

Configure Linux ip address with ifconfig command

Linux ifconfig command is used to setup a network interface card (NIC). It means we can use ifconfig command to configure ip address, netmask and gateway for the card. The ifconfig command is also used to configure or tuning the network interface card such as changing the ip address or assigning ip alias, protocol, parameter and other options. We can also use ifconfig command to view network interface card's status and to activate or deactivate the interface driver.

User need to have root privileged in order to use the ifconfig command. So, switch to root by issuing su command. For a Ubuntu Linux add a sudo before the ifconfig command.

ifconfig's syntax to configure ip address, netmask and to activate or deactivate network interface card:

ifconfig <interface> <ip address> netmask <netmask ip> up/down

Where:

<interface> = Network interface card (eth0, eth1, etc)

<ip address> = NIC ip address (i.e. 192.168.1.5)

<netmask ip> = netmask ip (i.e. 255.255.255.0)

up/down = Choose up to activate and down to deactivate.

Example:

ifconfig eth0 192.168.1.5 netmask 255.255.255.0 up

Simple way to configure Linux ip address

ifconfig's syntax:

ifconfig [interface] [ip address] [option]

Use ifconfig command to change ip address of the first network interface card example:

ifconfig eth0 192.168.1.5

Use ifconfig command to change ip address of the second network interface card example:

ifconfig eth1 10.21.35.5

Use ifconfig command to change netmask of the first network interface card example:

ifconfig eth0 netmask 255.255.255.0

Use ifconfig command to change netmask of the second network interface card example:

ifconfig eth0 netmask 255.255.255.0

Example on how to bring up the first network interface card using Linux ifconfig command:

ifconfig eth0 192.168.1.5 up

Example on how to bring down the first network interface card using Linux ifconfig command:
ifconfig eth0 down

netstat command

Linux netstat command is another useful network utility in Linux. We can use netstat to list network connections, view routing table and information about network interface. The netstat command has been one of useful tools for network troubleshooting. This tutorial is a basic guide to the netstat command with usage examples to help the new Linux beginner.

Linux netstat command examples

The syntax for netstat command is:

netstat <option>

Below are the common options used with netstat command:

-a	Lists all listening and non-listening sockets.
-i	Displays statistics for your network interfaces.
-l	Lists listening sockets.
-s	Displays summary information for each protocol.
-r	Displays your routing table.

Lists all listening and non-listening sockets using netstat command with **-a** option:

```
root@slackware:~# netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp      0      0 *:time                  *:                       LISTEN
tcp      0      0 *:netbios-ssn          *:                       LISTEN
tcp      0      0 *:auth                  *:                       LISTEN
tcp      0      0 slackware.example.c:domain *:                       LISTEN
tcp      0      0 localhost:domain      *:                       LISTEN
tcp      0      0 *:ssh                   *:                       LISTEN
tcp      0      0 localhost:rndc         *:                       LISTEN
tcp      0      0 *:microsoft-ds         *:                       LISTEN
tcp      0      52 slackware.example.com:ssh 192.168.1.6:1320      ESTABLISHED
tcp6     0      0 [::]:ssh               [::]:*                  LISTEN
tcp6     0      0 :::1%8191:rndc         [::]:*                  LISTEN
...
...
...
```

Displays statistics for Linux network interfaces using netstat command with **-i** option:

```
root@slackware:~# netstat -i
Kernel Interface table
Iface    MTU Met  RX-OK RX-ERR RX-DRP RX-OVR    TX-OK TX-ERR TX-DRP TX-OVR Flg
eth0      1500 0      156   0      0 0      128   0      0 0
BMRU
lo        16436 0      17    0      0 0      17    0      0 0 LRU
root@slackware:~#
```

Lists listening sockets using netstat command with **-l** option:

```
root@slackware:~# netstat -l
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp    0      0 *:time                  *:*                     LISTEN
tcp    0      0 *:netbios-ssn          *:*                     LISTEN
tcp    0      0 *:auth                  *:*                     LISTEN
tcp    0      0 slackware.example.c:domain *:*                     LISTEN
tcp    0      0 localhost:domain       *:*                     LISTEN
tcp    0      0 *:ssh                   *:*                     LISTEN
tcp    0      0 localhost:rndc          *:*                     LISTEN
tcp    0      0 *:microsoft-ds         *:*                     LISTEN
tcp6   0      0 [::]:ssh                [::]:*                  LISTEN
tcp6   0      0 :::1%8191:rndc         [::]:*                  LISTEN
udp    0      0 *:biff                  *:*                     LISTEN
udp    0      0 slackware.examp:netbios-ns *:*                     LISTEN
udp    0      0 *:netbios-ns           *:*                     LISTEN
udp    0      0 slackware.exam:netbios-dgm *:*                     LISTEN
udp    0      0 *:netbios-dgm          *:*                     LISTEN
udp    0      0 *:time                  *:*                     LISTEN
udp    0      0 *:48176                 *:*                     LISTEN
udp    0      0 slackware.example.c:domain *:*                     LISTEN
udp    0      0 localhost:domain       *:*                     LISTEN
udp6   0      0 [::]:50273              [::]:*                  LISTEN
Active UNIX domain sockets (only servers)
Proto RefCnt Flags       Type       State         I-Node  Path
unix  2      [ ACC ]    STREAM    LISTENING    7941    /dev/gpmctl
unix  2      [ ACC ]    STREAM    LISTENING    7064    @/var/run/hald/dbus-
hPhDf9IKkl
unix  2      [ ACC ]    STREAM    LISTENING    7067    @/var/run/hald/dbus-
QrEWsd14tf
unix  2      [ ACC ]    STREAM    LISTENING    7037    /var/run/dbus/system_bus_socket
unix  2      [ ACC ]    STREAM    LISTENING    7003    /var/run/acpid.socket
root@slackware:~#
```

Displays summary information for each protocol using netstat command with **-s** option:

```
root@slackware:~# netstat -s
Ip:
  263 total packets received
  0 forwarded
```

```
0 incoming packets discarded
243 incoming packets delivered
210 requests sent out
Icmp:
  5 ICMP messages received
  0 input ICMP message failed.
  ICMP input histogram:
    destination unreachable: 3
    echo replies: 2
  2 ICMP messages sent
  0 ICMP messages failed
  ICMP output histogram:
    echo request: 2
IcmpMsg:
  InType0: 2
  InType3: 3
  OutType8: 2
Tcp:
  2 active connections openings
  1 passive connection openings
  2 failed connection attempts
  0 connection resets received
  1 connections established
  175 segments received
  152 segments send out
  0 segments retransmited
  0 bad segments received.
  2 resets sent
Udp:
  63 packets received
  0 packets to unknown port received.
  0 packet receive errors
  56 packets sent
UdpLite:
TcpExt:
  1 delayed acks further delayed because of locked socket
  1 packets directly queued to recvmsg prequeue.
  1 bytes directly received in process context from prequeue
  24 packet headers predicted
  95 acknowledgments not containing data payload received
  2 predicted acknowledgments
IpExt:
  InBcastPkts: 37
  OutBcastPkts: 25
root@slackware:~#
```

Displays Linux routing table using netstat command with **-r** option:

```
root@slackware:~# netstat -r
Kernel IP routing table
Destination Gateway Genmask Flags MSS Window irtt Iface
localnet * 255.255.255.0 U 0 0 0 eth0
```

```
loopback * 255.0.0.0 U 0 0 0 lo
default 192.168.1.1 0.0.0.0 UG 0 0 0 eth0
```

Linux route command description and examples

Besides Linux ifconfig command, the Linux route command is another important network commands every Linux user should know. The route command can be used to add or modify a static route and a default gateway in the Linux or Unix system. As specify in the Linux Programmer's Manual, Linux route command shows or manipulate the IP routing table. The IP stated is the Internet Protocol (ip address, netmask, gateway) which has been set during configuring network interface card (NIC) in the Linux ifconfig tutorial earlier.

The Linux route command comes with many options but most network administrators familiar with add and del options. The route add command is used to add a new route while the route del command is to delete a route.

The route add syntax:

```
route add net < ip address > netmask < netmask ip > dev < interface >
```

Where:

< ip address > is network interface card ip address

< netmask ip > ip netmask such 255.255.255.0

Interface = eth0, eth1, eth2, etc

The route del syntax:

```
route del net < ip address > netmask < netmask ip > dev <interface >
```

Where:

<ip address > is network interface card ip address

<netmask ip > ip netmask such 255.255.255.0

Interface = eth0, eth1, eth2, etc

Linux ping command

The ping command is famous not only in Linux system but windows as well. Normally, it is used to check network connection between two hosts. However, ping offers many options in linux. The ping manual is a good tutorial, make sure you read it.

Ok now let's check our network interface with ping. We can try pinging our gateway router if we already in the network but if in standalone pc, ping our own NIC just for practice and look how things work.

The ping format is ping <option> <target ip>:

```
root@hitam:~# ping -c3 192.168.1.5
PING 192.168.1.5 (192.168.1.5) 56(84) bytes of data.
 64 bytes from 192.168.1.5: icmp_seq=1    ttl=64 time=0.200 ms
 64 bytes from 192.168.1.5: icmp_seq=2    ttl=64 time=0.287 ms
 64 bytes from 192.168.1.5: icmp_seq=3    ttl=64 time=0.290 ms
--- 192.168.1.5 ping statistics ---
 3 packets transmitted, 3 received, 0% packet loss, time
1998ms
rtt min/avg/max/mdev = 0.200/0.259/0.290/0.041 ms
root@hitam:~#
```

In the example above, we use ping command with c3 which means we ping to count and print output three times only.