

MIDTERM OF COMPUTER NETWORKS

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Abstract

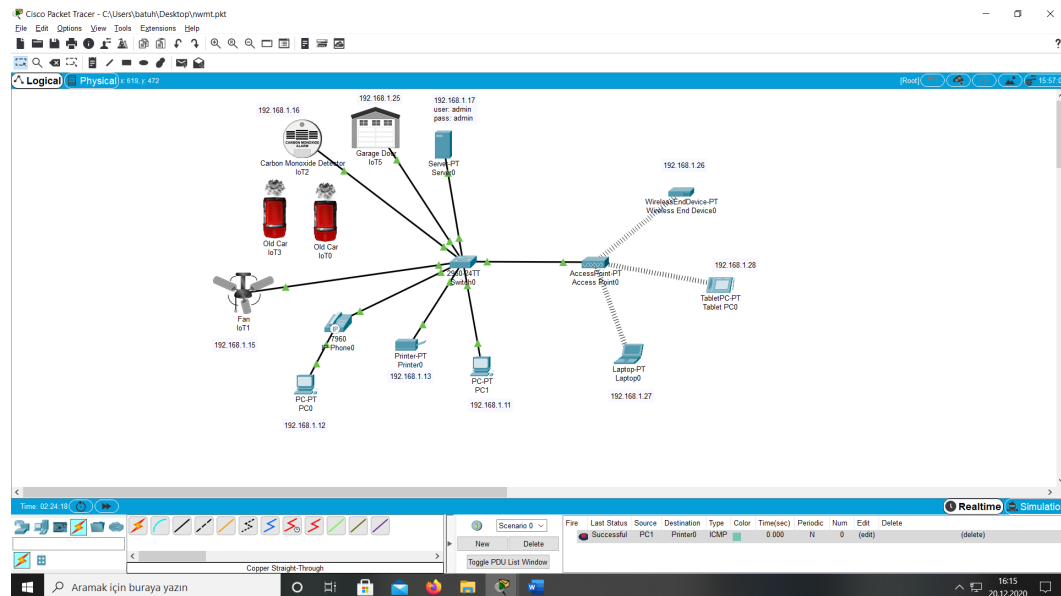
In this assignment i used cisco packet tracer. I added and made communications between networks devices with using packet tracer. Our network is not a big one. It was like intranet. It was a good experience and introduction.

1 Introduction

Our purpose on this assignment was practising our knowledge on computer networks lesson with cisco packet tracer. I understood relationship and communication between devices better after this assignment. I will mention about cables, network devices, IoT devices later on this report.

2 Assignments

2.1 Implementing the Topology



Elements of topology are in the left bottom. I selected devices and cables from there. Switch, access point, laptop, tablet, wireless end device, PC, IP phone, server and some IoT devices, copper straight cable are which i used for this assignment. At first IP phone connections gave error because device was closed. I opened it. I used copper straight cable because there was not a same devices connection and i did not need fiber cable because this network was small.

2.2 IP Configuration

I gave manually IP address to devices for communication. This devices can not communicate each other without an IP address. Here is a table below shows you IP addresses and MAC addresses of devices. MAC address is physical. Every device has a unique MAC address.

Device	IP Address	Mac Address
PC0	192.168.1.12	0007.EC80.5947
PC1	192.168.1.11	0002.1601.2A71
Server0	192.168.1.17	0001.4218.B48A
Laptop0	192.168.1.27	0002.4A36.D36A
Printer0	192.168.1.13	000C.CFE8.E550
Wireless ED0	192.168.1.26	0001.431B.3757
Tablet PC0	192.168.1.28	00D0.973D.2DEE
Fan	192.168.1.15	0090.2121.8800
CO detector	192.168.1.16	0060.2F47.1B03
Garage door	192.168.1.25	0030.A3D2.A338

I wrote arp -a command to PC1. This command gives the devices which PC1 had a communication before.

```
C:\>arp -a
Internet Address      Physical Address      Type
192.168.1.12          0007.ec80.5947        dynamic
192.168.1.13          000c.cfe8.e550        dynamic
192.168.1.15          0090.2121.8800        dynamic
192.168.1.16          0060.2f47.1b03        dynamic
192.168.1.17          0001.4218.b48a        dynamic
192.168.1.25          0030.a3d2.a338        dynamic
192.168.1.27          0002.4a36.d36a        dynamic
```

2.3 Pinging

I wrote ping command for Fan with using devices IP address. Fan has cabled connection to PC1 with switch. As we can see below, average ping value is 0.

```

C:\>ping 192.168.1.15

Pinging 192.168.1.15 with 32 bytes of data:

Reply from 192.168.1.15: bytes=32 time<1ms TTL=255
Reply from 192.168.1.15: bytes=32 time<1ms TTL=255
Reply from 192.168.1.15: bytes=32 time<1ms TTL=255
Reply from 192.168.1.15: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.1.15:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

```

I wrote ping command for Laptop with using devices IP address. Laptop has wireless connection to PC1. For wireless connection, i selected PT-LAPTOP-NM-1W module. It provides one 2.4GHz wireless interface suitable for connection to wireless networks. As we can see below, average ping value is 17.

```

C:\>ping 192.168.1.27

Pinging 192.168.1.27 with 32 bytes of data:

Reply from 192.168.1.27: bytes=32 time=34ms TTL=128
Reply from 192.168.1.27: bytes=32 time=14ms TTL=128
Reply from 192.168.1.27: bytes=32 time=7ms TTL=128
Reply from 192.168.1.27: bytes=32 time=13ms TTL=128

Ping statistics for 192.168.1.27:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 7ms, Maximum = 34ms, Average = 17ms

```

2.4 Configure IoT Devices

I would like to activate carbon monoxide detector in this assignment. I also added a garage door and two old cars for controlling carbon monoxide level. I configured these devices with using server device. Old cars starts working with alt+click. From browser of PC1, I controlled IoT devices. While cars are not working, carbon monoxide level was near to zero. Here is what happened when i started cars and garage door closed.

▼

● IoT2 (PTT0810U7Y4-)

Carbon Monoxide Detector

Alarm

Level

0.121231

▼

● IoT5 (PTT08106UI9-)

Garage Door

On

▼

● IoT1 (PTT08100YIP-)

Ceiling Fan

Status

Off Low High

And here is what happened when garage door opened.

▼

● IoT2 (PTT0810U7Y4-)

Carbon Monoxide Detector

Alarm

Level

0.00000762939

▼

● IoT5 (PTT08106UI9-)

Garage Door

On

I actually wanted to do this work with using conditions. But values were far from realistic dangerous carbon monoxide levels. It was increasing more than 10 in a small network.

Web Browser

X

<

>

URL

http://192.168.1.17/conditions.html

Go

Stop

IoT Server - Device Conditions

[Home](#) |
 [Conditions](#) |
 [Editor](#) |
 [Log Out](#)

Actions		Enabled	Name	Condition	Actions
Edit	Remove	Yes	open	IoT2 Level >= 10	Set IoT5 On to true
Edit	Remove	Yes	close	IoT2 Level < 5	Set IoT5 On to false

3 Results

Network devices can not communicate other devices without an IP address. There is also MAC address. MAC address is physical, IP Address is logical address. We can use ping command for control our communication. Wireless connection effects ping value negative. Cable connection is better if it is possible. Controlling IoT devices is possible with connect them in a server with

using browser.

4 Conclusion

In conclusion, I practised my theoretical knowledge from computer networks lesson. Teacher gave us freedom for adding something different. I selected carbon monoxide levels to add. From now, i know better how a network works. After this assignment, i am sure i can simulate bigger topologies.