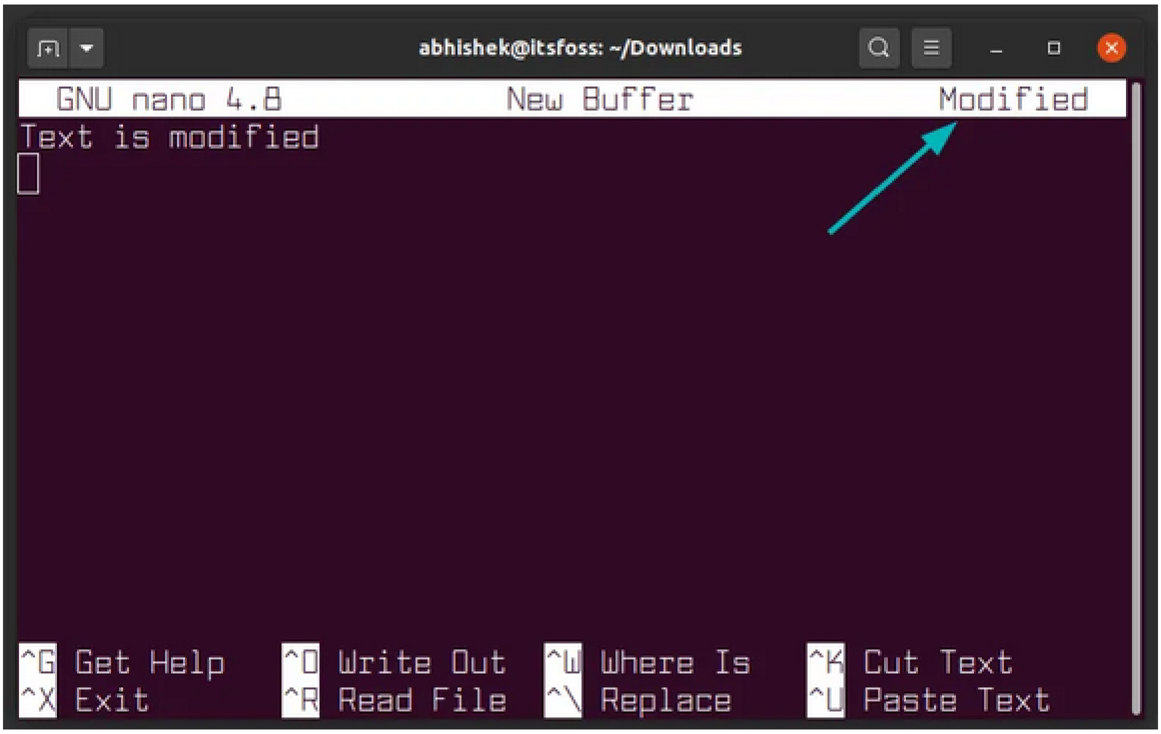
Managing Data and File permissions

Text Editors NANO AND VIM The vi command-line text editor is included in all POSIX compliant operating systems. Learning vi is easy but mastering is difficult which is necessary for system administration. Vi has evolved into many different forms, including vim, which stands for "vi improved". To install vim sudo apt install vim Examples and Usage To start vim type vim.

- : -> for entering command line
- q -> short for quit
- a -> short for all buffers
- ! -> force
- :qa! -> quit all now
- H = left
- J = down
- K = up
- L = right
- use / and the word you are looking for to search forward.
- /hello
- To search backwards
- ?hello

Nano is bundled with many popular Linux distros, and you can launch it by running the nano command. All actions in nano are initiated with keyboard shortcuts, and you can see the most important ones at the bottom of the screen. To create a newfile: nano file1.txt Nano options and shorcuts.



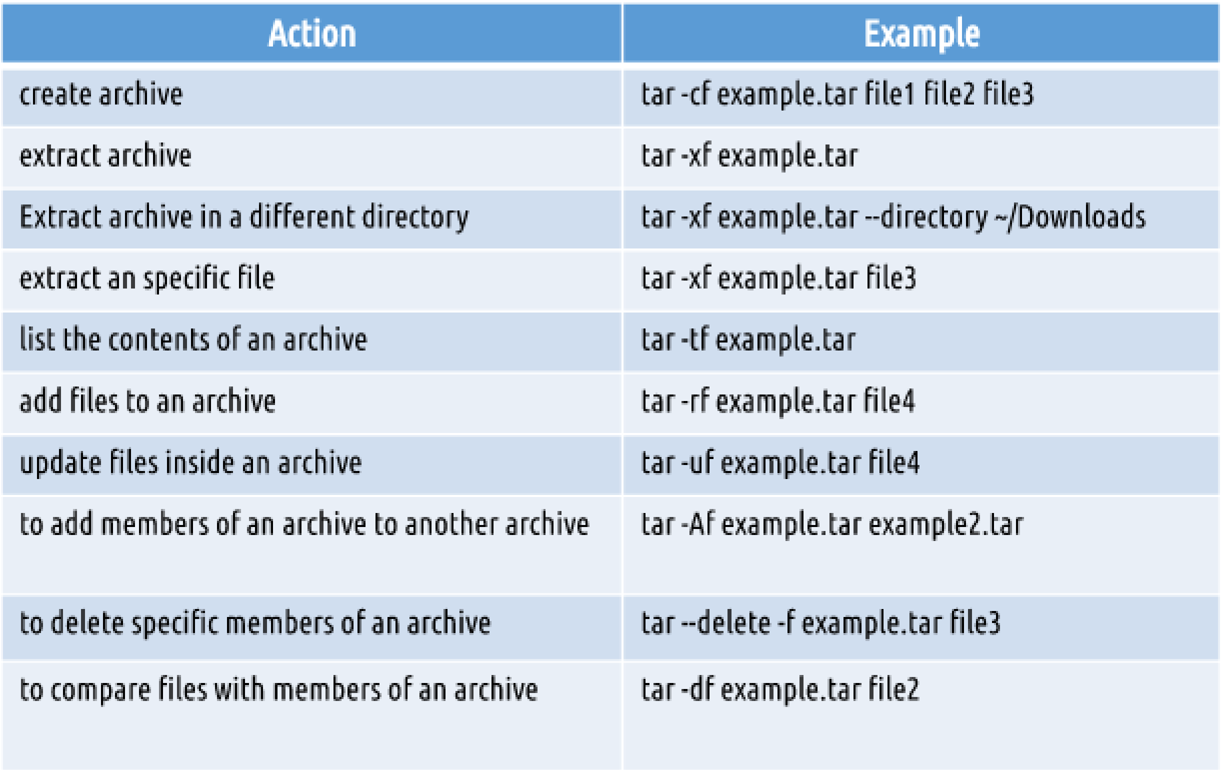
```
  GNU nano 4.8                New Buffer                Modified
Text is modified




^G Get Help    ^O Write Out   ^W Where Is    ^K Cut Text
^X Exit        ^R Read File   ^\ Replace     ^U Paste Text
```

Managing Data

Backup: Copies files and directories to an archive System Backup : Use to restore data in case of a system failure or data loss or corruption. Archive: File containing many other files, each of which is still identified by filename, owner , permissions and timestamp.

Archiving Utilities Tar: creates archives by combining files and directories into a single file.

Examples and usage



Action	Example
create archive	tar -cf example.tar file1 file2 file3
extract archive	tar -xf example.tar
Extract archive in a different directory	tar -xf example.tar --directory ~/Downloads
extract an specific file	tar -xf example.tar file3
list the contents of an archive	tar -tf example.tar
add files to an archive	tar -rf example.tar file4
update files inside an archive	tar -uf example.tar file4
to add members of an archive to another archive	tar -Af example.tar example2.tar
to delete specific members of an archive	tar --delete -f example.tar file3
to compare files with members of an archive	tar -df example.tar file2

CPIO: Creates an archive, restores files or copies a directory. Examples and usage Cpio requires a list of files to archive. To create archive -o

- ls | cpio -ov > archive.cpio
- To extract an archive to cpio use the -i option with <
- cpio -iv < archive.cpio
- To create a tar archive with cpio
- ls | cpio -ov -H tar -F example.tar

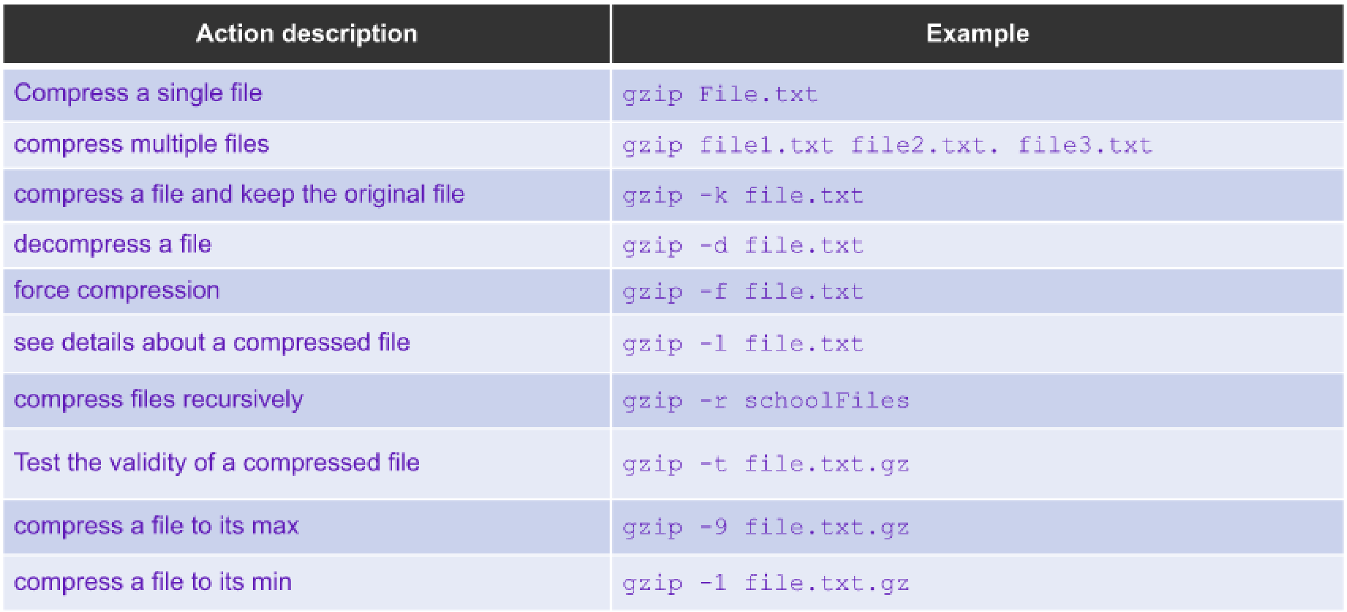
Ar:creates, modifies and extracts from archives. The ar program creates modifies and extracts from archives. Examples and usage

- ar r test.a *.txt(archive files with ar)
- ar t test.a (to list contents of an archive)

File Compression Originally, Unix file compression was handled by a utility called 'compress'. The gzip, bzip2, and xz commands are used for compression.

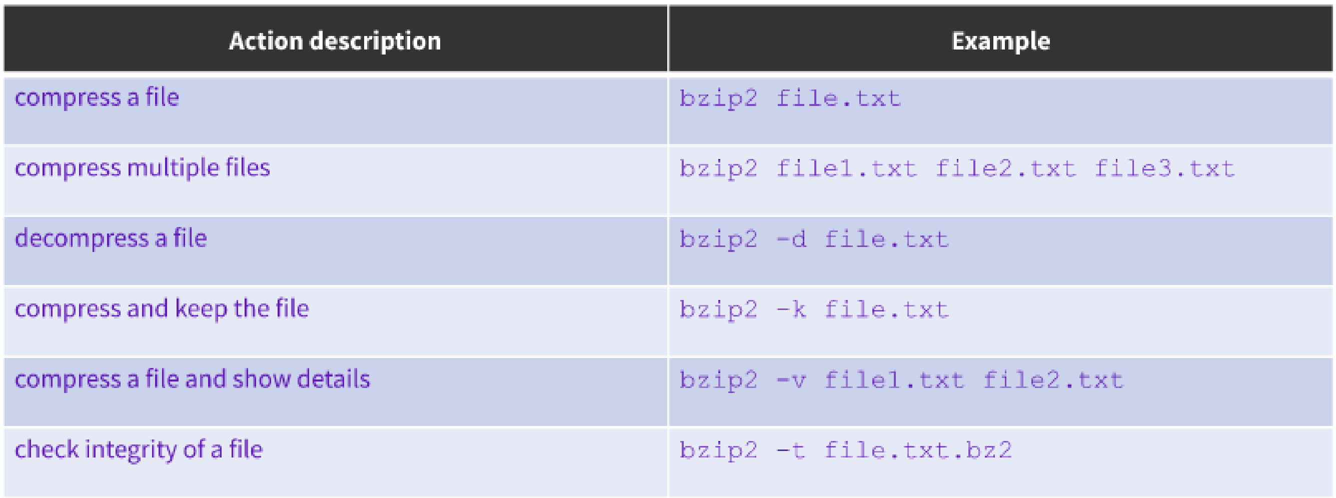
- When we compress a file with any of these tools the result is a file with similar name but with different file extension dependant on the tool used. For example: file.txt --->> file.txt.gz file.txt --->> file.txt.bz2 file.txt --->> file.txt.xz

Gzip Usage



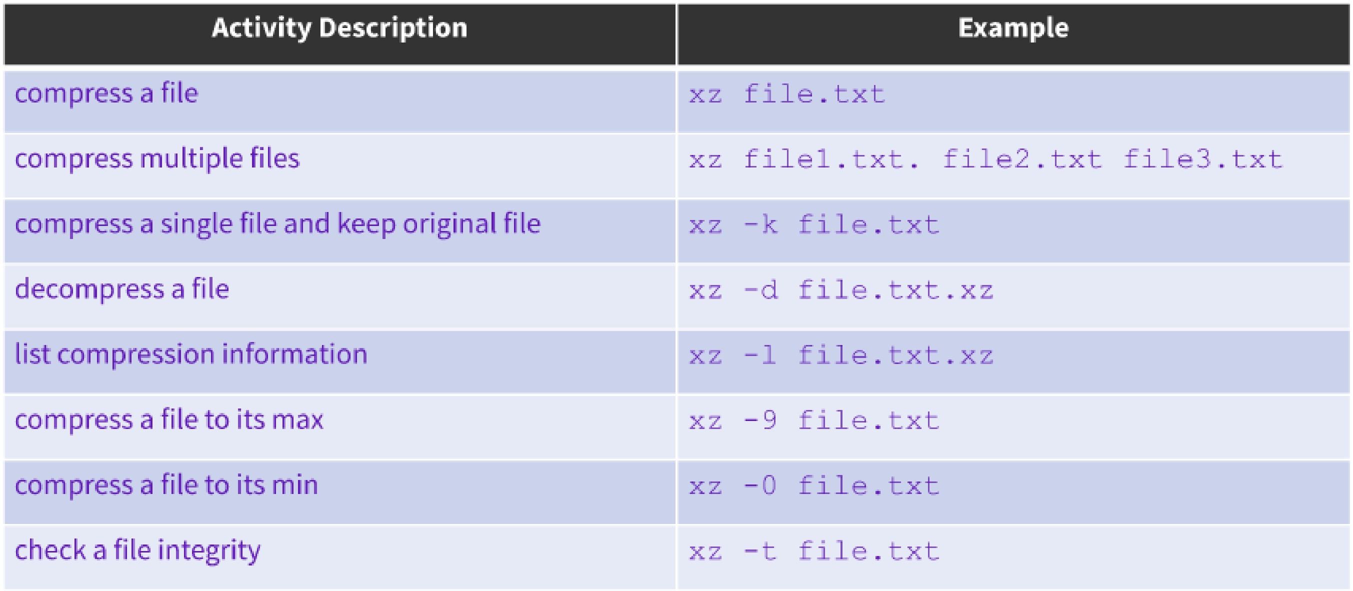
Action description	Example
Compress a single file	`gzip File.txt`
compress multiple files	`gzip file1.txt file2.txt. file3.txt`
compress a file and keep the original file	`gzip -k file.txt`
decompress a file	`gzip -d file.txt`
force compression	`gzip -f file.txt`
see details about a compressed file	`gzip -l file.txt`
compress files recursively	`gzip -r schoolFiles`
Test the validity of a compressed file	`gzip -t file.txt.gz`
compress a file to its max	`gzip -9 file.txt.gz`
compress a file to its min	`gzip -1 file.txt.gz`

Bzip Usage



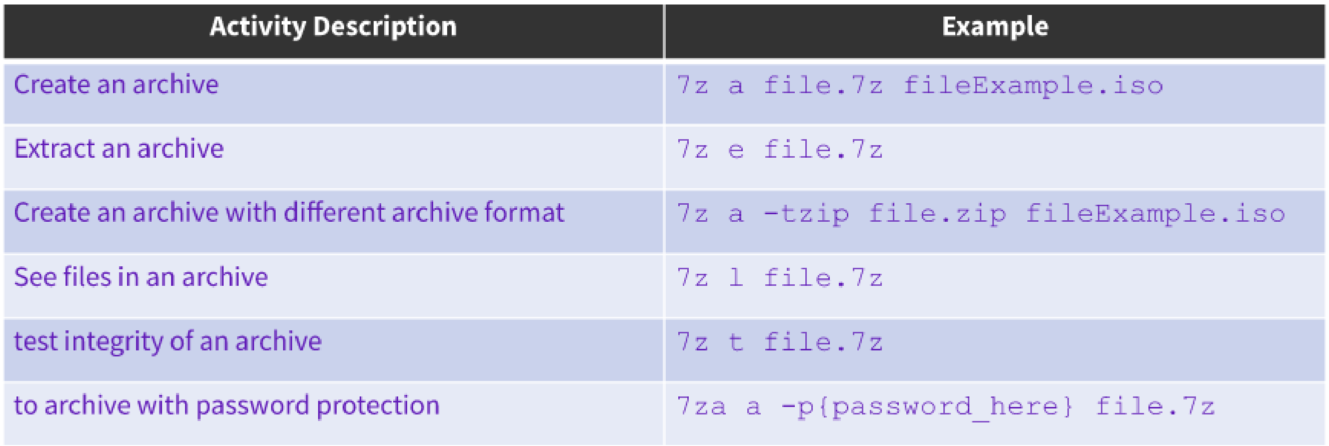
Action description	Example
compress a file	`bzip2 file.txt`
compress multiple files	`bzip2 file1.txt file2.txt file3.txt`
decompress a file	`bzip2 -d file.txt`
compress and keep the file	`bzip2 -k file.txt`
compress a file and show details	`bzip2 -v file1.txt file2.txt`
check integrity of a file	`bzip2 -t file.txt.bz2`

XZ Usage

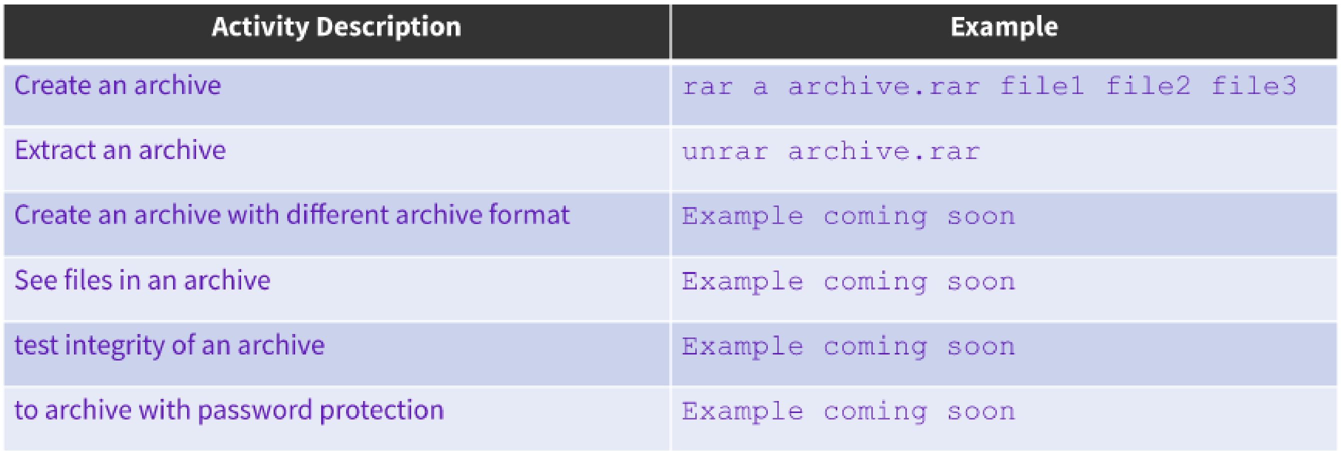


Activity Description	Example
compress a file	`xz file.txt`
compress multiple files	`xz file1.txt. file2.txt file3.txt`
compress a single file and keep original file	`xz -k file.txt`
decompress a file	`xz -d file.txt.xz`
list compression information	`xz -l file.txt.xz`
compress a file to its max	`xz -9 file.txt`
compress a file to its min	`xz -0 file.txt`
check a file integrity	`xz -t file.txt`

File compression with zip,7zip and rar Zip is an archiving and compression utility. 7-zip is open source file archiver with a high compression ratio. Rar allows linux user to extract or create rar archives.



Activity Description	Example
Create an archive	`7z a file.7z fileExample.iso`
Extract an archive	`7z e file.7z`
Create an archive with different archive format	`7z a -tzip file.zip fileExample.iso`
See files in an archive	`7z l file.7z`
test integrity of an archive	`7z t file.7z`
to archive with password protection	`7za a -p{password_here} file.7z`



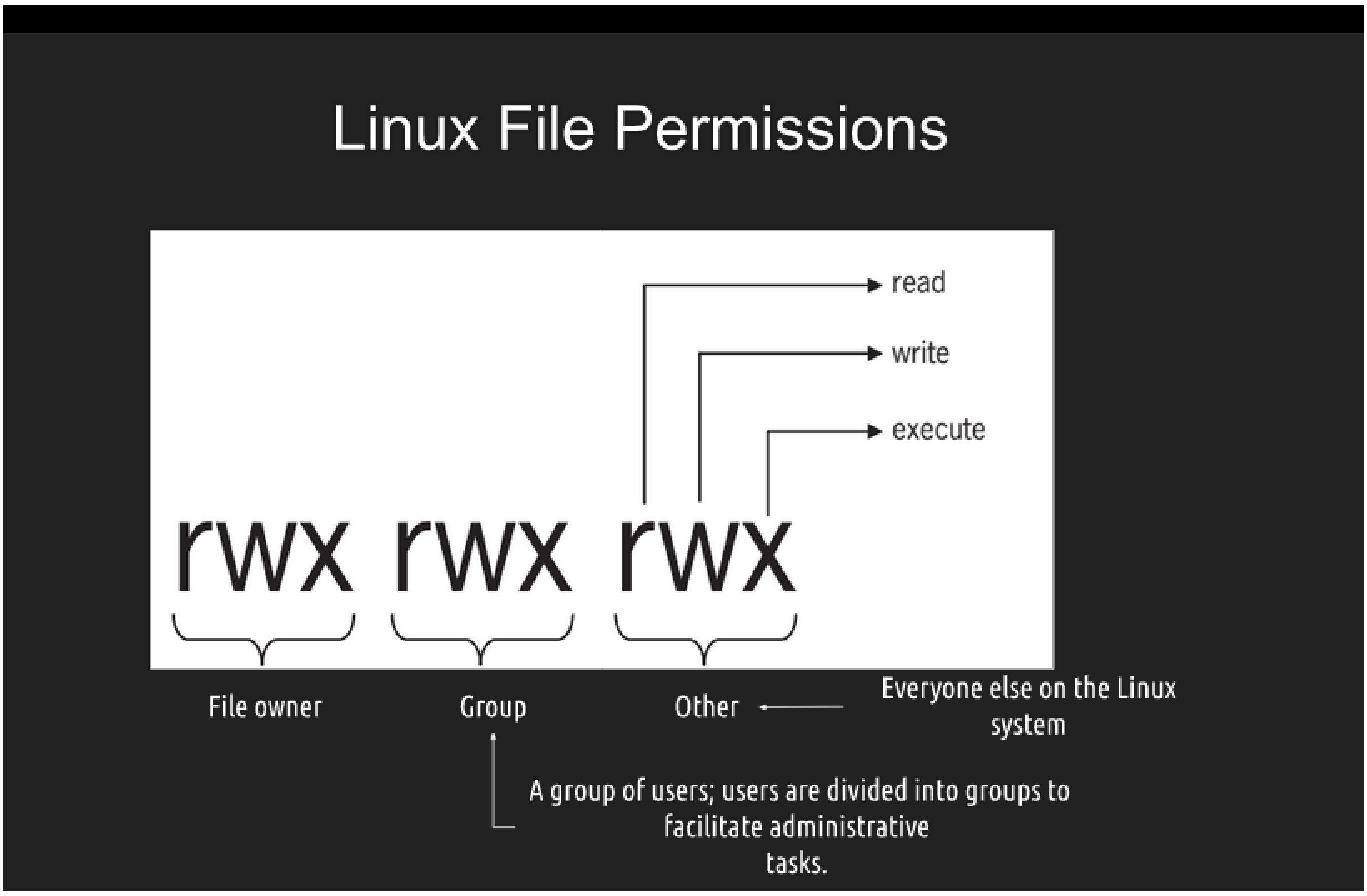
Activity Description	Example
Create an archive	`rar a archive.rar file1 file2 file3`
Extract an archive	`unrar archive.rar`
Create an archive with different archive format	`Example coming soon`
See files in an archive	`Example coming soon`
test integrity of an archive	`Example coming soon`
to archive with password protection	`Example coming soon`

Linux File Permissions | File Ownership.

- A file can be owned only by one user and one group.
- ls -l shows you the file user owner and group owner. chown command is used for changing group owner. Example and usage:

chown file.txt

File Permissions



Linux File Permissions

Everyone else on the Linux system

A group of users; users are divided into groups to facilitate administrative tasks.

Files vs Directories Read gives users to read the file or open the directory Write gives users permission to read and edit its content and for directories to view and add or remove subdirectories Execute allows users to run the file (allows users to run the file) and for directories switching directories with cd command.

Examples and Usage SYMBOLIC NOTATION

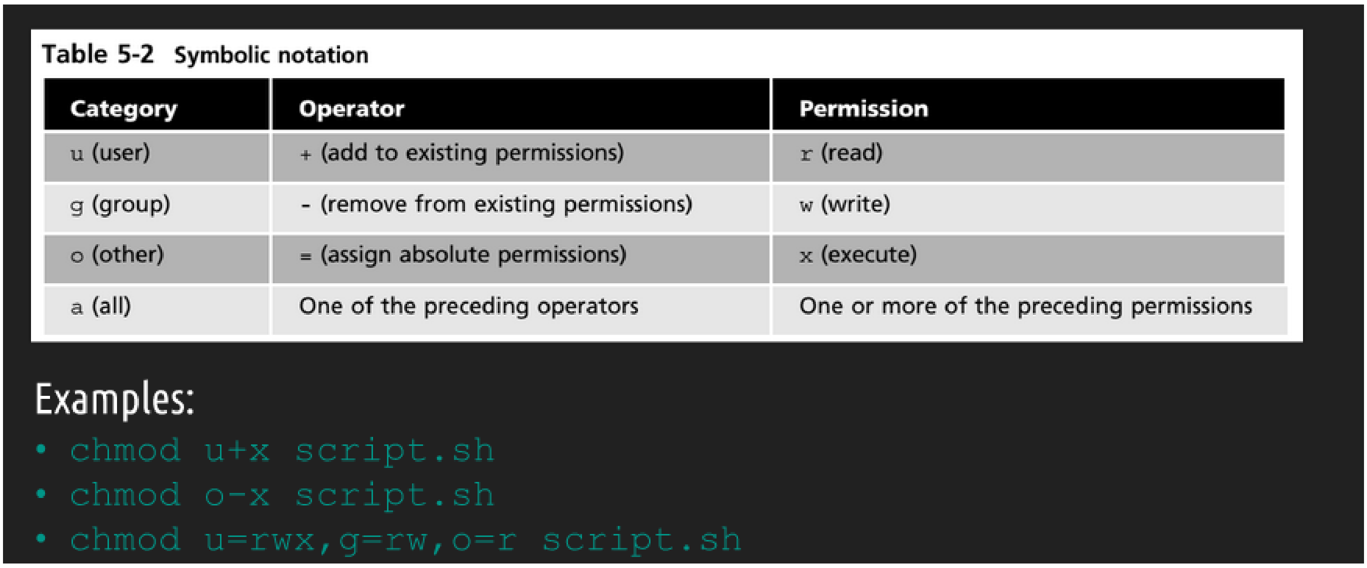


Table 5-2 Symbolic notation

Category	Operator	Permission
u (user)	+ (add to existing permissions)	r (read)
g (group)	- (remove from existing permissions)	w (write)
o (other)	= (assign absolute permissions)	x (execute)
a (all)	One of the preceding operators	One or more of the preceding permissions

Examples:

- `chmod u+x script.sh`
- `chmod o-x script.sh`
- `chmod u=rwx,g=rw,o=r script.sh`

Numeric Notation

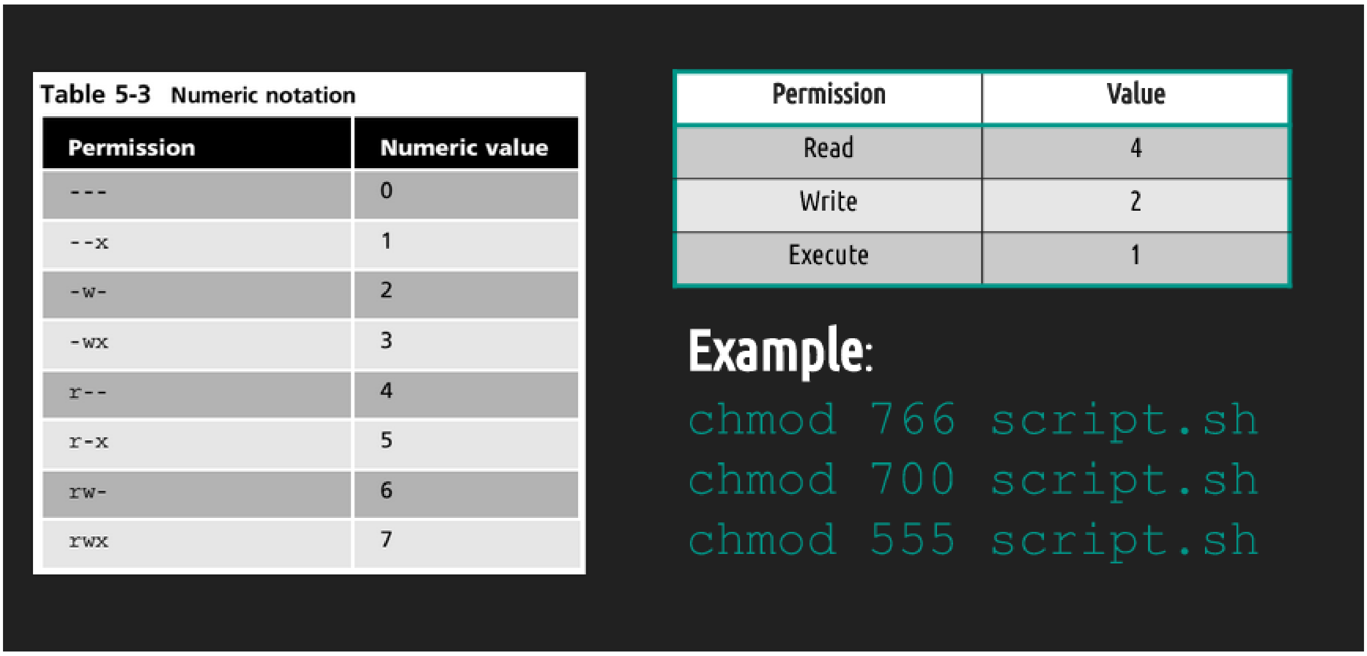


Table 5-3 Numeric notation

Permission	Numeric value
`---`	0
`--x`	1
`-w-`	2
`-wx`	3
`r--`	4
`r-x`	5
`rw-`	6
`rwx`	7

Permission	Value
Read	4
Write	2
Execute	1

Example:

```
chmod 766 script.sh
chmod 700 script.sh
chmod 555 script.sh
```