

Q7) Use Linux to view the MAC address table of a switch (if using a Linux-based network switch). Use the bridge or ip link commands to inspect the MAC table and demonstrate a basic switch's operation.

## Checking Bridged Interfaces and Viewing Available Network Interfaces

```
user@vishal-virtualbox:~$ sudo bridge link
[sudo] password for user:
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 master br0 state forwarding priority 32 cost 5
user@vishal-virtualbox:~$ ip link show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN mode DEFAULT group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel master br0 state UP mode DEFAULT group default qlen 1000
    link/ether 08:00:27:68:dd:9f brd ff:ff:ff:ff:ff:ff
3: br0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc noqueue state UP mode DEFAULT group default qlen 1000
    link/ether 72:cf:85:dd:68:b3 brd ff:ff:ff:ff:ff:ff
```

- **enp0s3** is the network interface.
- **master br0** → This means enp0s3 is part of a **bridge (br0)**, acting like a switch.
- **lo** → Loopback interface (not involved in switching).
- **enp0s3** → Connected to br0 (the switch bridge).
- **br0** → The virtual bridge that behaves like a network switch.

## Viewing the MAC Address Table, Checking Connected Devices and Viewing Bridge Configuration

```
link/ether 72:cf:85:dd:68:b3 brd ff:ff:ff:ff:ff:ff
user@vishal-virtualbox:~$ sudo bridge fdb show
a0:91:a2:2a:3b:55 dev enp0s3 master br0
6c:e5:c9:0c:fc:db dev enp0s3 master br0
ac:35:ee:89:54:4a dev enp0s3 master br0
46:ae:30:77:8a:d5 dev enp0s3 master br0
b0:95:75:d1:02:50 dev enp0s3 master br0
08:00:27:68:dd:9f dev enp0s3 vlan 1 master br0 permanent
08:00:27:68:dd:9f dev enp0s3 master br0 permanent
01:00:5e:00:00:01 dev enp0s3 self permanent
33:33:00:00:00:01 dev enp0s3 self permanent
33:33:ff:68:dd:9f dev enp0s3 self permanent
33:33:00:00:00:fb dev enp0s3 self permanent
01:00:5e:00:00:fb dev enp0s3 self permanent
33:33:00:00:00:01 dev br0 self permanent
01:00:5e:00:00:6a dev br0 self permanent
33:33:00:00:00:6a dev br0 self permanent
01:00:5e:00:00:01 dev br0 self permanent
33:33:ff:dd:68:b3 dev br0 self permanent
33:33:00:00:00:fb dev br0 self permanent
72:cf:85:dd:68:b3 dev br0 vlan 1 master br0 permanent
72:cf:85:dd:68:b3 dev br0 master br0 permanent
user@vishal-virtualbox:~$ ip neigh show
192.168.0.107 dev enp0s3 lladdr e0:9d:31:d5:b2:db STALE
192.168.0.104 dev enp0s3 lladdr 46:ae:30:77:8a:d5 STALE
192.168.0.1 dev enp0s3 INCOMPLETE
fe80::d7cf:4464:66cf:17e8 dev enp0s3 lladdr e0:9d:31:d5:b2:db STALE
fe80::b295:75ff:fed1:250 dev enp0s3 lladdr b0:95:75:d1:02:50 router STALE
fe80::b295:75ff:fed1:250 dev br0 lladdr b0:95:75:d1:02:50 router STALE
user@vishal-virtualbox:~$ brctl show
bridge name      bridge id        STP enabled      interfaces
br0               8000.72cf85dd68b3  no               enp0s3
user@vishal-virtualbox:~$ S
```

- Each entry contains a **MAC address**, showing which devices are connected.

- **dev enp0s3 master br0** → These MAC addresses are learned through enp0s3 and stored in the br0 switch.
- **Permanent Entries** (like 08:00:27:68:dd:9f) are fixed, while dynamic ones may be updated when devices move.