

# Commands in Ubuntu Terminal:-

## 1. nmcli dev status

```
[07/28/20]seed@VM:~$ nmcli dev status
DEVICE   TYPE      STATE      CONNECTION
enp0s3   ethernet  connected  Wired connection 1
lo       loopback  unmanaged  --
```

## 2. nmcli dev show

```
[07/28/20]seed@VM:~$ nmcli dev show
GENERAL.DEVICE:                               enp0s3
GENERAL.TYPE:                                  ethernet
GENERAL.HWADDR:                                08:00:27:89:71:F7
GENERAL.MTU:                                    1500
GENERAL.STATE:                                 100 (connected)
GENERAL.CONNECTION:                           Wired connection 1
GENERAL.CON-PATH:                             /org/freedesktop/NetworkManager/ActiveConnection/1
WIRED-PROPERTIES.CARRIER:                    on
IP4.ADDRESS[1]:                               10.0.2.15/24
IP4.GATEWAY:                                   10.0.2.2
IP4.ROUTE[1]:                                 dst = 169.254.0.0/16, nh = 0.0.0.0, mt = 1000
IP4.DNS[1]:                                    192.168.1.254
IP6.ADDRESS[1]:                                fe80::d0a7:4c3c:5ca6:c336/64
IP6.GATEWAY:
GENERAL.DEVICE:                               lo
GENERAL.TYPE:                                  loopback
GENERAL.HWADDR:                                00:00:00:00:00:00
GENERAL.MTU:                                    65536
GENERAL.STATE:                                 10 (unmanaged)
GENERAL.CONNECTION:                           --
GENERAL.CON-PATH:                             --
IP4.ADDRESS[1]:                               127.0.0.1/8
IP4.GATEWAY:
IP6.ADDRESS[1]:                                ::1/128
IP6.GATEWAY:
```

## 3. ifconfig

```
Terminal
[07/27/20]seed@VM:~$ ifconfig
enp0s3   Link encap:Ethernet  HWaddr 08:00:27:89:71:f7
         inet addr:10.0.2.15  Bcast:10.0.2.255  Mask:255.255.255.0
         inet6 addr: fe80::d0a7:4c3c:5ca6:c336/64 Scope:Link
         UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
         RX packets:4 errors:0 dropped:0 overruns:0 frame:0
         TX packets:75 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1000
         RX bytes:930 (930.0 B)  TX bytes:8095 (8.0 KB)

lo       Link encap:Local Loopback
         inet addr:127.0.0.1  Mask:255.0.0.0
         inet6 addr: ::1/128 Scope:Host
         UP LOOPBACK RUNNING  MTU:65536  Metric:1
         RX packets:97 errors:0 dropped:0 overruns:0 frame:0
         TX packets:97 errors:0 dropped:0 overruns:0 carrier:0
         collisions:0 txqueuelen:1
         RX bytes:22856 (22.8 KB)  TX bytes:22856 (22.8 KB)

[07/27/20]seed@VM:~$
```

## **Explanation:-**

### **1. Interfaces**

#### **i) enp0s3**

It is a physical interface representing Ethernet network card. It's used for communication with other computers on the network and on the Internet.

#### **ii) lo**

It is a special virtual network interface called *loopback device*. Loopback is used mainly for diagnostics and troubleshooting, and to connect to services running on local host.

### **2. Details of Interfaces**

#### **i) Link encap: Ethernet**

It shows how packets are encapsulated for transmission. This denotes that the interface is an Ethernet related device.

#### **ii) HWaddr**

It is hardware address of the Ethernet interface (also known as MAC address). Usually, the first half part of this address will contain the manufacturer code which is common for all the Ethernet cards manufactured by the same manufacturer and the rest will denote the device Id which should not be the same for any two devices manufactured at the same place.

#### **iii) inet addr**

It is IPv4 address assigned to the interface.

#### **iv) Bcast**

It is broadcast address for the interface.

**v) Mask**

A subnet mask is a number that defines a range of IP addresses available within a network. Systems within the same subnet can communicate directly with each other, while systems on different subnets must communicate through a router. A subnet mask of 255.255.255.0 allows for close to 256 unique hosts within the network (since not all 256 IP addresses are used).

**vi) Scope**

It is scope of IPv6 address. It can be *link-local* or *global*. Link-local address is used in local area network and is not routable. Global address is routable.

**vii) UP**

It indicates that kernel modules related to the interface have been loaded and interface is activated.

**viii) BROADCAST**

It indicates that interface is configured to handle broadcast packets, which is required for obtaining IP address via DHCP.

**ix) MTU**

It is Maximum Transmission Unit. IP datagrams larger than MTU bytes will be fragmented into multiple Ethernet frames. The value of MTU for all Ethernet devices by default is set to 1500. Though we can change the value by passing the necessary option to the ifconfig command. Setting this to a higher value could hazard packet fragmentation or buffer overflows. Do compare the MTU value of your Ethernet device and the loopback device and see if they are same or different. Usually, the loopback device will have a larger packet length.

**x) RUNNING**

It indicates that interface is ready to accept data.

**xi) MULTICAST**

It indicates that interface supports multicasting.

**xii) Metric**

This option can take a value of 0,1,2,3... with the lower the value the more leverage it has. The value of this property decides the priority of the device. This parameter has significance only while routing packets. For example, if you have two Ethernet cards and we want to forcibly make your machine use one card over the other in sending the data. Then we can set the Metric value of the Ethernet card which we favor lower than that of the other Ethernet card.

**xiii) Gateway**

The default gateway is used as the destination of all traffic that is not on the same subnet. The gateway is a layer 3 device such as a router or multi-layer switch that is used to route traffic on a hop-by-hop basis. The only thing the end device needs to know is whether the data is on the same subnet. If it's not, the source device delivers traffic to the end device through the default gateway.

### 3. Interface statistics

**i) RX packets**

It is a total number of packets received.

**ii) RX errors**

It shows a total number of packets received with error. This includes too-long-frames errors, ring-buffer overflow errors, CRC errors, frame alignment errors; fifo overruns, and missed packets.

**iii) RX dropped**

It is a number of dropped packets due to unintended VLAN tags or receiving IPv6 frames when interface is not configured for IPv6.

**iv) RX frame**

It is a number of misaligned frames, i.e. frames with length not divisible by 8.

**v) RX overruns**

It is a number of received packets that experienced fifo overruns, caused by rate at which a buffer gets full and kernel isn't able to empty it.

**vi) TX packets**

It is total number of packets transmitted.

**vii) TX errors, TX dropped and TX overruns**

These are similar to RX equivalents.

**viii) TX carriers**

It is a number of packets that experienced loss of carriers. This usually happens when link is flapping.

**ix) TX collisions**

It is a number of transmitted packets that experienced Ethernet collisions.

**x) TX txqueuelen**

It is length of transmission queue.

**xi) RX bytes**

It is a total number of bytes received over interface.

**xii) TX bytes**

It is a total number of bytes transmitted over interface.