

Ex 3

COMPILING FROM THE SOURCE

Date: 29.08.20

Aim:

To study and implement the compiling from the source.

Description:

tar

The Linux 'tar' stands for tape archive, is used to create Archive and extract the Archive files. tar command in Linux is one of the important commands which provides archiving functionality in Linux. We can use Linux tar command to create compressed or uncompressed Archive files and also maintain and modify them.

zip

ZIP is a compression and file packaging utility for Unix. Each file is stored in a single .zip { .zip-filename } file with the extension .zip. ZIP is a compression and file packaging utility for Unix. Each file is stored in a single .zip { .zip-filename } file with the extension .zip.

gzip

gzip command compresses files. Each single file is compressed into a single file. The compressed file consists of a GNU zip header and deflated data. If given a file as an argument, gzip compresses the file, adds a ".gz" suffix, and deletes the original file. With no arguments, gzip compresses the standard input and writes the compressed file to standard output.

Difference between Gzip and zip command in Unix and when to use which command

- ZIP and GZIP are two very popular methods of compressing files, in order to save space, or to reduce the amount of time needed to transmit the files across the network, or internet.
- In general, GZIP is much better compared to ZIP, in terms of compression, especially when compressing a huge number of files.
- The common practice with GZIP, is to archive all the files into a single tarball before compression. In ZIP files, the individual files are compressed and then added to the archive.

- When you want to pull a single file from a ZIP, it is simply extracted, then decompressed. With GZIP, the whole file needs to be decompressed before you can extract the file you want from the archive.
- When pulling a 1MB file from a 10GB archive, it is quite clear that it would take a lot longer in GZIP, than in ZIP.
- GZIP's disadvantage in how it operates, is also responsible for GZIP's advantage. Since the compression algorithm in GZIP compresses one large file instead of multiple smaller ones, it can take advantage of the redundancy in the files to reduce the file size even further.
- If you archive and compress 10 identical files with ZIP and GZIP, the ZIP file would be over 10 times bigger than the resulting GZIP file.

Commands:

| Sl. No. | Command Name | Syntax | options |
|---------|----------------|--|---|
| 1. | rpm | rpm {rpm-file} | -a, --all Query all packages -f Query for packages owning given file |
| 2. | apt-get | apt-get [options] source pkg1 [pkg2 ...] | -a It prints all the system information in the order -s It prints the kernel name. -n It prints the hostname of the network node -r It prints the kernel release |

| | | | |
|-----------|------------|---|--|
| | | | <p>date</p> <p>-v</p> <p>It prints the version of the current kernel</p> |
| 3. | tar | tar [options] [archive-file] [file or directory to be archived] | <p>-c</p> <p>Creates Archive</p> <p>-x</p> <p>Extract the archive</p> <p>-f</p> <p>Creates archive with given filename</p> <p>-t</p> <p>Displays or lists files in archive file</p> <p>-u</p> <p>Archives and adds to an existing archive file</p> <p>-A</p> <p>Concatenates the archive files</p> <p>-z</p> <p>zip, tells tar command that create tar file using gzip</p> <p>-W</p> <p>Verify a archive file</p> <p>-r</p> <p>update or add file or directory in already existed .tar file</p> |

| | | | |
|----|------|----------------------------------|---|
| 4. | zip | zip [options] zipfile files_list | <p>-d :</p> <p>Removes the file from the zip archive</p> <p>-u :</p> <p>Updates the file in the zip archive</p> <p>-m :</p> <p>Deletes the original files after zipping</p> <p>-r :</p> <p>To zip a directory recursively</p> <p>-x :</p> <p>Exclude the files in creating the zip</p> <p>-v :</p> <p>Verbose mode or print diagnostic version info</p> |
| 5. | gzip | gzip [Options] [filenames] | <p>-f :</p> <p>Sometimes a file cannot be compressed</p> <p>-k :</p> <p>By default when you compress a file using the “gzip” command you end up with a new file with the extension</p> <p>-L :</p> |

| | | | |
|--|--|--|--|
| | | | <p>This option displays the gzip license</p> <p>-r :</p> <p>This option can compress every file in a folder and its subfolders</p> <p>-[1-9] :</p> <p>It allows to change the compression level</p> <p>-v :</p> <p>his option displays the name and percentage reduction for each file compressed or decompressed</p> <p>-d :</p> <p>This option allows you to decompress a file using the “gzip” command.</p> |
|--|--|--|--|

Exercise:

1. Compile the source from Openttd package

Installing Openttd using package manager

```
gloria@kali: ~/Downloads
File Actions Edit View Help
gloria@kali:~/Downloads$ sudo apt-get install openttd
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libcdio18 libmpdec2 libprotobuf22 libx264-155 libx264-159 openjdk-8-jre
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  fluid-soundfont-gm libao-common libao4 libsdl2-2.0-0 libxdg-basedir1 openttd-data openttd-opengfx
  openttd-openmsx timidity
Suggested packages:
  fluid-soundfont-gs fluidsynth libsndio6.1 openttd-opensfx freepats pmidi timidity-daemon
The following NEW packages will be installed:
  fluid-soundfont-gm libao-common libao4 libsdl2-2.0-0 libxdg-basedir1 openttd openttd-data
  openttd-opengfx openttd-openmsx timidity
0 upgraded, 10 newly installed, 0 to remove and 18 not upgraded.
Need to get 129 MB of archives.
After this operation, 176 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://kali.download/kali kali-rolling/main amd64 fluid-soundfont-gm all 3.1-5.1 [120 MB]
Get:2 http://kali.download/kali kali-rolling/main amd64 libao-common all 1.2.2+20180113-1 [11.6 kB]
Get:3 http://kali.download/kali kali-rolling/main amd64 libao4 amd64 1.2.2+20180113-1+b1 [37.6 kB]
Get:4 http://kali.download/kali kali-rolling/main amd64 libsdl2-2.0-0 amd64 2.0.12+dfsg1-2 [450 kB]
Get:5 http://kali.download/kali kali-rolling/main amd64 libxdg-basedir1 amd64 1.2.0-2+b1 [11.3 kB]
Get:6 http://kali.download/kali kali-rolling/main amd64 openttd-data all 1.10.3-1 [2,831 kB]
Get:7 http://kali.download/kali kali-rolling/main amd64 openttd amd64 1.10.3-1 [2,360 kB]
Get:8 http://kali.download/kali kali-rolling/main amd64 openttd-opengfx all 0.6.0-1 [2,895 kB]
Get:9 http://kali.download/kali kali-rolling/main amd64 openttd-openmsx all 0.3.1-6 [95.1 kB]
Get:10 http://kali.download/kali kali-rolling/main amd64 timidity amd64 2.14.0-8 [627 kB]
Fetched 129 MB in 48s (2,677 kB/s)
Selecting previously unselected package fluid-soundfont-gm.
```

Check the version of Openttd

```
gloria@kali: ~/Downloads
File Actions Edit View Help
gloria@kali:~/Downloads$ openttd version
OpenTTD 1.10.3
```

Output:

Run the Openttd



2. Compile the source from JFrog package

Download and Extract the JFrog file

```
gloria@kali: ~/Downloads/jfrog_lab

File  Actions  Edit  View  Help

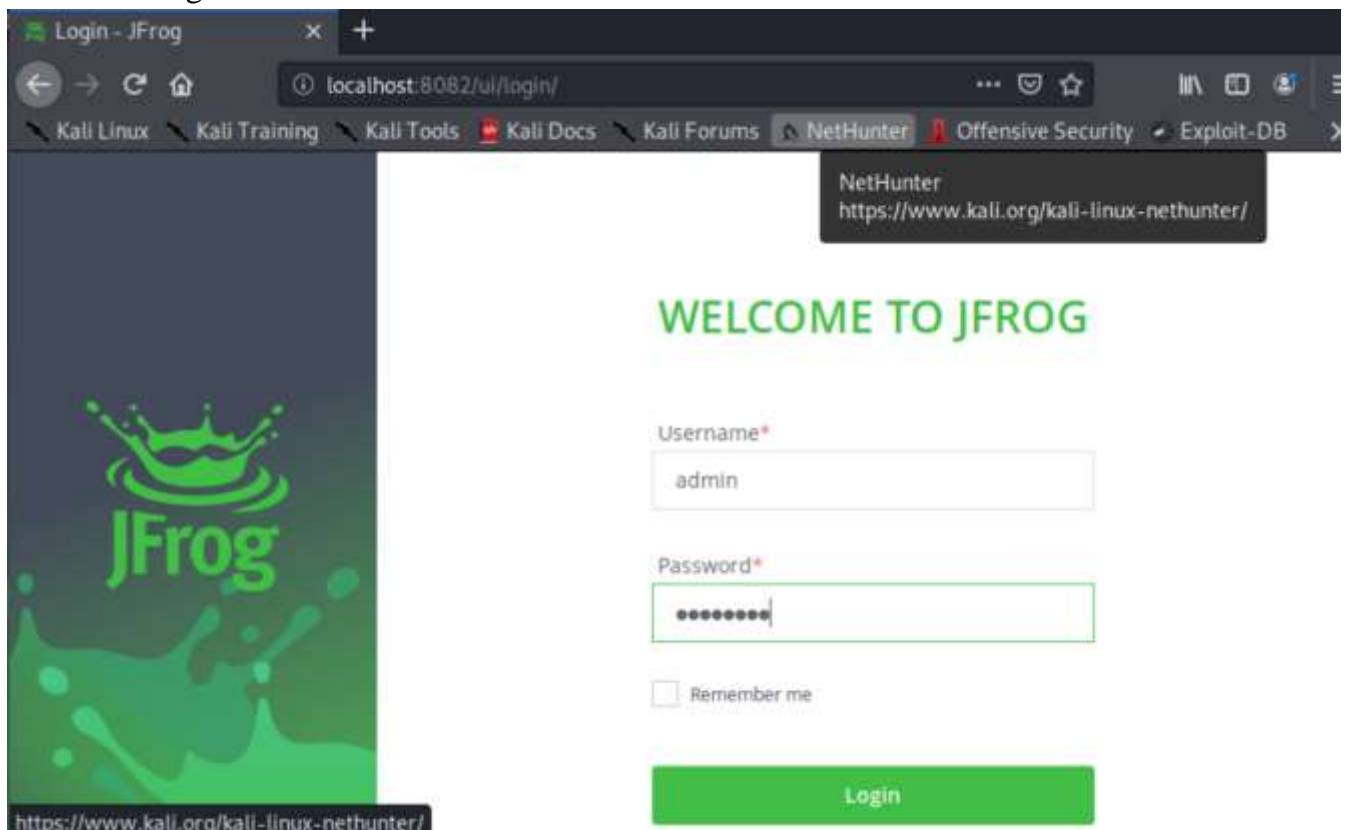
gloria@kali:~$ cd Downloads/
gloria@kali:~/Downloads$ mkdir jfrog_lab
gloria@kali:~/Downloads$ cd jfrog_lab
gloria@kali:~/Downloads/jfrog_lab$ tar -xvf jfrog-artifactory-oss-7.7.8-linux.tar.gz
artifactory-oss-7.7.8/app/metadata/bin/jf-metadata
artifactory-oss-7.7.8/app/router/bin/jf-router
```


Compiling the Source of JFrog

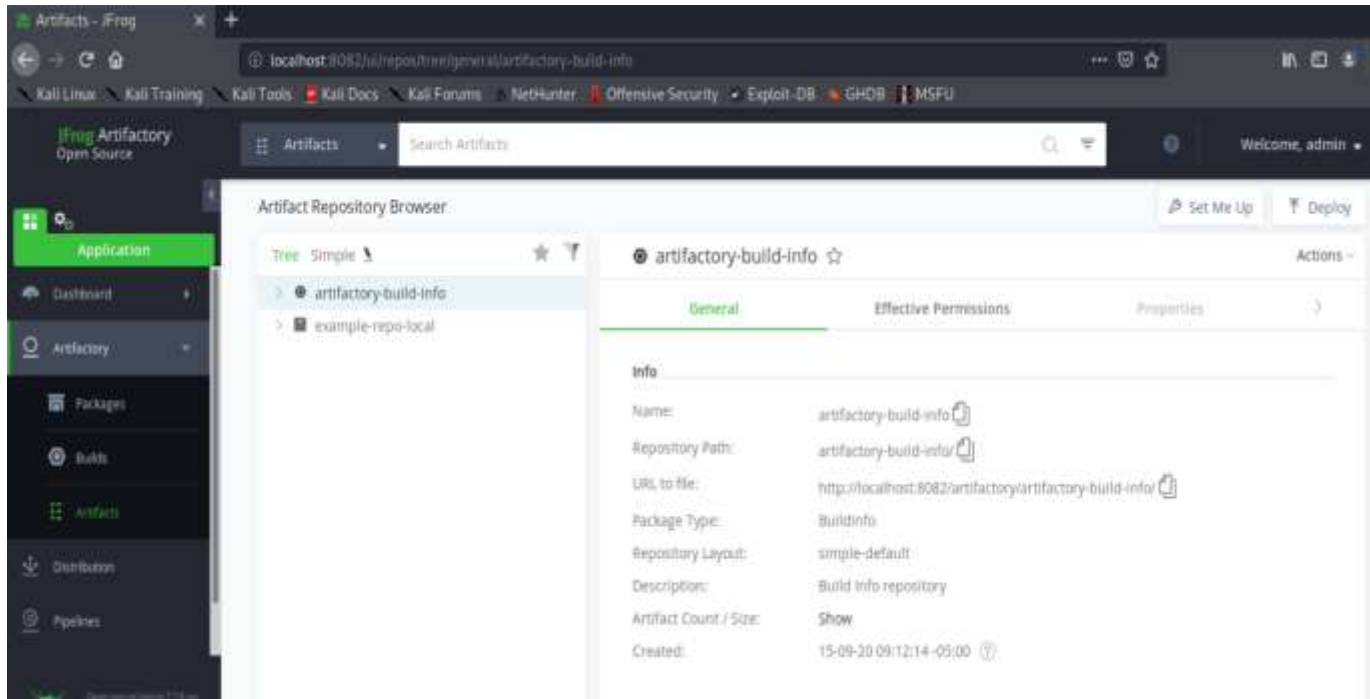
```
gloria@kali:~/Downloads/jfrog_lab$ cd artifactory-oss-7.7.8
gloria@kali:~/Downloads/jfrog_lab/artifactory-oss-7.7.8$ cd app
gloria@kali:~/Downloads/jfrog_lab/artifactory-oss-7.7.8/app$ cd bin
gloria@kali:~/Downloads/jfrog_lab/artifactory-oss-7.7.8/app/bin$ ./artifactoryctl
2020-09-15T14:11:33.415Z [shell] [INFO] [] [installerCommon.sh:1334] [main] - Checking open files a
2020-09-15T14:11:33.432Z [shell] [INFO] [] [installerCommon.sh:1337] [main] - Current max open file
2020-09-15T14:11:33.449Z [shell] [INFO] [] [installerCommon.sh:1348] [main] - Current max open pro
2020-09-15T14:11:33.469Z [shell] [INFO] [] [installerCommon.sh:1415] [main] - Testing directory /ho
ions for user id 1000
2020-09-15T14:11:33.491Z [shell] [INFO] [] [installerCommon.sh:1430] [main] - Permissions for /home
2020-09-15T14:11:34.240Z [shell] [INFO] [] [installerCommon.sh:3035] [main] - Setting JF_SHARED_NO
2020-09-15T14:11:34.288Z [shell] [INFO] [] [installerCommon.sh:3035] [main] - Setting JF_SHARED_NO
2020-09-15T14:11:34.333Z [shell] [INFO] [] [installerCommon.sh:3035] [main] - Setting JF_SHARED_NO
2020-09-15T14:11:34.458Z [shell] [INFO] [] [artifactoryCommon.sh:112] [main] - Final command: -serve
add-opens java.base/java.util=ALL-UNNAMED --add-opens java.base/java.lang.reflect=ALL-UNNAMED --add-opens j
MED --add-opens java.base/java.nio=ALL-UNNAMED --add-opens java.desktop/java.awt.font=ALL-UNNAMED -Dfile.e

Artifactory OSS
Version: 7.7.8
Revision: 70708900
Artifactory Home: '/home/gloria/Downloads/jfrog_lab/artifactory-oss-7.7.8'
Node ID: 'kali'
```

Run the JFrog in the Browser and Enter Valid Credentials



Output:



3. Compile the Source from gcc

Check the Version of gcc

```
gloria@kali: ~  
File Actions Edit View Help  
gloria@kali:~$ gcc --version  
gcc (Debian 9.3.0-15) 9.3.0  
Copyright (C) 2019 Free Software Foundation, Inc.  
This is free software; see the source for copying conditions. There is NO  
warranty; not even for MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE.  
gloria@kali:~$
```

Sample Program

```
gloria@kali: ~/Downloads  
File Actions Edit View Help  
#include<stdio.h>  
int main()  
{  
    printf("This is Open source lab");  
    printf("WELCOME!");  
}
```

Output:

Compile and Run the C program using gcc

```
gloria@kali: ~/Downloads
File Actions Edit View Help
gloria@kali:~/Downloads$ vi hey.c
gloria@kali:~/Downloads$ gcc -o intro hey.c
gloria@kali:~/Downloads$ ./intro
This is Open source labWELCOME!gloria@kali:~/Downloads$
```

4. Compile the source from any open source package (GIMP)

Installing GIMP using package manager

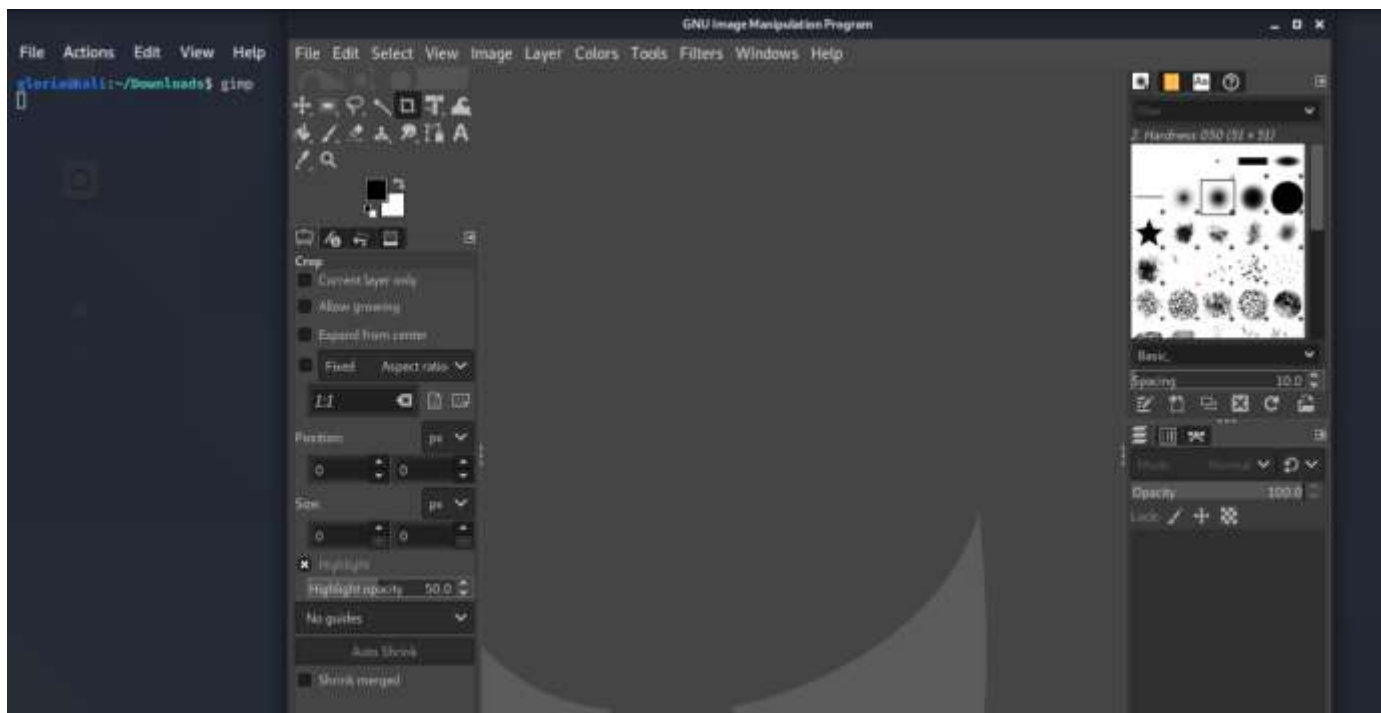
```
This is Open source labWELCOME!gloria@kali:~/Downloads$ sudo apt-get install gimp -y
[sudo] password for gloria:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libcdio18 libmpdec2 libprotobuf22 libx264-155 libx264-159 openjdk-8-jre
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  ghostscript gimp-data gsfonts libamd2 libbabl-0.1-0 libcamd2 libccolamd2 libcholmod3 libcolamd2 libde265-0
  libgegl-0.4-0 libgegl-common libgexiv2-2 libgimp2.0 libheif1 libilmbase24 libilmbase25 libmetis5 libmng1
  libmypaint-1.5-1 libmypaint-common libopenexr24 libopenexr25 libraw20 libsuitesparseconfig5 libumfpack5
  libwmf0.2-7
Suggested packages:
  ghostscript-x gimp-help-en | gimp-help gimp-data-extras libwmf0.2-7-gtk
The following NEW packages will be installed:
  ghostscript gimp gimp-data gsfonts libamd2 libbabl-0.1-0 libcamd2 libccolamd2 libcholmod3 libcolamd2
  libde265-0 libgegl-0.4-0 libgegl-common libgexiv2-2 libgimp2.0 libheif1 libilmbase24 libilmbase25 libmetis5
  libmng1 libmypaint-1.5-1 libmypaint-common libopenexr24 libopenexr25 libraw20 libsuitesparseconfig5
  libumfpack5 libwmf0.2-7
```

Update the System to Compile GIMP

```
gloria@kali: ~/Downloads
File Actions Edit View Help
gloria@kali:~/Downloads$ sudo apt-get update
Get:1 http://kali.download/kali kali-rolling InRelease [30.5 kB]
Get:2 http://kali.download/kali kali-rolling/main amd64 Packages [16.6 MB]
Get:3 http://kali.download/kali kali-rolling/contrib amd64 Packages [100 kB]
Get:4 http://kali.download/kali kali-rolling/non-free amd64 Packages [199 kB]
Fetched 16.9 MB in 8s (2,200 kB/s)
Reading package lists... Done
W: Target Packages (main/binary-amd64/Packages) is configured multiple times in /etc/apt/sources
apt/sources.list:7
W: Target Packages (main/binary-all/Packages) is configured multiple times in /etc/apt/sources
t/sources.list:7
W: Target Translations (main/i18n/Translation-en_US) is configured multiple times in /etc/apt/
/etc/apt/sources.list:7
W: Target Translations (main/i18n/Translation-en) is configured multiple times in /etc/apt/sou
c/apt/sources.list:7
```

Output:

Run the GIMP



Result: The compiling from the source is studied and executed.

Video Link: <https://youtu.be/elp4FOITXNI>