

Packet Tracer - Verify Directly Connected Networks (Instructor Version)

Instructor Note: Red font color or gray highlights indicate text that appears in the instructor copy only.

Addressing Table

Device	Interface	IP Address / Prefix	Default Gateway
R1	G0/0/0	172.16.20.1/25	N/A
	G0/0/1	172.16.20.129/25	N/A
	S0/1/0	209.165.200.225/30	N/A
PC1	NIC	172.16.20.10/25	172.16.20.1
PC2	NIC	172.16.20.138/25	172.16.20.129
R2	G0/0/0	2001:db8:c0de:12::1/64	N/A
	G0/0/1	2001:db8:c0de:13::1/64	N/A
	S0/1/1	2001:db8:c0de:11::1/64	N/A
		fe80::2	N/A
PC3	NIC	2001:db8:c0de:12::a/64	fe80::2
PC4	NIC	2001:db8:c0de:13::a/64	fe80::2

Objectives

- Verify IPv4 Directly Connected Networks
- Verify IPv6 Directly Connected Networks
- Troubleshoot connectivity issues.

Background

Routers R1 and R2 each have two LANs. Your task is to verify the addressing on each device and verify connectivity between the LANs.

Note: The user EXEC password is **cisco**. The privileged EXEC password is **class**.

Instructions

Part 1: Verify IPv4 Directly Connected Networks

Step 1: Verify IPv4 addresses and port status on R1.

- Check the status of the configured interfaces by filtering the output.

```
R1# show ip interface brief | exclude unassigned
Interface                IP-Address      OK? Method Status          Protocol
GigabitEthernet0/0/0    172.16.20.1     YES manual administratively down down
GigabitEthernet0/0/1    172.16.20.129  YES manual up              up
Serial0/1/0              209.165.200.229 YES manual up              up
```

- b. Based on the output, correct any port status problems that you see.
- c. Refer to the **Addressing Table** and verify the IP addresses configured on R1. Make any corrections to addressing if necessary.
- d. Display the routing table by filtering to start the output at the word **Gateway**.

Note: Terms that are used to filter output can be shortened to match text as long as the match is unique. For example, Gateway, Gate, and Ga will have the same effect. G will not. Filtering is case-sensitive

```
R1# show ip route | begin Gate
Gateway of last resort is 209.165.200.226 to network 0.0.0.0

    172.16.0.0/16 is variably subnetted, 4 subnets, 2 masks
C       172.16.20.0/25 is directly connected, GigabitEthernet0/0/0
L       172.16.20.1/32 is directly connected, GigabitEthernet0/0/0
C       172.16.20.128/25 is directly connected, GigabitEthernet0/0/1
L       172.16.20.129/32 is directly connected, GigabitEthernet0/0/1
    209.165.200.0/24 is variably subnetted, 2 subnets, 2 masks
C       209.165.200.224/30 is directly connected, Serial0/1/0
L       209.165.200.225/32 is directly connected, Serial0/1/0
S*    0.0.0.0/0 [1/0] via 209.165.200.226
```

What is the Gateway of last resort address?

209.165.200.226

- e. Display interface information and filter for **Description** or **connected**.

Note: When using **include** or **exclude** multiple searches can be performed by separating the search strings with a pipe symbol (|)

```
R1# show interface | include Desc|conn
GigabitEthernet0/0/0 is up, line protocol is up (connected)
  Description: Connection to SW1
GigabitEthernet0/0/1 is up, line protocol is up (connected)
  Description: Connection to SW2
Serial0/1/0 is up, line protocol is up (connected)
  Description: Circuit ID BCB123450001
```

What is the Circuit ID displayed from your output?

BCB123450001

- f. Display specific interface information for G0/0/0 by filtering for **duplex**.

What is the duplex setting, speed, and media type?

Full-duplex, 100Mb/s, media type is RJ45

Step 2: Verify connectivity.

PC1 and **PC2** should be able to ping each other and the **Dual Stack Server**. If not, verify the status of the interfaces and the IP address assignments.

Part 2: Verify IPv6 Directly Connected Networks

Step 1: Verify IPv6 addresses and port status on R2.

- a. Check the status of the configured interfaces.

```
R2# show ipv6 int brief
GigabitEthernet0/0/0      [up/up]
    FE80::2
    2001:DB8:CODE:12::1
GigabitEthernet0/0/1      [up/up]
    FE80::2
    2001:DB8:CODE:14::1
Serial0/1/0                [administratively down/down]
    unassigned
Serial0/1/1                [up/up]
    FE80::2D0:BCFF:FE32:7C24
    2001:DB8:CODE:11::1
```

What is the status of the configured interfaces?

All configured interfaces are up/up.

- b. Refer to the **Addressing Table** and make any corrections to addressing as necessary.

Note: When changing an IPv6 address it is necessary to remove the incorrect address since an interface is capable of supporting multiple IPv6 networks.

```
R2(config)# int g0/0/1
R2(config-if)# no ipv6 address 2001:db8:c0de:14::1/64
```

Configure the correct address on the interface.

R2(config-if)# ipv6 address 2001:db8:c0de:13::1/64

- c. Display the IPv6 routing table.

Note: Filtering commands do not presently work with the IPv6 commands.

- d. Display all IPv6 addressing configured on interfaces by filtering the output of the **running-config**.

Filter the output on **R2** for **ipv6** or **interface**.

```
R2# sh run | include ipv6|interface
ipv6 unicast-routing
no ipv6 cef
interface GigabitEthernet0/0/0
    ipv6 address FE80::2 link-local
    ipv6 address 2001:DB8:CODE:12::1/64
    ipv6 enable
interface GigabitEthernet0/0/1
    ipv6 address FE80::2 link-local
    ipv6 address 2001:DB8:CODE:13::1/64
    ipv6 enable
interface Serial0/1/0
```

```
interface Serial0/1/1
  ipv6 address 2001:DB8:CODE:11::1/64
  ipv6 enable
interface Vlan1
  ipv6 route ::/0 Serial0/1/1
```

How many addresses are configured on each Gigabit interface?

There are 2 IPv6 addresses. The IPv6 /64 address and the IPv6 link-local address.

Step 2: Verify connectivity.

PC3 and **PC4** should be able to ping each other and the **Dual Stack Server**. If not, verify the interface status and IPv6 address assignments.

Final Configuration

Router R1

```
interface g0/0/0
  no shutdown
interface s0/1/0
  ip address 209.165.200.225 255.255.255.252
  no shutdown
```

Router R2

```
interface g0/0/1
  ipv6 address 2001:db8:c0de:13::1/64
  no ipv6 address 2001:db8:c0de:14::1/64
```