CSC 262
Lab Project 1: Installing Linux

1 Basic Install Instructions

Step 1 First, pick a machine. If on, shut it down. After it's powered down, set the romtec switch to position II.

Step 2 Boot up the system, when the monitor starts displaying the Dell logo, press F2. This will enter the ROM-BIOS, go to the boot sequence option and make sure that the CD-ROM is set to boot before the harddrive.

Step 3 Insert the Fedora Core DVD I gave you. Close the drive and exit the BIOS.

Step 4 When the boot DVD is running, select 'Install or Update Existing System' (you may skip the media test if you want to save yourself some time)

Step 5 Select English, and the US English Keyboard. Set the hostname to be 'automatic via DHCP', and set the Time Zone to New York.

Step 6 When asked for a root password, use csc262!, that way I can get on to the system to fix stuff in case something breaks.

Step 7 Select 'Remove Linux Partitions on selected drives and create default layout', actually partition the disk by clicking write changes to disk.

Step 8 Make sure to select 'Software Development' when asked to select software packages (you may unselect office and productivity, but you don't have to). After this, the actual system will start installing. This can take a while (10-30 minutes in my experience), so hopefully you brought something to read or some homework to work on! :)

Step 9 After all the software packages are installed, remove the DVD from the drive and click 'Reboot'

Step 10 After the system reboots, you'll have more configuration to do. First, create a user account for the class. You can name it whatever you want. Next, do not submit a hardware profile to Redhat.

2 Additional Configuration

Displays Under the System/Administration menu, there should be an item named 'Display'. Open it up, and under the hardware tab, set the monitor type to be 'Generic LCD panel 1024x768'. Logout to restart X Windows (the Linux display software).

Firewall Under System/Administration, select the Firewall item. Make sure that everything is turned off (it should be, by default).

SELinux Under System/Administration select 'SELinux Administration', under status all Modes should be set to 'enforcing'

Emacs Under System/Administration select Add/Remove Software. Within that wizard, search for emacs. Select the 'GNU Emacs Text Editor' for installation (this will cause it to search for dependencies and install them as well). After a few minutes, you'll have emacs on your system!

3 Interacting with the computer

For those of you new to the Linux/UNIX world, despite 10 years of intense effort, the only real way to use a UNIX machine is at the command line. From the Redhat desktop, the way to get at the command line is to start the Terminal program (which is under Applications/System Tools).

3.1 Files and Directories

To see all the files in the current directory, type 'ls' (which is short for list). Hit enter and all the files and directories should be displayed. To see what a particular file might be, type 'file <filename>', where <filename> is the file you want to query. This will display what the system thinks the file is. To make a directory, you use the command 'mkdir <directory>'. Linux uses the '/' character to separate directories (unlike windows, which uses '\' and Mac Classic, which uses ':'). To enter a directory, use the 'cd' command (as in 'cd <directory>') to go back a directory, type 'cd ..' ('..' is a special directory that always links to the parent directory). 'rm' (short for remove) is used to delete files (use 'rm <filename>'). Be careful! UNIX systems don't have a trashcan, when you use rm, it's gone forever! ('rmdir' performs the same task for directories).

3.2 su and sudo

Occasionally, you may need to perform some administrative tasks. In order to do this, you'll have to log in as the system administrator (on unix systems this account is called 'root'). The 'su' command lets you log in as root from a running shell. Type 'su' and enter the root password when prompted. su creates an entire new shell running as root, and this can be kind of dangerous if you forget when you're acting as root and when you're acting as a normal user. `sudo` is a command to allow you to perform one task as root. But first your account must be entered into the sudoers file. As root, type `emacs /etc/sudoers`, edit the file so that it looks like

```
...
#User priviledge specification
root ALL=(ALL) ALL
me ALL=(ALL) ALL
```

```
...
```

but, instead of 'me', put your username. Now save the file (C-x C-s). Now you can use 'sudo', by typing 'sudo <command>', where command is the program you need to run as root.

3.3 Man

`man` is the UNIX command to bring up manual pages for commands. As an example type 'man ls' to see the full manual for the ls command. man is helpful if you forget exactly how to use a particular program, you just type 'man <command>' and if there's a manual page, it will be displayed.

Q1: How would you bring up the manual page for `man`?

3.4 Permissions

UNIX file systems have ownership and permissions. Each file is owned by a particular user and a particular group. Each file also has permissions associated with it that dictate how it may be used. Type `ls -l` at the command line, `ls` should display something like:

```
total 185528
drwx------    32 turk  turk      1088 Aug 29 10:22 Desktop
drwx------   163 turk  turk      5542 Jul 20 22:53 Documents
-rw-r--r--     1 turk  turk    522489 Dec 18  2006 EECS-2006-183.pdf
drwx------    43 turk  turk      1462 Aug 27 17:00 Library
drwx------    10 turk  turk       340 Aug 13 09:00 Movies
drwxr-xr-x    19 turk  turk       646 Aug 16 12:12 Music
drwx------    62 turk  turk      2108 Aug 16 15:14 Pictures
drwxr-xr-x     5 turk  turk       170 Mar 28 14:58 Public
...
```

The string of mysterious characters at the left is where the permission information is stored. The next column displays the number of links, which is unimportant. The next column displays the owning user (in this case 'turk') and the next column displays the owning group (also 'turk'). The permissions string is a little tricky. The first letter tells you whether or not the file is actually a directory (a 'd') or just a plain file (a '-'). The rest of the string consists of the permissions for the file owner, group members, and the rest of the world. Let's examine the Music directory listing. The first triplet is 'rwx' which means that the owner can read, write, and execute this file (for directories, execution means being able to enter them). The next (group) triplet is 'r-x' meaning group members can read and execute, but not write. The last triplet is also 'r-x' meaning that anybody else can read and execute.

Permissions are changed with the `chmod` command. Ownership and groups are changed with the `chown` and `chgrp` commands. Use `man` to learn more.

Q2: How would you invoke `chmod` to give everybody write access to the Music directory?

Q3: Can you use `chmod` to create a file that cannot be read, written, or executed by anyone (if so, what would it look like)?

3.5 tar, gzip, gunzip

Sometimes you need to collect together a bunch of files. The `tar` command (short for tape archive) is used to create a file that is an archive of a bunch of other files. `gzip` is a program to compress files. If you've ever seen `.tar.gz` or `.tgz` files, then you've seen gzipped tar files. `gunzip` undoes what `gzip` does.

Q4: How would you use `tar` to create an archive of the Music directory named `mus.tar`?

3.6 cat, less, and editors

`cat` and `less` are both commands used to display text files. `cat` just dumps all the output to the terminal, so it's good for short files. `less` displays the file a page at a time, so it's good for longer files. Most UNIX systems comes with two time-honored text editors: `vi` and `emacs`. Of course, newer linux distributions come with WYSIWYG text editors, but all the truly cool computer scientists use vi or emacs :). `vi` is definitely the more hostile of the two, but once you learn it you can edit files extremely quickly. Emacs is considerably more user-friendly, and all kinds of helpful guides can be found online. A good one is available at:
`http://www.farne.uklinux.net/emacs-primer.html`. Another one (assuming you can get past the super-hero theme) is at:
`http://www.cs.brown.edu/courses/cs015/docs/emacs.shtml`. I also have an HTML and PDF version of an emacs quick reference on my web page (at the bottom, under 'Other Goodies').