24/11/22

LAB-3

AIM : Configuring default route to the router

Topology:

Procedure:

→ Place 6 generic PC's, 3 switches and 3 routers and connect two PC's to each switch with copper straight through wire and each switch is connected to one router with a copper straight through wire and the three routers are connected among themselves by serial DCE cable and the nodes are placed for all the devices and networks

→ A PC is clicked to set the attributes for a PC and each PC has three attributes which are the IP address, Subnet mask and the gateway and all the three are set according to the nodes placed. This process is done for all the 6 PC's

→ For router 1, the configurations are done in the command line interface (CLI). The IP address and Subnet mask are set for both the interfaces - fastethernet 0/0 as 10.0.0.10 and 255.0.0.0 and serial 2/0 as 40.0.0.1 and 255.0.0.0. Router 2 is the default router for Router 1 and this done by the command ip route 0.0.0.0 0.0.0.0 40.0.0.2

→ For Router 2, the IP address and Subnet mask are set for all three interfaces - fastethernet 0/0 as 20.0.0.3 and 255.0.0.0 and serial 2/0 as 40.0.0.2 and 255.0.0.0 and serial 3/0 as 50.0.0.1 and 255.0.0.0

→ Router 2 does not have any default routers and static routing is done for the network 10 and 40 by the following command ip route 10.0.0.0 255.0.0.0 40.0.0.1
ip route 30.0.0.0 255.0.0.0 50.0.0.2

→ Router 3 is configured in both the interfaces with IP address and subnet mask as fastethernet 0/0 with 30.0.0.10 and 255.0.0.0 and Serial 2/0 with 50.0.0.2 and 255.0.0.0. The default router for router 3 is Router 2 and this set by the command ip route 0.0.0.0 0.0.0.0 50.0.0.1

→ Ping command is executed from 10.0.0.1 to 20.0.0.1 and from 10.0.0.1 to 30.0.0.2

Observations:

Learning outcome:

→ One router cannot have two default routers

→ The default router for first router is the middle router because any packets which have to be delivered will go to the middle router

→ The default router for third router is the middle router for the same reason

→ The middle router does not have any default router because if one of the router is made default then there is a chance that the packets which are to be sent to the switch are sent to the router

Result:

```
ping 20.0.0.1
Pinging 20.0.0.1 with 32 bytes of data
Request timed out
Reply from 20.0.0.1 : bytes = 32, time = 1ms, TTL = 126
Reply from 20.0.0.1 : bytes = 32, time = 2ms, TTL = 126
Reply from 20.0.0.1 : bytes = 32, time = 6ms, TTL = 126

ping 30.0.0.2
Pinging 30.0.0.2 with 32 bytes of data
Request timed out
Reply from 30.0.0.2: bytes = 32, time = 4ms, TTL = 125
Reply from 30.0.0.2: bytes = 32, time = 4ms, TTL = 125
Reply from 30.0.0.2: bytes = 32, time = 4ms, TTL = 125
```

Router0

Physical | Config | CLI

IOS Command Line Interface

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 10.0.0.10 255.0.0.0
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
exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#ip address 40.0.0.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

%LINK-5-CHANGED: Interface Serial2/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up

Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 40.0.0.2
Router(config)#exit
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 40.0.0.2 to network 0.0.0.0

C    10.0.0.0/8 is directly connected, FastEthernet0/0
C    40.0.0.0/8 is directly connected, Serial2/0
S*   0.0.0.0/0 [1/0] via 40.0.0.2
Router#
```


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Router1

Physical | Config | CLI

IOS Command Line Interface

```
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#ip address 50.0.0.1 255.0.0.0
Router(config-if)#no shut

%LINK-5-CHANGED: Interface Serial3/0, changed state to down
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface Serial3/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 20.0.0.10 255.0.0.0
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)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

%LINK-5-CHANGED: Interface Serial3/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial3/0, changed state to up

Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 10.0.0.0 255.0.0.0 40.0.0.1
Router(config)#ip route 30.0.0.0 255.0.0.0 50.0.0.2
Router(config)#exit
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

S    10.0.0.0/8 [1/0] via 40.0.0.1
C    20.0.0.0/8 is directly connected, FastEthernet0/0
S    30.0.0.0/8 [1/0] via 50.0.0.2
C    40.0.0.0/8 is directly connected, Serial2/0
C    50.0.0.0/8 is directly connected, Serial3/0
Router#
```


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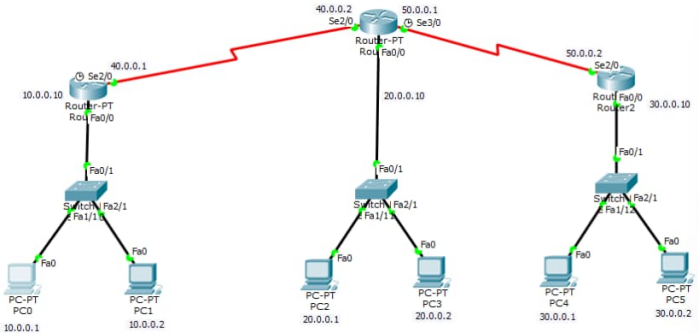
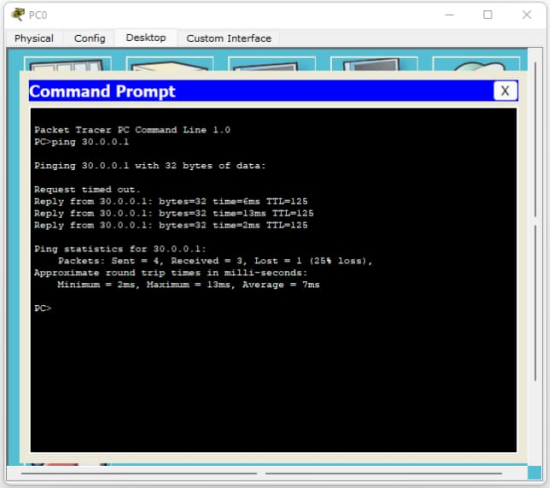

40.0.0.2
Se2/0
50.0.0.1
Se3/0
Router-PT
Rou Fa0/0
40.0.0.1
Se2/0
10.0.0.10
Router-PT
Rou Fa0/0
20.0.0.10
50.0.0.2
Se2/0
Rout Fa0/0
Router2
30.0.0.10
Fa0/1
Switch Fa2/1
Fa1/1
Fa0/1
Switch Fa2/1
Fa1/1
Fa0/1
Switch Fa2/1
Fa1/1
Fa0
Fa0
Fa0
Fa0
Fa0
Fa0
PC-PT
PC0
10.0.0.1
PC-PT
PC1
10.0.0.2
PC-PT
PC2
20.0.0.1
PC-PT
PC3
20.0.0.2
PC-PT
PC4
30.0.0.1
PC-PT
PC5
30.0.0.2


PC0
Physical
Config
Desktop
Custom Interface
Command Prompt
X
Packet Tracer PC Command Line 1.0
PC>ping 30.0.0.1
Pinging 30.0.0.1 with 32 bytes of data:
Request timed out.
Reply from 30.0.0.1: bytes=32 time=6ms TTL=125
Reply from 30.0.0.1: bytes=32 time=13ms TTL=125
Reply from 30.0.0.1: bytes=32 time=2ms TTL=125
Ping statistics for 30.0.0.1:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 13ms, Average = 7ms
PC>