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Linux Commands

List of essential Linux security commands

3 years ago • by David Adams

This tutorial shows some of the most basic Linux commands oriented to security.

Using the command netstat to find open ports:

One of the most basic commands to monitor the state of your device is **netstat** which shows the open ports and established connections.

Below an example of the **netstat** with additional options output:

```
# netstat -anp
                                                                                                                                                                                                                 PID/Program name
                                         0 127.0.0.1:5939
                                                                                                                                                                                                                 1254/teamviewerd
                                            0 127.0.0.1:25
0 192.168.43.38:37722
                                                                                                                 172.217.162.14:443
31.13.94.52:443
172.217.172.78:443
172.217.172.196:443
172.217.30.238:443
172.217.172.99:443
18.223.3.241:514
172.217.192.189:443
18.223.3.241:514
172.217.172.99:443
18.223.3.241:514
172.217.172.99:443
                                            0 192.108.43.38:46214
0 192.168.43.38:37182
0 192.168.43.38:35332
0 192.168.43.38:44964
                                                                                                                                                                                  ESTABLISHED 28326/firefox-esr
                                                                                                                                                                                ESTABLISHED 28326/firefox-esr

TIME WAIT -

ESTABLISHED 28326/firefox-esr

ESTABLISHED 28326/firefox-esr

ESTABLISHED 878/rsyslogd

ESTABLISHED 28326/firefox-esr

ESTABLISHED 28326/firefox-esr

ESTABLISHED 28326/firefox-esr

ESTABLISHED 28326/firefox-esr

ESTABLISHED 28326/firefox-esr

ESTABLISHED 28326/firefox-esr
                                     0 192.108.43.38:36172
1829 192.168.43.38:35458
0 192.168.43.38:38416
0 192.168.43.38:36149
                                      1829 192.168.43.38:35460
0 192.168.43.38:46994
                                                                                                                                                                                                                1431/exim4
5454/dhclient
                                             0 ::1:25
0 0.0.0.0:68
                                             0 0.0.0.0:68
                                                                                                                                                                                                                 2481/dhclient
                                                                                                                                                                                                                894/avahi-daemon: r
894/avahi-daemon: r
                                             0 0.0.0.0:54031
                                                                                                                  0.0.0.0:*
                                             0 0.0.0.0:5353
                                                                                                                                                                                                                894/avahi-daemon: r
888/NetworkManager
                                                                Type
STREAM
                                                                                                                                                         PID/Program name
                                                                                                                                                                                                                /tmp/.X11-unix/X0
@/tmp/.ICE-unix/1483
/tmp/ssh-z4FfepN2uFBK/age
                                                                                             LISTENING
                                                                                                                                                          1483/mate-session
```

Where:

- -a: shows the state for sockets.
- -n: shows IP addresses instead of hots.
- **-p:** shows the program establishing the conenction.

An output extract better look:

```
linuxhint@montsegur: ~
root@montsegur:~# netstat -anp
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address
                                             Foreign Address
                                                                                   PID/Program name
                                                                       State
          0
                  0 127.0.0.1:5939
                                             0.0.0.0:*
                                                                                    1254/teamviewerd
                                                                       LISTEN
          0
                  0 0.0.0.0:8084
                                             0.0.0.0:*
tcp
                                                                       LISTEN
                                                                                   933/mono
          0
                                                                                    1431/exim4
tcp
                  0 127.0.0.1:25
                                             0.0.0.0:*
                                                                       LISTEN
tcp
          0
                  0 192.168.43.38:37722
                                             172.217.162.14:443
                                                                       ESTABLISHED 28326/firefox-esr
                  0 192.168.43.38:46214
                                             31.13.94.52:443
                                                                       ESTABLISHED 28326/firefox-esr
tcp
                                                                       ESTABLISHED 28326/firefox-esr
          0
                  0 192.168.43.38:37182
                                             172.217.172.78:443
tcp
          0
                  0 192.168.43.38:35332
                                             172.217.172.106:443
                                                                       TIME WAIT
tcp
                  0 192.168.43.38:44964
                                             172.217.30.238:443
                                                                       ESTABLISHED 28326/firefox-esr
tcp
                  0 192.168.43.38:36172
                                             172.217.172.99:443
                                                                       ESTABLISHED 28326/firefox-esr
tcp
               1829 192.168.43.38:35458
                                             18.223.3.241:514
                                                                       ESTABLISHED 878/rsyslogd
tcp
          0
                  0 192.168.43.38:38416
                                             172.217.192.189:443
                                                                       ESTABLISHED 28326/firefox-esr
tcp
                  0 192.168.43.38:36140
                                             172.217.172.99:443
                                                                       ESTABLISHED 28326/firefox-esr
tcp
                                             18.223.3.241:514
          0
               1829 192.168.43.38:35460
                                                                       ESTABLISHED 878/rsyslogd
tcp
                                             172.217.172.100:443
          0
                  0 192.168.43.38:46994
                                                                       ESTABLISHED 28326/firefox-esr
tcp
                  0 192.168.43.38:42142
                                             172.217.172.69:443
                                                                       ESTABLISHED 28326/firefox-esr
          0
tcp
          0
                  0 ::1:25
                                                                       LISTEN
                                                                                    1431/exim4
tcp6
                                                                                    5454/dhclient
                  0 0.0.0.0:68
                                             0.0.0.0:*
```

The first column shows the protocol, you can see both TCP and UDP are included, the first screenshot also shows UNIX sockets. If you are suspicious that something is wrong, checking ports is of course mandatory.

Setting basic rules with UFW:

LinuxHint has published great tutorials on UFW and Iptables, here I will focus on a restrictive policy firewall. It is recommended to keep a restrictive policy denying all incoming traffic unless you want it to be allowed.

To install UFW run:

apt install ufw linuxhint@montsegur: ~ root@montsegur:/# apt install ufw Reading package lists... Done Building dependency tree Reading state information... Done The following NEW packages will be installed: 0 upgraded, 1 newly installed, 0 to remove and 4 not upgraded. Need to get 164 kB of archives. After this operation, 852 kB of additional disk space will be used. Get:1 http://deb.debian.org/debian buster/main amd64 ufw all 0.36-1 [164 kB] Fetched 164 kB in 2s (82.5 kB/s) Preconfiguring packages ... Selecting previously unselected package ufw. (Reading database ... 324767 files and directories currently installed.) Preparing to unpack .../archives/ufw 0.36-1 all.deb ...

To enable the firewall at startup run:

Unpacking ufw (0.36-1) ...
Setting up ufw (0.36-1) ...

Processing triggers for man-db (2.8.5-2) ...
Processing triggers for rsyslog (8.1901.0-1) ...

sudo ufw enable

Then apply a default restrictive policy by running:

You will need to manually open the ports you want to use by running:

ufw allow <port>

Auditing yourself with nmap:

Nmap is, if not the best, one of the best security scanners in the market. It is the main tool used by sysadmins to audit their network security. If you are in a DMZ you can scan your external IP, you can also scan your router or your local host.

A very simple scan against your localhost would be:

```
♥ : A : X
                           linuxhint@montsegur: ~
root@montsegur:~# nmap localhost
Starting Nmap 7.70 ( https://nmap.org ) at 2020-02-02 01:10 -03
Nmap scan report for localhost (127.0.0.1)
Host is up (0.000048s latency).
Other addresses for localhost (not scanned): ::1
Not shown: 998 closed ports
PORT.
         STATE SERVICE
25/tcp
         open
               smtp
8084/tcp open
               unknown
Nmap done: 1 IP address (1 host up) scanned in 1.70 seconds
root@montsegur:~#
```

As you see the output shows my port 25 and port 8084 are open.

Nmap has a lot of possibilities, including OS, Version detection, vulnerability scans, etc. At LinuxHint we have published a lot of tutorials focused on Nmap and its different techniques. You can find them here.

The command chkrootkit to check your system for chrootkit infections:

Rootkits are probably the most dangerous threat to computers. The command chkrootkit

(check rootkit) can help you to detect known rootkits.

To install chkrootkit run:

```
# apt install chkrootkit
                            linuxhint@montsegur: ~
  root@montsegur:/# apt install chkrootkit
  Reading package lists... Done
  Building dependency tree
  Reading state information... Done
  The following NEW packages will be installed:
    chkrootkit
  O upgraded, 1 newly installed, O to remove and 4 not upgraded.
  Need to get 293 kB of archives.
  After this operation, 956 kB of additional disk space will be used.
  Get:1 http://deb.debian.org/debian buster/main amd64 chkrootkit amd64
  0.52-3+b10 [293 kB]
  Fetched 293 kB in 2s (178 kB/s)
  Preconfiguring packages ...
  Selecting previously unselected package chkrootkit.
  (Reading database ... 324860 files and directories currently installed
  Preparing to unpack .../chkrootkit 0.52-3+b10 amd64.deb ...
  Unpacking chkrootkit (0.52-3+b10) ...
  Setting up chkrootkit (0.52-3+b10) ...
  Processing triggers for man-db (2.8.5-2) ...
  root@montsegur:/#
```

Then run:

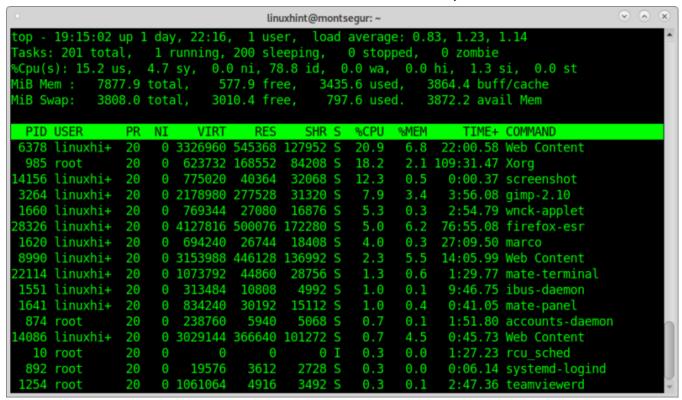
sudo chkrootkit

```
linuxhint@montsegur: ~
root@montsegur:/# sudo chkrootkit
ROOTDIR is `/'
Checking `amd'...
                                                                           not found
Checking `basename'...
                                                                           not infected
Checking `biff'...
Checking `chfn'...
Checking `chsh'...
                                                                           not found
                                                                           not infected
                                                                           not infected
Checking `cron'...
Checking `crontab'...
                                                                           not infected
                                                                           not infected
Checking `
            date'...
                                                                           not infected
Checking `du'...
Checking `dirname'...
                                                                           not infected
                                                                           not infected
Checking `
                                                                           not infected
            echo'...
Checking `egrep'...
Checking `env'...
                                                                           not infected
                                                                           not infected
Checking `find'...
                                                                           not infected
Checking `fingerd'...
Checking `gpm'...
                                                                           not found
                                                                           not found
Checking `
            grep'...
                                                                           not infected
Checking `Checking `
            hdparm'...
                                                                           not infected
            su'...
                                                                           not infected
Checking `ifconfig'...
                                                                           not infected
Checking `inetd'...
                                                                           not infected
```

Using the command **top** to check processes taking most of your resources:

To get a fast view on running resources you can use the command top, on the terminal run:

top

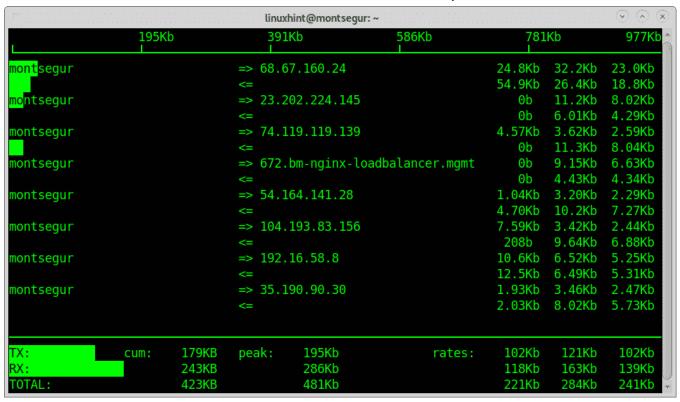


The command **iftop** to monitor your network traffic:

Another great tool to monitor your traffic is iftop,

```
# sudo iftop <interface>
In my case:
```

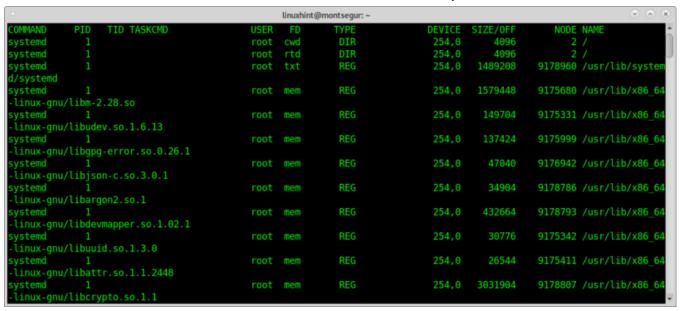
sudo iftop wlp3s0



The command lsof (list open file) to check for filesprocesses association:

Upon being suspicious something is wrong, the command **lsof** can list you the open processes and to which programs are they associated, on the console run:

lsof



The who and w to know who is logged into your device:

Additionally, to know how to defend your system it is mandatory to know how to react before you are suspicious your system has been hacked. One of the first commands to run before such situation are **w** or **who** which will show what users are logged into your system and through what terminal. Let's begin with the command **w**:

W

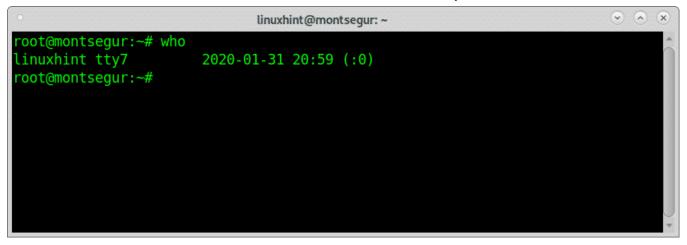
```
root@montsegur:~# w
01:08:28 up 1 day, 4:09, 1 user, load average: 3.67, 1.86, 1.25
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
linuxhin tty7 :0 Fri20 28:09m 1:11m 2.72s mate-se
root@montsegur:~#
```

Note: commands "w" and "who" may not show users logged from pseudo terminals like Xfce terminal or MATE terminal.

The column called **USER** displays the **username**, the screenshot above shows the only user logged is linuxhint, the column **TTY** shows the terminal (tty7), the third column **FROM** displays the user address, in this scenario there are not remote users logged in but if they were logged in you could see IP addresses there. The **LOGIN**@ column specifies the time in which the user logged in, the column **JCPU** summarizes the minutes of process executed in the terminal or TTY. the **PCPU** displays the CPU used by the process listed in the last column **WHAT**.

While **w** equals to executing **uptime**, **who** and **ps -a** together another alternative, despite with less information is the command "**who**":

who



The command *last* to check the login activity:

Other way to supervise users' activity is through the command "last" which allows to read the file **wtmp** which contains information on login access, login source, login time, with features to improve specific login events, to try it run:

Checking the login activity with the command last:

The command last reads the file **wtmp** to find information on login activity, you can print it by running:

last

```
linuxhint@montsegur: ~
root@montsegur:~# last
                                                              still logged in
linuxhin tty7
                       : 0
                                         Fri Jan 31 20:59
                       4.19.0-6-amd64
reboot
         system boot
                                         Fri Jan 31 20:58
                                                              still running
                                         Fri Jan 31 20:58 - down
                                                                      (00:00)
root
         ttv2
linuxhin tty7
                       : 0
                                         Fri Jan 31 18:22 - 20:58
                                                                     (02:35)
         system boot
                                         Fri Jan 31 18:22 - 20:58
reboot
                       4.19.0-6-amd64
                                                                      (02:36)
linuxhin tty7
                                         Fri Jan 31 13:41 - 17:47
                                                                     (04:06)
                       : 0
                       4.19.0-6-amd64
                                         Fri Jan 31 13:41 - 17:47
                                                                     (04:06)
reboot
         system boot
root
         tty2
                                         Fri Jan 31 10:42 - down
                                                                      (00:00)
linuxhin ttv7
                       : 0
                                         Fri Jan 31 09:22 - 10:43
                                                                      (01:20)
reboot
         system boot
                       4.19.0-6-amd64
                                         Fri Jan 31 09:22 - 10:43
                                                                     (01:20)
linuxhin tty7
                                         Thu Jan 30 23:22 - crash
                       : 0
                                                                      (09:59)
reboot
         system boot
                       4.19.0-6-amd64
                                         Thu Jan 30 23:22 - 10:43
                                                                     (11:20)
                                         Thu Jan 30 13:07 - 20:10
linuxhin tty7
                       : 0
                                                                      (07:02)
reboot
         system boot
                       4.19.0-6-amd64
                                         Thu Jan 30 13:07 - 23:21
                                                                      (10:14)
                                         Wed Jan 29 23:41 - crash
linuxhin tty7
                                                                     (13:25)
                       : 0
reboot
         system boot
                       4.19.0-6-amd64
                                         Wed Jan 29 23:41 - 23:21
                                                                      (23:40)
linuxhin tty7
                       :0
                                         Wed Jan 29 22:55 - 23:40
                                                                      (00:44)
reboot
         system boot
                       4.19.0-6-amd64
                                         Wed Jan 29 22:55 - 23:40
                                                                      (00:45)
linuxhin tty7
                       : 0
                                         Wed Jan 29 12:53 - 21:44
                                                                      (08:51)
                       4.19.0-6-amd64
                                         Wed Jan 29 12:52 - 21:44
reboot
         system boot
                                                                      (08:51)
```

Checking your SELinux status and enable it if needed:

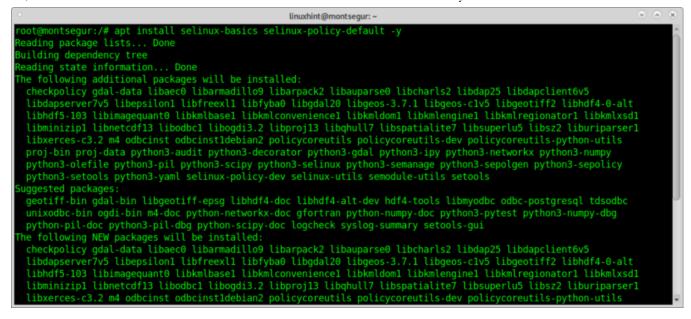
SELinux is restriction system which improves any Linux security, it comes by default on some Linux distributions, it is widely explained here on linuxhint.

You can check your SELinux status by running:

```
# sestatus
```

If you get a command not found error, you can install SELinux by running:

apt install selinux-basics selinux-policy-default -y



Then run:

selinux-activate

Check any user activity using the command **history**:

At any time, you can check any user activity (if you are root) by using the command history logged as the user you want to monitor:

history

```
linuxhint@montsegur: ~
     sudo shutdown -h now
265
266 locate vlc
267 cp *.lua /usr/lib/x86 64-linux-gnu/vlc/plugins/
268 sudo shutdown -h now
269
    sudo ifconfig
    ping google.com
270
    sudo route add default gw 192.168.1.1
271
272 nano /etc/resolv.conf
273
    ping google.com
274 ping 8.8.8.8
    ping 192.168.1.1
275
276 nano /etc/resolv.conf
   nano /etc/resolv.conf
277
   ping 192.168.1.1
278
279 ping 8.8.8.8
280 shutdown -h now
    sudo shutdown -h now
281
282
    sudo ifconfig
283
    sudo route
284 nano /etc/resolv.conf
285 ping 8.8.8.8
    sudo ifconfig enp2s0 192.168.1.6
286
287 ping 8.8.8.8
```

The command history reads the file bash_history of each user. Of course, this file can be adulterated, and you as root can read this file directly without invoking the command history. Yet, if you want to monitor activity running is recommended.

I hope you found this article on essential Linux security commands useful. Keep following LinuxHint for more tips and updates on Linux and networking.

ABOUT THE AUTHOR



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David Adams is a System Admin and writer that is focused on open source technologies, security software, and computer systems.

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