Packet Tracer - Troubleshoot Common Network Problems

Answers: 5.6.6 Packet Tracer - Troubleshoot Common Network Problems

Addressing Table

Device	Interface	IPv4 Address	Subnet Mask	Default Gateway
R1	G0/0/0	209.165.200.225	255.255.255.248	N/A
	G0/0/1	10.1.1.2	255.255.255.252	
R3	G0/0/0	10.2.2.2	255.255.255.252	N/A
	G0/0/1	172.16.3.1	255.255.255.0	
FIREWALL	VLAN1	192.168.1.1	255.255.255.0	N/A
	VLAN2	209.165.200.226	255.255.255.248	
	VLAN3	192.168.2.1	255.255.255.0	
DEVASC Server	NIC	IN: 192.168.2.3	255.255.255.0	192.168.1.1
	VLAN1	OUT: 209.165.200.227	255.255.255.248	209.165.200.225
Example Server	NIC	64.100.0.10	255.255.255.0	64.100.0.1
PC-A	NIC	DHCP Assigned	255.255.255.0	192.168.1.1
PC-B	NIC	172.16.3.2	255.255.255.0	172.16.3.1

Objectives

Part 1: Test connectivity

Part 2: Troubleshoot R3

Part 3: Troubleshoot R1

Part 4: Troubleshoot DNS

Background / Scenario

Networks have a lot of components working together to ensure connectivity and data delivery. Often, these components may not work properly. This may be due to a simple device misconfiguration, or many, seemingly unrelated problems that must be systematically resolved. As a developer, you may need to troubleshoot network issues to regain connectivity. To troubleshoot network issues, it is necessary to take a step-by-step methodical approach, using clues to determine the problem and implement a solution. You may often find more than one problem preventing a connection from working.

Note: In this activity, the two web servers are referred to as **DEVASC Server** and **Example Server**. In the topology, they are named with their URL: **www.devasc-netacad.pka** and **www.example.com**.

 www.netacad.com

Instructions

Part 1: Test Connectivity

In this Part, you are on PC-B, trying to reach the web page of the **DEVASC Server**.

Step 1: Test the connectivity of the network.

a. Click **PC-B**.

b. Click **Desktop**.

c. Click **Web Browser**.

d. Enter **www.devasc-netacad.pka** in the URL field and click **Go**.

The web page request will not work. There may be one or many different problems between PC-B and the server. We will begin troubleshooting from PC-B and work our way over to the server, troubleshooting along the way.

Step 2: Troubleshoot the basic configuration of PC-B.

In the Packet Tracer work area, you can see that the connection between PC-B and S3 has red icons. This means that the connection is physically down between the two or TCP/IP is not correctly configured on PC-B. Begin by troubleshooting the protocol stack first.

a. Click **PC-B**.

b. Close the **Web Browser**, if it is open.

c. Click **Command Prompt**.

d. Ping the loopback address to ensure that TCP/IP is installed and working properly.

```
C:\>ping 127.0.0.1

Pinging 127.0.0.1 with 32 bytes of data:

Reply from 127.0.0.1: bytes=32 time=3ms TTL=128
Reply from 127.0.0.1: bytes=32 time=16ms TTL=128
Reply from 127.0.0.1: bytes=32 time=3ms TTL=128
Reply from 127.0.0.1: bytes=32 time=3ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 3ms, Maximum = 16ms, Average = 6ms

C:\>
```

Because there were successful replies, we know that TCP/IP is installed and working correctly. This means that, most likely, either the Ethernet port on PC-B or S3 is not enabled.

e. Click **Config** on **PC-B**.

f. Click **FastEthernet0**.

g. The Port Status is Off. Click **On** next to **Port Status** to enable the interface.

Notice the icons between PC-B and S3 turn green after a few seconds to indicate communication between the two devices.

h. Click **Desktop**.

i. Close the **Command Prompt** window.

Step 3: Check the IP configuration.

a. Click **IP Configuration**.

b. You should be provided with an IP address if there is a DHCP server on the network.

   Notice that the DHCP request failed. Because PC-B cannot reach a DHCP server, you will need to provide static IP address information.

c. Click the radio button next to **Static** to assign the interface IP Configuration information:

   IP Address: 172.16.3.2

   Subnet Mask: 255.255.255.0

   Default Gateway: 172.16.3.1

   DNS Server: 64.100.0.10

   You now have the correct information to get to the default gateway.

d. Close **IP Configuration** and click **Web Browser**.

e. Enter **www.devasc-netacad.pka** in the URL field and click **Go**.

   Again, the request fails.

Part 2: Troubleshoot R3

In this Part, you will test connectivity to the next network device, **R3**, to continue troubleshooting.

Step 1: Communicate with the default gateway.

a. Close the **Web Browser**, if it is open.

b. Click **Command Prompt**.

c. Ping the default gateway.

```
C:\>ping 172.16.3.1

Pinging 172.16.3.1 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 172.16.3.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

You know that the IP addressing information on PC-B is correct, that the interface is up, and that the TCP/IP stack is working properly. There must be something wrong with the default gateway preventing communication.

Step 2: Check the IP configuration of R3.

a. Click **R3**.

b. Click **Config**.

c. Click **GigabitEthernet0/0/1**. This is the interface connected to the 172.16.3.0/24 network.

The interface is up, and there is IP addressing information for it, but it is not correct for the 172.16.3.0 network.

d. Change the IP address for the interface to **172.16.3.1**.

Step 3: Check connectivity.

a. Return to **PC-B** and ping the default gateway again to ensure communication is working between the devices.

```
C:\>ping 172.16.3.1

Pinging 172.16.3.1 with 32 bytes of data:

Reply from 172.16.3.1: bytes=32 time<1ms TTL=255
Reply from 172.16.3.1: bytes=32 time<1ms TTL=255
Reply from 172.16.3.1: bytes=32 time=2ms TTL=255
Reply from 172.16.3.1: bytes=32 time<1ms TTL=255

Ping statistics for 172.16.3.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 2ms, Average = 0ms

C:\>
```

Great! We now have communication between PC-B and the default gateway.

b. Return to the **Web Browser** on **PC-B** and attempt to connect to the **www.devasc-netacad.pka** web page on the **DEVASC Server** again.

It still does not work.

Part 3: Troubleshoot R1

In this Part, you will continue troubleshooting on the next device in the path, **R1**, because you do not have any control over the devices in the Internet cloud.

Step 1: Check the basic configuration of R1.

By looking at the Packet Tracer work area, we can see that there is a physical problem with the cabling between **R1** and **FIREWALL**.

a. Click **R1**, and then the **Config** tab.

b. Check the **Port Status** of each interface.

The ports are up.

The network between the devices is 209.165.200.224/29. The IP addresses of the ports at either end of the cable must fall in this range for communication to take place.

Step 2: Check the cable.

a. Hover over **FIREWALL**.

VLAN2 has an acceptable IP address, and the link is up.

b. Hover over **R1**.

G0/0/0 has an acceptable IP address, and the link is up. The problem is the cable itself. It may be damaged, or it may be connected to an incorrect port.

You will need to re-cable the connection between the devices.

Step 3: Replace the cable.

a. Be sure to click any white space in the topology to de-select any devices that may be currently selected. Then use the **Delete** tool to remove the cable between R1 and **FIREWALL**.

b. Click **Connections**.

c. Click the **Copper Straight-Through** cable, and then click **FIREWALL**.

d. Choose **Ethernet0/0** as the connection. This is the port assigned to 209.165.200.224/29 (VLAN1).

e. Click **R1**.

f. Choose port **GigabitEthernet0/0/0**. This is the port assigned to 209.165.200.224/29.

You should now see icons on both sides of the cable, and soon they turn green.

Step 4: Check connectivity.

a. Return to the **Web Browser** on PC-B and attempt to bring up the DEVASC server web page.

It still does not work. To find out if it is a connection issue or a protocol issue, attempt to ping the **DEVASC Server** IP address.

b. Return to the **Command Prompt**.

c. Ping the IP address of the **DEVASC Server**. In Packet Tracer, the first set of pings may fail until the network converges.

```
C:\> ping 209.165.200.225

Pinging 209.165.200.225 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 209.165.200.225:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\> ping 209.165.200.225

Pinging 209.165.200.225 with 32 bytes of data:

Reply from 209.165.200.225: bytes=32 time<1ms TTL=253
Reply from 209.165.200.225: bytes=32 time=1ms TTL=253
Reply from 209.165.200.225: bytes=32 time<1ms TTL=253
Reply from 209.165.200.225: bytes=32 time<1ms TTL=253

Ping statistics for 209.165.200.225:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
```

```
          Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
C:\>
```

This is what you wanted to see. We are getting all the way to the **DEVASC Server**, and all the way back using ICMP. This tells you there may be something wrong with the DNS configuration.

Part 4: Troubleshoot DNS

Because there is connectivity from PC-B to the **DEVASC Server** using ICMP, you know all the physical problems and configuration problems preventing connections before have been solved. This means there is most likely a protocol issue preventing the web page from displaying.

a. Open the **Web Browser** on **PC-B**.

b. Type the IP address of the DEVASC server, along with the port to which you would like to connect: 80.

209.165.200.227:80

You will receive a response from the server.

```
Request Timeout
```

The web page does not respond to port 80. In a previous lab, the server was configured to only connect using secure HTTP (HTTPS). This was to make sure that the FIREWALL does not forwarding traffic on the unencrypted port 80. You need to use HTTPS to connect to the web page:

https://209.165.200.227

After a few seconds, the web page finally displays!

The most likely problem is the DNS configuration.

Step 2: Verify DNS.

a. On **PC-B**, open **IP Configuration**.

b. Ensure the **DNS Server** is set to 64.100.0.10.

c. Since it is correctly configured, check the configuration of the DNS settings on the **Example Server**.

Step 3: Verify DNS server configuration.

a. Click the **Example Server**.

b. Click **Services**.

c. Click **DNS**.

There are no DNS records and the service is disabled.

d. Add an entry for the **DEVASC Server** with the **Name** set to **www.devasc-netacad.pka** and **Address** set to 209.165.200.227. Then click **Add**.

Even though the entry is now correct, DNS has not been turned on.

e. Turn **On** DNS.

f. Return to **PC-B**, open a **Web Browser**, and type **https://www.devasc-netacad.pka** in the **URL** field. Be sure you add https:// as FIREWALL only allows secure web traffic.

You will now see that the web page is accessible using DNS across the network.