Module A.3 OS - Concept Map (Rough Research)

Linux OS

Topic A - Productivity & Application Software

* Productivity software is a category of application programs that helps users produce things such as documents, [databases](https://searchsqlserver.techtarget.com/definition/database), graphs, worksheets and presentations
* There are many application softwares that are applicable with the Linux OS
* Some applications are Thunderbird which is Mozilla Firefox’s email client
* While some Linux distros like Ubuntu come with their own flashy app stores, none are as quick and easy to use as [Synaptic](http://www.nongnu.org/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

### [VLC Media Player, VLC](http://www.videolan.org/vlc/index.en-GB.html) 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

### [Mozilla 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

### [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.

* [Pidgin](https://pidgin.im/) is an instant messaging program which allows you to connect to multiple chat networks at once
* <https://www.techradar.com/news/best-linux-apps>

Topic B - Entertainment & Media Software

* Media and Entertainment Software refers to the main means of mass communication like broadcasting, publishing, and the internet
* Entertainment in this case, refers to an event, performance, or activity designed to entertain a targeted demographic
* With the Linux OS, there are many Entertainment and Media Softwares that are usable for the users
* Some are:
* Spotify, a digital music streaming service available to users, a platform equipped with millions of songs at one’s command
* Buka, is a modern ebook manager and reader, it is an app to organize a users ebook collection
* Darktable, it is an open source photography workflow application and raw developer
* Shotcut, is a free, open source, cross-platform video editor
* UMPlayer, stands for Universal Media Player as it can play all kinds of media formats and also platform independent
* DigiKam, is an advanced photo editing and management software available for all major operating systems including Linux, Windows, and MAC OS
* PiTiVi is a non-linear video editor using GStreamer for Linux desktop environment
* <https://www.linuxtechi.com/10-multimedia-software-for-linux-desktop/>
* <https://blog.ubuntu.com/2018/08/30/top-10-linux-apps-for-entertainment-and-leisure>

Topic C - Programming Tools & Environment

* A programming tool or software development tool is a computer program that software developers use to create, debug, maintain, or otherwise support other programs and applications
* There are many programming tools that use the Linux OS
* 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
* Anjuta, is a free open source IDE it’s easy to install and offers such features as project management, application wizards, an interactive debugger and a powerful source code editor
* Eclipse, is a multi-language IDE written in Java with an extensive plug-in system to allow the user to extend functionality
* Quanta Plus, is a HTML development tool that is capable of hand coding and supports multiple coding languages like HTML, XHTML, CSS and XML
* <https://www.techrepublic.com/blog/10-things/10-linux-and-open-source-developer-tools-you-should-not-overlook/>

Topic D - System Tools

<https://www.tecmint.com/command-line-tools-to-monitor-linux-performance/>

* The definition of PC system tools are the programs used for software development or systemmaintenance. Virtually any program or utility that helps programmers or users develop applications or maintain their computers can be called a tool
* Many system tools exist with the Linux OS
* Linux Top, 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
* VMStat (Virtual Memory Statistics), Linux VmStat command is used to display statistics of virtual memory, kernerl 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
* NetStat (Network Statistics), is a command line tool for monitoring incoming and outgoing network packets statistics as well as interface statistics. It is very useful tool for every system administrator to monitor network performance and troubleshoot network related problems
* Monitorix, is a free lightweight utility that is designed to run and monitor system and network resources as many as possible in Linux/Unix servers. It has a built in HTTP web server that regularly collects system and network information and display them in graphs. It Monitors system load average and usage, memory allocation, disk driver health, system services, network ports, mail statistics (Sendmail, Postfix, Dovecot, etc), MySQL statistics and many more. It designed to monitor overall system performance and helps in detecting failures, bottlenecks, abnormal activities etc

Topic E - Software Security & Updates

* Operating System security is the process of ensuring OS integrity, confidentiality and availability. OS security refers to specified steps or measures used to protect the OS from threats, viruses, worms, malware or remote hacker intrusions
* [Linux portal](https://en.wikipedia.org/wiki/Portal:Linux) [Computer security portal](https://en.wikipedia.org/wiki/Portal:Computer_security) Linux (and Unix) have a multi-tier security that permits user [root](https://en.wikipedia.org/wiki/Root_(Linux)) any system-wide changes. Regular users can be limited: where they can save files, what hardware they can access, their memory usage, applications, disk usage ([quota](https://en.wikipedia.org/wiki/Disk_quota)), and the range of [priority](https://en.wikipedia.org/wiki/Scheduling_(computing)) settings they can apply, can all be specified to provide sufficient freedoms. If necessary they must become root
* The Linux OS has many security softwares
* There are Authentication Modules, PAM & OPIE
* System Logging, Syslog
* Network services
* Security auditing, crack, Tiger, and Tripwire
* <https://en.wikipedia.org/wiki/Category:Linux_security_software>
* More Linux based security tools are
* 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. There are two versions of NMAP available, a [command line interface and a graphical user interface](https://searchwindowsserver.techtarget.com/tip/CLI-vs-GUI-Find-the-right-admin-tool-for-various-scenarios) known as Zenmap
* Malware, antivirus scanners, 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 chRootkit and Rootkit Hunter
* 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

Topic F - File Systems & User Accounts

* A filesystem is the methods and data structures that an operating system uses to keep track of files on a disk or partition; that is, the way the files are organized on the disk. The word is also used to refer to a partition or disk that is used to store the files or the type of the filesystem.
* User accounts are an established relationship between a user and a computer, network or information service. User accounts are assigned a username. Passwords are optional for computers and networks, but mandatory for registrations and subscriptions to online services
* Linux supports numerous file systems but common choices for the system disk on a block device include the ext\* family ([ext2](https://en.wikipedia.org/wiki/Ext2), [ext3](https://en.wikipedia.org/wiki/Ext3) and [ext4](https://en.wikipedia.org/wiki/Ext4)), [XFS](https://en.wikipedia.org/wiki/XFS), [JFS](https://en.wikipedia.org/wiki/JFS_(file_system)), and [btrfs](https://en.wikipedia.org/wiki/Btrfs). For raw flash without a [flash translation layer](https://en.wikipedia.org/wiki/Flash_translation_layer) (FTL) or [Memory Technology Device](https://en.wikipedia.org/wiki/Memory_Technology_Device) (MTD), there are [UBIFS](https://en.wikipedia.org/wiki/UBIFS), [JFFS2](https://en.wikipedia.org/wiki/JFFS2) and [YAFFS](https://en.wikipedia.org/wiki/YAFFS), among others. [SquashFS](https://en.wikipedia.org/wiki/SquashFS) is a common compressed read-only file system

Topic G - Special Features of Linux

* The Linux OS has many special features that can help users be more efficient with whatever they are doing on their computer
* 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
* Multitple Filesystem Support
* Multiple Networking Protocols (TCP/IP, IPX/SPX, Appletalk, AX.25)
* Shell

Topic H - Limitations of Linux

* Limitations are a limiting rule or circumstance; a restriction
* It won't run on an 8 bit computer.
* It won't run on hardware where the manufacturer actively prohibits Linux driver development, but that's political and not software.
* Currently, Linux supports only a subset of RED and BLUE QoS, but does not support BLACK, PURPLE or GREEN. (Now you know the answer to that question in the Valerie Aurora version of the TCP/IP drinking game.)
* Linux does not have current support for IBCS.
* The DEC VAX architecture is out of date.
* The HP plugin scheduler system is absent, so you're not able to create containers with independent scheduling algorithms
* <https://www.quora.com/What-are-the-limitations-of-Linux>