

Red Hat System Administration I

Lab1

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2. What is the difference between cat and more command?

cat and more commands are both used to display the contents of a file in the terminal

cat:

- Displays the entire content of a file at once.
- Useful for viewing small files.

Note : also can be used to concatenate multiple files and display them together.

If we try : **cat /etc/passwd**

```
[nada_mohamed2243@localhost ~]$ cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
games:x:12:100:games:/usr/games:/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/sbin/nologin
nobody:x:65534:65534:Kernel Overflow User:/:/sbin/nologin
tss:x:59:59:Account used for TPM access:/:/usr/sbin/nologin
systemd-coredump:x:999:997:systemd Core Dumper:/:/sbin/nologin
dbus:x:81:81:System message bus:/:/sbin/nologin
polkitd:x:998:996:User for polkitd:/:/sbin/nologin
sssd:x:997:995:User for sssd:/:/sbin/nologin
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
geoclue:x:996:994:User for geoclue:/var/lib/geoclue:/sbin/nologin
rtkit:x:172:172:RealtimeKit:/:/sbin/nologin
pipewire:x:995:992:PipeWire System Daemon:/run/pipewire:/usr/sbin/nologin
libstoragemgmt:x:989:989:daemon account for libstoragemgmt:/:/usr/sbin/nologin
cockpit-wsinstance:x:988:988:User for cockpit-ws instances:/nonexisting:/sbin/nologin
flatpak:x:987:987:User for flatpak system helper:/:/sbin/nologin
colord:x:986:986:User for colord:/var/lib/colord:/sbin/nologin
setroubleshoot:x:985:985:SELinux troubleshoot server:/var/lib/setroubleshoot:/usr/sbin/nologin
clevis:x:984:984:Clevis Decryption Framework unprivileged user:/var/cache/clevis:/usr/sbin/nologin
gdm:x:42:42:/:/var/lib/gdm:/sbin/nologin
gnome-initial-setup:x:983:983:/:/run/gnome-initial-setup:/sbin/nologin
chrony:x:982:982:chrony system user:/var/lib/chrony:/sbin/nologin
sshd:x:74:74:Privilege-separated SSH:/usr/share/empty.sshd:/usr/sbin/nologin
dnsmasq:x:981:981:Dnsmasq DHCP and DNS server:/var/lib/dnsmasq:/usr/sbin/nologin
tcpdump:x:72:72:/:/sbin/nologin
nada_mohamed2243:x:1000:1000:nada_mohamed2243:/home/nada_mohamed2243:/bin/bash
[nada_mohamed2243@localhost ~]$ ^C
```

more:

- Displays the content of a file one screen at a time(all the file) and we can use the keyboard to show the full content (e.g., spacebar to move to the next page, q to quit).
- Useful for viewing large files.
- If we try : **more /etc/passwd**

```
[nada_mohamed2243@localhost ~]$ more /etc/passwd
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
lp:x:4:7:lp:/var/spool/lpd:/sbin/nologin
sync:x:5:0:sync:/sbin:/bin/sync
shutdown:x:6:0:shutdown:/sbin:/sbin/shutdown
halt:x:7:0:halt:/sbin:/sbin/halt
mail:x:8:12:mail:/var/spool/mail:/sbin/nologin
operator:x:11:0:operator:/root:/sbin/nologin
games:x:12:100:games:/usr/games:/sbin/nologin
ftp:x:14:50:FTP User:/var/ftp:/sbin/nologin
nobody:x:65534:65534:Kernel Overflow User:/:/sbin/nologin
tss:x:59:59:Account used for TPM access:/:/usr/sbin/nologin
systemd-coredump:x:999:997:systemd Core Dumper:/:/sbin/nologin
dbus:x:81:81:System message bus:/:/sbin/nologin
polkitd:x:998:996:User for polkitd:/:/sbin/nologin
sssd:x:997:995:User for sssd:/:/sbin/nologin
avahi:x:70:70:Avahi mDNS/DNS-SD Stack:/var/run/avahi-daemon:/sbin/nologin
geoclue:x:996:994:User for geoclue:/var/lib/geoclue:/sbin/nologin
rtkit:x:172:172:RealtimeKit:/:/sbin/nologin
pipewire:x:995:992:PipeWire System Daemon:/run/pipewire:/usr/sbin/nologin
libstoragemgmt:x:989:989:daemon account for libstoragemgmt:/:/usr/sbin/nologin
cockpit-wsinstance:x:988:988:User for cockpit-ws instances:/nonexisting:/sbin/nologin
flatpak:x:987:987:User for flatpak system helper:/:/sbin/nologin
colord:x:986:986:User for colord:/var/lib/colord:/sbin/nologin
setroubleshoot:x:985:985:SELinux troubleshoot server:/var/lib/setroubleshoot:/usr/sbin/nologin
clevis:x:984:984:Clevis Decryption Framework unprivileged user:/var/cache/clevis:/usr/sbin/nologin
gdm:x:42:42:/:/var/lib/gdm:/sbin/nologin
gnome-initial-setup:x:983:983:/:run/gnome-initial-setup:/:/sbin/nologin
chrony:x:982:982:chrony system user:/var/lib/chrony:/sbin/nologin
sshd:x:74:74:Privilege-separated SSH:/usr/share/empty.sshd:/usr/sbin/nologin
dnsmasq:x:981:981:Dnsmasq DHCP and DNS server:/var/lib/dnsmasq:/usr/sbin/nologin
tcpdump:x:72:72:/:/sbin/nologin
nada_mohamed2243:x:1000:1000:nada_mohamed2243:/home/nada_mohamed2243:/bin/bash
[nada_mohamed2243@localhost ~]$
```

3. What is the difference between rm and rmdir using man?

rm : → we use **man rm**

```
nada_mohamed2243@localhost:~ — man -a rm
RM(1) User Commands RM(1)

NAME
rm - remove files or directories

SYNOPSIS
rm [OPTION]... [FILE]...

DESCRIPTION
This manual page documents the GNU version of rm. rm removes each specified file. By default, it does not remove directories.

If the -I or --interactive=once option is given, and there are more than three files or the -r, -R, or --recursive are given, then rm prompts the user for whether to proceed with the entire operation. If the response is not affirmative, the entire command is aborted.

Otherwise, if a file is unwritable, standard input is a terminal, and the -f or --force option is not given, or the -i or --interactive=always option is given, rm prompts the user for whether to remove the file. If the response is not affirmative, the file is skipped.

OPTIONS
Remove (unlink) the FILE(s).

-f, --force
    ignore nonexistent files and arguments, never prompt

-i
    prompt before every removal

-I
    prompt once before removing more than three files, or when removing recursively; less intrusive than -i, while still giving protection against most mistakes

--interactive[=WHEN]
    prompt according to WHEN: never, once (-I), or always (-i); without WHEN, prompt always

--one-file-system
Manual page rm(1) line 1/85 43% (press h for help or q to quit)

--one-file-system
    when removing a hierarchy recursively, skip any directory that is on a file system different from that of the corresponding command line argument

--no-preserve-root
    do not treat '/' specially

--preserve-root[=all]
    do not remove '/' (default); with 'all', reject any command line argument on a separate device from its parent

-r, -R, --recursive
    remove directories and their contents recursively

-d, --dir
    remove empty directories

-v, --verbose
    explain what is being done

--help
    display this help and exit

--version
    output version information and exit

By default, rm does not remove directories. Use the --recursive (-r or -R) option to remove each listed directory, too, along with all of its contents.

To remove a file whose name starts with a '-', for example '-foo', use one of these commands:

    rm -- -foo
Manual page rm(1) line 30/85 71% (press h for help or q to quit)
```

output version information and exit

By default, `rm` does not remove directories. Use the **--recursive** (**-r** or **-R**) option to remove each listed directory, too, along with all of its contents.

To remove a file whose name starts with a '-', for example '-foo', use one of these commands:

```
rm -- -foo
```

```
rm ./-foo
```

Note that if you use `rm` to remove a file, it might be possible to recover some of its contents, given sufficient expertise and/or time. For greater assurance that the contents are truly unrecoverable, consider using `shred`.

AUTHOR

Written by Paul Rubin, David MacKenzie, Richard M. Stallman, and Jim Meyering.

REPORTING BUGS

GNU coreutils online help: <<https://www.gnu.org/software/coreutils/>>

Report any translation bugs to <<https://translationproject.org/team/>>

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SEE ALSO

`unlink(1)`, `unlink(2)`, `chattr(1)`, `shred(1)`

Full documentation <<https://www.gnu.org/software/coreutils/rm>>

or available locally via: `info '(coreutils) rm invocation'`

There is another sections contain rm
We can know all by using
man -a rm

rmdir : → **man rmdir**

```
nada_mohamed2243@localhost:~ — man rmdir
RMDIR(1) User Commands RMDIR(1)

NAME
    rmdir - remove empty directories

SYNOPSIS
    rmdir [OPTION]... DIRECTORY...

DESCRIPTION
    Remove the DIRECTORY(ies), if they are empty.

    --ignore-fail-on-non-empty
        ignore each failure that is solely because a directory
        is non-empty

    -p, --parents
        remove DIRECTORY and its ancestors; e.g., 'rmdir -p a/b/c' is similar to 'rmdir a/b/c a/b a'

    -v, --verbose
        output a diagnostic for every directory processed

    --help
        display this help and exit

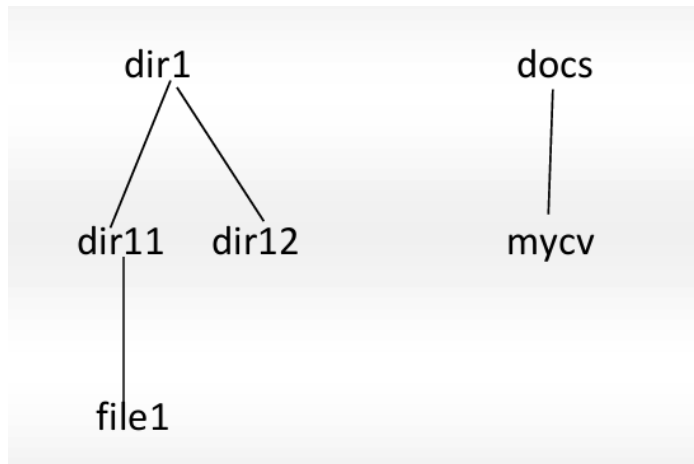
    --version
        output version information and exit

AUTHOR
    Written by David MacKenzie.

REPORTING BUGS
    Manual page rmdir(1) line 1/46 56% (press h for help or q to quit)
```

To know all sections that contain rmdir
We can use
man -a rmdir

4. Create the following hierarchy under your home directory:



We can use :

touch → to make files

mkdir → to make directories

pwd → to ensure that we are in home directory

cd → if we don't exist in home directory

```
nada_mohamed2243@localhost:~$  
[nada_mohamed2243@localhost ~]$ mkdir dir1  
[nada_mohamed2243@localhost ~]$ ls  
Desktop Documents Music Public Videos  
dir1 Downloads Pictures Templates  
[nada_mohamed2243@localhost ~]$ mkdir docs  
[nada_mohamed2243@localhost ~]$ ls  
Desktop docs Downloads Pictures Templates  
dir1 Documents Music Public Videos  
[nada_mohamed2243@localhost ~]$ mkdir dir1/dir11 dir1/dir12  
[nada_mohamed2243@localhost ~]$ ls dir1  
dir11 dir12  
[nada_mohamed2243@localhost ~]$ touch dir1/dir11/file1  
[nada_mohamed2243@localhost ~]$ ls dir1/dir11  
file1  
[nada_mohamed2243@localhost ~]$ touch docs/mycv  
[nada_mohamed2243@localhost ~]$ ls docs  
mycv
```

ls → to list the content of specific directory

ls -R → show all content from your place as the tree

```
[nada_mohamed2243@localhost ~]$ ls -R
.:
Desktop  docs      Downloads  Pictures  Templates
dir1     Documents Music      Public    Videos

./Desktop:

./dir1:
dir11  dir12

./dir1/dir11:
file1

./dir1/dir12:

./docs:
mycv

./Documents:

./Downloads:

./Music:

./Pictures:

./Public:

./Templates:

./Videos:
[nada_mohamed2243@localhost ~]$
```


a. Remove dir11 in one-step. What did you notice? And how did you overcome that?

Here if we try to make `rmdir dir1/dir11` → will failed because dir11 contain file1 and not empty

```
[nada_mohamed2243@localhost ~]$ rmdir dir1/dir11
rmdir: failed to remove 'dir1/dir11': Directory not empty
[nada_mohamed2243@localhost ~]$
```

To overcome this we can use

`rm -r dir1/dir11`

```
[nada_mohamed2243@localhost ~]$ rm -r dir1/dir11
[nada_mohamed2243@localhost ~]$ ls dir1
dir12
[nada_mohamed2243@localhost ~]$
```

b. Then remove dir12 using `rmdir -p` command. State what happened to the hierarchy (Note: you are in your home directory).

Will remove the parent of it (dir1 → that become empty)

```
[nada_mohamed2243@localhost ~]$ rmdir -p dir1/dir12
[nada_mohamed2243@localhost ~]$ ls dir1
ls: cannot access 'dir1': No such file or directory
[nada_mohamed2243@localhost ~]$ ls
Desktop  Documents  Music      Public     Videos
docs     Downloads  Pictures   Templates
[nada_mohamed2243@localhost ~]$
```

c. The output of the command pwd was /home/user. Write the absolute and relative path for the file mycv.

absolute path → /home/user/docs/mycv

relative path → docs/mycv

5. Copy the /etc/passwd file to your home directory making its name is mypasswd.

We can use cp /etc/passwd mypasswd

```
[nada_mohamed2243@localhost ~]$ cp /etc/passwd mypasswd
[nada_mohamed2243@localhost ~]$ ls
Desktop  Documents  Music      Pictures   Templates
docs     Downloads  mypasswd  Public     Videos
[nada_mohamed2243@localhost ~]$
```

6. Rename this new file to be oldpasswd.

We can use mv mypassword oldpassword

```
[nada_mohamed2243@localhost ~]$ mv mypasswd oldpasswd
[nada_mohamed2243@localhost ~]$ ls
Desktop  Documents  Music      Pictures   Templates
docs     Downloads  oldpasswd  Public     Videos
[nada_mohamed2243@localhost ~]$
```

7. You are in /usr/bin, list four ways to go to your home directory.

cd - → like back

cd ~

cd

cd /home/user

cd \$HOME

```
[nada_mohamed2243@localhost bin]$ cd ~
[nada_mohamed2243@localhost ~]$ cd ../../usr/bin
[nada_mohamed2243@localhost bin]$ cd
[nada_mohamed2243@localhost ~]$ cd ../../usr/bin
[nada_mohamed2243@localhost bin]$ cd -
/home/nada_mohamed2243
[nada_mohamed2243@localhost ~]$ cd ../../usr/bin
[nada_mohamed2243@localhost bin]$ cd /home/nada_mohamed2243
[nada_mohamed2243@localhost ~]$ cd ../../usr/bin
[nada_mohamed2243@localhost bin]$ cd $HOME
[nada_mohamed2243@localhost ~]$
```

8. List Linux commands in /usr/bin that start with letter w.

We can use **ls /usr/bin/w***

```
[nada_mohamed2243@localhost ~]$ ls /usr/bin/w*
/usr/bin/w           /usr/bin/which
/usr/bin/wait        /usr/bin/whiptail
/usr/bin/wall         /usr/bin/who
/usr/bin/watch        /usr/bin/whoami
/usr/bin/watchgnupg   /usr/bin/wireplumber
/usr/bin/wavpack      /usr/bin/wnck-urgency-monitor
/usr/bin/wc           /usr/bin/wpctl
/usr/bin/wdctl        /usr/bin/wpexec
/usr/bin/wget         /usr/bin/write
/usr/bin/whatis       /usr/bin/wvgain
/usr/bin/whatis.man-db /usr/bin/wvtag
/usr/bin/whereis      /usr/bin/wvunpack
[nada_mohamed2243@localhost ~]$
```

9. Display the first 4 lines of /etc/passwd.

We can use **head -n 4 /etc/passwd**

```
[nada_mohamed2243@localhost ~]$ head -n 4 /etc/passwd
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
adm:x:3:4:adm:/var/adm:/sbin/nologin
[nada_mohamed2243@localhost ~]$
```

10. Display the last 7 lines of /etc/passwd.

We can use **tail -n 7 /etc/passwd**

```
[nada_mohamed2243@localhost ~]$ tail -n 7 /etc/passwd
gdm:x:42:42::/var/lib/gdm:/sbin/nologin
gnome-initial-setup:x:983:983::/run/gnome-initial-setup:/sbin/nologin
chrony:x:982:982:chrony system user:/var/lib/chrony:/sbin/nologin
sshd:x:74:74:Privilege-separated SSH:/usr/share/empty.sshd:/usr/sbin/nologin
dnsmasq:x:981:981:Dnsmasq DHCP and DNS server:/var/lib/dnsmasq:/usr/sbin/nologin
tcpdump:x:72:72:::/sbin/nologin
nada_mohamed2243:x:1000:1000:nada_mohamed2243:/home/nada_mohamed2243:/bin/bash
[nada_mohamed2243@localhost ~]$
```

11. Display the man pages of passwd the command and the file sequentially in one command.

We can use → **man passwd man -s 5 passwd**

Or to run without enter → **man passwd && man -s 5 passwd**

```
[nada_mohamed2243@localhost ~]$ man man
[nada_mohamed2243@localhost ~]$ man -a passwd
--Man-- next: passwd(1openssl) [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]

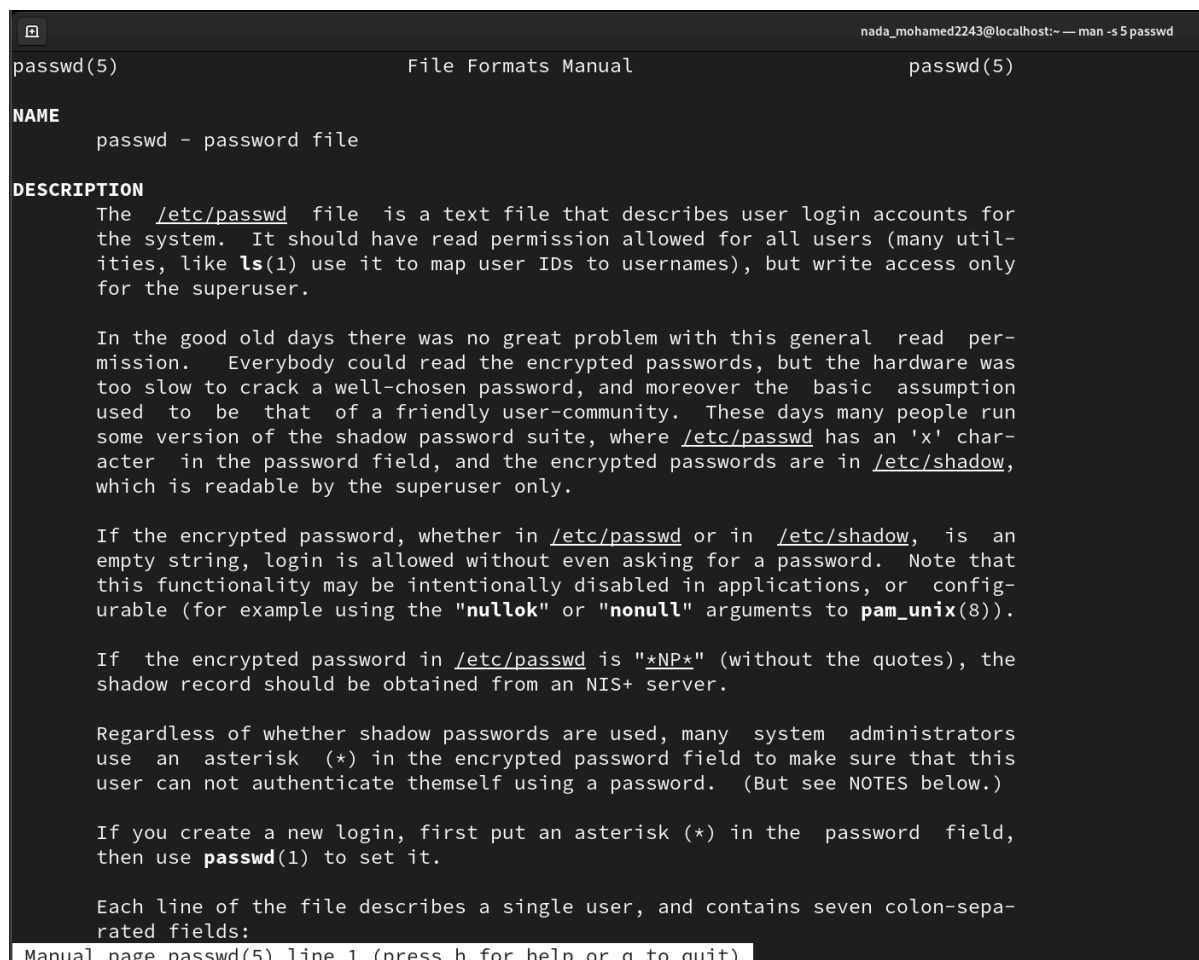
--Man-- next: passwd(5) [ view (return) | skip (Ctrl-D) | quit (Ctrl-C) ]

[nada_mohamed2243@localhost ~]$ man passwd && man -s 5 passwd
[nada_mohamed2243@localhost ~]$
```

12. Display the man page of the passwd file.

File → section 5 so we use **man -s 5 passwd**

```
[nada_mohamed2243@localhost ~]$ man -s 5 passwd
```



```
passwd(5)                                File Formats Manual                                passwd(5)

NAME
    passwd - password file

DESCRIPTION
    The /etc/passwd file is a text file that describes user login accounts for the system. It should have read permission allowed for all users (many utilities, like ls(1) use it to map user IDs to usernames), but write access only for the superuser.

    In the good old days there was no great problem with this general read permission. Everybody could read the encrypted passwords, but the hardware was too slow to crack a well-chosen password, and moreover the basic assumption used to be that of a friendly user-community. These days many people run some version of the shadow password suite, where /etc/passwd has an 'x' character in the password field, and the encrypted passwords are in /etc/shadow, which is readable by the superuser only.

    If the encrypted password, whether in /etc/passwd or in /etc/shadow, is an empty string, login is allowed without even asking for a password. Note that this functionality may be intentionally disabled in applications, or configurable (for example using the "nullok" or "nonull" arguments to pam_unix(8)).

    If the encrypted password in /etc/passwd is "*NP*" (without the quotes), the shadow record should be obtained from an NIS+ server.

    Regardless of whether shadow passwords are used, many system administrators use an asterisk (*) in the encrypted password field to make sure that this user can not authenticate themselves using a password. (But see NOTES below.)

    If you create a new login, first put an asterisk (*) in the password field, then use passwd(1) to set it.

    Each line of the file describes a single user, and contains seven colon-separated fields:

Manual page passwd(5) line 1 (press h for help or q to quit)
```

13. Display a list of all the commands that contain the keyword passwd in their man page.

We can use → **man -k passwd**

```
[nada_mohamed2243@localhost ~]$ man -k passwd
passwd: nothing appropriate.
```