



LINUX AADMIN 1 LAB 4

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1. Compress a file by compress, gzip, zip commands and decompress it again.

- compress :

```
devops@devops-virtual-machine:~/practice/docs$ ls -l
total 12
-rw-rw-r-- 1 devops devops 0 Apr 15 16:43 empty1
-rw-rw-r-- 1 devops devops 0 Apr 15 16:43 empty2
-rw-r--r-- 1 devops devops 2931 Apr 15 16:43 not-empty1
-rw-r--r-- 1 devops devops 2931 Apr 15 16:43 not-empty2
-rw-r--r-- 1 devops devops 2931 Apr 15 16:43 not-empty3
devops@devops-virtual-machine:~/practice/docs$ compress -v empty{1,2} not-empty{1..3}
empty1: No compression -- empty1 unchanged
empty2: No compression -- empty2 unchanged
not-empty1: -- replaced with not-empty1.Z Compression: 47.66%
not-empty2: -- replaced with not-empty2.Z Compression: 47.66%
not-empty3: -- replaced with not-empty3.Z Compression: 47.66%
devops@devops-virtual-machine:~/practice/docs$ ls -l
total 12
-rw-rw-r-- 1 devops devops 0 Apr 15 16:43 empty1
-rw-rw-r-- 1 devops devops 0 Apr 15 16:43 empty2
-rw-r--r-- 1 devops devops 1534 Apr 15 16:43 not-empty1.Z
-rw-r--r-- 1 devops devops 1534 Apr 15 16:43 not-empty2.Z
-rw-r--r-- 1 devops devops 1534 Apr 15 16:43 not-empty3.Z
devops@devops-virtual-machine:~/practice/docs$ uncompress -v not-empty{1..3}.Z
not-empty1.Z: 47.7% -- replaced with not-empty1
not-empty2.Z: 47.7% -- replaced with not-empty2
not-empty3.Z: 47.7% -- replaced with not-empty3
```

Notice Files' sizes

Looks like compress doesn't work with empty files!

-v > Write compression statistics.

- gzip :

```
devops@devops-virtual-machine:~/practice/docs$ gzip -vk empty1 not-empty1
empty1: 0.0% -- created empty1.gz
not-empty1: 64.4% -- created not-empty1.gz
devops@devops-virtual-machine:~/practice/docs$ ls -l
total 20
-rw-rw-r-- 1 devops devops 0 Apr 15 16:43 empty1
-rw-rw-r-- 1 devops devops 27 Apr 15 16:43 empty1.gz
-rw-rw-r-- 1 devops devops 0 Apr 15 16:43 empty2
-rw-r--r-- 1 devops devops 2931 Apr 15 16:43 not-empty1
-rw-r--r-- 1 devops devops 1073 Apr 15 16:43 not-empty1.gz
-rw-r--r-- 1 devops devops 2931 Apr 15 16:43 not-empty2
-rw-r--r-- 1 devops devops 2931 Apr 15 16:43 not-empty3
devops@devops-virtual-machine:~/practice/docs$ gzip -l empty1.gz
compressed uncompressed ratio uncompressed_name
> 27 > 0 0.0% empty1
devops@devops-virtual-machine:~/practice/docs$
devops@devops-virtual-machine:~/practice/docs$ gunzip empty1.gz not-empty1.gz
gzip: empty1 already exists; do you wish to overwrite (y or n)? y
gzip: not-empty1 already exists; do you wish to overwrite (y or n)? y
devops@devops-virtual-machine:~/practice/docs$ ls
empty1 empty2 not-empty1 not-empty2 not-empty3
devops@devops-virtual-machine:~/practice/docs$
```

Unlike the compress command, gzip compressed empty files without any error, but with 0% compression reduction

-k option is to keep original files.

Using -l option to show more info.

As we can see, compressed empty file is even bigger in size than the original one!

- zip :

```
devops@devops-virtual-machine:~/practice/docs$ ls
empty1 empty2 not-empty1 not-empty2 not-empty3
devops@devops-virtual-machine:~/practice/docs$ zip -v archive empty{1,2} not-empty{1..3}
  adding: empty1      (in=0) (out=0) (stored 0%)
  adding: empty2      (in=0) (out=0) (stored 0%)
  adding: not-empty1  (in=2931) (out=1044) (deflated 64%)
  adding: not-empty2  (in=2931) (out=1044) (deflated 64%)
  adding: not-empty3  (in=2931) (out=1044) (deflated 64%)
total bytes=8793, compressed=3132 -> 64% savings
devops@devops-virtual-machine:~/practice/docs$ ls
archive.zip empty1 empty2 not-empty1 not-empty2 not-empty3
devops@devops-virtual-machine:~/practice/docs$
devops@devops-virtual-machine:~/practice/docs$ mkdir dir && mv archive.zip dir/
devops@devops-virtual-machine:~/practice/docs$ cd dir/
devops@devops-virtual-machine:~/practice/docs/dir$ unzip archive.zip
Archive:  archive.zip
  extracting: empty1
  extracting: empty2
   inflating: not-empty1
   inflating: not-empty2
   inflating: not-empty3
devops@devops-virtual-machine:~/practice/docs/dir$ ls
archive.zip empty1 empty2 not-empty1 not-empty2 not-empty3
devops@devops-virtual-machine:~/practice/docs/dir$ pwd
/home/devops/practice/docs/dir
devops@devops-virtual-machine:~/practice/docs/dir$ cd ..
devops@devops-virtual-machine:~/practice/docs$ ls
dir empty1 empty2 not-empty1 not-empty2 not-empty3
devops@devops-virtual-machine:~/practice/docs$
```

zip takes first argument as the name of the zipped file, and the rest of the arguments is the original files you want to zip.

So zip can compress multiple files in one file!

zip can compress empty files also, still with 0 reduction.

State the differences between compress and gzip commands.

	compress	gzip	zip
Number of files compressed in one file	One file at a time	One file at a time	Multiple files in one file
File type	.Z	.gz	.zip
Empty files	Error	0 reduction	0 reduction
Compatibility	Not supported on some systems (I installed it)	More widely used and is supported on almost all operating systems	Supported on almost all operating systems, and the archives can be opened by multiple programs

2. What is the command used to view the content of a compressed file.

```
devops@devops-virtual-machine:~/practice/docs/compressed$ ls -l
total 28
-rw-rw-r-- 1 devops devops 20480 Apr 15 19:56 archive.tar
-rw-rw-r-- 1 devops devops 1354 Apr 15 18:25 archive.zip
-rw-r--r-- 1 devops devops 1073 Apr 15 16:43 not-empty1.gz
devops@devops-virtual-machine:~/practice/docs/compressed$ tar -tf archive.tar
empty1
empty2
not-empty1
not-empty2
not-empty3
devops@devops-virtual-machine:~/practice/docs/compressed$ unzip -l archive.zip
Archive:  archive.zip
  Length      Date    Time    Name
  -----
         0  2023-04-15 16:43    empty1
    2931  2023-04-15 16:43  not-empty1
  -----
    2931                     2 files
devops@devops-virtual-machine:~/practice/docs/compressed$ gzip -l not-empty1.gz
compressed      uncompressed  ratio uncompressed_name
      1073             2931    64.4% not-empty1
devops@devops-virtual-machine:~/practice/docs/compressed$ ls
archive.tar archive.zip not-empty1.gz
devops@devops-virtual-machine:~/practice/docs/compressed$
```

3. Backup /etc directory using tar utility.

```
devops@devops-virtual-machine:~/practice/docs$ ls
compressed empty1 empty2 etc-compressed-backup not-empty1 not-empty2 not-empty3
devops@devops-virtual-machine:~/practice/docs$ cd etc-compressed-backup/
devops@devops-virtual-machine:~/practice/docs/etc-compressed-backup$ ls
devops@devops-virtual-machine:~/practice/docs/etc-compressed-backup$ sudo tar -czvf etc_backup.tar.gz /etc
[sudo] password for devops:
tar: Removing leading `/' from member names
/etc/
/etc/deluser.conf
/etc/ubuntu-advantage/
/etc/ubuntu-advantage/help_data.yaml
/etc/ubuntu-advantage/uaclient.conf
/etc/X11/
/etc/X11/xorg.conf.d/
/etc/X11/XvMCConfig
/etc/X11/app-defaults/
```

*-z option is used to compress
the final tar file using gzip*

```
devops@devops-virtual-machine:~/practice/docs/etc-compressed-backup$ ls
etc_backup.tar.gz
devops@devops-virtual-machine:~/practice/docs/etc-compressed-backup$ gzip -l etc_backup.tar.gz
compressed      uncompressed  ratio uncompressed_name
    1862932             14192640    86.9% etc_backup.tar
devops@devops-virtual-machine:~/practice/docs/etc-compressed-backup$
```

4. Starting from your home directory, find all files that were modified in the last two days.

```
devops@devops-virtual-machine:~$ pwd
/home/devops
devops@devops-virtual-machine:~$ man find
devops@devops-virtual-machine:~$ find -mtime -2
.
./.gnupg
./.profile
./.config/ibus/bus
./.config/ibus/bus/485a8ac6458740c3919c94ab443eef9e-unix-0
./.config/ibus/bus/485a8ac6458740c3919c94ab443eef9e-unix-wayland-0
./.config/dconf
./.config/dconf/user
```

5. Starting from /etc, find files owned by the root user.

```
devops@devops-virtual-machine:~$ sudo find /etc -type f -user root
/etc/deluser.conf
/etc/ubuntu-advantage/help_data.yaml
/etc/ubuntu-advantage/uaclient.conf
/etc/X11/XvMCConfig
/etc/X11/app-defaults/XSm
/etc/X11/app-defaults/Editres-color
/etc/X11/app-defaults/XCalc-color
```

6. Find all directories in your home directory.

```
devops@devops-virtual-machine:~$ ls -la
.          .bash_logout  Documents    .gradle     .local      Pictures    script.sh   Templates
..         .bashrc       Downloads    IdeaProjects .m2         .pki        setup.sh    Videos
.android   .cache        .emacs.d     .java       Music       practice    snap        .viminfo
apache-maven-3.6.3-bin.tar.gz .config       .gitconfig   .jdk        openjdk-13.0.1_linux-x64_bin.tar.gz .profile    .ssh        .vscode
.bash_history Desktop       .gnupg       .lessht     .pam_environment .Public     .sudo_as_admin_successful

devops@devops-virtual-machine:~$ find ~ -type d
/home/devops
/home/devops/Videos
/home/devops/.emacs.d
/home/devops/.gnupg
/home/devops/Templates
/home/devops/.android
/home/devops/.java
/home/devops/.java/fonts
/home/devops/.java/fonts/17.0.4.1
/home/devops/.java/fonts/17.0.3
/home/devops/.java/.userPrefs
/home/devops/.java/.userPrefs/jetbrains
/home/devops/.java/.userPrefs/jetbrains/!(?!cg"p!{}!}@"j!{k!|w"w!'8!b!p!':!e@==
/home/devops/.java/.userPrefs/jetbrains/jetprofile
/home/devops/.java/.userPrefs/jetbrains/jetprofile/asset
/home/devops/Public
/home/devops/.vscode
/home/devops/.vscode/extensions
```

8. Identify the file types of the following: /etc/passwd, /dev/pts/0, /etc, /dev/sda

```
devops@devops-virtual-machine:~$ file /etc/passwd /dev/pts/0 /etc/ /dev/sda
/etc/passwd: ASCII text
/dev/pts/0:  character special (136/0)
/etc/:      directory
/dev/sda:   block special (8/0)
devops@devops-virtual-machine:~$
```

10. Copy /etc/passwd to your home directory, use the commands diff and cmp, and Edit in the file you copied, and then use these commands again, and check the output.

```
devops@devops-virtual-machine:~/practice/docs$ cp /etc/passwd copied-passwd
devops@devops-virtual-machine:~/practice/docs$ ls
compressed  copied-passwd  empty1  empty2  etc-compressed-backup  not-empty1  not-empty2  not-empty3
devops@devops-virtual-machine:~/practice/docs$ diff /etc/passwd copied-passwd
devops@devops-virtual-machine:~/practice/docs$ cmp /etc/passwd copied-passwd
devops@devops-virtual-machine:~/practice/docs$ vim copied-passwd
devops@devops-virtual-machine:~/practice/docs$ diff /etc/passwd copied-passwd
1,5d0
< root:x:0:0:root:/root:/bin/bash
< daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
< bin:x:2:2:bin:/bin:/usr/sbin/nologin
< sys:x:3:3:sys:/dev:/usr/sbin/nologin
< sync:x:4:65534:sync:/bin:/bin/sync
devops@devops-virtual-machine:~/practice/docs$ cmp /etc/passwd copied-passwd
/etc/passwd copied-passwd differ: byte 1, line 1
devops@devops-virtual-machine:~/practice/docs$ man cmp
devops@devops-virtual-machine:~/practice/docs$
```

I deleted first five lines using vim
In command mode : d5d, while I was in the first line.