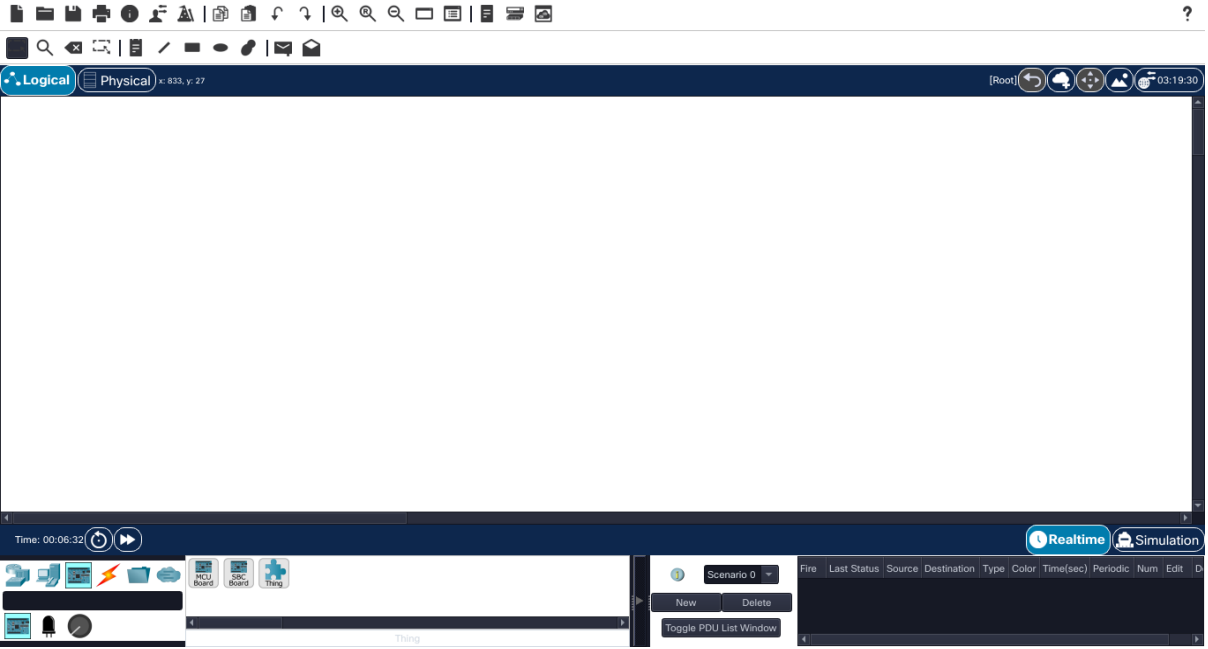
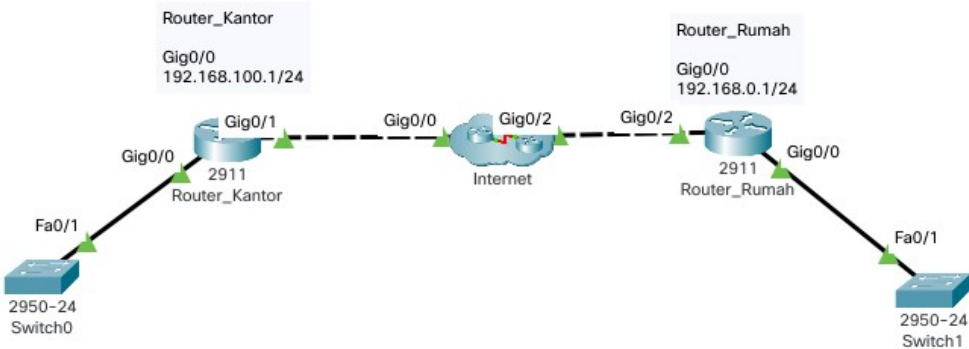
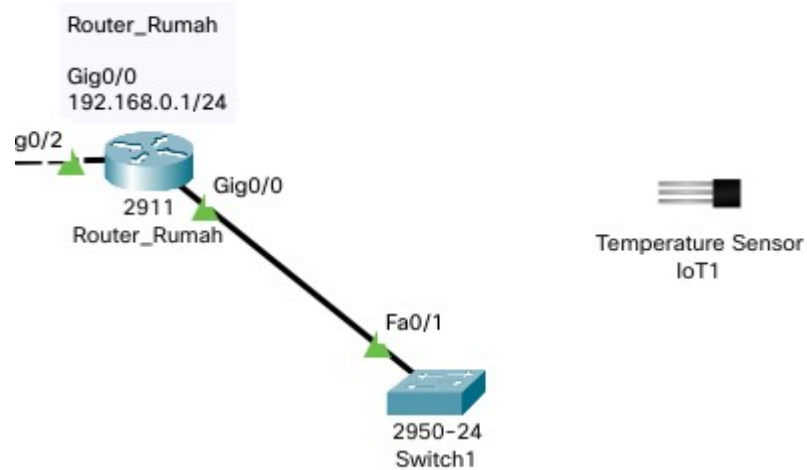
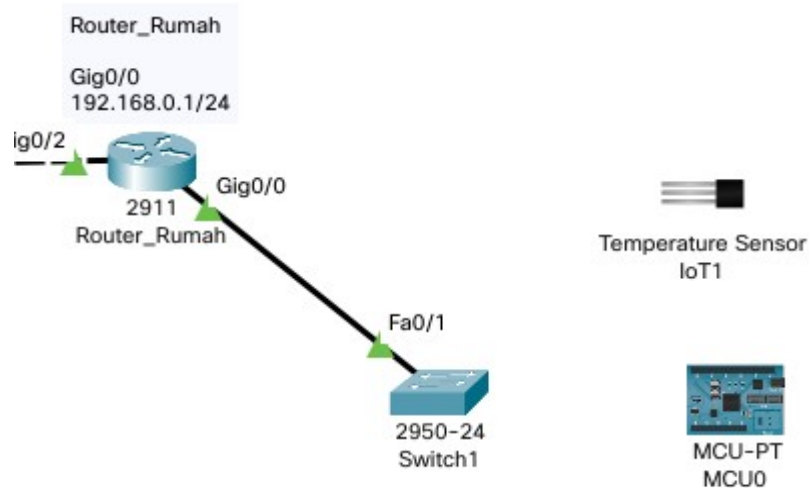


# Praktikum 3 – Internet of Things

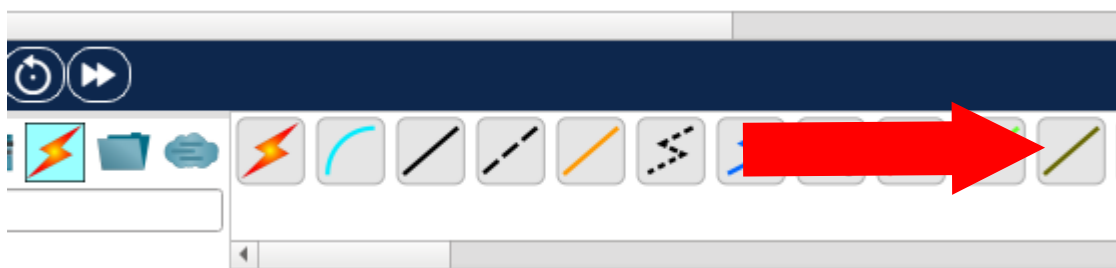
No	Langkah-langkah
1	Buka <b>Cisco Packet Tracer</b> . Jika memiliki akun silahkan login. Jika tidak, <b>Packet Tracer</b> hanya akan menyediakan 3 kali opsi penyimpanan.
	 <p>The screenshot shows the Cisco Packet Tracer application window. The top menu bar includes options like File, Edit, View, and Help. Below the menu is a toolbar with various icons for creating and editing network components. The main workspace is currently empty, displaying a blue background with a grid. The bottom status bar shows the time as 00:06:32 and the simulation mode as Realtime.</p>
2	Buka file <b>Template.pkt</b> yang akan kita gunakan seterusnya untuk praktikum. Berisikan simulasi konektivitas melalui <b>Internet</b> dari jaringan <b>Kantor</b> ke jaringan <b>Rumah</b> . Pastikan <b>RouterKantor</b> dapat berkomunikasi dengan <b>RouterRumah</b>
	 <p>The diagram illustrates a network topology for Internet connectivity between two sites. On the left, a switch labeled '2950-24 Switch0' is connected to 'Router_Kantor' (a 2911 model) via its Fa0/1 port. Router_Kantor's Gig0/0 interface is configured with the IP address 192.168.100.1/24. A dashed line represents the 'Internet' cloud, which connects to 'Router_Rumah' (also a 2911 model) via its Gig0/2 interface. Router_Rumah's Gig0/0 interface is configured with the IP address 192.168.0.1/24. Finally, Router_Rumah is connected to '2950-24 Switch1' via its Fa0/1 port. The diagram uses standard Cisco Packet Tracer symbols for routers, switches, and the Internet cloud.</p>
3	Tambahkan sensor baru dengan jenis <b>Temperature Sensor</b> ke jaringan rumah



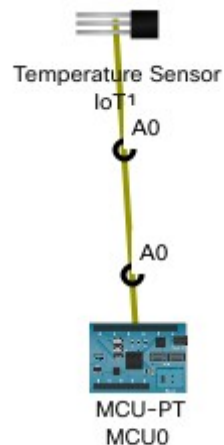
4 Tambahkan **MCU-PT** ke jaringan Rumah



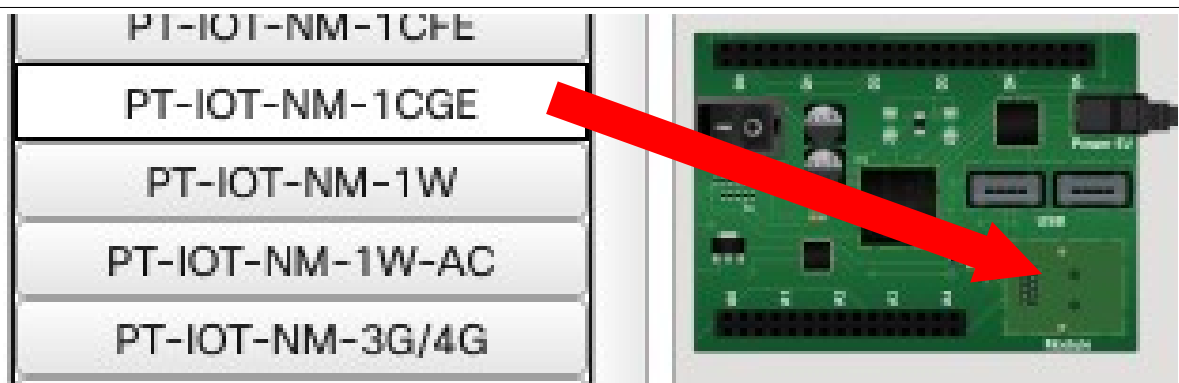
5 Sambungkan **MCU-PT** dengan **Temperature Sensor** dengan menggunakan **IoT Custom Cable**



6 Tancapkan ke **A0 (Temperature Sensor)** dan **A0 (MCU-PT)**

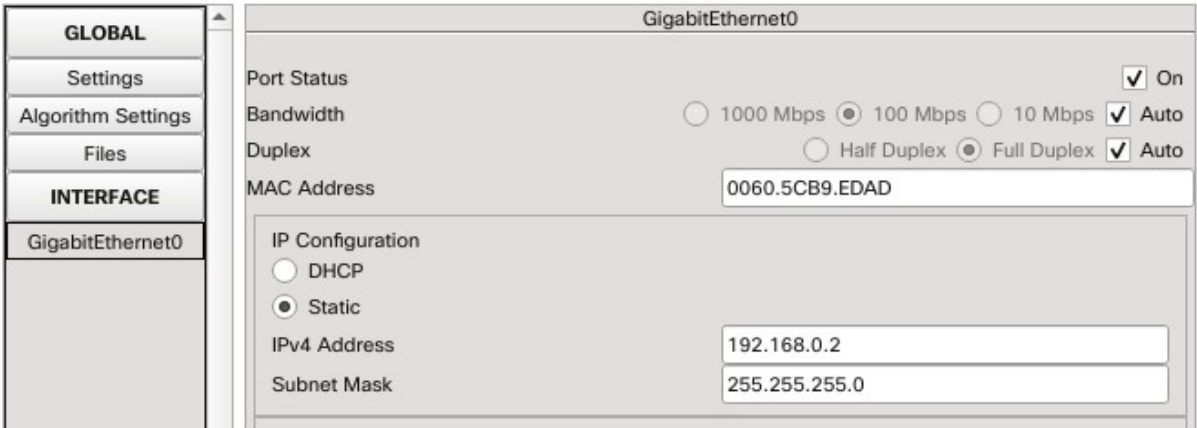
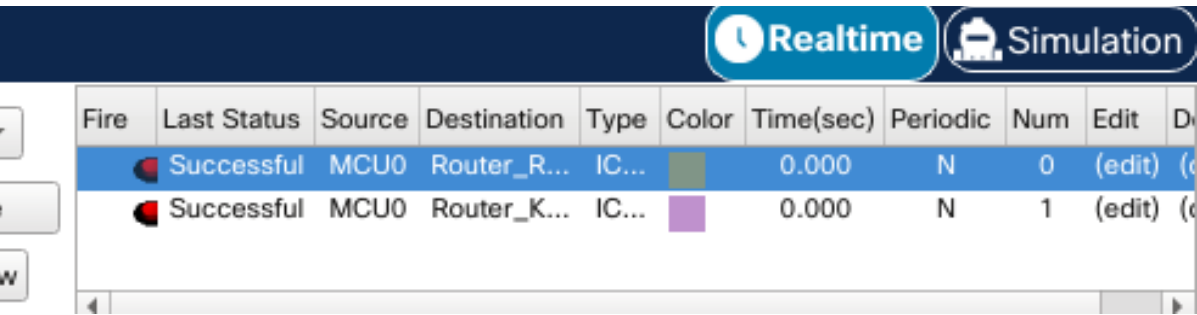
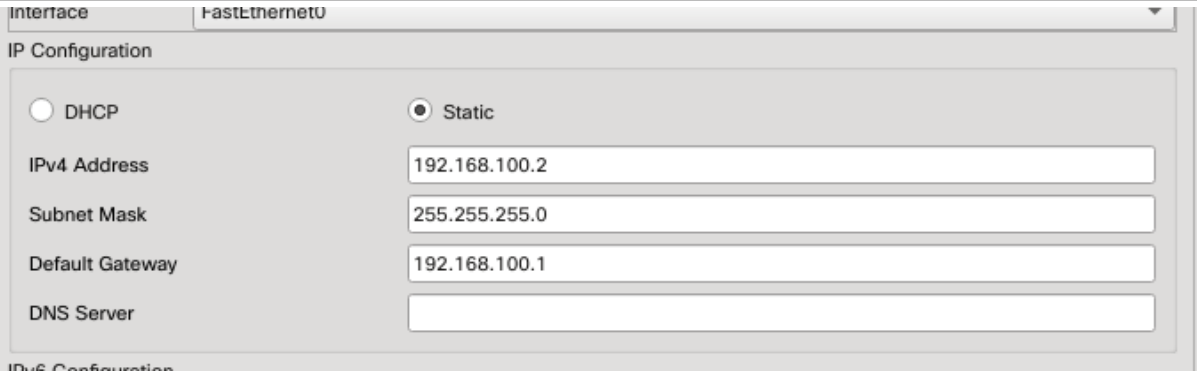
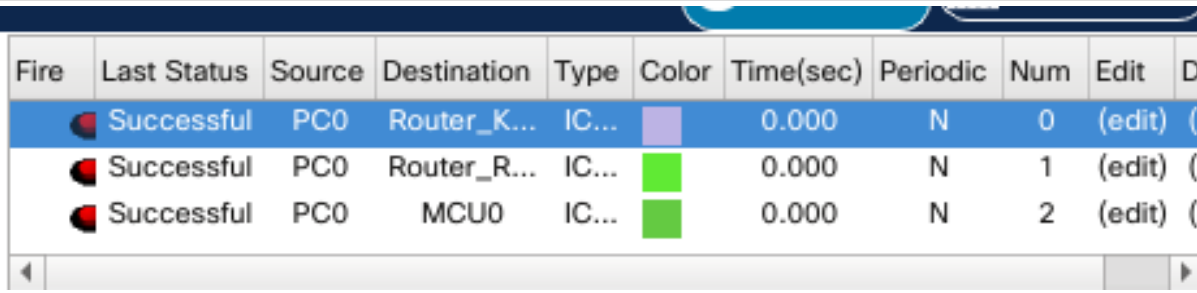


- 7 Sebelum menghubungkan **MCU-PT** ke **Switch**, tambahkan module **Gigabit**. Jangan lupa **Matikan** perangkat sebelum memasang



- 8 Hubungkan **MCU** ke **Switch**. Dan Berikan IP: **192.168.0.2/24**, dan **GW: 192.168.0.1**.

<div>GLOBAL</div> <div>Settings</div> <div>Algorithm Settings</div> <div>Files</div> <div>INTERFACE</div> <div>GigabitEthernet0</div>	<div>Global Settings</div> <div>Display Name MCU0</div> <div>Serial Number PTT0810W644-</div> <div> <div>Gateway/DNS IPv4</div> <div> <input type="radio"/> DHCP           <input checked="" type="radio"/> Static         </div> <div>Default Gateway 192.168.0.1</div> <div>DNS Server</div> </div>
---	---

	
9	Tes <b>PING</b> dari <b>MCU</b> ke <b>Router Kantor</b> , dan <b>Router Rumah</b>
	
10	Tambahkan <b>PC0</b> ke <b>Jaringan Kantor</b> , hubungkan ke <b>Switch</b> dan berikan IP: <b>192.168.10.2/24</b> , dan <b>GW: 192.168.100.1</b>
	
11	Tes <b>PING</b> dari <b>MCU</b> ke <b>Router Kantor</b> , <b>Router Rumah</b> , dan <b>MCU</b>
	
12	Buka <b>MCU0</b> , klik <b>Tab Programming</b> , klik <b>New</b> , dan pilih <b>Empty – Python</b> . Klik <b>Create</b>

Create Project

×

Enter a project name and select the project type.

Name:

☒ Template  
☐ Global Script Project

Empty - Python

MQTT Broker - (Python)

Create

Cancel

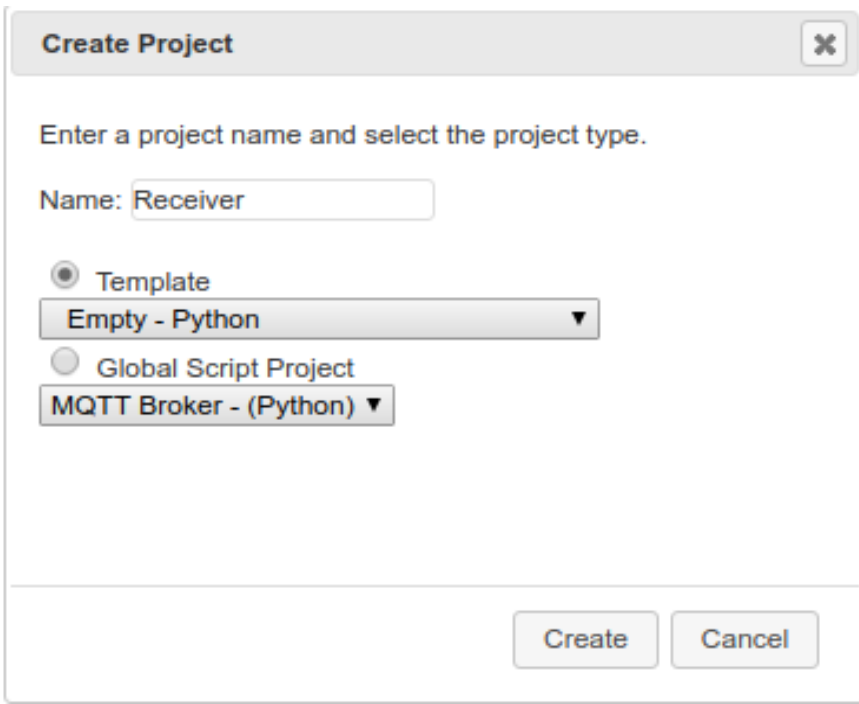
13 Di dalam file **main.py** (cek file **Praktikum 3 – Client.py**), Tempelkan kode berikut:

```

1  from gpio import *
2  from tcp import *
3  from time import *
4
5  serverIP = "192.168.100.2"
6  serverPort = 1234
7
8  client = TCPCClient()
9
10 def onTCPConnectionChange(type):
11     print("connection to " + client.remoteIP() + " changed to state " + str(type))
12
13 def onTCPReceive(data):
14     print("received from " + client.remoteIP() + " with data: " + data)
15
16 def main():
17     client.onConnectionChange(onTCPConnectionChange)
18     print(client.connect(serverIP, serverPort))
19
20     count = 0
21     while True:
22         count += 1
23         # Membaca Suhu
24         adc = analogRead(A0);
25         volt = adc/float(1024)
26         temp = 100-(volt*100)
27         # Mengirim Suhu
28         data = str(round(temp,2)) + " Celsius"
29         print("sending to " + client.remoteIP() + " with data: " + data)
30         client.send(data)
31         sleep(5)
32
33 if __name__ == "__main__":
34     main()

```

14 Buka **PC0**, dan buatlah kode **Python** dengan cara yang sama seperti di atas

	
15	Masukkan kode berikut ke file <b>main.py</b> (cek file <b>Praktikum 3 – Server.py</b> )
	<pre> 1  from tcp import * 2  from time import * 3 4  port = 1234 5  server = TCPServer() 6 7  def onTCPNewClient(client): 8      def onTCPConnectionChange(type): 9          print("connection to " + client.remoteIP() + " changed to state " + str(type)) 10 11      def onTCPReceive(data): 12          print("received from " + client.remoteIP() + " Suhu Rumah: " + data) 13          client.send("Accepted") 14 15      client.onConnectionChange(onTCPConnectionChange) 16      client.onReceive(onTCPReceive) 17 18  def main(): 19      server.onNewClient(onTCPNewClient) 20      print(server.listen(port)) 21 22      # don't let it finish 23      while True: 24          sleep(3600) 25 26  if __name__ == "__main__": 27      main() </pre>
16	Tes <b>RUN</b> dimulai dari <b>PC0</b> baru <b>MCU-PT</b>
	<b>Client</b>

```
Starting Temperature (Python)...
True
sending to 192.168.100.2 with data: 40.82 Celsius
connection to 192.168.100.2 changed to state 0
sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
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sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
sending to 192.168.100.2 with data: 40.82 Celsius
|
```

## Server

```
Starting Receiver (Python)...
True
received from 192.168.0.2 Suhu Rumah: 40.82 Celsius
received from 192.168.0.2 Suhu Rumah: 40.82 Celsius
received from 192.168.0.2 Suhu Rumah: 40.82 Celsius
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received from 192.168.0.2 Suhu Rumah: 40.82 Celsius
received from 192.168.0.2 Suhu Rumah: 40.82 Celsius
```

**SELESAI**