

Task-5

a). Configure network devices, such as hubs and switches within a network topology using Packet Tracer software.

Step 1: Set Up the Workspace

1. **Open Packet Tracer:** Launch the software on your computer.
2. **Create a New Project:** Click on “File” and select “New.”

Step 2: Add Devices

1. **Select Devices:** On the bottom left, find the device types.
 - **Hubs:** Navigate to the “Hubs” category and drag a **Hub-PT** onto the workspace.
 - **Switches:** Go to the “Switches” category and drag a **Switch-PT** onto the workspace.

Step 3: Connect Devices

2. **Select the Connection Tool:** Click on the "Connections" icon (the lightning bolt).
3. **Connect Devices:** Click on the first device (hub/switch) and then on the second device to create a link. Choose appropriate cables (usually copper straight-through and copper cross-over cables for connecting to switches).

Step 4: Testing the Network

1. **Add End Devices:** Drag and drop PCs to the workspace and connect them to the switch/hub.
2. **Assign IP Addresses:**
 - Click on each PC, go to the "Desktop" tab, and select "IP Config."
 - Enter an IP address and subnet mask (e.g., 10.0.0.2) with a subnet mask of 255.255.255.0).
3. **Test Connectivity:**
 - Use the "Command Prompt" on PCs to ping each other (e.g., ping 10.0.0.3).

PC0

Physical Config **Desktop** Programming Attributes

IP Configuration X

Interface FastEthernet0

IP Configuration

☐ DHCP ☒ Static

IPv4 Address 10.0.0.2

Subnet Mask 255.0.0.0

Default Gateway 0.0.0.0

DNS Server 0.0.0.0

IPv6 Configuration

☐ Automatic ☒ Static

IPv6 Address /

Link Local Address FE80::20C:CFFF:FE6D:1403

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

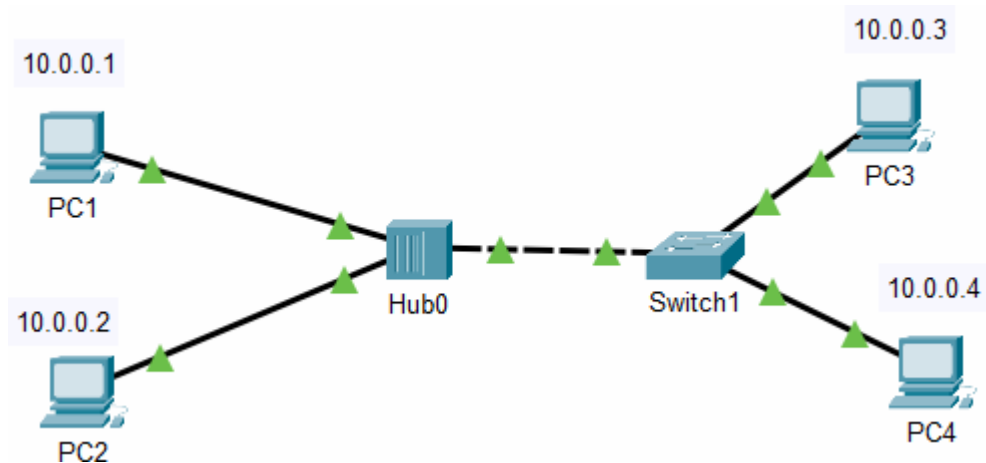
Authentication MD5

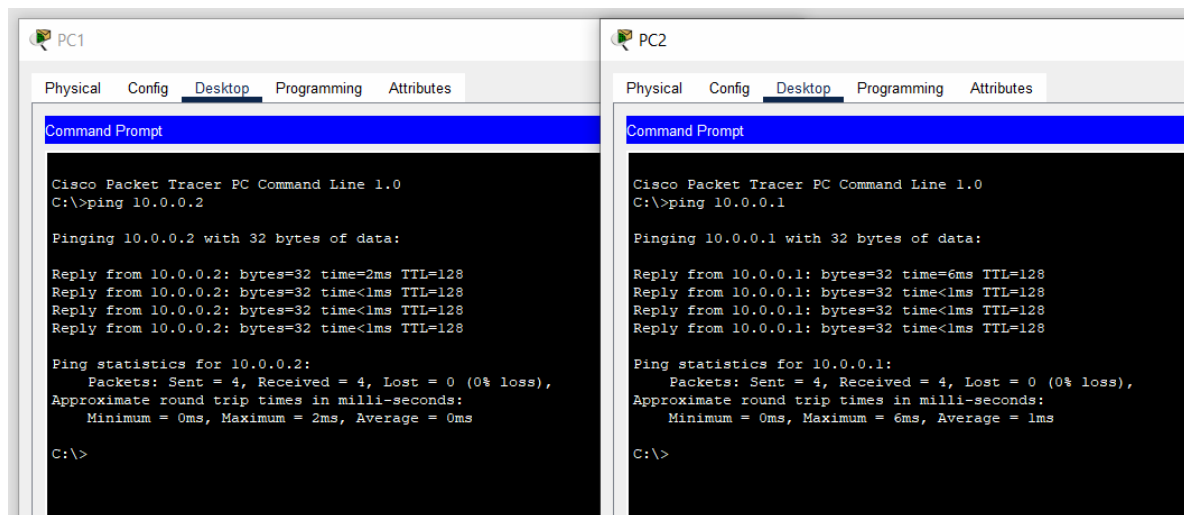
Username

Password

Step 7: Save Your Project

1. **Save:** Click on "File" and select "Save" to store your configuration.

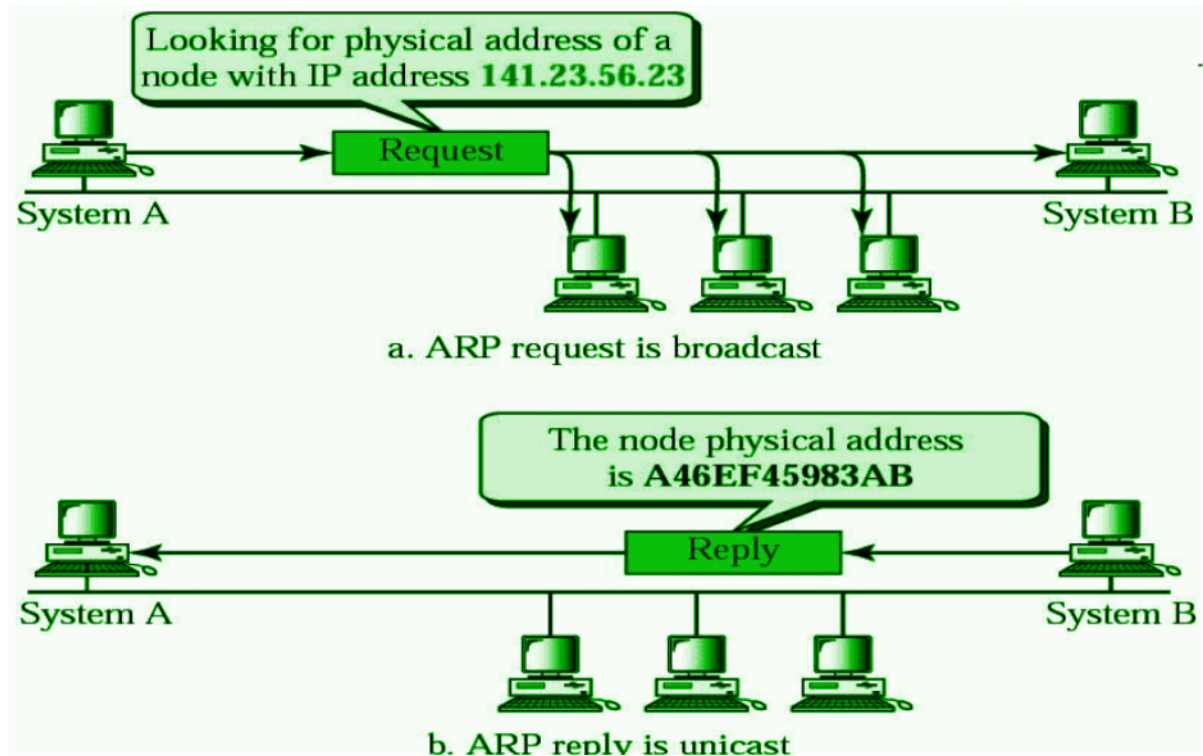




b).Construct a single LAN and understand the concepts and operation of ARP.

What is ARP?

- ARP is used to map IP addresses to MAC addresses in a local area network (LAN). When a device wants to communicate with another device in the same subnet, it must know the MAC address corresponding to the IP address it wants to reach.



Step 1: Create a Simple LAN in Packet Tracer

1. **Open Packet Tracer:** Launch the application.
2. **Add Devices:**
 - **Switch:** Drag a switch onto the workspace.
 - **PCs:** Drag two or more PCs onto the workspace.

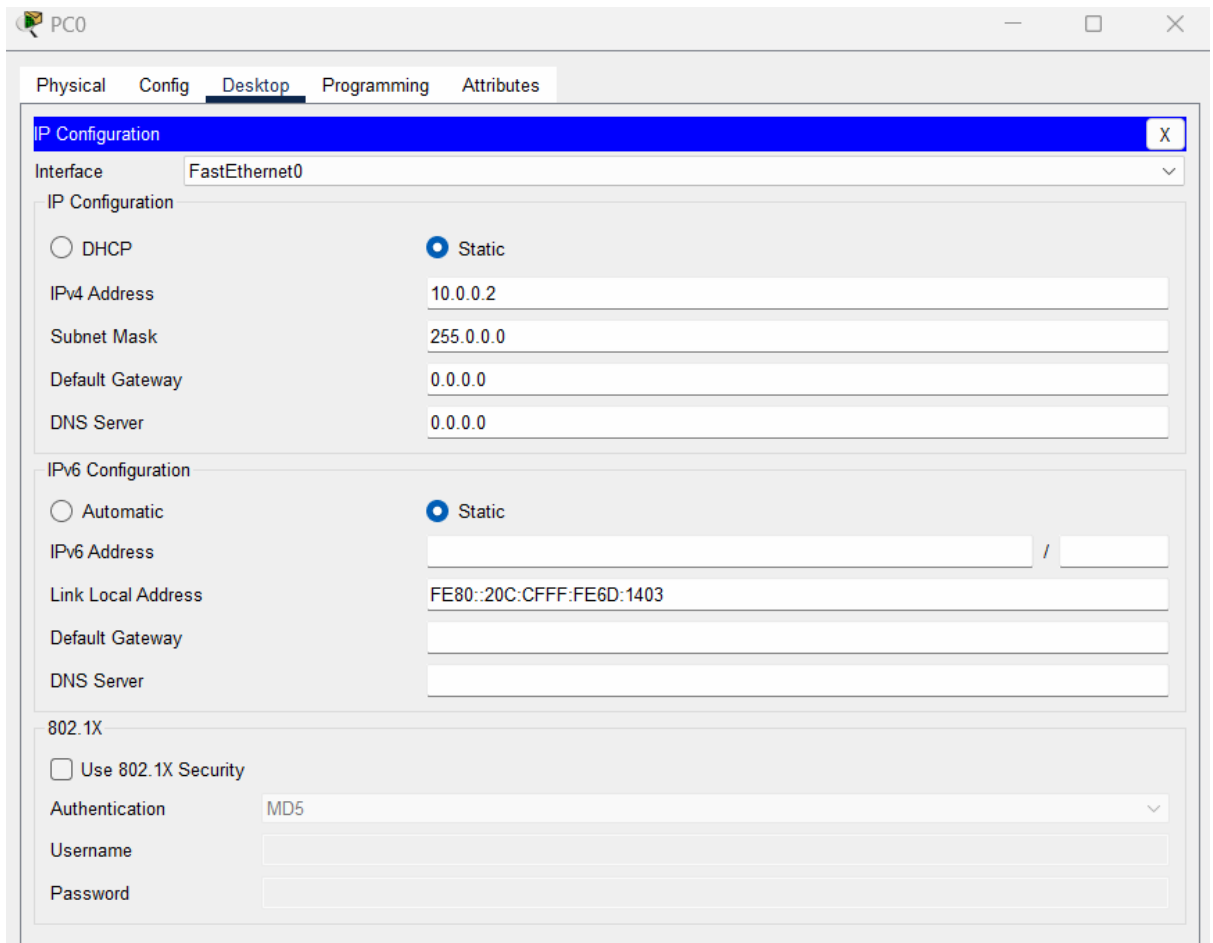
Step 2: Connect Devices

1. **Select the Connection Tool:** Click on the "Connections" icon (lightning bolt).
2. **Connect PCs to the Switch:** Use copper straight-through cables to connect each PC to the switch.

Step 3: Configure IP Addresses

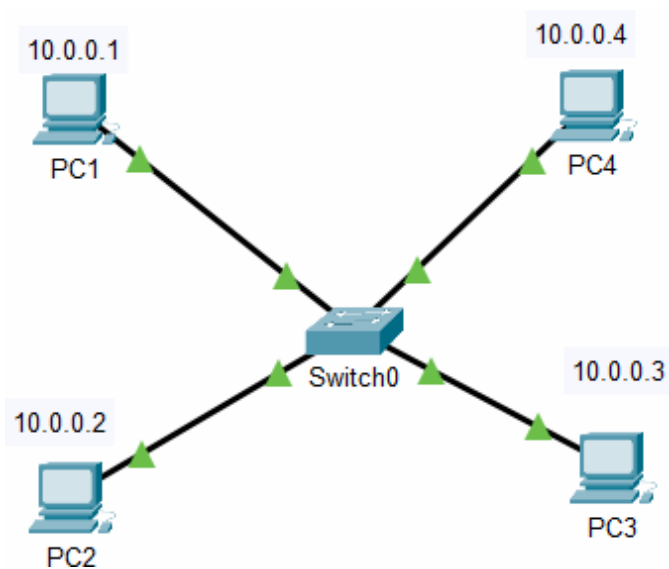
1. **Select Each PC:**
 - Click on the PC and go to the "Desktop" tab.
 - Open "IP Configuration".
 - Assign IP addresses and subnet masks:
 - **PC1:** IP Address: 10.0.0.1, Subnet Mask: 255.0.0.0

- **PC2:** IP Address: 10.0.0.2, Subnet Mask: 255.0.0.0
- (Continue for more PCs if desired, incrementing the last octet)

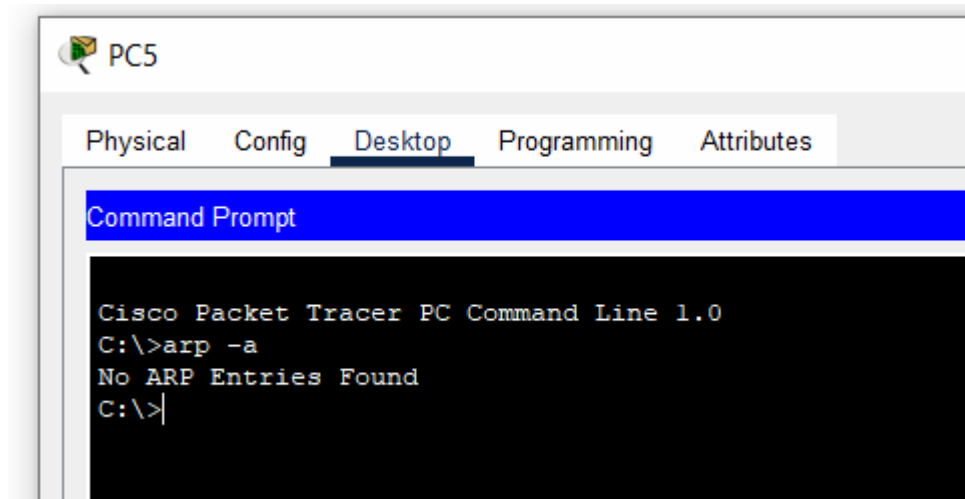


Step 4: Understand ARP

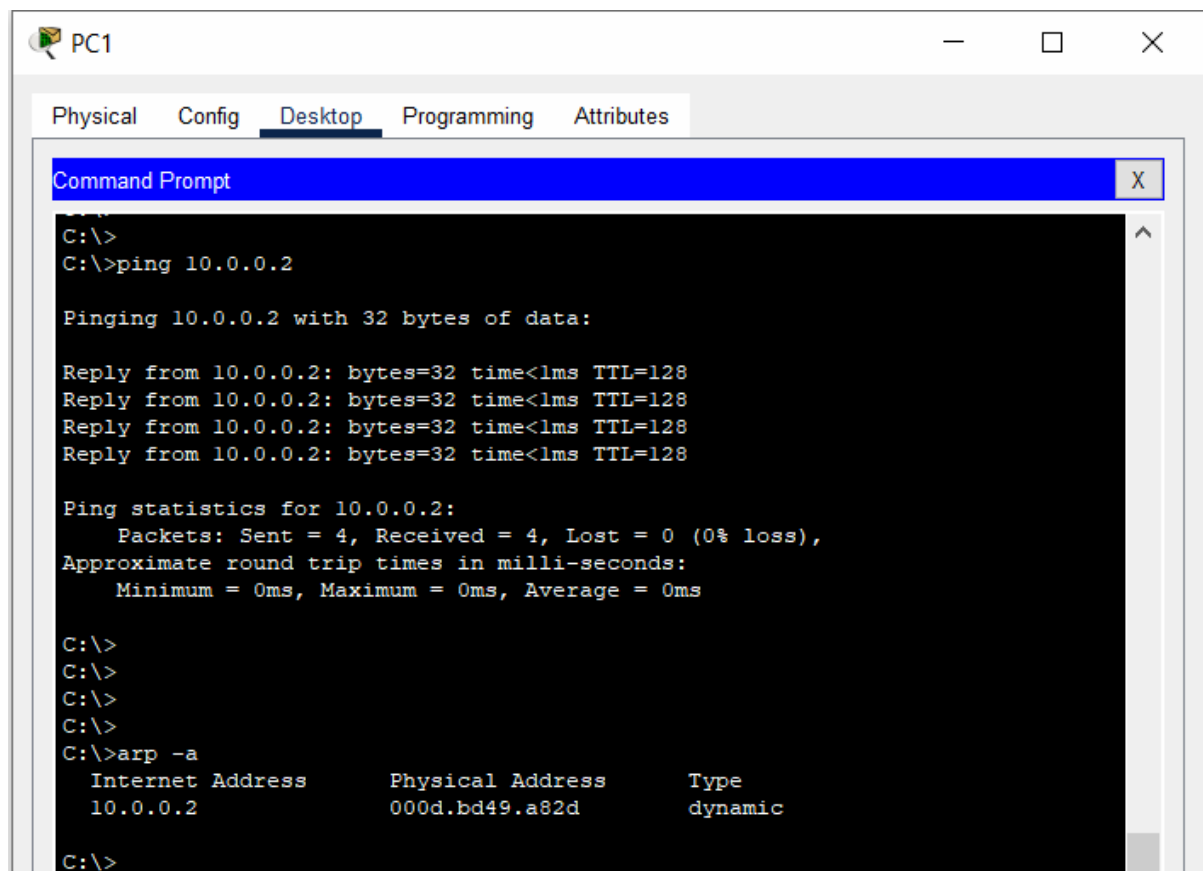
Below topology illustrates 4 PCs with IP address ranging from 10.0.0.1- 10.0.0.4



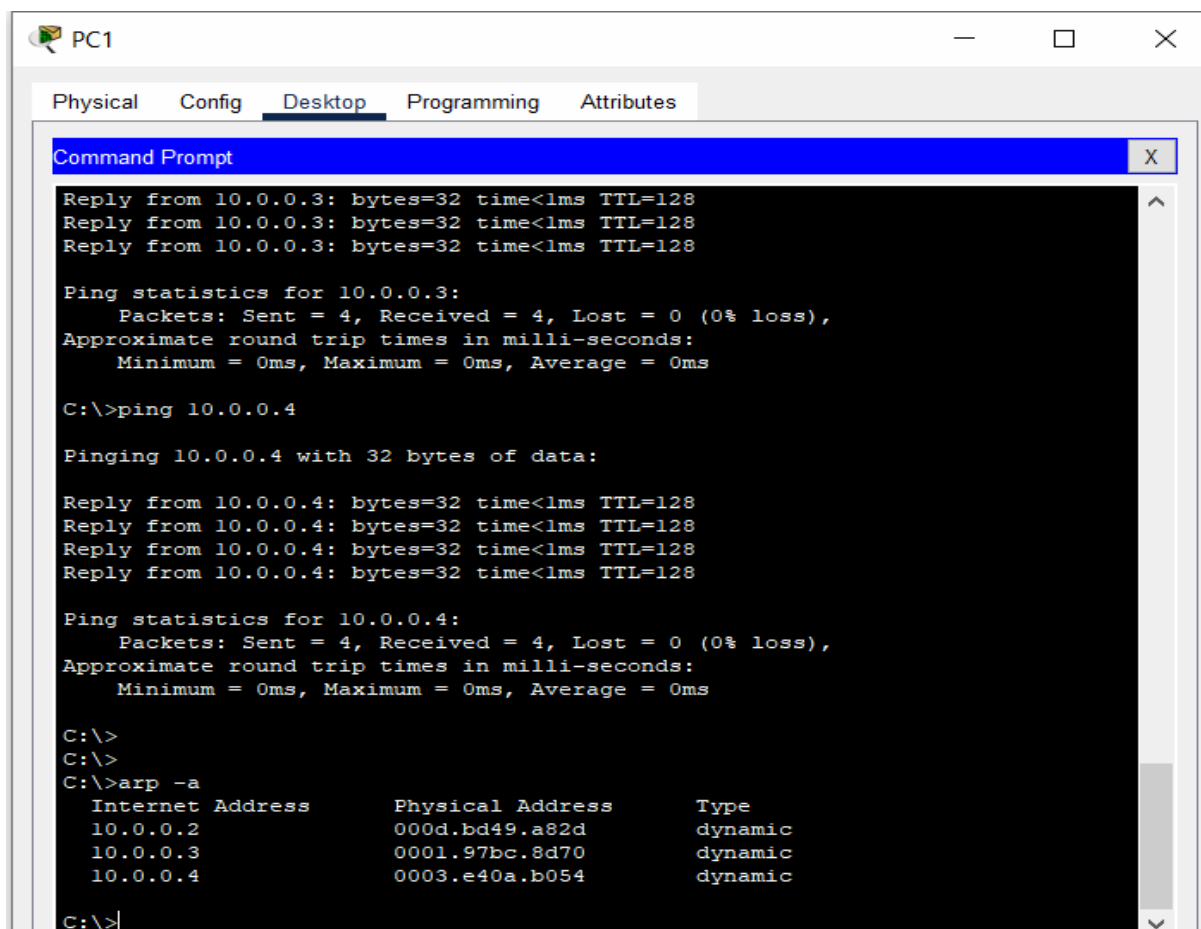
Initially if we look into ARP table of PC 1 there are no entries



Now ping to PC2 from PC1 as illustrated below. And check the arp table.



Now from PC1 ping PC3 and PC4 and watch the arp tables



The screenshot shows a Windows-style window titled "PC1" with tabs for "Physical", "Config", "Desktop", "Programming", and "Attributes". The "Desktop" tab is active, displaying a "Command Prompt" window. The Command Prompt shows the results of pinging 10.0.0.3 and 10.0.0.4, followed by the command "arp -a" which displays the ARP table. The ARP table lists three entries: 10.0.0.2, 10.0.0.3, and 10.0.0.4, all with dynamic physical addresses.

```
Command Prompt
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128
Reply from 10.0.0.3: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.0.0.4

Pinging 10.0.0.4 with 32 bytes of data:

Reply from 10.0.0.4: bytes=32 time<1ms TTL=128
Reply from 10.0.0.4: bytes=32 time<1ms TTL=128
Reply from 10.0.0.4: bytes=32 time<1ms TTL=128
Reply from 10.0.0.4: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
C:\>
C:\>arp -a
    Internet Address      Physical Address   Type
    10.0.0.2              000d.bd49.a82d    dynamic
    10.0.0.3              0001.97bc.8d70    dynamic
    10.0.0.4              0003.e40a.b054    dynamic

C:\>
```

Now you can ping from other systems and see how the ARP tables are constructed.