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BY SK · PUBLISHED AUGUST 10, 2016 · UPDATED AUGUST 9, 2019





Some of you might wondering why would we assign multiple IP addresses to single Network card. There can be many reasons. Say for example, you are doing some testing on your Linux box that requires two or more network cards. Would you buy new one? No, It is not necessary! You can set multiple IP series, for example 192.168.1.0, 192.168.2.0, 192.168.3.0 etc., for a network card, and use all of them at the same time. Sounds useful? Of course, it is! This method might be helpful when setting up Internet sharing servers, like Squid proxy. I have done this for one of my client years ago. They had computer labs with different IP series in their network and only one Squid proxy server. So, I created multiple IP series in the squid proxy server, and shared the Internet to the different networks. If you ever been in a situation like this, just follow this guide.

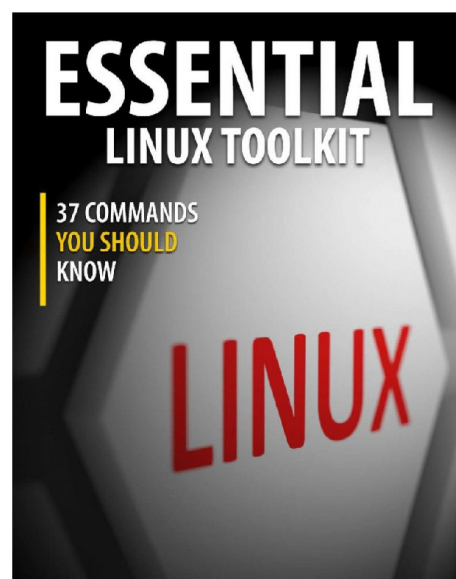
Assign multiple IP addresses to single Network card in DEB based systems

I tested this guide on Ubuntu 16.04 LTS server edition. However, this will work on Debian and other DEB based systems such as Linux Mint, Elementary OS etc.

As you may know already, we can find the



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IP address in Ubuntu using command:

```
$ ifconfig
```

Or

```
$ ip addr
```

Sample output:

```
1: lo: <LOOPBACK,UP,LOWER_UP>  
   link/loopback 00:00:00:00:00:00  
   inet 127.0.0.1/8 scope host  
     valid_lft forever preferred_  
   inet6 ::1/128 scope host  
     valid_lft forever preferred_  
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP>  
   link/ether 08:00:27:12:f8:c1  
   inet 192.168.1.105/24 brd 192.168.1.255 scope global  
     valid_lft forever preferred_  
   inet6 fe80::a00:27ff:fe12:f8c1 scope link  
     valid_lft forever preferred_
```

As you see above, the IP address of my network card **enp0s3** is **192.168.1.105**.

It is obvious that I have assigned class A type IP series i.e **192.168.1.0** to my network card. What If I need an different series, for example **192.168.2.0**?

Just run the following command to set an extra IP.

```
$ sudo ip addr add 192.168.2.24/24 dev enp0s3
```

Here **24** indicates the netmask i.e 255.255.255.0.

Now, let us check if the new IP has been assigned or not.



```
$ ip addr
```

Sample output:

```
1: lo: <LOOPBACK,UP,LOWER_UP>  
    link/loopback 00:00:00:00:00:00  
    inet 127.0.0.1/8 scope host  
        valid_lft forever preferred_lft  
    inet6 ::1/128 scope host  
        valid_lft forever preferred_lft  
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP>  
    link/ether 08:00:27:12:f8:c1  
    inet 192.168.1.105/24 brd 192.168.1.255 scope eth0  
        valid_lft forever preferred_lft  
    inet 192.168.2.105/24 scope eth0  
        valid_lft forever preferred_lft  
    inet6 fe80::a00:27ff:fe12:f8c1/64 scope link  
        valid_lft forever preferred_lft
```

As you see in the above output, my network card has now two IP i.e **192.168.1.105** and **192.168.2.105**. Similarly you can assign as many additional IPs as you like i.e 192.168.3.105, 192.168.4.105 etc.

Let us ping the new IP address:

```
$ sudo ping -c 3 192.168.2.105
```

Sample output:

```
PING 192.168.2.105 (192.168.2.105): 64 bytes of data: 64 bytes from 192.168.2.105: icmp_seq=1 ttl=64 time=0.040 ms  
64 bytes from 192.168.2.105: icmp_seq=2 ttl=64 time=0.040 ms  
64 bytes from 192.168.2.105: icmp_seq=3 ttl=64 time=0.040 ms  
--- 192.168.2.105 ping statistics ---  
3 packets transmitted, 3 received, 0% packet loss, time 0.040ms  
rtt min/avg/max/mdev = 0.040/0.040/0.040/0.000 ms
```

Congratulations! It's working!!

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Wait, I haven't finished yet. What we have done so far is we assigned the new IP temporarily. After you reboot the system, the new IP will be gone. How do you make it permanent? It's simple too.

Assign multiple IP addresses permanently:

Edit `/etc/network/interfaces` file:

```
$ sudo nano /etc/network/inte
```

Now, add the additional IP address as shown below:

```
iface enp0s3 inet static
    address 192.168.2.105/24
```

Save and close the file.

Run the following command to take effect the saved changes.

```
$ sudo ifdown enp0s3 && sudo
```

Sample output:

```
Killed old client process
Internet Systems Consortium D
Copyright 2004-2015 Internet
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For info, please visit https:

Listening on LPF/enp0s3/08:00
Sending on LPF/enp0s3/08:00:2
Sending on Socket/fallback
DHCPRELEASE on enp0s3 to 192.
RTNETLINK answers: Cannot ass
Internet Systems Consortium D
Copyright 2004-2015 Internet
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```

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```
Listening on LPF/enp0s3/08:00
Sending on LPF/enp0s3/08:00:2
Sending on Socket/fallback
DHCPDISCOVER on enp0s3 to 255
DHCPDISCOVER on enp0s3 to 255
DHCPCREQUEST of 192.168.1.105
DHCPOFFER of 192.168.1.105 fr
DHCPACK of 192.168.1.105 from
bound to 192.168.1.105 -- ren
```

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Now, let us run the following command to check whether the new IP address has been assigned or not.

```
$ ip addr
```

Sample output:

Assign multiple IP addresses In Ubuntu

That's it. Also, You can check after rebooting the system. You will see that the new IP is assigned permanently.

Assign multiple IP addresses to single Network card in RPM based systems

I tested this on CentOS 7 64 bit server edition. However, the same steps should work on other RPM based systems such as Fedora, Red hat Linux, and Scientific Linux.

Just run the following command to add an additional IP temporarily.

```
$ sudo ip addr add 192.168.2.
```

You can start using the new IP right away.

To add IP address permanent, just Edit network card configuration file as **root** user:

```
# vi /etc/sysconfig/network-s
```

Add a new IP address as shown below.

```
IPADDR1="192.168.2.150"
```

For other IP address, add line "IPADDR2="192.168.3.150". You can add any number of IP addresses one by one.

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Save and close the file.

Restart network service using command:

```
# systemctl restart network
```

Verify the new IP address using command:

```
# ip addr
```

Sample output:

```
1: lo: <LOOPBACK,UP,LOWER_UP>  
  link/loopback 00:00:00:00:00:00  
  inet 127.0.0.1/8 scope host  
    valid_lft forever preferred_lft  
  inet6 ::1/128 scope host  
    valid_lft forever preferred_lft  
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP>  
  link/ether 08:00:27:80:63:19  
  inet 192.168.1.150/24 brd 192.168.1.255 scope eth0  
    valid_lft forever preferred_lft  
  inet 192.168.2.150/24 brd 192.168.2.255 scope eth1  
    valid_lft forever preferred_lft  
  inet6 fe80::a00:27ff:fe80:6319 scope link  
    valid_lft forever preferred_lft
```

Similarly, add as many IPs as you want.

Assign different class IP addresses

There are five classes of available IP ranges namely: Class A, Class B, Class C, Class D, and Class E. Class A, B, and C are commonly used.

Class	Address Range	Supports
Class A	1.0.0.1 to 126.255.255.254	Supports 16 million hosts on each of 127 networks.
Class B	128.1.0.1 to 191.255.255.254	Supports 65,000 hosts on each of

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		16,000 networks.
Class C	192.0.1.1 to 223.255.254.254	Supports 254 hosts on each of 2 million networks.
Class D	224.0.0.0 to 239.255.255.255	Reserved for multicast groups.
Class E	240.0.0.0 to 254.255.255.254	Reserved for future use, or Research and Development Purposes.

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Source: <http://www.computerhope.com/jargon/i/ip.htm>

As you may noticed, I have been using Class A type addresses in this guide.

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I want to assign a different class IP, for example class A (1.0.0.0 series). Is it possible? Of course, it is.

Just add the IP address of your choice in the network card config file.

Assign different class IP addresses in Ubuntu/Debian based systems:

In DEB based systems, edit **/etc/network/interfaces** file:

```
$ sudo nano /etc/network/interfaces
```

Add the IP address:

```
iface enp0s3 inet static
address 10.0.0.105/16
```

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Assign Different Class IP Addresses In Ubuntu

Save and close the file.

Run the following command to take effect the changes.

```
$ sudo ifdown enp0s3 && sudo
```

Check if the new IP has been added using command:

```
$ ip addr
```

Sample output:

Ping the new IP address with command:

```
$ sudo ping -c 3 10.0.0.105
```

Sample output:

```
PING 10.0.0.105 (10.0.0.105):
64 bytes from 10.0.0.105: icmp: seq=1 ttl=64 time=0.042 ms
64 bytes from 10.0.0.105: icmp: seq=2 ttl=64 time=0.042 ms
64 bytes from 10.0.0.105: icmp: seq=3 ttl=64 time=0.042 ms

--- 10.0.0.105 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time=100ms
rtt min/avg/max/mdev = 0.042/0.042/0.042/0.000 ms
```

Like this way, we can add multiple IPs to single Network card in Ubuntu, Debian and derivatives like Linux Mint, and Elementary OS etc.

Assign different class IP addresses in CentOS/RHEL /Scientific Linux based systems:

Edit network card configuration file as **root** user:

```
# vi /etc/sysconfig/network-scripts/ifcfg-eth0
```

Add a new IP address as shown below. Please note that you must add correct prefix (netmask) for each class IP range.

Let us add a class A type IP. for example 10.0.0.150.

```
IPADDR2="10.0.0.150"
[...]
```

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```
PREFIX2=16
```

Make sure the IPADDR number (IPADDR²) and PREFIX number (PREFIX²) are same for each network.

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Assign Different Class IP Addresses In CentOS

Save and close the file. Restart network service to take effect the changes.

```
# systemctl restart network
```

Check the new IP using command:

```
# ip addr
```

Sample output:

```
1: lo: <LOOPBACK,UP,LOWER_UP>  
   link/loopback 00:00:00:00:00:00  
   inet 127.0.0.1/8 scope host  
     valid_lft forever preferred_  
   inet6 ::1/128 scope host  
     valid_lft forever preferred_  
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP>  
   link/ether 08:00:27:80:63:19  
   inet 192.168.1.150/24 brd 192.168.1.255 scope eth0  
     valid_lft forever preferred_  
   inet 192.168.2.150/24 brd 192.168.2.255 scope eth0
```

```
valid_lft forever preferred_  
inet 10.0.0.150/16 brd 10.25  
valid_lft forever preferred_  
inet6 fe80::a00:27ff:fe80:63  
valid_lft forever preferred_
```

Let us ping the IP:

```
# ping -c 3 10.0.0.150
```

Sample output:

```
PING 10.0.0.150 (10.0.0.150)  
64 bytes from 10.0.0.150: icr  
64 bytes from 10.0.0.150: icr  
64 bytes from 10.0.0.150: icr  
  
--- 10.0.0.150 ping statistic  
3 packets transmitted, 3 rece  
rtt min/avg/max/mdev = 0.097/
```



The new IP address has been added and it's working. No need to buy a new card, do some complex router configuration, or anything. Using this method, we can easily add multiple different IP series in minutes.

Recommended Read:

- [How to change MAC address in Linux](#)

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AlekseyShi © August 10, 2016 at 8:06 pm

My solution to make multiple addresses.

1. With netctl

```
[root@localhost ~]# pacman -S netctl
[root@localhost ~]# cp /etc/netctl/examples/ethernet-static /etc/netctl/enp3s0
Description='A basic static ethernet connection'
Interface=enp3s0
Connection=ethernet
IP=static
Address=('192.168.0.23/24' '192.168.3.23/24')
Routes=('192.168.0.0/16 via 192.168.3.1')
Gateway='192.168.0.1'
DNS=('192.168.0.1')
## For IPv6 autoconfiguration
#IP6=stateless
## For IPv6 static address configuration
#IP6=static
#Address6=('1234:5678:9abc:def::1/64'
'1234:3456::123/96')
#Routes6=('abcd::1234')
#Gateway6='1234:0:123::abcd'
[root@localhost ~]# netctl start enp3s0
[root@localhost ~]# netctl status enp3s0
```

2. With nmcli

```
[root@localhost ~]# nmcli connection add con-name
myEthernet ifname net0 autoconnect no type ethernet
ip4 192.168.0.64/24 gw4 192.168.0.1
```

...

```
root@localhost qq]# nmcli connection modify
```

```
myEthernet +ipv4.addresses 192.168.3.64/24
root@localhost qq]# nmcli c mod myEthernet
ipv4.routes '192.168.0.0/16 192.168.3.1'
root@localhost qq]# nmcli connection up myEthernet
root@localhost qq]# nmcli connection show
myEthernet
```

Reply



SK © November 14, 2016 at 6:44 am

Thanks for sharing.

Reply



Anders Jackson © November 14, 2016 at 12:13 am

192.168.0.0/16 are not a A class IP-V4 address, it is a C-class.

So, instead of guessing wrong, use the command sipcalc(1) or ipcalc(1) to calculate the proper masks and ip addresses.

```
$ sudo apt-get install sipcalc
```

```
$ sipcalc 192.168.1.1/24
```

```
-[ipv4 : 192.168.1.1/24] - 0
```

```
[CIDR]
```

```
Host address - 192.168.1.1
```

```
Host address (decimal) - 3232235777
```

```
Host address (hex) - C0A80101
```

```
Network address - 192.168.1.0
```

```
Network mask - 255.255.255.0
```

```
Network mask (bits) - 24
```

```
Network mask (hex) - FFFFFFF0
```

```
Broadcast address - 192.168.1.255
```

```
Cisco wildcard - 0.0.0.255
```

```
Addresses in network - 256
```

```
Network range - 192.168.1.0 - 192.168.1.255
```

```
Usable range - 192.168.1.1 - 192.168.1.254
```

```
-
```

```
$ sipcalc 192.168.1.1 255.255.255.0
```

```
-[ipv4 : 192.168.1.1 255.255.255.0] - 0
```

```
[CIDR]
```

```
Host address - 192.168.1.1
```

```
Host address (decimal) - 3232235777
```

```
Host address (hex) - C0A80101
```

```
Network address - 192.168.1.0
```

```
Network mask - 255.255.255.0
```

```
Network mask (bits) - 24
```

```
Network mask (hex) - FFFFFFF0
```

```
Broadcast address - 192.168.1.255
```

```
Cisco wildcard - 0.0.0.255
```

```
Addresses in network - 256
```

```
Network range - 192.168.1.0 - 192.168.1.255
```

```
Usable range - 192.168.1.1 - 192.168.1.254
```

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–
\$ echo "Also try different options, like -c"

And use IPv6 instead of IPv4, as IPv6 is supposed to handle many addresses in all machines. IPv4 not so much.

Reply



SK © November 14, 2016 at 6:43 am

Great stuff. Thank you.

Reply



Mark © July 17, 2018 at 7:35 am

Ah. I wondered about that. The article was saying the IPs were A and the table saying C.

Reply



Jordi © July 20, 2018 at 9:54 am

Nmcli is the way to go for Centos, Fedora, RHEL7 and above. The ifconfig command has been deprecated. It will not show up interface device aliases and etc...

So make sure NetworkManager service is running, or start it. Then check the full device interface configuration.

```
Systemctl start NetworkManager
```

```
Nmcli con show enp0s3
```

Furthermore, with nmcli you can also script an IP address change remotely, change hostnames, assign connections SSID and passwords for wireless networks and more.

Nmcli is definitely an efficient solution in the enterprise world

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