**LINUX EXERCISE (LAB 04)**

**How to submit your assignment**

Check the requirements of the lab 01.

Exercise 1. Install FileZilla (CentOS **or** Ubuntu)

FileZilla is a free, open-source FTP client software that allows you to transfer files between your local computer and a remote server. It supports various file transfer protocols such as FTP, SFTP, and FTPS. With FileZilla, you can upload, download, and manage files on your server with ease.

* Create a **bin** and **depot** folder in root’s home directory.

sudo su

Type password if prompt pops up

cd ~

mkdir bin

mkdir depot

Để check ownership của 1 folder, gõ ls -l

* Create a software directory inside **depot**.

cd depot

mkdir software

* Download the compressed FileZilla tarball from <http://filezilla-project.org/download.php> (FileZilla\_3.50.0\_x86\_64-linux-gnu.tar.bz2) to the desktop.
* Move the tarball from the desktop to the /root/depot/software/ directory.
* Change (cd) to the /root/depot/software directory

cd ~/depot/software

wget <https://download.filezilla-project.org/client/FileZilla_3.50.0_x86_64-linux-gnu.tar.bz2>

* Decompress the tarball (hint: Lesson 6 PowerPoint’s)
* Extract the tarball contents to software

cd ~/depot/software

tar -xvf FileZilla\_3.50.0\_x86\_64-linux-gnu.tar.bz2 -C .

- "tar" is the command for manipulating tar archives.

- "-x" specifies that we want to extract files from the archive.

- "-v" stands for "verbose" and causes tar to print the names of the files it is extracting.

- "-f" specifies the name of the archive file we want to extract from.

* Browse the new FileZilla3 directory and locate the filezilla executable in the bin directory.

cd ~/depot/software/FileZilla3/bin

ls

The file filezilla is the executable file

* Create a symbolic link named filezilla in your /root/bin directory to the filezilla executable.

cd ~/bin

sudo ln -s ~/depot/software/FileZilla3/bin/filezilla ./filezilla

* Is /root/bin in your path? (hint: use echo $PATH)\

Yes it is

echo $PATH sẽ thấy if the /root/bin directory is listed in the output of the previous command. If it is listed, then /root/bin is in your PATH and you can access the filezilla executable from any directory. If it is not listed, then you need to add it to your PATH. Ở đây là /usr/bin và ta có thể cd /root/bin bất cứ lúc nào

* Run filezilla (use & to run in background)

/root/depot/software/FileZilla3/bin/filezilla &

Ta cd dến thư mục và chạy thi k hoạt động vì k có trong path, phải dùng đường dẫn tuyệt đối

Báo lỗi thiếu package libgtk2.0-0

Có thể cài với: sudo apt-get install libgtk2.0-0

* Connect to a FTP server, with your username and password. For example: you can connect to [dlpuser@dlptest.com](mailto:dlpuser@dlptest.com) with the following account information
* Username: dlpuser@dlptest.com
* Password: eUj8GeW55SvYaswqUyDSm5v6N

FileZilla tự động mã hóa các thứ, port mặc định là 21 với FTP

Exercise 2. Install the compilers and kernel development packages using yum or apt depending on your distribution (Fedora or Debian).

* Check whether gcc and kernel-devel are installed or not. Uninstall them if installed.

dpkg -l | grep -E 'gcc|linux-headers'

if exist we can remove with:

sudo apt-get remove build-essential linux-headers-$(uname -r)

* Install gcc and kernel-devel packages using yum or apt

sudo apt-get update

sudo apt-get install build-essential

sudo apt-get install linux-headers-$(uname -r)

The build-essential package includes compilers and other necessary tools for building software, while the linux-headers-$(uname -r) package provides the header files and other development files for the currently running kernel.

=> cái linux-headers bị lỗi k cài dược trên wsl2

* Check installation using yum or apt

dpkg -l | grep -E 'gcc|linux-headers'

* Check whether the installation is successful or not

apt list --installed | grep gcc

apt list --installed | grep linux-headers-$(uname -r)

Exercise 3. What is Buildroot? What are its distinct characteristics compared to toolchain tools like Bootlin or Debian cross-tools? Additionally, attempt to install Buildroot on your Linux system.

Buildroot is an open-source project and a popular tool for building embedded Linux systems. It allows users to generate custom Linux images, including the kernel, bootloader, root filesystem, and application software, for a variety of hardware architectures and target platforms.

Compared to other toolchain tools like Bootlin or Debian cross-tools, Buildroot has several distinct characteristics:

1. Simplified Configuration: Buildroot uses a menu-driven configuration system that allows users to easily select and configure the various components of their Linux system. This makes it easy for users to customize their system without having to manually edit configuration files.

2. Lightweight and Fast: Buildroot is designed to be lightweight and fast, with a minimal overhead in terms of disk space, memory usage, and build time. This makes it ideal for embedded systems that have limited resources.

3. Modular Design: Buildroot is designed to be modular, with a wide range of pre-built packages and modules that can be easily added or removed as needed. This allows users to create customized Linux systems with only the components they need.

4. Easy to Extend: Buildroot has a well-documented and easy-to-use architecture that makes it easy for users to extend and customize the toolchain. Users can add new packages, create custom scripts, or even add new target platforms to the system.

Install bằng giao diện:

Download the latest version of Buildroot from the official website (<https://buildroot.org/download.html>).

Extract the contents of the archive to a directory on your system.

Open a terminal and navigate to the directory where you extracted the Buildroot archive.

Run the command make menuconfig to open the Buildroot configuration menu.

Use the menu to configure the various components of your Linux system, such as the kernel, bootloader, root filesystem, and target platform.

Once you have finished configuring the system, run the command make to build the Linux image.

After the build is complete, you can copy the resulting image to your target device and boot it up.

Install bằng command:

sudo apt-get update

sudo apt-get install build-essential git wget unzip python3 => Install the required dependencies

git clone git://git.buildroot.net/buildroot

cd buildroot

make menuconfig => This will open a text-based menu interface where you can select the features you want to include in your Buildroot build. You can use the arrow keys to navigate the menu, and the spacebar to select or deselect items.

save config and exit menu

make => This will download and compile all the necessary components, and create a root filesystem image in the output/images directory => để build buildroot

(Optional) Install the Buildroot-generated root filesystem on a target device or emulator. You can use tools like QEMU or VirtualBox to emulate the target hardware and test your Buildroot image. Alternatively, you can transfer the Buildroot image to a physical device and boot from it.