Linux Basics Tutorial version 2.0

Presented by Beth Lynn Eicher

for
Western PA Linux Users Group

Copyright October 16, 2004

Released under the Creative Commons Attribution-NonCommercial-ShareAlike 2.0 License http://creativecommons.org/licenses/by-nc-sa/2.0/

No warranty whatsoever. This document contains external links.
About this tutorial

Yet Another Linux Basics tutorial...
- RedHat does it in four 8 hour days, the compressed version is one 8 hour day
- Novell does it in 5 hours
- This is the attempt to teach you THE BASICS in 2.5 hours without vendor bias

This is a work in progress.
If this is too slow or fast let me know!
What is Linux?

A Fully-Functional Multi-User Multi-Process Unix-like Open Source Operating System comprised of Linus Torvalds' kernel, many GNU tools, and software from many many more contributors worldwide.
The myths

You have to be a programmer to use Linux.
Linux is only for servers.
There's no software for Linux.
You can't use Windows software anymore.
Windows is everywhere and Linux is nowhere.
Linux is something new – it's not going to last.
Root and Users
Demo of Knoppix

We will take a look at Knoppix Linux which boots from any modern Intel-based PC with a cdrom without installing anything on your hard drive.
Desktop Usage

Why pay $$$ for software when you could be using

http://www.openoffice.org
http://www.mozilla.org
http://www.gimp.org
What's my version of Linux?

uname -r is the version of the Linux kernel
distro version numbers never match
Wheel of Distros

Hacker Friendly and User Friendly Distros
Grabbing your distro...

- **distrowatch.com** Boasts that there are 304 Linux distros in their database
- Online and local retailers like **amazon.com** will sell Linux distros still in the box and books that include a copy of the author's favorite distro
- Once you've made a choice you can download the cdrom image or install floppies from the distributor's website or a mirror
- Don't have a cdrw? **cheapbytes** Can help you out.
Shameless plug...

LUGs are another great way to get started with Linux.

http://www.wplug.org

Installfests, General Users Meetings, Tutorials such as this, Mailing Lists, and more!
Books you should read

Linux Administration Handbook
by Evi Nemeth, Garth Snyder, Trent Hein, Trent R. Hein

Linux Companion for System Administrators
second ed
Jochen Hein

RHCE Linux Exam Cram
second ed
Kara J. Pritchard
Good commands that you need to memorize, today!

File Commands: ls, cd, cp, mv, rm, mkdir, rmdir

text reading: cat, more, less

text tools: awk, grep, sed

text editors: vi, emacs, pico, gedit

time: date, cal, uptime
More commands...

Location: find, locate, which, whereis
File extraction: tar, unzip, gunzip
Processes: top, ps, lsof, kill, fg, bg
User tools: passwd, w, who, finger, talk
Environment: printenv, setenv, echo
More commands...

Internet: lynx, pine, whois, finger
Service control: chkconfig, init.d, service
Printing: lpr, lpq
Networking: ifconfig, route, traceroute, dig, ping
And some more commands

disk usage: du, df, quota
partitions: fdisk, fsck, mkfs, tune2fs, mount
Shutting down and Rebooting

/etc/shutdown -h now
/etc/poweroff
/etc/shutdown -t60 -r
/sbin/reboot
Output redirection

echo "this" > foo
echo "that" >> foo

cat foo
this
that
Pipes and More

The pipe |
cat /etc/passwd | grep

The semicolon ;
mkfs /dev/hdb1 ; mkfs /dev/hdb2

The slashdot ./
./myscript
Getting Help

commands: man, info, {cmd} –help, apropos

Some distros have additional online documentation in html form

http://ldp.wplug.org
It all starts with / 

/bin
/boot
/dev
/etc
/home
/lib
/mnt
/opt
/proc
/root
/sbin
/tmp
/usr
/var
Partitions

/boot
/usr
/opt
/home
/var
/tmp
<swap>
Installing software

Software you install often lands in /usr/bin
/usr/local/bin or /opt

Don't look in the “Start menu” because chances are, it ain't there!!!
Installing Packages

**Debian Packages - dpkg**

Red Hat Packages – rpm

```
rpm -Uvh package.rpm
rpm -ivh package.rpm
rpm -aq | grep package
rpm -e package
```
Tar files

To extract a tar.gz file: `tar -zxvf {filename}`
To extract a .tar file: `tar -xvf foo.tar`
To create a .tar file: `tar -cvf /foodir foo.tar`

once you've extracted the tar file look for a readme.
Perhaps there's an executable installation file
Or a Makefile
Perhaps it's source you need to compile yourself
Security starts with you and your users!

Don't login as root, su instead.
No account or password sharing
logout or use xlock
Select GOOD passwords
Npasswd will help you pick good ones, respect it!
Protect your /etc/shadow

John the Ripper or crack will tell you if your passwords are good enough!

You can implement kerbeos and secure cards.
File permissions

To check the permissions use “ls -l”
utilize groups

chown {username} {filename}
chown :{groupname} {filename}

chmod to change permissions
chmod a+rwx {filename}
chmod u+r {filename}
chmod o-x {filename}
chmod 700 {filename}
Start with a minimal configuration!

Don't install all the whistles and bells. Only install what you need now.
Educate yourself about the services you are running!

No one should use telnet or ftp, use ssh/scp instead

Use chkconfig –list

check [http://www.cert.org](http://www.cert.org) for vulnerabilities

turn off any services that are vulnerabilities until you can update or patch!
Update your packages!

Up2date from RHN is depreciated!
Use apt-get or yum instead
SUSE YOU – YAST Updater
Whole presentations on Linux security can and have been done

http://www.wplug.org/meetings/one-meeting?wp_meeting_id=3001
How to stay out of trouble

- Always shut down safely
- Do not do everything as root
- Put your files in /home
- Take the time to understand what you are doing
- Backups!
Files you never want to rm

- anything in /dev
- anything in /proc
- don't get tempted by /proc/kcore
- anything in /boot
- /lib/kernel/modules/ {the kernel you want to use}
- contents of /etc, /bin, /usr/bin, /usr/lib
- you may remove the contents of /tmp but not /tmp itself!
Get into trouble
Things you can try...

It won't boot!
Get out your Knoppix CD

This process seems hung
ctrl+C or ctrl+Z, failing that try to kill it

See if you can jump to another a virtual console
ctrl+alt+f2

Exit the GUI by Alt+Backspace
Today's Handouts

Linux command line
http://www.satlug.org/present/presentation-03.00.html

What is Linux?
Special Thanks

Bill Eicher

Mark and Duncan

Huggybot

Bill Moran

David Ostroske
OK this is really the end

yup, that's all folks