Hands-on Projects

These projects should be completed in the order given. The hands-on projects presented in this chapter should take a total of three hours to complete. The requirements for this lab include:

* A computer with Fedora Linux installed according to Hands-on Project 2-1 and Ubuntu Server Linux installed according to Hands-On Project 6-1.

# Project 11-1

In this hands-on project, you use common compression utilities to compress and uncompress information on Fedora 24.

1. Boot your **Fedora** Linux virtual machine. Login to your chosen desktop environment as **user1** using password **LNXrocks!** and open up a terminal window.
2. At the terminal, become **root** by typing **su -** and press enter and provide **LNXrocks!** as the password.
3. At the command prompt, type **dnf install ncompress** and press Enter. Press y when prompted to complete the installation of the ncompress RPM package (and any package dependencies).
4. Copy the **/etc/services** file to your home directory. Use the **-h** option with the **ls** command to view the file size of the services file.
5. At the command prompt, type **compress -v services** and press Enter to compress the services file. What was the compression ratio? Use the **-h** option with the **ls** command to view the file size of the services file.
6. At the command prompt, type **uncompress -v services.Z** and press Enter to decompress the services file.
7. Create the **compress** directory and copy the **/etc/hosts** and **/etc/inittab** files to this directory.
8. At the command prompt, type **compress -vr compress/** and press Enter to compress the contents of the compress subdirectory. Next, type **ll -R compress** at the command prompt and press Enter to view the contents of the compress directory.
9. At the command prompt, type **uncompress -vr compress** and press Enter to decompress the contents of the Desktop subdirectory. Next, type **ll -R compress** at the command prompt and press Enter to verify that these files were uncompressed.
10. At the command prompt, type **ps -ef | compress -v >psfile.Z** and press Enter to compress the output of the ps –ef command to a file called psfile.Z. Review the compression ratio.
11. At the command prompt, type **zless psfile.Z** and press Enter to view the compressed contents of the psfile.Z file. When finished, press q to quit the more utility.
12. At the command prompt, type **gzip -v services** and press Enter to compress the services file. Next, type **ll -h** at the command prompt and press Enter. What extension does the services file have and how large is it?**(.gz)**
13. At the command prompt, type **gunzip -v services.gz** and press Enter to decompress the services file.
14. At the command prompt, type **gzip -v -9 services** and press Enter to compress the services file. Review the compression ratio.
15. At the command prompt, type **gunzip -v services.gz** and press Enter to decompress the services file.
16. At the command prompt, type **gzip -v -1 services** and press Enter to compress the services file. Review the compression ratio.
17. At the command prompt, type **gunzip -v services.gz** and press Enter to decompress the services file.
18. At the command prompt, type **bzip2 -v services** and press Enter to compress the services file. Observe the compression ratio. Use the **-h** option with the **ls** command to view the file size of the services file.
19. At the command prompt, type **bunzip2 -v services.bz2** and press Enter to decompress the services file.
20. **Provide screenshot(s) of steps 3 through 19.**

# Project 11-2

In this hands-on project, you create, view, and extract archives using the tar utility.

1. Boot your **Fedora** Linux virtual machine. Login to your chosen desktop environment as **user1** using password **LNXrocks!** and open up a terminal window.
2. At the terminal, become **root** by typing **su -** and press enter and provide **LNXrocks!** as the password.
3. At the command prompt, type **tar -cvf test1.tar /etc/samba** and press Enter to create an archive called test1.tar in the current directory that contains the /etc/samba directory and its contents. Next, type **ll** at the command prompt and press Enter.
4. At the command prompt, type **tar -tvf test1.tar** and press Enter. Review the contents of the test1.tar archive.
5. Create the **/new1** directory and then make this your current directory.
6. At the command prompt, type **tar -xvf /root/test1.tar** and press Enter to extract the contents of the test1.tar archive. Next, type **ls -RF** at the command prompt and press Enter to view the contents of the /new1 directory.
7. Return to your home directory from the **/new1** directory.
8. At the command prompt, type **tar -zcvf test2.tar.gz /etc/samba** and press Enter to create a gzip-compressed archive called test2.tar.gz in the current directory that contains the /etc/samba directory and its contents. Use the **-h** option with the **ls** command to compare the file size from the output in step 3.
9. At the command prompt, type **tar -ztvf test2.tar.gz** and press Enter. Review the output.
10. At the command prompt, type **mkdir /new2** and press Enter. Next, type **cd /new2** at the command prompt and press Enter to change the current directory to the /new2 directory.
11. At the command prompt, type **tar -zxvf /root/test2.tar.gz** and press Enter to uncompress and extract the contents of the test2.tar.gz archive. Next, type **ls -RF** at the command prompt and press Enter to view the contents of the /new2 directory.
12. At the command prompt, type **cd** and press Enter to return to your home directory.
13. Remove the **/new1** and **/new2** directories. Remove both the **test1.tar** and the **test2.tar.gz** files.
14. **Provide screenshot(s) of steps 3 through 13.**

# Project 11-3

In this hands-on project, you create, view, and extract archives using the cpio and dump utilities.

1. Boot your **Fedora** Linux virtual machine. Login to your chosen desktop environment as **user1** using password **LNXrocks!** and open up a terminal window.
2. At the terminal, become **root** by typing **su -** and press enter and provide **LNXrocks!** as the password.
3. At the command prompt, type **find /etc/samba | cpio -ovcBL -O test.cpio** and press Enter to create an archive in the file test.cpio that contains the /etc/samba directory and its contents. What does each option indicate in the aforementioned command? **o=create; v=verbose; C=set the io block size; B=set io block size to 5120 bytes;** **-O=set the host file**
4. At the command prompt, type **cpio -ivtB -I test.cpio** and press Enter. What is displayed? **A long list of the files inside of test.cpio;** What does each option indicate in the aforementioned command? **-i=extract the files; v=list the files like long list;-t=contents of the input;-B= set io block size to 5120 bytes; -I=use the given filename to use instead of standard input.**
5. At the command prompt, type **cpio -ivcdumB -I test.cpio** and press Enter to extract the contents of the archive in the test.cpio file. To what location were the files extracted? **They were extracted to the samba directory.** Were any files overwritten? **No.**  What does each option indicate in the aforementioned command? **-i=extract files; -v=long list the files processed; -c=use the SVR4 portable format; -d=create leading directories; -u=replace all files; -m=retain file modification times when creating files; -B=set the i/o block size to 5120 bytes; -I = archive filename to use instead of standard input.**
6. At the command prompt, type **dnf install dump** and press Enter. Press y when prompted to complete the installation of the dump RPM package (and any package dependencies).
7. At the command prompt, type **dump -0uf test.dump /dev/sda1** and press Enter to create an archive of the /boot filesystem in the archive file test.dump. What type of backup was performed? **A full backup was done.** Will the /etc/dumpdates file be updated? **Yes, up to 9 times**
8. At the command prompt, type **cat /etc/dumpdates** and press Enter. Does the file indicate your full backup and time? **Yes, it does.**
9. Create the **/new** directory and make this your current directory.
10. At the command prompt, type **restore -rf /root/test.dump** and press Enter. What was displayed? **Nothing is displayed.** Are absolute or relative pathnames used? **Absolute pathnames are used**
11. Type **ls -F** at the command prompt and press Enter to view the contents of the /new directory. What is displayed? **The contents of /new followed by a symbol that signifies filetype**
12. At the command prompt, type **cd** and press Enter to return to your home directory.
13. Remove the **/new** directory along with the **test** files we created.
14. **Provide screenshot(s) of steps 3 through 13.**

# Project 11-4

In this hands-on project, you compile and install a program from source code.

1. Boot your **Fedora** Linux virtual machine. Login to your chosen desktop environment as **user1** using password **LNXrocks!** and open up a terminal window.
2. At the terminal, become **root** by typing **su -** and press enter and provide **LNXrocks!** as the password.
3. At the command prompt, type **wget https://github.com/rdesktop/rdesktop/releases/download/v1.8.3/rdesktop-1.8.3.tar.gz** and press Enter to download the source code for rdesktop.
4. At the command prompt, type **dnf groupinstall "Development Tools"** and press Enter to install the compiler tools from a software repository.
5. At the command prompt, type **dnf install libX11-devel openssl-devel** and press Enter to install the X11 and OpenSSL development libraries from a software repository.
6. At the command prompt, type **tar zxvf rdesktop-1.8.3.tar.gz** and press Enter to uncompress and extract the contents of the tarball. Next, type **ls -F** at the command prompt and press Enter. What directory was created? **/Rdesktop-1.8.3**
7. Make the **rdesktop-1.8.3** directory your current directory. Next, type **ls -F** at the command prompt and press Enter. Is there an executable configure program? **Yes, config.guess, config.sub, configure.** Are there README and INSTALL files present? **Yes**
8. At the command prompt, type **./configure --disable-credssp --disable-smartcard** and press Enter to run the configure script without configuring for credssp and smartcard support. What does this program do? **It runs the configuration file in rdesktop-1.8.3.** Near the bottom of the output, can you see whether the Makefile was created successfully? **Yes it was created.**
9. At the command prompt, type **make** and press Enter. What does the make program do? **It checks a program and compiles the necessary pieces.** Which program compiles the different parts of the program? **The make program.**
10. At the command prompt, type **make install** and press Enter. What does the make install command do?  **It sets off flags for errors.**
11. Return to your home directory and remove the **rdesktop-1.8.3** directory.
12. At the command prompt, type **which rdesktop** and press Enter. Which directory contains the rdesktop executable program? **/usr/bin/which.** Is a central database updated with this information? **No**
13. At the command prompt, type **man rdesktop** and press Enter. View the available options for the rdesktop command and press q to quit when finished.
14. **Provide screenshot(s) of steps 3 through 13.**

# Project 11-5

In this hands-on project, you use the rpm and dnf commands to query, remove, and install the ncompress RPM package.

1. Boot your **Fedora** Linux virtual machine. Login to your chosen desktop environment as **user1** using password **LNXrocks!** and open up a terminal window.
2. At the terminal, become **root** by typing **su -** and press enter and provide **LNXrocks!** as the password.
3. At the command prompt, type **rpm -qa | less** and press Enter to view the RPM packages installed on your computer. Are there many of them? **There is a shit ton!** Briefly scroll through the list and press q when finished to exit the less utility.
4. At the command prompt, type **rpm -q ncompress** and press Enter. Is the ncompress RPM package installed on your computer? **Yes, the ncompress package is installed.** When did you install it? **I installed it on Nov 7**
5. At the command prompt, type **rpm -qi ncompress** and press Enter to view the information about the ncompress RPM package. What license does this package use? **Public Domain**
6. At the command prompt, type **rpm -ql ncompress** and press Enter to view the locations of all files that belong to the ncompress package. What directory holds the compress and uncompress executables? **/usr/share/man/man1**
7. At the command prompt, type **rpm -e ncompress** and press Enter. What does this option to the rpm command do? **Uninstalls ncompress**
8. At the command prompt, type **rpm -q ncompress** and press Enter. Is the ncompress RPM package installed? **Not anymore**
9. At the command prompt, type **dnf search compress | less** and press Enter. Is the ncompress RPM package listed? **Not listed** Press q to quit the less utility.
10. At the command prompt, type **dnf list available | grep compress** and press Enter. Is the ncompress RPM package available for installation from a software repository? **Yes, the package is available**
11. At the command prompt, type **dnf install ncompress** and press Enter. Press y when prompted to complete the installation.
12. At the command prompt, type **rpm -q ncompress** and press Enter. Is the ncompress RPM package installed? **Yes, it is installed**
13. **Provide screenshot(s) of steps 3 through 12.**

# Project 11-6

In this hands-on project, you use the dpkg and apt-get commands to install, query, and remove the ncompress DPM package.

1. Boot your **Ubuntu** Linux virtual machine. Login to your chosen desktop environment as **root** using password **LNXrocks!** and open up a terminal window.
2. At the command prompt, type **dpkg -l | less** and press Enter to view the DPM packages installed on your computer. Briefly scroll through the list and press q when finished to exit the less utility.
3. At the command prompt, type **dpkg -L ncompress** and press Enter to list the files that comprise the ncompress package, is the ncompress DPM package installed on your computer? **No, the ncompress package is not installed**
4. At the command prompt, type **apt-cache search compress | less** and press Enter. Is ncompress listed? **No, ncompress is not listed.** Press q to quit the less utility when finished.
5. At the command prompt, type **apt-get install ncompress** and press Enter to install the ncompress DPM package from a software repository.
6. At the command prompt, type **dpkg -L ncompress** and press Enter to list the files that comprise the ncompress package. Next, type **dpkg -p ncompress** at the command prompt and press Enter to view the detailed information about the ncompress package.
7. At the command prompt, type **apt-get purge ncompress** and press Enter. Press y when prompted. What does the purge option do? **It removes(purges) from the system.**
8. At the command prompt, type **aptitude install ncompress** and press Enter. What does this command do? **It takes care of doing all the steps to install ncompress on the system**
9. **Provide screenshot(s) of steps 3 through 8.**