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Rough Research - Linux - Ubuntu

Office software - https://www.libreoffice.org/

Create professional documents, spreadsheets and presentations on Ubuntu with LibreOffice, the open source office suite that’s compatible with Microsoft Office. That means you can open and edit files like Word documents, Excel spreadsheets and PowerPoint presentations and share them with other users quickly and easily. You can also use Google docs directly from your desktop.

Web browsing

Renowned for speed and security, Ubuntu and Firefox make browsing the web a pleasure again. Ubuntu also includes Chrome, Opera and other browsers that can be installed from the Ubuntu Software Centre.

Email

Ubuntu comes with Thunderbird, Mozilla’s popular email application, so you’ll have fast desktop access to your email. No matter which email services you use; Microsoft Exchange, Gmail, Hotmail, POP or IMAP, email just works.

Photos

Ubuntu is full of free apps to help you enjoy, manage, edit and share your photos — whatever you use to take them. With fantastic support for cameras and phones, you won’t need any extra drivers to get up and running.

With Shotwell, you can quickly and easily import, organise, edit and view your pictures. And you can share your favourite snaps on all popular photo sites and social networks.

Edit and illustrate

Edit your photos or create professional illustrations and designs with tools like Gimp, Blender, and Inkscape, available in the Ubuntu Software Centre.

Videos

Watch all your favourite content on Ubuntu with apps for playing, managing and sharing your videos. Edit your movies with PiTiVi and then watch them in Movie Player — or add VLC and OpenShot from the Ubuntu Software Centre, for compatibility with even more file formats.

Gaming

From Sudoku to shoot-em-ups, we’ve got loads of games that’ll keep you busy for hours. There are thousands of games available for Ubuntu, including titles from the Unity and Steam platforms. Pick from critically acclaimed titles such as Dota 2, Civilization V, Kerbal Space Program, Football Manager 2018 and Borderlands: The Pre-Sequel.

An open source operating system

Our code is shared openly throughout the development cycle. We are transparent about our plans for future releases, so as a developer, carrier or manufacturer, you can work with us to start building Ubuntu mobile experiences now. - <https://www.ubuntu.com/desktop/features>

Linux Terminal also runs on Bash, which is the most programming supported command line. Most program installations take place in the command line on all linux distributions.

So, what do you do with bash? You will use it to find out what files are on your computer, and what is in them. You will use it to run programs that can make all sorts of changes to your computer, from editing files and images to converting them. From moving and copying files around to creating automatic back-ups. From downloading code of new programs to compiling and running them. But before you get too excited: it is key that you remember, bash is a tool, a single tool in a huge toolbox of programs. Bash alone will only let you do basic things with files and other programs. You will need to understand all the other tools in the toolbox of your system. This knowledge is vast and will come slowly, it is important that you take the time to learn them well rather than try to get the basic idea of most and break a leg tomorrow (or more likely, your music archive or collection of family pictures).

Security - <https://admin.insights.ubuntu.com/wp-content/uploads/226b/UK-Gov-Report-Summary.pdf?_ga=2.255106632.1932905956.1541772746-556835439.1541772746>

CESG, the security arm of the UK government that assesses operating systems and software, has published its findings for all ‘End User Device’ operating systems (OSs). Based at GCHQ, they included OSs for laptops and mobile devices in their assessment, and for uses designated at “OFFICIAL” level in accordance with UK Government Security Classification Policy. This is roughly equivalent to a standard set of best practice security features. Any enterprise would be interested in implementing these to make sure that information is not leaked from their organisation.

No currently available operating system can meet all of these requirements. Ubuntu however, scores the highest in a direct comparison.

File Systems - https://help.ubuntu.com/community/LinuxFilesystemsExplained

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ext3 | 2 TiB | 32 TiB | Yes | Standard linux filesystem for many years. Best choice for super-standard installation. |
| ext4 | 16 TiB | 1 EiB | Yes | Modern iteration of ext3. Best choice for new installations where super-standard isn't necessary. |

Limitations: Not accessible everywhere.

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

Netstat 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.

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.

<https://help.ubuntu.com/lts/serverguide/user-management.html.en> :-

Ubuntu developers made a conscientious decision to disable the administrative root account by default in all Ubuntu installations. This does not mean that the root account has been deleted or that it may not be accessed. It merely has been given a password which matches no possible encrypted value, therefore may not log in directly by itself.

Instead, users are encouraged to make use of a tool by the name of sudo to carry out system administrative duties. Sudo allows an authorized user to temporarily elevate their privileges using their own password instead of having to know the password belonging to the root account. This simple yet effective methodology provides accountability for all user actions, and gives the administrator granular control over which actions a user can perform with said privileges.

If for some reason you wish to enable the root account, simply give it a password:

Configurations with root passwords are not supported.

sudo passwd

Sudo will prompt you for your password, and then ask you to supply a new password for root as shown below:

[sudo] password for username: (enter your own password)

Enter new UNIX password: (enter a new password for root)

Retype new UNIX password: (repeat new password for root)

passwd: password updated successfully

To disable the root account password, use the following passwd syntax:

sudo passwd -l root

However, to disable the root account itself, use the following command:

usermod --expiredate 1

You should read more on Sudo by reading the man page:

man sudo

By default, the initial user created by the Ubuntu installer is a member of the group "sudo" which is added to the file /etc/sudoers as an authorized sudo user. If you wish to give any other account full root access through sudo, simply add them to the sudo group.

Adding and Deleting Users

The process for managing local users and groups is straightforward and differs very little from most other GNU/Linux operating systems. Ubuntu and other Debian based distributions encourage the use of the "adduser" package for account management.

To add a user account, use the following syntax, and follow the prompts to give the account a password and identifiable characteristics, such as a full name, phone number, etc.

Deleting an account does not remove their respective home folder. It is up to you whether or not you wish to delete the folder manually or keep it according to your desired retention policies.

If your server will be home to multiple users, you should pay close attention to the user home directory permissions to ensure confidentiality. By default, user home directories in Ubuntu are created with world read/execute permissions. This means that all users can browse and access the contents of other users home directories. This may not be suitable for your environment.

SSH Access by Disabled Users

Simply disabling/locking a user account will not prevent a user from logging into your server remotely if they have previously set up RSA public key authentication. They will still be able to gain shell access to the server, without the need for any password. Remember to check the users home directory for files that will allow for this type of authenticated SSH access, e.g. /home/username/.ssh/authorized\_keys.

Remove or rename the directory .ssh/ in the user's home folder to prevent further SSH authentication capabilities.

Be sure to check for any established SSH connections by the disabled user, as it is possible they may have existing inbound or outbound connections. Kill any that are found.

who | grep username (to get the pts/# terminal)

sudo pkill -f pts/#

Restrict SSH access to only user accounts that should have it. For example, you may create a group called "sshlogin" and add the group name as the value associated with the AllowGroups variable located in the file /etc/ssh/sshd\_config.

AllowGroups sshlogin

Then add your permitted SSH users to the group "sshlogin", and restart the SSH service.

sudo adduser username sshlogin

sudo systemctl restart sshd.service

External User Database Authentication

Most enterprise networks require centralized authentication and access controls for all system resources. If you have configured your server to authenticate users against external databases, be sure to disable the user accounts both externally and locally. This way you ensure that local fallback authentication is not possible.

**Swap Memory - https://help.ubuntu.com/community/SwapFaq**

Swap space is the area on a hard disk. It is a part of your machine's Virtual Memory, which is a combination of accessible physical memory (RAM) and the swap space. Swap holds memory pages that are temporarily inactive. Swap space is used when your operating system decides that it needs physical memory for active processes and the amount of available (unused) physical memory is insufficient. When this happens, inactive pages from the physical memory are then moved into the swap space, freeing up that physical memory for other uses. Note that the access time for swap is slower, depending on the speed of the hard drive. Do not consider it to be a complete replacement for the physical memory. Swap space can be a dedicated swap partition (recommended), a swap file, or a combination of swap partitions and swap file(s).

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Empty Swap

Introduction

This FAQ is aimed at Linux novices.

People always wonder how much swap they should create at install time, or after installing they may think, "have I made a large enough swap? Should I reinstall with a larger swap?"

This FAQ will tell you how much swap you need and how to add more swap after installation.

You will be given very simple answers (to prevent losing too much time reading this FAQ) and some explanations that may help you form your own opinion.

What is swap?

Swap space is the area on a hard disk. It is a part of your machine's Virtual Memory, which is a combination of accessible physical memory (RAM) and the swap space. Swap holds memory pages that are temporarily inactive. Swap space is used when your operating system decides that it needs physical memory for active processes and the amount of available (unused) physical memory is insufficient. When this happens, inactive pages from the physical memory are then moved into the swap space, freeing up that physical memory for other uses. Note that the access time for swap is slower, depending on the speed of the hard drive. Do not consider it to be a complete replacement for the physical memory. Swap space can be a dedicated swap partition (recommended), a swap file, or a combination of swap partitions and swap file(s).

Why do I need swap?

Memory consuming programs Sometimes, a large program (like LibreOffice, Neverwinter Nights, or a video editor) make the entire system need extra memory. A significant number of the pages used by these large programs during its startup may only be used for initialization and then never used again. The system can swap out those pages and free the memory for other programs or even for the disk cache. In these cases, swap will be used to help the system handle any extra load.

Hibernation (suspend-to-disk) The hibernation feature (suspend-to-disk) writes out the contents of RAM to the swap partition before turning off the machine. Therefore, your swap partition should be at least as big as your RAM size. The hibernation implementation currently used in Ubuntu, swsusp, needs a swap or suspend partition. It cannot use a swap file on an active file system.

Unforeseeable Circumstances Unforeseeable events can and will happen (a program going crazy, some action needing much more space than you thought, or any other unpredictable combination of events). In these cases, swap can give you an extra delay to figure out what happened, or to finish what you are working on.

Optimizing memory usage Since mechanical hard drives are considerably slower than RAM (SSD - Solid State Drive - storage is not as slow as physical drives, but still slower than RAM), when you need a file (be it a data file like a video, executables like Firefox, or libraries), the Linux kernel reads the file into RAM and keeps it there, so that the next time you need it, it is already in RAM and data access is much faster. The portions of RAM that accelerate disk read are called "cached memory." You will notice that they make a huge difference in terms of responsiveness. The Linux kernel automatically moves RAM reserved by programs--but not really used--into swap, so that it can serve the better purpose of extending cached memory.

Optimizing Swap performance Because swap space uses a disk device, this can cause performance issues in any system that uses swap space significantly because the system itself may also be using the same disk device at the same time that it is required for swap operations. One way to reduce this problem is to have swap space on a different physical drive so that the competition for that resource is either reduced or eliminated.

<https://www.channelfutures.com/open-source/five-essential-ubuntu-features> - Special Features

hardware autoconfiguration - Ubuntu comes with the drivers for most hardware built-in. Anyone who's installed a generic version of Windows (i.e., not one pre-configured by a PC vendor to work with certain hardware) knows how nice it is not to have to spend hours hunting around for drivers after installing the operating system.

multiple desktops - virtual desktops are like tabbed web browsing--you don't realize how extraordinarily useful they are until you try them. There are some third-party tools to achieve the same functionality in Windows, but in my experience few of them work well, if at all, in Vista and above.

software repositories - being able to install thousands of applications from Ubuntu's repositories in a few clicks is a huge plus. Besides the fact that the software is free and more secure than .exe packages downloaded from random websites, it's much more convenient to install programs from a centralized location.

ssh client - this probably only matters to geeks, but having an ssh client built into the operating system is a major plus for me. There are some decent ssh clients available for Windows, like Putty, but none are available in Windows out-of-the-box, and even the best of them isn't as functional as the trusty gnome-terminal.

no antivirus - security practices in the Windows world are profoundly contradictory. Many of the same companies that write Windows software also make millions of dollars selling resource-hogging applications to protect Windows applications from their security flaws. Ubuntu is by no means immune to malware, but practically speaking, it's as secure as it needs to be for most users out-of-the-box, without any expensive antivirus scanners added on.