# Packet Tracer - Use Ping and Traceroute to Test Network Connectivity

## 1. Addressing Table

| Device | Interface | IP Address / Prefix | | Default Gateway |
|---|---|---|---|---|
| R1 | G0/0 | 2001:db8:1:1::1/64 | | N/A |
| | G0/1 | 10.10.1.97 | 255.255.255.224 | N/A |
| | S0/0/1 | 10.10.1.6 | 255.255.255.252 | N/A |
| | | 2001:db8:1:2::2/64 | | |
| | | fe80::1 | | |
| R2 | S0/0/0 | 10.10.1.5 | 255.255.255.252 | N/A |
| | | 2001:db8:1:2::1/64 | | |
| | S0/0/1 | 10.10.1.9 | 255.255.255.252 | N/A |
| | | 2001:db8:1:3::1/64 | | |
| | | fe80::2 | | |
| R3 | G0/0 | 2001:db8:1:4::1/64 | | N/A |
| | G0/1 | 10.10.1.17 | 255.255.255.240 | N/A |
| | S0/0/1 | 10.10.1.10 | 255.255.255.252 | N/A |
| | | 2001:db8:1:3::2/64 | | |
| | | fe80::3 | | |
| PC1 | NIC | 10.10.1.98 | 255.255.255.224 | 10.10.1.97 |
| PC2 | NIC | 2001:DB8:1:1::2 | | FE80::1 |
| PC3 | NIC | 10.10.1.18 | 255.255.255.240 | 10.10.1.17 |
| PC4 | NIC | 2001:DB8:1:4::2 | | FE80::2 |

## Objectives

**Part 1: Test and Restore IPv4 Connectivity**

**Part 2: Test and Restore IPv6 Connectivity**

## Scenario

There are connectivity issues in this activity. In addition to gathering and documenting information about the network, you will locate the problems and implement acceptable solutions to restore connectivity.

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

# Instructions

## Part 1: Test and Restore IPv4 Connectivity

### Step 1: Use ipconfig and ping to verify connectivity.

a. Click **PC1** and open the **Command Prompt**.

b. Enter the **ipconfig /all** command to collect the IPv4 information. Complete the **Addressing Table** with the IPv4 address, subnet mask, and default gateway.

c. Click **PC3** and open the **Command Prompt**.

d. Enter the **ipconfig /all** command to collect the IPv4 information. Complete the **Addressing Table** with the IPv4 address, subnet mask, and default gateway.

e. Use the **ping** command to test connectivity between **PC1** and **PC3**. The ping should fail.

### Step 2: Locate the source of connectivity failure.

a. From **PC1**, enter the necessary command to trace the route to **PC3**.

What is the last successful IPv4 address that was reached?

10.10.1.17

b. The trace will eventually end after 30 attempts. Enter **Ctrl+C** to stop the trace before 30 attempts.

c. From **PC3**, enter the necessary command to trace the route to **PC1**.

What is the last successful IPv4 address that was reached?

10.10.1.97

d. Enter **Ctrl+C** to stop the trace.

e. Click **R1**. Press **ENTER** and log in to the router.

f. Enter the **show ip interface brief** command to list the interfaces and their status. There are two IPv4 addresses on the router. One should have been recorded in Step 2a.

What is the other?

10.10.1.6

g. Enter the **show ip route** command to list the networks to which the router is connected. Note that there are two networks connected to the **Serial0/0/1** interface.

What are they?

10.10.1.4/30

10.10.1.6/32

h. Repeat steps 2e through 2g with **R3** and record your answers.

10.10.1.10, 10.10.1.8/30 ,10.10.1.10/32

i. Click **R2**. Press **ENTER** and log into the router.

j. Enter the **show ip interface brief** command and record your addresses.

10.10.1.2, 10.10.1.9

k. Run more tests if it helps visualize the problem. Simulation mode is available.

### Step 3: Propose a solution to solve the problem.

Compare your answers in Step 2 to the documentation you have available for the network.

What is the error?

The IP address of R2's se0/0/0 interface is set to 10.10.1.2. Instead, it should have been 10.10.1.5

What solution would you propose to correct the problem?

Updating the ip address to 110.10.1.5

### Step 4: Implement the plan.

Implement the solution you proposed in Step 3b.

### Step 5: Verify that connectivity is restored.

a. From **PC1** test connectivity to **PC3**.

b. From **PC3** test connectivity to **PC1**.

Is the problem resolved?

Answer: Yes. the problem is solved.

### Step 6: Document the solution.

R2#show ip interface brief Interface IP-Address OK? Method Status Protocol
GigabitEthernet0/0 unassigned YES unset administratively down down
GigabitEthernet0/1 unassigned YES unset administratively down down
Serial0/0/0 10.10.1.2 YES manual up up
Serial0/0/1 10.10.1.9 YES manual up up
Vlan1 unassigned YES unset administratively down down
R2#config t
Enter configuration commands, one per line. End with CNTL/Z
R2(config)#interface s0/0/0
R2(config-if)#ip address 10.10.1.5 %
Incomplete command
R2(config-if)#ip address 10.10.1.5 255.255.255.252
R2(config-if)#
%DUAL-5-NBRCHANGE: IP-EIGRP 1: Neighbor 10.10.1.6 (Serial0/0/0) is up: new adjacency
R2(config-if)#no shutdown

## Part 2: Test and Restore IPv6 Connectivity

### Step 1: Use ipv6config and ping to verify connectivity.

a. Click **PC2** and open the **Command Prompt**.

b. Enter the **ipv6config /all** command to collect the IPv6 information. Complete the **Addressing Table** with the IPv6 address, subnet prefix, and default gateway.

c. Click **PC4** and open the **Command Prompt**.

d. Enter the **ipv6config /all** command to collect the IPv6 information. Complete the **Addressing Table** with the IPv6 address, subnet prefix, and default gateway.

e. Test connectivity between **PC2** and **PC4**. The ping should fail.

### Step 2: Locate the source of connectivity failure.

a. From **PC2**, enter the necessary command to trace the route to **PC4**.

What is the last successful IPv6 address that was reached?

Answer: 2001:DB8:1:3::2

b. The trace will eventually end after 30 attempts. Enter **Ctrl+C** to stop the trace before 30 attempts.

c. From **PC4**, enter the necessary command to trace the route to **PC2**.

What is the last successful IPv6 address that was reached?

Answer: No ipv6 address were reached.

d. Enter **Ctrl+C** to stop the trace.

e. Click **R3**. Press **ENTER** and log in to the router.

f. Enter the **show ipv6 interface brief** command to list the interfaces and their status. There are two IPv6 addresses on the router. One should match the gateway address recorded in Step 1d.

Is there a discrepancy?

Answer: Yes, there is a discrepancy

g. Run more tests if it helps visualize the problem. Simulation mode is available.

### Step 3: Propose a solution to solve the problem.

Compare your answers in Step 2 to the documentation you have available for the network.

What is the error?

Answer: PC4 default gateway is wrong

What solution would you propose to correct the problem?

Answer: Update the default gateway

### Step 4: Implement the plan.

Implement the solution you proposed in Step 3b.

### Step 5: Verify that connectivity is restored.

a. From **PC2** test connectivity to **PC4**.

b. From **PC4** test connectivity to **PC2**.

Is the problem resolved?

Yes

### Step 6: Document the solution.

C:\>ping 2001:DB8:1:4::2
Pinging 2001:DB8:1:4::2 with 32 bytes of data:
Reply from 2001:DB8:1:4::2: bytes=32 time=2ms TTL=125
Reply from 2001:DB8:1:4::2: bytes=32 time=12ms TTL=125
Reply from 2001:DB8:1:4::2: bytes=32 time=2ms TTL=125
Reply from 2001:DB8:1:4::2: bytes=32 time=2ms TTL=125
Ping statistics for 2001:DB8:1:4::2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 12ms, Average = 4ms
C:\>ping 2001:DB8:1:1::2
Pinging 2001:DB8:1:1::2 with 32 bytes of data:
Reply from 2001:DB8:1:1::2: bytes=32 time=2ms TTL=125
Reply from 2001:DB8:1:1::2: bytes=32 time=27ms TTL=125
Reply from 2001:DB8:1:1::2: bytes=32 time=17ms TTL=125
Reply from 2001:DB8:1:1::2: bytes=32 time=2ms TTL=125
Ping statistics for 2001:DB8:1:1::2:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 27ms, Average = 12ms