil memberikan asap => kipas nyala, jendela terbuka, sirine berbunyi

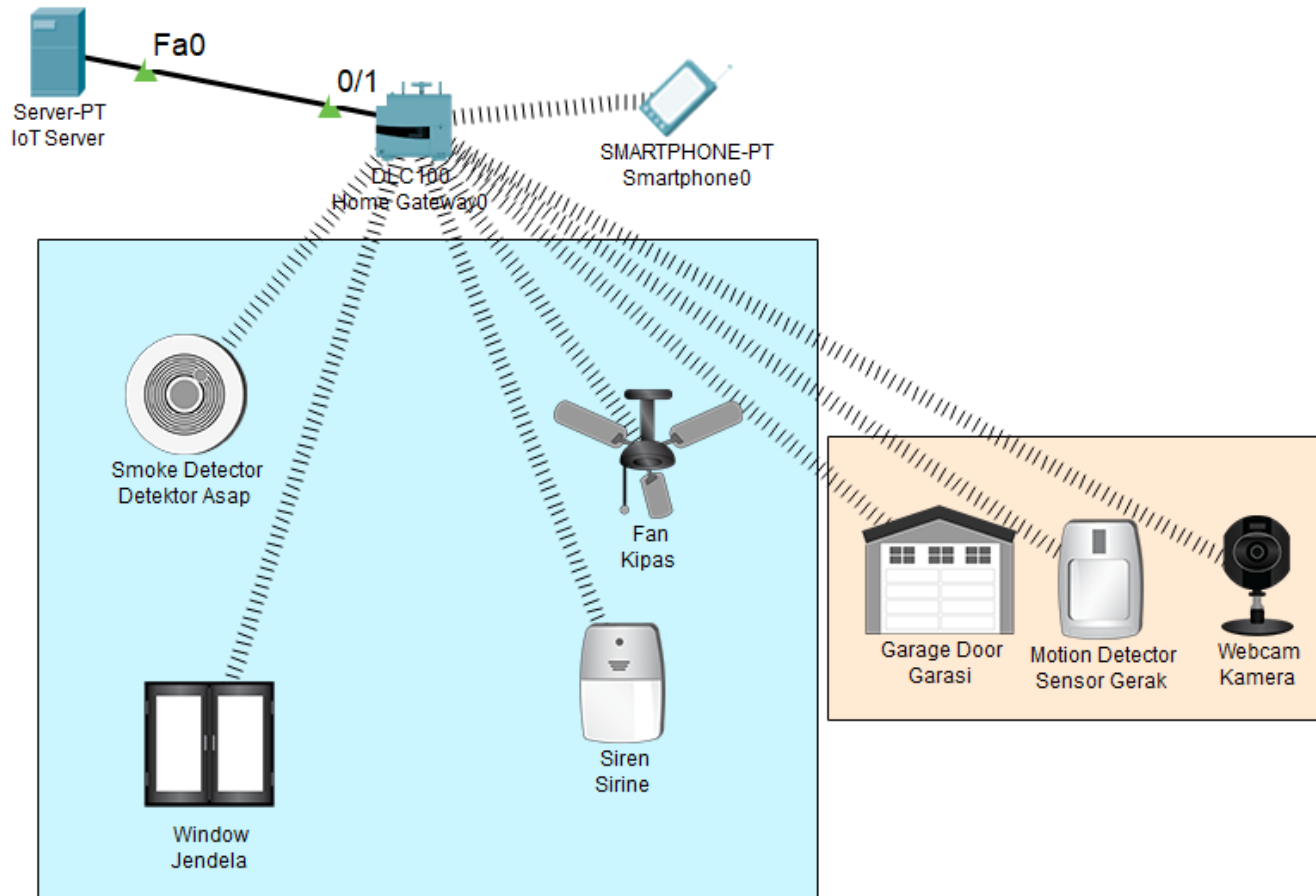
The diagram illustrates a network setup for IoT control. A Server-PT IoT Server is connected to a DEC100 Home Gateway via Fa0. The Home Gateway is connected to a SMARTPHONE-PT Smartphone0. The Home Gateway is also connected to four IoT devices: a Smoke Detector (Old Car IoT6), a Ceiling Fan (Fan Kipas), a Window (Window Jendela), and a Siren (Siren Sirine).

The IoT Monitor interface shows the following status:

- Detektor Asap (PTT0810NB26-) Smoke Detector**: Alarm Level is 0.153648 (indicated by a red dot).
- Kipas (PTT0810SJC8-) Ceiling Fan**: Status is High (indicated by a blue button).
- Jendela (PTT0810O29B-) Window**: On (indicated by a green bar).
- Sirine (PTT0810QZ4R-) Siren**: On (indicated by a green bar).

MOTION DETECTOR

Topologi Jaringan



Tambahkan Rule

Add Rule [X]

Name

Enabled

If:

Match + Condition + Group

is -

Then set:

+ Action

to -

to -

Add Rule [X]

Name

Enabled

If:

Match + Condition + Group

is -

Then set:

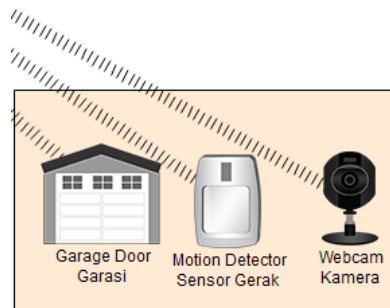
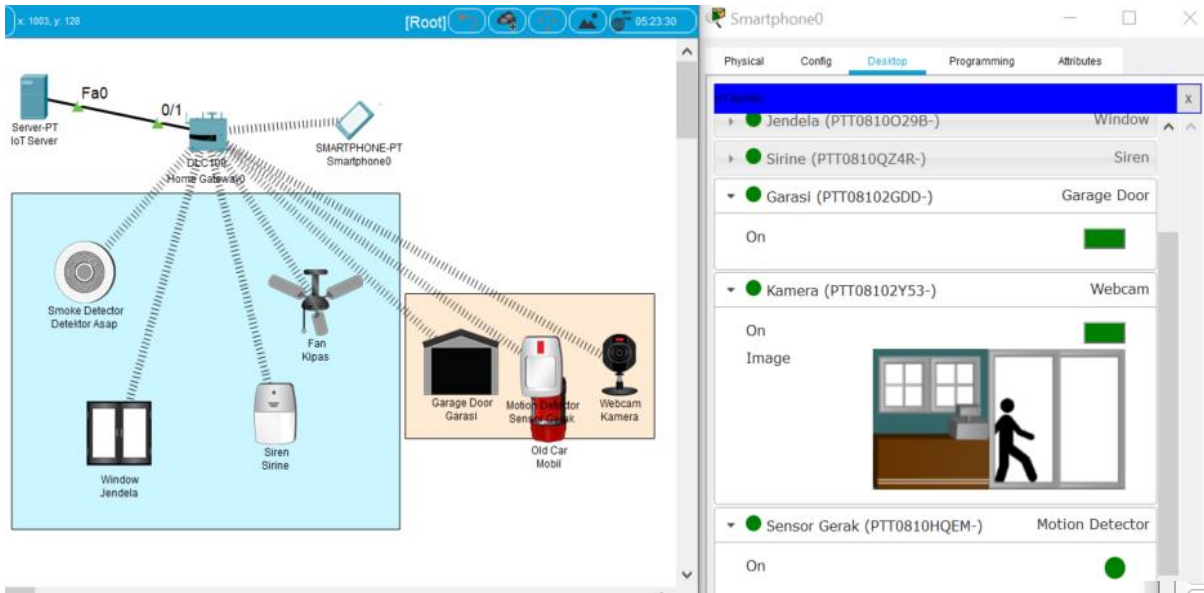
+ Action

to -

to -

OK Cancel

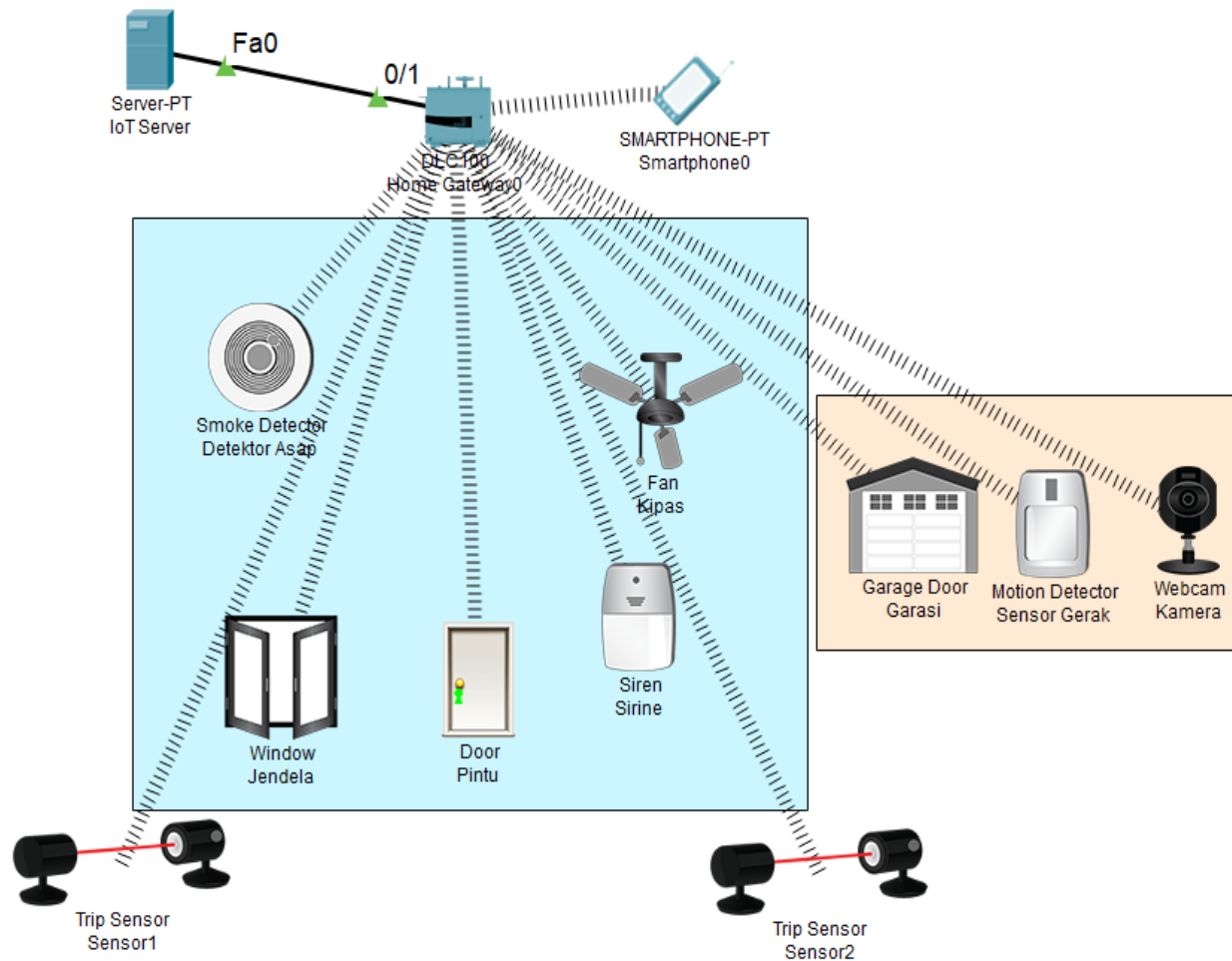
Pengujian



Garasi (PTT08102GDD-)	Garage Door
On	
Kamera (PTT08102Y53-)	Webcam
On	
Image	
Sensor Gerak (PTT0810HQEM-)	Motion Detector
On	

HOME SECURITY

Topologi Jaringan



Tambahkan Rule

Edit Rule

Name

Enabled

If:

Match

<input type="text" value="Sensor1"/>	<input type="text" value="On"/>	is	<input type="text" value="true"/>	<input type="button" value="-"/>
<input type="text" value="Sensor2"/>	<input type="text" value="On"/>	is	<input type="text" value="true"/>	<input type="button" value="-"/>

Then set:

<input type="text" value="Jendela"/>	<input type="text" value="On"/>	to	<input type="text" value="false"/>	<input type="button" value="+ Action"/>
<input type="text" value="Pintu"/>	<input type="text" value="Lock"/>	to	<input type="text" value="Lock"/>	<input type="button" value="-"/>
<input type="text" value="Sirine"/>	<input type="text" value="On"/>	to	<input type="text" value="true"/>	<input type="button" value="-"/>

Match All

And

A prospect must match **ALL** rule criteria.

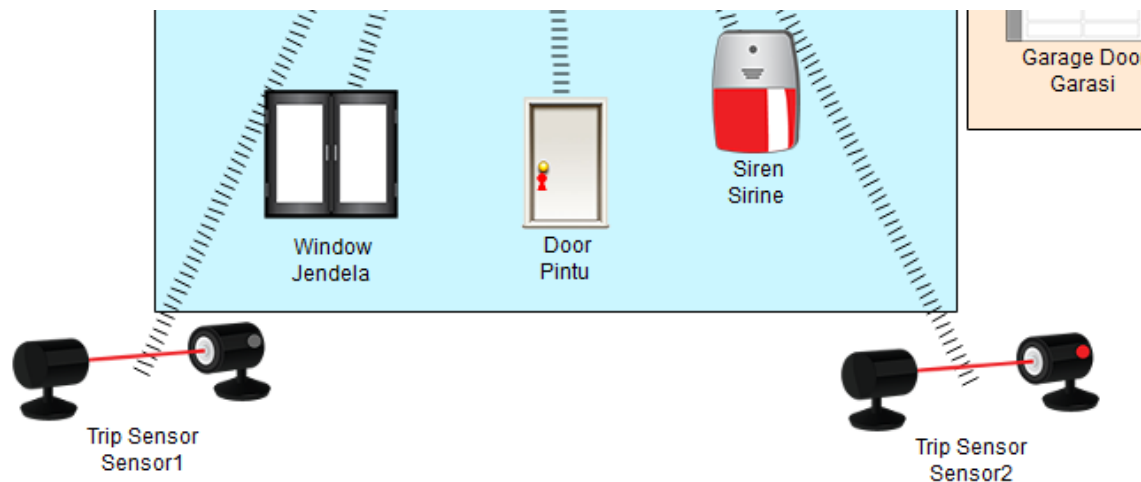
Match Any

Or

A prospect must match **ONE** of the rules.

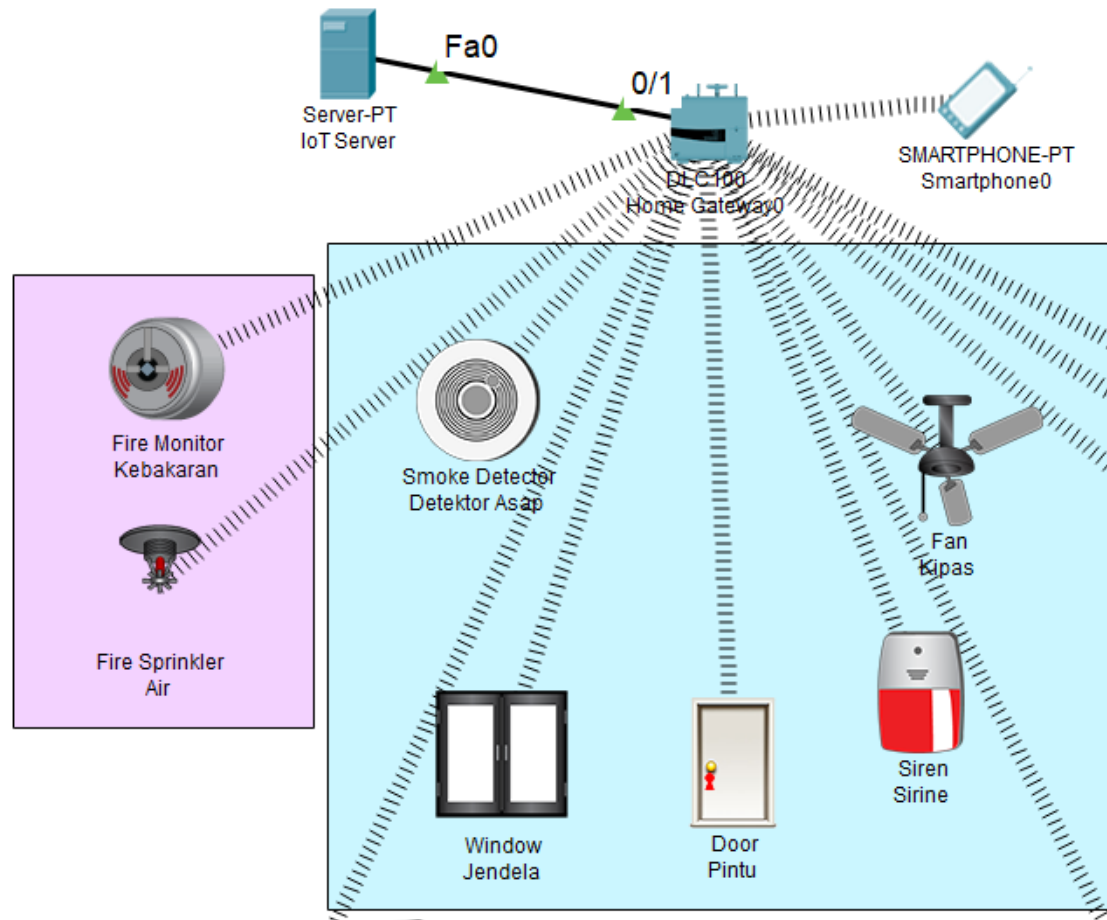
Pengujian

- Kondisi awal:
 - Jendela terbuka
 - Pintu tidak terkunci (unlocked)
- Nyalakan Sensor1 atau Sensor2 maka:
 - Jendela tertutup
 - Pintu terkunci (locked)
- Lakukan pengujian dengan **Match ALL**



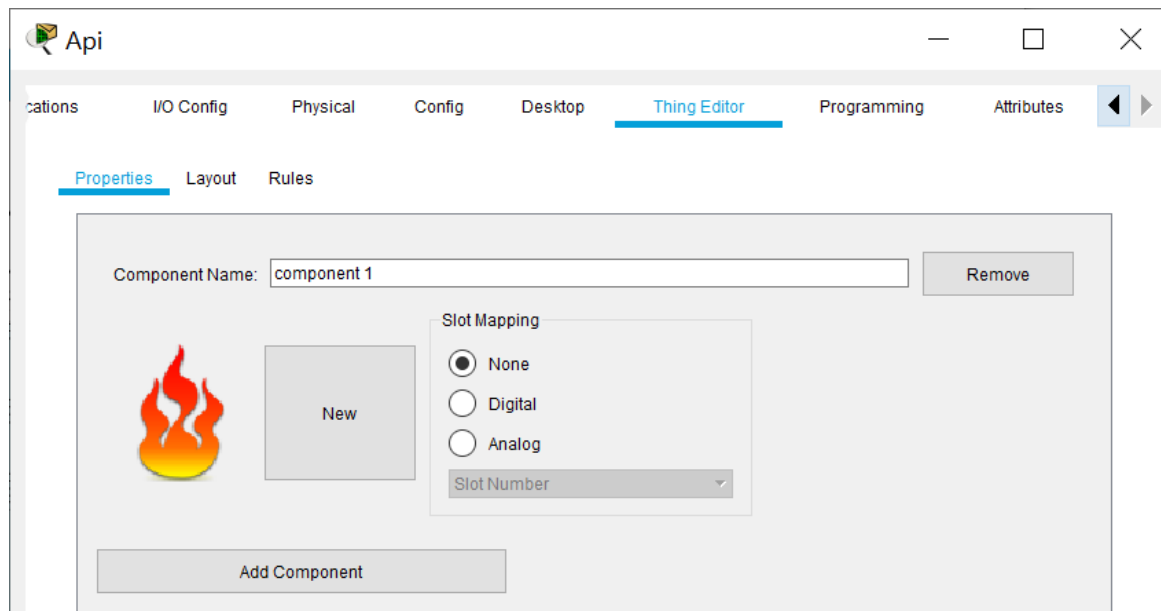
HOME SECURITY

Topologi Jaringan



Pembuatan Thing (API)

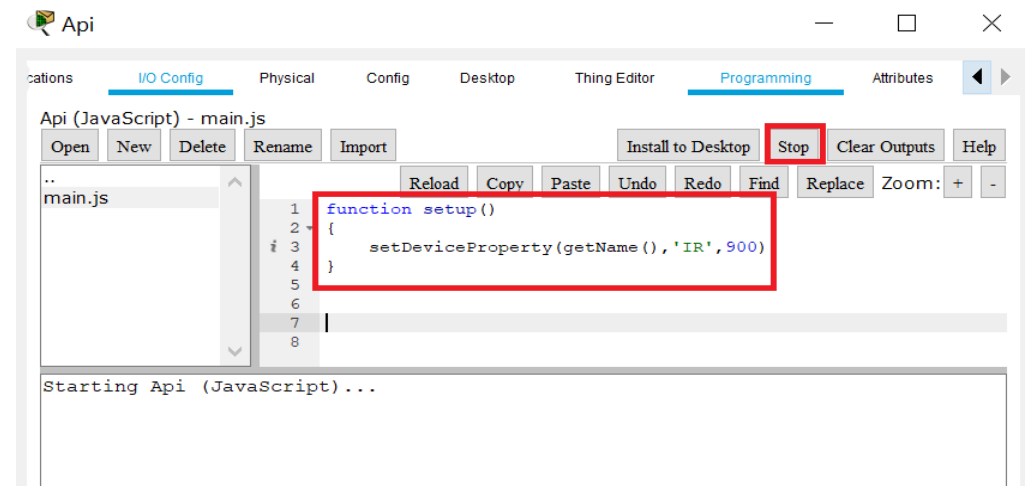
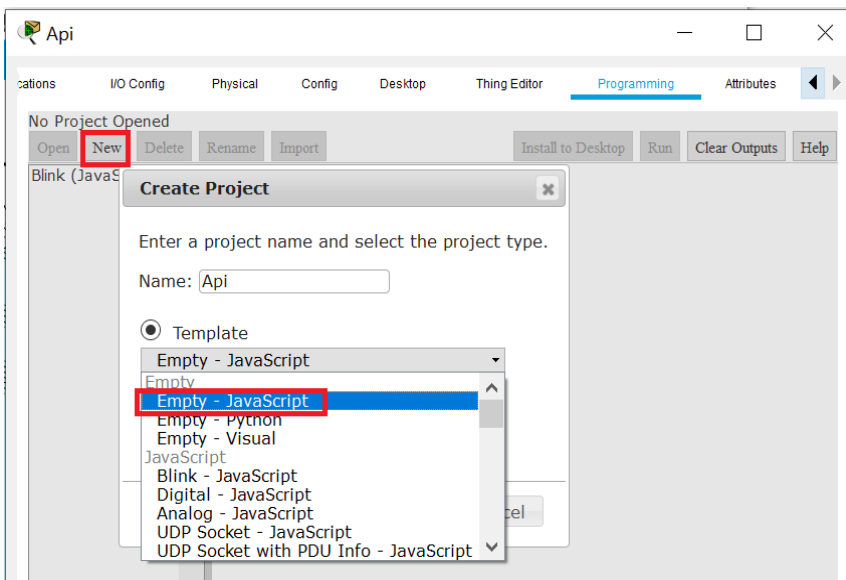
- Untuk membuat api yang akan menyalakan Fire Monitor.



C:\Program Files\Cisco Packet Tracer 7.2.1\art\IoE\Components

Pembuatan Thing (API)

- Pembuatan script API berdasarkan dari specification FIRE MONITOR.

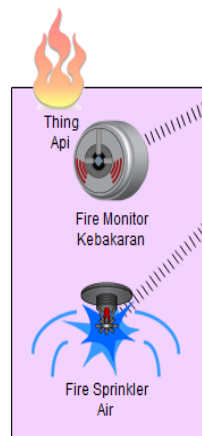


Tambahkan Rule & Pengujian

- Terdapat 2 rule untuk mengaktifkan dan mematikan sprinkler air.

Edit	Remove	Yes	Air-On	Kebakaran Fire Detected is true	Set Air Status to true
Edit	Remove	Yes	Air-Off	Kebakaran Fire Detected is false	Set Air Status to false

- Pengujian dengan cara mendekatkan API ke Fire Monitor



TUGAS

- Desainlah sebuah smart environment:
 - Smart Home
 - Smart Office
 - Smart Agriculture
 - Smart Factory
- Pilihlah perangkat sensor yg lainnya
- Buatlah laporan resmi dengan melampirkan:
 - Desain dan penjelasannya di file word
 - Desain di packet tracer
 - Terakhir pengumpulan: hari Sabtu jam 23.59
- Upload di google drive