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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.

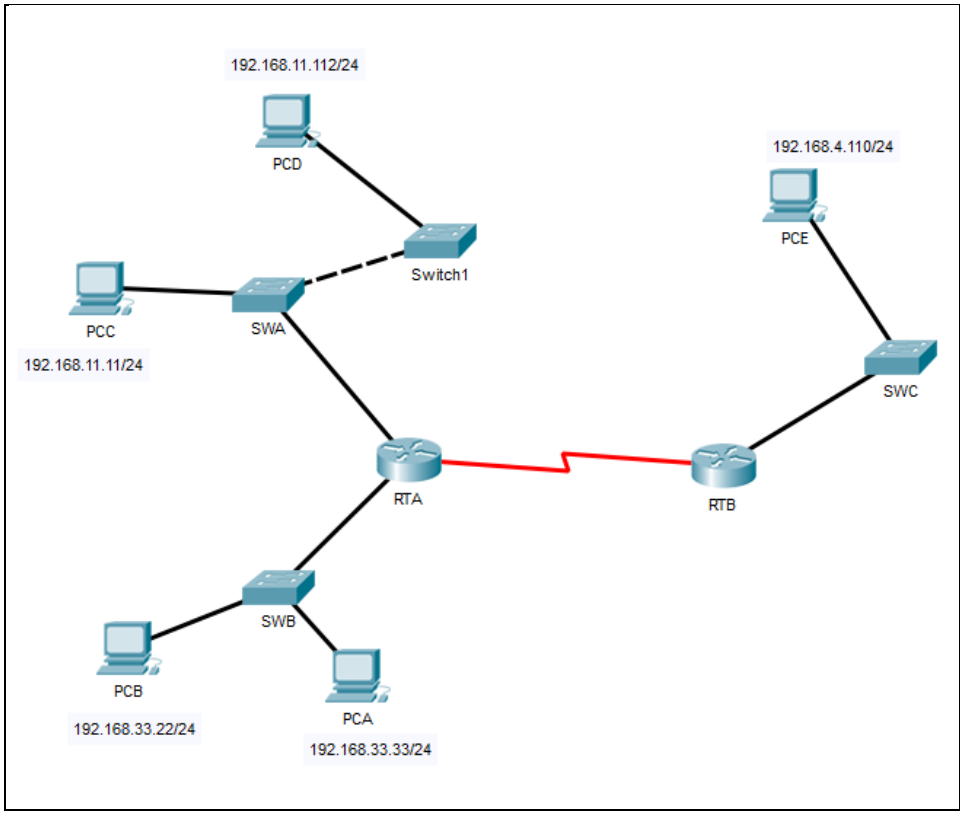


Figure 1

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.

a. Click **PCA** and click the Desktop tab > Command Prompt.

b. Enter the **ping 192.168.33.22** command. This may take a few seconds.

c. 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.

a. Click **PCC** and click the Desktop tab > Command Prompt.

b. 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:\>
```

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.

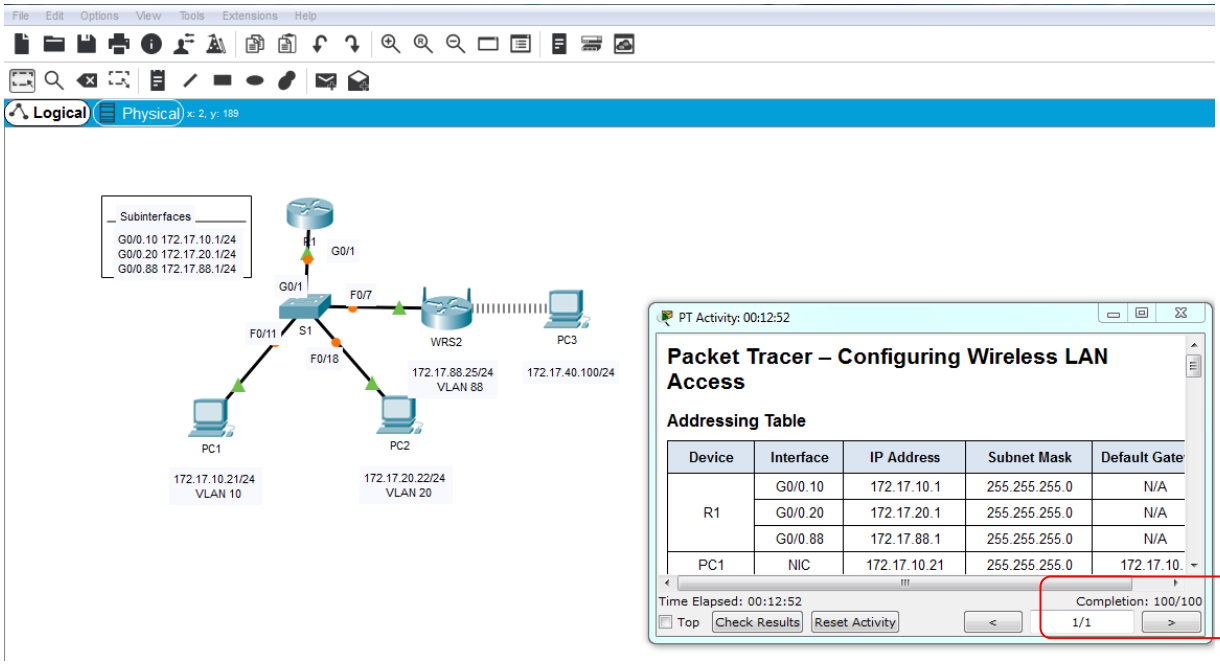
In this part, you will use ***Lab_4_Wireless.pka*** file.

Step1: Change the filename of the pka file.

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

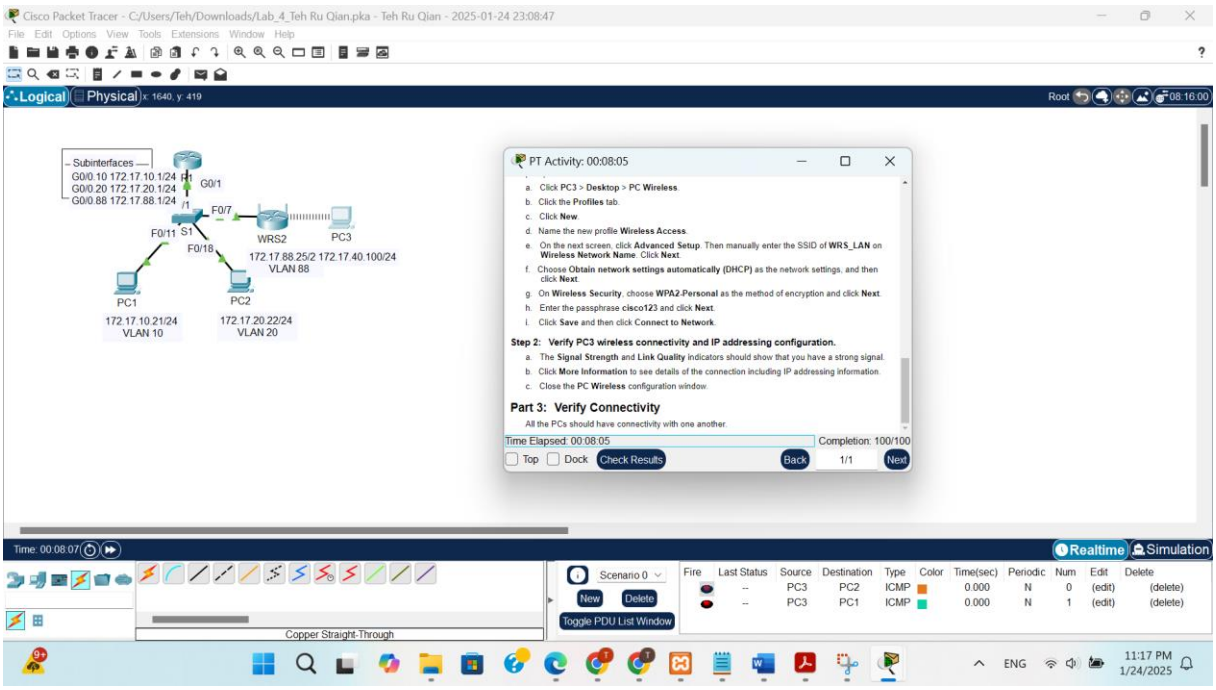
Filename: Lab4_Teh Ru Qian.pkt

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.



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
Logical
Physical
Subinterfaces
G0/0.10 172.17.10.1/24
G0/0.20 172.17.20.1/24
G0/0.88 172.17.88.1/24
G0/1
F0/7
F0/11
F0/18
S1
WRS2
PC3
172.17.88.25/2 172.17.40.100/24
VLAN 88
PC1
172.17.10.21/24
VLAN 10
PC2
172.17.20.22/24
VLAN 20
PT Activity: 00:08:05
Part 3: Verify Connectivity
All the PCs should have connectivity with one another.
Time Elapsed: 00:08:05
Completion: 100/100
Check Results
Back
1/1
Next
Realtime
Simulation
Copper Straight-Through
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
PC3
PC1
ICMP
0.000
ENG
11:17 PM
1/24/2025