**Level 1 – Rough Research**

Topic A - Productivity and Application Software

While some Linux distros like Ubuntu come with their own flashy app stores, none are as quick and easy to use as Synaptic, which simply serves as a graphical frontend for the 'apt-get' command line utility. You can install it on any Debian-based Linux distro such as Ubuntu or Linux Mint.Browse categories of apps such as 'Games and Amusement' using the pane on the left-hand side. Click the box next to an app name to mark it for installation (or uninstallation) then click the Apply button at the top to affect your changes. All the programs covered in this article can be installed via Synaptic.Firefox 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. Firefox supports a number of extensions to enhance your web experience, and you can customise the browser further via the Mozilla add-ons page, where it is possible to install a colourful theme. LibreOffice 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 Calculator 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. Read our full review of LibreOffice here.

Topic B - Entertainment And Media Software

Audacity is an editing program which allows you to record and tinker with audio. Not only can Audacity record audio simultaneously from various inputs (for example, a USB microphone or an electric guitar), it can also trim and edit clips. Furthermore, it supports multiple tracks, allowing you, for instance, to record lyrics and backing music separately. The software also supports a number of audio effects such as noise reduction, as detailed in its extremely comprehensive manual which is both bundled with Audacity and available online. Audacity also supports VST (Virtual Studio Technology) plugins. VLC is most commonly known for being a media player, although it does much more than this. When installed, it downloads codecs for virtually every kind of audio or video file, meaning you're unlikely to ever have playback issues again. The software can also play DVDs. You can use VLC to clip video files and even convert them from one format to another – from AVI to MP4, for example. See our guide on this [here](https://www.techradar.com/how-to/how-to-convert-videos-with-vlc). The media player client can also act as a server, allowing you to stream media from one device to another (handily, we’ve also got a guide on how to do this).GIMP (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. You can access these via the handy toolbox or dropdown menus. See our guide on how to use GIMP here. The GIMP website itself also has a great selection of tutorials. If you're accustomed to Adobe Photoshop, it may take some time for you to adjust to GIMP's interface, but it can do almost everything professional image editors are capable of. You can even add certain Photoshop plugins to GIMP. By default the program takes up less than 100MB, which is another considerable benefit, particularly for those short on disk space. Tracks can be exported in a number of popular sound formats such as WAV, OGG and MP3.

Topic C - Programming Tools and Environment

Bluefish is one of the most popular IDEs for Web development available. It can handle programming and markup languages, but it focuses on creating dynamic and interactive Web sites. Like many Linux applications, Bluefish is lightweight (using about 30% to 40% of the resources that similar applications use) and fast. Bluefish can open multiple documents at once (up to 3,500 documents, if needed). It includes project support, remote file support, search and replace (including regular expressions), unlimited undo/redo, customizable syntax highlighting for many languages, anti-aliased text in windows, and multiple encodings support, among other features. One of Bluefish nice features is the Quickbar, a user-defined toolbar that allows you to add buttons by right-clicking and choosing Add To Quickbar. You can add any HTML toolbar buttons to the Quickbar. Bluefish has a number of simple tools to help you add various elements to your code. Need a DHTML auto-submit select box? Easy. Choose Auto-submit Select Box from the DHTML drop-down and fill out the necessary items to add the element to your code. Bluefish has wizards for C, Apache, DHTML, DocBook, HTML, PHP+HTML, and SQL. If you develop your sites by hand, you should certainly be using Bluefish.Anjuta is a free, open source IDE for the C and C++ languages. It's easy to install (*urpmi anjuta* on Mandriva, for example) and offers such features as project management, application wizards, an interactive debugger, and a powerful source code editor (with source browsing, code completion, and syntax highlighting). The Anjuta team developed this powerful IDE to be easy to use and still meet all of your C and C++ programming needs. Anjuta has a flexible and powerful user interface that allows you to drag and drop the tools in the layout to arrange the GUI nearly any way you like. And each user-configured layout is persistent for the project (so you can have different layouts for every project you have going). Anjuta also enjoys a powerful plug-in system that allows you to decide which plugins are active and which are not for each project. And like all open source projects, you can develop your own plugins for Anjuta. One of the most powerful tools in the Anjuta application is the project manager. This tool can open nearly any automake/autoconf-based project. This project manager doesn't add any Anjuta-based information to the project, so your project can be maintained and developed outside of Anjuta as well.GCC is a GNU compiler that works for C, C++, Objective C, FORTRAN, Java, and Ada. It's a command-line tool but is very powerful. Many IDEs have tools that are merely front ends for GCC. GCC is actually a set of tools. The most used are the compilers for C and C++ code. How does one tool compile for different languages? Simple: For C, you invoke the "gcc" command and for C++, you invoke the "g++" command. Two compilers in the same toolkit. And g++ is a compiler, not just a preprocessor. It will build object code from source code without using an intermediary to first build C code from C++ source. This creates better object code and gives you better debugging information. Linux was written in C.

Topic D - System Tools

Linux Top command is a performance monitoring program which is used frequently by many system administrators to monitor Linux performance and it is available under many Linux/Unix like operating systems. The top command used to display all the running and active real-time processes in ordered list and updates it regularly. It display CPU usage, Memory usage, Swap Memory, Cache Size, Buffer Size, Process PID, User, Commands and much more. It also shows high memory and cpu utilization of a running processes. The top command is much useful for system administrator to monitor and take correct action when required. Let’s see top command in action.Linux VmStat command used to display statistics of virtual memory, kernel threads, disks, system processes, I/O blocks, interrupts, CPU activity and much more. By default vmstat command is not available under Linux systems you need to install a package called sysstat that includes a vmstat program. The common usage of command format is.Lsof command used in many Linux/Unix like system that is used to display list of all the open files and the processes. The open files included are disk files, network sockets, pipes, devices and processes. One of the main reason for using this command is when a disk cannot be unmounted and displays the error that files are being used or opened. With this command you can easily identify which files are in use. The most common format for this command is.

Topic E - Software Security and Updates

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. We have already covered Wireshark in detail in an earlier tutorial. Another Linux-based tool for security is NMAP, 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. There are two versions of NMAP available, a command line interface and a graphical user interface known as Zenmap. While both have essentially identical functionality, the GUI version has inbuilt scan profiles to readily scan the target. The Linux platform is seeing development of antivirus and other security enhancers to make things easy for a layman. 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. For seeking out the rootkits in your distros, the readily available programs are chkRootkit and Rootkit Hunter.

Topic F - File System and User Accounts

File Systems:

Ext2.--Ext3.--Ext4.--Jfs.--ReiserFS.--XFS.--Btrfs

Topic G - Special Features

Portable(Multiplatform),Multitasking,Multi User,Multiprocessor (SMP) Support,,Multithreading Support,Virtual Memory,Hierarchical File System,Graphical User,Interface (X Window System, Wayland),Wide Hardware Support,Dynamically Linked,Shared Libraries as well as Static Libraries,POSIX Compliant (Almost),Multiple Virtual Consoles,Multiple File System Support,Multiple Networking Protocols (TCP/IP,IPX/SPX, Appletalk, AX.25),Shell,Strong Security Model,Open Source

Topic H - Limitations

Linux has no speech recognition for Synthia to use (just type). AVI and Quicktime movies can not be opened in Linux. SynthEyes CAN open RED R3D's and all normally-supported image sequence types, as support is integrated in SynthEyes. Linux uses UTF-8 encoding throughout, unlike the ISO-Latin-1 used for the Windows and macOS versions. Most things should go well within Linux, with the exception of OpenGL text for non-ASCII characters. Any non-ASCII characters in a SNI version saved in Linux will be misinterpreted in Win & Mac. The keyboard accelerator map is interpreted using a US layout. While this interferes with your ability to remember a few keys, many of the accelerators are based on the positions of the keys, and should not move. Money: That is the simplest answer to your question. Linux \*could\* run ANY Windows based program, if the money was there to support development. Without the money, the limit is based partly on required kernel/source code availability and sheer will of people to make it work. The same could be said for the ability to run any macOS software. Linux can go in any direction the masses decide. The direction the kernel goes in or the amount of support isn’t required on marketability though, only on community support. Without legal limitations, Linux can go places that Microsoft and Apple can not. With the money behind Microsoft and Apple. they can go places Linux can not (initially). At the end of the day though… patents are the primary way to protect inventions for a limited amount of time. Patents also require an outside individual to be able to duplicate the invention for their own use… which lends itself to the creation of at least mostly compatible systems. Patents are how money-grabbing entities work… compared to how open-source systems work. That which is started at a patented product, will eventually become public domain (open-source if you dare) however, that which starts as open-source can’t easily be patented to prevent others from re-implementing it.