

Lab: 12

TITLE: 3-ROUTER CONFIGURATION

Aim: To configure static routes (3 Router) in a network using Cisco Packet Tracer and troubleshoot the errors.

Software's: Cisco Packet Tracer

Theory:

Router is a layer 3 device which enables communication between stations which are in different network, hence router routes between the networks. Here in this setup we consider 5 different networks connected to 3 routers via a switch. The physical topology of the network used here is tree topology.

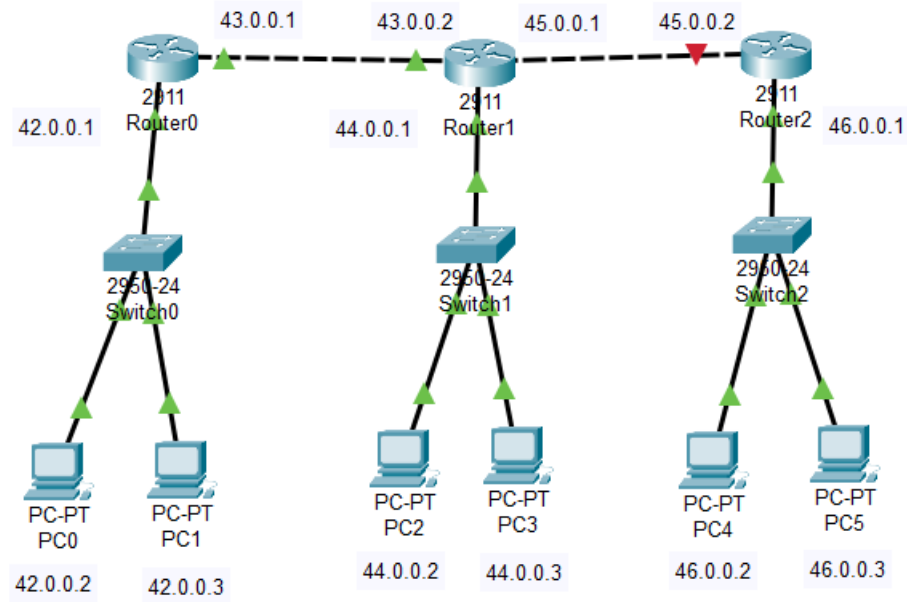
Routers and the stations are initially configured and then the routers are given either static/dynamic routes with the help of which they find the path to reach each and every network component in the LAN.

Procedure:

- Initially all the routers, switches and pcs are connected to each other using cross over cables.
- Routers are connected to each other on serial interface and the switches and pcs are connected over fast Ethernet interface.
- Every router and pcs are configured with proper ip addresses
- Every pcs gateway address is the ip address of the router interface that they are connected to. This is because the router facilitates communication between networks.
- Now with static routing or dynamic routing protocols all the components in the network learn each other's existence and the routes to reach them. In this network static routing is used.
- Ping every network component to see if the established LAN network is functioning or no.

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Result:



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DEVICE	INTE FACE	IP ADDRESS	SUBNET MASK	NEXT HOP
Router 0	Fast Ethernet 0/0	43.0.0.1	255.0.0.0	44.0.0.0/8 via 43.0.0.2
Router 0	Fast Ethernet 0/1	42.0.0.1	255.0.0.0	46.0.0.0/8 via 43.0.0.2 45.0.0.0/8 via 43.0.0.2
Router 1	Fast Ethernet 0/0	43.0.0.2	255.0.0.0	42.0.0.0/8 via 43.0.0.1
Router 1	Fast Ethernet 0/1	44.0.0.1	255.0.0.0	46.0.0.0/8 via 45.0.0.2
Router 1	Fast Ethernet 0/2	45.0.0.1	255.0.0.0	
Router 2	Fast Ethernet 0/0	45.0.0.2	255.0.0.0	44.0.0.0/8 via 45.0.0.1
Router 2	Fast Ethernet 0/1	46.0.0.1	255.0.0.0	42.0.0.0/8 via 45.0.0.1 43.0.0.0/8 via 45.0.0.1
PC 0	Gateway=	42.0.0.2	255.0.0.0	
PC 1	Gateway=	42.0.0.3	255.0.0.0	
PC 2	Gateway=	44.0.0.2	255.0.0.0	
PC 3	Gateway=	44.0.0.3	255.0.0.0	
PC 4	Gateway=	46.0.0.2	255.0.0.0	
PC 5	Gateway=	46.0.0.3	255.0.0.0	

Testing Connectivity:

- Go to PC 0, open the Command Prompt, and ping the IP address of PC2 (44.0.0.2).
- Similarly, from PC 2, pings the IP address of PC 0 (42.0.0.2).

If the static routes are configured correctly, the ping should be successful, indicating that the two networks can communicate.

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Observation:

After successfully configuring the static routes, PC0 should be able to ping PC3, and vice versa, indicating that the static routes are correctly set up.

```
C:\>ping 44.0.0.2

Pinging 44.0.0.2 with 32 bytes of data:

Reply from 44.0.0.2: bytes=32 time<1ms TTL=126
Reply from 44.0.0.2: bytes=32 time<1ms TTL=126
Reply from 44.0.0.2: bytes=32 time<1ms TTL=126
Reply from 44.0.0.2: bytes=32 time<1ms TTL=126

Ping statistics for 44.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
C:\>ping 42.0.0.2

Pinging 42.0.0.2 with 32 bytes of data:

Reply from 42.0.0.2: bytes=32 time=4ms TTL=128
Reply from 42.0.0.2: bytes=32 time=7ms TTL=128
Reply from 42.0.0.2: bytes=32 time=14ms TTL=128
Reply from 42.0.0.2: bytes=32 time=15ms TTL=128

Ping statistics for 42.0.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 15ms, Average = 10ms
```

Conclusion:

In this experiment, we successfully configured a three-router network topology using Cisco Packet Tracer. By manually configuring static routes on each router, we established clear communication paths between the five different networks in our setup. The network's functionality was confirmed by successfully pinging between PCs on separate networks, demonstrating that the static routes were correctly implemented and enabled end-to-end connectivity across the entire LAN.

PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2