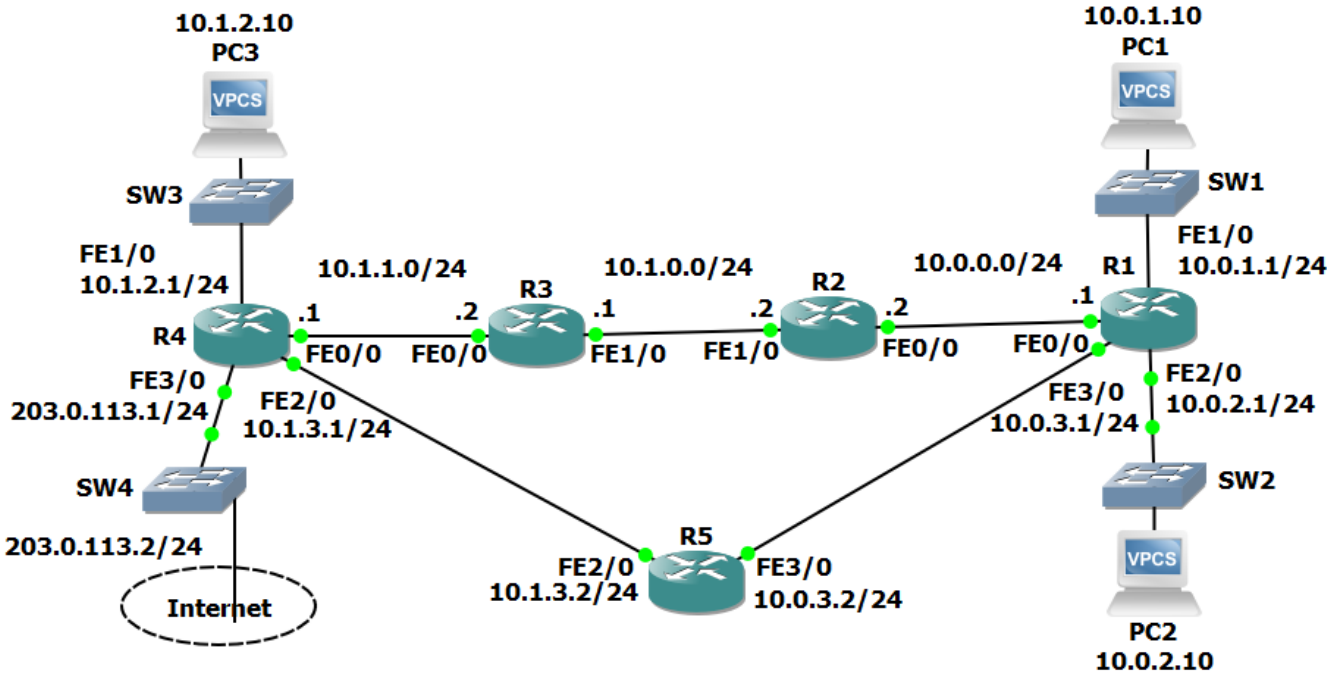
16 Routing Fundamentals - Lab Exercise

In this lab you will configure and verify connected, local, static, summary and default routes. You will also examine the effect of longest prefix match routing.

Lab Topology



Load the Startup Configurations

Open the ' 16 Routing Fundamentals.gns3project' file in GNS3 to load the lab.

Connected and Local Routes

1) Configure the PCs with an IP address and default gateway according to the Lab Topology diagram

2) Configure IP addresses on R1 according to the Lab Topology diagram

3) Verify routes have been automatically added for the connected and local networks (note that local routes only appear from IOS 15)

4) Should you be able to ping from PC1 to PC2? Verify this.

5) Verify the traffic path from PC1 to PC2.

6) Should you be able to ping from PC1 to PC3? Verify this.

Static Routes

7) Configure IP addresses on R2, R3 and R4 according to the Lab Topology diagram. Do not configure the Internet FastEthernet 3/0 interface on R4. Do not configure R5.

8) Configure static routes on R1, R2, R3 and R4 to allow connectivity between all their subnets. Use /24 prefixes for each network.

9) Verify connectivity between PC1, PC2 and PC3.

10) Verify the path traffic takes from PC1 to PC3.

Summary Routes

11) Remove all the static routes on R1

12) Verify that PC1 loses connectivity to PC3

13) Restore connectivity to all subnets with a single command on R1.

14) Verify the routing table on R1 does not contain /24 routes to remote subnets.

15) Ensure that connectivity is restored between PC1 and PC3.

Longest Prefix Match

16) Configure IP addresses on R5 according to the Lab Topology diagram

17) Do not add any additional routes. Does PC1 have reachability to the FastEthernet 2/0 interface on R5? If so, which path will the traffic take?

18) Ensure reachability over the shortest possible path from R5 to all directly connected networks on R1. Achieve this with a single command.

19) Verify the path traffic takes from PC1 to the FastEthernet 2/0 interface on R5.

20) Verify the path the return traffic takes from R5 to PC1.

21) Ensure that traffic between PC1 and the FastEthernet 2/0 interface on R5 takes the most direct path in both directions.

22) Verify that traffic between PC1 and the FastEthernet 2/0 interface on R5 takes the most direct path in both directions.

Default Route and Load Balancing

23) Configure an IP address on the Internet FastEthernet 3/0 interface on R4 according to the lab topology diagram.

24) Ensure that all PCs have a route out to the internet through the Internet Service Provider connection on R4. (Note that the lab does not actually have Internet connectivity.)

25) Traffic between PC1 and the internet should be load balanced over R2 and R5.