Lab # 07: Static Routing using Packet Tracer

Introduction

Static routing is a form of routing that occurs when a router uses a manually-configured routing entry, rather than information from dynamic routing traffic. In many cases, static routes are manually configured by a network administrator by adding in entries into a routing table, though this may not always be the case. Unlike dynamic routing, static routes are fixed and do not change if the network is changed or reconfigured. Static routing and dynamic routing are not mutually exclusive. Both dynamic routing and static routing are usually used on a router to maximize routing efficiency and to provide backups in case dynamic routing information fails to be exchanged. Static routing can also be used in stub networks, or to provide a gateway of last resort.

The objective of this lab is to:

- To configure & implement Static Route successfully on said devices and test its all functionalities practically.

TOPOLOGY: Setup your lab topology as below.
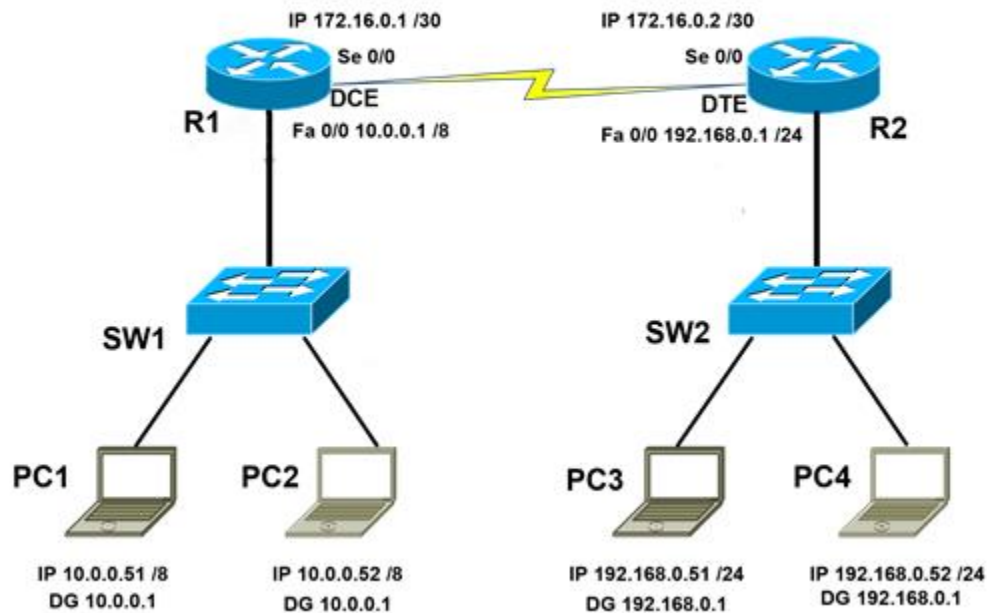
Procedure:

1. Configure the hostnames for switches as SW1, SW2 & for Routers as R1, R2 as shown in above topology

2. Set the ip address of interface Fa 0/0 for R1 and R2 as shown in above topology

3. Set the ip address of interface Se 0/0 for R1, set clock rate for this interface & also set ip address of interface Se 0/0 for R2 as shown in above topology

4. Configure static route on R1 & R2

5. Set the ip address and default gateway for pc's PC1, PC2, PC3 & PC4 as shown in above topology

6. Verify the static route configured on R1 & R2 by using **show ip route** command

7. Check the connectivity between all PC's with each other

Configuration:

Step 1:

Configure the hostnames for switches as SW1, SW2 & for Routers as R1,R2 as shown in above topology

1.1: For SW1

Switch>enable

Switch#configure terminal

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

Switch(config)#hostname SW1

SW1(config)#

1.2: For SW2

Switch>enable

Switch#configure terminal

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

Switch(config)#hostname SW2

SW2(config)#

1.3: For R1

Router>enable

Router#configure terminal

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

Router(config)#hostname R1

R1(config)#

1.4: For R2

Router>enable

Router#configure terminal

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

Router(config)#hostname R2

R2(config)#

Step 2:

Set the ip address of interface Fa 0/0 for R1 and R2 as shown in above topology

2.1: For R1

R1(config)#interface fastEthernet 0/0

R1(config-if)#ip address 10.0.0.1 255.0.0.0

R1(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

2.2: For R2

R2(config)#interface fastEthernet 0/0

R2(config-if)#ip address 192.168.0.1 255.255.255.0

R2(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

Step 3:

Set the ip address of interface Se 0/0 for R1, set clock rate for this interface & also set ip address of interface Se 0/0 for R2 as shown in above topology

3.1: For R1

R1(config)#interface serial 0/0

R1(config-if)#ip address 172.16.0.1 255.255.255.252

R1(config-if)#clock rate 64000

R1(config-if)#no shutdown

3.2: For R2

R2(config)#interface serial 0/0

R2(config-if)#ip address 172.16.0.2 255.255.255.252

R2(config-if)#no shutdown

Step 4:

Configure static route on R1 & R2

4.1: For R1

    R1(config)#ip route 192.168.0.0 255.255.255.0 172.16.0.2

OR

    R1(config)#ip route 192.168.0.0 255.255.255.0 serial0/0

4.2: For R2

    R2(config)#ip route 10.0.0.0 255.0.0.0 172.16.0.1

OR

    R2(config)#ip route 10.0.0.0 255.0.0.0 serial0/0

Step 5:

Verify the static route configured on R1 & R2 by using show ip route command

5.1: For R1

R1#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   10.0.0.0/8 is directly connected, FastEthernet0/0

172.16.0.0/30 is subnetted, 1 subnets
C   172.16.0.0 is directly connected, Serial0/0
S   192.168.0.0/24 [1/0] via 172.16.0.2

5.2: For R2

R2#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 172.16.0.1
     172.16.0.0/30 is subnetted, 1 subnets
C   172.16.0.0 is directly connected, Serial0/0
C   192.168.0.0/24 is directly connected, FastEthernet0/0

Step 6:

Check the connectivity between all PC's with each other

6.1: Check the connectivity between PC1 & PC3

PC1>ping 192.168.0.51

Pinging 192.168.0.51 with 32 bytes of data:

Request timed out.
Reply from 192.168.0.51: bytes=32 time=141ms TTL=126
Reply from 192.168.0.51: bytes=32 time=140ms TTL=126
Reply from 192.168.0.51: bytes=32 time=140ms TTL=126

Ping statistics for 192.168.0.51:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:

Minimum = 140ms, Maximum = 141ms, Average = 140ms

6.2: Check the connectivity between PC2 & PC4

PC2>ping 192.168.0.52

Pinging 192.168.0.52 with 32 bytes of data:

Request timed out.
Reply from 192.168.0.52: bytes=32 time=141ms TTL=126
Reply from 192.168.0.52: bytes=32 time=140ms TTL=126
Reply from 192.168.0.52: bytes=32 time=140ms TTL=126

Ping statistics for 192.168.0.52:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 140ms, Maximum = 141ms, Average = 140ms