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NIST College
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Computer Network (CSC258)

LAB 4
Introduction to Packet Tracer, creation of LAN, assigning IP to the hosts and testing the connectivity between the host.

Objective:

1. To understand the network simulator tool.
2. To create a LAN topology, IP addressing: static and DHCP and test the connectivity.

Apparatus: Packet Tracer

Theory:

i. Introduction to Packet Tracer
ii. Introduction to LAN
iii. Static IP
iv. DHCP

Lab Topology

i. Draw the following lab topology for the given tasks.

Task 1:

i. Draw the LAN topology as shown in the figure 1.

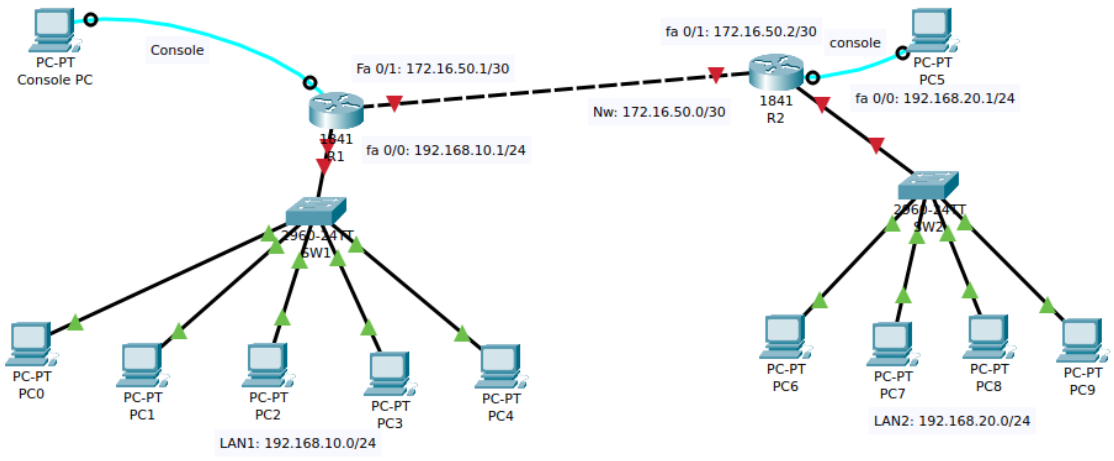

Figure 1: A LAN topology.

Task 2:

i. Assign Static IP to the computers connected to the LAN1 and test its connectivity.

Task 3:

i. Change the hostname of router as R1 and switch as SW1 of LAN1.
ii. Change the hostname of router as R2 and swich as SW2 of LAN2.
iii. Assign an IP 192.168.10.1/24 to an FastEthernet 0/1 of R1.
iv. Assign an IP 172.16.50.1/30 to an FastEthernet 0/0 of R1.
v. Assign an IP 192.168.10.2/24 to an FastEthernet 0/1 of R2.
vi. Assign an IP 172.16.50.2/30 to an FastEthernet 0/0 of R2.

Task 4:

i. Configure DHCP in LAN2 Router R1 with network address of 192.168.20.0/24.

Taks 5:

observe and analyse the outputs of following commands:

i. R1>enable
ii. R1#show ip interface brief
iii. R1#show running-config
iv. R1#show startup-config
v. R1#copy running-config startup-config
vi. R1#show startup-config

Compare the output of iv and vi after execution of v.

Sample codes

Configuration of router R1:

Assigning hostname as R1 and assign IP address to port f0/0 of R1.

```
Router>enable
Router#config terminal
Router(config)#hostname R1
R1(config)#interface fastEthernet 0/0
R1(config-if)#ip address 192.168.10.1 255.255.255.0
R1(conig-if)#no shutdown
R1(config-if)#description Connection of R1 to LAN1 Network
R1(config-if)#end
```

R1#show ip interface brief

Assigning IP to f0/1 of R1
R1#config terminal
R1(config)#int f0/1
R1(config-if)#ip address 172.16.50.1 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#description Connection to R2 router.
R1(config-if)#end
R1#show ip interface brief

To show running configuration on Router R1
R1#show running-config

To show start-up configuration on Router R1
R1#show startup-config

To copy running-config to startup config and show startup -config
R1#copy running-config startup-config
R1#show startup-config
R1#show running-config

Are the outputs of show running-config and show startup-config same?

Configuration of R2
Assigning IP 192.168.20.1/24 to F0/0 and enabling DHCP

Router>enable
Router#config termian
Router(config)#hostname R2

To verify the IP on router interface
R2(config)#show ip interface brief

To assign IP to interface F0/0 on router 2
R2(config)#interface fastEthernet 0/0
R2(config-if)#ip address 192.168.20.1 255.255.255.0

R2(config-if)#no shutdown
R2(config-if)#description Connection to LAN2
R2(config-if)#end
R2#

To verify the IP on router interface
R2#show ip interface brief

Observe the output with previous one. What do you observe?

To see the configuration so far you have done.
R2#show running-config

To enable DHCP in router 2
R2#config terminal
R2(config)#ip dhcp pool LAN2POOL
R2(dhcp-config)#network 192.168.20.0 255.255.255.0
R2(dhcp-config)#defualt-router 192.168.20.1
R2(dhcp-config)#dns-server 192.168.5.100 %if you have dns server connected to lan
R2(dhcp-config)#exit
R2(config)# ip dhcp excluded-address 192.168.20.1
R2(config)#ip dhcp exlucded-address 192.168.20.100
R2(config)#exit

To verify the dhcp configuration on router
R2#show running-config

To enable dhcp in hosts connected to swtich on LAN2
Go to PC → Desktop→ IP Configuration → enable DHCP

See the output.

To verify the connectivity
Open command prompt of PC
C:\> ping 192.168.20.3

Ping the IP of interface of F0/1 of Router 2 from PC0

C:\> ping 172.16.50.2

What output do you observe? Does PCO can reach it? Why? Why not? Justify the reason.

Similary, ping PC8 (say its ip is 192.168.20.4) from PC0? What can you infer from the output

C:\> ping 192.168.20.4

Task 6:

Connect the following LAN topology and enable DHCP in both switches and verify and test the connectivity between the host.

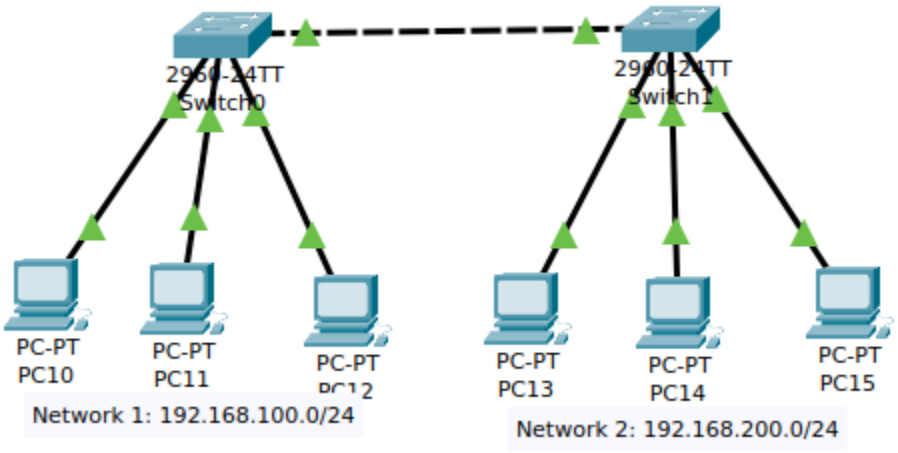

Figure 2: A LAN topology.