

Lab no: 8

Date: 2024/09/26

Title: Static Routing Implementation

Objectives:

- To understand the principles of static routing.
- To learn how to configure static routes on a router using the Command Line Interface (CLI).

Background Theory:

Static routing is a method in which network administrators manually configure routing tables on routers to direct traffic to specific destinations. This technique is widely used in small or controlled networks where simplicity and predictability are key. Using the Command Line Interface (CLI), static routes can be added, modified, or deleted, enabling precise control over how data packets are forwarded. Static routing is advantageous for its reliability and security, as it eliminates the need for routing protocol overhead and minimizes exposure to routing vulnerabilities. Proper implementation ensures efficient communication across networks.

Process for Static Routing:

Step 1: Setup an environment with 2 routers, 2 switches and some desktops, ensuring all devices are connected properly

Step 2: Manually assign IP addresses and subnet masks to the desktops, router interfaces, and the interface of each router.

Step 3: Enable router using command “*en*” to enter privileged EXEC mode.

Step 4: Enter the global configuration mode with command “*config t*”.

Step 5: Configure static routes for each router to establish communication between different networks entering “*ip route [Destination Network] [Subnet Mask] [Next Hop IP Address]*”.

Step 6: Save the configuration with the command “*do wr*” (write memory).

Step 7: Follow the same process on the other router to complete the static routing configuration.

```

Router#en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.3.0 255.255.255.0 192.168.1.4
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
wr
Building configuration...
[OK]
Router#

```

Fig: Static Routes of Router1 using CLI

```

Router#en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 192.168.2.0 255.255.255.0 192.168.1.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console
wr
Building configuration...
[OK]
Router#

```

Fig: Static Routes of Router0 using CLI

Observation and Findings:

Implementing Static Routing using 2 routers, switches and some desktops.

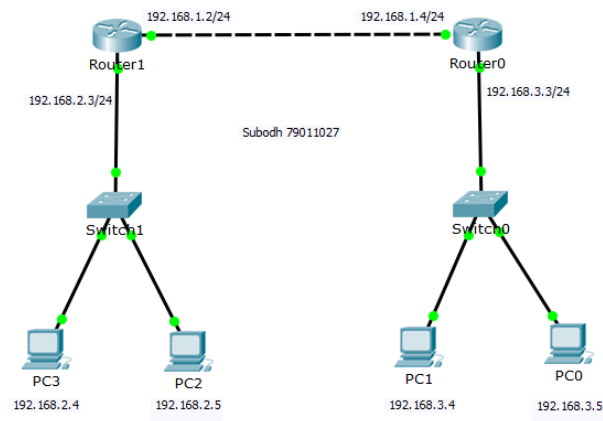


Fig: Router Configuration

Output:

```

Packet Tracer PC Command Line 1.0
PC>ping 192.168.3.4

Pinging 192.168.3.4 with 32 bytes of data:

Reply from 192.168.3.4: bytes=32 time=1ms TTL=126
Reply from 192.168.3.4: bytes=32 time=0ms TTL=126
Reply from 192.168.3.4: bytes=32 time=0ms TTL=126
Reply from 192.168.3.4: bytes=32 time=0ms TTL=126

Ping statistics for 192.168.3.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>

```

Discussions:

The router was configured using CLI commands to implement static routing for managing network traffic between different subnets. The process involved assigning IP addresses to router interfaces and desktops, and defining static routes to ensure precise data forwarding. Successful ping tests between devices confirmed that the static routes were properly applied, enabling seamless communication between networks. This highlights the reliability and control provided by static routing when managing network configurations.

Conclusion:

Implementing static routing via CLI allowed for effective management of network traffic between subnets. The successful connectivity tests validated that the static routes were configured correctly, ensuring accurate and efficient data flow between the networks.