Unix and Linux

Downloading and Building Software

Installing from source code

We have discussed using packagers manages like yum, apt-get and brew to install software packages, but there is a lot of software available as source code.

To install this software, you must

- Download the source code, usually as a compressed archive
- Extract the code from the compressed archive
- Create a “Makefile” by running a configuration script
- Compile the code using the “make” program
- Install the compiled code in the appropriate directory (again using the “make” program

Check whether you have gcc

At a terminal prompt, type

```
gcc –v
```

If you see a gcc version number, you have gcc

If not, install it by typing (for CentOS)

```
sudo yum install gcc
```

Or (for Ubuntu or Debian)

```
sudo apt-get install gcc
```

Or (for Mac)

```
brew install gcc
```

Mac users may also need to install `wget`

```
brew install wget
```

Example: the “units” program

First create a `~/download` directory and make it your current directory
Use the “`wget`” program to download the code package by typing:

```
wget http://www.ee.surrey.ac.uk/Teaching/Unix/units-1.74.tar.gz
```

Uncompress the archive file

```
gunzip units-1.74.tar.gz
```

Extract the individual files from the archive

```
tar –xvf units-1.74.tar
```

Change to the new units-1.74 directory

Configuing and creating the Makefile

Carefully read the **README** and **INSTALL** text files (use the less command). These contain important information on how to compile and run the software.

Create an install directory:

```
mkdir ~/units174
```

Run the configure utility setting the installation path to this.

```
./configure --prefix=/home/username/units174
```

Or for Mac users

```
./configure --prefix=/users/username/units174
```

This will create a Makefile which you can view with the `less` command

Building the package

run the make program by typing

`make`

This will build the units program following the instructions in the Makefile

Check to make sure there were no errors by typing

`make check`

Install the program by typing

`make install`

Change to your `~/units174/bin` directory and

Test your new program by typing

`./units`

Or

`./units -v`

Install ruby

Ruby is a popular object-oriented programming language. It is often used in the rails environment (ruby on rails) to create web applications. Check to see if you already have a version of ruby on your computer by typing

`ruby -v`

Whether or not you have it, we will install the latest version.

Create a `~/ruby253` directory in your home directory into which you will install ruby version 2.5.3

Change to your `~/download` directory and use `wget` to download the ruby source code archive from

`https://cache.ruby-lang.org/pub/ruby/2.5/ruby-2.5.3.tar.gz`

Now follow the procedure that you used to build and install the units program and build and install ruby in your `~/ruby253` directory

Switching to the new ruby

Change to the `~/ruby253/bin` directory

Type

`ruby -v`

And

`./ruby -v`

You might see different versions.

The second one is the latest version that you just installed. To make sure this is the one that always gets used, add the directory to the front of your PATH by typing

`PATH=/home/username/ruby253/bin:$PATH`

Or, for Mac users

`PATH=/users/username/ruby253/bin:$PATH`

Install the apache web server

The apache web server is the most widely used web server on the Internet.

Create the `~/apache2` directory as the install directory

Change to your `~/download` directory.

Use `wget` to download the archive from

`https://www-eu.apache.org/dist//httpd/httpd-2.4.35.tar.gz`

Follow the same procedure to build and install it, EXCEPT run the configure command as

```
./configure --prefix=/home/username/apache2
```

Or, for Mac users

```
./configure --prefix=/users/username/apache2
```

Now build and install the program using the same steps you used for the other programs

Controlling the web server

To start the web server you will need superuser privileges which the cuadmin user can get.

Change to the `~/apache2/bin` directory

Temporarily switch to the cuadmin account by typing

```
su cuadmin
```

And typing the Ch@pm@n password

To start the server type:

```
sudo ./apachectl start
```

Testing the server

After starting the server, use your browser and go to the URL:

```
http://localhost
```

To stop the server,
Change to the `~/apache2/bin` directory

Type:

```
sudo ./apachectl stop
```

Quiz 5 and review quiz

If you have created and successfully tested all the programs, take Quiz #5 until you get perfect scores.

After you get a perfect score on Quiz #5, take the Review Quiz as many times as you can.