

## **Task 1: Basic Network Sniffer**

Build a network sniffer in Python that captures and analyzes network traffic. This project will help you understand how data flows on a network and how network packets are structured.

### Python Code:

```
import socket
import struct
```

```
def main():
```

```
    # Create a raw socket and bind it to the network interface
```

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

```
    conn.bind(("192.168.0.106", 0))
```

```
    # Include IP headers
```

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

```
    # Enable promiscuous mode
```

```
    conn.ioctl(socket.SIO_RCVALL, socket.RCVALL_ON)
```

```
    # Sniff packets
```

```
    sniff(conn)
```

```
def sniff(conn):
```

```
    while True:
```

```
        # Receive packet
```

```
        raw_data, _ = conn.recvfrom(65536)
```

```
        # Extract Ethernet header (first 14 bytes)
```

```
        eth_header = raw_data[:14]
```

```
        # Unpack Ethernet header
```

```

dest_mac, src_mac, eth_proto = struct.unpack('!6s6sH', eth_header)

# Print MAC addresses and Ethernet protocol

print(f'Source      MAC:      {get_mac_address(src_mac)}      Destination      MAC:
{get_mac_address(dest_mac)} EtherType: {eth_proto}')

def get_mac_address(mac):

    return ":".join("{:02x}".format(b) for b in mac)

if __name__ == '__main__':

    main()

```

Output:

```

C:\Users\aparn\OneDrive\Documents\CodeAlpha>python sniffer.py
Source MAC: 40:00:80:06:81:78 Destination MAC: 45:00:00:34:b8:9e EtherType: 49320
Source MAC: 40:00:80:06:81:83 Destination MAC: 45:00:00:28:b8:9f EtherType: 49320
Source MAC: 40:00:80:06:7f:31 Destination MAC: 45:00:02:79:b8:a0 EtherType: 49320
Source MAC: 40:00:80:06:81:75 Destination MAC: 45:00:00:34:b8:a1 EtherType: 49320
Source MAC: 40:00:80:06:81:30 Destination MAC: 45:00:00:78:b8:a2 EtherType: 49320
Source MAC: 40:00:80:06:80:0e Destination MAC: 45:00:01:99:b8:a3 EtherType: 49320
Source MAC: 40:00:80:06:7b:de Destination MAC: 45:00:05:c8:b8:a4 EtherType: 49320
Source MAC: 40:00:80:06:80:b7 Destination MAC: 45:00:00:ee:b8:a5 EtherType: 49320
Source MAC: 40:00:80:06:81:7c Destination MAC: 45:00:00:28:b8:a6 EtherType: 49320
Source MAC: 40:00:80:06:81:7b Destination MAC: 45:00:00:28:b8:a7 EtherType: 49320
Source MAC: 40:00:80:06:81:7a Destination MAC: 45:00:00:28:b8:a8 EtherType: 49320
Source MAC: 40:00:80:06:81:61 Destination MAC: 45:00:00:40:b8:a9 EtherType: 49320
Source MAC: 40:00:80:06:81:70 Destination MAC: 45:00:00:28:b8:aa EtherType: 49320
Source MAC: 00:00:80:11:40:de Destination MAC: 45:00:00:4c:78:07 EtherType: 49320
Source MAC: 40:00:3e:11:8e:31 Destination MAC: 45:00:00:c9:2c:37 EtherType: 49320
Source MAC: 40:00:80:06:62:e8 Destination MAC: 45:00:00:34:48:93 EtherType: 49320
Source MAC: 40:00:80:06:62:e7 Destination MAC: 45:00:00:34:48:94 EtherType: 49320
Source MAC: 00:00:01:02:00:da Destination MAC: 46:00:00:28:82:cd EtherType: 49320
Source MAC: 40:00:80:06:62:e6 Destination MAC: 45:00:00:34:48:95 EtherType: 49320
Source MAC: 00:00:01:02:00:d9 Destination MAC: 46:00:00:28:82:ce EtherType: 49320
Source MAC: 00:00:01:02:00:d8 Destination MAC: 46:00:00:28:82:cf EtherType: 49320
Source MAC: 40:00:80:06:e1:ba Destination MAC: 45:00:00:44:bd:bf EtherType: 49320
Source MAC: 40:00:80:06:62:e5 Destination MAC: 45:00:00:34:48:96 EtherType: 49320
Source MAC: 40:00:ff:11:7c:eb Destination MAC: 45:00:01:15:5b:e1 EtherType: 49320
Source MAC: 40:00:ff:11:7c:f5 Destination MAC: 45:00:00:59:5c:93 EtherType: 49320
Source MAC: 40:00:80:06:af:55 Destination MAC: 45:00:00:29:1a:d1 EtherType: 49320
Source MAC: 40:00:80:06:62:e4 Destination MAC: 45:00:00:34:48:97 EtherType: 49320
Source MAC: 00:00:80:11:40:e7 Destination MAC: 45:00:00:42:78:08 EtherType: 49320
Source MAC: 00:00:80:11:40:e6 Destination MAC: 45:00:00:42:78:09 EtherType: 49320
Source MAC: 40:00:3e:11:82:d8 Destination MAC: 45:00:00:62:37:f7 EtherType: 49320
Source MAC: 40:00:3e:11:82:a6 Destination MAC: 45:00:00:93:37:f8 EtherType: 49320
Source MAC: 40:00:80:06:cb:3f Destination MAC: 45:00:00:34:f2:c1 EtherType: 49320
Source MAC: 40:00:80:06:cb:4a Destination MAC: 45:00:00:28:f2:c2 EtherType: 49320
Source MAC: 40:00:80:06:c9:2d Destination MAC: 45:00:02:44:f2:c3 EtherType: 49320
Source MAC: 40:00:80:06:cb:48 Destination MAC: 45:00:00:28:f2:c4 EtherType: 49320
Source MAC: 40:00:80:06:ca:f7 Destination MAC: 45:00:00:78:f2:c5 EtherType: 49320
Source MAC: 40:00:80:06:c6:df Destination MAC: 45:00:04:8f:f2:c6 EtherType: 49320
Source MAC: 40:00:80:06:cb:45 Destination MAC: 45:00:00:28:f2:c7 EtherType: 49320
Source MAC: 40:00:80:06:cb:44 Destination MAC: 45:00:00:28:f2:c8 EtherType: 49320
Source MAC: 40:00:80:06:cb:43 Destination MAC: 45:00:00:28:f2:c9 EtherType: 49320
Source MAC: 40:00:80:06:cb:42 Destination MAC: 45:00:00:28:f2:ca EtherType: 49320
Source MAC: 40:00:80:06:81:6b Destination MAC: 45:00:00:34:b8:ab EtherType: 49320
Source MAC: 40:00:80:06:81:76 Destination MAC: 45:00:00:28:b8:ac EtherType: 49320
Source MAC: 40:00:80:06:7f:24 Destination MAC: 45:00:02:79:b8:ad EtherType: 49320
Source MAC: 40:00:80:06:81:24 Destination MAC: 45:00:00:78:b8:ae EtherType: 49320

```