

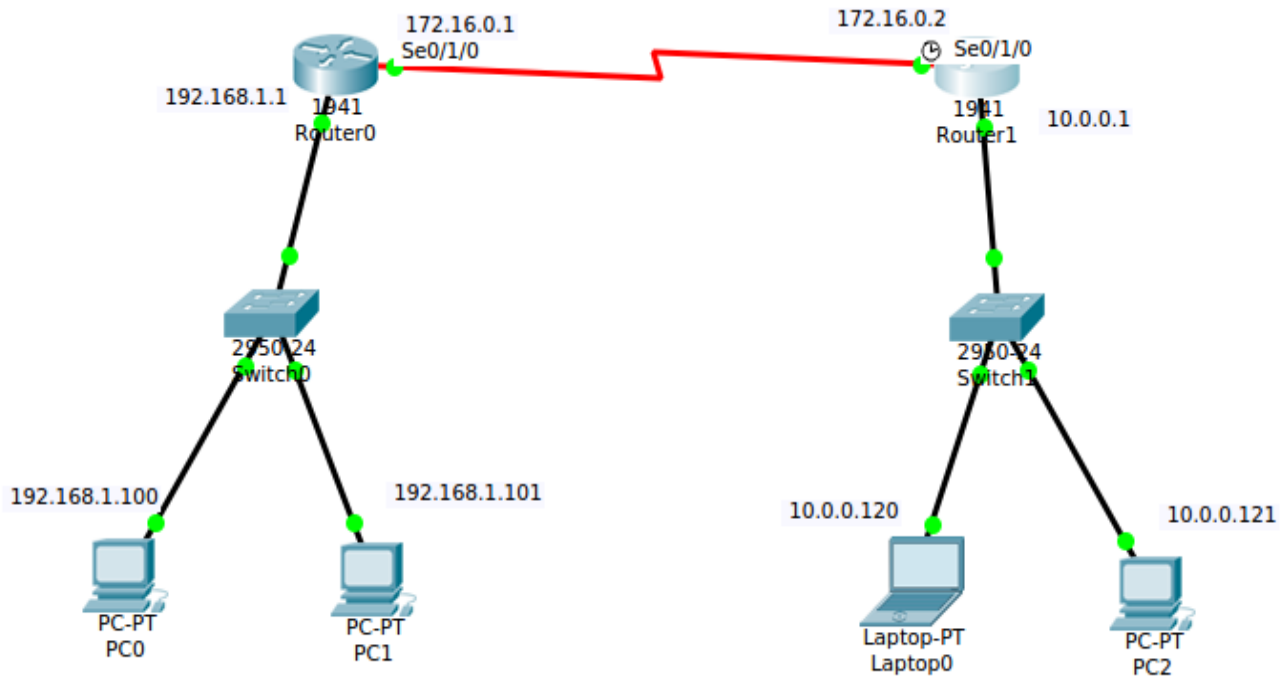
Experiment No: 8

Date: .....

## STATIC ROUTING

### AIM:

To configure Static Routing on Routers.



### Procedure

- In Packet tracer Software, create two working LANs, each with one switch and two systems.
- Connect them using two routers through a serial (WAN) interface.
- Set a static routing table and test the connection using the ping utility.

### DTE and DCE (data terminal equipment and data communications equipment)

Devices that communicate over a serial interface are divided into two classes: DTE and DCE. The most important difference between these types of devices is that the DCE device supplies the clock signal that paces the communications on the bus. So, to enable a serial link the clock rate in the DCE is to be set (say, 64000). Similarly the bandwidth in the DTE is to be set to a compatible value (say, 64). To check whether a router acts as a DCE or DTE, go to Privilege mode and type the command '**show controllers serial 0/1/0**'. To set the clock rate or bandwidth, go to interface configuration mode for the serial port and type the command '**clock rate 64000**' or '**bandwidth 64**' respectively.

## **Router Command Line Interface**

### **Router0**

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Router0
Router0(config)#
Router0(config)#interface GigabitEthernet0/0
Router0(config-if)#ip address 192.168.1.1 255.255.255.0
Router0(config-if)#no shutdown
Router0(config-if)#exit
Router0(config)#interface Serial0/1/0
Router0(config-if)#ip address 172.16.0.1 255.255.0.0
Router0(config-if)#no shutdown
Router0(config-if)#exit
Router0(config)#exit
Router0#
%SYS-5-CONFIG_I: Configured from console by console
```

```
Router0#show ip interface brief
```

Interface	IP-Address	OK?	Method	Status	Protocol
GigabitEthernet0/0	192.168.1.1	YES	manual	up	up
GigabitEthernet0/1	unassigned	YES	unset	administratively down	down
Serial0/1/0	172.16.0.1	YES	manual	down	down
Serial0/1/1	unassigned	YES	unset	administratively down	down
Vlan1	unassigned	YES	unset	administratively down	down

```
Router0#
```

### **Router1**

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Router1
Router1(config)#
Router1(config)#interface GigabitEthernet0/0
Router1(config-if)#ip address 10.0.0.1 255.0.0.0
Router1(config-if)#no shutdown
Router1(config-if)#exit
Router1(config)#interface Serial0/1/0
Router1(config-if)#ip address 172.16.0.2 255.255.0.0
```

```

Router1(config-if)#no shutdown
Router1(config-if)#exit
Router1(config)#exit
Router1#
Router1#show ip interface brief
Interface                IP-Address      OK?  MethodStatus          Protocol
GigabitEthernet0/0      10.0.0.1        YES  manual      up                    up
GigabitEthernet0/1      unassigned      YES  unset       administratively down  down
Serial0/1/0             172.16.0.2      YES  manual      up                    up
Serial0/1/1             unassigned      YES  unset       administratively down  down
Vlan1                   unassigned      YES  unset       administratively down  down
Router1#

```

### To create static routing table in Router0:

```

Router0#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router0(config)#ip route 10.0.0.0 255.0.0.0 172.16.0.2
Router0(config)#exit
Router0#
Router0#show ip route
Codes: L - local, C - connected, S - static, ...
Gateway of last resort is not set
S    10.0.0.0/8 [1/0] via 172.16.0.2
     172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C    172.16.0.0/16 is directly connected, Serial0/1/0
L    172.16.0.1/32 is directly connected, Serial0/1/0
     192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.1.0/24 is directly connected, GigabitEthernet0/0
L    192.168.1.1/32 is directly connected, GigabitEthernet0/0
Router0#

```

### To create static routing table in Router1:

```

Router1>en
Router1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router1(config)#ip route 192.168.1.0 255.255.255.0 172.16.0.1
Router1(config)#exit
Router1#
Router1#show ip route
Codes: L - local, C - connected, S - static, ...

```

```
Gateway of last resort is not set
    10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    10.0.0.0/8 is directly connected, GigabitEthernet0/0
L    10.0.0.1/32 is directly connected, GigabitEthernet0/0
    172.16.0.0/16 is variably subnetted, 2 subnets, 2 masks
C    172.16.0.0/16 is directly connected, Serial0/1/0
L    172.16.0.2/32 is directly connected, Serial0/1/0
S    192.168.1.0/24 [1/0] via 172.16.0.1
Router1#
```

### **To set the bandwidth for a DTE interface (say, Serial0/1/0 in Router0):**

```
Router0(config)#interface Serial0/1/0
Router0(config-if)#bandwidth 64
```

### **To set the clock rate for a DCE interface (say, Serial0/1/0 in Router1):**

```
Router1(config)#interface serial 0/1/0
Router1(config-if)#clock rate 64000
```

### **To store the running configuration for Router0 (and Router1):**

```
Router0#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Router0#
```

## **Testing The Connection**

### **Command Prompt of PC0**

```
PC>ipconfig
    FastEthernet0 Connection:(default port)
    Link-local IPv6 Address.....: FE80::210:11FF:FE05:5B64
    IP Address.....: 192.168.1.100
    Subnet Mask.....: 255.255.255.0
    Default Gateway.....: 192.168.1.1
PC>ping 10.0.0.121
    Pinging 10.0.0.121 with 32 bytes of data:
    Reply from 10.0.0.121: bytes=32 time=21ms TTL=126
    Reply from 10.0.0.121: bytes=32 time=1ms TTL=126
    Reply from 10.0.0.121: bytes=32 time=1ms TTL=126
    Reply from 10.0.0.121: bytes=32 time=1ms TTL=126
```

```
Ping statistics for 10.0.0.121:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milliseconds:  
Minimum = 1ms, Maximum = 21ms, Average = 6ms
```

```
PC>tracert 10.0.0.121
```

```
Tracing route to 10.0.0.121 over a maximum of 30 hops:
```

```
1 0 ms 0 ms 1 ms 192.168.1.1
```

```
2 0 ms 1 ms 1 ms 172.16.0.2
```

```
3 0 ms 1 ms 0 ms 10.0.0.121
```

```
Trace complete.
```

## **RESULT:**

Configured static routing in the given network and tested successfully.