The complete linux to power user guide

Time-stamps

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[01:01](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=61s) Introduction to Linux

[08:44](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=524s) Linux distributions explained

[15:56](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=956s) Installing VirtualBox and setting up our virtual machine

[23:47](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=1427s) Ubuntu Linux installation on a virtual machine

[36:26](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=2186s) Disabling the ISO and first boot up

[38:40](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=2320s) VirtualBox guest additions for a better user experience

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[2:10:26](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=7826s) How to create files using the command line interface (CLI)

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[3:29:13](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=12553s) How to remove/ignore directories in our repository

[3:34:25](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=12865s) Resolving merge conflicts through terminal

[3:41:42](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=13302s) How to setup and manage branches

[3:49:37](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=13777s) Meteor installation & setup

[3:55:32](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=14132s) Meteor project setup

[4:01:06](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=14466s) Router setup with React components

[4:13:31](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=15211s) Getting into the programming

[4:26:46](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=16006s) Rendering our blog posts

[4:42:06](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=16926s) Apache 2, PHP 5, and MySQL setup

[4:45:36](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=17136s) Server configuration

[4:51:14](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=17474s) Linux hosts file explained

[4:54:40](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=17680s) Deploying our Meteor app to an Apache 2 server

[5:00:03](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=18003s) MongoDB NoSQL database

[5:05:21](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=18321s) Virtual host setup

[5:16:46](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=19006s) phpMyAdmin setup

[5:24:50](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=19490s) Creating a basic virtual host

[5:33:00](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=19980s) Wordpress installation on top of our Apache 2 environment

[5:40:25](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=20425s) Database setup

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[6:06:55](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=22015s) Adding users to a group

[6:10:51](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=22251s) Introduction to networking

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[6:25:08](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=23108s) Networking commands

[6:35:40](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=23740s) NETSTAT command

[6:40:39](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=24039s) Linux host file

[6:49:59](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=24599s) TRACEROUTE commands

[6:53:57](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=24837s) Network mapping explained

[7:08:29](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=25709s) Using SSH to access the command line of a remote host

[7:11:06](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=25866s) Using SFTP to transfer files between machines

[7:14:43](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=26083s) Setting up SSH on our local machine

[7:20:10](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=26410s) MAN command explained

Chapter 1

Gnu developed by Richard Stallman working in MIT started the GNU project. The goal was to create an entirely free and open unix- like operating system the kernel he was developing was the “GNU Herd” which was not yet complete (early 90’s). Meanwhile Linus Torvalds set out on a project to develop a unix-like kernel known as linux and used GNU software such as GNU’s C-compiler to do it. While a kernel on its own is useless, he ended up including GNU software with the kernel to release an operating system. Later Richard Stallman’s group sponsored the group Debian to release a GNU/Linux distribution that was completely open for people to use and contribute to. Debian grew from a small group of hackers to a large community it is today.

Due to its popularity Debian has become the basis for countless linux distributions. Because of how distributable it is, anybody cause read the source code modify it and distribute it. Because of this there are now tons and tons of “distro’s”.

This creates a problem for beginners on what linux distribution you should use. Ubuntu is a distro created by canonical that uses the desktop environment called “unity”. It has become so famous that phones now run Ubuntu.

Ubuntus purpose was to create the stability of Debian but to release new versions more frequently. As such canonical releases 2 distributions per year. One is April and one is October. The naming convention of Ubuntu is (Year/Months). 18.10 is October 2018. Every 2 years a version called LTS is release which is supported for 5 years. In between LTS versions are only supported for 9 months. Latest was April of 2018.

1. To download Ubuntu go to Ubuntu.com.
2. Click on Deskop
3. Click Download Ubuntu.
4. We will then be prompted to choose to download the latest LTS release or the latest inbetween version.

! – Inbetween only has bug fixes and support for 9 months. While LTS has bug fixes and support for 2 years.

1. Download it and setup as virtual box.

Chapter 2

Linux distributions explained

Previous video mentioned how Debian was one of the first linux distributions along with Slackware, Redhat and OpenSUSE which are other types. The types are based upon the package managers.

Linux distro’s and there types are based off the different package managers. However, there are a few types that aren’t based upon these package managers. For example Gentu and Arch linux.

Debian was created in the early 90’s. As time goes on some people take the source code and use it to build there own distribution of linux based upon the source code from Debian. To continue on this subject, as time goes on Ubuntu was created later from the source code from Debian. Also, Later on other distro’s were created from the source code of Ubuntu.

Ubuntu has a lot of distros but only some are officially recognized. For example, one that is officially recognized is Kubuntu, this is essentially Ubuntu but with the KDE desktop environment instead of the Unity desktop environment.

You will notice the difference with KDE and Unity. Unity has a side bar with a dash that opens up similar to windows 10. While KDE has a dash at the bottom that is similar to something like windows 7. Newest KDS is called Plasma. “KDE Plasma”.

Linux mint is not an officially recognized distro of Ubuntu. However, the desktop environment called cinnamon is great desktop environment.

Another one on the same line as this is called Elementary. Elementary looks a lot like Mac OS.

Ubuntu Distributions the installs are all pretty much the same.

Chapter 3

Installing VirtualBox and setting up our virtual machine

Formatting of drive.

Primary = bootable

Logical = NOT bootable

1. It should be in /dev/ for devices.
2. Then sda for the partition. It should be /dev/sda
3. You should also create swap area. Swap space is extra ram for virtual memory. 5 GB should be ok. This will now show up as /dev/sda1. On Actual installs this should be from 8GB to 16GB.
4. As an additional step we want to set the root file system this should be a “EXT 4 journaling file system” 4 is the newest rendition. The root should just be (/) (logically, beginning of the partition.)

! – Keep in mind if we wanted to we could set a separate partition for home directories and change the / to /home.

1. We have the selection to choose where we will install the bootloader. By default this will be on the first partition or /dev/sda

Setup Tools and Package managers

RHEL(centOS, Fedora) IS, RPM based YUM package manager.

Debian(Ubuntu, Mint) IS, DPKG-based APT package manager (using apt-get, apt-cache, etc.

SUSE IS, RPM based Zypper package manager. It also has, YAST Or, Yet Another Setup Tool which is for systems administration purposes.

RHEL, the basic version of CentOS is also virtually identical to RHEL, the most popular Linux distribution in enterprise environments. CentOS is most popular in Enterprise Environments.

The SUSE family is similar to the RHEL or Red Hat Enterprise Linux. The two families are very similar.

Debian family is a pure open source community project (not owned by any corporation) and has a strong focus on stability. Debian provides by far the largest and most complete software repository to its users of any Linux distribution. Ubuntu aims at providing a good compromise between long term stability and ease of use. Since Ubuntu gets most of its packages from Debian’s stable branch, Ubuntu also has access to a very large software repository.

Linux Distribution Differences to Consider When choosing.

There is a lot of version flexibility. They are very distribution-flexible. While choosing between available Linux systems, you will notice that the technical differences are mainly about package management systems, software versions, and file locations. Once you get a grasp of those differences, it becomes relatively painless to switch from one Linux distribution to another.

Kernel = Considered brain of the operation. Glue between Hardware and Applications. For example, Linux Kernel.

Application  Kernel  Hardware

Distros = a collection of programs combined with a Linux Kernel to make of a Linux operating system. Examples being, RHEL (Red Hat Enterprise Linux), Fedora, Ubuntu, Gentoo

Bootloader = A program that boots an operating system. Examples, Grub and Isolinux.

Boot Loader Linux Kernel Init

Service = A program that runs as a background process. INIT will init background processes like httpd(Web Server), ftpd(FTP Service), named(Name Server), dhcpd(DHCP server). Other examples are, httpd, nfsd, ntpd, ftpd and named.

Filesystem = Method for storing and organizing files.

Hard disk drive  Raw Partition 1  File System1  User data.

 Raw Partition 2  File system2  User data.

Hard disk drive has raw partition and then the file system then user data on top of the file system. File System Examples are, ext3, ext4, FAT, XFS, NTFS and Btrfs.

X Windows system contains the standard toolkit and protocol to build graphical user interfaces on nearly all linux systems.

GUI is

1. Desktop (KDS, Gnome, XFCE)
2. Windows manager
3. X windows system/ X11

Console is

1. CLI/Shell
2. Kernel
3. Hardware

Desktop Environment is a graphical user interface on top of the operating System. GNOME, KDE, Xfce and Fluxbox.

Command Line is an interface for typing commands on top of the operating system.

Shell is a command line interpreter that interprets the command line input and instructs the operating system to perform any necessary tasks and commands. For example, bash t c s h (tc shell), and z s h (z shell).

Chapter 4 – First Bootup

! – make sure to remove the ISO from the storage options for the CD Drive

LightDM = the login screen manager for ubuntu. Its what you put in your login info before interacting with the desktop.

Imotal = the shortcut window that comes up when first booting ubuntu.

Superkey = the windows key which is the same as command on mac

6bvc4xez

Chapter 5 - [38:40](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=2320s) VirtualBox guest additions for a better user experience

Allows you to run the VM with more stability and greater performance. If on Mac OS you will need to open the virtual machine and you should see this menu at the top which one of the settings under “Devices” which will allow you to install guest additions.

After Guest Additions are installed you will notice that the resolutions will improve

CTRL + ALT + T = will open up terminal.

History = will print a list of commands ran into the console.

Chapter 6 - [46:14](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=2774s) Customizing our Ubuntu desktop

CD mount points

RHEL based distros use /mnt

Debian based Distro’s use /media

The Dash is the start menu for ubuntu. You can invoke the dash by pressing the windows key.

You can unpin things from the dash by pressing right button which will open up a list of things to do with that particular item.

Theme = GTK is the theming engine that unity uses. Which if you remember Unity is the desktop environment that Ubuntu use’s which is also the desktop environment for many smart phones.

The GTK controls everything about how everything in the desktop environment looks. For example, things like the Close, minimize and dock buttons as well as the color of the title bar and color of the icons.

To get other GTK themes you go to <http://gnome-look.org>. However, the 18.04 Ubuntu theme uses 3.x GTK version. And if you install an older version like 2.x then GTK will break.

COMMAND I RAN

Sudo apt-get install git

Git config –global user.name “emykazza”

Git config -global email.name [ddrury2000@gmail.com](mailto:ddrury2000@gmail.com)

Mkdir directoryname

Chmod 700 directoryname

Cd directoryname

! “Login to git hub using account then close and re-open the terminal window. This will log you into git so you can download repositories.

Cd directoryname

Git clone URL of repository.git

You will also need an icon theme – so look for that to download that

Git clone (repo for icons)

To unzip = tar xf ios.tar.xz

! – before we can start using our themes we first need to install the unity tweak tool

Sudo apt-get install unity-tweak-tool

! – now we need to access hidden items by pressing CTRL + H on the home directory. Create a new folder called .themes and copy the themes and icons to this directory.

! – to change the wallpaper download wallpaper you want and click set as wallpaper.

! – create a new directory called .icons for the icons

Now access the unity tweak tool. The dash isn’t updated yet likely. This is a known issue where changes to the dash do not occur immediately. This is Typically /home is where your home directory is. Also, /usr is where your user system resources are stored /user/bin are where your binary files for your applications are located which you can run but you wouldn’t typically access them this way. Also, /usr/share/Applications is where your applications will be stored as they are opened. When you click on these files within the /usr/share/applications they will know what binaries within /usr/bin to access to open the application. In here is where you will notice the Unity Tweak Tool is located.

ISSUE:

Failed to open – com.canonical.notify-osd when I tried to open the Unity Tweak Tool

FIX:

Sudo apt-get install notify-osd

Sudo apt-get install overlay-scrollbar

The unity tweak tool is somewhat self explanatory.

Launcher changes icon size auto-hide of dash menu, window transparency.

Go to Overview  Appearance  Theme.

Chapter 7 - [1:06:48](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=4008s) Installing Ubuntu alongside Windows (dual boot)

Installing cinnamon and others etc.

Booting to Linux from FlashDisk

Download unetbootin.github.io  format a flash drive to fat32 so you can boot it  point to iso then create. Make sure you disable Fast boot in power options for Non-mac PC’s.  boot to it  in install options configure install updates  Select “Do Something Else” to get to partition options  once in it and you are choosing to install ubuntu you should choose to partition the disk  You should highlight your NTFS partition and hit change which will shrink your main partition.  With shrunk space configure swap space. Configure this for 5GB should be ok but on normal install 8GB to 16GB is normal.  now create a new primary partition for operating system files and mount to root or /.  Find windows boot manager and install over windows boot manager (highlight the “Windows Boot Manager” and hit next. Grub will replace windows boot manager for boot selection and give choice to boot to linux or windows.

Chapter 8 - [1:23:09](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=4989s) Linux command line essentials

CTRL + ALT + T = open terminal.

pwd = print working directory (where you currently are)

cd = change directory (change to a specified directory)

“Absolute path” ( cd /sbin ) = this will change to the path directory /sbin no matter where you are.

“Relative path” ( cd share ) = will change to share directory if you are in /usr to /usr/share

“current path” ( cd ./share ) = ./ specifies the current directory we are in. if in /usr and cd ./lib we will go to /usr/lib

“Home” ( cd ~ ) = Will move us to our home directory.

“Home and a subdirectory path” ( cd ~/Documents ) = Will move us to homepath in Documents directory

Move to parent directory ( cd ../ ) = Will go from /home/dan to /home

ls = list contents of your current directory or one you specify

-r = reverse format

-p = file types

-s = sort based on file size

>ls pathname = will list the contents for the path name.

If pass in arguments do at end >ls ~/Documents -r = reverse order for home pathname + directory you added.

! – You can also just to l for ls command as well.

Chapter 9 - [1:36:17](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=5777s) Administrative privileges in terminal

Nano = txt file editor

Nano ./file = will edit the file called “file” in current directory.

CTRL + o = Will save the file

Sometimes you need to sudo to edit a file >sudo nano ./file

!! = To rerun the last command.

Sudo !! = Will rerun the last command but with admin rights.

Sudo su = will switch to the admin user to run commands (NOTICE username@ changes to root@)

Chapter 10 - [1:42:14](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=6134s) Using the package manager (apt-get) to install new applications

TO INSTALL

Package Manger for ubuntu is ( apt-get ) the next command is the action to be performed ( install ). Full command >apt-get install <packageName> for example bluefish which is text editor.

TO UNINSTALL

>sudo apt-get uninstall bluefish

TO INSTALL BUT NOT SURE WHAT WE WANT

>sudo apt-cache search bluefish

SEE IF SOMETHING IS INSTALLED

>apt-cache policy gimp

DOWNLOAD PROGRAMS NOT IN REPOSITORY

First see if installed >apt-cache policy <Program>. >find program online and download.

!-RPM is package manager for redhat.

. >cd ~/Downloads. >sudo dpkg -i ./packagename.deb. >google-chrome. Which opens it.

Chapter 11 - [1:53:09](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=6789s) Keeping programs updated in Linux

UPGRADE PROGRAMS

>sudo apt-get upgrade

Chapter 12 - [1:57:48](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=7068s) File permissions and ownership explained

CHANGE OWNERSHIP

>chown user:group (CAREFUL RUNNING THIS COMMAND AS MANY FILES NEED ROOT TO WORK).

Change ownership for all files below a directory in your current selected path.

>chown -R user:group ./mydir

You can then verify you have access

>ls -l ./mydir

CHANGE PERMISSIONS

>chmod 646 file.txt

DELETE A FILE

>rm filename.txt

Or, >rm -f filename.txt

-r = recursive

>rm ./\*.cpp = removes all files with cpp extension on selected directory.

>rm ./\* = removes everything leaving directory itself intact.

>rm mydir/\* = removes everything on a specified directory (mydir) in this case.

CREATE FILES QUICKLY

>touch filename.txt

MOVE FILES (can also be used for backup).

>mv LocationOfFile WhereNewLocationShouldBe

>mv a.out newdirectory/a.out = This will move a file name a.out to a new location inside “newdirectory”

Chapter 13 - [2:24:43](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=8683s) The FIND command and it’s practical uses

FIND FILES  
 >find DirPath parameters FilesToFind (find . -type f -name “\*.php”)

f = file, d = directory “exact name”

another example=>find . -type f -iname “\*.php”

i= will ignore case sensativity

another example=>find /etc -type f -iname “\*.conf”

Finds all config files in etc

Find based on permissions

>find . -type f -perm 0664= Finds all files with permissions of 664

Find based on size

>find . -size 100k

>find . -size +1m

>find . -size -1m

Find All files that are not equal that specified

>find . -type f -not -iname “\*.php”

What is you do not want it recurssive?

>find . -maxdepth 1 –type f -iname “\*.conf” =only goes to current directory not any farther down the path

Chapter 14 - [2:36:10](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=9370s) GREP command explained

Finding info within commands ran

For example if you have a php file with functions in them and you

wanted to find out what functions the file had you could grep them

>grep “function” file2.php

-i = will ignore case sensitivity.

>grep “function” -i ./\*

-n = will give you the line number where the value was found

>grep -n -i “function” ./\*

USE FINE IN CONJUNCTION WITH GREP

exec will then execute the next command

(start with exec End with {} +

>find . -type f -iname “\*.php” -exec grep -i -n “function {} +

Another Example

>find . -type f -size -10k -iname “\*.php” exec grep -i -n “function” {} +

REDIRECT OUTPUT OF A COMMAND

>ls > outfile.txt = exports results to file outfile.txt

VIEW THE RESULTS AND EXPORT TO A FILE with “tee”

> find . -type f -size -10k -iname “\*.php” -exec grep -i -n “function” {} + | tee of.txt = Will show results on screen and export to a file (tee)

Chapter 15 - [2:45:42](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=9942s) The TOP command and its uses

A process is an application that is running.

TOP = displays the top running processes.

The most important parts: PID, User(who is running process), TIME+(how long been up), COMMAND(command associated with process).

TO VIEW ALL PROCESSES

>ps -aux

TO VIEW ALL IN EASIER FORMAT AND FIND WHAT YOU WANT

>ps -aux | grep liri-browser = Will show you the results for the “liri-browser” results

IF YOU OPEN MULTIPLE BROWSERS EACH HAVE OWN PID SO IT GETS MESSY

YOU SHOULD THEN RUN >pgrep “name”

To kill a process

>Kill -9 PID

To Kill all processes by an application

>killall processname (>killall liri-browswer)

Chapter 16 - [2:52:36](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=10356s) Services explained

* + - 1. Download elasticsearch “elasticsearch”
      2. This will be used as an example of a service.

To start a service

>sudo service elasticsearch start

You will not get an output but you can verify its opened by going to a browser. Where is port 9200 of the localhost (localhost:9200). A json code will display that its working correctly.

To stop the service

>sudo service elasticsearch stop

Then try to access the localhost:9200 for elasticsearch and you will be unable

To get to it.

>service = a lighter way to stop and start services.

Say for example we want to run the service on a different port!

We need to alter the config file for elasticsearch which is a yml file or yaml.

Use find to locate it

>find /etc -type f -iname “elasticsearch\*”

>sudo nano /etc/elasticsearch/elasticsearch.yml

Find the location in the file where the ports are listed. Un-comment the port specification and change to 1150. Then save the file and exit

We must now restart so elasticsearch uses the new port number.

>sudo service elasticsearch restart

You can now check and see if it connects on localhost:1150. It does because with the service restarted it has updated the configuration file.

Ubuntu has updated to usage of different tools to start and stop (system control or systemctl)

To start

>sudo systemctl start elasticsearch

To stop

>sudo systemctl stop elasticsearch

Systemctl the action is before the program vs service which puts the action after the service.

You should use systemcontrol as it’s the newest method.

Chapter 17 - [2:59:20](https://www.youtube.com/watch?v=wBp0Rb-ZJak&t=10760s) Using CRONTABS to schedule tasks.