

Lab 5: Configuration of Static Routes and Default Routes

Objective

To understand the working principles of static routing and default routing in a network.

To configure static routes and default routes using both the graphical interface and CLI in Cisco Packet Tracer.

Theory

Static Routing

Static routing is a routing technique in which routes are manually configured by a network administrator. These routes do not change automatically and remain in the routing table until they are modified or removed. Static routing is best suited for small or stable networks where network paths are predictable and administrative control is required.

Default Routing

Default routing is used when no specific route to a destination network exists in the routing table. It acts as a gateway of last resort, forwarding packets to a predefined next-hop router. This method is commonly used to forward traffic toward external or unknown networks.

Command Line Interface (CLI)

The Command Line Interface allows administrators to configure and manage network devices using text-based commands. CLI provides greater flexibility and control over device configuration and is widely used for troubleshooting and advanced network management.

Procedure

1. Open Cisco Packet Tracer and design a network topology consisting of at least two routers connected to multiple networks with end devices.
2. Assign appropriate IP addresses, subnet masks, and default gateways to all routers and end devices.
3. Configure static routes on each router using the IP route command.
4. Configure default routes on each router.
5. Verify connectivity using the ping command.

Observations

Devices on different networks were able to communicate successfully after configuring static and default routes.

Routing tables forwarded packets correctly.

Outputs

```
C:\>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Reply from 192.168.2.3: bytes=32 time<1ms TTL=126
Reply from 192.168.2.3: bytes=32 time<1ms TTL=126
Reply from 192.168.2.3: bytes=32 time=1ms TTL=126
Reply from 192.168.2.3: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=10ms TTL=126
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=11ms TTL=126
Reply from 192.168.2.2: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 11ms, Average = 5ms
```

Conclusion

This experiment demonstrated the importance of static and default routing in network communication. Proper route configuration ensures reliable data transmission between different networks.