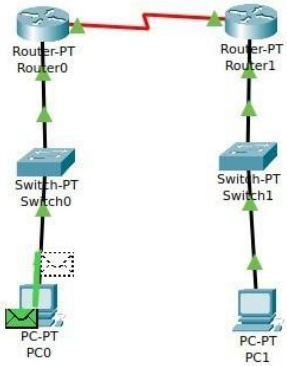
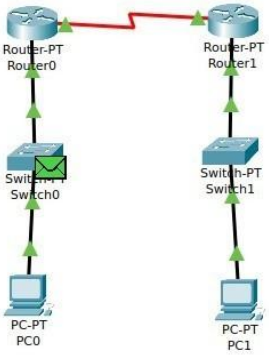
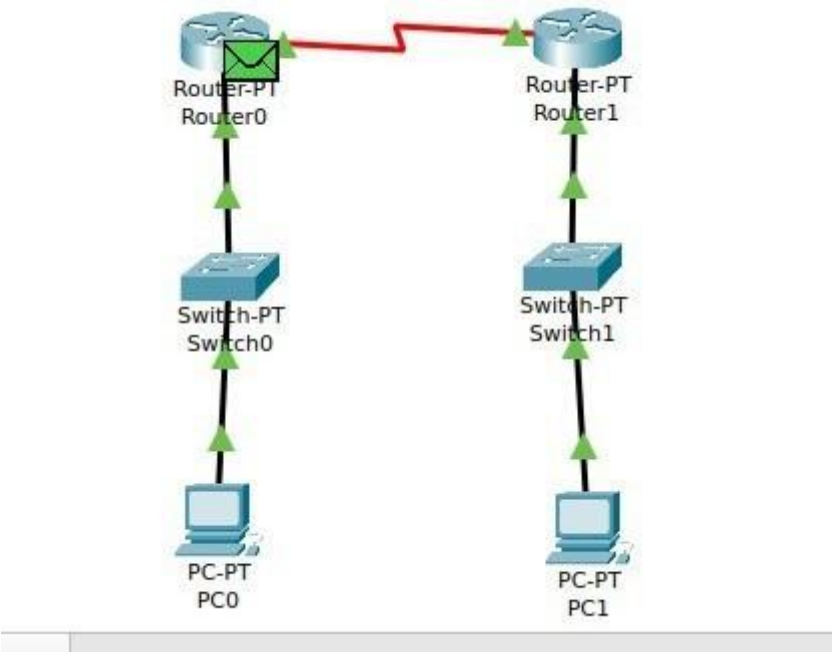
NAME- Swaraj Shinde ROLL NO-164
MOODLE ID-23102070 DIV -C

EXPERIMENT NO9:

OUTPUT-
SRC TO DESTINATION



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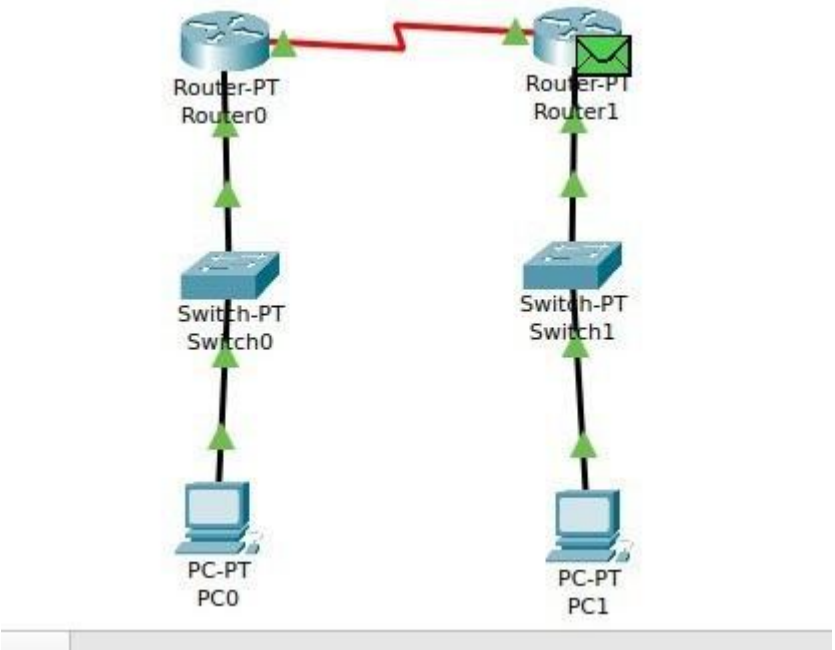
Router-PT
Router1
Switch-PT
Switch0
Switch-PT
Switch1
PC-PT
PC0
PC-PT
PC1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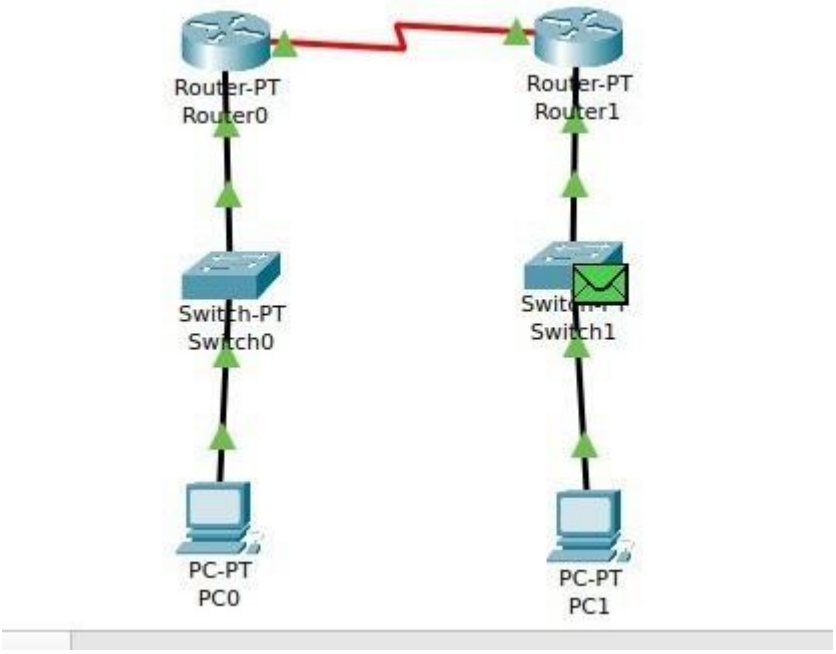
Router-PT
Router1
Switch-PT
Switch0
Switch-PT
Switch1
PC-PT
PC0
PC-PT
PC1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Switch-PT
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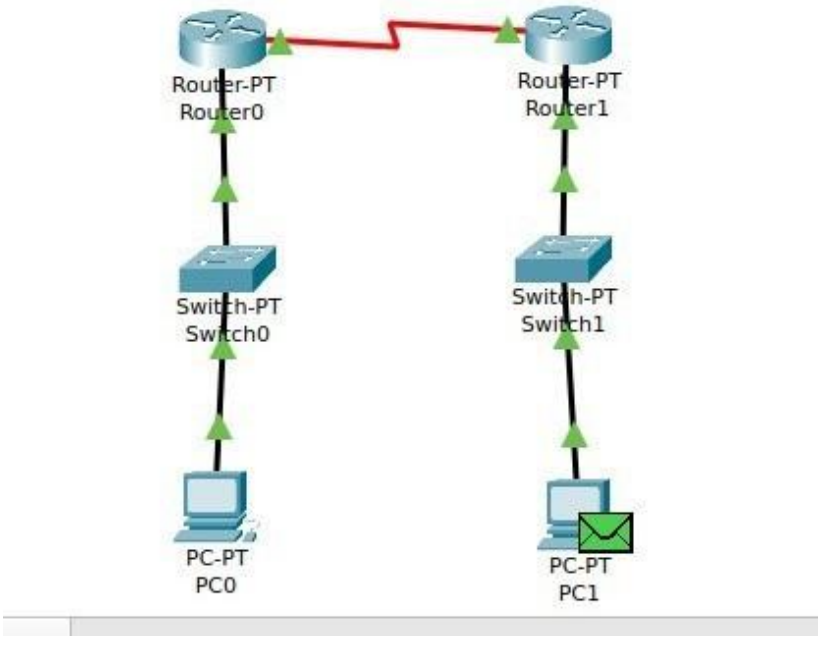
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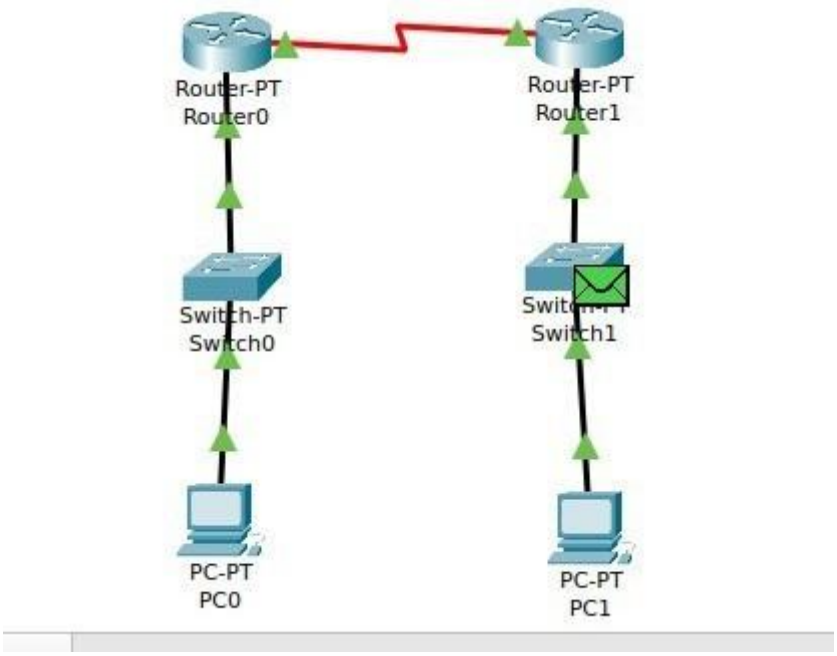
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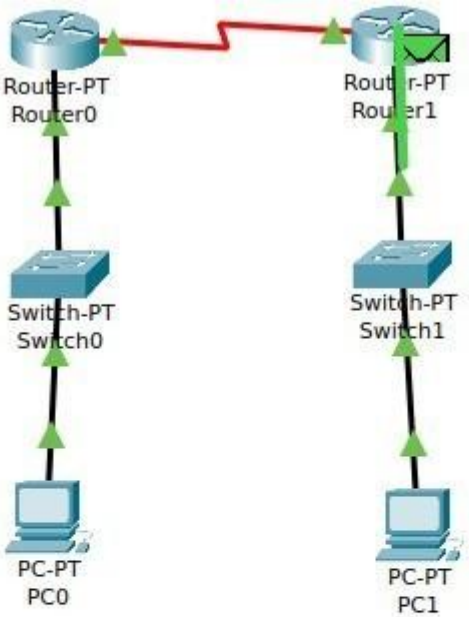
Router-PT
Router1
Switch-PT
Switch0
Switch1
PC-PT
PC0
PC-PT
PC1

NOW ACK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Switch-PT
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Switch-PT
Switch1
PC-PT
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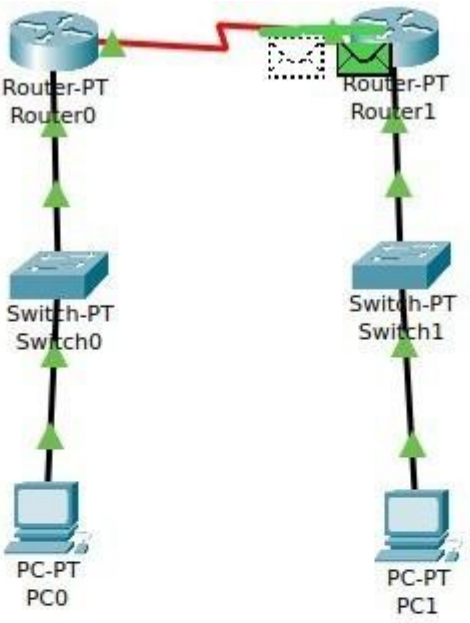
PC-PT
PC1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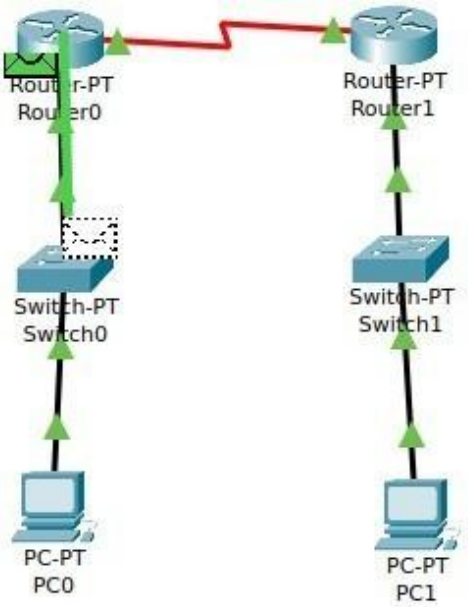
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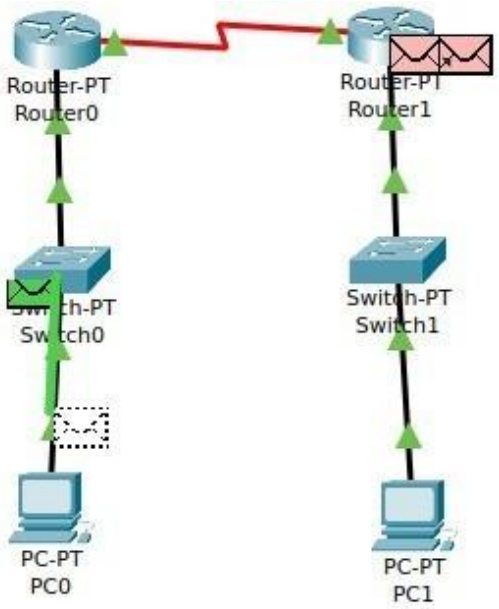
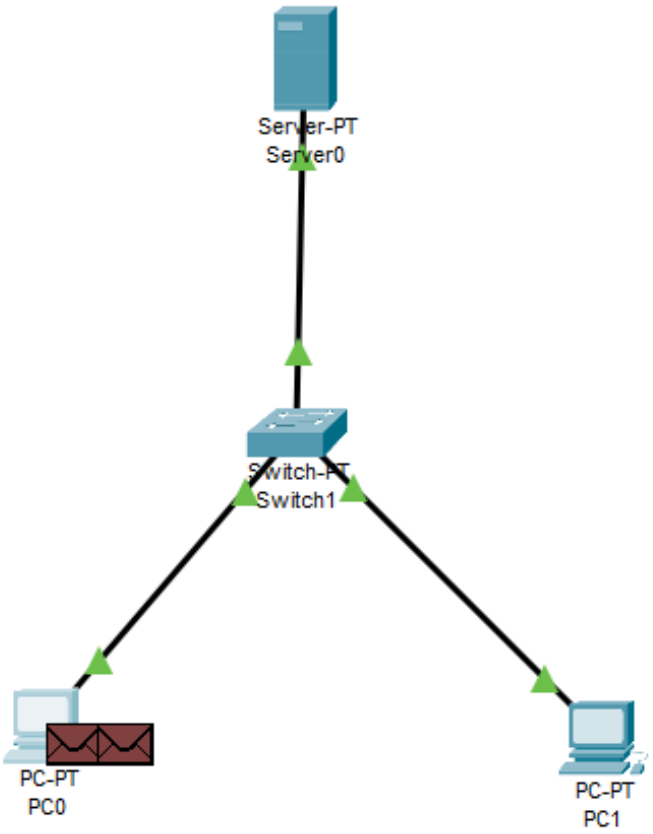
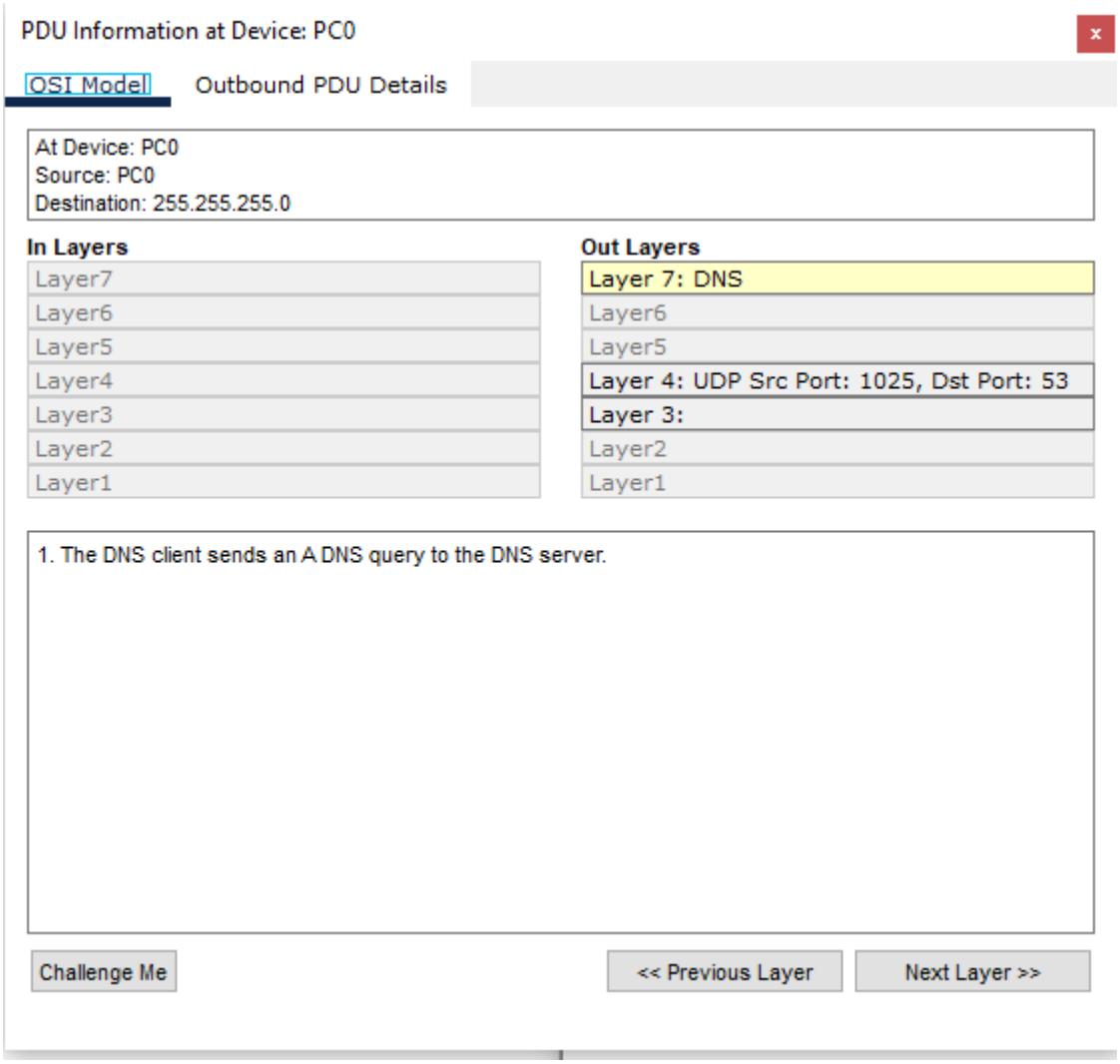
PC1

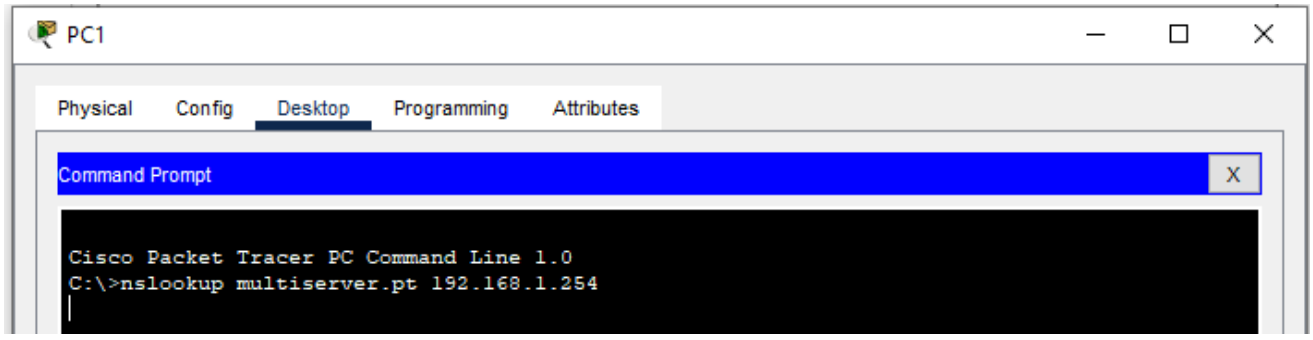

Router-PT
Router0
Router-PT
Router1
Switch-PT
Switch0
Switch-PT
Switch1
PC-PT
PC0
PC-PT
PC1

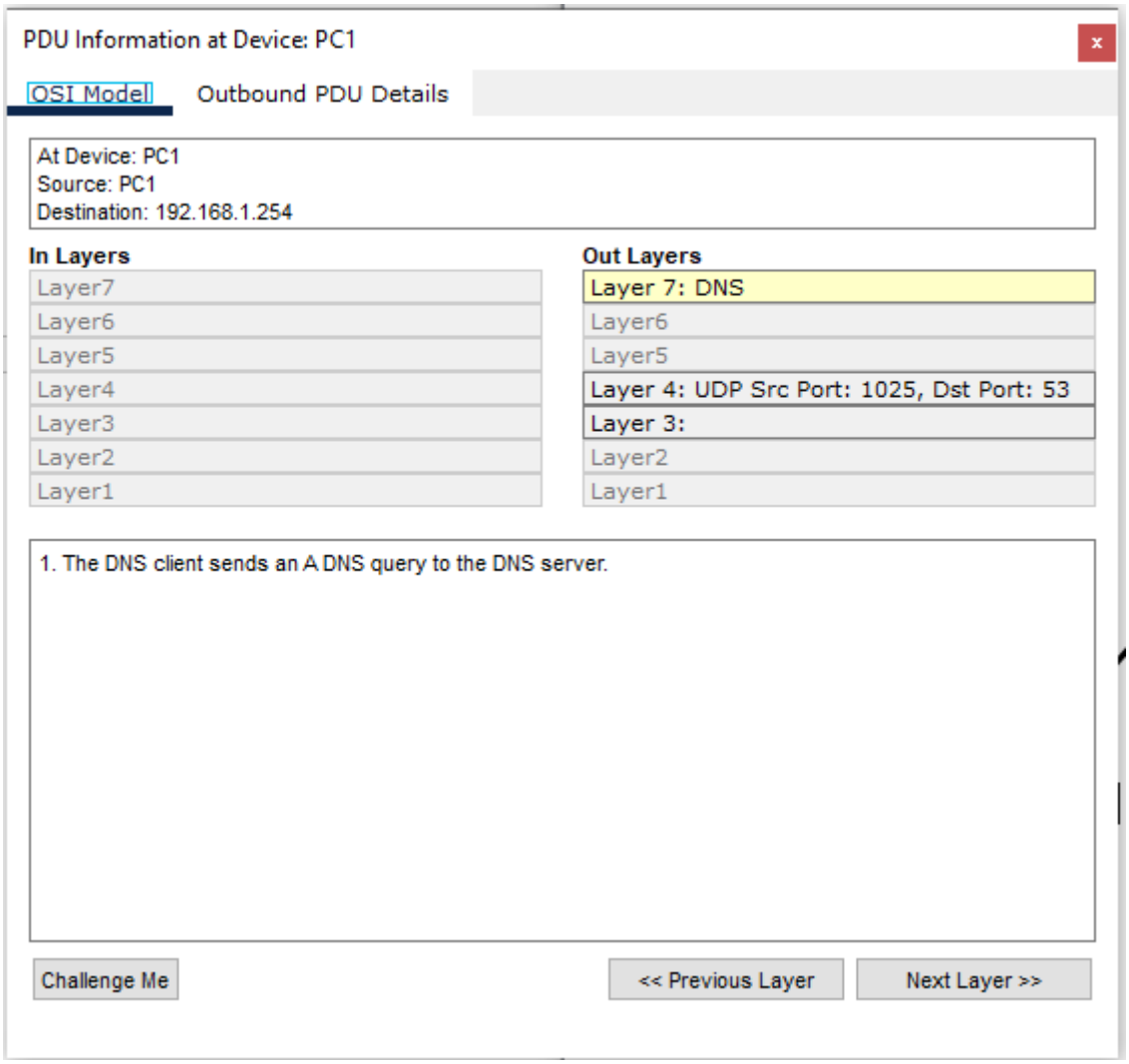
EXERCISE: Design and simulate a computer network using Cisco Packet Tracer to demonstrate the working of TCP and UDP protocols





nslookup multiserver.pt 192.168.1.254





1. Build the topology

1. Open Packet Tracer.
2. From **End Devices**, drag **2 PCs** and **1 Server** onto the workspace; from **Switches**, add a 2960 switch.
3. Connect every end device to the switch using **Copper Straight-through** cables (PC_A Fa0 → Switch, PC_B Fa0 → Switch, Server Fa0 → Switch).

2. Configure IP addresses

1. Click `PC_A` → **Desktop** → **IP Configuration** → set IP `192.168.1.10`, Mask `255.255.255.0`, Gateway `192.168.1.254`.
2. Click `PC_B` → **Desktop** → **IP Configuration** → set IP `192.168.1.11`, Mask `255.255.255.0`, Gateway `192.168.1.254`.
3. Click `Server` → **Desktop** → **IP Configuration** → set IP `192.168.1.254`, Mask `255.255.255.0`.

3. Enable Server services

1. Click the **Server** → **Services** tab.
2. **HTTP**: Turn **On**. (This will serve a basic web page over TCP port 80.)

3. **FTP**: Turn **On**. (Available on TCP port 21 for FTP tests.)
4. **DNS**: Turn **On** and add a record:
    - Name: `multiserver.pt` → IP: `192.168.1.254`
      (This enables DNS lookups from clients — DNS normally uses UDP port 53.)

4. Verify connectivity (Real Mode)

1. On each PC: **Desktop** → **Command Prompt** → `ping 192.168.1.254` — ensure replies are received.
2. If ping fails: check cables and IP configuration.

5. Prepare Simulation mode

1. Switch Packet Tracer to **Simulation** mode (bottom right).
2. Click **Edit Filters** → uncheck everything except the protocols you want to see (e.g., check **TCP** and **HTTP** for TCP tests; check **UDP** and **DNS** for UDP tests). This reduces noise.

6. Simulate and observe TCP (HTTP example)

1. On `PC_A`: **Desktop** → **Web Browser** → enter `http://192.168.1.254` (or `http://multiserver.pt` if using DNS).
2. In Simulation mode: press **Auto Capture/Play** or step with **Capture/Forward**.
3. Open and inspect a PDU envelope by clicking it. In **PDU Details** look at:
    - **Transport layer**: protocol = TCP
    - **Flags**: SYN → SYN+ACK → ACK (three-way handshake)
    - **Ports**: source ephemeral port (client) → destination port 80 (server)
    - **Sequence / Acknowledgement numbers** shown in TCP header.
4. Continue capture to view data transfer and connection teardown (FIN/ACK).
5. (Optional) Use PC_A **Command Prompt** → `ftp 192.168.1.254` to observe FTP (another TCP service on port 21).

7. Simulate and observe UDP (DNS example)

1. On `PC_B`: **Desktop** → **Command Prompt** → run:

```
2. nslookup multiserver.pt 192.168.1.254
```

   This sends a DNS query (UDP port 53) to the server.

3. In Simulation mode (with DNS/UDP filters), step through the packet:
    - **Transport layer**: protocol = UDP
    - **Ports**: source ephemeral port → destination port 53
    - Notice there is **no handshake** (single request → response) and **no TCP flags or sequence/ack numbers**.