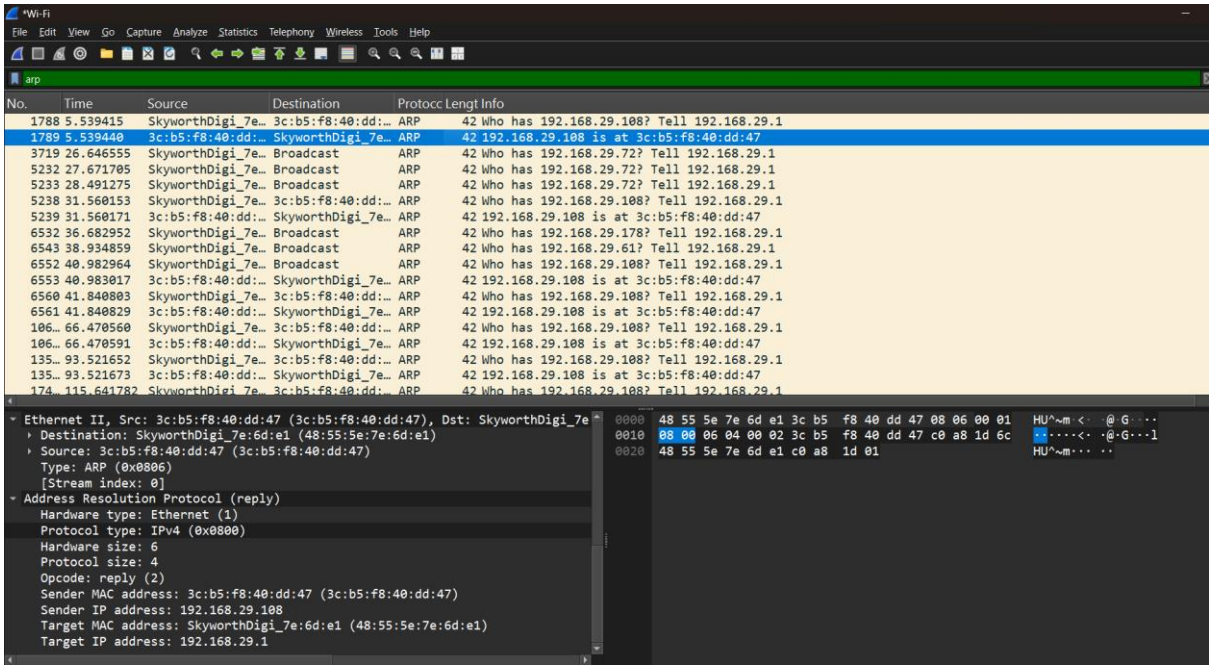
1. Capture and analyze ARP packets using Wireshark. Inspect the ARP request and reply frames when your device attempts to find the router's MAC address. Discuss the importance of ARP in packet forwarding.

Step 1: sending packets to the router using ping command

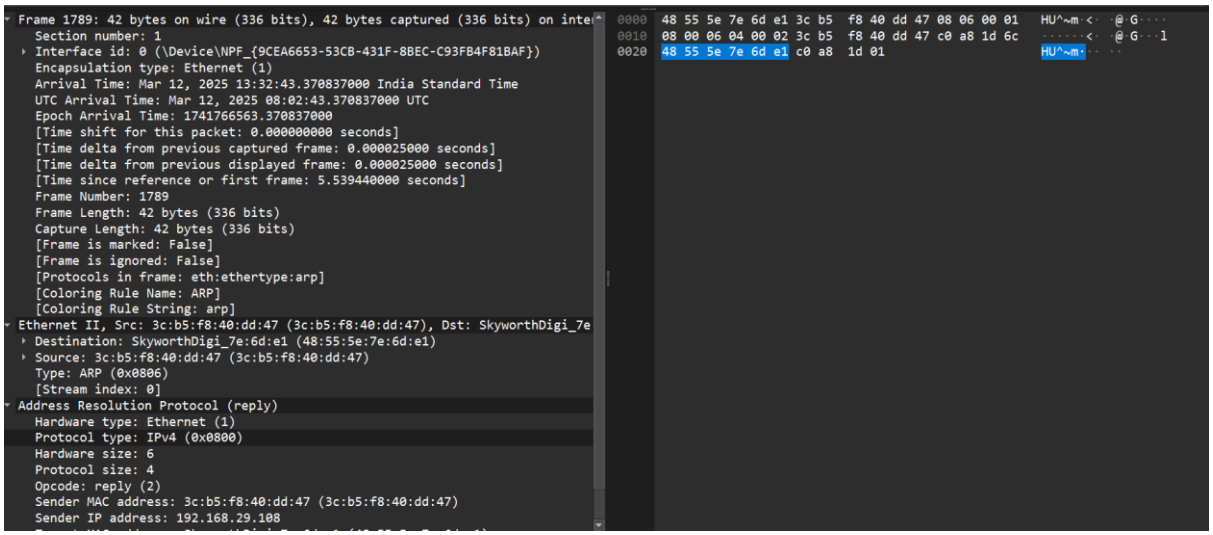
```
PS C:\WINDOWS\system32> ping 192.168.29.1

Pinging 192.168.29.1 with 32 bytes of data:
Reply from 192.168.29.1: bytes=32 time=1ms TTL=64
Reply from 192.168.29.1: bytes=32 time=1ms TTL=64
Reply from 192.168.29.1: bytes=32 time=1ms TTL=64
Reply from 192.168.29.1: bytes=32 time=2ms TTL=64

Ping statistics for 192.168.29.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms
```

Step 2: Capturing the Arp packets



Step:3: Analyzing the arp reply packets from the router which contains mac address of router

```
    [Coloring Rule String: arp]
Ethernet II, Src: 3c:b5:f8:40:dd:47 (3c:b5:f8:40:dd:47), Dst: SkyworthDigi_7e
  ▸ Destination: SkyworthDigi_7e:6d:e1 (48:55:5e:7e:6d:e1)
  ▸ Source: 3c:b5:f8:40:dd:47 (3c:b5:f8:40:dd:47)
    Type: ARP (0x0806)
    [Stream index: 0]
Address Resolution Protocol (reply)
    Hardware type: Ethernet (1)
    Protocol type: IPv4 (0x0800)
    Hardware size: 6
    Protocol size: 4
    Opcode: reply (2)
    Sender MAC address: 3c:b5:f8:40:dd:47 (3c:b5:f8:40:dd:47)
    Sender IP address: 192.168.29.108
    Target MAC address: SkyworthDigi_7e:6d:e1 (48:55:5e:7e:6d:e1)
    Target IP address: 192.168.29.1
```



Step 3: Importance of ARP in Packet Forwarding

- **Address Resolution**: Maps IP addresses to MAC addresses for network communication.
- **Local Network Communication**: Essential for devices to send packets within a LAN.
- **Packet Forwarding**: Ensures that packets reach the correct MAC address before being transmitted over Ethernet.
- **Security Concerns**: ARP spoofing can lead to **Man-in-the-Middle (MITM) attack**