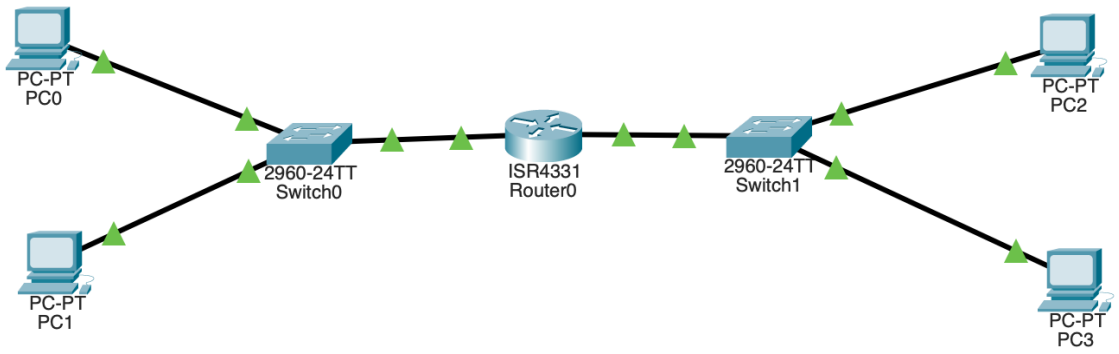
Packet Tracer Lab: ARP Communication

Part 1: Basic Network Setup

Connection

I open **Packet Tracer** and add the connections.



IP Address Configuration

Router Interfaces

Interface	IP Address	Subnet Mask
G0/0	192.168.1.1	255.255.255.0
G0/1	192.168.2.1	255.255.255.0

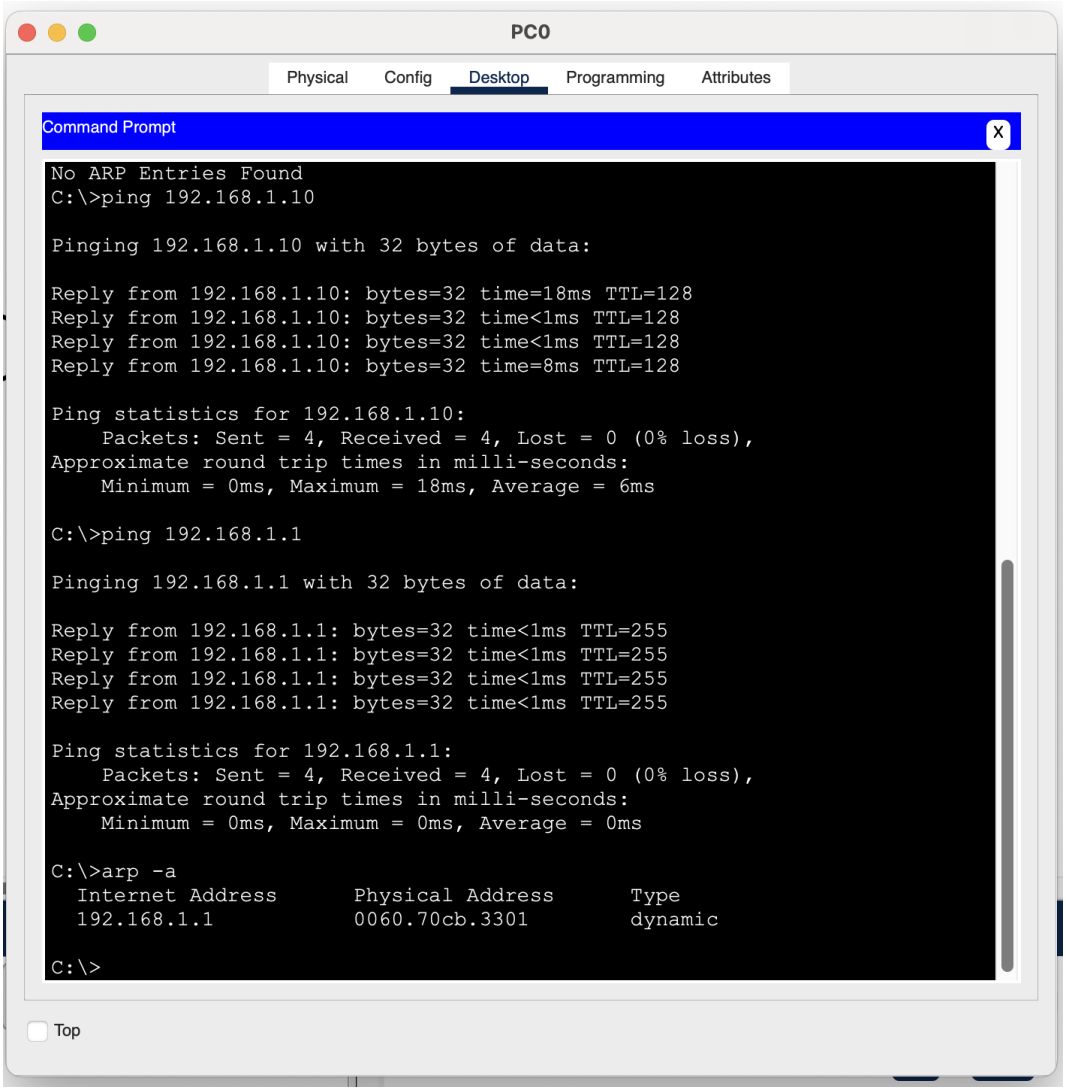
End Devices

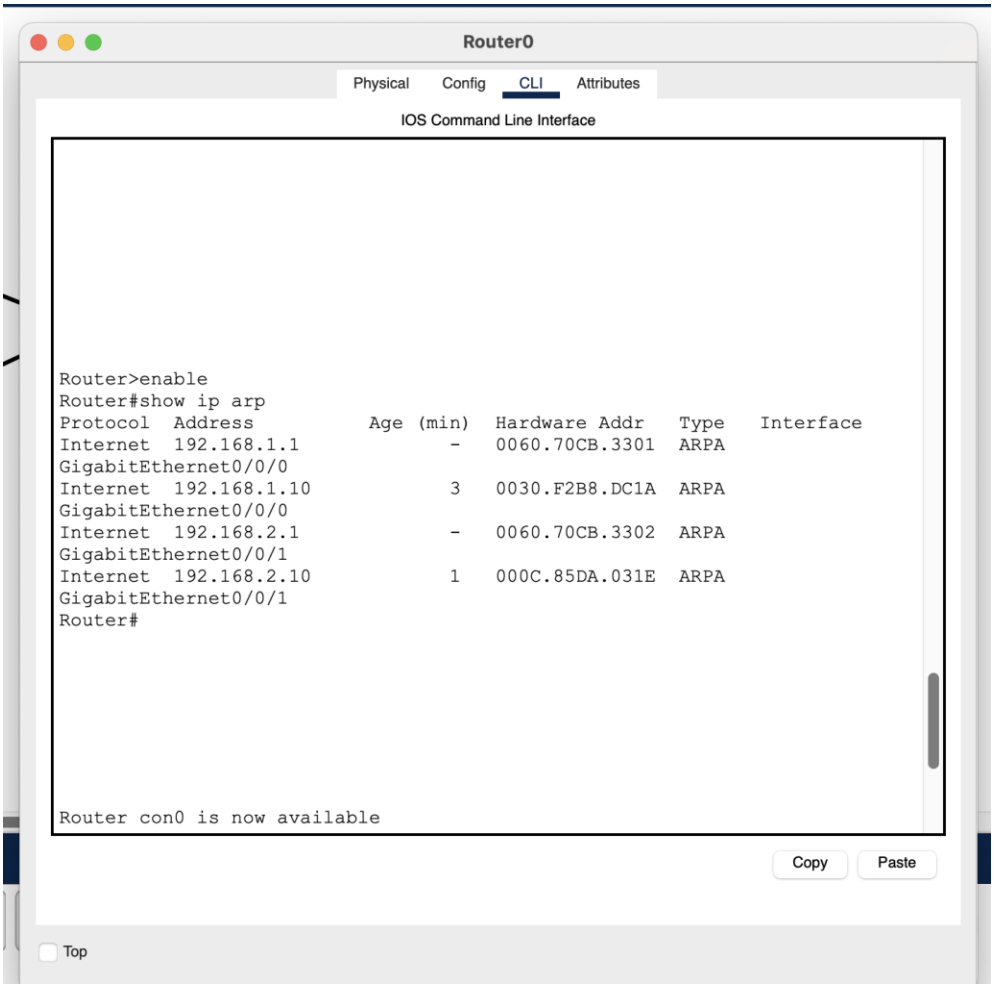
Device	IP Address	Subnet Mask	Default Gateway
PC0	192.168.1.10	255.255.255.0	192.168.1.1
PC1	192.168.1.11	255.255.255.0	192.168.1.1
PC2	192.168.2.10	255.255.255.0	192.168.2.1
PC3	192.168.2.11	255.255.255.0	192.168.2.1

Local ARP Operation (Same Subnet Communication)

Test Performed

Observation and Verification


PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
No ARP Entries Found
C:\>ping 192.168.1.10
Pinging 192.168.1.10 with 32 bytes of data:
Reply from 192.168.1.10: bytes=32 time=18ms TTL=128
Reply from 192.168.1.10: bytes=32 time<1ms TTL=128
Reply from 192.168.1.10: bytes=32 time<1ms TTL=128
Reply from 192.168.1.10: bytes=32 time=8ms TTL=128
Ping statistics for 192.168.1.10:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 18ms, Average = 6ms
C:\>ping 192.168.1.1
Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Ping statistics for 192.168.1.1:
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
192.168.1.1
0060.70cb.3301
dynamic
C:\>
Top



Conclusion

This lab successfully demonstrated the operation of ARP in both local and routed networks:

- **Local ARP** resolves MAC addresses for devices within the same subnet
- **Gateway ARP** is used when communicating with devices on different subnets
- **Routers perform ARP independently on each interface**
- End devices only store the MAC address of the **default gateway** for remote destinations

The results confirm that ARP is a critical protocol that enables IP communication by mapping IP addresses to MAC addresses at Layer 2.