LINUX COMMANDS / NETWORKING COMMANDS 0

A Linux Sysadmin's Guide to Network Management, Troubleshooting and Debugging

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20 Linux YUM (Yellowdog Updater, Modified) Commands

and managing servers and networks within data centers. There are numerous tools and utilities in Linux designed for the administrative purposes.

In this article, we will review some of the most used command-line tools and utilities for network management in Linux, under different categories. We will explain some common usage examples, which will make network management much easier in Linux.

Table of Contents

This list is equally useful to full-time network engineers.

Network Configuration, Troubleshooting and Debugging Tools

1. ifconfig Command

ifconfig is a command line interface tool for network interface configuration and also used to initialize an interfaces at system boot time. Once a server is up and running, it can be used to assign an IP Address to an interface and enable or disable the interface on demand.

It is also used to view the status IP Address, Hardware / MAC address, as well as MTU (Maximum Transmission Unit) size of the currently active interfaces. ifconfig is thus useful for debugging or performing system tuning.

Here is an example to display status of all active network interfaces

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```
enp1s0    Link encap:Ethernet  HWaddr 28:d2:44:eb:bd:98
inet addr:192.168.0.103  Bcast:192.168.0.255  Mask:255.255.255.0
inet6 addr: fe80::8f0c:7825:8057:5eec/64 Scope:Link
UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
RX packets:169854 errors:0 dropped:0 overruns:0 frame:0
TX packets:125995 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1000
RX bytes:174146270 (174.1 MB)  TX bytes:21062129 (21.0 MB)
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:15793 errors:0 dropped:0 overruns:0 frame:0
TX packets:15793 errors:0 dropped:0 overruns:0 carrier:0
collisions:0 txqueuelen:1
RX bytes:2898946 (2.8 MB)  TX bytes:2898946 (2.8 MB)
```

To list all interfaces which are currently available, whether **up** or **down**, use the `-a` flag.

```
$ ifconfig -a
```

To assign an IP address to an interface, use the following command.

```
$ sudo ifconfig eth0 192.168.56.5 netmask 255.255.255.0
```

To activate an network interface, type.

```
$ sudo ifconfig up eth0
```

To deactivate or shut down an network interface, type.

```
$ sudo ifconfig down eth0
```

Note: Although **ifconfig** is a great tool, it is now obsolete (deprecated), its replacement is **ip command** which is explained below.

2. IP Command

ip command is another useful command line utility for displaying and manipulating routing, network devices, interfaces. It is a replacement for **ifconfig** and many other networking commands. (Read our article "What's Difference Between ifconfig and ip Command" to learn more about it.)

The following command will show the IP address and other information about an network

```
$ ip addr show
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group def
link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
inet 127.0.0.1/8 scope host lo
valid_lft forever preferred_lft forever
inet6 ::1/128 scope host
valid_lft forever preferred_lft forever
2: enp1s0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state
link/ether 28:d2:44:eb:bd:98 brd ff:ff:ff:ff:ff:ff
inet 192.168.0.103/24 brd 192.168.0.255 scope global dynamic enp1s0
valid_lft 5772sec preferred_lft 5772sec
inet6 fe80::8f0c:7825:8057:5eec/64 scope link
valid_lft forever preferred_lft forever
3: wlp2s0: <BROADCAST,MULTICAST> mtu 1500 qdisc noop state DOWN group default
link/ether 38:b1:db:7c:78:c7 brd ff:ff:ff:ff:ff:ff
...
```

To temporarily assign IP Address to a specific network interface (eth0), type.

```
$ sudo ip addr add 192.168.56.1 dev eth0
```

To remove an assigned IP address from an network interface (eth0), type.

```
$ sudo ip addr del 192.168.56.15/24 dev eth0
```

To show the current neighbour table in kernel, type.

```
$ ip neigh
192.168.0.1 dev enp1s0 lladdr 10:fe:ed:3d:f3:82 REACHABLE
```

3. ifup, ifdown, and ifquery command

ifup command actives a network interface, making it available to transfer and receive data.

```
$ sudo ifup eth0
```

ifdown command disables a network interface, keeping it in a state where it cannot transfer or receive data.

```
$ sudo ifdown eth0
```

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receive answers to query about how it is currently configured.

```
$ sudo ifquery eth0
```

4. Ethtool Command

ethtool is a command line utility for querying and modifying network interface controller parameters and device drivers. The example below shows the usage of **ethtool** and a command to view the parameters for the network interface.

```
$ sudo ethtool enp0s3
Settings for enp0s3:
Supported ports: [ TP ]
Supported link modes:   10baseT/Half 10baseT/Full
100baseT/Half 100baseT/Full
1000baseT/Full
Supported pause frame use: No
Supports auto-negotiation: Yes
Advertised link modes:  10baseT/Half 10baseT/Full
100baseT/Half 100baseT/Full
1000baseT/Full
Advertised pause frame use: No
Advertised auto-negotiation: Yes
Speed: 1000Mb/s
Duplex: Full
Port: Twisted Pair
PHYAD: 0
Transceiver: internal
Auto-negotiation: on
MDI-X: off (auto)
Supports Wake-on: umbg
Wake-on: d
Current message level: 0x00000007 (7)
drv probe link
Link detected: yes
```

5. Ping Command

ping (**Packet INternet Groper**) is a utility normally used for testing connectivity between two systems on a network (**Local Area Network** (**LAN**) or **Wide Area Network** (**WAN**)). It use **ICMP** (**Internet Control Message Protocol**) to communicate to nodes on a network.

To test connectivity to another node, simply provide its IP or host name, for example.

```
$ ping 192.168.0.103
PING 192.168.0.103 (192.168.0.103) 56(84) bytes of data.
64 bytes from 192.168.0.103: icmp_seq=1 ttl=64 time=0.191 ms
64 bytes from 192.168.0.103: icmp_seq=2 ttl=64 time=0.156 ms
64 bytes from 192.168.0.103: icmp_seq=3 ttl=64 time=0.179 ms
64 bytes from 192.168.0.103: icmp_seq=4 ttl=64 time=0.182 ms
```

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```
^C
--- 192.168.0.103 ping statistics ---
6 packets transmitted, 6 received, 0% packet loss, time 5099ms
rtt min/avg/max/mdev = 0.156/0.178/0.207/0.023 ms
```

You can also tell ping to exit after a specified number of ECHO_REQUEST packets, using the -c flag as shown.

```
$ ping -c 4 192.168.0.103
PING 192.168.0.103 (192.168.0.103) 56(84) bytes of data.
64 bytes from 192.168.0.103: icmp_seq=1 ttl=64 time=1.09 ms
64 bytes from 192.168.0.103: icmp_seq=2 ttl=64 time=0.157 ms
64 bytes from 192.168.0.103: icmp_seq=3 ttl=64 time=0.163 ms
64 bytes from 192.168.0.103: icmp_seq=4 ttl=64 time=0.190 ms
--- 192.168.0.103 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3029ms
rtt min/avg/max/mdev = 0.157/0.402/1.098/0.402 ms
```

6. Traceroute Command

Traceroute is a command line utility for tracing the full path from your local system to another network system. It prints number of hops (router IP's) in that path you travel to reach the end server. It is an easy-to-use network troubleshooting utility after ping command.

In this example, we are tracing the route packets take from the local system to one of Google's servers with IP address 216.58.204.46.

```
$ traceroute 216.58.204.46
traceroute to 216.58.204.46 (216.58.204.46), 30 hops max, 60 byte packets
1  gateway (192.168.0.1)  0.487 ms  0.277 ms  0.269 ms
2  5.5.5.215 (5.5.5.215)  1.846 ms  1.631 ms  1.553 ms
3  * * *
4  72.14.194.226 (72.14.194.226)  3.762 ms  3.683 ms  3.577 ms
5  108.170.248.179 (108.170.248.179)  4.666 ms 108.170.248.162 (108.170.248.1
6  72.14.235.133 (72.14.235.133)  72.443 ms 209.85.241.175 (209.85.241.175)
7  66.249.94.140 (66.249.94.140)  128.726 ms  127.506 ms 209.85.248.5 (209.85
8  74.125.251.181 (74.125.251.181)  127.219 ms 108.170.236.124 (108.170.236.1
9  216.239.49.134 (216.239.49.134)  236.906 ms 209.85.242.80 (209.85.242.80)
10  209.85.251.138 (209.85.251.138)  252.002 ms 216.239.43.227 (216.239.43.22
11  216.239.43.227 (216.239.43.227)  251.452 ms 72.14.234.8 (72.14.234.8)  27
12  209.85.250.9 (209.85.250.9)  274.521 ms  274.450 ms 209.85.253.249 (209.8
13  209.85.250.9 (209.85.250.9)  269.147 ms 209.85.254.244 (209.85.254.244)
14  64.233.175.112 (64.233.175.112)  344.852 ms 216.239.57.236 (216.239.57.23
15  108.170.246.129 (108.170.246.129)  345.054 ms  345.342 ms 64.233.175.112
16  108.170.238.119 (108.170.238.119)  345.610 ms 108.170.246.161 (108.170.24
17  lhr25s12-in-f46.1e100.net (216.58.204.46)  345.382 ms  345.031 ms  344.88
```

7. MTR Network Diagnostic Tool

of **ping** and **traceroute** into a single diagnostic tool. Its output is updated in real-time, by default until you exit the program by pressing `q`.

The easiest way of running **mtr** is to provide it a host name or IP address as an argument, as follows.

```
$ mtr google.com
OR
$ mtr 216.58.223.78
```

Sample Output

```
tecmint.com (0.0.0.0)                                  Thu Jul 12 08:58:27 2
First TTL: 1
Host                                                 Loss%   Snt   Last   A
1. 192.168.0.1                                       0.0%    41    0.5   0.
2. 5.5.5.215                                         0.0%    40    1.9   1.
3. 209.snat-111-91-120.hns.net.in                    23.1%    40    1.9   2
4. 72.14.194.226                                     0.0%    40   89.1   5.
5. 108.170.248.193                                   0.0%    40    3.0   4.
6. 108.170.237.43                                    0.0%    40    2.9   5.
7. bom07s10-in-f174.1e100.net                        0.0%    40    2.6   6.
```

You can limit the number of **pings** to a specific value and exit **mtr** after those pings, using the `-c` flag as shown.

```
$ mtr -c 4 google.com
```

8. Route Command

route is a command line utility for displaying or manipulating the IP routing table of a Linux system. It is mainly used to configure static routes to specific hosts or networks via an interface.

You can view Kernel IP routing table by typing.

```
$ route
Destination     Gateway         Genmask         Flags Metric Ref    Use Iface
default         gateway         0.0.0.0         UG    100    0        0 enp0s
192.168.0.0     0.0.0.0         255.255.255.0   U     100    0        0 enp0s
192.168.122.0   0.0.0.0         255.255.255.0   U     0      0        0 virbr
```

There are numerous commands you can use to configure routing. Here are some useful ones:

```
$ sudo route add default gw <gateway-ip>
```

Add a network route to the routing table.

```
$ sudo route add -net <network ip/cidr> gw <gateway ip> <interface>
```

Delete a specific route entry from the routing table.

```
$ sudo route del -net <network ip/cidr>
```

9. Nmcli Command

Nmcli is an easy-to-use, scriptable command-line tool to report network status, manage network connections, and control the NetworkManager.

To view all your network devices, type.

```
$ nmcli dev status
DEVICE      TYPE      STATE      CONNECTION
virbr0      bridge    connected  virbr0
enp0s3      ethernet  connected  Wired connection 1
```

To check network connections on your system, type.

```
$ nmcli con show
Wired connection 1  bc3638ff-205a-3bbb-8845-5a4b0f7eef91  802-3-ethernet  enp
virbr0              00f5d53e-fd51-41d3-b069-bdfd2dde062b  bridge          vir
```

To see only the active connections, add the `-a` flag.

```
$ nmcli con show -a
```

Network Scanning and Performance Analysis Tools

10. Netstat Command

netstat is a command line tool that displays useful information such as network connections, routing tables, interface statistics, and much more, concerning the Linux networking subsystem. It is useful for network troubleshooting and performance analysis.

programs are listening on what ports. For instance, the following command will show all TCP ports in listening mode and what programs are listening on them.

```
$ sudo netstat -tnlp
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 0.0.0.0:587             0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:5003          0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:110             0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:143             0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:111             0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:465             0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:53              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:21              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:631           0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:25              0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:8090            0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:993             0.0.0.0:*               LISTEN
tcp        0      0 0.0.0.0:995             0.0.0.0:*               LISTEN
tcp6       0      0 :::3306                 :::*                    LISTEN
tcp6       0      0 :::3307                 :::*                    LISTEN
tcp6       0      0 :::587                  :::*                    LISTEN
tcp6       0      0 :::110                  :::*                    LISTEN
tcp6       0      0 :::143                  :::*                    LISTEN
tcp6       0      0 :::111                  :::*                    LISTEN
tcp6       0      0 :::80                   :::*                    LISTEN
tcp6       0      0 :::465                  :::*                    LISTEN
tcp6       0      0 :::53                   :::*                    LISTEN
tcp6       0      0 :::21                   :::*                    LISTEN
tcp6       0      0 :::22                   :::*                    LISTEN
tcp6       0      0 ::1:631                 :::*                    LISTEN
tcp6       0      0 :::25                   :::*                    LISTEN
tcp6       0      0 :::993                  :::*                    LISTEN
tcp6       0      0 :::995                  :::*                    LISTEN
```

To view kernel routing table, use the `-r` flag (which is equivalent to running **route** command above).

```
$ netstat -r
Destination     Gateway         Genmask         Flags   MSS Window  irtt Ifac
default         gateway         0.0.0.0         UG        0 0          0 enp0
192.168.0.0     0.0.0.0         255.255.255.0   U         0 0          0 enp0
192.168.122.0   0.0.0.0         255.255.255.0   U         0 0          0 virb
```

Note: Although Netstat is a great tool, it is now obsolete (deprecated), its replacement is **ss command** which is explained below.

11. ss Command

ss (**socket statistics**) is a powerful command line utility to investigate sockets. It dumps socket statistics and displays information similar to **netstat**. In addition, it shows more

The following example show how to list all **TCP** ports (**sockets**) that are open on a server.

```
$ ss -ta
State      Recv-Q Send-Q                                        Local Address
LISTEN     0      100                                                   *
LISTEN     0      128                                               127.0.0.1
LISTEN     0      100                                                   *
LISTEN     0      100                                                   *
LISTEN     0      128                                                   *
LISTEN     0      100                                                   *
LISTEN     0      128                                                   *
LISTEN     0      9                                                     *
LISTEN     0      128                                                   *
LISTEN     0      128                                               127.0.0.1
LISTEN     0      100                                                   *
LISTEN     0      128                                                   *
LISTEN     0      100                                                   *
LISTEN     0      100                                                   *
ESTAB      0      0                                             192.168.0.104
ESTAB      0      0                                                 127.0.0.1
ESTAB      0      0                                                 127.0.0.1
ESTAB      0      0                                                 127.0.0.1
ESTAB      0      0                                                 127.0.0.1
LISTEN     0      80                                                    ::
...
```

To display all active **TCP** connections together with their timers, run the following command.

```
$ ss -to
```

12 NC Command

NC (NetCat) also referred to as the "**Network Swiss Army knife**", is a powerful utility used for almost any task related to TCP, UDP, or UNIX-domain sockets. It is used open TCP connections, listen on arbitrary TCP and UDP ports, perform port scanning plus more.

You can also use it as a simple TCP proxies, for network daemon testing, to check if remote ports are reachable and much more. Furthermore, you can employ **nc** together with pv command to transfer files between two computers.

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The following example, will show how to scan a list of ports.

```
$ nc -zv server2.tecmint.lan 21 22 80 443 3000
```

You can also specify a range of ports as shown.

```
$ nc -zv server2.tecmint.lan 20-90
```

The following example shows how to use **nc** to open a TCP connection to port **5000** on **server2.tecmint.lan**, using port **3000** as the source port, with a timeout of **10** seconds.

```
$ nc -p 3000 -w 10 server2.tecmint.lan 5000
```

13. Nmap Command

Nmap (**Network Mapper**) is a powerful and extremely versatile tool for Linux system/network administrators. It is used gather information about a single host or explore networks an entire network. Nmap is also used to perform security scans, network audit and finding open ports on remote hosts and so much more.

You can scan a host using its host name or IP address, for instance.

```
$ nmap google.com
Starting Nmap 6.40 ( http://nmap.org ) at 2018-07-12 09:23 BST
Nmap scan report for google.com (172.217.166.78)
Host is up (0.0036s latency).
rDNS record for 172.217.166.78: bom05s15-in-f14.1e100.net
Not shown: 998 filtered ports
PORT    STATE SERVICE
80/tcp  open  http
443/tcp open  https
Nmap done: 1 IP address (1 host up) scanned in 4.92 seconds
```

Alternatively, use an IP address as shown.

```
$ nmap 192.168.0.103
```

```
Host is up (0.000051s latency).
Not shown: 994 closed ports
PORT     STATE SERVICE
22/tcp   open  ssh
25/tcp   open  smtp
902/tcp  open  iss-realsecure
4242/tcp open  vrml-multi-use
5900/tcp open  vnc
8080/tcp open  http-proxy
MAC Address: 28:D2:44:EB:BD:98 (Lcfc(hefei) Electronics Technology Co.)
Nmap done: 1 IP address (1 host up) scanned in 0.13 seconds
```

Read our following useful articles on nmap command.

- How to Use Nmap Script Engine (NSE) Scripts in Linux
- A Practical Guide to Nmap (Network Security Scanner) in Kali Linux
- Find Out All Live Hosts IP Addresses Connected on Network in Linux

DNS Lookup Utilities

14. host Command

host command is a simple utility for carrying out DNS lookups, it translates host names to IP addresses and vice versa.

```
$ host google.com
google.com has address 172.217.166.78
google.com mail is handled by 20 alt1.aspmx.l.google.com.
google.com mail is handled by 30 alt2.aspmx.l.google.com.
google.com mail is handled by 40 alt3.aspmx.l.google.com.
google.com mail is handled by 50 alt4.aspmx.l.google.com.
google.com mail is handled by 10 aspmx.l.google.com.
```

15. dig Command

dig (domain information groper) is also another simple DNS lookup utility, that is used to query DNS related information such as A Record, CNAME, MX Record etc, for example:

```
$ dig google.com
; <<>> DiG 9.9.4-RedHat-9.9.4-51.el7 <<>> google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 23083
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 13, ADDITIONAL: 14
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;google.com.                    IN      A
;; ANSWER SECTION:
google.com.             72      IN      A       172.217.166.78
```

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```
com.                    13482   IN      NS      d.gtld-servers.net.
com.                    13482   IN      NS      e.gtld-servers.net.
com.                    13482   IN      NS      f.gtld-servers.net.
com.                    13482   IN      NS      g.gtld-servers.net.
com.                    13482   IN      NS      h.gtld-servers.net.
com.                    13482   IN      NS      i.gtld-servers.net.
com.                    13482   IN      NS      j.gtld-servers.net.
com.                    13482   IN      NS      k.gtld-servers.net.
com.                    13482   IN      NS      l.gtld-servers.net.
com.                    13482   IN      NS      m.gtld-servers.net.
com.                    13482   IN      NS      a.gtld-servers.net.
com.                    13482   IN      NS      b.gtld-servers.net.
;; ADDITIONAL SECTION:
a.gtld-servers.net.     81883   IN      A       192.5.6.30
b.gtld-servers.net.     3999    IN      A       192.33.14.30
c.gtld-servers.net.     14876   IN      A       192.26.92.30
d.gtld-servers.net.     85172   IN      A       192.31.80.30
e.gtld-servers.net.     95861   IN      A       192.12.94.30
f.gtld-servers.net.     78471   IN      A       192.35.51.30
g.gtld-servers.net.     5217    IN      A       192.42.93.30
h.gtld-servers.net.     111531  IN      A       192.54.112.30
i.gtld-servers.net.     93017   IN      A       192.43.172.30
j.gtld-servers.net.     93542   IN      A       192.48.79.30
k.gtld-servers.net.     107218  IN      A       192.52.178.30
l.gtld-servers.net.     6280    IN      A       192.41.162.30
m.gtld-servers.net.     2689    IN      A       192.55.83.30
;; Query time: 4 msec
;; SERVER: 192.168.0.1#53(192.168.0.1)
;; WHEN: Thu Jul 12 09:30:57 BST 2018
;; MSG SIZE  rcvd: 487
```

16. NSLookup Command

Nslookup is also a popular command line utility to query DNS servers both interactively and non-interactively. It is used to query DNS resource records (RR). You can find out "A" record (IP address) of a domain as shown.

```
$ nslookup google.com
Server:         192.168.0.1
Address:        192.168.0.1#53
Non-authoritative answer:
Name:   google.com
Address: 172.217.166.78
```

You can also perform a reverse domain lookup as shown.

```
$ nslookup 216.58.208.174
Server:         192.168.0.1
Address:        192.168.0.1#53
Non-authoritative answer:
174.208.58.216.in-addr.arpa     name = lhr25s09-in-f14.1e100.net.
174.208.58.216.in-addr.arpa     name = lhr25s09-in-f174.1e100.net.
Authoritative answers can be found from:
```

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```
in-addr.arpa    nameserver = a.in-addr-servers.arpa.
in-addr.arpa    nameserver = b.in-addr-servers.arpa.
in-addr.arpa    nameserver = c.in-addr-servers.arpa.
in-addr.arpa    nameserver = d.in-addr-servers.arpa.
a.in-addr-servers.arpa  internet address = 199.180.182.53
b.in-addr-servers.arpa  internet address = 199.253.183.183
c.in-addr-servers.arpa  internet address = 196.216.169.10
d.in-addr-servers.arpa  internet address = 200.10.60.53
e.in-addr-servers.arpa  internet address = 203.119.86.101
f.in-addr-servers.arpa  internet address = 193.0.9.1
```

Linux Network Packet Analyzers

17. Tcpdump Command

Tcpdump is a very powerful and widely used command-line network sniffer. It is used to capture and analyze TCP/IP packets transmitted or received over a network on a specific interface.

To capture packets from a given interface, specify it using the `-i` option.

```
$ tcpdump -i eth1
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on enp0s3, link-type EN10MB (Ethernet), capture size 262144 bytes
09:35:40.287439 IP tecmint.com.ssh > 192.168.0.103.36398: Flags [P.], seq 415
09:35:40.287655 IP 192.168.0.103.36398 > tecmint.com.ssh: Flags [.], ack 196,
09:35:40.288269 IP tecmint.com.54899 > gateway.domain: 43760+ PTR? 103.0.168.
09:35:40.333763 IP gateway.domain > tecmint.com.54899: 43760 NXDomain* 0/1/0
09:35:40.335311 IP tecmint.com.52036 > gateway.domain: 44289+ PTR? 1.0.168.19
```

To capture a specific number of packets, use the `-c` option to enter the desired number.

```
$ tcpdump -c 5 -i eth1
```

You can also capture and save packets to a file for later analysis, use the `-w` flag to specify the output file.

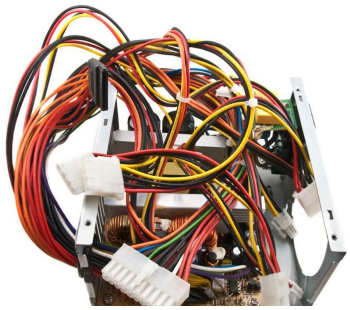
```
$ tcpdump -w captured.pacs -i eth1
```

18. Wireshark Utility

Wireshark is a popular, powerful, versatile and easy to use tool for capturing and analyzing packets in a packet-switched network, in real-time.

You can also save data it has captured to a file for later inspection. It is used by system

troubleshooting purposes.



Read our article "10 Tips On How to Use Wireshark to Analyze Network Packets to learn more about Wireshark".

19. Bmon Tool

bmon is a powerful, command line based network monitoring and debugging utility for Unix-like systems, it captures networking related statistics and prints them visually in a human friendly format. It is a reliable and effective real-time bandwidth monitor and rate estimator.

Read our article "bmon – A Powerful Network Bandwidth Monitoring and Debugging Tool to learn more about bmon".

Linux Firewall Management Tools

20. Iptables Firewall

iptables is a command line tool for configuring, maintaining, and inspecting the tables IP packet filtering and NAT ruleset. It it used to set up and manage the Linux firewall (Netfilter). It allows you to list existing packet filter rules; add or delete or modify packet filter rules; list per-rule counters of the packet filter rules.

You can learn how to use **Iptables** for various purposes from our simple yet comprehensive guides.

- Basic Guide on IPTables (Linux Firewall) Tips / Commands
- 25 Useful IPtable Firewall Rules Every Linux Administrator Should Know
- How To Setup an Iptables Firewall to Enable Remote Access to Services
- How to Block Ping ICMP Requests to Linux Systems

21. Firewalld

Firewalld is a powerful and dynamic daemon to manage the Linux firewall (Netfilter), just like **iptables**. It uses "**networks zones**" instead of INPUT, OUTPUT and FORWARD CHAINS in iptables. On current Linux distributions such as RHEL/CentOS 7 and Fedora 21+,

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To get started with **firewalld**, consult these guides listed below:

- Useful 'FirewallD' Rules to Configure and Manage Firewall in Linux
- How to Configure 'FirewallD' in RHEL/CentOS 7 and Fedora 21
- How to Start/Stop and Enable/Disable FirewallD and Iptables Firewall in Linux
- Setting Up Samba and Configure FirewallD and SELinux to Allow File Sharing on Linux/Windows

Important: **Iptables** is still supported and can be installed with YUM package manager. However, you can't use **Firewalld** and **iptables** at the same time on same server – you must choose one.

22. UFW (Uncomplicated Firewall)

UFW is a well known and default firewall configuration tool on **Debian** and **Ubuntu** Linux distributions. It is used top enable/disable system firewall, add/delete/modify/reset packet filtering rules and much more.

To check UFW firewall status, type.

```
$ sudo ufw status
```

If UFW firewall is not active, you can activate or enable it using the following command.

```
$ sudo ufw enable
```

To disable UFW firewall, use the following command.

```
$ sudo ufw disable
```

Read our article "How to Setup UFW Firewall on Ubuntu and Debian" to learn more UFW).

If you want to find more information about a particular program, you can consult its man pages as shown.

```
$ man programs_name
```

That's all for now! In this comprehensive guide, we reviewed some of the most used command-line tools and utilities for network management in Linux, under different categories, for system administrators, and equally useful to full-time network

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You can share your thoughts about this guide via the comment form below. If we have missed any frequently used and important Linux networking tools/utilities or any useful related information, also let us know.

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Aaron Kili **View all Posts**

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