STATIC IP ROUTES

Lab Objective:

Learn how to configure static IP routing.

Lab Purpose:

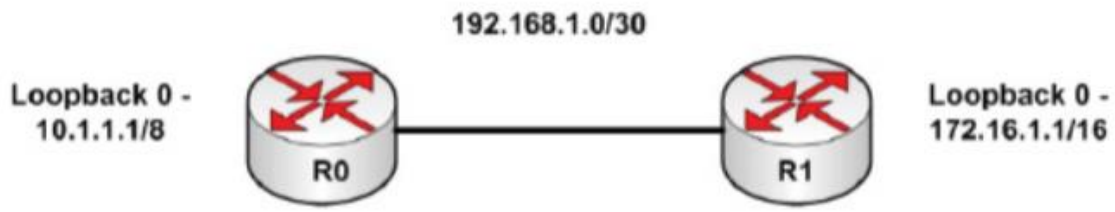
Small networks have no need of running dynamic routing protocols, which take up router CPY cycles and reserve bandwidth for routing updates. Static routes are easy to configure, and you need to know how to configure them as a network engineer.

Lab Tool:

Packet Tracer

Lab topology:

Please use the following topology to complete this lab exercise:



Lab Walkthrough:

Task 1:

Connect two routers together using a crossover cable.

Task 2:

Add the IP addresses to the routers connecting the interfaces and then the loopback interfaces.

Loopback interfaces exist in software only but let you test all your routing before installing into a customer's network.

Router>*enable*

Router#*configure terminal*

Router(config)#*hostname R0*

R0(config)#

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

R0(config)#*int lo0*

R0(config-if)#*ip add 10.1.1.1 255.0.0.0*

R0(config-if)#*int gig0/0*

R0(config-if)#*no shut*

%LINK-5-CHANGED: interface GigabitEthernet0/0, changed state to up

Then onto Router 1.

Router>*enable*

Router#*conf t*

Router(config)#*hostname R1*

R1(config)#

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

R1(config)#*int lo0*

R1(config-if)#*ip add 172.16.1.1 255.255.0.0*

R1(config-if)#*int gig0/0*

R1(config-if)#*ip add 192.168.1.2 255.255.255.252*

R1(config-if)#*no shut*

%LINK-5-CHANGED: interface GigabitEthernet0/0, changed state to up

Task 3:

Ping from R0 to R1 to check the connection works.

R0#*ping 192.168.1.2*

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 192.168.1.2, timeout is 2 seconds:

.!!!!

Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/0 ms

Task 4:

Ping from the loopback interface on R0 to the loopback on R1. Because the routers have no router to these networks, the ping packet will fail. You will need to use an extended ping command which lets you specify the source interface.

R0#*ping*

Protocol [ip]:

Target IP address: *172.16.1.1*

Repeat count [5]:

Datagram size [100]:

Timeout in seconds [2]:

Extended commands [n]: ***yes***

Source address or interface: *10.1.1.1*

Type of service [0]:

Set DF bit in IP header? [no]:

Validate reply data? [no]:

Data pattern [0xABCD]:

Loose, Strict, Record, Timestamp, Verbose [none]:

Sweep range of sizes [n]:

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:

Packet sent with source address of 10.1.1.1

…..

Success rate is 0 percent (0/5)

Task 5:

Add static routes. You can choose a next hop address or an exit interface. Bear in mind that R0 needs to know how to get to 172.16.0.0, but R1 also needs to know how to get to the 10.0.0.0 network.

R0(config)#*ip route 172.16.0.0 255.255.0.0 192.168.1.2*

R1(config)#*ip route 10.0.0.0 255.0.0.0 g0/0*

Task 6:

Test your static routes by pining each loopback interface from the opposite router. Make sure you type 'yes' or 'y' at the 'Extended commands' prompt. This feature lets you change the source interface of the ping, the ping number and size, etc.

R0#**ping**

Protocol [ip]:

Target IP address: **172.16.1.1**

Repeat count [5]:

Datagram size [100]:

Timeout in seconds [2]:

Extended commands [n]: *y*

Source address or interface: *10.1.1.1*

Type of service [0]:

Set DF bit in IP header? [no]:

Validate reply data? [no]:

Data pattern [0xABCD]:

Loose, Sctrict, Record, Timestamp, Verbose[none]:

Sweep range of sizes [n]:

Type escapte sequence to abort.

Sending 5, 100-bye ICMP echos to 172.16.1.1, timeout is 2 seconds:

Packet sent with a source address of 10.1.1.1

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

R1#*ping*

Protocol [ip]:

Target IP address: *10.1.1.1*

Repeat count [5]:

Datagram size [100]:

Timeout in seconds [2]:

Extended commands [n]: y

Source address or interface: *172.16.1.1*

Type of service [0]:

Set DF bit in IP header? [no]:

Validate reply data? [no]:

Data pattern [0xABCD]:

Loose, Sctrict, Record, Timestamp, Verbose[none]:

Sweep range of sizes [n]:

Type escapte sequence to abort.

Sending 5, 100-bye ICMP echos to 10.1.1.1, timeout is 2 seconds:

Packet sent with a source address of 172.16.1.1

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Note:

We used a /30 mask for the link between the two routers. This subnet mask would be used on point-to-point links because only two addresses are required.

Loopback interfaces stay up and do not require the 'no shutdown' command. They are very useful for testing and use in home labs where you have limited space and equipment.