

Linux Basic Commands

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Chapter 1. What is Linux

Just like Windows and Mac, Linux is an operating system. It is created by Linux Torvalds who was designed the core of the operating system back when he was a student for one of his classes. It is based on UNIX, but it has a greater success, because of the great community, open-source and hey, it is free!



Open source means that you have unlimited access to the code and you can design everything as you want. And for that reason there are hundreds of different interpretations for Linux, that are called Distributions or distros. Distros may be represent as different flavors, from one User Interface to another, they may have different settings but from the inside they are still Linux. Here is List of the most common ones:

- Ubuntu
- Linux Mint
- Debian
- Fedora
- Open Suse

Chapter 2. What is Linux Shell?

Shell is a program in Linux, which reads an given input from the user {command and parameters} and based on that input gives an output. Shell can be runed from both GUI and CLI.

There are Linux distribution that don't have Graphical Interfaces, so you must learn to navigate easily from the file system from command line first. So, go ahead, install Linux on your computer or run it with Virtual Machine. After the installation press Ctrl,Alt + T, and I will wait for you in the next chapter.

```
[ ] Taskset: 105, 240, 0, 1, running
[ ] User: user@kali: 0.70, 0.53, 0.28
[ ] Uptime: 30 days, 16:03:17
[ ] VM 2.0.0

PID USER      PRI  NI  VIRT   RES   SHR  S CPU% MEM%   TIME+  Command
88292 anyl    20   0 3923M 255M 79036 5 72.8 31.3 50013.10 cinnamon --replace
1219 anyl    20   0 0015M 0.500 0.776 5 2.7 1.1 42.21.16 /usr/lib/xorg/xorg -core :0 -seat seat0 -auth /var/run/
1584 anyl    20   0 0015M 0.500 0.776 5 1.3 0.5 0.01.43 /usr/lib/gnome-terminal/gnome-terminal-server
1561 anyl    20   0 0015M 0.500 0.776 5 0.7 1.1 0.00.90 /usr/lib/nautilus/nautilus
2011 anyl    20   0 1468 624 432 0 0 0.01 0.02 httpd
3309 anyl    20   0 1309M 127M 1504 5 0.0 2.2 23.38.48 /usr/sbin/mysqld --daemonize --pid-file=/run/mysqld/mys
933 anyl    20   0 2320 912 892 5 0.0 0.1 2.38.40
5249 anyl    20   0 020M 0.004 0.940 5 0.0 0.2 0.29.18 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
9130 anyl    20   0 828M 2.004 1.956 5 0.0 0.3 0.00.03 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
88990 anyl    -6   0 1330M 1076 540 5 0.0 0.2 0.14.12 /usr/bin/pulseaudio --start --log-target=syslog
2391 anyl    20   0 1391M 1076 504 5 0.0 0.2 2.12.45 /usr/bin/pulseaudio --start --log-target=syslog
88091 anyl    9   0 1130M 1076 540 5 0.0 0.2 0.19.71 /usr/bin/pulseaudio --start --log-target=syslog
1434 anyl    20   0 4008M 8.460 7.608 5 0.0 1.7 2.25.03 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/
88035 anyl    20   0 191M 0.520 15.315 5 0.0 0.0 0.00.16 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
130 anyl    20   0 191M 0.520 15.315 5 0.0 0.0 13.12.51 /lib/systemd/systemd-journald
99065 anyl    20   0 1939M 5.264 4.272 5 0.0 0.7 0.39.81 nemo-desktop
1170 anyl    20   0 960M 4.424 6.895 5 0.0 0.6 5.19.76 /usr/bin/containerd
229M anyl    20   0 229M 912 892 5 0.0 0.1 2.38.43 /usr/lib/accountsservice/accounts-daemon
749 anyl    20   0 268 316 976 5 0.0 1.3 1.72.74 avahi-daemon: running [anyl-ThinkCentre-M83.local]
5618 anyl    20   0 688 120 864 0 0.0 0.1 0.00.10 winx
743 anyl    20   0 560 884 744 5 0.0 0.0 0.00.04 /usr/sbin/acpid
757 anyl    20   0 4560 744 992 5 0.0 1.7 2.22.04 /usr/bin/dbus-daemon --system --address=systemd: --nofu
1018 anyl    20   0 207M 1.652 912 5 0.0 0.1 2.11.09 /usr/lib/policykit-1/policykit --no-nemo
2059 anyl    20   0 238M 1.717 1504 5 0.0 2.2 1.40.68 /usr/bin/mysqld --daemonize --pid-file=/run/mysqld/mys
88831 anyl    20   0 443M 2.384 1.236 5 0.0 0.0 0.00.34 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
88853 anyl    20   0 321M 2.228 1.748 5 0.0 0.0 0.00.09 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
1416 anyl    20   0 231M 1.504 5 0.0 2.2 1.38.61 /usr/bin/mysqld --daemonize --pid-file=/run/mysqld/mys
88850 anyl    20   0 395M 2.556 1.028 5 0.0 0.0 0.00.09 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
1025 anyl    20   0 175M 296 496 5 0.0 0.1 2.38.42 /usr/bin/lightdm --no-daemon --dbus-enable
1026 anyl    20   0 139M 1.727 1504 5 0.0 2.2 1.40.58 /usr/bin/mysqld --daemonize --pid-file=/run/mysqld/mys
1358 anyl    20   0 1939M 127M 1504 5 0.0 2.2 1.39.94 /usr/bin/mysqld --daemonize --pid-file=/run/mysqld/mys
88839 anyl    20   0 841M 2.404 1.144 5 0.0 0.0 0.00.13 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
88839 anyl    20   0 517M 1.672 1.504 5 0.0 0.0 0.00.09 blueberry-udev-agent
1247 anyl    20   0 328M 396 644 5 0.0 0.1 3.24.56 /usr/sbin/sshd -D
88854 anyl    20   0 321M 2.204 1.732 5 0.0 0.0 0.00.09 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
88855 anyl    20   0 890M 4.584 1.584 5 0.0 2.2 1.41.21 /usr/bin/mysqld --daemonize --pid-file=/run/mysqld/mys
88833 anyl    20   0 475M 1.696 1.712 5 0.0 0.4 8.00.42 /usr/lib/x86_64-linux-gnu/cinnamon-settings-daemon/csd-
5577 anyl    20   0 620 112 416 5 0.0 0.1 0.00.03 bash
9132 anyl    20   0 191M 1.672 964 5 0.0 0.7 0.00.70 mtrupdate
9131 anyl    20   0 9192 576 832 5 0.0 0.1 0.00.04 /usr/bin/dbus-daemon --config-file=/usr/share/defaults/
91448 anyl    20   0 734M 7.644 3.172 5 0.0 0.9 8.15.65 cinnamon-screensaver
1362 anyl    20   0 1939M 127M 1504 5 0.0 2.2 1.41.10 /usr/bin/mysqld --daemonize --pid-file=/run/mysqld/mys
1352 anyl    20   0 1008M 8.460 7.760 5 0.0 1.8 0.50.51 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/
1070 anyl    20   0 4008M 8.460 7.608 5 0.0 1.7 1.26.61 /usr/bin/dockerd -H fd:// --containerd=/run/containerd/
141 anyl    20   0 159M 996 660 5 0.0 2.0 0.63.64 /sbin/init splash
366 anyl    20   0 7716 720 540 5 0.0 0.0 0.00.00 /sbin/metadata-#
366 anyl    20   0 4276 732 216 5 0.0 0.1 0.22.27 /lib/systemd/systemd-udev
653 systemd- 20   0 760 132 484 5 0.0 0.1 0.12.80 /lib/systemd/systemd-resolved
155 anyl    20   0 191M 100 256 5 0.0 0.0 0.00.00 /usr/bin/mkcert -d localhost

1.191P 2.240up 3.564M 4.145F 5736 6.607M 7.710C 8.8F 9.03C 9.011L 10.010uit
-- INSERT --
```

Chapter 3. The File System

There are Linux distribution that don't have Graphical Interfaces, so you must learn to navigate easily from the file system from command line first. So, go ahead, install Linux on your computer or run it with Virtual Machine. After the installation press Ctrl,Alt + T, and I will wait for you in the next chapter.

Chapter 4. pwd

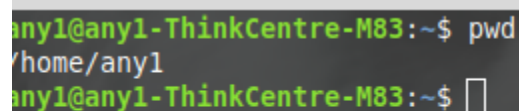
This command is used for knowing where you are on the file system.

You must have installed Linux or run it with through a virtual machine

You must have opened the terminal with the combination of Ctrl+Alt+T or from the menu → terminal

The first command from this chapter is going to be one of the most important ones. It simply says:

Print Working Directory. As we know the directory is just a file, which is representing a content, or dynamic linking with flag which tells us that this file is a directory. We can move through the system when we are going to such a file. So pwd will basically print the current directory which we are in at the moment.

A screenshot of a Linux terminal window. The prompt is 'any1@any1-ThinkCentre-M83:~\$'. The user has entered the command 'pwd'. The output is '/home/any1'. The prompt is now 'any1@any1-ThinkCentre-M83:~\$' followed by a cursor.

```
any1@any1-ThinkCentre-M83:~$ pwd
/home/any1
any1@any1-ThinkCentre-M83:~$
```

- Open Linux Terminal
- Enter the command pwd
- Type Enter

Chapter 5. ls

Lists all items in the current directory.

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ls is short for list and it does as it says. It lists every file in the current directory.

Q: For example I have a directory named "A", and in it there are files called "a1","b1".

What will be the output from the terminal when I give the input "ls" ?

A: The answer is simple. It depends. Read once again the description for the command pwd and you will now why it depends. So if we are in currently in the location of A it will display a1, b1. Otherwise the answer is: what is having in the directory of {pwd}.

```
any1@any1-ThinkCentre-M83:~/Desktop/LCS$ ls
mvnw mvnw.cmd offices.iml pom.xml README.md src target
any1@any1-ThinkCentre-M83:~/Desktop/LCS$ ls -al
total 72
drwxrwxr-x 7 any1 any1 4096 Apr 28 14:32 .
drwxr-xr-x 10 any1 any1 4096 Jun 13 16:33 ..
drwxrwxr-x 8 any1 any1 4096 Apr 28 14:41 .git
-rw-rw-r-- 1 any1 any1 395 Apr 23 10:02 .gitignore
drwxrwxr-x 3 any1 any1 4096 Apr 28 14:40 .idea
drwxrwxr-x 3 any1 any1 4096 Apr 23 10:02 .mvn
-rw-rw-r-- 1 any1 any1 10070 Apr 23 10:02 mvnw
-rw-rw-r-- 1 any1 any1 6608 Apr 23 10:02 mvnw.cmd
-rw-rw-r-- 1 any1 any1 10423 Apr 25 20:15 offices.iml
-rw-rw-r-- 1 any1 any1 1644 Apr 23 10:02 pom.xml
-rw-rw-r-- 1 any1 any1 31 Apr 23 10:02 README.md
drwxrwxr-x 4 any1 any1 4096 Apr 23 10:02 src
drwxrwxr-x 8 any1 any1 4096 Apr 28 14:32 target
any1@any1-ThinkCentre-M83:~/Desktop/LCS$
```

- Open Linux Terminal
- Enter the command ls
- Type Enter

Chapter 6. What are Linux Permissions

So after we have a concept about the file system and the commands `pwd` and `ls`, it is time to know about Linux permissions and command options, flags:

Here we are on our way to learn more about Linux.

So basically, Permissions is what are the accessibilities from the users to the files.

There is the One User which has all the rights and it is called Super User, but for that later.

On our computer there can be many users that are can access the file system. But how to control access for all of them? The answer is by putting them in a groups and describe which groups have access. This is controlled by a bit mask.

Everything in Linux is files!

Permissions:

1 – execute

2 – write

3 – write and execute

4 – read

5 – read and execute

6 – read and write

7 – read, write and execute – full accessibility.

The bit masking is done by this 8 numbers (0 – has no access to the file). This numbers represents the words read, write, execute, and by bits are 0, 1, 0 – cannot do {read, write or execute} 1 – can do. So if we want the user to can read and execute the number is 5 and it is calculated by 0 and 1s read write execute 1 0 1 -> by 10's system is equal to 5. That is how it is calculated.

Chapter 7. What are flags?

Flags are simply options to the commands. As far we know how to list the files that are in the current directory. It is done by `ls` command. We also know a little bit about permissions. So let's see how we can see the permissions on the files. It is done by giving the command `ls` a flag `l` – for long

`ls -l`

Now we can see a list of files with their permissions and there are rwe (read write execute), but why are they repeated 3 times.

It is because the permissions are grouped by: Owner of the file rights, Group Rights, Other Rights.

Chapter 8. Linux Manual

That's cool, but how to see which command, which options have ?

The answer is man. The Linux embedded manual for short man is a command where you can find the all information for Linux in one place. Without using of internet, it is on your computer and it is available 24/7. And it is a command.

Q:But how to use man?

A1: First try to understand it by yourself. Think. If you not manage to understand the answer it will be provided by A2.

A2: man man – how tricky ☺

```
MAN(1)                                Manual pager utils                                MAN(1)

NAME
    man - an interface to the on-line reference manuals

SYNOPSIS
    man [-C file] [-d] [-D] [--warnings[=warnings]] [-R encoding] [-L
    locale] [-m system[,...]] [-M path] [-S list] [-e extension] [-i|-I]
    [--regex|--wildcard] [--names-only] [-a] [-u] [--no-subpages] [-P
    pager] [-r prompt] [-7] [-E encoding] [--no-hyphenation] [--no-justifi-
    cation] [-p string] [-t] [-T[device]] [-H[browser]] [-X[dpi]] [-Z]
    [[section] page[.section] ...] ...
    man -k [apropos options] regexp ...
    man -K [-w|-W] [-S list] [-i|-I] [--regex] [section] term ...
    man -f [whatIs options] page ...
    man -l [-C file] [-d] [-D] [--warnings[=warnings]] [-R encoding] [-L
    locale] [-P pager] [-r prompt] [-7] [-E encoding] [-p string] [-t]
    [-T[device]] [-H[browser]] [-X[dpi]] [-Z] file ...
    man -w|-W [-C file] [-d] [-D] page ...
    man -c [-C file] [-d] [-D] page ...
    man [-?V]

DESCRIPTION
    Manual page man(1) line 1 (press h for help or q to quit)
```

Chapter 9. cd

Change directory command is used to move through the file system.

You must have installed Linux or run it with through a virtual machine

You must have opened the terminal with the combination of Ctrl+Alt+T or from the menu → terminal

The cd or change directory is used to move through the file system easily. For example if there you are located in the Downloads and there is directory called potato and you want to go there you have to enter the command cd potato

```
any1@any1-ThinkCentre-M83:~/Desktop$ cd demo
any1@any1-ThinkCentre-M83:~/Desktop/demo$ ls
demo.iml  HELP.md  mvnw      mvnw.cmd  pom.xml   src       target
any1@any1-ThinkCentre-M83:~/Desktop/demo$ cd src
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$
```

1. Open Linux Terminal
2. Type the command cd
3. Type the name of the directory you want to enter as a first parameter of the command
4. Press Enter
5. List all of the directories to make sure you are on the right directory

Chapter 10. mkdir, rmdir

The commands mkdir and rmdir are making and deleting directories.

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Make directory or mkdir is basically making a directory and place it on your current location

Remove directory or rmdir Just like mkdir only it is doing the opposite thing.

```
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ ls
main test
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ mkdir hello
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ ls
hello main test
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ rmdir hello
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ ls
main test
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$
```

1. List the current directory as it is shown on [chapter 5 \(on page 5\)](#)
2. Type mkdir command
3. Then type name as you want for directory
4. Press Enter and you will see after you list again, that the new directory is there
5. Then type rmdir and the name of the directory that you created on step 4
6. Press Enter and you will see after you list, that the directory has been deleted.

Chapter 11. touch, rm

The commands touch and rm are creating and deleting files.

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touch is using for two things. The first purpose is to make file by doing

touch <name of the file> and it place an empty file in your current location. And the second thing it does is to change the -last modified time of the file to the time when the command is executed.

The command rm or remove is used to remove a single file from your current locations. Just provide the command a parameter – the name of the file which you want to be removed and it is done. The most common used flags of the remove command are -r and -f -r -> recursively it removes every file from the directory of your choice . -f -> force, without asking for permissions on every step of the deleting process. Try rm -rf / ☹ or Or don't ! // It will remove our your files including the Linux OS.

```
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ ls
main test
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ touch hello
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ ls
hello main test
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ vim hello
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ cat hello
a
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ rm hello
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$ ls
main test
any1@any1-ThinkCentre-M83:~/Desktop/demo/src$
```

1. Open Linux terminal
2. Type the comand touch and then the name of the file you want to create or update
3. Press Enter
4. After you list the items in the current directory you will seethat the file is either created or updated
5. Type the command rm, to remove the file you recently created, then type the name of the file
6. Press Enter
7. You will see, as you list the items in the current directory, that your file is deleted.

Chapter 12. Cp and Mv

The commands cp and mv are coping and moving files through the file system.

You must have installed Linux or run it with through a virutal machine

You must have opened the terminal with the combination of Ctrl+Alt+T or from the menu → terminal

Cp for copy and mv for move are commands which are used to organize your files in other directories and copy their content.

the syntax is:

cp <file to be copied> <where to be copied>

Mv <file to be moved> <where to be moved> * the mv command can be used also to rename files.

1. Open Linux Terminal
2. Make a file, like it is described on the previous chapter
3. Type the command cp to copy the file
4. Type as a First parameter the name of the file that you are going to copy
5. Type as a Second Parameter the location which you want the file to be copied at.
6. Press Enter
7. Go to the location which you provided on step 5.
8. After you list the elements of the current directory, you will find out that there is a copy of the original file.

Chapter 13. Other useful commands

Here is a table with five of the most used Linux commands:

Table 1.

command	description
grep	It is the most powerfull searching tool.
chmod	It is used to change the permissions of specific file.
kill	This command terminates a proccess → kill {PID}
whoami	It is used to indentify the user, which is currently logged.
cat	This command outputs the content of the given file.