**Cisco Packet Tracer Exercise: Understanding ARP**

**Objectives:**

In this exercise, you will learn how **ARP (Address Resolution Protocol)** works using Cisco Packet Tracer by performing practical configurations and observing ARP requests and replies.

**Instructions:**

**Part 1: Setting Up the Network**

**Step 1: Start Cisco Packet Tracer**

* Open Cisco Packet Tracer.

**Step 2: Add Devices to the Workspace**

From the Device-Type Selection Box, add the following devices:

* **3 PCs** (End Devices > PC)
* **1 Server** (End Devices > Server)
* **1 Switch** (Network Devices > Switch)

**Step 3: Connect Devices**

Connect the devices using **Copper Straight-through cables** as follows:

* Connect **each PC** to the **switch**.
* Connect the **Server0** to the **switch**.

**Part 2: Configure IP Addresses**

**Step 4: Assign Static IP Addresses**

Configure each device with the following IP addresses:

| **Device** | **IPv4 Address** | **Subnet Mask** |
| --- | --- | --- |
| PC0 | 192.168.11.1 | 255.255.255.0 |
| PC1 | 192.168.11.2 | 255.255.255.0 |
| PC2 | 192.168.11.3 | 255.255.255.0 |
| Server0 | 192.168.11.4 | 255.255.255.0 |

**Part 3: Observing ARP in Simulation Mode**

**Step 5: Enter Simulation Mode**

* Click the **Simulation** button located at the bottom-right corner of Cisco Packet Tracer.

**Step 6: Open ARP Tables**

* Click **Inspect (Magnifying glass icon)**.
* Click **PC0**, select the **ARP table**, open it, and resize the window smaller.
* Click **Server0**, select the **ARP table**, open it, and resize the window smaller.

**Part 4: ARP Test from PC0 to Server0**

**Step 7: Open Command Prompt on PC0**

* Select **PC0** > Desktop > **Command Prompt**.

**Step 8: Check Current ARP Table on PC0**

* Type the following command:

arp -a

(This shows the current ARP entries.)

**Step 9: Ping from PC0 to Server0**

* From PC0, enter the following command:

ping 192.168.11.4

**Step 10: Observe ARP Packets**

* Click the **Play** button in Simulation Mode.
* Observe how an ARP packet is sent from PC0 to all devices.
* Notice that only **Server0** responds with an ARP reply.
* Confirm that ARP entries are now added in the ARP tables of PC0 and Server0.

**Step 11: ICMP Packet Observation**

* After the ARP process, observe that an **ICMP packet** (ping request) is sent from **PC0 to Server0**, and a reply is returned.

**Part 5: Additional ARP Test from PC1**

**Step 12: Observe ARP on PC1**

* Open the **ARP Table** on **PC1**.
* Open the **Command Prompt** on **PC1**.
* Type:

ping 192.168.11.4

* Observe the ARP request and reply packets traveling between **PC1** and **Server0**.

**Part 6: Finish the Exercise**

**Step 13: Return to Realtime Mode**

* Set the mode back to **Realtime** (bottom-right corner).
* Close Cisco Packet Tracer.