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EXERCISE 6

IMPLEMENT PACKET SNIFFING USING RAW SOCKETS IN PYTHON

PACKET SNIFFING:

Packet sniffing is the process of capturing and analyzing network data packets to monitor traffic, troubleshoot networks, or detect security issues.

AIM:

To develop a Python program using raw sockets that captures Ethernet frames and displays their Source MAC, Destination MAC, and Protocol information.

ALGORITHM:

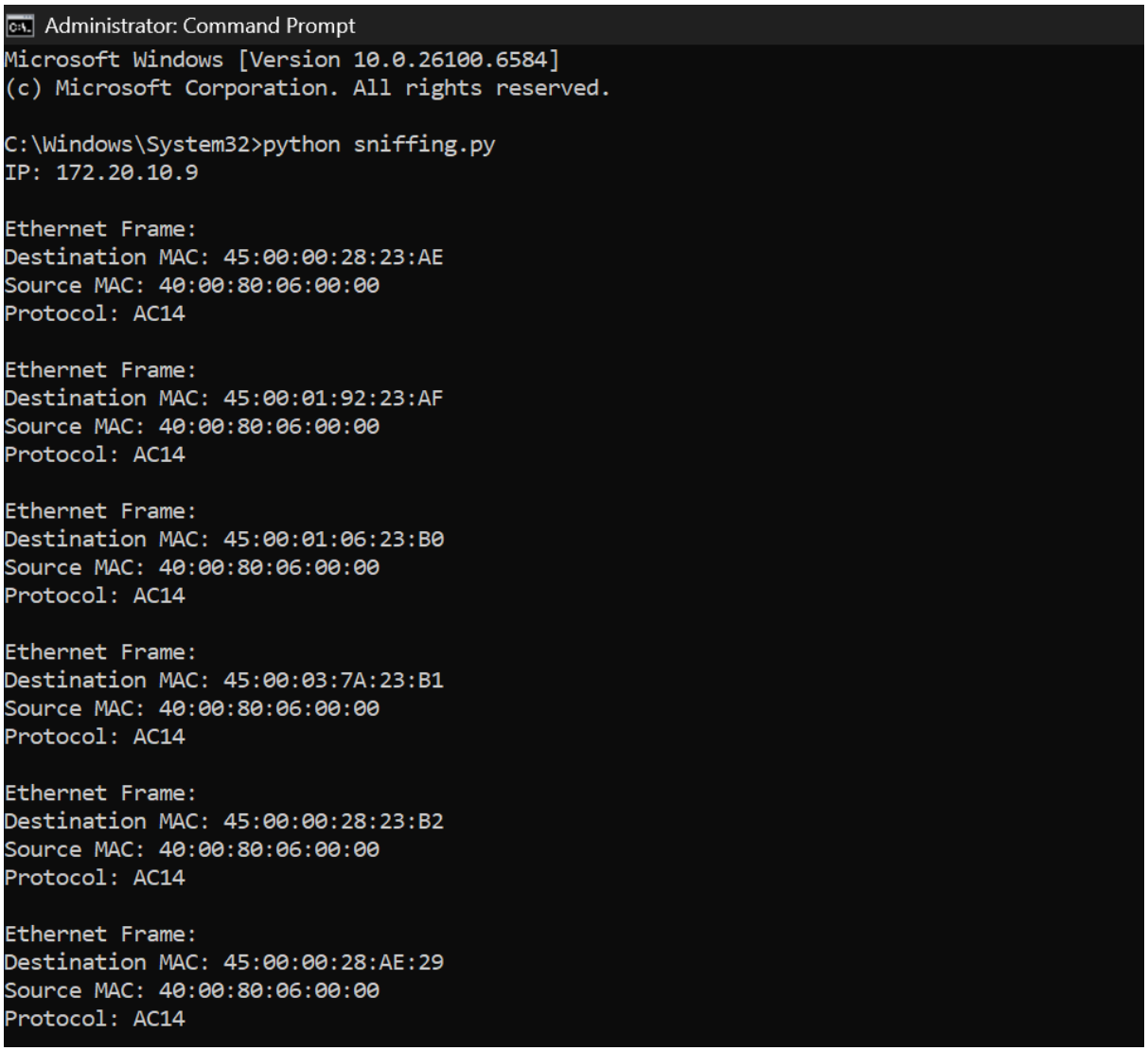
1. Get the host IP address.
2. Create a raw socket and bind it to the host.
3. Enable IP headers and promiscuous mode.
4. Continuously receive packets from the network.
5. For each packet
    - Extract destination MAC, source MAC, and protocol.
    - Convert them into human-readable format.
    - Display the results.

CODE:

```
import socket

import struct

import binascii

import textwrap

def main():

    # Get host

    host = socket.gethostbyname(socket.gethostname())

    print('IP: {}'.format(host))

    # Create a raw socket and bind it

    conn = socket.socket(socket.AF_INET, socket.SOCK_RAW, socket.IPPROTO_IP)

    conn.bind((host, 0))

    # Include IP headers

    conn.setsockopt(socket.IPPROTO_IP, socket.IP_HDRINCL, 1)
```

```
    # Enable promiscuous mode
    conn.ioctl(socket.SIO_RCVALL, socket.RCVALL_ON)

    while True:
        # Recive data
        raw_data, addr = conn.recvfrom(65536)
        # Unpack data
        dest_mac, src_mac, eth_proto, data = ethernet_frame(raw_data)
        print('\nEthernet Frame:')
        print("Destination MAC: {}".format(dest_mac))
        print("Source MAC: {}".format(src_mac))
        print("Protocol: {}".format(eth_proto))
# Unpack ethernet frame
def ethernet_frame(data):
    dest_mac, src_mac, proto = struct.unpack('!6s6s2s', data[:14])
    return get_mac_addr(dest_mac), get_mac_addr(src_mac), get_protocol(proto), data[14:]
# Return formatted MAC address AA:BB:CC:DD:EE:FF
def get_mac_addr(bytes_addr):
    bytes_str = map('{:02x}'.format, bytes_addr)
    mac_address = ':'.join(bytes_str).upper()
    return mac_address
# Return formatted protocol ABCD
def get_protocol(bytes_proto):
    bytes_str = map('{:02x}'.format, bytes_proto)
    protocol = ''.join(bytes_str).upper()
    return protocol
main()
```

OUTPUT:



RESULT:

The program successfully captures network packets and displays their MAC addresses and protocol details, demonstrating basic packet sniffing functionality.