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## Debian Linux Configure Network Interface Cards – IP address and Netmasks

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**Q.** How do I configure networking or network interface card on HP Debian Linux U1 Server?

**A.** Debian Linux provides GUI, command line tools and direct configuration file editing options to set up networking. Network configuration from the command line is possible.



[1]

## Configure the Network Manually

You can use `ip` or `ifconfig` command to configure IP address and other information.

### Task: Display the Current Network Configuration

Type the following command:

```
$ ip address show
```

Output:

```
1: lo: mtu 16436 qdisc noqueue
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: mtu 1500 qdisc pfifo_fast qlen 100
    link/ether 00:19:d1:2a:ba:a8 brd ff:ff:ff:ff:ff:ff
    inet 192.168.2.1/24 brd 192.168.2.255 scope global eth0
    inet6 fe80::219:d1ff:fe2a:baa8/64 scope link
        valid_lft forever preferred_lft forever
3: ra0: mtu 1500 qdisc pfifo_fast qlen 1000
    link/ether 00:17:9a:0a:f6:44 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.106/24 brd 192.168.1.255 scope global ra0
    inet6 fe80::217:9aff:fe0a:f644/64 scope link
        valid_lft forever preferred_lft forever
4: ppp0: mtu 1496 qdisc pfifo_fast qlen 3
    link/ppp
    inet 10.1.3.103 peer 10.0.31.18/32 scope global ppp0
```

You can also use `ifconfig -a` command, enter:

```
$ ifconfig -a
```

Output:

```
eth0      Link encap:Ethernet  HWaddr 00:19:D1:2A:BA:A8
          inet addr:192.168.2.1  Bcast:192.168.2.255  Mask:255.255.255.0
          inet6 addr: fe80::219:d1ff:fe2a:baa8/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:15819 errors:0 dropped:0 overruns:0 frame:0
          TX packets:27876 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:100
          RX bytes:1695948 (1.6 MB)  TX bytes:40399983 (38.5 MB)
          Base address:0x1000 Memory:93180000-931a0000

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:16436 Metric:1
RX packets:11943 errors:0 dropped:0 overruns:0 frame:0
TX packets:11943 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:0
RX bytes:7024449 (6.6 MB) TX bytes:7024449 (6.6 MB)

ppp0    Link encap:Point-to-Point Protocol
        inet addr:10.1.3.103 P-t-P:10.0.31.18 Mask:255.255.255.255
        UP POINTOPOINT RUNNING NOARP MULTICAST MTU:1496 Metric:1
        RX packets:34922 errors:0 dropped:0 overruns:0 frame:0
        TX packets:15764 errors:0 dropped:0 overruns:0 carrier:0
        collisions:0 txqueuelen:3
        RX bytes:50535608 (48.1 MB) TX bytes:1256881 (1.1 MB)

ra0     Link encap:Ethernet HWaddr 00:17:9A:0A:F6:44
        inet addr:192.168.1.106 Bcast:192.168.1.255 Mask:255.255.255.0
        inet6 addr: fe80::217:9aff:fe0a:f644/64 Scope:Link
        UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
        RX packets:73809 errors:0 dropped:0 overruns:0 frame:0
        TX packets:31332 errors:1 dropped:1 overruns:0 carrier:0
        collisions:27 txqueuelen:1000
        RX bytes:61373519 (58.5 MB) TX bytes:5007190 (4.7 MB)
        Interrupt:20

```

The information is grouped by network interfaces. Every interface entry starts with a digit, called the interface index, with the interface name displayed after the interface index. In the above example, there are four interfaces:

- **lo** : Loopback interface, used to access local services such as proxy or webserver <http://127.0.0.1/>
- **eth0** : The first Ethernet interface connected to network switch or router
- **ra0** : The first wireless interface
- **ppp0** :The first point-to-point interface, used to connect via VPN or dial up service

### Task: Device / Interface Statistics

Type the following command:

```

$ ip -s link show interface-name
$ ip -s link show eth0
$ ip -s link show ppp0

```

Output:

```

4: ppp0:  mtu 1496 qdisc pfifo_fast qlen 3
    link/ppp
    RX:  bytes  packets  errors  dropped  overrun mcast
    50537336   34946    0       0        0        0
    TX:  bytes  packets  errors  dropped  carrier collsns
    1257745    15776    0       0        0        0

```

## Change the Current Network Configuration

You must login as the root to change current network settings.

### Task: Assign an IP Address to a Device Interface

In the following example, the command assigns the IP address 192.168.1.10 to the device eth0. The network mask is 24 (255.255.255.0) bits long. The brd + option sets the broadcast address automatically as determined by the network mask.

```
# ip address add 192.168.1.100/24 brd + dev eth0
```

You can also use ifconfig command, enter

```
# ifconfig eth0 192.168.1.100 netmask 255.255.255.0 up
```

### Task: Remove / Delete / Deactivate IP address from a device interface

## Save Network Settings to a Configuration File To change the current network configuration setting you'll need <sup>4/5</sup>

To remove IP / delete device, enter:

```
# ip address del 192.168.1.100 dev eth0
```

OR

```
# ifconfig eth0 down
```

## Save Network Settings to a Configuration File

**To change the current network configuration setting you'll need to edit /etc/network/interfaces file using a text editor such as vi. This is the only way to save device setting to a configuration file so that system can remember changes after a reboot.**

### Task: Configure a Device Statically

Open /etc/network/interfaces file as the root user:

```
# vi /etc/network/interfaces
```

Let us assign static public routable (or private) IP address to eth0, enter:

```
auto eth0
iface eth0 inet static
address 192.168.2.1
netmask 255.255.255.0
```

Save and close the file. Where,

- **auto eth0** : Identify the physical interfaces such as eth0, eth1 and so on
- **iface eth0 inet static** : This method used to define ethernet interfaces with statically allocated IPv4 addresses
- **address 192.168.2.1** : Static IP address
- **netmask 255.255.255.0** : Static netmask

### Task: Configure a Device Dynamically with DHCP

Open /etc/network/interfaces file as the root user:

```
# vi /etc/network/interfaces
```

Let us configure eth0 using DHCP. When the device is configured by using DHCP, you don't need to set any options for the network address configuration in the file.

```
auto eth0
iface eth0 inet dhcp
```

Save and close the file.

Where,

- **auto eth0** : Identify the physical interfaces such as eth0, eth1 and so on
- **iface eth0 inet dhcp** : This method used to define ethernet interfaces with DHCP server allocated IPv4 addresses

## Start and Stop Configured Interfaces

To apply changes to a configuration file, you need to stop and restart the corresponding interface

```
# /etc/init.d/networking stop
# /etc/init.d/networking start
# /etc/init.d/networking restart
```

You can also use following command to bring down or up the eth0. **Disables the device eth0**, enter:

```
# ifdown eth0
```

Enables **eth0** again, enter:

```
# ifup eth0
```

## Further readings:

- [Debian Linux DNS Configuration](#) [2]
- [Debian Linux Static Routing Configuration](#) [3]
- [Ubuntu Linux Configure Network Interface Card](#) [4]

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[2] Debian Linux DNS Configuration: <http://www.cyberciti.biz/tips/linux-how-to-setup-as-dns-client.html>

[3] Debian Linux Static Routing Configuration: <http://www.cyberciti.biz/tips/configuring-static-routes-in-debian-or-red-hat-linux-systems.html>

[4] Ubuntu Linux Configure Network Interface Card: <http://www.cyberciti.biz/tips/howto-ubuntu-linux-convert-dhcp-network-configuration-to-static-ip-configuration.html>