Packet Tracer - Use Ping and Traceroute to Test Network Connectivity

Addressing Table

Device	Interface	IP Address / Prefix		Default Gateway
R1	G0/0	2001:db8:1:1::1/64		N/A
R1	G0/1	10.10.1.97	255.255.255.224	N/A
R1	S0/0/1	10.10.1.6	255.255.255.252	N/A
R1	S0/0/1	2001:db8:1:2::2/64		N/A
R1	S0/0/1	fe80::1		N/A
R2	S0/0/0	10.10.1.5	255.255.255.252	N/A
R2	S0/0/0	2001:db8:1:2::1/64		N/A
R2	S0/0/1	10.10.1.9	255.255.255.252	N/A
R2	S0/0/1	2001:db8:1:3::1/64		N/A
R2	S0/0/1	fe80::2		N/A
R3	G0/0	2001:db8:1:4::1/64		N/A
R3	G0/1	10.10.1.17	255.255.255.240	N/A
R3	S0/0/1	10.10.1.10	255.255.255.252	N/A
R3	S0/0/1	2001:db8:1:3::2/64		N/A
R3	S0/0/1	fe80::3		N/A
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**.

   Question:
   What is the last successful IPv4 address that was reached?

   10.10.1.97

   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**.

   Question:
   What is the last successful IPv4 address that was reached?

   10.10.1.17

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

Open configuration window

   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.

   Question:
   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.

   Question:
   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.

   10.10.1.8/30

   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.

   Serial0/0/0 10.10.1.2
   Serial0/0/1 10.10.1.9

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

Close configuration window

Step 3:   Propose a solution to solve the problem.

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

Question:
What is the error?

In R2, Serial0/0/0 ip address is wrong.

What solution would you propose to correct the problem?

Configure the ip address using CLI.

Step 4:   Implement the plan.

Implement the solution you proposed in Step 3b.

```
R2>en
Password:
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#
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#int Serial0/0/0
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 shut down
R2(config-if)#exit
```

Step 5:   Verify that connectivity is restored.

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

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

Question:
Is the problem resolved?

Yes

Step 6:   Document the solution.

```
User Access Verification

Password:

R2>en
Password:
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#
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#int Serial0/0/0
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 shut down
R2(config-if)#exit
R2(config)#
|
```

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**.

_{Question:}
What is the last successful IPv6 address that was reached?

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**.

_{Question:}
What is the last successful IPv6 address that was reached?

> ***No IPv6 address was 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.

> _{Question:}
> Is there a discrepancy?

> ***The default gateway of PC4 doesn't match. But it matches the addressing table.***

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.

> _{Question:}
> What is the error?

> ***PC4 has a default gateway of FE80::2, but R3 has a default gateway of FE80::3. However, since R3's default gateway matches the addressing table provided at the beginning, the issue is most likely with PC4's IP configuration.***

What solution would you propose to correct the problem?

> ***Update PC4 IP configuration with the correct gateway***

Step 4:   Implement the plan.
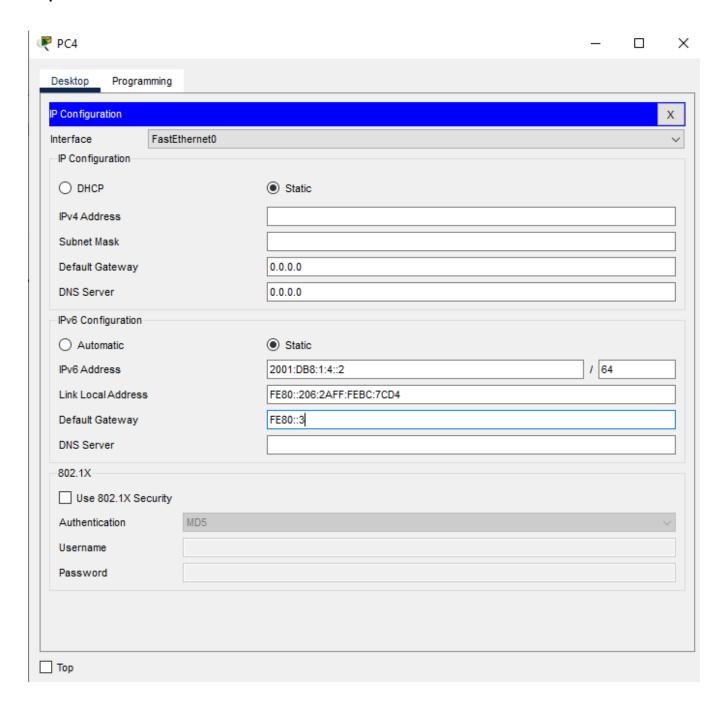
Implement the solution you proposed in Step 3b.

Step 5:   Verify that connectivity is restored.

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

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

> _{Question:}
> Is the problem resolved?

> ***Yes***

Step 6:   Document the solution.