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Lab 4 plus

*Lab 4 plus is a combination of Lab 4 and an extra activity on ARP.

Packet Tracer Simulation – Exploration of ARP and Switch Table Communications

Objectives

- To explore ARP and switching operations.

Introduction

The topology is given to you. All IP addresses have been assigned to all devices. Please follow each step in sequence.

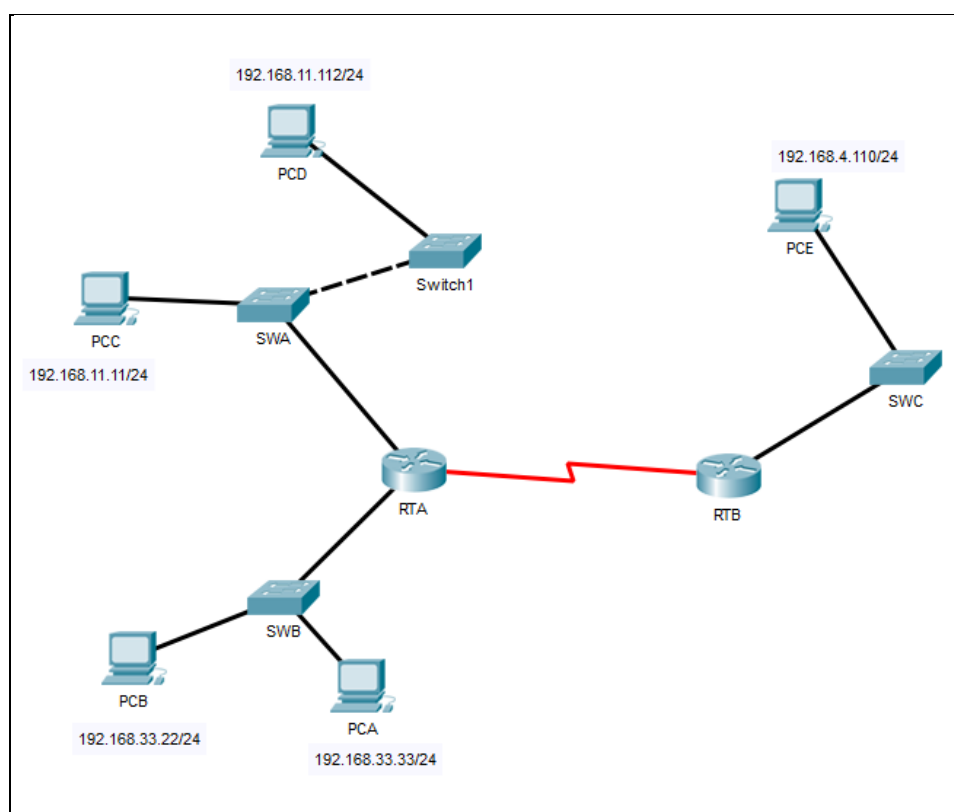


Figure 1

Part 1: Review the topology

Step 1: Open the *Lab_4_ARP.pkt*, and Perform the following tasks.

- a. At Router RTA, enter the CLI. At the command prompt type the following commands. Snap the results after the last command and paste it here.

```
RTA>enable
RTA#show arp
```

Answer:

```
RTA#show arp
Protocol Address      Age (min)  Hardware Addr  Type   Interface
Internet 192.168.11.1      -         0002.4A00.0E91  ARPA   FastEthernet1/0
Internet 192.168.33.1      -         000C.CF0C.593A  ARPA   FastEthernet0/0
RTA#
```

- b. At Router RTB, enter the CLI. At the command prompt type the commands as in Figure 2. Snap the results after the last command and paste it here.

Answer:

```
RTB#show arp
Protocol Address      Age (min)  Hardware Addr  Type   Interface
Internet 192.168.4.1      -         0001.977A.B614  ARPA   FastEthernet0/0
RTB#
```

- c. At Switches SWA, SWAB and SWC, enter the CLI. At the command prompt type the following commands. Snap the results after the last command and paste it here.

```
SWA>enable
SWA#show arp
SWA#show mac-address-table
```

Answer:

SWA

```
SWA#show arp
SWA#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type        Ports
----    -
1       0002.4a00.0e91    DYNAMIC     Fa0/1
1       000c.8546.7d85    DYNAMIC     Fa1/1
SWA#
```

SWB

```
SWB#show arp
SWB#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type      Ports
----    -
1       000c.cf0c.593a   DYNAMIC   Fa0/1
SWB#
```

SWC

```
SWC#show arp
SWC#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type      Ports
----    -
1       0001.977a.b614   DYNAMIC   Fa0/1
SWC#
```

- d. At PCA, click on the PC icon, and then choose Desktop-Command Prompt. At the command prompt type **arp -a** and click enter. Snap the results after the last command and paste it here. Do this to all PCs in the topology.

Answer:

PCA

```
C:\>arp -a
No ARP Entries Found
C:\>
```

PCB

```
C:\>arp -a
No ARP Entries Found
C:\>
```

PCC

```
C:\>ARP -a
No ARP Entries Found
C:\>
```

PCD

```
C:\>arp -a
No ARP Entries Found
C:\>
```

PCE

```
C:\>arp -a
No ARP Entries Found
C:\>
```

- e. What are your thoughts on the results?

Answer:

No entry for all PCs because all the PCs didn't receive any ARP request. There will be no entry in the PC ARP table.

Part 2: Generate Network Traffic

Step 1: Generate traffic between PCA and PCB.

In the command prompt Perform the following tasks task to reduce the amount of network traffic viewed in the simulation.

- Click **PCA** and click the Desktop tab > Command Prompt.
- Enter the **ping 192.168.33.22** command. This may take a few seconds.
- In the Command prompt of PCA, type **arp -a**. Paste the result of this command here.

Answer:

```
C:\>ping 192.168.33.22

Pinging 192.168.33.22 with 32 bytes of data:

Reply from 192.168.33.22: bytes=32 time=16ms TTL=128
Reply from 192.168.33.22: bytes=32 time<1ms TTL=128
Reply from 192.168.33.22: bytes=32 time=5ms TTL=128
Reply from 192.168.33.22: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.33.22:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 16ms, Average = 5ms

C:\>arp -a

Internet Address      Physical Address      Type
192.168.33.22         0060.47ea.a746       dynamic
```

- d. In the Command prompt of PCB, type **arp -a**. Paste the result of this command here

Answer:

```
C:\>arp -a

Internet Address      Physical Address      Type
192.168.33.33         0002.1755.9a06       dynamic
```

- e. In the Command prompt of PCC, PCD abd PCE, type **arp -a**. Paste the result of this command here.

Answer:

PCC

```
C:\>arp -a
No ARP Entries Found
C:\>
```

PCD

```
C:\>arp -a
No ARP Entries Found
C:\>
```

PCE

```
C:\>arp -a
No ARP Entries Found
C:\>
```

Step 2: Generate traffic between PCC to all other PC except PCA.

- Click **PCC** and click the Desktop tab > Command Prompt.
- Enter the **ping 192.168.33.22** command (ping to PCB). Then type **arp -a**. Paste the result after these commands here.

Answer:

```
C:\>ping 192.168.33.22

Pinging 192.168.33.22 with 32 bytes of data:

Request timed out.
Reply from 192.168.33.22: bytes=32 time<1ms TTL=127
Reply from 192.168.33.22: bytes=32 time<1ms TTL=127
Reply from 192.168.33.22: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.33.22:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>arp -a
    Internet Address      Physical Address         Type
    192.168.11.1          0002.4a00.0e91          dynamic

C:\>
```

- Enter the **ping 192.168.11.112** command (ping to PCD). Then type **arp -a**. Paste the result after these commands here.

Answer:

```

C:\>ping 192.168.11.112

Pinging 192.168.11.112 with 32 bytes of data:

Reply from 192.168.11.112: bytes=32 time<1ms TTL=128
Reply from 192.168.11.112: bytes=32 time<1ms TTL=128
Reply from 192.168.11.112: bytes=32 time<1ms TTL=128
Reply from 192.168.11.112: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.11.112:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>arp -a

Internet Address      Physical Address      Type
192.168.11.1          0002.4a00.0e91        dynamic
192.168.11.112        0001.6462.0278        dynamic

C:\>

```

- d. Enter the **ping 192.168.4.110** command (ping to PCE). Then type **arp -a**. Paste the result after these commands here.

Answer:

```

C:\>ping 192.168.4.110

Pinging 192.168.4.110 with 32 bytes of data:

Request timed out.
Reply from 192.168.4.110: bytes=32 time=2ms TTL=126
Reply from 192.168.4.110: bytes=32 time=1ms TTL=126
Reply from 192.168.4.110: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.4.110:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\>arp -a

Internet Address      Physical Address      Type
192.168.11.1          0002.4a00.0e91        dynamic
192.168.11.112        0001.6462.0278        dynamic

C:\>

```

- e. Discuss the results you got from all the commands on PCC.

Answer:

The ARP entries are revealed in the ARP table only after PCC pings PCB, PCD and PCE. No ARP entries are found before these ping activities. The ARP table displays entries once PCB, PCD and PCE receive the ARP request from PCC and subsequently receive pings from PCB, PCD and PCE.

- f. At Router RTA, enter the CLI. At the command prompt type the following commands. Snap the results after the last command and paste it here.

```

RTA>enable
RTA#show arp

```

Answer:

```
RTA#show arp
Protocol Address      Age (min)  Hardware Addr  Type   Interface
Internet 192.168.11.1      -         0002.4A00.0E91  ARPA   FastEthernet1/0
Internet 192.168.11.11     8         00D0.D39A.C0D9  ARPA   FastEthernet1/0
Internet 192.168.33.1      -         000C.CF0C.593A  ARPA   FastEthernet0/0
Internet 192.168.33.22     8         0060.47EA.A746  ARPA   FastEthernet0/0
RTA#
```

- g. At Router RTA, enter the CLI. At the command prompt type the following commands. Snap the results after the last command and paste it here.

```
RTB>enable
RTB#show arp
```

Answer:

```
RTB#show arp
Protocol Address      Age (min)  Hardware Addr  Type   Interface
Internet 192.168.4.1      -         0001.977A.B614  ARPA   FastEthernet0/0
Internet 192.168.4.110  6         0060.702D.7C08  ARPA   FastEthernet0/0
RTB#
```

Step 3: Switch MAC address table.

- a. At Switch SWA, enter the CLI. At the command prompt type the following commands. Snap the results after the last command and paste it here.

```
SWA>enable
SWA#show arp

SWA#show mac-address-table
```

Answer:

```
SWA#
SWA#show arp

SWA#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type        Ports
----    -
1       0002.4a00.0e91    DYNAMIC     Fa0/1
1       000c.8546.7d85    DYNAMIC     Fa1/1
SWA#
```

- b. At Switch SWB, enter the CLI. At the command prompt type the following commands. Snap the results after the last command and paste it here.

```
SWB>enable
SWB#show arp

SWB#show mac-address-table
```

Answer:

```
SWB#show arp
SWB#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       000c.cf0c.593a   DYNAMIC Fa0/1
SWB#
```

- c. At Switches SWC and Switch1, enter the CLI. At the command prompt type the following commands. Snap the results after the last command and paste it here.

```
SWC>enable
SWC#show arp

SWC#show mac-address-table
```

Answer:

```
SWC#show arp
SWC#show mac-address-table
      Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
1       0001.977a.b614   DYNAMIC Fa0/1
SWC#
```

- d. Do switches use arp table? (Y/N)

Answer:

Yes

- e. Explain your answer in (d) **Hint: the answer may surprise you. Google for the explanation. It is not part of NetComm syllabi, it is just for knowledge..*

Answer:

Switches utilize an ARP table to store the IP addresses and corresponding MAC addresses of network devices. This table serves the purpose of identifying the destination MAC addresses for communication with network nodes.

- f. What information does the command *show mac-address-table* gives?

Answer:

To view MAC address table entries on a switch, the term "DYNAMIC" specifically pertains to displaying MAC addresses that have been learned by the switch during its operation.

Part 3: Attach wireless lab results.

In this part, you will use *Lab_4_Wireless.pka* file.

Step1: Change the filename of the pka file.

- a. Change the Lab 4 filename to include your name. **Example: Lab4AliAhmad.pkt*

Filename: Lab4_Teh Ru Qian.pkt

- b. Go through the instructions. As you complete the tasks, you will see the bottom right hand corner of the pkt file increase in completion percentage, until you get 100/100.

The screenshot displays the Packet Tracer interface. On the left, a network topology is shown with a central switch S1 connected to three PCs (PC1, PC2, PC3) and a wireless router WRS2. PC1 is connected to S1 via F0/11, PC2 via F0/16, and PC3 via WRS2's F0/7. WRS2 is connected to S1 via G0/1. The topology includes VLANs 10, 20, and 88. On the right, the 'Packet Tracer - Configuring Wireless LAN Access' activity wizard is open. It shows an 'Addressing Table' with the following data:

Device	Interface	IP Address	Subnet Mask	Default Gate
R1	G0/0.10	172.17.10.1	255.255.255.0	N/A
	G0/0.20	172.17.20.1	255.255.255.0	N/A
	G0/0.88	172.17.88.1	255.255.255.0	N/A
PC1	NIC	172.17.10.21	255.255.255.0	172.17.10.1

At the bottom of the activity wizard, the 'Completion' status is shown as '100/100' with a red box highlighting the progress bar and the '1/1' indicator.

- c. Once you have completed fully, capture the screen (which includes the filename, the topology and the activity wizard showing completion) and paste it here.

Answer:

Cisco Packet Tracer - C:/Users/Teh/Downloads/Lab_4_Teh_Ru_Qian.pka - Teh Ru Qian - 2025-01-24 23:08:47

File Edit Options View Tools Extensions Window Help

Logical Physical x: 1640, y: 419 Root 08:16:00

Subinterfaces

- G0/0.10 172.17.17.10/24
- G0/0.20 172.17.20.1/24
- G0/0.88 172.17.88.1/24

PC1 172.17.10.21/24 VLAN 10

PC2 172.17.20.22/24 VLAN 20

WRS2 172.17.88.25/2 172.17.40.100/24 VLAN 88

PT Activity: 00:08:05

- Click PC3 > Desktop > PC Wireless.
- Click the Profiles tab.
- Click New.
- Name the new profile **Wireless Access**.
- On the next screen, click **Advanced Setup**. Then manually enter the SSID of WRS2_LAN on **Wireless Network Name**. Click **Next**.
- Choose **Obtain network settings automatically (DHCP)** as the network settings, and then click **Next**.
- On **Wireless Security**, choose **WPA2-Personal** as the method of encryption and click **Next**.
- Enter the passphrase **clisco123** and click **Next**.
- Click **Save** and then click **Connect to Network**.

Step 2: Verify PC3 wireless connectivity and IP addressing configuration.

- The **Signal Strength** and **Link Quality** indicators should show that you have a strong signal.
- Click **More Information** to see details of the connection including IP addressing information.
- Close the PC Wireless configuration window.

Part 3: Verify Connectivity

All the PCs should have connectivity with one another.

Time Elapsed: 00:08:05 Completion: 100/100

☐ Top ☐ Dock 1/1

Time: 00:08:07 Realtime Simulation

Scenario 0

New Delete

Toggle PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	--	PC3	PC2	ICMP		0.000	N	0	(edit)	(delete)
	--	PC3	PC1	ICMP		0.000	N	1	(edit)	(delete)

Copper Straight-Through

11:17 PM 1/24/2025