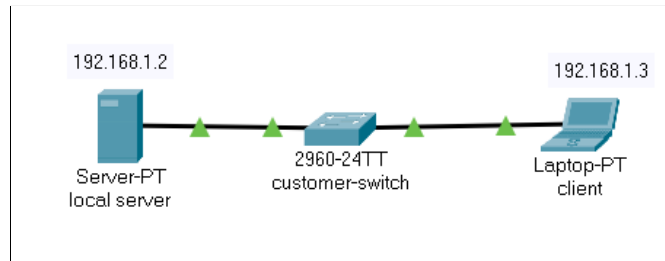


Experiment 6**Aim:** Performing an Initial Switch Configuration**Diagram :****Procedure/Commands :**

1. We are gonna implement the above diagram and ping the server from the laptop.
2. Select a 2960-24TT switch, a laptop-PT and Sever-PT. Connect them with straight wire cables.
3. now we'll configure the switch, click on switch then click CLI.

1. Configure the switch host name.
-once CLI is up press return to start, first mode is the user mode. To configure the switch we need to be in privileged mode.
Switch>en
Switch#config t
Switch(config)#hostname customerSwitch
2. Configure the privileged mode password and secret
-we can set authenticity for this mode so that only you or concerned authorities can access/configure the switch.
-secret stores the password in a hash form which is difficult to hack.
customerSwitch(config)#enable password cisco
customerSwitch(config)#enable secret cisco123
3. Configure the console password.
-usually an IT guy connects his/her laptop with a console cable to the switch and configures it instead of using CLI of the switch. On this occasion we can set authenticity for the console interface too.
customerSwitch(config)#line console 0
customerSwitch(config-line)#password cisco
customerSwitch(config-line)#login
customerSwitch(config-line)#exit
4. Configure the vty password
-vty is used for telnet access
customerSwitch(config)#line vty 0 15
customerSwitch(config-line)#password cisco
customerSwitch(config-line)#login
customerSwitch(config-line)#exit
5. Configure an IP address on interface VLAN1.
-using switches we can divide a network into virtualLAN
customerSwitch(config)#interface vlan 1
customerSwitch(config-if)#ip address 192.168.1.5 255.255.255.0
customerSwitch(config-if)#no shut
%LINK-5-CHANGED: Interface Vlan1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
customerSwitch(config-if)#exit
6. Configure the default gateway.
-gateway is used to establish a connection with other networks, if this switch is connected to a router using this gateway one can contact other ntwks.
customerSwitch(config)#ip default-gateway 192.168.1.1
customerSwitch(config)#

```
customerSwitch(config)#end
```

7. Saving the config

-we can save the configuration made into the NVRAM so that if the switch is turned off and on we need not configure it again.

```
customerSwitch#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
customerSwitch#
%SYS-5-CONFIG_I: Configured from console by console
```

8. Set ip addresses for the laptop and the server.

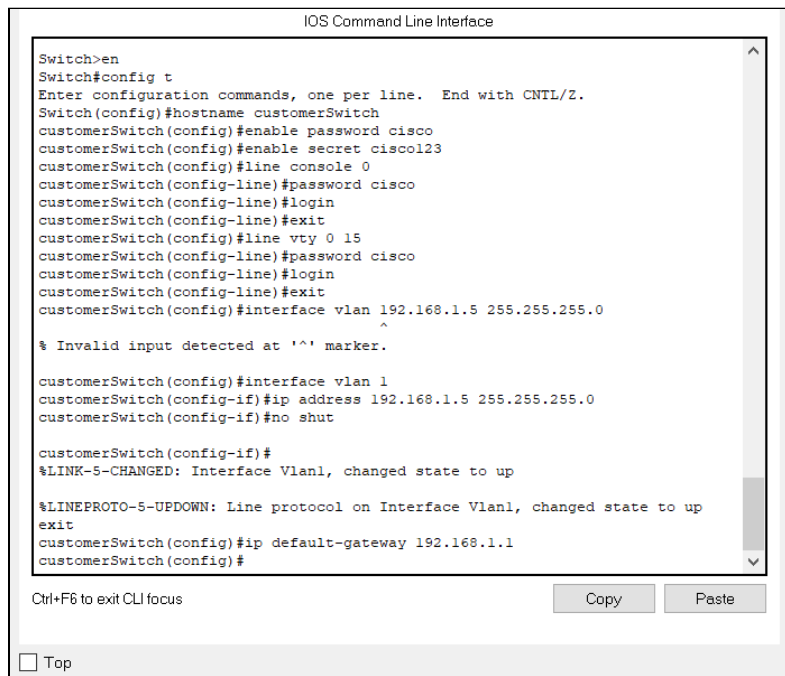
-click on laptop>Desktop>ip configuration. Enter ip 192.168.1.3 subnet 255.255.255.0

-click on Server>Desktop>ip configuration enter ip 192.168.1.2 subnet 255.255.255.0

9. Setup is done , now we can test it.

Output :

-This is a pic of CLI (configured switch)



```
IOS Command Line Interface

Switch>en
Switch#config t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname customerSwitch
customerSwitch(config)#enable password cisco
customerSwitch(config)#enable secret cisco123
customerSwitch(config)#line console 0
customerSwitch(config-line)#password cisco
customerSwitch(config-line)#login
customerSwitch(config-line)#exit
customerSwitch(config)#line vty 0 15
customerSwitch(config-line)#password cisco
customerSwitch(config-line)#login
customerSwitch(config-line)#exit
customerSwitch(config)#interface vlan 192.168.1.5 255.255.255.0
^
% Invalid input detected at '^' marker.

customerSwitch(config)#interface vlan 1
customerSwitch(config-if)#ip address 192.168.1.1 255.255.255.0
customerSwitch(config-if)#no shut

customerSwitch(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
exit
customerSwitch(config)#ip default-gateway 192.168.1.1
customerSwitch(config)#
```

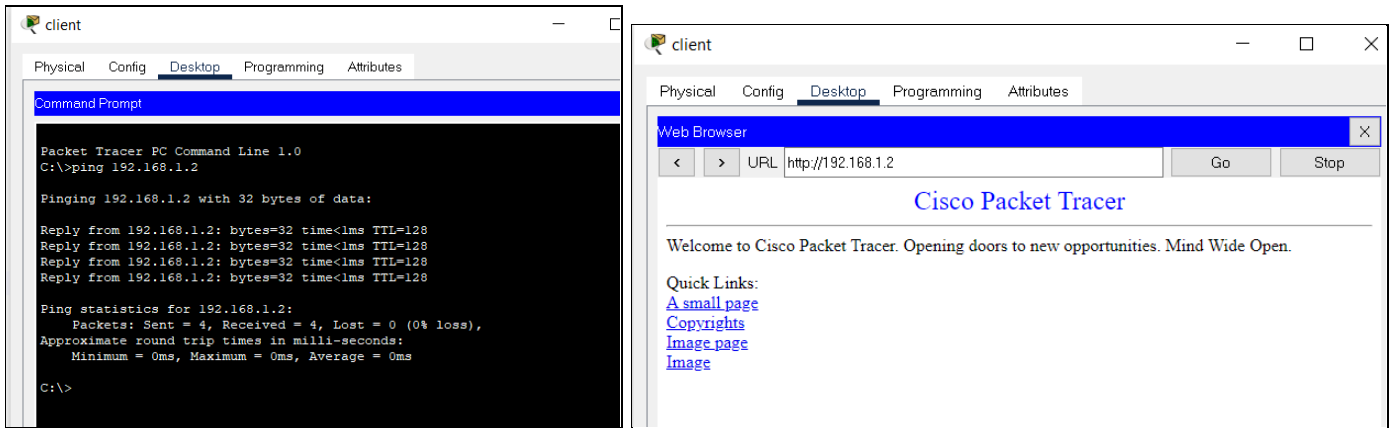
Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

-now click laptop>desktop>command prompt and type ping 192.168.1.2. If 0%loss then successful.

-now click laptop>desktop>web browser and type 192.168.1.2 and click go. If you get cisco default page then connection successful.



-This two pics prove that connection was successful.

REFLECTION

- a. What is the significance of assigning the IP address to the VLAN1 interface instead of any of the Fast Ethernet interfaces?

Ans. It is recommended to use VLAN1 to prevent unnecessary broadcast from being processed by the network management. Vlan1 used to break up networks for servers into one. Any client can be connected to any logical LAN. The advantage is that the consumer could be in any part of the house, or even another building.

- b. What command is necessary to enforce password authentication on the console and vty lines?

Ans. password cisco
Router(config-line)# login authentication CONSOLE

- c. How many gigabit ports are available on the Cisco Catalyst 2960 switch that you used in the activity?

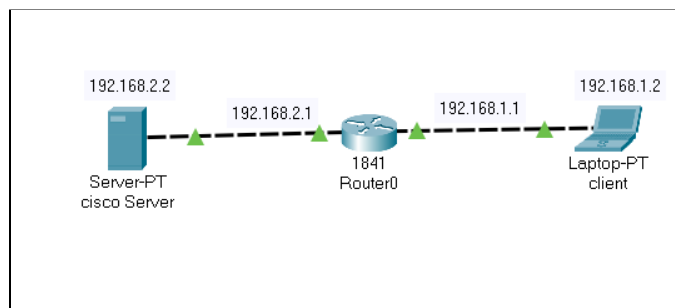
Ans. 24 or 48 Gigabit Ethernet ports

Conclusion : Switch was configured ,and client ping to the local server was successful.

Experiment 7:

Aim : Performing an Initial Router Configuration

Diagram :



Procedures/Commands :

1. We are gonna implement the above diagram and ping the server from the laptop.
2. Select a 1841 router , a laptop-PT and Sever-PT. Connect them with cross wire cables.

3.now we'll configure the router,click on switch then click CLI .

1. Configure the router host name

-once CLI is up press return to start , first mode is the user mode. To configure the router we need to be in privileged mode.

```
Router>en
Router#config t
Router(config)#hostname CustomerRouter
```

2. Configure the privileged mode and secret passwords

--we can set authenticity for this mode so that only you or concerned authorities can access/configure the router.

-secret stores the password in a hash form which is difficult to hack.

```
CustomerRouter(config)#enable password cisco
CustomerRouter(config)#enable secret cisco123
```

3. Configure the console password.

--usually an IT guy connects his/her laptop with a console cable to the router and configures it instead of using CLI of the router. On this occasion we can set authenticity for the console interface too.

```
CustomerRouter(config)#line console 0
CustomerRouter(config-line)#password cisco123
CustomerRouter(config-line)#login
CustomerRouter(config-line)#exit
```

4. Configure the vty password to allow Telnet access to the router

```
CustomerRouter(config)#line vty 0 4
CustomerRouter(config-line)#password cisco123
CustomerRouter(config-line)#login
CustomerRouter(config-line)#exit
```

5. Set an ip address to the fastEthernet 0/1 interface(laptop side)

-interface may change depending how you give connection. Here fa0/1 of the router is connected to the laptop.

```
CustomerRouter(config)#int fa0/1
CustomerRouter(config-if)#ip address 192.168.1.1 255.255.255.0
CustomerRouter(config-if)#no shut
CustomerRouter(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
CustomerRouter(config-if)#exit
```

6. Set an ip address to the fastEthernet 0/0 interface (server side)

```
CustomerRouter(config)#int fa0/0
CustomerRouter(config-if)#ip address 192.168.2.1 255.255.255.0
CustomerRouter(config-if)#no shut
CustomerRouter(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
CustomerRouter(config-if)#exit
CustomerRouter(config)#
CustomerRouter(config)#end
```

7. Saving the config

-we can save the configuration made into the NVRAM so that if the switch is turned off and on we need not configure it again

```
CustomerRouter#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
CustomerRouter#
%SYS-5-CONFIG_I: Configured from console by console
```

8. Set ip addresses for the laptop and the server.

-click on laptop>Desktop>ip configuration. Enter ip 192.168.1.2 subnet 255.255.255.0 with gateway 192.168.1.1

-click on Server>Desktop>ip configuration enter ip 192.168.2.2 subnet 255.255.255.0 with gateway 192.168.2.1

9. Setup is done ,we can test now.

Output :

-This is a pic of CLI (configured router)

```

Router0
Physical Config CLI Attributes

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>en
Router>config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname CustomerRouter
CustomerRouter(config)#enable password cisco
% Ambiguous command: "en password cisco"
CustomerRouter(config)#enable password cisco
CustomerRouter(config)#enable secret cisco123
CustomerRouter(config)#line console 0
CustomerRouter(config-line)#password cisco123
CustomerRouter(config-line)#login
CustomerRouter(config-line)#exit
CustomerRouter(config)#line vty 0 4
CustomerRouter(config-line)#password cisco123
CustomerRouter(config-line)#login
CustomerRouter(config-line)#exit
CustomerRouter(config)#int fa0/1
CustomerRouter(config-if)#ip address 192.168.1.1 255.255.255.0
CustomerRouter(config-if)#no shut

CustomerRouter(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

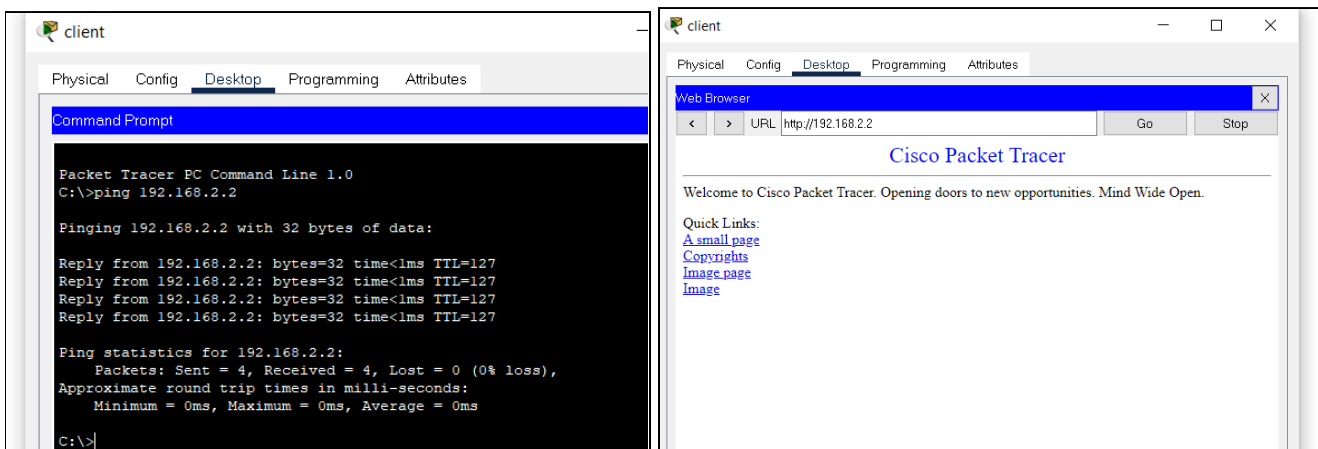
CustomerRouter(config-if)#exit
CustomerRouter(config)#int fa0/0
CustomerRouter(config-if)#ip address 192.168.2.1 255.255.255.0
CustomerRouter(config-if)#no shut

CustomerRouter(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

CustomerRouter(config-if)#exit
CustomerRouter(config)#
CustomerRouter(config)#end
CustomerRouter#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
CustomerRouter#
%SYS-5-CONFIG_I: Configured from console by console
  
```

-now click laptop>desktop>command prompt and type ping 192.168.2.2 , If 0%loss then successful.

-now click laptop>desktop>web browser and type 192.168.2.1 and click go. If you get cisco default page then connection successful.



-This two pics prove that connection was successful.

Conclusion : router was configured ,and client ping to the server was successful.

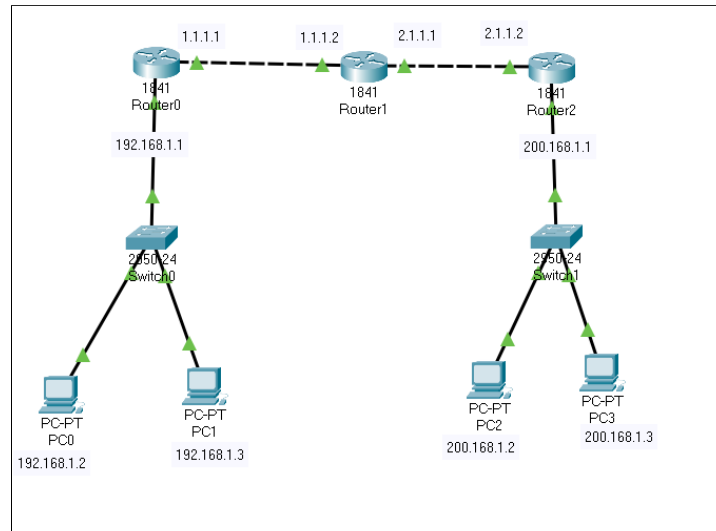
Experiment 6

Aim :Configure a Network topology using packet tracer software.

Apparatus : Packet tracer Software

Procedure: To implement this practical following network topology is required to be configured using the commands learned in previous practical.

Diagram :



Procedure/Commands :

1. We are gonna implement the above diagram and ping PC of one network to PC of other network..
2. Select three 1841 routers , four PC-PT and two 2590-24 switches . Connect them as shown.
3. First we need to decide how many networks there are, what will be the network id for those.
4. analyzing the topology we can see that there are two switches connected under respective routers they each form a network. One network is different from the other as they are connected to different routers .
5. Let us assume the network under router 0 is 192.168.1.0 and that under router2 is 200.168.1.0 . Both are Class C ip addresses therefore subnet is 255.255.255.0
6. The routers here need their own ip so that they can hop our message packets to other packets.
7. Lets assume ip address 1.1.1.1 , 1.1.1.2 , 2.1.1.1 , 2.1.1.2 . These are Class A ip address therefore subnet of 255.0.0.0
8. Now that we have made necessary assumptions let's proceed.
9. all these 3 routers have to be configured .
- 10..now we'll configure the router2, click on switch then click CLI .

For router2 :

1. Enter the privileged mode

```
Router>en
Router#config t
```

Enter configuration commands, one per line. End with CNTL/Z.

2. Set ip for fa0/0 interface (facing router 1)

-the interface may change depending on how you connected . the interface fa0/0 of router2 is connected to router1 here.

```
Router(config)#int fa0/0
Router(config-if)#ip address 2.1.1.2 255.0.0.0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Router(config-if)#exit
```

3. Set ip for fa0/1 interface this acts as gateway (facing switch)

```
Router(config)#int fa0/1
Router(config-if)#ip address 200.168.1.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up
```

Router(config-if)#exit

- Now we need to make an entry in the routing table so that any packet from this network(200.168.1.0) wants to send it to other network(192.168.1.0) it should know which path to follow

Syntax :ip route dest-ntwk-ip subnet next-router-hop-ip

Router(config)#ip route 192.168.1.0 255.255.255.0 2.1.1.1

- Do this similar steps for the other routers(repeat 1-4) ,
-put proper ip addresses to the respective interfaces as shown in diagram(as assumed)
- Now we need to set ip address for those 4 PCs
-ip address of PCs will be derived from network id example say
network id is 192.168.1.0 with gateway(192.168.1.1), ip address of pcs can be 192.168.1.x where x=1 to 254.
Do not use gateway as an ip address of a PC.
-click PC1>Desktop>ip configuration n set ipv4 to 192.168.1.3 subnet 255.255.255.0 gateway to 192.168.1.1(pic is included in output)
-do the same for PC0 with ipv4 as 192.168.1.2
-For PC2 ipv4 will be 200.168.1.2 225.255.255.0 and gateway 200.168.1.1
-For PC3 200.168.1.3 255.255.255.0 200.168.1.1

- Setup is done so we can test it.

Output :

-Pic of CLI (router 2)

```

Router2
Physical Config CLI Attributes
IOS Command Line Interface

Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip address 2.1.1.2 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed
state to up

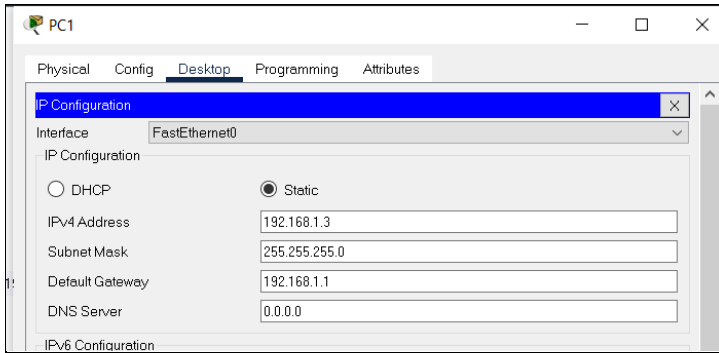
Router(config-if)#exit
Router(config)#int fa0/1
Router(config-if)#ip address 200.168.1.1 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/1, changed state to up

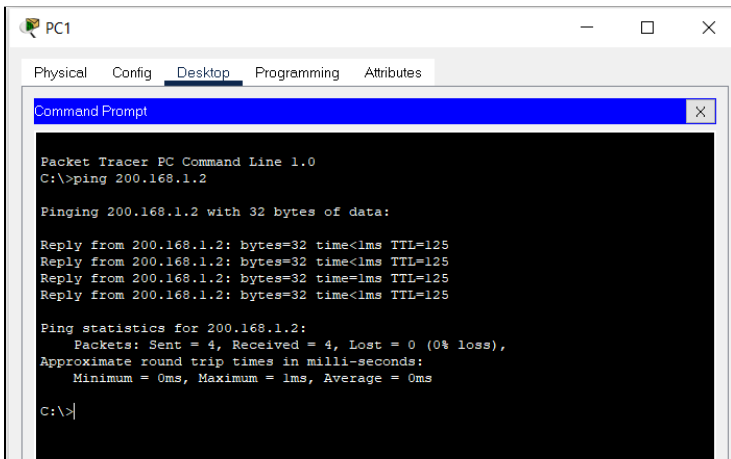
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed
state to up

Router(config-if)#exit
Router(config)#ip route 192.168.1.0 255.255.255.0 2.1.1.1
Router(config)#
Router(config)#
  
```

- Pic of ip configuration of PC1



- Now go to the command prompt of PC1 and type ping 200.168.1.2 ,here we are pinging PC4 from PC1.



REFLECTION:

1. Which Cisco IOS CLI commands did you use most?

- login
- enable
- configure terminal
- enable password cisco
- enable secret cisco123
- exit

2. How can you make the customer router passwords more secure?

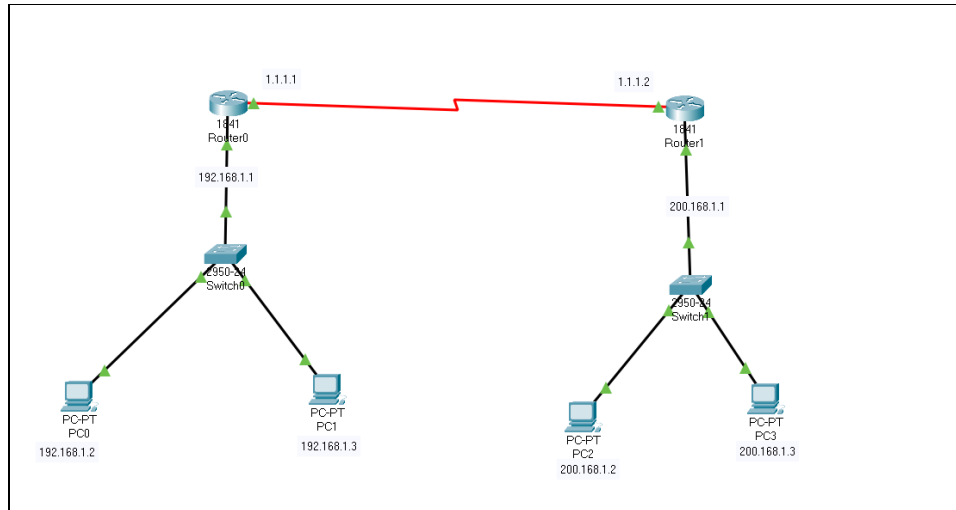
Ans.using enable secret <key>.This will hash and save the password providing more security.

Conclusion : The given topology was implemented, all the routers configured and pc of one network(192.168.1.0) was able to ping the other network(200.168.1.0).

Experiment 7

Aim :Configure a Network topology using packet tracer software

Diagram :



Procedure/Commands :

1. We are gonna implement the above diagram and ping PC of one network to PC of other network..
2. Select two 1841 routers, four PC-PT and two 2590-24 switches. Connect them as shown.
3. First we need to decide how many networks there are, what will be the network id for those.
4. Analyzing the topology we can see that there are two switches connected under respective routers; they each form a network. One network is different from the other as they are connected to different routers.
5. Let us assume the network under router 0 is 192.168.1.0 and that under router 1 is 200.168.1.0. Both are Class C IP addresses; therefore, the subnet is 255.255.255.0.
6. The routers here need their own IP so that they can hop our message packets to other packets.
7. Let's assume IP address 1.1.1.1, 1.1.1.2. These are Class A IP addresses; therefore, the subnet is 255.0.0.0.
8. Now that we have made necessary assumptions, let's proceed.
9. All these 2 routers have to be configured. Before configuring, we need to add one module to these routers. Click on the router and switch it off. In the physical tab, select WIC-2T and place it in one of the two empty slots (see pic in output). Then turn on the router back. Do the same for other routers too.
10. Now we need to connect these two routers with a serial DTE connector or select auto.
11. Now we'll configure the router1, click on switch then click CLI.

Router 0 config

1. Enter the privileged mode

```
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
```

2. Set IP for fa0/0 interface (facing switch)

-the interface may change depending on how you connected. the interface fa0/0 of router1 is connected to switch here.

```
Router(config)#int fa0/0
Router(config-if)#ip address 200.168.1.1 255.255.255.0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
Router(config-if)#exit
```

3. Set IP for the serial interface (facing router0)

```
Router(config)#int se0/1/0
Router(config-if)#ip address 1.1.1.2 255.0.0.0
Router(config-if)#no shut
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
Router(config-if)#exit
```

4. Now we need to make an entry in the routing table so that any packet from this network (200.168.1.0) wants to send it to other network (192.168.1.0) it should know which path to follow

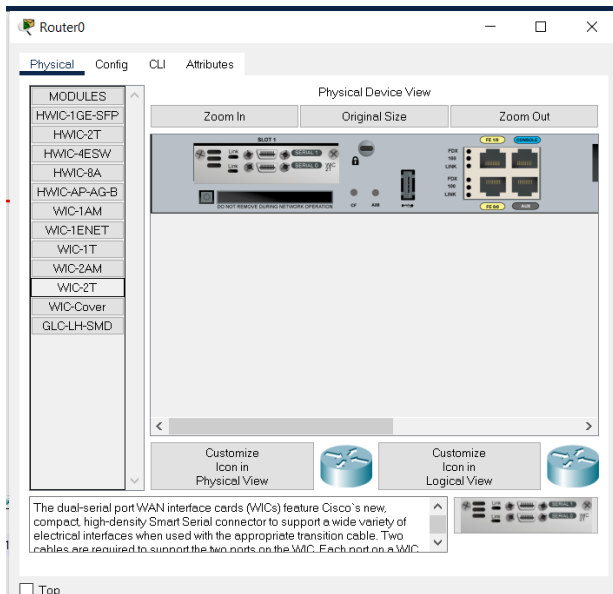
GOA COLLEGE OF ENGINEERING

Syntax :ip route dest-ntwk-ip subnet next-router-hop-ip
Router(config)#ip route 192.168.1.0 255.255.255.0 1.1.1.1

5. Do this similar steps for the other routers(repeat 1-4) ,
-put proper ip addresses to the respective interfaces as shown in diagram(as assumed)
6. Now we need to set ip address for those 4 PCs
-ip address of PCs will be derived from network id example say
network id is 192.168.1.0 with gateway(192.168.1.1), ip address of pcs can be 192.168.1.x where x=1 to 254.
Do not use gateway as an ip address of a PC.
-click PC1>Desktop>ip configuration n set ipv4 to 192.168.1.3 subnet 255.255.255.0 gateway to 192.168.1.1(pic is included in output)
-do the same for PC0 with ipv4 as 192.168.1.2
-For PC2 ipv4 will be 200.168.1.2 225.255.255.0 and gateway 200.168.1.1
-For PC3 200.168.1.3 255.255.255.0 200.168.1.1
7. Setup is done so we can test it.

Output :

-This is a pic of router0 physical tab where we added the WIC-2T module.



-This is a pic of CLI (router1 config)

```

zone-pair
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#
Router(config)#ip route 192.168.1.0 255.255.255.0 1.1.1.1
Router(config)#
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter
       area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C      1.0.0.0/8 is directly connected, Serial0/1/0
S      192.168.1.0/24 [1/0] via 1.1.1.1
C      200.168.1.0/24 is directly connected, FastEthernet0/0

Router#

```

-open command prompt of PC2 of network(200.168.1.0) and ping PC1 of network(192.168.1.0)

```

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=20ms TTL=126
Reply from 192.168.1.3: bytes=32 time=1ms TTL=126
Reply from 192.168.1.3: bytes=32 time=1ms TTL=126
Reply from 192.168.1.3: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 20ms, Average = 5ms

```

Conclusion :The given topology was implemented, all the routers configured and pc of one network(192.168.1.0) was able to ping the other network(200.168.1.0).