**LINUX**

**Topic A – Productivity & Application Software**

**Applications:** Desktop environments do not offer the full array of apps. Just like Windows and Mac, Linux offers thousands upon thousands of high-quality software titles that can be easily found and installed. Most modern Linux distributions (more on this in a moment) include App Store-like tools that centralize and simplify application installation. For example: Ubuntu Linux has the Ubuntu Software Center (Figure 1) which allows you to quickly search among the thousands of apps and install them from one centralized location.

* [**Firefox**](https://www.mozilla.org/en-GB/firefox/new/): is the default web browser for a number of Linux distros such as Ubuntu and Linux Mint. The browser’s simple and fluid interface is one of its many attractions. Firefox will play YouTube videos right off the bat, and can download plugins to play other formats for you. The browser also updates itself from the get-go, meaning you always have the latest version.
* [**GIMP**](https://www.gimp.org/): (GNU Image Manipulation Program) is a free image editor. It can be used to edit and retouch images by resizing, adding layers and other special effects.By default the program takes up less than 100MB, which is another considerable benefit, particularly for those short on disk space.
* **Deluge:** While many Linux distributions already come with a BitTorrent client, [Deluge](http://deluge-torrent.org/) stands out as a lightweight yet fully-featured app for downloading your files. You can even [set up Deluge](http://dev.deluge-torrent.org/wiki/UserGuide/ThinClient) so that it can be accessed via a web interface from other devices, allowing you to download files to your home computer when you're away.
* [**LibreOffice**](https://www.libreoffice.org/) is nothing less than a full-blown office suite, on a par with commercial alternatives like Microsoft Office. While the interface may look rather basic, this product has some extremely advanced features.The LibreOffice word processor Writer, spreadsheet software Calc and presentation app Impress are preinstalled in Ubuntu and most of its derivatives. The suite also includes three less well-known apps – Draw, Math and Base – which are used for editing vector graphics, composing mathematical formulae and managing databases respectively. While LibreOffice uses the ODF (Open Document Format) by default it can open and save Microsoft Office compatible files too.

<https://www.techradar.com/news/best-linux-apps>

**Topic B – Entertainment & Media Software**

[**Kodi**](https://kodi.tv/) (previously known as XBMC) is a free and open source, highly customizable media server software. It is cross-platform and runs on Linux, Windows, MacOS; iOS and Android. It is more than just a media server; it’s an ideal entertainment center software with a fabulous user interface and several other media server software appliances are based on it.

features

* Runs on a wide variety of devices.
* It is user friendly.
* Supports a web interface.
* Supports a variety of user created Add-ons.
* Supports televisions and remote controls.
* Has a highly configurable interface via skins.
* Allows you to watch and record live TV.
* Supports importing pictures into a library.
* Allows you to browse, view, sort, filter or even start a slideshow of your pictures and much more.

[**Plex**](https://www.plex.tv/)is a powerful, secure and fully-featured and easy-to-install media server software. It runs on Linux, Windows, MacOS, and many other platforms. It supports almost all major file formats and allows you to organize your media in a central point for easy access. Plex has an easy-to-navigate interface, and a collection of useful apps for a variety of devices: phones, tablets, gaming consoles, streaming devices and smart TVs.

Features

* Supports encrypted connections with multiple user accounts.
* Allows you to easily pick and choose what to share.
* Offers a parental control functionality.
* Supports mobile sync which offers offline access to your media files.
* Supports flinging of video from one device to another.
* Also supports cloud sync.
* Supports audio fingerprinting and automatic photo-tagging.
* Has a media optimizer and much more.

<https://www.tecmint.com/best-media-server-software-for-linux/>

**Topic C – Programming Tools & Environment**

The OS is comprised of a number of pieces:

* **The Bootloader:** The software that manages the boot process of your computer. For most users, this will simply be a splash screen that pops up and eventually goes away to boot into the operating system.
* **The kernel:** This is the one piece of the whole that is actually called “Linux”. The kernel is the core of the system and manages the CPU, memory, and peripheral devices. The kernel is the “lowest” level of the OS.
* **Daemons:** These are background services (printing, sound, scheduling, etc) that either startup during boot, or after you log into the desktop.
* **The Shell:** You’ve probably heard mention of the Linux command line. This is the shell – a command process that allows you to control the computer via commands typed into a text interface. This is what, at one time, scared people away from Linux the most (assuming they had to learn a seemingly archaic command line structure to make Linux work). This is no longer the case. With modern desktop Linux, there is no need to ever touch the command line.
* **Graphical Server:** This is the sub-system that displays the graphics on your monitor. It is commonly referred to as the X server or just “X”.
* **Desktop Environment:** This is the piece of the puzzle that the users actually interact with. There are many desktop environments to choose from (Unity, GNOME, Cinnamon, Enlightenment, KDE, XFCE, etc). Each desktop environment includes built-in applications (such as file managers, configuration tools, web browsers, games, etc).

**Topic D – System Tools**

**Remote Connection tool**

* eHorus: it will allow us to quickly locate a device in the network map previously configured from any web browser.

**Backup tools and data compression**

* 7zip: This open source alternative contains private add-ons such as unRAR

**For full disaster recovery**

* Clonezilla: No matter what kind of file system we have on hard disks (ext n on Linux, FAT n on MS Windows, HFS+ on Mac, etc.) it is software that initiates a full backup to a server connected by local or external network, which we have previously configured (very important to assign fixed IP addresses by MAC address).

**Topic E – Software Security & Updates**

* **Firewalls:** They of course use firewalls and antivirus tools.
  + By default, Linux comes with a firewall tool called **iptables**. Gufw firewall being a popular choice. It’s actually a front-end to the Uncomplicated Firewall, which itself is based on iptables.
* **Many coders (eyes):**The fact that coders can read and comment upon each other’s , Anyone can review it and make sure there are no bugs or back doors.” Linux code is reviewed by the tech community, which lends itself to security: By having that much oversight, there are fewer vulnerabilities, bugs and threats.” That’s a subtle and perhaps counterintuitive explanation, but by having dozens — or sometimes hundreds — of people read through every line of code in the operating system, the code is actually more robust and the chance of flaws slipping into the wild is diminished. That had a lot to do with why *PC World* came right out and said Linux is more secure. As Katherine Noyes [explains](https://www.pcworld.com/article/202452/why_linux_is_more_secure_than_windows.html), “Microsoft may tout its large team of paid developers, but it’s unlikely that team can compare with a global base of Linux user-developers around the globe. Security can only benefit through all those extra eyeballs. <https://www.computerworld.com/article/3252823/linux/why-linux-is-better-than-windows-or-macos-for-security.html>
* **Long passwords:** help keep your accounts safe from people other than you.Password managers cut away the hassle of remembering complex passwords by creating and storing them in a password protected database for you. This file of passwords is usually heavily secured, so even if a person managed to get a hold of it, it’d be impossible to access.
* [**Sandboxes**](https://www.makeuseof.com/tag/whats-a-sandbox-and-why-should-you-be-playing-in-one/): help to protect your system by restricting what your programs can do in them. Programs inside of them aren’t able to affect anything outside of it, such as important system files
* **Backing up:** Even with lots of security software, you never quite know what might go wrong. As such, it’s important to [back up your hard drive](https://www.makeuseof.com/tag/2-methods-to-clone-your-linux-hard-drive/) regularly. After all, even if you repel threats at the software level, you can still fall foul to a computer failure.

<https://www.makeuseof.com/tag/security-tools-linux/>

**Security tools**

* **Wireshark:** (formerly known as Ethereal) is a very powerful packet analyzer for system administrators. Its features include live capturing of packets; browsing the contents of the packet; and, understanding various protocols and their parts.
* **NMAP:** Another Linux-based tool for security is [NMAP](http://searchsecurity.techtarget.co.uk/tip/Nmap-tutorial-Nmap-scan-examples-for-vulnerability-discovery), a must-have security scanner. It analyzes raw IP packets and then provides details about the live hosts in the network along with their banner information, ports, services and versions running. Any unintentionally open port on the target system can be detected by the tool, and necessary action can be taken.
* **ClamAV:** Among Linux-based tools for security, ClamAV is an antivirus software program written exclusively for a Linux distro. It is designed to detect Trojans, viruses, malware and other threats on the system.
* **Snort:** Among Linux-based tools for security, Snort is a very powerful free, open-source tool that helps in the detection of intruders and also highlights malicious attacks against the system. In effect, [Snort](https://searchitchannel.techtarget.com/tutorial/Snort-Tutorial-How-to-use-Snort-intrusion-detection-resources)is merely a packet filter. But the true value of this tool lies in its signature-based detection of attacks by analyzing packets that Wireshark or tcpdump are incapable of analyzing.
* **NIKTO** is another open source Web server scanner that tests Web servers for potentially dangerous CGI files. It also performs version-specific analysis, such as identifying outdated frameworks. NIKTO can also be used to test IDS systems. One must note that every test or check report doesn’t necessarily point to a security problem, hence the person analyzing NIKTO reports needs to be careful in this regard.

<https://www.computerweekly.com/tip/10-Linux-security-tools-for-system-administrators>

**Topic F – File System & User Accounts**

**User accounts:** Every user on a Linux system, whether created as an account for a real human being or associated with a particular service or system function, is stored in a file called "/etc/passwd".

The "/etc/passwd" file contains information about the users on the system. Each line describes a distinct user.

<https://www.digitalocean.com/community/tutorials/how-to-view-system-users-in-linux-on-ubuntu>

In Linux, you can choose whether you want to manage files and folders with a file manager or if you rather like to use the command line which is the traditional way. The last-mentioned method is often faster but requires some deeper knowledge of several commands to list, create, delete, or edit files and their properties.

Linux is multi-user system. This means more than one person can use the Linux. With the help of various software servers, configurations, and commands, multiple users can use Linux.

In order to gain access to the system and its resources, users are required to log in. By controlling access to system, you can prevent unauthorized users from using system as well as control access to data.

<https://www.cyberciti.biz/faq/linux-what-defines-a-user-account/>

**File Systems:**

**Specifying Paths**

As opposed to Windows, Linux does not use backslashes to separate the components of a pathname, it uses slashes instead.

Partitions, Drives/Devices and Directories

Linux does not use drive letters as Windows does. From the mere appearance of a pathname in Linux you can not tell whether you are addressing a partition, a drive/device, a network device or an “ordinary” directory.

**Mounting and Unmounting**

Another crucial difference between Windows/DOS and Linux is the concept of *mounting* and *unmounting* partitions, drives or directories. Windows detects partitions and drives during the boot process and assigns a drive letter to them. In Linux however, partitions or devices are usually not visible in the directory tree unless they are*mounted*, that means integrated into the file system at a specific location in the directory tree. As a normal user you cannot access data on a partition or a device unless it is mounted. But don't worry— most of the times you do not have to mount partitions or devices manually. During the installation of your system, you can define partitions to be mounted automatically when the system is started. Removable devices are usually also detected and mounted automatically by your system—the desktop environments such as KDE or GNOME will inform you about the appearance of a new device. Although this concept of mounting and unmounting may appear complicated or cumbersome at first sight this also offers great flexibility: for example you can easily mount a directory from a another machine over the network and act on that directory as though it were located on your local machine.

**Case-Sensitivity**

Linux distinguishes between uppercase and lowercase letters in the file system. For example, whether you name a file test.txt, TeST.txt or Test.txt make a difference in Linux.

File Extensions

As opposed to Windows, files in Linux *may* have a file extension, such as .txt, but do not need to have one. When you start working with the shell this sometimes makes it difficult for beginners to differentiate between files and folders, depending on the command you use to list the contents of a directory.

**Hidden Files**

Similar to Windows, Linux also distinguishes between “normal” files and *hidden files* which are often configuration files that you usually do not want to access or see as a normal user. In Linux, hidden files are indicated by a dot in front (for example, .hiddenfile). In order to access hidden files you can switch view in the file managers as described in Section “Managing Folders and Files with Konqueror” (Chapter 1, *Getting Started with the KDE Desktop*, ↑KDE User Guide) or use a certain command in the shell as described in [Section 8.2.2, “Using Commands with Options”](https://www.pks.mpg.de/~mueller/docs/suse10.2/html/opensuse-manual_en/manual/sec.new.bash.commands.html#sec.new.bash.commands.options).

**File System Permissions**

Because Linux is a multiuser system, every file in a Linux file system belongs to a user and a group. Only the owner of a file or directory (or, of course, root) can grant other users access permission to it. Linux basically distinguishes between three different types of access permissions: write permission, read permission and execute permission.

<https://www.pks.mpg.de/~mueller/docs/suse10.2/html/opensuse-manual_en/manual/sec.new.fs.html>

**Topic G – Special Features of your OS**

* **Customized keyboards**
* **Live CD and USB**
* **Application support;** Linux has its own software repository from where users can download and install thousands of applications just by issuing a command in Linux Terminal or Shell. Linux can also run Windows applications if needed.
* **Graphical User interface**
* **Good security**
* <https://www.linuxchange.org/5-best-features-of-linux-operating-system-that-you-need-to-know/>
* **Open Source** – Linux source code is freely available and it is community based development project. Multiple teams works in collaboration to enhance the capability of Linux operating system and it is continuously evolving.
* **Multi-User** – Linux is a multiuser system means multiple users can access system resources like memory/ ram/ application programs at same time.
* <http://www.linux-india.org/important-features-of-linux-operating-system/>

Topic H – Limitations of your OS

* **No standard edition**; While Windows and Mac have several definite versions, there is no one standard edition of Linux. In fact, there are hundreds of different user-developed editions.
* **More complex;** The simplest way to put it: Linux is not as easy to use as Windows or Mac. It requires a broader base of knowledge about computing than other operating systems, and this can be very challenging for a beginning user. If you are used to using Windows or Mac, you will have to unlearn and relearn many different functions and processes.
* **Non-Compatible Software**; A disadvantage to using a Linux OS is that the majority of your favorite programs will not run on it. If you are used to certain software, you will have to find a comparable Linux option.

[Initial release date](https://www.google.ca/search?safe=strict&rlz=1C1GGRV_enCA814CA814&q=linux+initial+release+date&stick=H4sIAAAAAAAAAOPgE-LUz9U3SCuoqirQ0soot9JPzs_JSU0uyczP088vSC1KLMnMS48vriwuSc0ttirOyCxQSEksSQUAaS4mrTkAAAA&sa=X&ved=2ahUKEwimndOI_sTeAhWM4IMKHRgVD0IQ6BMoADAmegQIAxAK): September 17, 1991

(google)

Linux is an operating system that runs on the Linux kernel which was created by Linus Torvalds back in the early 1990s in Finland. The kernel was made available for free and allowed other programmers to add to the kernel as a free contribution. After hundreds of programmers started developing the kernel, the Linux system rapidly grew. Like UNIX, Linux is a free operating system which can by run on your PC hardware and it provides you with more control over your operating system. (<https://www.spamlaws.com/how-linux-works.html>)

An operating system is simply a collection of software that manages hardware resources and provides an environment where applications can run. The operating system allows applications to store information, send documents to printers, interact with users and other things.

It’s been around since the mid ‘90s, and has since reached a user-base that spans industries and continents. For those in the know, you understand that Linux is actually everywhere. It’s in your phones, in your cars, in your refrigerators, your Roku devices. It runs most of the Internet, the supercomputers making scientific breakthroughs, and the world\'s stock exchanges.

<https://www.linux.com/what-is-linux>