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# Ultimate Edition Guide

This guide was not written via the Ultimate Edition Team, it is specific to Ubuntu Natty Narwhal. Ultimate Edition 3.0 was built off Natty Narwhal so all the below should also apply to it as well.

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## General Notes

### General Notes

- This is the original Ubuntuguide. You are free to copy this guide but not to sell it or any derivative of it. Copyright of the names Ubuntuguide and Ubuntu Guide reside solely with this site. This Ubuntu help guide is neither sold nor distributed in any other medium. Beware of copies that are for sale or are similarly named; they are neither endorsed nor sanctioned by this guide. Ubuntuguide is not associated with Canonical Ltd nor with any commercial enterprise.
- Ubuntu allows a user to accomplish tasks from either a menu-driven [Graphical User Interface \(GUI\)](#) or from a text-based [command-line interface \(CLI\)](#). In Ubuntu, the command-line-interface terminal is called Terminal, which is started: Menu -> Applications -> Accessories -> Terminal.

Text inside the grey dotted box like this should be put into the command-line Terminal.

- Many changes to the operating system can only be done by a User with Administrative privileges. 'sudo' elevates a User's privileges to the Administrator level temporarily (i.e. when installing programs or making changes to the system). Example:

```
sudo bash
```

- 'gksudo' can be used instead of 'sudo' when opening a Graphical Application through the "Run Command" dialog box or as a menu item. Example:

```
gksudo gedit /etc/apt/sources.list
```

- ◆ Many file management tasks can be accomplished with root Administrative privileges by starting the Nautilus file manager in a similar fashion. (Use 'gksudo' if starting Nautilus from a menu item.)

```
gksudo nautilus
```

or

```
sudo nautilus
```

- "man" command can be used to find help manual for a command. For example, "man sudo" will display the manual page for the "sudo" command:

```
man sudo
```

- While "apt-get" and "aptitude" are fast ways of installing programs/packages, you can also use the [Synaptic Package Manager](#), a GUI method for installing programs/packages. Most (but not all) programs/packages available with apt-get install will also be available from the Synaptic Package Manager. In this guide, when you see

```
sudo apt-get install package
```

you can search for *package* in Synaptic and install it that way.

- Many instructions use the text editor "nano" (which is universally available in Linux). However, it is often easier to use the text editor "gedit" in Ubuntu instead.
- "Menu" refers to the menu bar at the top (or bottom) of the desktop, akin to the Start menu in Microsoft Windows or the Menu bar of the Apple Macintosh.
- If you are using the 64-bit version, replace any "i386" with "amd64"

## Other versions

### How to find out which version of Ubuntu you're using

Open the command terminal and type:

```
lsb_release -a
```

### How to find out which kernel you are using

```
uname -a
```

## Newer Versions of Ubuntu

- Ubuntu has a six month release cycle, with releases in April and October.
- [Oneiric Ocelot \(11.10\)](#), scheduled for release in October 2011. This will not be an LTS version.

## Older Versions of Ubuntu

- [Maverick Meerkat \(10.10\)](#) (supported until April 2012)
- [Lucid Lynx \(10.04\)](#) (Long Term Support version with desktop support until April 2013 and server support until April 2015)
- [Karmic Koala \(9.10\)](#) (supported until April 2011)
- [Jaunty Jackalope \(9.04\)](#) (no longer supported)
- [Hardy Heron \(8.04 LTS\)](#) (Long Term Support version with desktop support until April 2011 and server support until April 2013)
- [Dapper Drake \(6.06 LTS\)](#) (Long Term Support for server until June 2011; desktop no longer supported)
- See [this complete list](#) of older and newer versions.

## Other Resources

- [Ubuntu Forums](#) has a large community for online solutions and specific help.

## Ubuntu Resources

### Unity Desktop

[Unity](#) is the default desktop environment used in Ubuntu. It is compatible with the GTK platform used by Gnome. It was designed to be used for netbooks, but is developed by Canonical to be useful on all types of devices.

### Gnome Project

[Gnome3](#) is an alternative desktop available for Ubuntu, and a [list of Gnome projects](#) is available.

- Installation [method 1](#):

```
sudo add-apt-repository ppa:gnome3-team/gnome3
```

```
sudo apt-get update
sudo apt-get dist-upgrade
sudo apt-get install gnome-shell
```

- Installation [method 2](#):

```
sudo add-apt-repository ppa:ubuntugnometeam/gnome3
sudo add-apt-repository ppa:ubuntugnometeam/ppa-gen
sudo apt-get update
sudo apt-get install ugr-desktop-g3
sudo apt-get dist-upgrade
```

### Ubuntu Screenshots and Screencasts

- [What is Ubuntu?](#)
- [Ubuntu 11.04 Unity Desktop](#) and [other YouTube videos](#).

### New Applications Resources

- [GetDeb](#) - Features the latest versions of software available from the official repositories as well as software not available in the official repositories. Available in easy-to-install .deb files (see [Apt and Package Basics](#)).
- [Top 100 Open source Applications](#)
- [Linux Alternatives](#)
- See our [full list of add-on applications](#).

### Other \*buntu guides and help manuals

- [Kubuntuguide](#) -- Kubuntu uses the popular KDE desktop environment
- [Lubuntu](#) -- Lubuntu can run with as little as 256 Mb RAM. It is better for older machines with limited resources.
- [official Ubuntu Server Guide](#) -- a good starting reference for server packages
- [Ubuntu Doctors Guild](#) -- a collection of tips for using (K)ubuntu Linux in health care environments
- [SkoleLinux](#) -- a collection of (open-source) educational tools for Debian/Ubuntu Linux

# Installing Ubuntu

Warning: During installation, there is an advanced option (Ready to install -> Advanced) to install the GRUB2 bootloader into the same partition into which the (K)Ubuntu OS is installed but not to change the MBR (Master Boot Record). Pay careful attention during this step if your system uses a boot partition, uses multiple OS (more than 2), or chainloads bootloaders. For systems with such a boot partition, it is best not to overwrite the MBR.

## Hardware requirements

Ubuntu Natty Narwhal runs well with as little as 384 Mb RAM. (The GUI installer requires a minimum of 256 Mb RAM, while the alternative text-based installer can run using only 192 Mb RAM.) [Netbooks](#) can run Ubuntu Natty Narwhal.

The installation takes between 3-4 Gb hard drive space, and 8 - 10 Gb will be needed to run comfortably.

If you have an older computer with less memory than this, consider [Lubuntu](#) (if 160 Mb RAM or greater), [PuppyLinux](#) (if 256 Mb or greater), or [DSL](#) (if minimal RAM, limited hard drive space, running from a USBdrive, or running from within another OS).

## Fresh Installation

- Download the latest ISO image from [Ubuntu 11.04](#).  
See [this guide](#) for burning the ISO image to a CD ("LiveCD").  
[Use the LiveCD](#) for installation.
- Another method involves installing the [Server version](#) first and then installing the [Ubuntu desktop](#).
- The [Alternate CD version](#) also allows the use of the same fast text-based installer used in the Server version (requiring less RAM), and there are more installation options than on the Desktop CD ("Regular Download").
- A LiveCD can also be transferred to a [USB flashdrive](#) (using usb-creator-gtk) and the [USB flashdrive then used](#) to install Ubuntu on systems without CD drives. (Also see the [Ubuntu Community documentation](#).)

## Dual-Booting Windows and Ubuntu

A user may experience problems dual-booting Ubuntu and Windows. In general, a Windows OS should be installed first, because its bootloader is very particular. A default Windows installation usually occupies the entire hard drive, so the main Windows partition [needs to be shrunk](#), creating free space for the Ubuntu partitions. (You should clean up unnecessary files and defragment the drive before resizing.) See [changing the Windows partition size](#).

After shrinking a Windows partition, you should reboot once into Windows prior to installing Ubuntu or further manipulating the partitions. This allows the Windows system to automatically rescan the newly-resized partition (using chkdsk in XP or other utilities in more recent versions of Windows) and write changes to its own bootup files. (If you forget to do this, you may later have to repair the Windows partition bootup files manually using the Windows Recovery Console.)

Newer installations of Windows use two primary [partitions](#) (a small Windows boot partition and a large Windows OS partition). An Ubuntu Linux installation also requires two partitions -- a linux-swap partition and the OS partition. The Linux partitions can either be two primary partitions or can be two logical partitions within an extended partition. Some computer retailers use all four partitions on a hard drive. Unless there are two free partitions available (either primary or logical) in which to install Ubuntu, however, it will appear as if there is no available free space. If only one partition on a hard drive can be made available, it must be used as an extended partition (in which multiple logical partitions can then be created). Partition management can be done using the [GParted](#) utility.

If there are only two existing primary partitions on a hard drive (and plenty of free space on it) then there will be no problem installing Ubuntu as the second operating system and it is done automatically from the Ubuntu LiveCD. Allow the Ubuntu LiveCD to install to "largest available free space." Alternatively, if there is an extended partition with plenty of free space within it, the Ubuntu LiveCD will install to this "largest available free space" as well.

The main Windows partition should be at least 20 Gb (recommended 30 Gb for Vista/Windows 7), and a Ubuntu partition at least 10 Gb (recommended 20 Gb). Obviously, if you have plenty of disk space, make the partition for whichever will be your favoured operating system larger. For a recommended partitioning scheme, see [this section](#).

Conversely you can install a retail version of Windows (but not an OEM or recovery version) after Ubuntu by creating a primary NTFS partition using [GParted](#). (You may have to use GParted from a Live CD/USB). Once the primary NTFS partition is created you can boot your Windows CD/DVD and choose to install Windows to that NTFS partition. When installation is complete, reboot to insure Windows boots properly. Once that is ascertained, use the Ubuntu Live CD/USB to install GRUB back to the MBR. (This is necessary because Windows overwrites the MBR and designates its own bootloader as the master bootloader.) Once GRUB is installed you will be able to boot either OS.

Alternatives include:

- [Wubi](#) (Windows-based Ubuntu Installer), an officially supported dual-boot installer that allows Ubuntu to be run mounted in a virtual-disk within the Windows environment (which can cause a slight degradation in performance). Because the installation requires an intact functioning Windows system, it is recommended to install Ubuntu in this manner for short-term evaluation purposes only. A permanent Ubuntu installation should be installed in its own partition, with its own filesystem, and should not rely on Windows.
- [EasyBCD](#), a free Windows-based program that allows you to [dual-boot Windows 7/Vista and Ubuntu](#) (as well as other operating systems) by configuring the Windows 7/Vista bootloader.

## Installing multiple OS on a single computer

Warning: During installation, there is an advanced option (Ready to install -> Advanced) to install the GRUB2 bootloader into the same partition into which the (K)Ubuntu OS is installed but not to change the MBR (Master Boot Record). Pay careful attention during this step if your system uses a boot partition, uses multiple OS (more than 2), or chainloads bootloaders. For systems with such a boot partition, it is best not to overwrite the MBR.

- Example, from the Desktop version GUI installer, a point in the installation will be reached:

Summary -> Advanced -> Device for boot loader installation: */dev/sda6*

In this example, this setting will cause the GRUB2 bootloader to be installed into */dev/sda6* only (the partition into which the new (K)Ubuntu OS is being installed). The MBR (Master Boot Record) will not be changed. However, if the default setting of */dev/sda* is allowed, then GRUB2 will not only be installed into partition *dev/sda6* (into which the (K)Ubuntu OS is installed) but also the MBR (MasterBootRecord) will be changed so that the copy of GRUB2 stored there will be designated as the master bootloader for all Operating Systems on the entire computer. This may be undesirable if you wish to use bootloaders other than GRUB2.

If you want to install more than 2 operating systems on a single computer, check out [these tips](#). Also see these tips regarding [manipulating partitions](#).

## Use Startup Manager to change Grub settings

Grub is a bootup utility that controls which OS to load by default and other bootup settings. You can change Grub settings from [Startup Manager](#), a GUI that is able to manage settings for Grub (Grub Legacy), Grub 2, U splash, and Splashy. Also see [the Ubuntu Community help](#) page for Startup Manager usage instructions. Install:

```
sudo apt-get install startupmanager menu
```

Run:

Menu -> System -> Administration -> Startup Manager

Note: You can also edit the Grub settings [manually](#) from the command-line interface.

## Dual-Booting Mac OS X and Ubuntu

- Also see [these tips](#) for installing multiple OS.

Mac OS X has a similar structure to Linux (it is BSD Unix based). Dual-booting Mac OS X and Ubuntu detailed instructions can be found [here](#).

## Installing Mac OS X after Ubuntu

- If you decide to dual boot with OS X, choose ext2 as your partition type during the Ubuntu installation. (For this the Super Grub Disk CD is a useful utility. You can download the Super Grub .iso image file at [forjamari.linux.org](#) and burn the image to a CD-ROM.)
- Once you have installed Ubuntu, edit the Grub start-up list:

```
sudo nano /boot/grub/menu.lst
```

and add the following lines:

```
title Mac OS X
root (hd0,0)
makeactive
chainloader +1
```

Reboot your Mac and go to the terminal in Max OS X (if you have any issues booting, boot from your Mac OS X DVD). Press F8 and enter -s. Enter:

```
fdisk -e /dev/rdisk0
flag 2 <--note that flag 2 is my Mac partition number two
quit
y
reboot
```

- If are still unsure whether it is working correctly, use the Super Grub Disk CD and make grub active.

## Installing Ubuntu after Mac OS X

- If you get an error message during boot such as HFS+error in the bootloader, you can also use the Super Grub Disk for recovering Linux GRUB and the Windows MBR (Master Boot Record).
- Once you have installed Ubuntu, edit the Grub start-up list:

```
sudo nano /boot/grub/menu.lst
```

and add the following lines:

```
title Mac OS X
root (hd0,0)
makeactive
chainloader +1
```

If you have issues with Mac OSX or Windows in GRUB, try changing the Mac OS X Grub entry change root (hd0,0) to root (hd0,1)

This means you will boot into partition number 1. You can try any partition number until you get it right.

## Upgrading to Natty

- Also see the [official Ubuntu desktop upgrade documentation](#).

There are several methods for upgrades from the command-line interface (Terminal) (which can be used for both the desktop and server editions of Ubuntu/Kubuntu).

- This is the preferred method:

```
sudo apt-get install update-manager-core
sudo do-release-upgrade
```

- You can also use the update-manager (all editions):

```
sudo apt-get install update-manager
sudo update-manager -d
```

- You can also use:

```
sudo apt-get update
sudo apt-get upgrade
sudo apt-get dist-upgrade
```

(Note: the first two lines simply make sure your current distribution is current before upgrading the entire distribution, and are optional.

## Reinstalling applications after a fresh installation

If you upgrade your Ubuntu system with a fresh installation, it is possible to mark the packages and services installed on your old system (prior to the upgrade) and save the settings ("markings") into a file. Then install the new version of Ubuntu and allow the system to reinstall packages and services using the settings saved in the "markings" file. For instructions, see this [Ubuntu forum thread](#). In brief:

- On the old system:

Synaptic Package Manager -> File -> Save Markings

- Save the markings file to an external medium, such as a USB drive.
- Complete the backup of your system's other important files (e.g. the /home directory) before the installation of the new system.
- In the freshly-installed new system:

Synaptic Package Manager -> File -> Read markings and load the file on your USB drive (or other external storage) previously saved.

Note: Many packages, dependencies, and compatibilities change between version of Ubuntu, so this method does not always work. [Automated updates](#) remains the recommended method.

- Alternatively you can use this command-line method.

◇ Prior to the clean installation, run:

```
dpkg --get-selections > ~/my-packages
```

This creates a *my-packages* file in the ~ (home) directory which will contain a list of the packages installed on the old system. Copy this file to a safe place (as you will need it after the new installation).

◇ Proceed with the clean installation. Enable the same repositories that were enabled in the old system.

◇ Now copy the *my-packages* file to the ~ (/home) folder. Run:

```
sudo dpkg --set-selections < my-packages && sudo apt-get dselect-upgrade
```

Any packages that you had installed (that are in the new repositories) will now be installed. Excluded will be any manually-installed packages (that are not in the new repositories) and any packages that were compiled from source.

## Add Extra Repositories

Software packages and programs are freely available for download at multiple online sites with standardized structures, called repositories. There are repositories officially sanctioned and monitored by the Kubuntu/Ubuntu developer community, while other repositories are independently provided, without official sanction or supervision (and should be used with caution). Additional information is available from [the Ubuntu Repository Guide](#).

## Types of Repositories

- There are four major package repository types in Ubuntu:
  - ◇ main - Supported by Canonical. This is the major part of the distribution.
  - ◇ restricted - Software not licensed under the [GPL](#) (or similar software license), but supported by Canonical.
  - ◇ universe - Software licensed under the GPL (or similar license) and supported by users.
  - ◇ multiverse - Software not licensed under the GPL (or similar license), but supported by users.
- There are also these additional types of repositories:
  - ◇ natty-updates - Updates to official packages.
  - ◇ natty-backports - Current version software from Oneiric Ocelot (Natty+1) that have been backported to Natty Narwhal.
  - ◇ natty-proposed - Proposed updates & changes (bleeding edge stuff).

## Third party repositories

Software developers often maintain their own repositories, from which software packages can be downloaded and installed directly to your computer (if you add the repository to your list). Many of these third party repositories and software packages have never been reviewed by the (K)Ubuntu/Debian community and can present a security risk to your computer. Trojans, backdoors, and other malicious software can be present at any unregulated repository. When using repositories not endorsed by the (K)ubuntu/Debian community, make sure you have utter confidence in that site before enabling the repository and installing a software package from it.

## Add Repositories using Synaptic Package Manager

This is the preferred method.

- Menu -> System -> Administration -> Synaptic Package Manager -> Settings -> Repositories.
- Here you can enable the repositories for Ubuntu Software and Third Party Software.
- For Third Party Software select Add -> enter the repository's address. It will have a format similar to:

```
deb http://archive.ubuntu.com/ubuntu/ natty main restricted
deb-src http://archive.ubuntu.com/ubuntu/ natty main restricted
```

◇ *Example:* To add the Medibuntu repository, Add:

```
deb http://packages.medibuntu.org/ natty free non-free
```

◇ Download the repository key to a folder.

◇ *Example:* The Medibuntu key can be downloaded from  
<http://packages.medibuntu.org/medibuntu-key.gpg>

- Then add the key from:

Menu -> System -> Administration -> Synaptic Manager -> Settings -> Repositories -> Authentication -> Import Key File...

◇ (Alternatively, you can manually add the key from the command line Terminal. See [Add Repository keys](#).)

- Refresh the package list from the new repository:

Synaptic -> Reload

## Manually add repositories

- Do this at your own risk. Modify the default `Ubuntu.sources.list` only if you understand what you're doing. Mixing repositories can **break** your system. For more information see the [Ubuntu Command-line Repository guide](#).

◇ Create a backup of your current list of sources.

```
sudo cp -i /etc/apt/sources.list /etc/apt/sources.list_backup
```

Note: `sudo` - runs the command with root privileges. `cp` = copy. `-i` = prompt to overwrite if a file already exists.

◇ Edit the list of sources:

```
sudo nano /etc/apt/sources.list
```

or using a graphical editor:

```
gksudo gedit /etc/apt/sources.list
```

- Note: To use your local mirror you can add "xx." before *archive.ubuntu.com*, where **xx** = your country code.

*Example:* deb http://gb.archive.ubuntu.com/ubuntu lcid main restricted universe multiverse indicates a repository for Great Britain (gb).

◇ Here is a sample sources.list. At the end have been added repositories for Medibuntu and Google:

```
#deb cdrom:[Ubuntu 11.04 _Natty Narwhal_ - Release i386]/ natty main restricted
# See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to
# newer versions of the distribution.

deb http://gb.archive.ubuntu.com/ubuntu/ natty main restricted
deb-src http://gb.archive.ubuntu.com/ubuntu/ natty main restricted

## Major bug fix updates produced after the final release of the
## distribution.
deb http://gb.archive.ubuntu.com/ubuntu/ natty-updates main restricted
deb-src http://gb.archive.ubuntu.com/ubuntu/ natty-updates main restricted

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team. Also, please note that software in universe WILL NOT receive any
## review or updates from the Ubuntu security team.
deb http://gb.archive.ubuntu.com/ubuntu/ natty universe
deb-src http://gb.archive.ubuntu.com/ubuntu/ natty universe
deb http://gb.archive.ubuntu.com/ubuntu/ natty-updates universe
deb-src http://gb.archive.ubuntu.com/ubuntu/ natty-updates universe

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team, and may not be under a free licence. Please satisfy yourself as to
## your rights to use the software. Also, please note that software in
## multiverse WILL NOT receive any review or updates from the Ubuntu
## security team.
deb http://gb.archive.ubuntu.com/ubuntu/ natty multiverse
deb-src http://gb.archive.ubuntu.com/ubuntu/ natty multiverse
deb http://gb.archive.ubuntu.com/ubuntu/ natty-updates multiverse
deb-src http://gb.archive.ubuntu.com/ubuntu/ natty-updates multiverse

## Uncomment the following two lines to add software from the 'backports'
## repository.
## N.B. software from this repository may not have been tested as
```

```
## extensively as that contained in the main release, although it includes
## newer versions of some applications which may provide useful features.
## Also, please note that software in backports WILL NOT receive any review
## or updates from the Ubuntu security team.
deb http://gb.archive.ubuntu.com/ubuntu/ natty-backports main restricted universe multiverse
deb-src http://gb.archive.ubuntu.com/ubuntu/ natty-backports main restricted universe multivers

## Uncomment the following two lines to add software from Canonical's
## 'partner' repository. This software is not part of Ubuntu, but is
## offered by Canonical and the respective vendors as a service to Ubuntu
## users.
deb http://archive.canonical.com/ubuntu natty partner
deb-src http://archive.canonical.com/ubuntu natty partner

deb http://security.ubuntu.com/ubuntu natty-security main restricted
deb-src http://security.ubuntu.com/ubuntu natty-security main restricted
deb http://security.ubuntu.com/ubuntu natty-security universe
deb-src http://security.ubuntu.com/ubuntu natty-security universe
deb http://security.ubuntu.com/ubuntu natty-security multiverse
deb-src http://security.ubuntu.com/ubuntu natty-security multiverse

## Medibuntu - Ubuntu 11.04 "Natty Narwhal"
## Please report any bug on https://bugs.launchpad.net/medibuntu/
deb http://packages.medibuntu.org/ natty free non-free
deb-src http://packages.medibuntu.org/ natty free non-free

# Google software repository
deb http://dl.google.com/linux/deb/ stable non-free
```

◇ Download and add the repository keys to your keyring. See [Add repository keys](#).

◇ Refresh the packages list from the new repositories:

```
sudo apt-get update
```

## Add repository keys

◇ Download the gpg keys for the repositories and automatically add them to your repository keyring:

◇ *Example:* To obtain and add the Medibuntu repository key:

```
wget --quiet http://packages.medibuntu.org/medibuntu-key.gpg -O - | sudo apt-key add -
```

◇ *Example:* To obtain and add the Google repository key:

```
wget --quiet http://dl.google.com/linux/linux_signing_key.pub -O - | sudo apt-key add -
```

Note: `wget` - retrieves a file from a network location. `--quiet` = no output. `-O` = Output downloaded item to terminal. The `|` (pipe symbol) is used to capture the output from the previous command (in our case the screen) and use it as an input for the piped command (i.e. `apt-key`, which adds it to the keyring).

- Alternatively (and perhaps more easily), you can use `apt-key` directly:

```
sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-keys KEY
```

where `KEY` is the missing key code printed in `apt-get` output, e.g. `EF4186FE247510BE`.

Note: Key servers often use port 11371. Make sure your [firewall](#) allows port 11371 to be open.

## Package Installation and Updates

### Apt and Package Basics

- Read [Add Extra Repositories](#)

Most new users will use the [Synaptic Package Manager](#) to install packages. These instructions are for installing packages from the command-line Terminal. Terminal can be started:

Menu -> Applications -> Accessories -> Terminal

- Install packages:

```
sudo apt-get install packagename
```

- *Example:*

```
sudo apt-get install mpd sbackup
```

- Remove packages:

```
sudo apt-get remove packagename
```

- To remove all dependencies:

```
sudo apt-get autoremove
```

- *Example:*

```
sudo apt-get remove mpd sbackup
```

- Search for packages:

```
apt-cache search <keywords>
```

- *Examples:*

```
apt-cache search Music MP3  
apt-cache search "Text Editor"
```

- Update the apt package database after [adding/removing repositories](#):

```
sudo apt-get update
```

- Upgrade packages:

```
sudo apt-get upgrade
```

- Upgrade the entire distribution (e.g. from Maverick to Natty):

```
sudo apt-get dist-upgrade
```

### Installing .deb packages

Debian (.deb) packages are the packages that are used in Ubuntu. You can install any .deb package in your system. .deb files can generally be installed from your file manager (Nautilus) merely by clicking on them, since file associations with the default installer is already set in Ubuntu. These instructions are for those who wish to install packages from the command-line terminal (Terminal).

- Install a downloaded Debian (Ubuntu) package (.deb):

```
sudo dpkg -i packagename.deb
```

- Remove a Debian (Ubuntu) package (.deb):

```
sudo dpkg -r packagename
```

- Reconfigure/Repair an installed Debian (Ubuntu) package (.deb):

```
sudo dpkg-reconfigure packagename
```

*\*Example:*

```
sudo dpkg-reconfigure mpd
```

## Handling (Tar/GZip) and (Tar/Bzip2) archives

(Tar/GZip) archives end in ".tar.gz" and (Tar/Bzip2) archives end in ".tar.bz2". Bzip2 is the newer, more efficient compression method. These files can generally be automatically extracted by merely clicking on them from your file manager (Nautilus), since file associations with the appropriate archival utilities are set by default in Ubuntu. These instructions are for those who wish to use the command line Terminal.

◊ To extract:

```
tar xvf packagename.tar.gz
```

Note: tar is an application which can extract files from an archive, decompressing if necessary.

- x means extract.
- v means verbose (list what it is extracting).
- f specifies the file to use.

- Decompressing ".gz" files

```
gunzip file.gz
```

- Decompressing ".bz2" files

```
bunzip2 file.bz2
```

Note: You can also decompress a package first by using the command gunzip (for .gz) or bunzip2 (for .bz2), leaving the .tar file. You would then use tar to extract it.

◊ To create a .gz archive:

```
tar cvfz packagename.tar.gz folder
```

◊ To create a .bz2 archive:

```
tar cvfj packagename.tar.bz2 folder
```

## Installing a package from source

- Make sure you have all the necessary development tools (i.e. libraries, compilers, headers):

```
sudo apt-get install build-essential linux-headers-$(uname -r)
```

Note: "uname -r" lists the current kernel you are using

- Extract the archive that contains the source files:

```
tar xvf sourcefilesarchive.tar.gz
```

- Build the package using the package's script (in this case the configure script), compile the package (make), and install the compiled package into your system (make install):

```
cd /path/to/extracted/sourcefiles
```

```
./configure  
sudo make  
sudo make install
```

Note: typing `./` before a filename in the current folder allows the Linux shell to try and execute the file as an application even if it is not in the path (the set of folders which it searches when you type a command name). If you get a "permission denied" error, the file is not marked as being executable. To fix this:

```
sudo chmod +x filename
```

*Example:* In the above instructions, `configure` is the shell script to build the package from source. To be sure the `configure` script is executable:

```
sudo chmod +x configure
```

### Create a .deb package from source files

If your build from source is successful, you can make a Debian (Ubuntu) package (.deb) for future use:

- Install package tools:

```
sudo apt-get install checkinstall
```

- Rebuild package using "checkinstall":

```
cd /path/to/extracted/package  
./configure  
sudo make  
sudo checkinstall
```

- Keep the resulting ".deb" file for future use. It can later be installed using:

```
sudo dpkg -i packagename.deb
```

Note: These are basic instructions that may not always work. Some packages require additional dependencies and optional parameters to be specified in order to build them successfully. Also see [these Ubuntu wiki instructions](#). More info about .deb package structure can be found [here](#).

### Aptitude

Aptitude is a terminal-based package manager that can be used instead of apt-get. Aptitude marks packages that are automatically installed and removes them when no packages depend on them. This makes it easy to remove applications completely. To use Aptitude, replace apt-get with aptitude in the command line.

Example:

```
sudo aptitude install packagename
sudo aptitude remove packagename

sudo aptitude update
sudo aptitude upgrade
```

For an ncurses-based graphical user interface, type

```
sudo aptitude
```

For more information, see [the aptitude documentation](#).

### Synaptic Package Manager

While "apt-get" and "aptitude" are fast ways of installing programs/packages, you can also use the Synaptic Package Manager (Menu -> System -> Administration -> Synaptic Manager), a GUI method for installing programs/packages. Most (but not all) programs/packages available with apt-get install will also be available from the Synaptic Package Manager. This is the preferred method for most desktop users. In this guide, when you see

```
sudo apt-get install package
```

you can simply search for *package* in Synaptic and install it that way.

Menu -> System -> Administration -> Synaptic Package Manager

◇ Search for the name of the program/package. You can also search for a word in its description.

-> Mark for Installation -> Apply

◇ The selected program(s) will be automatically installed, along with its dependencies.

## Ubuntu Software Center (Add/Remove Programs)

Not all packages available from apt-get, aptitude, and Synaptic Package Manager are available in the Ubuntu Software Center. However, it is the easiest interface for new users of Ubuntu and directs them to preferred packages.

Menu -> Applications -> Ubuntu Software Center

◇ Search for the sort of program you want to add. Example: type *MP3* to see a list of mp3 software.

-> Mark for Installation -> Apply

◇ The selected program(s) will be automatically installed.

## Manual Updates

- Read [General Notes](#)
- Read [Add Extra Repositories](#)
- Manually, from Terminal (command line interface):

```
sudo apt-get update  
sudo apt-get upgrade
```

or

- Use Synaptic Package Manager:

Menu -> System -> Administration -> Synaptic Package Manager -> "Reload" then "Mark all upgrades"

If there are packages available for updating, you will be prompted whether to install them.

## Automated Updates

- Use Synaptic Package Manager:

## Ultimate Edition Guide

Menu -> System -> Administration -> Synaptic Manager -> Settings -> Preferences -> General -> Reloading Outdated Package Information -> Automatic

# Desktop Add-ons

There are many add-on icons, themes, wallpapers, 3-D effects, and other customizations available for the GNOME desktop.

## Gnome Eye-Candy Resources

- [Gnome Look](#) has wallpapers, splash screens, icons, and themes for windows managers (including Metacity and Compiz) and other applications.

## Ubuntu Wallpaper

- Download free [Maverick Meerkat wallpapers](#).

## Change Plymouth Splash Screen

This is the initial splash screen you see at bootup. Different Plymouth themes can be found by searching for plymouth-theme in a Package Manager. Install a new one and then:

```
sudo update-alternatives --config default.plymouth
sudo update-initramfs -u
```

and manually select the theme you wish to use.

Plymouth does not reliably work with nVidia drivers and during bootup a blank screen may result for several seconds.

## Metacity

Metacity is the default desktop compositing manager in Gnome. It is lightweight, streamlined and does not have many configurable options, but has multiple themes available at Gnome Look.

## Compiz Fusion

Compiz Fusion is available as a separate Windows Manager, to allow advanced desktop effects such as the rotating cube desktop. Many Ubuntu users choose to run Compiz, which is quite fast in Ubuntu. Install:

```
sudo apt-get install compiz compizconfig-settings-manager compiz-fusion-plugins-main compiz-fus
```

To change to Compiz as the Window Manager:

- Select Compiz Configuration:

Menu -> System -> Preferences -> CompizConfig Settings Manager

Note: You must logout and log back in for the change to take effect.

### Fusion Icon

Fusion Icon is a tray icon that allows you to easily switch between window managers, window decorators, and gives you quick access to the Compiz Settings Manager. This allows quick toggling of 3-D desktop effects (that may not be compatible with some applications).

```
sudo apt-get install fusion-icon
```

Menu -> Applications -> System Tools -> Compiz Fusion Icon

You can then easily access CompizConfig Settings Manager from the icon.

### Rotate the Compiz Cube

Set the CompizConfig Settings Manager to enable the "Desktop Cube" and "Rotate Cube" and "Viewport Switcher" options. Click on the icon for each to customize settings. For example, to change the appearance of the cube, click on the Desktop Cube icon to access its settings. You can set the hotkey buttons for rotating the cube in the "Viewport Switcher" settings. Otherwise, hold down the Ctrl+Alt+Left mouse button and drag the mouse (or touchpad) the direction you want to rotate the cube.

Remember, the cube rotates between desktops. It's not a cube unless you have at least 4 desktops running. You will not get a cube if you are only using 2 desktops (you will get a "plate"). You can still rotate the sides of the plate, of course, but it will not be a cube. (Recent users from the Windows OS may have no experience with the concept of simultaneous desktops, but they are nice once you learn how to use them).

When running Compiz fusion as the Windows Manager, you must change the default number of desktops from within CompizConfig Settings Manger. To enable 4 desktops:

CompizConfig Settings Manager -> General -> General Options -> Desktop Size -> Horizontal Virtual Size -> 4

When you start an application, you can assign it to any one of the 4 desktops by right-clicking the upper left corner of the application window and choosing the "To Desktop..." option. Rotating the cube shows the different desktops. You can also go to a desktop using the taskbar icon which shows the 4 desktops.

## Emerald

Emerald is the theme engine for Compiz Fusion. Multiple themes are available. (These themes originated from the Beryl project before it merged with Compiz to form Compiz Fusion.) The Emerald Theme Manager for Compiz Fusion can be installed:

```
sudo apt-get install emerald
```

## Google Desktop

[Google Desktop for Linux](#) is a proprietary suite of widgets and applications to give Google control over your computer and thereby allow you to use Google services. A .deb package can be downloaded and installed from [Google Linux Downloads](#). For installation instructions, see [Google Desktop for Linux Instructions](#).

## gDesklets

[gDesklets](#) are similar to Windows widgets and Google gadgets and provide information such as weather, system resources, and news. For more information refer to this [gdesklet installation tutorial](#). Install:

```
sudo apt-get install gdesklets
```

## Dock applications

Avant Window Manager, Cairo Dock, gnome-do and Wbar are dock-like applications for Ubuntu Linux. A dock represents running programs as icons at the bottom of the screen (as is done on the Mac OS X desktop), instead of by toolbar panel segments (as is done in Windows and other Linux window managers). See this [brief comparison of dock applications](#).

## Avant Window Navigator

- [Avant Window Navigator](#) requires that a desktop composition manager (such as Metacity, Compiz, Xcompmgr, KDE4 (Kubuntu), or xfwm4 (Xubuntu)) be installed and running.
- Install and upgrade proprietary nVidia or ATI graphics drivers so that the compositing manager functions properly.
- Install AWN:

```
sudo apt-get install avant-window-navigator awn-manager
```

(Note: If you are using Gnome (Ubuntu) and do not already have a compositing manager installed (such as Compiz), Metacity will be installed as part of the installation.)

- Enable automatic startup of AWN at bootup:

◇ Menu -> System -> Preferences -> Startup Applications -> Add...

```
avant-window-navigator
```

- Select which applets should run from the dock menu by default:

◇ Menu -> Applications -> Accessories -> Avant Window Navigator Manager

You can drag application icons onto the list, then activate or deactivate the applets from the list.

## Cairo Dock

[Cairo Dock](#) can be used either with a desktop compositing manager (such as Metacity for Gnome, Compiz, or the KDE4 Window Manager) or without one. See [the Ubuntu installation instructions](#) for details. It is available from the repositories:

```
sudo apt-get install cairo-dock cairo-dock-plug-ins
```

## Gnome Do

[Gnome Do](#) is a docking utility for Gnome. Install:

```
sudo apt-get install gnome-do
```

- From the preferences pane of gnome-do select the Docky look and feel to get the dock (rather than the default Quicksilver-like) look and feel.

## wbar

[wbar](#) is a quick-launch bar (not a dock) that has an appearance similar to Avant Window Manager and Cairo Dock. It is GTK (Gnome) based but can work in all desktop environments. It does not require a compositing manager to be installed and is therefore quicker and more suitable for low-end hardware systems. It is the default in the Google gOS desktop and is available as a .deb package from Google. Download and install (from the command-line Terminal):

```
wget http://wbar.googlecode.com/files/wbar_1.3.3_i386.deb
sudo dpkg -i wbar_1.3.3_i386.deb
```

- Start wbar with custom start options (e.g. by pressing alt+F2). Here is an example:

```
wbar -isize 48 -j 1 -p bottom -balfa 40 -bpress -nanim 3 -z 2.5 -above-desk
```

Here is another example:

```
wbar -above-desk -pos bottom -isize 60 -nanim 1 -bpress -jumpf 0.0 -zoomf 1.5
```

For a full list of command-line startup options, see:

```
wbar --help
```

Tip: If you want the "wave" effect just increase the -nanim value. I like the icons to just pop up so I don't use it, but with 9 icons 5 there is a nice "wave" effect.

Obviously, you could create a menu item with the command line options (similar to the examples above), or a batch file that can be automatically started at system startup (as a cron event or startup session).

You can also change wbar startup options by editing the configuration file:

```
sudo gedit /usr/share/wbar/dot.wbar
```

See [this example configuration file](#). However, not all options are able to be set from the configuration file and must be run from the command line. For more info see [this wbar guide](#).

### wbarconf

A simple [wbar configuration utility](#) can be downloaded as a .deb package and installed:

```
wget http://koti.kapsi.fi/~ighea/wbarconf/wbarconf_0.7.2-1_i386.deb
sudo dpkg -i wbarconf_0.7.2-1_i386.deb
```

# Virtualization

Virtualization allows a second operating system (OS), such as Windows or OS X, to be run from within (K)Ubuntu. This requires extra RAM (because both (K)Ubuntu and the virtualized second OS require separate amounts of RAM) and a license for the second OS. If you wish to run a virtualized instance of Windows XP, for instance, you must have a license for Windows XP.

## VirtualBox

[VirtualBox](#) is a fast and complete virtualization solution owned and maintained by Sun Microsystems. There is a free and fully open-source edition available under the GNU GPL license.

- Install the open-source edition:

```
sudo apt-get install virtualbox-ose virtualbox-ose-source virtualbox-guest-additions
```

- You can also add the QT-version (if using KDE/Kubuntu, for example):

```
sudo apt-get install virtualbox-ose-qt
```

- Start VirtualBox:

Menu -> VirtualBox OSE PC virtualization solution

For usage instructions, see the [End-user documentation](#). For information on installing Virtualbox in Windows so that Ubuntu can then be installed within in a virtual machine running in Windows, see [this page](#).

## Proprietary versions of VirtualBox

A few [additional features](#) that are not yet in the OSE version, such as a USB device interface, are available in the proprietary version of VirtualBox. To [install a proprietary edition](#) of VirtualBox:

- Add the security key:

```
wget -q http://download.virtualbox.org/virtualbox/debian/oracle_vbox.asc -O- | sudo apt-key add
```

- Add the repository string to your [repository list](#) and update:

```
echo "deb http://download.virtualbox.org/virtualbox/debian maverick non-free" | sudo tee /etc/a
sudo apt-get update
```

- Install:

```
sudo apt-get install virtualbox
```

## VMWare

[VMWare](#) is a commercial virtualization platform that currently offers two free products: VMWare Player and [VMWare Server](#) (the latter with a free renewable yearly license). VMWare Player can play virtual appliances that have already been created, whereas VMWare Server (which has a broader range of features) allows the creation of virtual machines. In general, VMWare Server is recommended unless you only need to play an appliance. (Appliances will also run in VMWare Server). Users that wish to run servers (or processes) that need to be available to a network from within the virtual machine should use VMServer. If you wish to install a new OS within a virtual machine (other than in an appliance), you will need VMWare Server.

### VMWare Player

Installation instructions are on the website, or at [the Ubuntu community wiki](#). In brief, to install the free VMWare Player:

- Install pre-requisites:

```
sudo apt-get install build-essential linux-headers-$(uname -r)
```

- Get the binary package/installation script, give it executable privileges, then run the installation script:

```
wget http://download3.vmware.com/software/vmplayer/VMware-Player-2.5.3-185404.i386.bundle
chmod +x VMware-Player-2.5.3-185404.i386.bundle
sudo ./VMware-Player-2.5.3-185404.i386.bundle
```

- Run:

Menu -> Applications -> System Tools -> VMWare Player

### Create an Ubuntu Appliance

While any edition of Ubuntu can be installed in a virtual machine, the minimal installation option (F4) of the Ubuntu Server creates a highly-efficient edition (previously known as JeOS) optimised for use within a virtual appliance (which can then be played using VMWare Player or other virtual machine client). See this [walkthrough](#).

A virtual appliance for VMWare Player (using this JeOS minimal server) can also be built using [vmbuilder](#).

## VMWare Server

- Install pre-requisites:

```
sudo apt-get install build-essential linux-headers-$(uname -r)
```

- Download the server source files for your architecture (32-bit or 64-bit) from the [VMWare Server website](#) and retrieve your license key by email.
- Extract the files, give execution privileges to the install script, and run the install script:

```
tar xvf VMware-server-2.0.1-156745.i386.tar.gz
cd vmware-server-distrib
chmod +x vmware-install.pl
sudo ./vmware-install.pl
```

## VMWare Package

VMWare Appliances (that include an Ubuntu/Debian OS) can be created using VMWare Server and the VMWare Package utility. These appliances can then be deployed to users who can play them using VMWare Player. Install:

```
sudo apt-get install vmware-package
```

## Keyboard errors in VMware guest

After installing VMWare 6.5, and installing a guest OS, the Function, arrow and Del/End/etc keys do not function. This is a bug with VMWare's code. Add this line to `~/vmware/config` (create file if necessary) to fix this issue:

```
xkeymap.nokeycodeMap = true
```

## KVM

[KVM](#) is the free open source virtualization solution implemented as a Linux kernel module (in the recent kernels) for computers whose processors contain virtualization extensions (Intel VT or AMD-V). See the [Ubuntu installation instructions](#). Install:

```
sudo apt-get install kvm
```

## Qemu (without KVM)

If your computer does not have the virtualization extensions, you can still run the QEMU virtualization platform. See [this Ubuntu community documentation](#). It can be [installed from source code](#).

## Xen

[Xen](#) is an efficient open-source virtualization ("hypervisor") platform (which includes a merge with QEMU). It is the basis for the Amazon EC2 Cloud and is generally intended for use on a server (or on "baremetal" systems, i.e. no OS yet installed). It is free open source under a GPL license. The latest desktop (and installation instructions) is available from the website. (A commercial version is also offered by Citrix.) Implementation in Ubuntu requires some modification, currently. For more info, see the [Ubuntu community documentation](#). Install:

```
sudo apt-get install xen-hypervisor xen-docs convirt
```

A [Xen virtual machine host](#) can also be installed automatically with [certain 64-bit CPUs](#), using the 64-bit Ubuntu [Server](#) LiveCD. (A (K)Ubuntu desktop can then later be added -- see [Ubuntu server](#)).

## Virtual Machine Manager

[Virtual Machine Manager](#) is an application to allow viewing of all instances of virtual machines on your system. It includes a secure implementation of VNC. This and other virtual management tools are available as an integrated package in (K)Ubuntu. Install:

```
sudo apt-get install ubuntu-virt-mgmt
```

## Crossover for Linux

Codeweavers' [Crossover Office for Linux](#) is a subscription-based commercial package that allows many Windows programs to be run on Ubuntu without the need for a Microsoft OS license or a complete virtualization system. See the website for more info. Codeweavers releases older versions of this product into the free package Wine.

## Wine

[Wine](#) is a free open-source package that is similar to (and implements many elements of) CrossOver for Linux. Like CrossOver for Linux, no Microsoft license or virtualization platform is required to run Windows programs. See [these instructions](#) for installing the latest version of Wine.

```
sudo apt-get install wine
```

Also consider installing Microsoft's TrueType fonts:

```
sudo apt-get install msttcorefonts
```

### PlayOnLinux

[PlayOnLinux](#) is a Wine frontend which simplifies the installation and launch of many Windows programs, particularly games. Install:

```
sudo apt-get install playonlinux
```

### Internet Explorer 7

Internet Explorer 7 can be installed with PlayOnLinux. Select "Internet Explorer 7" from the "Internet" section of PlayonLinux.

### Internet Explorer 6 & 7

Internet Explorer 6 & 7 can function under Wine, albeit imperfectly. For most purposes, Firefox can be used (with the User Agent Switcher plugin) to mimic Internet Explorer.

- Make sure you have [Wine](#) and cabextract packages:

```
sudo apt-get install wine cabextract
```

- Download the [Winetricks](#) installation script:

```
wget http://winezeug.googlecode.com/svn/trunk/winetricks
```

- Install with winetricks:

```
sudo ./winetricks ie6  
sudo ./winetricks ie7
```

Note: Winetricks is automatically installed with the [current version of Wine](#).

## Transgaming Cedega

[Cedega](#) is a commercial application (similar to CrossOver Office and Wine), for installing and running some Windows applications, specifically games, without the need for virtualization or a Microsoft license. It provides 3D support, software acceleration support, and a high level of DirectX support. Installation instructions are found on the website.

## Mono

[Mono](#) is a free open source project sponsored by Novell to allow .NET programs to function in Linux ((K)Ubuntu) and Mac OS X. . Several GNOME applications (like Tomboy, F-Spot, and Banshee) require mono to be installed, so mono may already be installed by default on your system. The most recent version is available [here](#).

```
sudo apt-get install mono-2.0-devel
```

## Moonlight

- See [Moonlight plugin for Firefox](#)

## Java

- Install Java:

```
sudo apt-get install default-jre
```

## DosBox

[DOSBox](#) is a DOS-emulator that emulates CPU:286/386 realmode/protected mode, Directory FileSystem/XMS/EMS, Tandy/Hercules/CGA/EGA/VGA/VESA graphics, and a SoundBlaster/Gravis Ultra Sound card (for sound compatibility with older games). You can "re-live" classic games that otherwise won't run on newer computers.

```
sudo apt-get install dosbox
```

## ScummVM

[ScummVM](#) allows certain classic graphical point-and-click adventure games to run (provided you already have their data files). ScummVM replaces the executables shipped with the games, allowing play on Linux operating systems (for which they were not originally designed).

```
sudo apt-get install scummvm
```

# Edutainment Applications

There are many superb applications that can be installed with a single click.

Menu -> Applications -> Ubuntu Software Center-> Education

Below are a few examples that can be installed from this menu:

- [Celestia](#) -- a free planetarium and space simulator for the desktop
- [Stellarium](#) -- an astounding planetarium for the desktop
- [K3DSurf](#) -- a program for modeling 3,4,5, and 6 dimensional models.
- [Bibletime](#)-- a Bible study tool using the QT platform
- [Zekr](#) -- an Islamic Quran study tool (available in Utilities)
- [Oregano](#) -- a program for electrical engineering schematics
- [RIPlot](#) -- a high quality graph generator
- [Mnemosyne](#) -- a flash-card tool
- [Gramps](#) -- map your family-tree and co-operate with genealogy projects

## Google Earth

[Google Earth](#) gives you an annotated eagle's eye view of our planet. This is a free proprietary package (you must accept the license to use this package).

```
sudo apt-get install googleearth-package  
make-googleearth-package --force
```

Doubleclick on the resulting .deb file.

-- or --

To install the latest Linux binary, download and save the GoogleEarthLinux.bin package from [Google Earth downloads](#). Then install:

```
chmod +x GoogleEarthLinux.bin  
./GoogleEarthLinux.bin
```

Run:

Menu -> Applications -> Internet -> Google Earth 3D planet viewer

You should turn off the Google Earth -> View -> Atmosphere setting, or you might see clouds everywhere and the ground won't show up.

## Troubleshooting

If Google Earth opens, shows the splash screen, and then crashes, youâ€™re probably experiencing a common issue. Running `~/google-earth/googleearth` in a terminal will show this error: `./googleearth-bin: relocation error: /usr/lib/i686/cmov/libssl.so.0.9.8: symbol BIO_test_flags, version OPENSSL_0.9.8 not defined in file libcrypto.so.0.9.8 with link time reference`

To fix this, browse to the folder you installed Google Earth into. By default this will be `google-earth` in your home folder. Find the file `libcrypto.so.0.9.8` and rename it to something else, like `libcrypto.so.0.9.8.bak`. Google Earth should now start correctly.

```
cd ~/google-earth
sudo mv libcrypto.so.0.9.8 libcrypto.so.0.9.8.bak
sudo ln -s /usr/lib/libcrypto.so.0.9.8 ~/google-earth/libcrypto.so.0.9.8
```

(Note: You can also specify `/home/user/google-earth` instead of `~/google-earth`).

For other issues, see the [Ubuntu help pages on Google Earth](#).

## Uninstall Google Earth

To uninstall run the `uninstall` shell script located in the `/home/user/google-earth` folder (or whichever folder you installed `google-earth` into).

## FBReader (e-book reader)

[FBReader](#) is a free cross-platform e-book reader, based on the GTK platform. Install:

```
sudo apt-get install fbreader
```

## Calibre (e-book reader)

[Calibre](#) is an e-book reader and library manager. See [these installation instructions](#).

# Games

There are some phenomenal games for (K)Ubuntu Linux.

- [Ubuntu Gamers Arena](#) and [Ubuntu Gamer](#).
- [Best Linux Games for 2008](#).
- [Best 25 Linux Games of 2007](#).

There are hundreds of free, open-source games available in (K)Ubuntu. Most (including the [KDE Games](#) collection and the [Gnome Games](#) collection) can be accessed through the Games section of your [Package Manager](#).

Examples are:

- [PouetChess](#) -- an excellent 3-D chess game.
- [PokerTH](#) -- a very nice Texas Hold 'Em Poker
- [Kajongg](#) -- a real MahJongg game, for humans and/or robots.
- [Planet Penguin Racer](#) -- Penguin slides down a 3-D luge run, catching fish. ([Extreme Tux Racer](#) is a newer version, but works in 32-bit only.)
- [KsirK](#) -- play Risk against the computer or in a multiplayer environment.
- [TORCS](#) -- the 3-D Car Racing game
- [Pingus](#) -- a Lemmings clone (similar to Super Mario Bros.) that uses penguins instead of lemmings.
- [Frozen Bubble](#) -- the award-winning, addicting, time-wasting, bubble-popping game.
- [Frets on Fire](#) -- similar to Guitar Hero. You can [import songs from Guitar Hero](#) and from [community sites](#).
- [Scorched3d](#) -- turn-based artillery game in a 3D rendered landscape
- [Pyscrabble](#) (and pyscrabble-server) -- online Scrabble game and server. (Also see [Lexulous](#) and the [Internet Scrabble Club](#) for browser-based online games similar to Scrabble.)

## Wing Commander Privateer

The Linux version of this [free version of Wing Commander](#) can be downloaded as a binary [here](#).

## Vdrift

[Vdrift](#) is a free open source 3-D racing game, similar to Need for Speed, with realistic physics, multiple drift tracks, and multiplayer games. Support for joysticks, mice and keyboard is included. A binary package for Linux is available from the website.

## Action

Incredible action games (including those from the Top 25) are available in Ubuntu. Many can be installed using:

Menu -> Applications -> Ubuntu Software Center -> Games

Examples are:

- [Alien Arena](#) -- a multi-player first person shooter action game with free servers. (Package: alien-arena) (Server: alien-arena-server)
- [OpenArena](#) -- an open-source multi-player first person shooter action game, with free servers. (Package: openarena) (Server: openarena-server)
- [Tremulous](#) -- a Halo-like multiplayer first person shooter action game. The repositories have the current version. (Package: tremulous) (Server: tremulous-server)
- [Sauerbraten](#) - a multiplayer graphics-rich first person shooter game evolved from Cube. (Package: sauerbraten) (Server: sauerbraten-server)
- [Nexuiz](#) -- an open-source multi-player first person shooter game with free servers and tournaments. (Package: nexuiz) (Server: nexuiz-server) A 35 map add-on community pack is also available [here](#). To install it, extract the map pack to `/home/username/.nexuiz/data` (or `~/nexuiz/data`).

Note: Many of these games require advanced [graphics](#). Make sure you have the necessary hardware drivers activated.

## UrbanTerror

[UrbanTerror](#) is a multiplayer first person shooter action game (with an integrated server). It uses the open-source quake 3 engine and features many real weapons and free-to-use servers for multi-player functionality. "Not recommended for adolescents in Germany." Download and install the binary using [these instructions](#).

## Doom

Skulltag, [ZDoom](#), and PrBoom (Freedom) are versions of Doom2. For Doom3, see [Doom3 on Ubuntu](#).

## Skulltag

[Skulltag](#) is an updated version of [ZDoom](#) that includes network play. See the [website](#) for simple (K)Ubuntu installation instructions. (You can use the Freedom Iwad (see below) if you don't have an original Doom2.wad.) Note: Most of the modules require dependencies from the Universe repositories. Make sure you

have the Universe [repositories](#) enabled (Synaptic Package Manager -> Settings -> Repositories -> Edit Software Sources -> Community-maintained Open Source software (universe) -> (ticked)).

- Install prerequisites:

```
sudo apt-get install timidity timidity-interfaces-extra
```

- Then add the skulltag repositories, update, and install Skulltag and DoomSeeker (the Skulltag online server utility):

```
echo "deb http://skulltag.net/download/files/release/deb/ jaunty multiverse" | sudo tee /etc/ap
sudo apt-get update
sudo apt-get install skulltag doomseeker-skulltag
```

- If you don't have a doom2.wad, tnt.wad, or plutonia.wad already, you can copy the freedoom.wad to your ~/.skulltag folder:

```
cd ~/.skulltag
wget http://mirror.cinquix.com/pub/savannah/freedoom/freedoom-iwad/freedoom-iwad-0.6.4.zip
unzip freedoom-iwad-0.6.4.zip
cp freedoom*/doom2.wad .
rm freedoom-iwad-0.6.4.zip
```

- If you need more help (regarding the Skulltag-server, firewalls, and port forwarding with Skulltag, for example), see these [additional tips](#).
- Skulltag runs on any platform, with any graphics, and on almost any computer. There are thousands of add-ons, maps, and gameplay modes, giving a nearly endless variety of gameplay. The interface makes obtaining and playing the modifications very easy. This is my favorite game of all time (and I have been playing it for years).

## PrBoom

[PrBoom](#) is a free open source port of the original first person shooter action game, [Doom2](#). It does not have the advanced options of ZDoom. Freedom is a free Iwad (set of maps) to replace the original Doom2.wad.

```
sudo apt-get install prboom freedoom timidity timidity-interfaces-extra
```

There are [thousands of extra maps \(Wads\)](#) available for this game. It is easiest to keep a directory for your wads in your home directory:

```
mkdir /home/user/wads
```

or alternatively, use the /usr/share/games/doom folder, giving universal privileges to the folder:

```
chmod -R 777 /usr/share/games/doom
```

Place your doom2.wad, tnt.wad, or plutonia.wad (from your original game) into this folder. If you don't have one, you can copy the Freedom version of doom2.wad from /usr/share/games/freedom into this folder. Place any new .wad's you have downloaded from the Internet into this folder as well. Then run the game using both the original iwad map as well as your new .wad map (you will only see the new map).

```
prboom -iwad /home/user/wads/doom2.wad -file /home/user/wads/new_wad.wad
```

Note: Only doom2.wad, tnt.wad, or plutonia.wad can be used as an iwad. You must have one of these in addition to any new wad you wish to use. When in doubt, use doom2.wad.

Note: this game can also be installed using Menu -> Applications -> Ubuntu Software Center -> Games as Freedom, but you must also install timidity and timidity-interfaces-extra.

## MMORPG

### Spring

[The Spring Project](#) is a scripting engine platform to develop and play free multiplayer games such as [Star Wars Imperial Winter](#) and [Complete Annihilation](#). Install:

```
sudo apt-get install spring
```

### Regnum Online

[Regnum Online MMPORG](#) -- see basic [installation instructions](#) and the [help forum](#) as needed.

### PlaneShift

[PlaneShift](#) is a free full-immersion online fantasy game (MMPORG). Client downloads and patches are available [here](#).

- Make the downloaded binary installation file executable:

```
cd /directory_where_downloaded
chmod +x PlaneShift-v0.5.4-x64.bin
```

- Run the executable binary as root (this must be done from the command line Terminal):

```
sudo ./PlaneShift-v0.5.4-x64.bin
```

- Follow the instructions for installation. When prompted whether to manually set permissions, answer "no."
- During installation, most users have recommended installing this game to your /home directory as a single user installation, instead of to /opt for all users. This avoids permissions problems. I was able to install to /opt, but it takes some effort.
- Make sure your user belongs to the games group:

Menu -> System -> Administration -> Users and Groups -> *user* -> Manage Groups -> *games* -> Properties -> Group Members -> *user (ticked)* -> OK

- Register for a free account at [PlaneShift Registration](#).
- If you installed the game to the menu, it will be in

Menu -> Applications -> Lost & Found -> Client and Setup

To run it from the menu, I had to edit the menu entries by checking the box: "Run in terminal." Alternatively, run it from the command-line Terminal:

```
sudo /opt/PlaneShift/pssetup
sudo /opt/PlaneShift/psclient
```

Notes: This game ran very slowly for me on a 32-bit installation with a DSL connection and I gave up. The 64-bit installation worked better.

## Dolphin (Wii emulator)

The [Dolphin emulator](#) is an open-source cross-platform Wii emulator that allows many Wii game disks to be run on many operating systems. (Whether the Wii Netflix disk will run under the Dolphin emulator has not yet been established.) (The Dolphin-emulator has no relationship to the KDE Dolphin file manager). Installation instructions are [here](#).

# Internet Applications

Internet applications enable you to make full use of your Internet connection. Web browsers, Email clients, Instant Messengers, and more are included in this category.

## Web Browsers

### Mozilla Firefox

[Mozilla Firefox](#) is the ubiquitous web browser. Based on open source components, it is trademarked and cannot be altered or re-distributed with any change that involves the name or trademarks. Install the current version:

```
sudo apt-get install firefox
```

### Firefox Plug-ins

#### Adblock Plus plug-in (block ads in a web page)

[Adblock Plus](#) blocks ads that appear in web pages. You can subscribe to a free filter service, and can add ads to block with a single click.

```
sudo apt-get install xul-ext-adblock-plus
```

- You can also add this extension from Firefox -> Tools -> Add-ons -> Get Add-ons -> Search All Add-ons -> Adblock Plus. (This method will also ensure that automatic updates are installed by Firefox.)

#### Noscript plug-in (controls scripts)

The [Noscript](#) plugin is considered one of the most important security measures for browsing the Internet. Most viruses and trojans gain access to computers from the Internet through scripts. This plugin allows you to choose which scripts to allow and blocks the rest.

- Add this extension from Firefox -> Tools -> Add-ons -> Get Add-ons -> Search All Add-ons -> Noscript. (This method will also ensure that automatic updates are installed by Firefox.)

### RefreshBlocker plug-in (prevents redirects)

[RefreshBlocker](#) allows the user to decide which websites (and pages) will be allowed to redirect (based on META tags within the webpage). Although Firefox (as of version 3.5) blocks all directs by default, the behavior is not customizable; it is therefore preferable to turn off the Firefox redirect control and use RefreshBlocker instead.

- Add this extension from Firefox -> Tools -> Add-ons -> Get Add-ons -> Search All Add-ons -> RefreshBlocker. (This method will also ensure that automatic updates are installed by Firefox.)
- Turn off the Firefox automatic redirect blocker:

Firefox -> Enter *about:config* in the browser location bar -> *right-click* on "accessibility:blockautorefresh" -> **Toggle** to change the value from *true* to *false*

### User Agent Switcher plug-in for Firefox

The [User Agent Switcher](#) plugin allows a browser to masquerade as another browser, allowing (most of the time) browser-specific content to be displayed.

- You can add this extension from Firefox -> Tools -> Add-ons -> Get Add-ons -> Search All Add-ons -> User Agent Switcher. (This method will also ensure that automatic updates are installed by Firefox.)

### Video DownloadHelper plug-in for Firefox

The [Video DownloadHelper](#) plugin allows the download of videos (including Flash videos) from sites like YouTube.

- You can add this extension from Firefox -> Tools -> Add-ons -> Get Add-ons -> Search All Add-ons -> Video DownloadHelper. (This method will also ensure that automatic updates are installed by Firefox.)

### Unplug Download Management

The [UnPlug](#) add-on lets you save video and audio which is embedded on a webpage.

- You can add this extension from Firefox -> Tools -> Add-ons -> Get Add-ons -> Browse All Add-ons. (This method will also ensure that automatic updates are installed by Firefox.)

### Lucifox (eBook reader extension)

[Lucifox](#) (Lucidor for Firefox) enables e-books to be read and e-book catalogs to be browsed in a Firefox window.

- To install, go to the website and click "Download Now."

### Java Runtime Environment (JRE) for Firefox plug-in

This package also installs the Java Runtime Environment. (JRE is also installed when OpenOffice or [ubuntu-restricted-extras](#) is installed.)

```
sudo apt-get install sun-java6-jre sun-java6-plugin
```

Note: You must accept the license to use this product.

### Adobe Acrobat Reader for Firefox Plug-in

This plugin allows you to view Adobe Acrobat (PDF) files within the Firefox browser.

- Read [Add Extra Kubuntu Repositories](#) and enable the Natty partner repository:

```
deb http://archive.canonical.com/ubuntu natty partner
```

then install Adobe Reader:

```
sudo apt-get install acroread
```

- Alternatively, this plugin is also available from the Medibuntu repository. Add the Medibuntu repository to your [repository list](#):

```
deb http://packages.medibuntu.org/ natty free non-free
```

then install:

```
sudo apt-get install acroread mozilla-acroread acroread-plugins acroread-fonts
```

### Adobe Flash Player for Firefox Plug-in

To install the official Adobe Flash plugin (Flash 10) for Firefox:

```
sudo apt-get install adobe-flashplugin
```

### Gnash Plug-in (Open source Flash Player replacement)

[Gnash](#) is available in a 64-bit version as well as a 32-bit version. It is the open source replacement for Adobe Flashplayer.

```
sudo apt-get install gnash
```

After installing, change your web browser's Preferences -> Applications so that SWF and SPL files use Gnash.

### VLC plug-in for Firefox

This package allows the popular VLC player to play media within the Firefox browser.

```
sudo apt-get install mozilla-plugin-vlc
```

### Gecko MediaPlayer Plug-in for Firefox

[Gecko MediaPlayer](#) is a browser plugin for all Gecko-based browsers (Firefox, SeaMonkey, IceApe, Opera) that allows Mplayer to play multimedia within the browser. Install:

```
sudo apt-get install gecko-mediaplayer
```

An alternative is to use the mplayer plugin for Firefox. Install:

```
sudo apt-get install mozilla-mplayer
```

### Kaffeine Plug-in for Firefox

This package allows the Kaffeine media player (often used in KDE-based desktops) to play multimedia within the Firefox browser.

```
sudo apt-get install kaffeine-mozilla
```

### Helix player plug-in for Firefox

This package installs the [Helix player](#) (the open source player that plays Real Player content in Linux) as well as the plugin that plays RealMedia within the Firefox browser.

```
sudo apt-get install mozilla-helix-player
```

### Moonlight plugin for Firefox

[Moonlight](#) is part of the Novell Mono project that is an open source implementation of Silverlight (the Microsoft multimedia presentation platform). It is based on FFMpeg. It is made to work best with the Firefox 3 web browser, as a plugin (but also works with other mozilla browsers). Version 2.3 is available as a plugin for mozilla-based browsers:

```
sudo apt-get install moonlight-plugin-mozilla
```

The stable version 2.4 is available [here](#). The Moonlight 3.99 plugin (compatible with most Silverlight 3/4 content) [is here](#).

- Netflix under Moonlight

Netflix streaming requires both the capabilities of Silverlight 2.0 and Digital Rights Management modules. Although the current version of Moonlight 2.0 will run most Silverlight content (including Netflix content), Netflix has not yet released Digital Rights Management modules for Linux. Please contact [Netflix](#) directly for further information or [sign a petition](#).

### FireFTP for Firefox

[FireFTP](#) is a Firefox extension for FTP transfers.

### Firefox Widgets

### Turn off browser bar drop-down list in Firefox

This is the most frequently asked problem regarding Firefox. To [turn off the location browser bar drop-down list](#) (and therefore not show your browsing history):

Firefox -> about:config (in the location browser bar) -> browser.urlbar.maxRichResults -> *right-click*  
-> Modify -> set value to 0

### IceCat

[IceCat](#) is Firefox distributed without the Mozilla trademark restrictions. It is endorsed by the Debian project (on which Ubuntu is based). It is formerly known as IceWeasel and is also known as IceApe Browser. Install the current version:

```
sudo apt-get install iceape-browser
```

## SeaMonkey

[SeaMonkey](#) is an open-source integrated internet application suite (including web browser, IM (IRC) client, Email client, RSS/News reader, and web development tools). It is based on the same components as the Mozilla products and shares the trademark and branding restrictions. There are many [plugins](#), similar to those for Thunderbird and Firefox. Install:

```
sudo apt-get install seamonkey
```

## IceApe

[IceApe](#) is an open-source integrated internet application suite (including web browser, IM (IRC) client, Email client, RSS/News reader, and web development tools). It is based on the same components as the Mozilla product SeaMonkey, but has no restrictive trademark licensing, and is endorsed by the Debian project (on which Ubuntu is based). Install the current version:

```
sudo apt-get install iceape
```

## Opera

[Opera](#) is a proprietary browser and internet suite (currently free on PCs) also used in some mobile devices and gaming consoles. It includes email, an address book, IRC chat, integrated BitTorrent, and webfeeds. A limited number of plugins are also available.

```
sudo apt-get install opera
```

## Chromium

[Chromium](#) is the open-source browser on which the Google Chrome browser is based. Install:

```
sudo apt-get install chromium-browser
```

- Start Chromium:

Menu -> Applications -> Internet -> Chromium Web Browser

## Google Chrome

[Google Chrome](#) is Google's web browser. Based on the [Chromium](#) browser, Google adds the Google name

and logo, an auto-updater system called GoogleUpdate, RLZ, and other Google add-ons. Download and install it [here](#).

## Download Managers

### MultiGet

[MultiGet](#) is a GTK-based free-standing download manager utility.

```
sudo apt-get install multiget
```

### Usenet Clients

#### Pan

[Pan](#) is a Gnome-based [Usenet](#) reader and [nzb](#) binary downloader. Install:

```
sudo apt-get install pan
```

#### Kwooty

[Kwooty](#) is a [Usenet](#) reader and [nzb](#) binary downloader for KDE4. Installation instructions from source or PPA repositories are at the website.

## Email Clients

### Evolution

[Evolution](#) is the default Gnome-based email client in Ubuntu. If not installed:

```
sudo apt-get install evolution
```

## Evolution and PGP

Email messages can be encrypted in [PGP](#) and sent by email using Evolution. See [this tutorial](#) for an example how to configure it.

## Thunderbird

[Mozilla Thunderbird](#) is a licensed and trademarked free open-source email client that is compatible with Firefox. Install:

```
sudo apt-get install thunderbird
```

## Lightning calendar extension

[Lightning](#) is the calendar extension for Thunderbird (with functionality similar to the stand-alone application [Sunbird](#)). It is currently available in a 32-bit version only. (If using a 64-bit OS, install the [Sunbird](#) calendar client instead.) Install by clicking on the Linux download at the website.

## Enigmail

[Enigmail](#) is an add-on to Thunderbird that allows you to easily encrypt your email using [OpenPGP](#), which is included in the kernel by default. It also allows you to create and manage the encryption keys. Install:

```
sudo apt-get install enigmail
```

- Also see [these tips](#) for instructions on setting up e-mail with PGP encryption.

## New Mail Icon for Thunderbird

["New Mail Icon"](#) is an experimental tray add-on which notifies you of new mail. Download from the website. Install:

Thunderbird -> Tools -> Add-ons -> Install -> select downloaded file

## KMail

[KMail](#) (Kontakt Mail) is the default email client included with [Kontakt](#) in KDE (Kubuntu). Kontakt includes email, an address book, a calendar, reminders, pop-up notes, a link to the Akregator News/RSS reader, time-tracking, and more. Install:

```
sudo apt-get install kontakt
```

## Newsreaders

### Akregator

[Akregator](#) is the default news/[RSS](#) reader included with Kubuntu (KDE). Usage instructions are found in the [Handbook](#). Install:

```
sudo apt-get install akregator
```

### RSSOwl

[RSSOwl](#) is a Java-based [RSS](#) | RDF | Atom Newsfeed Reader.

Install java and in order to use the internal browser, install the packages xulrunner and firefox:

```
sudo apt-get install sun-java6-jre firefox xulrunner
```

Change to your "opt" directory:

```
cd /opt
```

Download the zip-archive into your opt directory:

```
sudo wget http://downloads.sourceforge.net/rssowl/rssowl-2.0.6.linux.zip
```

Extract the archive and remove the extracted file:

```
sudo unzip ./rssowl-2.0.6.linux.zip && sudo rm ./rssowl-2.0.6.linux.zip
```

Make a startscript:

```
sudo gedit /usr/bin/runRSSOwl.sh
```

add the following lines to your startscript file `/usr/bin/runRSSOwl.sh` and save it afterwards.

```
#!/bin/bash
cd /opt/rssowl
./RSSOwl
```

Make the startscript executable:

```
sudo chmod u+x /usr/bin/runRSSOwl.sh
```

To start RSSOwl:

```
runRSSOwl.sh
```

## Instant Messengers

### Empathy

[Empathy](#) is an open source IM application. It is the default in the Ubuntu (Gnome) desktop. You can access multiple services with it. If not already installed, you can install it:

```
sudo apt-get install empathy
```

### Pidgin

[Pidgin](#) is an open source IM application. It is the previous default in the Ubuntu (Gnome) desktop. You can access multiple services with it.

```
sudo apt-get install pidgin
```

### Kopete

[Kopete](#) is the default Instant Messenger application for Kubuntu. You can access multiple services with it. Install:

```
sudo apt-get install kopete
```

### Kopete Styles

Additional [styles for Kopete](#) are available from KDE-look. Install from:

Kopete -> Settings -> Configure -> Chat Window -> Style -> Get New...

## GoogleTalk on Kopete

[Kopete](#) can be configured to work with [GoogleTalk](#) Instant Messaging (but not VOIP) using the Jabber protocol. See these [GoogleTalk instructions](#).

## Konversation (IRC client)

[Konversation](#) is the default Kubuntu Internet Relay Chat (IRC) client. It functions similar to the venerable mIRC. "A little less action and a little more Konversation." -- Elves Install:

```
sudo apt-get install konversation
```

## aMSN

aMSN is an MSN Messenger utility that functions like the original client. It is alternative to [Pidgin](#) for MSN users. Install it:

```
sudo apt-get install amsn
```

To enable Drag-and-Drop capabilities to aMSN for easy file transfer see [Ubuntu Geek](#).

## Emesene

[Emesene](#) is an MSN messenger client that uses a simplified interface similar to the original client. It is alternative to [Pidgin](#) for MSN users. Install it:

```
sudo apt-get install emesene
```

## FTP Clients

You might wish to use a dedicated [FTP](#) client instead of the one in your browser.

## Filezilla

[Filezilla](#) is the ubiquitous free open-source FTP client and server for all platforms.

```
sudo apt-get install filezilla
```

## Filesharing / P2P

Do not share copyrighted material or content that is otherwise illegal to share.

### Transmission (BitTorrent Client)

Transmission is the GTK-based default [BitTorrent](#) client in Ubuntu (Gnome).

```
sudo apt-get install transmission
```

### KTorrent

[KTorrent](#) is the default BitTorrent client in Kubuntu. Install:

```
sudo apt-get install ktorrent
```

Be sure to have your firewall ports open (by default 6881 and 4444).

### Azureus

[Azureus](#) is a Java-based BitTorrent client.

```
sudo apt-get install azureus
```

### QTorrent

QTorrent is a PyQT-based BitTorrent Client that is supposed to be very fast.

[QTorrent](#)

### Apollon (P2P Filesharing)

[Apollon](#) is an older BitTorrent client oriented towards KDE. It uses plugins for compatibility with multiple networks.

```
sudo apt-get install apollon gift
```

## MLDonkey (P2P eMule/eDonkey2000)

MLDonkey is a P2P file sharing program (and network) that is able to use different network protocols. To install the MLDonkey core server, follow [these instructions](#).

### MLDonkey GUI frontends

- Install the Gnome GUI frontend for MLDonkey:

```
sudo apt-get install mldonkey-gui
```

- Another GUI is called [Sancho](#).
- [KMLDonkey](#) is the KDE (Kubuntu) frontend for [MLDonkey](#).

```
sudo apt-get install kmlonkey
```

# Videoconferencing and VOIP

Videoconferencing and voice over Internet (VOIP) applications are merging into integrated applications. Most of these applications now allow placing calls to non-Internet based telephones for a small fee.

## Ekiga

Formerly known as Gnomemeeting, [Ekiga](#) is a SIP compliant fully functional open source integrated VOIP and videoconferencing program.

```
sudo apt-get install ekiga
```

## Skype

[Skype](#) is a proprietary integrated VOIP and video conferencing program similar to Ekiga. Also see instructions on [how to record Skype conversations](#).

- Install pre-requisites:

```
sudo apt-get install libqt4-dbus libqt4-network libqt4-xml
```

- To get the most recent version, download and install the 32-bit version:

```
wget -O skype-ubuntu-current_i386.deb http://www.skype.com/go/getskype-linux-beta-ubuntu-32
sudo dpkg -i skype-ubuntu-current_i386.deb
sudo rm skype-ubuntu-current_i386.deb
```

- In the past, some users have noted that they cannot get their microphone inputs to work with any version later than 2.1.0.47. They installed:

```
wget -O skype-ubuntu-current_i386.deb http://download.skype.com/linux/skype-debian_2.1.0.47-1_i
sudo dpkg -i skype-ubuntu-current_i386.deb
sudo rm skype-ubuntu-current_i386.deb
```

or

```
wget -O skype-ubuntu-current_amd64.deb http://download.skype.com/linux/skype-ubuntu-intrepid_2.
sudo dpkg -i skype-ubuntu-current_amd64.deb
sudo rm skype-ubuntu-current_amd64.deb
```

### How to install Skype on a 64-bit system

The current version of Skype for 64-bit systems is a masqueraded 32-bit module. To use on a 64-bit system you might still need to install the needed packages:

```
sudo apt-get install ia32-libs lib32asound2 libqt4-core libqt4-gui
```

- Then download and install the current Skype .deb package from the Skype website:

```
wget -O skype_ubuntu-current_amd64.deb http://www.skype.com/go/gets skype-linux-beta-ubuntu-64
sudo dpkg -i skype-ubuntu-current_amd64.deb
sudo rm skype-ubuntu-current_amd64.deb
```

- If the 64-bit version doesn't work for you, use the 32-bit version:

```
wget -O skype-ubuntu-current_i386.deb http://www.skype.com/go/gets skype-linux-beta-ubuntu-32
sudo dpkg -i --force-architecture skype-ubuntu-current_i386.deb
sudo rm skype-ubuntu-current_i386.deb
```

### Installing Skype repository

It is possible to install Skype by adding the repository and installing from there. This has an advantage of maintaining updates automatically.

- Install the repository security key. (This requires an open port 11371 in your firewall for the keyserver.)

```
sudo apt-key adv --keyserver pgp.mit.edu --recv-keys 0xd66b746e
```

- Add the Skype repository, update, and install Skype:

```
echo "deb http://download.skype.com/linux/repos/debian/ stable non-free" | sudo tee -a /etc/apt/sources.list
sudo apt-get update
sudo apt-get install skype
```

## Wengophone

[Wengophone](#) is an integrated VOIP and videoconferencing client available on many platforms. Wengophone was initially an open-source GPL-licensed package ('Wengophone Classic'). Both the Classic version (available as a .deb file) and the current proprietary binary version are available from the website. Wengophone Classic has now been rebranded as [QuteCom](#), however. To install the current version as an Ubuntu/Kubuntu package, see [these instructions](#).

- Download and install the older Wengophone Classic version (.deb package):

```
wget http://download.wengo.com/wengophone/rc/wengophone-0.958m-1.i386.deb
dpkg -i --force-architecture wengophone-0.958m-1.i386.deb
```

## Gizmo5

[Gizmo5](#) is an Internet soft-phone application, similar to Skype, that uses the SIP protocol. Install (.deb package):

```
wget http://download.gizmo5.com/GizmoDownload/gizmo-project_3.1.0.79_libstc++6_i386.deb
dpkg -i --force-architecture gizmo-project_3.1.0.79_libstc++6_i386.deb
```

## Asterisk VOIP PBX system

[Asterisk](#) is an enterprise-grade, free open source PBX and telephony system for VOIP.

```
sudo apt-get install asterisk
```

## Kiax

[Kiax](#) is an [LGPL](#)-licensed open source IAX (Inter-Asterisk eXchange) application. It is used for making VoIP calls from an Asterisk PBX. The current version must be installed from source files. See the website for download and installation instructions, or see [this Ubuntu Launchpad site](#).

## OpenSIPS / OpenSER (SIP server)

[OpenSIPS](#) is an open-source [SIP](#) server that allows connections to be made through the Internet for [VoIP](#), [IM](#), and other communications protocols. While there are many public SIP servers, these are subject to [spoofing](#) and other "impersonation" problems. A company may wish to host its own SIP server to avoid the problems inherent in public services whose trustworthiness can not be determined. OpenSIPS is the successor to [OpenSER](#) (which is the version in the repositories). Install OpenSER 1.3.2 from the repositories:

```
sudo apt-get install openser
```

Alternately, the newest version of OpenSIPS can be downloaded as a .deb package from the website and installed. Installation and usage instructions are on the website.

## Web meetings

Web meeting software allows video conferencing among many clients, with one server as host.

### BigBlueButton

[BigBlueButton](#) is a free open source chat/video/audio and desktop sharing platform similar to GoToMeeting, WebEx, DimDim and similar products. Developed by GoogleCode, it utilises all open-source modules. A [Moodle plugin](#) is also available. See these [installation instructions](#) and these [additional detailed instructions](#).

### WebHuddle

[WebHuddle](#) is a free, open source Java-based browser client (and server) for web meetings. To install the server, first install pre-requisites, including Java, JBOSS Application Server, and xvfb.

```
sudo apt-get sun-java6-jre jbossas4 xvfb
```

For more details on setting this up in (K)Ubuntu, see [this](#).

# Privacy

## PGP (Message Encryption)

[PGP](#) (OpenPGP and [GnuPGP](#)) is a tool to encrypt your messages (such as email) to be unlocked only by someone who has a key to unlock it.

### Seahorse

[Seahorse](#) is the GUI for Gnome to manage the key pairs and other options of [GnuPGP](#). It can also manage your [SSH](#) keys. For more info see [this tutorial](#). Run:

Menu -> Applications -> Accessories --> Passwords and Encryption Keys

## Tor (Network Privacy)

[Tor](#) is a project to allow privacy while using the Internet and limit usage tracking (by masking your IP address).

- You will also need to install privoxy:

```
sudo apt-get install privoxy
```

- Install Tor by following the instructions [here](#). Note that the instructions require port 11371 on your firewall to be open to use the gpg keyserver (and download the key for the debian package). Then see the [Tor installation guide](#) for further details.
- Edit configuration files.

Edit the privoxy configuration file:

```
sudo nano /etc/privoxy/config
```

Add the line

```
forward-socks4a / localhost:9050 .
```

restart Privoxy:

```
sudo /etc/init.d/privoxy restart
```

Edit the Tor configuration file:

```
sudo nano /etc/tor/torrc
```

Add the line

```
ControlPort 9051
```

Comment out the line by adding a # at the beginning, so it looks like:

```
#RunAsDaemon 1  
RunAsDaemon 0
```

(This prevents the Tor daemon from automatically starting at bootup.)

restart Tor

```
sudo /etc/init.d/tor restart
```

### Tor GUIs

There are two main GUIs for Tor.

- [Vidalia](#) is a cross-platform Qt-based GUI for Tor. See [these instructions](#) to install it.
- [TorK](#) is the KDE interface, used in Kubuntu, but which can run in Ubuntu (Gnome) as well.

```
sudo apt-get install tork
```

In addition, a [Torbutton](#) is available for Firefox, which toggles Tor usage. Install as a Firefox add-on or:

```
sudo apt-get install torbutton-extension
```

# Proprietary Extras

Proprietary software helps you maximize your Internet experience, but is not open source. The software available includes Multimedia Codecs, Java Runtime Environment, and plug-ins for Firefox.

## Restricted Extras

The Ubuntu Restricted Extras will install Adobe Flash Player, Java Runtime Environment (JRE) (sun-java-jre) with Firefox plug-ins (icedtea), a set of Microsoft Fonts (msttcorefonts), multimedia codecs (w32codecs or w64codecs), mp3-compatible encoding (lame), FFMpeg, extra Gstreamer codecs, the package for DVD decoding (libdvdread4, but [see below](#) for info on libdvdcss2), the unrar archiver, odbc, and cabextract. It also installs multiple "stripped" codecs and avutils (libavcodec-unstripped-52 and libavutil-unstripped-49). This is a single command approach.

```
sudo apt-get install ubuntu-restricted-extras
```

Note: Installation only works completely and properly when done from the command-line Terminal. The entire package will not usually install completely from within a Package Manager.

# Photos and Graphics

Manage and edit your photos, create stunning 3D drawings and graphics, or convert between formats.

## GIMP (Image Manipulator)

[Gimp](#) is a powerful, full-featured, free open-source graphics and image editor, similar to Adobe Photoshop.

```
sudo apt-get install gimp
```

There is an extra set of brushes, palettes, and gradients for The GIMP.

```
sudo apt-get install gimp-data-extras
```

## Dia (Diagram editor)

[Dia](#) is a free open source GTK-based diagram creation program for Gnome. It is similar to Visio.

```
sudo apt-get install dia
```

## Kivio (Diagram editor)

[Kivio](#) is an open source flow-chart and diagram creation program that is part of the KOffice Suite for KDE. It supports Dia stencils.

```
sudo apt-get install kivio
```

## Inkscape Vector Illustrator

[Inkscape Vector Illustrator](#) is an open source drawing program similar to Illustrator and CorelDraw.

```
sudo apt-get install inkscape
```

## Digikam (Photo Organiser)

[Digikam](#) is a comprehensive open source digital photo organiser and editor. Install it:

```
sudo apt-get install digikam kipi-plugins digikam-doc
```

## F-spot (Photo Organiser)

[F-spot](#) is a comprehensive open source digital photo organiser and editor for the Gnome desktop. Install it:

```
sudo apt-get install f-spot
```

## Google Picasa (Photo Organiser)

[Google Picasa](#) is a photo editor and organiser similar to Digikam. It allows uploads to a Google web server for online exchange. For more info, see the [Picasa for Linux FAQ](#). A self-installing .deb file is available at [Picasa 2.7 downloads](#).

## Shotwell (Photo Organiser)

[Shotwell](#) is a new photo organiser for the Gnome desktop. See [these installation instructions](#).

## Tesseract (Optical Character Reader)

[Tesseract](#) is a command-line optical character reader. Install:

```
sudo apt-get install tesseract-ocr
```

[Ocropus](#) is a document-analysis engine that uses Tesseract. Install:

```
sudo apt-get install ocropus
```

## Cuneiform (Optical Character Reader)

[Cuneiform](#) is an optical character reader. Install (multiverse [repositories](#) must be enabled):

```
sudo apt-get install cuneiform
```

◇ [Pdfocr](#) is a tool to use Cuneiform for OCR and then to add the resulting text file layer back to the PDF file to make it searchable.

## **Xsane (Scanning utility)**

[Xsane](#) is a full-featured scanning utility. Install:

```
sudo apt-get install xsane
```

## **Gnome-Scan (Scanning Utility)**

[Gnome-Scan](#) is a simple utility for scanning (still in alpha stage). Install:

```
sudo apt-get install gnomescan
```

## **Gwenview (Image Manipulator)**

[Gwenview](#) is the quick image manipulator installed by default in Kubuntu (K menu -> Graphics -> Gwenview Image Viewer). Simple cut-and-paste, resizing, and format conversion are some of the graphics files manipulations that can be accomplished. Install:

```
sudo apt-get install gwenview
```

## **OpenClipart (ClipArt Library)**

[OpenClipart](#) is a utility to provide access to a large library of free clipart. It includes a utility for OpenOffice Gallery. Install:

```
sudo apt-get install openclipart
```

# Screencasts and Desktop Recording

Several utilities allow you to capture your desktop (and then create a [screencast](#) from it).

## recordMyDesktop (Desktop Session Recording)

[recordMyDesktop](#) is a desktop recording utility, which has both pyGTK and a pyQT4 GUI frontends available. Recordings are saved in Theora video/Vorbis audio files. Only the Gtk version is available from the repositories (but it works well with KDE/Kubuntu nevertheless). To install with the gtk GUI:

```
sudo apt-get install gtk-recordmydesktop
```

### Using recordMyDesktop with PulseAudio

- If you have not installed Pulse Audio Controls and Volume utility, they are useful for monitoring your pulse audio devices:

```
sudo apt-get install pavucontrol paprefs padevchooser
```

- Change the recordMyDesktop settings so that the capture device is the one you select through pulse audio:

```
gtk-recordMyDesktop -> Sound Quality (ticked) -> Advanced -> Sound -> Device: pulse
```

This sets recordMyDesktop to use whichever input device(s) are selected through pulse audio. If you have several input devices, all of them will be recorded. This is an easy way to mix inputs.

## Istanbul (Desktop Session Recording)

[Istanbul](#) is a desktop recorder for the Gnome desktop. It records your session into an OGG Theora video file.

```
sudo apt-get install istanbul
```

## xvidcap (Desktop Session Recording)

[xvidcap](#) is a utility to capture your desktop as a video. Install:

```
sudo apt-get install xvidcap
```

## WebCamStudio

[WebCamStudio](#) creates a virtual webcam that can mix several video sources together and can be used for live broadcasting. See the website for installation instructions.

## Wink (Presentation Editor)

[Wink](#) is a open source tutorial and presentation editor. It allows you to capture screenshots and use them for presentations.

```
sudo apt-get install wink
```

## Camorama (Web Cam)

[Camorama](#) is a simple GTK-based (i.e. Gnome-based) interface for webcams using the v4l (video for linux) drivers.

```
sudo apt-get install camorama
```

## Freeseer (Presentation capture)

[Freeseer](#) is a utility to capture output from a projector or other display device (including another computer). See [these installation instructions](#).

## ScreenCast Demos

- See this [ScreenCast](#) section.

## rtmpdump (Capture streaming video)

[Rtmpdump](#) allows the capture of many types of streaming video. Current installation instructions are at the website.

- Here are old installation instructions:

```
sudo apt-get install build-essential checkinstall libssl-dev
wget http://rtmpdump.mplayerhq.hu/download/rtmpdump-2.3.tgz
tar xvf rtmpdump-2.3.tgz
cd rtmpdump-2.3
```

```
make SYS=posix
sudo checkinstall
sudo ldconfig
```

When prompted during installation, name the package *rtmpdump*.

# Video Applications

Capture, record, edit, and convert video using these applications. Also see [this list](#) of open source video applications. Trivia: The movie [Avatar](#) was created at Weta Digital on a super-computer comprised of 4,000 servers running Kubuntu Linux, co-ordinated by the open-source [Sun Grid Engine](#).

## OpenShot

[OpenShot](#) is a GTK-based non-linear video editing suite for Linux. Install:

```
sudo apt-get install openshot
```

## PiTiVi (Non-linear Video Editing Suite)

[PiTiVi](#) is a simple, limited-capability open source video editor that will be the default in newer versions of Ubuntu. It uses the GStreamer/Fluendo framework. Install:

```
sudo apt-get install pitivi
```

## Avidemux (Video editor/processor)

[Avidemux](#) is a free, GPL-licensed open source cross-platform video editor and processor. Using mencoder as a backend, it allows cropping, trimming, special effects, and conversions between many filetypes (MPG/DVD, AVI, MP4, ASF). Install the GTK-based version:

```
sudo apt-get install avidemux
```

## Kino (Non-linear Video Editing Suite)

[Kino](#) is a widely used GUI-based non-linear video editing suite for Linux. It imports video files into (and then uses) the [DV](#) (Digital Video) format for editing.

```
sudo apt-get install kino mjpegtools
```

## KdenLive (Non-linear Video Editing Suite for KDE)

[Kdenlive](#) is a GUI-based non-linear video editing suite for KDE based on FFmpeg and the MLT video framework. It has tools for DV, video4linux, and screen capture. Install:

```
sudo apt-get install kdenlive mjpegtools
```

## Cinelerra (Non-linear Video Editing Suite)

[Cinelerra Community Version](#) is a complete high-end open source video editing suite that is a derivative of a similar commercial system. Follow the [installation instructions for Ubuntu](#).

## LIVES (Video editor/processor)

[LIVES](#) is a free, GPL-license open source video editor and processor that is promoted as being useful for VJ editors. Install:

```
sudo apt-get install lives
```

## OpenMovieEditor

[OpenMovieEditor](#) is a free, open source movie editing program for basic movie making. Install:

```
sudo apt-get install openmovieeditor
```

## Blender

[Blender](#) is a free GPL-licensed 3D graphics and modeling tool that has been used in several animation projects. Install:

```
sudo apt-get install blender
```

## Stopmotion (Animation)

[Stopmotion](#) is an open-source program for creating stopmotion animation. Install:

```
sudo apt-get install stopmotion
```

# Audio Applications

## Audacity (Audio Editor and Recorder)

[Audacity](#) is the leading cross-platform free open source (GPL-licensed) audio recorder and editor. It can be used to record, splice, edit, and manipulate sound files similar to tools found in recording studios. Install:

```
sudo apt-get install audacity
```

## Ardour (Digital Audio Workstation)

[Ardour](#) is a free, GTK-based professional-grade digital audio workstation for high end audio manipulation and mixing. Install:

```
sudo apt-get install ardour
```

## Rosegarden (Digital Audio Workstation)

[Rosegarden](#) is a midi/audio interface for synthesizers, as well as a digital audio studio for recording, editing, and notating music. It is often used in combination with Audacity. Install:

```
sudo apt-get install rosegarden
```

## Hydrogen (Drum synthesizer)

[Hydrogen](#) is an advanced drum machine for Linux. Install:

```
sudo apt-get install hydrogen
```

## EasyTag (ID3 editor)

[EasyTag](#) is a utility for editing the ID3 tags of mp3 and other music files. Install:

```
sudo apt-get install easytag
```

Run:

Applications -> Sound & Video -> EasyTAG

## PuddleTag (ID3 editor)

[PuddleTag](#) is a comprehensive utility for editing the ID3 tags of mp3 and other music files. Install:

```
sudo apt-get install python-qt4 python-pyparsing python-mutagen python-configobj python-musicbr
wget -O puddletag_current.deb http://sourceforge.net/projects/puddletag/files/puddletag_0.9.12-
sudo dpkg -i puddletag_current.deb
```

## UbuntuStudio (Ubuntu distribution customized for multimedia editing)

[UbuntuStudio](#) is an official derivative of Ubuntu that pre-packages many multimedia editing packages. (Each of the packages can also be installed independently.) See the website for a full list of the premier audiovisual software packages available for Ubuntu Linux.

- Install all the [audio applications](#) found in UbuntuStudio:

```
sudo apt-get install ubuntustudio-audio
```

- Install all the [video applications](#) found in UbuntuStudio:

```
sudo apt-get install ubuntustudio-video
```

- Install all the [graphics applications](#) found in UbuntuStudio:

```
sudo apt-get install ubuntustudio-graphics
```

# Audio / Video conversion

[Here](#) is a nice review of some of the applications that enables conversion and handling of these types of files.

## FFMPEG video / audio conversion

FFMPEG is the swiss-army knife of video and audio format conversion. It succeeds when no other program can. It is free and open source. If it not yet installed on your system as part of another package (it is used by many video/audio editors), then install it:

```
sudo apt-get install ffmpeg
```

- To convert many different formats, read the [FFMPEG documentation](#). Also see [this tutorial](#).

Example: To convert a saved Flash video (.flv) to an MPEG-2 format playable on a DVD, convert:

```
ffmpeg -i samplevideo.flv -target ntsc-dvd samplevideo.mpg
```

Then use [K3b](#) (or [Gnomebaker](#)) to write the mpg file to a New DVD Data Project.

- ◊ For PAL use -target pal-dvd. For widescreen, use -target film-dvd. For other conversion tips, see [this forum](#). (Note: Most Flash video has very low resolution, with a screen size of 360x270, for example. You may see a slight diminishment in resolution if you wish to convert it to 720x480 (which is the NTSC standard size) or other screen size. You can keep the original screen size and resolution by omitting the -target parameter.) If your original file is 16:9 widescreen and you desire a 4:3 letterbox output for playing on an overscanned TV, you may need to pad the file so that the widescreen is not compressed (see [this forum](#)):

```
ffmpeg -i samplevideo.flv -target ntsc-dvd -s 648x364 -padleft 36 -padright 36 -padtop 58 -padbottom 58
```

- You can also use the WinFF GUI and add the command (as above) as a "Preset," for subsequent use. For example:

Video converter (WinFF) -> Edit -> Presets ->

Preset Name: Letterbox -> Preset Label: 16:9 Widescreen to 4:3 Letterbox

Preset command: -target ntsc-dvd -s 648x364 -padleft 36 -padright 36 -padtop 58 -padbottom 58

Output file extension: mpg -> Category: DVD

-> Add/Update -> Save

- To convert to MPEG-4 (mp4) files, use

```
ffmpeg -i samplevideo.flv outputvideo.mp4
```

- FFMpeg requires that multiple [restricted extra codecs](#) be installed. This can be done in a single easy step from the command-line Terminal:

```
sudo apt-get install ubuntu-restricted-extras
```

### FFMPEG GUI

[WinFF](#) is a free, GPL-licensed open source GUI frontend for FFMPEG. Install:

```
sudo apt-get install winff xterm
```

Run:

Menu -> Applications -> Sound & Video -> WinFF

### Join video segments

Individual video segments (MPEG-2, for example) can easily be joined:

```
cat samplevideo1.mpg samplevideo2.mpg samplevideo3.mpg > samplevideo123.mpg
```

You can then write the resulting MPEG-2 file to a DVD and play it in most DVD players.

### Split a file into segments

Any file can be [split](#) into segments using the Linux command:

```
split -b 1440k my_big_file
```

which will split *my\_big\_file* into equal segments of size 1440 kb.

### Save any streaming Flash video

An easy way is to install the [Video Download Helper plug-in for Firefox](#).

Otherwise, most Flash videos download to the /tmp directory while you watch the video, creating a randomly-named video file there (such as Flashuh4G6s). When you close the webpage, this file in the /tmp directory will be erased. After the entire video has downloaded, but before you close the webpage, copy that file (such as Flashuh4G6s) to your home directory (where it will not be erased). Of course, for this to work, you must change your Flash (or Gnash) settings to allow an unlimited buffer. While watching your Flash video, *right click* to bring up the Flash -> Settings window. Set the Buffer to "Unlimited."

Once you have copied the file, rename it appropriately with the .flv added to the filename. You can then watch it using VLC or Mplayer.

[Here](#) is another method that involves making a symbolic link.

### Save rtmp / flv streams

[flvstreamer](#) is a command-line application to dump rtmp streams. Install:

```
sudo apt-get install flvstreamer
```

[Example](#) of usage:

```
flvstreamer -r "rtmp://host/dir/file.flv" -o filename.flv
```

If you see the following the "WARNING: Download may be incomplete, try --resume!" message, try to use the --resume option:

```
flvstreamer -r "rtmp://host/dir/file.flv" -o filename.flv --resume
```

### Convert Flash video audio to mp3

Once you have downloaded flash video content (.flv) from the Internet (using the [Video Download Helper plug-in for Firefox](#), for example), the audio component can be converted to an mp3 using this command (from the command line Terminal). (This will work for any type of video file, not just Flash.)

```
ffmpeg -i nameofvideoclip.flv -ab 160k -ac 2 -ar 44100 -vn nameoffile.mp3
```

where -i indicates the input, -ab indicates the bit rate (in this example 160kb/sec), -vn means no video output, -ac 2 means 2 channels, -ar 44100 indicates the sampling frequency. See [FFMPEG docs](#) for more info.

### 2ManDVD

[2ManDVD](#) is a GUI utility for creating DVD videos. It is the successor of ManDVD. Choose the version for your architecture and install it from [the 2ManDVD website](#). Click on the download link and select to open it with the GDebi Package Installer (default). (If you have previously installed ManDVD you must uninstall it first.) For a usage tutorial, read this [2ManDVD guide](#).

Run:

Menu -> Applications -> Sound & Video -> 2ManDVD

### DeVeDe

[DeVeDe](#) is a program to create video DVDs and CDs suitable for home players (i.e. VCD, sVCD or CVD) from any source video file that is supported by MPlayer. Choose the version for your architecture and install it from [the DeVeDe website](#). Click on the download link and select to open it with the GDebi Package Installer (default). For a usage tutorial, read this [DeVeDe guide](#).

Run:

Menu -> Applications -> Sound & Video -> DeVeDe

### ManDVD

[ManDVD](#) is a QT-based DVD authoring tool which accepts several different file types as input. Install:

```
sudo apt-get install mandvd xine-ui
```

### DVD Author

[DVD author](#) allows you to create menus and format your MPEG-2 videos onto a DVD disc so that you can play it in a commercial DVD player. DVD Author is a command line tool, but several GUI's exist. Install:

```
sudo apt-get install dvdauthor
```

### QDVDAuthor

[QDVDAuthor](#) is a Qt-based GUI for DVD Author. A package for Natty does not exist, but the Maverick package can be used.

- Enable the Maverick multiverse repository temporarily by adding it to the Synaptic Package Manager Origin of Packages ("Other" software):

Menu -> System -> Synaptic -> Settings -> Edit Origins -> Software Sources: Other Software -> Add...

```
deb http://us.archive.ubuntu.com/ubuntu maverick multiverse
```

- From the Get and Remove Software menu (of Synaptic), install the *qdvdauthor* package (and the *qdvdauthor-common* package if it is not automatically installed as a dependency).
- Once the download/installation is complete, disable the Maverick multiverse repository (to prevent conflict with other Natty packages).
- Download and install the addons:

```
cd /tmp
wget http://qdvdauthor.sourceforge.net/data/masks.tar.bz2 -O masks.tar.bz2
wget http://qdvdauthor.sourceforge.net/data/buttons.tar.bz2 -O buttons.tar.bz2
wget http://qdvdauthor.sourceforge.net/data/alpha_trans.tar.bz2 -O alpha_trans.tar.bz2
cd /usr/share/qdvdauthor/
sudo tar -xjf /tmp/masks.tar.bz2
sudo tar -xjf /tmp/buttons.tar.bz2
sudo tar -xjf /tmp/alpha_trans.tar.bz2
```

Run:

Menu -> Multimedia -> QDVDAuthor

Follow instructions in the Quick-Start Guide:

QDVDAuthor -> Help -> Quick-Start Guide

For a tutorial on authoring DVDs, see [this guide](#).

## ToVid

[ToVid](#) is a collection of tools to create a DVD from a number of different video formats. A GUI is available.

Install:

```
sudo apt-get install tovidgui tovid
```

## Other DVD authoring programs

There are several other DVD authoring programs. For additional information see the [Ubuntu Community](#) pages. Packages include:

- [Bombono](#), a GTK-based, GUI DVD authoring program. Install (requires multiverse repositories to be enabled):

```
sudo apt-get install bombono-dvd
```

- [KMediaFactory](#) is a KDE-based DVD authoring frontend for dvdauthor. (The DVD folders can then be burned to disc using K3b.) Install (requires multiverse repositories to be enabled):

```
sudo apt-get install kmediafactory
```

## Ripper X CD Ripper/Encoder

[Ripper X](#) is a GTK-based (i.e. Gnome) open source utility to rip CD audio tracks to OGG, MP3, or FLAC formats. It supports CDDb lookups.

```
sudo apt-get install ripperx
```

## Asunder CD Ripper/Encoder

[Asunder](#) is a GTK-based open source CD ripper/encoder which saves to Wav, MP3, OGG, FLAC, or WavPack. Self-installing .deb packages are available [here](#).

## Audex CD Ripper/Encoder

[Audex](#) is a port to KDE4 of the KAudioCreator package used in KDE 3. It can create output for LAME (MP3-compliant), OGG Vorbis (oggenc), FLAC and RIFF WAVE. It must be installed from source, currently (see the website).

## Gnac (GNome Audio Converter)

[Gnac \(GNome Audio Converter\)](#) converts between all GStreamer supported audio formats. It is not yet part of the standard repositories. See [these installation instructions](#).

## SOX (encodes/decodes audio)

[SoX](#) is a somewhat confusing command-line utility to convert audio formats. See [this usage guide](#). Install:

```
sudo apt-get install sox
```

Run:

```
sox
```

# CDs and DVDs

## Brasero (CD/DVD burner)

[Brasero](#) is a CD/DVD burning application that is now part of the Gnome desktop (but can be used with any Ubuntu derivative). If not already installed:

```
sudo apt-get install brasero
```

## Gnomebaker (CD/DVD burner)

[Gnomebaker](#) has been the default CD/DVD burning application for the Gnome desktop. If not installed:

```
sudo apt-get install gnomebaker
```

## K3b (CD/DVD burner)

[k3b](#) (KDE Burn Baby Burn) is the default KDE CD and DVD burning utility included in Kubuntu, but can run well in Gnome. (Due to licensing requirements, mp3 capabilities must be installed separately as the libk3b6-extracodecs package). Install:

```
sudo apt-get install k3b libk3b6-extracodecs
```

## Normalize audio levels

Volume normalization for an audio CD requires a separate external plugin. Install:

```
sudo apt-get install normalize-audio
```

Then select normalization:

K3b -> Project -> Properties -> Advanced -> Settings:Normalize volume levels (*ticked*)

## DVD Playback Capability

To play encrypted DVDs, the libvdcss2 package is essential. libvdcss2 is a simple library designed for accessing DVDs like a block device without having to bother about the decryption. More information about this package can be found at [VideoLAN](#).

- You can install `libdvdcss2` as a 64-bit `.deb` package without installing the Medibuntu repositories:

```
wget -c http://packages.medibuntu.org/pool/free/libd/libdvdcss/libdvdcss2_1.2.10-0.3medibuntu1_
sudo dpkg -i libdvdcss2_1.2.10-0.3medibuntu1_amd64.deb
```

or a 32-bit `.deb` package:

```
wget -c http://packages.medibuntu.org/pool/free/libd/libdvdcss/libdvdcss2_1.2.10-0.3medibuntu1_
sudo dpkg -i libdvdcss2_1.2.10-0.3medibuntu1_i386.deb
```

- You can also use guidelines provided at [Medibuntu](#). This will install the Medibuntu repositories on your system and then install the `libdvdcss2` package:

```
sudo wget --output-document=/etc/apt/sources.list.d/medibuntu.list http://www.medibuntu.org/sou
sudo apt-get update
sudo apt-get --yes --allow-unauthenticated install medibuntu-keyring
sudo apt-get update
sudo apt-get install libdvdcss2
```

- You can also install 32 bit or 64 bit Windows multimedia codecs (if you haven't already done so using [ubuntu-restricted-extras](#)):

```
sudo apt-get install w32codecs
```

or

```
sudo apt-get install w64codecs
```

- Instead of downloading directly from Medibuntu, you could also use the script included with the `libdvdread4` package to download and install `libdvdcss2`:

```
sudo apt-get install libdvdread4
sudo /usr/share/doc/libdvdread4/install-css.sh
```

## K9copy (DVD Ripper)

[K9copy](#) is the free open source [DVD backup](#), copying, compression, and authoring utility that requires [libdvdcss](#). For other info, see [this](#) or [this](#) guide. You can easily create MPEG-2, MPEG-4, or DVD videos with this utility.

```
sudo apt-get install k9copy
```

- **Tips:** At times you may not be able to copy your DVD directly from DVD to DVD. This may be because you have a small imperfection in the DVD, or because the DVD was initially created with a non-standard burning method. There are two methods that can help solve this problem:

- ◇ Copy the VIDEO\_TS and AUDIO\_TS folders from your original DVD directly to your hard drive. Then use k9copy to burn a DVD directly from these hard drive folders.
- ◇ Use k3b (or Gnomebaker) to copy an .iso image from the original DVD to your hard drive. Then use k9copy to extract from the hard drive .iso image and then burn a DVD directly from it.

## Handbrake

[Handbrake](#) is a GPL-licensed open source tool for converting DVD to MPEG-4 (iPod format) that is an alternative to k9copy. (It can handle many DVDs that k9copy cannot.) Installation is from the developmental [PPA archive](#).

## dvd::rip

[dvd::rip](#) is a [DVD backup](#)/copy program, written in GTK-based perl, that uses the [transcode](#) and [ffmpeg](#) video/audio processing and conversion tools. See the website for installation and official documentation. For other info, see [this dvd::rip tutorial](#). Install:

```
sudo apt-get install dvdrip rar
```

## Acidrip

[Acidrip](#) is a [DVD backup](#)/copy program, written in GTK-based perl, that uses the [Mplayer](#) and [Mencoder](#) video/audio processing and conversion tools. See the website for installation and official documentation. Install:

```
sudo apt-get install acidrip
```

## DVD Fab (DVD Ripper)

[DVD Fab](#) is the favoured DVD backup tool for today's DVD encryption methods. It must be run in Wine (since it is a Windows application). It comes as a fully featured 30-day trial, but see [these instructions](#) for fine-tuning the trial period.

# Music Players

## Rhythmbox

[Rhythmbox](#) is the default music player in Ubuntu (Gnome), relying on the Gstreamer framework.

### Play Internet Radio through Rhythmbox

Internet radio can be played through Rhythmbox by installing the rhythmbox-radio-browser plugin:

```
sudo apt-get install rhythmbox-radio-browser
```

- Restart Rhythmbox and select the plugin:

Rhythmbox -> Edit -> Plugins -> Internet radio station browser (*ticked*) -> Library -> Radio browser

Note: Internet radio streams use many different ports. You must adjust your firewall to allow the ports over which the streams will be sent.

## Amarok

[Amarok](#) is the default music player in Kubuntu. Install:

```
sudo apt-get install amarok
```

### Amarok themes

[Amarok themes](#) can be downloaded from KDE Look and installed.

- Download the theme (ending in .tar.bz2) to your home directory (or chosen directory).
- Amarok -> Settings -> Appearance -> Install New Style
- Select the downloaded file.

### Play Shoutcast Internet Radio through Amarok

[Shoutcast](#) internet radio can be played through Amarok 2.2 or later by installing the Shoutcast script:

Amarok -> Tools -> Script Manager -> Get more scripts -> Order by:Rating (*ticked*) -> Shoutcast service -> Install -> Restart Amarok -> Tools -> Script Manager -> Shoutcast service tralala (*ticked*) -> Ok -> Internet -> Shoutcast service tralala

Note: Internet radio streams use many different ports. You must adjust your firewall to allow the ports over which the streams will be sent.

## Audacious

[Audacious](#) is a compact, fast music player that is a fork of XMMS. It resembles WinAmp and can use WinAmp and XMMS skins. It supports many plugins and is ideal for streaming content. Install:

```
sudo apt-get install audacious
```

You can switch between the "PulseAudio Output Plugin" and the "ALSA Output Plugin" under

Audacious -> Preferences -> Audio -> Current output plugin.

## Banshee Music Player

[Banshee](#) is a Gstreamer, [Mono](#) and Gtk-based music player for Linux and Mac OS X. It supports multiple mp3 players (including the iPod). There are plugins for podcasts, internet radio, and more.

```
sudo apt-get install banshee
```

## Exaile Music Manager and Player

[Exaile](#) is a GTK-based music player that supports many formats, incorporates a Shoutcast directory, a plugin for iPod, Last.FM support, tabbed playlists, and other features. Install:

```
sudo apt-get install exaile
```

## Songbird Music Player

[Songbird](#) is an open source music player from Mozilla with an appearance meant to resemble iTunes. It is in current development and does not yet have full support for mp3 players (such as the iPod). It incorporates a Shoutcast internet radio interface. The current beta version can be downloaded from the website.

## aTunes

[aTunes](#) is a Java-based player designed to be similar to iTunes. Installation instructions are [here](#).

# Multimedia Players

Most current video multimedia players play many video formats, including the Flash video .flv format.

## MPlayer Multimedia Player

[Mplayer](#) is a video player with a wide range of formats supported (including RealMedia and Windows-codecs) and a wide variety of outputs.

```
sudo apt-get install mplayer
```

## SMPlayer

[SMPlayer](#) is an enhanced frontend for MPlayer.

```
sudo apt-get install smplayer
```

## Dump a video stream to disc

You can dump a video stream to disc using Mplayer:

```
mplayer -dumpstream streamurl
```

If you don't know the exact URL of the stream you wish to save, you can discover it from the webpage it is embedded in by using the Firefox add-on [UnPlug](#). Do not save streams that are illegal to download.

## VLC Multimedia Player

[VLC](#) is a cross-platform multimedia player that supports many formats without need for additional codecs. It can not only [receive video streams](#) (also see [here](#) to convert it to mp4), but can act as a server for video streams, as well. It is one of the only players that can view and backup almost any DVD format, no matter which copy protection is used. See [these tips](#) for using VLC to backup/rip encrypted DVDs.

```
sudo apt-get install vlc vlc-plugin-pulse
```

## VLC plugins

There are many VLC plugins. You will likely only need to install a few of them, however, depending on your hardware and input/output configuration:

```
sudo apt-get install vlc-plugin-ggi vlc-plugin-jack vlc-plugin-pulse vlc-plugin-sdl vlc-plugin-
```

## Xine-UI Multimedia Player

[Xine UI](#) is a multimedia player based, of course, on the xine platform. It can also play streamed video from the Internet and supports most formats, including some uncommon ones.

```
sudo apt-get install xine-ui
```

## Kaffeine Video Player

[Kaffeine](#) is the default video player in Kubuntu. Install:

```
sudo apt-get install kaffeine
```

## RealPlayer 11 Multimedia Player

The Linux Realplayer is actually based on the open-source [Helix player](#). Helix itself can be installed as a package easily (read [Helix plug-in](#)) and used instead of Realplayer. These instructions are to install the proprietary version of RealPlayer only.

Download [Real Player official linux player](#)

Open a terminal and cd to the directory you have downloaded realplayer's .bin file. Then issue the following commands

```
chmod +x RealPlayer11GOLD.bin
sudo ./RealPlayer11GOLD.bin
```

When it asks for installation path enter /usr/local/RealPlayer

For all other questions just choose default by pressing enter.

If you have installed mozilla-mplayer package you will need to delete the mplayer firefox plugin for real player videos. Other wise all real player files will open with mplayer. For that please do this

```
cd /usr/lib/firefox/plugins
sudo rm mplayerplug-in-rm.*
```

Please remember to restart firefox and when ever you click on a real player video choose the option open with and use /usr/bin/realplay

## Internet TV

### Miro Player

[Miro Player](#) (formerly Democracy TV Player) is an open-source Internet TV and video player that allows you to watch Internet TV and videos. Unlike other video players, it contains a structured guide that includes more than 2500 channels, has built-in BitTorrent, and has features that can automatically save videos, such as from YouTube.

```
sudo apt-get install miro
```

### Myth TV

See [MythTV](#)

### Sopcast Internet TV

[Sopcast](#) is an interface to play live P2P video streams through the [VLC media player](#). Install VLC first. This is a Chinese program and most content is hosted in China and may not be legal in your area. Please consult local regulations.

You can install the SopCast Player PPA using the following commands:

```
echo "deb http://ppa.launchpad.net/jason-scheunemann/ppa/ubuntu `lsb_release -cs` main" | sudo
sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-keys CD30EE56
```

If you are using Karmic or later:

```
sudo add-apt-repository ppa:jason-scheunemann/ppa
sudo apt-get update
sudo apt-get install sopcast-player
```

Run:

Applications->Sound & Video->SopCast Player

### Zattoo

[Zattoo](#) is a free Internet TV player that allows you to watch terrestrial television from various countries in Europe. See the [Zattoo Download](#) page for further instructions on installation. For screenshots and an alternate installation guide, see [this UbuntuGeek guide](#).

- Install dependencies first:

```
sudo apt-get install libgtkglext1 adobe-flashplugin
```

- Download the latest .deb package from [Zattoo Download](#) page.

```
wget http://zattoo.com/release/download.php
```

- Install the downloaded .deb package:

```
sudo dpkg -i *.deb
```

- Run Zattoo:

K -> Application -> Multimedia -> Zattoo Player

Note: you have to register for a free account when the player starts.

### TV Time (TV Viewer)

[TVTime](#) allows the display of television and other digital inputs (made available to the computer by a [video capture card](#)). A plugin for the [Remuco remote control](#) (remuco-tvtime) is also available. Install:

```
sudo apt-get install tvtime
```

### ABC iView

[Python-iView](#) is a program that works with [rtmpdump](#) to record streams offered by [ABC iView](#) (Australia). Installation instructions are at the [PPA repository](#).

## BBC iPlayer

[BBC iPlayer](#) provides replays and downloads of BBC programs to UK residents. The BBC, however, has crippled its streams to prevent downloading and legal actions against iPlayer appear to be in progress. ([Flvstreamer](#) may be required for rtmp stream recording). To install a Flash 64-bit edition of iPlayer:

```
sudo aptitude remove flashplugin-installer
sudo add-apt-repository ppa:sevenmachines/flash
sudo aptitude update
sudo aptitude install flashplugin64-installer
```

### get\_iplayer (BBC program recording)

- [get\\_iplayer](#) allows BBC streams (through their iplayer service) for UK users, as well as Hulu streams for US users, to be recorded to mp4, wav and mp3 files (depending on content). Install v2.66 (may not work for all users):

```
sudo apt-get install get-iplayer
```

- To install a newer version:

```
sudo apt-get install flvstreamer id3v2 libbmp3-info-perl atomicparsley libwww-perl perl
wget ftp://ftp.infradead.org/pub/get_iplayer/get_iplayer-2.79.tar.gz
tar xvf get_iplayer-2.79.tar.gz
sudo ln -s iplayer-2.79/get_iplayer /usr/bin/get_iplayer
```

Note: When running this version, use *get\_iplayer* instead of *get-iplayer*.

- Add preferences:

```
get_iplayer --prefs-add --modes=flashhd,flashvhigh,flashhigh,flashnormal,iphone
get_iplayer --prefs-add --flvstreamer "/usr/bin/flvstreamer"
```

- Delete ~/.swfinfo:

```
cd ~/.swfinfo
sudo rm *
cd ..
sudo rmdir swfinfo
```

- See the website for usage or:

```
man get-iplayer
```

- Get a current listing of what's available and save it in the home directory

```
get-iplayer >~/iplayer-listing.txt
```

- Having found some interesting programmes (and noted the numbers found in the left-hand column), download them:

```
get-iplayer --get 123 537
```

- For Live Streaming (with [mplayer](#)) use one of [these commands](#).
- iPlayer can be run in Wine using [these instructions](#).
- Some users will need to install [rtmpdump](#) for successful streaming.

## Internet Radio

Internet radio streams through different ports, so check your firewall if you are not able to play the streams.

### Last FM

[LastFM](#) is a service for sharing music recommendations and individual radio streams. It is included as an option in Amarok, or can be installed separately:

```
sudo apt-get install lastfm
```

### Shoutcast Internet Radio

[Shoutcast](#) is the first and last free mp3 streaming service. Hundreds of radio streams can be played through Amarok, Audacious, or other multimedia player. Simply [associate](#) the .pls streams with your favourite player ([Audacious](#) or XMMS2 recommended).

### StreamTuner Stream Directory Browser

[StreamTuner](#) lists streams available on the Internet through a GTK-based interface. It lists Shoutcast and Live365 streams, among others. Install:

```
sudo apt-get install streamtuner
```

## Media Centers and PVR (Personal Video Recorder)

There are a number of open-source Media Centers for Linux, some of which include personal video recorder functions. For a full list of open-source media centers, see [this guide](#).

### MythTV

[MythTV](#) is a media center with PVR (personal video recorder) for retrieving, recording, and playing broadcast and Internet TV and other multimedia content. It has many options and plugins for expansion. To be useful, you will need a [compatible TV tuner card](#). For setup tips, see [this guide](#). Install:

```
sudo apt-get install mythtv
```

### Mythbuntu

[Mythbuntu](#) is an integrated Ubuntu (Xubuntu) desktop optimised for MythTV usage. It can be used instead of adding MythTV to a Ubuntu desktop.

### XBMC

[XBMC](#) is a free, mature, open-source cross-platform media center. It does not have a PVR capability nor as many functions as MythTV, but has a very nice interface.

- Add these [third party repositories](#):

```
deb http://ppa.launchpad.net/team-xbmc-intrepid/ubuntu intrepid main
deb-src http://ppa.launchpad.net/team-xbmc-intrepid/ubuntu intrepid main
```

- Install:

```
sudo apt-get update
sudo apt-get install xbmc
```

### Boxee

[Boxee](#) is an XBMC-like open source package to allow streaming video over the Internet, including from YouTube and other sites. It is a fork of XBMC, and is still in alpha development and testing stage. It is currently available for 32-bit systems only, and recommended for Hardy. A current version is anticipated soon. (Note: Boxee does not run Netflix on Linux, despite their ads). See these [download instructions](#).

## Elisa

[Elisa](#) is a cross-platform media center that uses the Gstreamer multimedia framework. Commercial plugins are available from Fluendo. It supports PVR and Music Jukebox . Install:

```
sudo apt-get install elisa
```

## LinuxMCE

See [LinuxMCE](#).

## Multimedia Servers

### MPD Multimedia Playing Server

[MPD](#) is a music server meant for LAN usage. It can be controlled from remote clients. It can also stream internet streams.

### TiMidity++ MIDI Sound Server

[TiMidity](#) is a MIDI software synthesizer required by several games and other MIDI-dependent applications.

```
sudo apt-get install timidity
```

### uShare UPnP A/V Media Server

[uShare](#) is a UPnP media server compatible with the Xbox360 and PS3.

```
sudo apt-get install ushare
```

Also see: [How-to: Run uShare at Startup](#).

# Home Automation / Home Theater / Home Security

## Complete Systems

### Linux MCE (Media Center Edition)

[LinuxMCE](#) is an integrated home theater/home security/home automation/telephone PBX/intercom system for your home. It incorporates [MythTV](#), [Pluto](#) home automation, [Motion](#) security surveillance, [Asterisk](#) PBX, [VDR](#) video disk recorder, and other home automation/security/theater packages in an integrated platform. It is available in 32 and 64 bit versions. LinuxMCE can run either as a standalone Home Theater PC or can co-ordinate a fully networked home, using the networking capabilities that are intrinsically part of the Kubuntu Linux OS. For more info see the [LinuxMCE website](#) or [wiki](#).

The most recent stable version runs on Kubuntu 7.10 (Gutsy). A beta version for Kubuntu 8.10 (Intrepid) has been released, and the full version is anticipated soon. LinuxMCE can be installed at the same time as the Kubuntu OS (on a new PC with an nVidia graphics card), with a single DVD installation. Alternatively, Kubuntu can be installed first and LinuxMCE then installed from a 2 CD installation.

### Other systems in development

- [Minerva](#) -- home automation and multimedia control with a GUI interface. It can even hook into Google Calendar.
- [DomotiGa](#) -- home automation software from the Netherlands, using a MySQL database.
- [NetHomeServer](#) is a Java-based cross-platform automation system authored by a single coder. It is in alpha development but can be downloaded from the website and evaluated.
- The [Wosh](#) framework is message-based middleware to effect home automation processes. the project is in early development.
- [Linux Home Automation](#) contains information regarding many nascent home automation projects.

## Home Security

### Zoneminder surveillance system

[Zoneminder](#) manages surveillance cameras and stores images on the hard disk. Images can be viewed using a [\(LAMP\) server](#) remotely. X10 devices can be triggered using built-in perl scripts. Install:

```
sudo apt-get install zoneminder ffmpeg
```

### Myth Zoneminder

[MythZoneminder](#) allows you to view your security cameras through Myth TV, essentially. It is a plugin that interfaces the two packages Zoneminder (which must be working on your system) and Myth TV (which must also be working.) See the [installation instructions](#). Install:

```
sudo apt-get install mythzoneminder
```

# Office Suites

## Open Office

[Open Office](#) is installed by default in Ubuntu, with Writer (Word equivalent), Presentation (PowerPoint equivalent), Calc spreadsheet (Excel equivalent), and Base relational database (Access equivalent).

## Open Word 2007 Documents in Open Office

The latest edition of OpenOffice opens .docx (i.e. Word 2007) documents by default.

## LibreOffice

[LibreOffice](#) is a free and open source (GPL-licensed) office suite similar to OpenOffice. Install:

```
sudo add-apt-repository ppa:libreoffice/ppa
sudo apt-get update
sudo apt-get install libreoffice libreoffice-gnome
```

## KOffice

The [KOffice](#) suite is part of the KDE project and is meant to provide the capabilities of the OpenOffice suite without the licensing restrictions of OpenOffice. It can be used in any version of Ubuntu. Install:

```
sudo apt-get install koffice
```

## AbiWord

[AbiWord](#) is a fast, collaboration-enabled word processor. For the most current version see [the AbiWord web site](#). To install from the repositories:

```
sudo apt-get install abiword
```

## Xournal

[Xournal](#) is a free (GPL-licensed) GTK/Gnome-based application for notetaking, sketching, or keeping a journal using a stylus. Install (universe repositories must be enabled):

```
sudo apt-get install xournal
```

### PDF Files

[PDF](#) is the file format used by Adobe Acrobat (which can be read by many e-book readers as well). There are many PDF-oriented utilities available in Ubuntu. In the Synaptic Package Manager, search for "pdf".

### Print to a PDF file

(K)Ubuntu allows printing of any document to the PDF format by default. From any application:

File -> Print -> Print to File -> Output: PDF

### View a PDF document

[Evince](#) is the default PDF document viewer in Ubuntu. PDF files are associated by default with Evince, so clicking on a PDF file (from a file manager such as Nautilus) will open it with Evince. Evince can also be started:

Menu -> Office -> Evince

### Scan to a PDF file

[Gscan2pdf](#) is a utility to do exactly that: scan to a PDF file. Multiple options for scanning can be set. Install:

```
sudo apt-get install gscan2pdf
```

### PDF-Shuffler (PDF file management)

[PDF-Shuffler](#) is a free GTK-based utility to manipulate multiple PDF files, allowing individual pages or entire PDF documents to be re-arranged, rotated, merged, or deleted. This is an essential tool for working with PDF files. Install:

```
sudo apt-get install pdf-shuffler
```

Run:

Menu -> Office -> PDF-Shuffler

## MaxView (PDF file management)

[MaxView](#) is a utility to capture, manipulate and rearrange, and print .pdf and .max files. Written in Qt, it is similar in some respects to Paperport.

- [Download](#) and install the .deb package (use *i386* instead of *amd64* if using a 32-bit OS):

```
wget -O maxview_current.deb http://sourceforge.net/projects/maxview/files/maxview0.7-2/maxview_0.7-2_i386.deb
sudo dpkg -i maxview_current.deb
```

- Start MaxView in a GUI by creating a menu item with the Command: `maxview /home/user`, where `/home/user` is the directory in which you wish MaxView to start.

## PDFedit (PDF file editor)

[PDFedit](#) is a free (GPL-licensed), Qt-based PDF file editing and manipulation program that uses a GUI for editing. Install:

```
sudo apt-get install pdfedit
```

## Import PDF files into a word processor

### Import PDF files into OpenOffice Writer

PDF files can be [imported](#) into the OpenOffice Writer word processor as a hybrid document (not a scanned character document) by installing:

```
sudo apt-get install openoffice.org-pdfimport
```

### Import PDF files into KWord

Kword is the Word Processor package in KOffice. It allows the importing of PDF files by default.

## PDF-XChange (PDF file editor)

[PDF-XChange](#) is a free Windows-based application to view, modify, or perform simple editing of PDF files. It works under [Wine](#).

## Personal Information Managers

### Kontact Personal Information Manager

[Kontact](#) is the default PIM included with Kubuntu. Kontact includes email, an address book, a calendar, reminders, pop-up notes, a link to the Akregator News/[RSS](#) reader, time-tracking, and more. Its many functions resemble MS-Outlook. Through connectors it interfaces with many [groupware servers](#) (such as Kolab and eGroupware). Install:

```
sudo apt-get install kontact
```

### Mozilla Sunbird (Calendar)

[Sunbird](#) is a standalone group calendar client that in the future will be replaced by the [Lightning extension for Thunderbird and Firefox](#). (It is available in a 64-bit and 32-bit version, whereas the Lightning extension is currently only available in a 32-bit version.) Download from the [website](#) and install by clicking on the downloaded file to extract, or:

```
sudo mkdir /etc/sunbird
cd /etc/sunbird
sudo wget -O sunbird-current.tar.bz2 http://download.mozilla.org/?product=sunbird-1.0b1&os=linu
tar -xvzf sunbird-current.tar.bz2
```

Replace `os=linux64` with `os=linux` if using a 32-bit OS.

- Then create a menu item named *Sunbird* to point to the Command: `/etc/sunbird/sunbird`

### BasKet Note Pads

[BasKet Note Pads](#) is a personal note-taking application that resides on your computer and can be used for creating "to-do" lists. It is great for centralising your thoughts in one place. Install it:

```
sudo apt-get install basket
```

### Planner (Project planning & management)

[Planner](#) is an [MS-Project](#)-like planning and management tool.

```
sudo apt-get install planner
```

## **Time Tracker**

You can keep track how long you use an application with TimeTracker. Keep records for billing or simply limit your Internet usage.

# Groupware

Groupware solutions include shared calendars, group email servers, groups address lists, group projects, and internal messaging. They require (one or more) servers with [LAMP](#) or similar [server](#) stacks.

## Groupware Servers

Groupware servers are meant to operate on a server platform. You must install the server version of Ubuntu/Ubuntu first. Read [Servers](#).

### Kolab

[Kolab](#) is the most comprehensive open-source groupware solution available and is distributed as a multi-platform solution. (It integrates easily with both Ubuntu (including Evolution) and KDE/Kubuntu (including Kontact).) It is free and open source with a GPL license (unlike other groupware solutions), yet enterprise support is also available. It is scalable to large organizations and is Outlook (MS-Exchange) and Mozilla compatible. This is a German package, however, and documentation in English can occasionally be limited. The Kolab website provides its own instructions for [installation from source](#) (currently [v. 2.2](#)). Version 2.2 includes the Horde web interface. The current beta Debian package instructions are [here](#) or the OpenPkg installation instructions are [here](#).

- Note: Kolab uses its own server components, and it is best to run Kolab on a dedicated server. However, it is possible to run other servers on the same machine, as long as you choose alternate ports if the server modules conflict.
- Install the compiler and other necessary stuff:

```
sudo apt-get install build-essential
```

### Kolab Ubuntu package

- There is an Ubuntu/Kubuntu package for the new version of Kolab (v. 2.2), but no documentation support for it yet exists. Install:

```
sudo apt-get install kolabd
```

## Manual Kolab installation

- Make a directory for the Kolab installation and make it universally accessible:

```
sudo cd /
sudo mkdir /kolab
sudo chmod 777 /kolab
```

- *Optional:* If you wish to mount kolab in its own partition, then create a new partition (using Gparted, for example). Figure out the device name of your extra partition:

```
sudo fdisk -l
```

It should be something like /dev/sda3.

Mount /dev/sda3 (or whatever your partition is) as /kolab by editing /etc/fstab:

```
sudo nano /etc/fstab
```

and adding the line:

```
/dev/sda3 /kolab ext3 defaults,rw 0 0
```

then reboot and make sure there are no errors.

- Make a directory into which to download kolab:

```
cd /tmp
mkdir /kolabtmp
```

- Download all the current Kolab files:

```
cd /tmp/kolabtmp
wget -r -ll -nd --no-parent http://files.kolab.org/server/release/kolab-server-2.2.2/sources/
```

- Install Kolab (as root using sudo -s):

```
sudo -s
sh install-kolab.sh 2>&1 | tee kolab-install.log
```

- Reboot your system.
- Stop Kolab services and run the configuration utility:

```
sudo /kolab/bin/openpkg rc all stop
sudo /kolab/sbin/kolab_bootstrap -b
```

Obviously, you should know all your details, such as your fully qualified host name (which you can determine from `hostname -f`), domain details, etc., before doing this step. If you are not familiar with [OpenLDAP](#) and [LDAP](#) basics, you should learn about it, as Kolab uses the `slapd` OpenLDAP server daemon.

- Restart all Kolab services:

```
sudo /kolab/bin/openpkg rc all start
```

- Login to the web administrator interface using "manager" and the password you set at bootstrap configuration:

```
https://yourhost.yourdomain.name/admin
```

## Citadel

[Citadel](#) is a turn-key fully open source groupware solution (that is both KDE and Kolab-1 compliant). Based on a bulletin-board framework spanning over 20 years, it is user friendly and interfaces with both KDE and Gnome apps and also has a web-based client. It is also WebDAV compliant and can be used with Thunderbird.

- Install the Citadel server:

```
sudo apt-get install citadel-server
```

- Install the Citadel client:

```
sudo apt-get install citadel-client
```

- Install both:

```
sudo apt-get install citadel-suite
```

## eGroupware

[eGroupware](#) is a robust and stable free open source groupware solution (with GPL license) based on the LAMP stack (the default server stack included with Ubuntu Server) and the Postfix mail server (both of which should be installed first). There is a new version recently available, with a new corporate sponsor in Germany and a commercial enterprise version. Compatibility with many clients has been improved. Egroupware provides the easiest installation and quickest setup time of all groupware solutions. Much of the documentation for the current version, unfortunately, is not in English.

```
sudo apt-get install egroupware
```

### Open-Xchange

[Open-Xchange](#) is a proprietary groupware solution (meant as an MS-Exchange replacement) that has released a "community edition" based on commercial versions. The latest .deb package is for Hardy Heron 8.04. It is compliant with many different types of clients, including Kontact, Outlook, and Palm PDAs. Installation instructions are at the website and are not trivial.

### OpenGroupware

[OpenGroupware](#) is a groupware solution based on the postgresSQL database. There is an enterprise version and a limited open source version, and development appears to have been stagnant in 2008. Installation must be from source, as packages are very outdated. See the website for details.

### Zarafa

[Zarafa](#) is the leading European MS-Exchange replacement/groupware solution. It is proprietary, but a GPL-licensed (except for trademarks) free open-source community edition was released in 2008. Download instructions are available from the website.

### Zimbra

[Zimbra](#) is a proprietary groupware solution (now owned by VMWare) that offers an open source "community edition". Although currently free, the community edition is limited in features and does not have a GPL license. All submitted modifications and contributions become the property of VMWare. See the [Zimbra wiki](#).

A Beta version for Lucid Lynx 10.04 LTS is available for 64-bit users, or the older Hardy 8.04 version can be used.

### SugarCRM Server

[SugarCRM](#) is a commercial customer relationship management (CRM) platform and groupware server (sales, marketing, support, project management, calendaring) system with a community edition. It supports MySQL and MS SQL databases. For more info see [SugarCRM Server Setup](#).

## SchoolTool

[SchoolTool](#) is a free open source groupware solution for use in primary and secondary schools which includes calendaring, gradebooks, attendance records, and student information databases. It was created with the help of the Shuttleworth Foundation (which also sponsors Ubuntu). See [these installation instructions](#).

## Groupware Clients

Many groupware solutions have connectors to interface with clients such as Kontact/KMail and Mozilla Thunderbird (or SeaMonkey).

## Evolution Exchange

The Evolution Exchange connector adds connectivity (using Outlook Web Access) to the Evolution suite for MS Exchange 2000 and 2003. Install:

```
sudo apt-get install evolution-exchange
```

## Kontact Personal Information Manager

The [Kontact Personal Information Manager](#), included in Ubuntu by default, [interfaces with many groupware servers](#).

## KDE Groupware Wizard

Kubuntu provides a wizard (script) to help clients (such as Kontact/Kmail) connect to a groupware server. Currently supported groupware servers are Kolab, eGroupware, SUSE Linux Openexchange, and Novell Groupwise.

## Zimbra Desktop

[Zimbra Desktop](#) is a desktop that collaborates with Zimbra servers. See the [Zimbra Desktop FAQ](#). For more info also see [UbuntuGeek's Zimbra Desktop Installation Guide for Hardy 8.04](#).

## Oracle Calendar Desktop Client

The [Oracle Calendar Desktop Client](#) is proprietary calendaring software for use with Oracle groupware/database systems.

Download Oracle Calendar Desktop Client:

```
wget http://www.k-state.edu/infotech/calendar/oracle-10-clients/DesktopClients/Linux/cal_linux_
```

Extract:

```
tar -xvf cal_linux_1011.tar.gz
```

Change into the extracted files directory:

```
cd OracleCalendar_inst/
```

Prepare the files:

```
mv cal_linux cal_linux.bak; cat cal_linux.bak | sed "s/export LD_ASSUME_KERNEL/#xport LD_ASSUME
```

Change permissions:

```
chmod +x gui_install.sh cal_linux
```

Start the GUI installer:

```
sudo sh gui_install.sh
```

## Group Calendars

### DAViCal Calendar Server

[DAViCal](#) is a [CalDAV](#), PostgreSQL, Apache and php-based shared Calendar server that works with Mozilla Thunderbird/Lightning/Sunbird, Evolution, and other calendar clients. Install:

```
sudo apt-get install davical
```

Then see [these detailed installation instructions](#).

## Darwin Calendar Server

[Darwin Calendar Server](#) is an open-source port of Apple's [CalDAV](#)-based calendar server that works with Mozilla Thunderbird/Lightning/Sunbird, Evolution, and other calendar clients. Install version 1.2 from the repositories (then see the website for usage instructions):

```
sudo apt-get install calendarserver
```

## WebCalendar

[WebCalendar](#) is an [ICS](#)-based server for group calendars that can use many different databases as the backend, is written in PHP, and is compatible with clients such as Sunbird/Thunderbird (Lightning), Apple iCal, and Evolution. The newest version can also be viewed using [RSS](#) clients. See the website and [the wiki](#) for installing the newest (1.2) version. Install the older (1.05) version from the repositories:

```
sudo apt-get install webcalendar
```

# Financial Software

For a brief introduction, see this list of [10 Linux financial tools](#).

## KMyMoney (Personal Finance Management)

[KMyMoney](#) is a personal finance manager that uses double entry accounting, the method professional accountants use. It is similar to MS-MyMoney and Intuit Quicken, with automatic setup of categories for businesses. It is designed for the KDE/Kubuntu desktop (but will work in Gnome/Ubuntu). Install:

```
sudo apt-get install kmyoney2
```

## GnuCash (Personal Finance Management)

[GnuCash](#) is a free, open source GPL-licensed personal finance manager that uses double entry accounting like professional accountants. It is GTK-based (Gnome 2). The current version can be installed from source files (see the website for installation instructions), or the package version can be installed:

```
sudo apt-get install gnucash
```

## Skrooge (Personal Finance Management)

[Skrooge](#) is a free, GPL-licensed personal finances manager written for the KDE desktop that is able to import/export data to/from many other finance managers.

```
sudo apt-get install skrooge
```

## Moneydance (Personal Finance Management)

[Moneydance](#) is a commercial cross-platform Java-based personal finance manager similar to KMyMoney that sells for \$50 per license.

## SQL-Ledger (Enterprise Finance Management)

[SQL-Ledger ERP](#) is a free, open-source, platform independent double-accounting-method system and enterprise resource planner (inventory, work and purchase orders, taxes, etc.) that uses the SQL database server (PostgreSQL/Oracle/Mysql databases). It uses a web browser for an interface and be accessed

remotely. It is extremely comprehensive and is available in many languages. Install:

```
sudo apt-get install sql-ledger
```

## LedgerSMB (Enterprise Finance Management)

[LedgerSMB](#) is a fork of the SQL-Ledger project that offers fairly solid AR, AP, and GL tracking as well as inventory control. It is in rapid development and encourages community support. A Debian (.deb) package is available [here](#).

## WebERP (Enterprise Finance Management)

[WebERP](#) is a free, open-source enterprise resource planner and accounting suite similar to SQL-Ledger that uses a web browser as an interface. It runs on the [LAMP server](#). It is somewhat difficult to implement and use, but conforms to strict accounting guidelines. Set up your LAMP server first, then install using the web site instructions.

## Phreebooks (Enterprise Finance Management)

[Phreebooks](#) is a free open-source enterprise resource planner and accounting suite similar to WebERP. It also runs on a [LAMP server](#). It is in active development in 2008. A demo is available at the website.

## Quasar (Enterprise Finance Management)

[Quasar](#) is a proprietary Linux-based accounting suite similar to Quickbooks. For a single user without point-of-sale or networking needs, it is free. For other users it costs CA\$500 per seat. An installer for KDE-based systems is [here](#).

## Stock Market monitoring software

- [BeanCounter](#) - A stock portfolio performance monitoring tool. Install:

```
sudo apt-get install beancounter
```

- [Smtm](#) - Show Me The Money is a configurable Perl/Tk stock ticker program. Written by the creator of BeanCounter.

```
sudo apt-get install smtm
```

- [Qtstalker](#) - commodity and stock market charting and technical analysis

```
sudo apt-get install qtstalker
```

- [JStock](#) -- a Java based portfolio manager and stock market monitoring tool. See these [installation instructions](#).

# Wiki software

Wiki software allows an organization to have a manual that can be edited by a number of collaborators. Wikipedia is the best known example.

## MediaWiki

[MediaWiki](#) is the free, open source server software that Wikipedia uses. It is scalable to very large uses. It runs on the [LAMP server stack](#) (which uses the MySQL database and is available as an installation option with the (K)ubuntu [server](#)), or it can be used with a PostgreSQL database. See these detailed [instructions](#). (Other instructions are also available [here](#).) Install from the repositories:

```
sudo apt-get install mediawiki
```

- Edit the config file so it recognizes MediaWiki:

```
sudo nano /etc/mediawiki/apache.conf
```

Uncomment (remove the #) the line:

```
Alias /mediawiki /var/lib/mediawiki
```

- Restart apache2:

```
sudo /etc/init.d/apache2 restart
```

- Run/install MediaWiki by logging into:

```
http://localhost/mediawiki
```

You will be prompted for configuration variables to be set. The trickiest is the MySQL user/password. Hopefully you remember your MySQL superuser that you set at the time of LAMP (or MySQL) installation.

- Copy your local settings configuration file to /etc/mediawiki (and make a backup of the original):

```
sudo cp /var/lib/mediawiki/config/LocalSettings.php /etc/mediawiki
sudo mv /var/lib/mediawiki/config/LocalSettings.php /var/lib/mediawiki/config/LocalSettings_at_
```

Edit your configuration variables there:

```
sudo kate /etc/mediawiki/LocalSettings.php
```

- If you are using a virtual host server, make a symbolic link (named in this example *mywiki*) from your `/usr/share/mediawiki` installation folder to your `/var/www` folder:

```
sudo ln -s /usr/share/mediawiki /var/www/mywiki
```

then make sure you have an apache2 virtual hosts configuration file (in `/etc/apache2/sites-available`) that points to `/var/www/mywiki` as the DocumentRoot. Make a symbolic link from your virtual host configuration file in `/etc/apache2/sites-available` to `/etc/apache2/sites-enabled` to enable it. Restart apache2 after enabling the sites. (Warning: MediaWiki is not secure at installation and can be easily hacked by new users. Do not publish your wiki to the Internet before reading all the instructions and changing the configuration file (`LocalSettings.php`) so that it is more secure.) You would then access the database at:

```
http://my.virtualwikihost.org
```

## Twiki

[Twiki](#) is an open source wiki engine used by many small to medium size companies internally. It has an active development team with multiple plugins. See the website for installation instructions. Install:

```
sudo apt-get install twiki
```

## Moin Moin

[Moin Moin](#) is free, open source (GPL-licensed) wiki software written using Python, with a large community of users, including the Apache, Debian, and Ubuntu wikis. See [these Ubuntu installation instructions](#). Install:

```
sudo apt-get install python-moinmoin
```

## TiddlyWiki

[TiddlyWiki](#) is an open source personal wiki. It is ideal for creating a list of things to do, note taking, or as a collaboration tool for a small team. It is a single HTML file that can reside on your computer or can even be uploaded to a web server and be used as a simple website. It is developed using a Firefox browser as an interface. Installation instructions are on the website.

# Web Publishing

## Drupal (Web content publishing)

[Drupal](#) is the leading open-source website creation and content collaboration tools. A modular approach to website building, from simple out-of-the-box websites to complex sites is possible with a short learning curve. Get more info on how to [get started](#). Drupal requires an installation of a [LAMP](#) server stack; if you have not already installed LAMP, it will be installed along with Drupal. I have found it easier to use the [MySQL](#) database (the "M" in LAMP), but Drupal can also integrate with [PostgreSQL](#) if you have it installed.

### Drupal7

Drupal7 has just been released and is not yet available in (K)Ubuntu as a package. Instructions are evolving.

### Drupal6 (Web content publishing)

Drupal6 is available as a package, or from the command-line terminal:

```
sudo apt-get install drupal6
```

- After everything is installed (and the problems below sorted out), restart the apache2 server:

```
sudo /etc/init.d/apache2 restart
```

- Finish installation through your browser:

```
http://localhost/drupal6/install.php
```

You can then also see these [installation tips](#) for installing through the browser, then see these [Drupal site building tips](#). A Drupal/Ubuntu users group is found at [Drubuntu](#).

### Installation quirks

#### Exim vs. Postfix

[Exim](#) and [Postfix](#) are mail handlers. I had installed Postfix at the time I installed my Ubuntu server (but was not using it). But Drupal6 uses Exim and therefore removes Postfix at installation and installs Exim instead. Therefore, it is better not to use Drupal6 on a mail server that uses Postfix.

## WordPress

[WordPress](#) is a popular free open source web content manager that started as a blog tool and now incorporates many publishing elements. For bloggers and small to medium-sized websites, WordPress provides the fastest installation and customization process with many modules. WordPress requires an installation of a [LAMP](#) server stack first. Then install:

```
sudo apt-get install wordpress
```

- Make a symbolic link from your Apache2 www folder to your installation folder and install a new MySQL database named *localhost* to use with WordPress:

```
sudo ln -s /usr/share/wordpress /var/www/wordpress
sudo bash /usr/share/doc/wordpress/examples/setup-mysql -n wordpress localhost
```

Note: If you already know the name of your (virtual) host URL for WordPress, then use it as the name of your database instead of localhost. For example, my URL is *mysite\_x.homeserve.org* so my command is:

```
sudo bash /usr/share/doc/wordpress/examples/setup-mysql -n wordpress mysite_x.homeserve.org
```

- If you will access your WordPress server through a virtual host, then create your virtual host configuration file in the */etc/apache2/sites-available* folder. Once you have edited the file, make a symbolic link from it to the */etc/apache2/sites-enabled* folder. Restart apache2:

```
sudo /etc/init.d/apache2 restart
```

- Install WordPress through a browser:

<http://localhost/wordpress>

or, if you are using a virtual host:

[http://mysite\\_x.homeserve.org/wordpress](http://mysite_x.homeserve.org/wordpress)

Note: The Jaunty repositories contain version 2.7.1, which is [subject to a security worm](#). If you install this version, please [update](#) immediately to the current version from the Tools -> Upgrade menu. (Alternatively, install the current source version from the website.)

For the automatic updater to work, all the WordPress files, folders, and subfolders must be owned by www-data (which is also the owner of the apache2 process) prior to updating.

```
sudo chown -R www-data /usr/share/wordpress
```

## Joomla (Web content publishing)

[Joomla](#) is a powerful open source website creation and content management tool that allows website creation for use in every arena from the simple to complex corporate environments. [Info for beginners](#) is a good place to start.

## Scribus (Desktop publishing)

[Scribus](#) is an open-source package that provides professional-appearing desktop publishing.

```
sudo apt-get install scribus
```

## Plone (Content Management System)

[Plone](#) is a free, open source (GPL-licensed) multi-platform content management system used by many large organizations around the world. It is available with an integrated installer [here](#). Some users have had some difficulties in Jaunty, due to changes in Python.

## Gallery (Photo album website)

[Gallery](#) is a PHP-based method of presenting a photo album on a website. A [Drupal interface](#) is also available for Gallery2. Install:

```
sudo apt-get install gallery2
```

## phpBB (Forums)

[phpBB](#) is the leading open source platform for Forums. A [LAMP](#) server stack (or [PostgreSQL](#) database instead of MySQL) will be required and should be installed first. Then make sure the universe repositories are enabled and install:

```
sudo apt-get install phpbb3
```

# Distance teaching

## Moodle

[Moodle](#) is a free open source platform for hosting online learning courses. It can be integrated with webinar software. A [LAMP](#) server installation is required (sudo tasksel install lamp-server). Also find free Moodle themes [here](#). Install:

```
sudo apt-get moodle
```

- Database server software for Moodle: *mysql-server* -> follow remainder of instructions. Assuming the database is hosted on the same computer as the one Moodle is being installed upon, accept localhost for the options when prompted.
- Edit Moodle configuration options (if needed):

```
sudo gedit /etc/moodle/config.php
```

- Edit Moodle apache2 configuration file (if needed):

```
sudo gedit /etc/moodle/apache.conf
```

- Finish installation through the browser. (I recommend the "unattended" installation.)

<http://localhost/moodle/admin>

For more information, see [these detailed tips](#).

## Claroline

[Claroline](#) is a free open source platform for hosting e-learning courses and online student collaboration. A [LAMP](#) server installation is required. Installation is from source files available at the website, with instructions found [here](#).

## Dokeos

[Dokeos](#) has a free learning platform, but also a medically-oriented proprietary platform that includes modules for case presentations and imaging. It is widely used in Europe.

# Software Development

## Kompozer Web Development Editor

[Kompozer](#) is a [Gecko](#)-based web authoring system that combines web page editing with web file management in a WYSIWYG manner. It supports XML, CSS, and JavaScript in an XUL architecture.

```
sudo apt-get install kompozer
```

## Quanta Plus (Web IDE)

[Quanta Plus](#) is an integrated development environment integrated with the KDE desktop. It allows webpage development, database design, and XML design and scripting, for example, using multiple development tools. The latest stable version is 3.5, however, and integrates with the KDE 3.5 environment (Ubuntu Hardy Heron). You should therefore use Ubuntu Hardy Heron with this product. (There is also a commercial version (Quanta Gold), also oriented towards KDE 3).

```
sudo apt-get install quanta kompare kxsldbg cervisia
```

## Netbeans IDE

[Netbeans](#) is a free open-source integrated development environment used to create applications using Ajax, Ruby, pHp, Groovy, Java, Javascript, C++, and other scripting tools.

```
sudo apt-get install netbeans
```

## BlueFish Web Development Editor

[BlueFish](#) is a GTK-based (Gnome-oriented) editor to write websites, scripts and programming code. It supports perl, Python, pHp, CSS, XML, Java, Javascript, C, SQL, and other formats.

```
sudo apt-get install bluefish
```

## Gobby (Multi-user development)

[Gobby](#) is a free, multi-platform open source collaborative editor supporting multiple documents in one session and a multi-user chat. Install:

```
sudo apt-get install gobby
```

## Eclipse IDE

[Eclipse](#) is a free open-source cross-platform integrated development environment with plugin support for a large set of programming languages, e.g. Java, C/C++, Python, PHP.

```
sudo apt-get install eclipse
```

## Version control software

Copies of software being developed at many different locations require a method to ensure that the multiple distributed copies remain synchronized. This can be done using a central repository or using a distributed synchronization technique. For further information, see the [official Ubuntu documentation](#). Several version control platforms exist:

- [Bazaar](#) is sponsored by Canonical and allows distributed synchronization. Also see the [official Ubuntu documentation](#).
- [Subversion](#). Now part of Apache, this is one of the most widely used systems and uses a central repository for synchronization. Also see the [official Ubuntu documentation](#).
- [CVS](#) was previously the most widely used system. Also see the [official Ubuntu documentation](#).

## Personal repositories

(K)Ubuntu uses Debian (.deb) packages. Individuals or organizations can create repositories for personal or specialized use. See [the Debian wiki introduction](#). Also see this [Ubuntu community advice](#) and [this](#).

### mini-dinstall

Using mini-dinstall with dput, a simple repository can be created. This can then be copied to an online server for public or private access. See [this tutorial](#) and [this](#).

### Debarchiver

[DebArchiver](#) is a command-line utility that allows the creation of a folder-based repository. Instructions are from `man debarchiver`. Install:

```
sudo apt-get install debarchiver
```

# Science, Technology, and Engineering Applications

What .. you thought Ubuntu was just for play? Also see [Ubuntu Science](#).

## Health applications

### Vista (Enterprise Electronic Health Record)

[OpenVistA](#) and [WorldVistA](#) are two varieties of the largest and most robust CCHIT-approved electronic health record platform in the public domain. They are GPL licensed, are based on the US Veterans Administration health record system, and can be installed as an integrated database, server, and client system. See the detailed download and installation instructions for [OpenVistA](#) and [WorldVistA](#), or visit [Vistapedia](#) for other instructions. Also see the [Ultimate Server with OpenVistA EHR](#).

## CAD

- [QCAD](#) is a commercial CAD alternative to AutoCAD with a community open source edition. Install:

```
sudo apt-get install qcad
```

- [VariCAD](#) is a commercial 3D CAD package for multiple platforms (including Linux). There is no open source or community version.

## Mathematical solutions

[Scilab](#), Octave, and Freemat are three open source solutions for solving complex numerical mathematical problems. Symbolic mathematical problems can be solved with Maxima and Mathomatic. All of these programs are included in the Ubuntu Universe repositories.

### Octave

Gnu [Octave](#) is a free, open source (GPL licensed) platform for solving linear and non-linear equations, similar to (and mostly compatible with) Matlab. It interfaces well with [Gnuplot](#). For troubleshooting tips, see [this thread](#). Install:

```
sudo apt-get install octave3.0
```

Also recommended:

```
sudo apt-get install libatlas3gf-base gnuplot qtoctave
```

Note: [QTOctave](#) is a GUI for Gnuplot or Easyplot 1.1, and the ATLAS library is an algebra-software-optimization set of utilities.

[EasyPlot 1.1](#) is an alternative to GnuPlot, with a [version](#) that can be used with QTOctave. It must be installed from source.

An older GUI for Octave/Gnuplot is [qgfe](#) (available as the package qgfe).

### Freemat

[Freemat](#) is a free, open source (GPL licensed) platform for solving linear and non-linear equations, similar to (and mostly compatible with) Matlab. Install from Add/Remove Programs (Edutainment) or

```
sudo apt-get install freemat
```

### Maxima

[Maxima](#) is a free, open source (GPL licensed) computer algebra system (CAS) for doing symbolic mathematics. It can solve equations with many variables, simplify expressions, do calculus, and many other advanced operations. To install:

```
sudo apt-get install wxmaxima
```

To run, enter:

```
maxima
```

or select wxMaxima from the Applications/Science menu. wxMaxima is the standard Maxima GUI.

### Mathomatic

[Mathomatic](#) is a free, open source (LGPL licensed) command-line computer algebra system for doing calculations and symbolic mathematics. It can automatically solve and simplify algebraic equations, do some calculus, and other simple but useful operations. To install:

```
sudo apt-get install mathomatic mathomatic-primes
```

To run, enter:

```
mathomatic
```

or select it from the Applications/Science menu.

## Amateur Radio applications

[Fldigi](#) is a free, open-source (GPL) application for digital-mode amateur radio communications using a sound card. Enable "Community Maintained Software (universe)" in Software Sources; then install either from Add/Remove Programs under (Amateur Radio) or by typing

```
sudo apt-get install fldigi
```

## Amateur Electronics

### Arduino

[Arduino](#) is an open-source electronics prototyping platform based on flexible, easy-to-use hardware and software. It's intended for artists, designers, and hobbyists interested in creating interactive objects or environments. See this [tutorial](#).

### LaTeX

[LaTeX](#) is a LaTeX is a free high-quality typesetting system for the production of technical and scientific documentation.

### LyX

[LyX](#) is a WYSIWYG frontend and GUI interface useful in creating documents formatted for LaTeX. Install:

```
sudo apt-get install lyx
```

### LaTeX Reference Managers

- The standard LaTeX bibliography (BibTeX) tool can be manipulated with one of several tools:

◇ nbibtex. Install:

```
sudo apt-get install nbibtex
```

◇ jabref. Install:

```
sudo apt-get install jabref
```

◇ biblatex. Install:

```
sudo apt-get install biblatex
```

◇ kbibtex (for KDE). Install:

```
sudo apt-get install kbibtex
```

- [Zotero](#) is a Firefox plugin that allows culling references (and reference content) from online references.

## Miscellaneous software (not endorsed by this guide)

### **JBidwatcher**

[JBidwatcher](#) is a Java-based application allowing you to monitor auctions, submit bids, snipe (bid at the last moment), and otherwise track your auction-site experience. See the website for more details.

# Utilities

Utilities facilitate everyday tasks, such as keeping the clock up to date, archiving utilities, and more.

## Archiving Utilities

### ZIP

The command-line terminal utility [ZIP](#) creates files that are compatible with the time-honored PKZIP and WinZip. It is included in (K)Ubuntu by default. Extracting zip files can be done with the unzip utility. using the -P option allows using a password for the files:

```
zip -r -P mypassword desination.zip *
```

Note: The -r option indicates to include all subdirectories recursively.

### FileRoller (Archiving GUI)

[FileRoller](#) is a GUI for many types of archival utilities.

### X-archiver (Archiving GUI)

[Xarchiver](#) is a GTK-based GUI front-end for many archiving utilities. Install:

```
sudo apt-get install xarchiver
```

### BChunk

BChunk is a command-line utility that allows you to convert .cue and .bin files into an .iso file (so that they can be opened and manipulated in Ubuntu). **Warning: If the bin/cue image has audio tracks, they will be lost.**

Get BChunk

```
sudo apt-get install bchunk
```

To convert .cue and .bin files, navigate to the folder and run this command (replacing filenames with your own):

```
bchunk inputfilename.bin inputfilename.cue outputfilename.iso
```

After the file is converted into ISO you can mount it using:

```
sudo mount -o loop outputfilename.iso /media/output
```

Navigate to /media/output and you should see all the content there. You can then copy it anywhere.

To unmount:

```
sudo umount /media/output
```

### HJSplit Files Joiner/Splitter

HJSplit for Linux (Java version).

- Make sure you have Java Runtime Environment installed:

```
sudo apt-get install sun-java6-jre
```

- Download the HJSplit JAR file:

```
wget http://www.freebyte.com/download/hjsplit/hjsplit_g.jar
```

- Create the directory for HJSplit:

```
sudo mkdir /opt/hjsplit
```

- Move the file to an appropriate directory:

```
sudo mv hjsplit_g.jar /opt/hjsplit/
```

- Run:

```
cd /opt/hjsplit/ && java -jar hjsplit_g.jar
```

Note: You could also make a terminal shortcut (menu item) in K Menu Editor.

### Rar

Rar archives files into the proprietary .rar format.

```
sudo apt-get install rar
```

This application is a 40-day trial.

### Unrar

Unrar extracts files archived with the proprietary .rar format. A free version can be installed:

```
sudo apt-get install unrar-free
```

or the proprietary version (also free for noncommercial use) can be installed with the [ubuntu-restricted-extras](#) package or with:

```
sudo apt-get install unrar
```

### 7-Zip

The open-source 7-Zip archive format was originally designed for Windows (and DOS) but is also available for Ubuntu. The GNU/Linux version of 7-Zip does not come with a GUI, but Ark can hook into 7-Zip to handle 7z archives. Install:

```
sudo apt-get install p7zip-full
```

To allow the 7-Zip extension for Ark to extract .rar files, also install:

```
sudo apt-get install p7zip-rar
```

## Hard Drive Utilities

### KDiskFree (Hard drive properties monitor)

[KDiskFree](#) is a KDE utility for monitoring free disk space, etc.

```
sudo apt-get install kdf
```

## Clock Utilities

## Screensavers

A screensaver is useful as a security precaution as well as a power and screen element saver. Using even a simple "Blank Screen" screensaver with a password can slow a potentially malicious passerby from gaining access to your keyboard and computer while you are away from your desk.

Menu -> System -> Preferences -> Screen Saver

- Set a security password:

Screen Saver -> Lock screen when screensaver is active (*ticked*)

## Partition Managers

Also see [these tips](#) for partitioning scheme suggestions, other partitioning tools and methods, and usage of multiple partitions for multiple OSs.

### GParted Partition Manager

[Gparted](#) is a GTK (Gnome)-based partition manager that can also be used with KDE.

- This utility works best when run from a LiveCD. Recent versions of the Ubuntu LiveCD have a copy of GParted on them. Start the Ubuntu LiveCD in demo mode (not in install mode) and then start GParted:

Menu -> System -> Administration -> GParted

- An alternative is to download the Gparted .iso image [here](#). Follow [these instructions](#) to burn this .iso image to CD. [Use this GParted LiveCD](#) as your partition manager.
- You can also install the package into your OS (once it is installed on your hard drive):

```
sudo apt-get install gparted
```

# System Backup and Recovery

## Rsync

[Rsync](#) is the directory backup and transfer tool for Linux. It is installed by default in Ubuntu. It can provide any type of backup, and options are extensive. Several GUI frontends for Rsync are listed [here](#).

## GRsync

[GRsync](#) is a GTK-based GUI front-end for Rsync. Install:

```
sudo apt-get install grsync
```

## Bacula

[Bacula](#) is the most widely-used GTK-based open source (GPL-licensed) network backup utility that is used in both server and desktop installations. A catalogue of backups can be maintained using MySQL, PostgreSQL, or SQLite. For more info see the [Ubuntu documentation](#). Both text-based and GUI frontends are available. Install the MySQL version:

```
sudo apt-get install bacula
```

## SBackup

[SBackup](#) is a simple backup and restore utility for the GTK-desktop. Install:

```
sudo apt-get install sbackup
```

## Keep (Backup and Recovery)

[Keep](#) is a QT/KDE based backup utility used in previous versions of Ubuntu. It is no longer maintained and is not included in Ubuntu by default. Install:

```
sudo apt-get install keep
```

Run:

- Menu -> Applications -> System Tools -> Keep (Backup System)

- Backup:
  - Click "Add a Directory to Backup"
  - Select directories you wish to backup
  - Select a location to place the backup
  - Set how often you wish the backups to take place, and how long to keep them
  - Click "Backup Now"
  - Select the directory groups you wish to backup.
- Recover:
  - Click "Restore a Backup"
  - Select the directory groups you wish to restore.

### Partimage (Partition backup)

[Partimage](#) is a free open-source utility to back up an entire partition into an .iso image. It can be used across a network, as well. Install and run:

```
sudo apt-get install partimage
sudo partimage
```

Partimage cannot be used from within the partition you wish to backup. You will either have to run it from a different partition or from a [LiveCD that contains it](#). (A serious limitation of Partimage is its inability to backup/restore split image files to/from multiple media (e.g. spanned DVDs/CDs), limiting its usefulness as an inexpensive cloning and distribution solution. Partition image backup/restoration must be to/from a single hard drive, large capacity USB stick, or networked storage space.)

### cp

An entire partition's filesystem can easily be copied to another partition using the `cp -a` command. (However, this cannot be done for the partition of a filesystem that is running. Use the (K)Ubuntu LiveCD to copy partitions when necessary.) Obviously the destination partition should be as large or larger than the source partition, and while not necessary, probably is best if both partitions are of the same filesystem type (e.g. ext4). Use [GParted](#) to create or manipulate the destination partition, if necessary. To copy the entire filesystem, for example, from the ext4 partition `/dev/sda6` into the ext4 partition at `/dev/sda7`, mount both partitions:

```
sudo mkdir /media/part_sda6
sudo mkdir /media/part_sda7

sudo mount /dev/sda6 -t ext4 /media/part_sda6
sudo mount /dev/sda7 -t ext4 /media/part_sda7
```

Then merely copy the contents from one partition to the other:

```
sudo cp -a /media/partsd6/* /media/partsd7
```

- Of course, once the partition's filesystem is copied, a bootmanager (Grub2 or Grub Legacy) will have to be updated/reconfigured to recognize the new partition's OS in order to enable it to boot. Also, the `/etc/fstab` file of the new partition's filesystem may need to be edited (in regards to the UUIDs of the various partitions), to prevent conflicts. To determine the UUIDs of all current partitions on a hard drive:

```
sudo blkid
```

Edit `fstab` so that the UUIDs are correctly reflected there.

- To confirm that the file copy has completed, the Linux command `du` (also see [these tips](#)) can be used to calculate the disk usage for both the source and destination folders in order to compare the values (to ensure that they are the same). For example, the values should be the same for both partitions after copying has completed:

```
sudo du /media/partsd6
```

```
sudo du /media/partsd7
```

## dd

`dd` is a \*nix command that enables the copying of files or an entire disk using a single command. Parameters must be precisely specified to avoid risk of accidentally erasing data. See [these brief instructions](#) or [these instructions](#) for detailed options. You cannot copy a hard drive that contains the operating system you are currently running. Instead, boot into a LiveCD and run the `dd` command that way. An example command to copy Hard drive X to Hard drive Y is:

```
dd if=/dev/hdx of=/dev/hdy
```

- [ddrescue](#) is a variation of the `dd` command that allows working with potentially corrupted datasets, partitions, or hard drives.

## FSArchiver (Filesystem Archiver)

[FSArchiver](#) is a utility to backup the filesystem by files (instead of by partition blocks). A filesystem backed up in this way can be moved to a different sized partition or another disk filesystem altogether (e.g. from ext3 to ext4). Backups can be split and stored on (and restored from) spanned media (e.g. multiple DVDs/CDs). It

is included in the [System Rescue CD](#). Install:

```
sudo apt-get install fsarchiver
```

# System Rescue and Cloning Utilities

## System Rescue CD

[SystemRescueCD](#) is a LiveCD that includes important utilities such as [GParted](#), [Partimage](#), [ddrescue](#), [Rsync](#), and [FSArchiver](#). Several of these utilities cannot be used from within a running partition, so using them from a LiveCD is often necessary. [Download](#) and [burn](#) the LiveCD from the website.

## Clonezilla

[Clonezilla](#) allows the backup or duplication of a partition for a single machine or for multiple machines over a network. (It is similar to Norton Ghost.) It includes [Partimage](#), [partclone](#), and other utilities. It is [available](#) as a LiveCD which can then be [burned](#). (A serious limitation of Clonezilla is its inability to backup/restore split image files to/from multiple media (e.g. spanned DVDs/CDs), limiting its usefulness as an inexpensive cloning and distribution solution. Partition image backup/restoration must be to/from a single hard drive, large capacity USB stick, or networked storage space.)

## Disk Imaging software

- [G4U](#) is a utility to image a disk bit by bit.
- [G4L](#) is a utility to image a disk bit by bit. It includes a GUI interface.

## Ubuntu Customization Kit

- [Ubuntu Customization Kit](#) is a utility to customize a (K)Ubuntu LiveCD. Install:

```
sudo apt-get install uck
```

## Remastering software

Debian and (K)Ubuntu Linux operating systems can be "remastered" and customized (using one of a number of utilities) for re-distribution. (See [this Wikipedia list](#).) This enables an organization to pre-load desired applications and customizations for distribution among its members, while preserving the intrinsic architecture and function of (K)Ubuntu. The customized (K)Ubuntu OS can then be distributed on a CD or on a USB flashdrive. Users are then free to further customize the OS, or even to revert back to the original default (K)Ubuntu settings. Also see the [Ubuntu wiki](#).

- oem-config-gtk

```
sudo apt-get install oem-config-gtk
```

- [Remastersys for Ubuntu](#). For tips, see [this page](#).
- [Reconstructor](#). The open source engine can be [downloaded](#) and installed as a .deb package.

## Run Ubuntu LiveCD from a USB pendrive

The Ubuntu LiveCD can be installed on and run from a USB pendrive. Settings can be "persistently" saved (but the LiveCD kernel modules can not be upgraded). Programs can be installed and run, however, and files saved to the USB drive. (The installed programs will remain installed). An [Ubuntu Live CD](#) is needed to do the installation. For additional info, see the [Ubuntu Community documentation](#) or the [PendriveLinux instructions](#).

The USB "LiveCD" can be used to install Ubuntu on computers (including [netbooks](#)) that do not have CD-ROM/DVD drives.

USB pendrives to be used to run Ubuntu should have a minimum of 2 Gb (preferably 4 Gb). If you wish to install a fast, fully functional Linux system on a pendrive that has less memory than that, use [PuppyLinux](#) or [Lubuntu](#).

## USB Creator

You can make a "LiveCD" on a USB pendrive using USB Creator and either a LiveCD or an .iso version of the LiveCD stored on your hard drive. USB Creator is installed by default in Ubuntu. If not, install:

```
sudo apt-get install usb-creator-gtk
```

- Run:

Menu -> System -> Startup Disk Creator

## Create a boot CD to allow booting from the USB drive

Many computers do not allow booting from a USB drive (but they do allow booting from the CD-ROM). You can create a CD-ROM using [these PendriveLinux instructions](#) and set your BIOS to boot from this CD-ROM. When you boot from this CD-ROM, it will use the bootup files on the Ubuntu USB drive you previously created (in the step above).

# User Administration

## Users and Groups

Menu -> System -> Administration -> Users and Groups

- Add New Users

Menu -> System -> Administration -> Users and Groups -> Add

- Remove Users

Menu -> System -> Administration -> Users and Groups -> *user* -> Delete

- Modify Users

Menu -> System -> Administration -> Users and Groups -> *user* -> Advanced Settings

or

Menu -> System -> Administration -> Users and Groups -> *user* -> Manage Groups

It is quite often necessary to have extra privileges to do certain tasks. These privileges are assigned to your user by belonging to certain groups. The tasks are allowed to be performed by any user belonging to the group associated with that task.

*Example:* a "sudoer" is a user who can perform certain administrative tasks, such as updating the system. To become a "sudoer" a user must belong to the "sudo" group.

Menu -> System -> Administration -> Users and Groups -> *user* -> Manage Groups --> *sudo* -> Properties -> Group Members -> *user* (*ticked*)

To become an administrator, you must belong to the adm, admin, and sudo groups. To be a virtualbox user, you must belong to the virtualbox group. To change printer settings you must belong to lpadmin. To use the cdrom, you must belong to cdrom. To use hot-pluggable devices, you must belong to plugdev. To share Samba folders (on a Windows-based network), you must belong to sambashare. To access NTFS files using the virtual filesystem fuse, you must belong to the fuse group. To use many games, you must belong to the games group. The list is long, and not always obvious.

Unfortunately, while this is the feature that gives Linux such a high-level of security, it can also take diligence to remember to add your user to certain groups. It is not uncommon for programs and functions on your system not to work merely because you don't have privileges to do so because you forgot to add your user to the appropriate group(s).

Of most importance, you must already be an administrator in order to change membership in groups. Therefore, if you create a new user and intend to give that user administrative privileges (by assigning the user to the administrative groups), you must do so from your original administrator account (the one you set up at installation) or from another administrative user account.

## Timekpr (Parental controls)

[Timekpr](#) is a program to track and control the computer usage of user accounts.

- If updating, remove any prior versions:

```
sudo dpkg --purge timekpr
```

- Add the timekpr [third-party repositories](#):

```
sudo add-apt-repository ppa:nedberg
```

- Install:

```
sudo apt-get install timekpr
```

When prompted which default display manager to use, select "gdm"

- Start:

Menu -> System -> Administration -> Timekpr Control Panel

## Web content filtering

[DansGuardian](#) provides web filtering capability, similar to NetNanny. It is useful for limiting objectionable content in publicly accessible workstations, or for filtering objectionable content for younger users. It integrates with ClamAV, and uses several criteria for filtering websites (which is difficult to modify). It is used with [Tinyproxy](#) (best for individual users) or the [Squid](#) proxy (best for a network server). Install:

```
sudo apt-get install dansguardian tinyproxy
```

or

```
sudo apt-get install dansguardian squid
```

See [these installation instructions](#) for setup details. In brief,

- Edit the dansguardian configuration file:

```
sudo nano /etc/dansguardian/dansguardian.conf
```

comment out the UNCONFIGURED line:

```
#UNCONFIGURED
```

If using tinyproxy instead of Squid, change the proxyport to 8888:

```
proxyport 8888
```

- Reinstall dansguardian:

```
sudo apt-get install --reinstall dansguardian
```

- Set your browser to use the localhost:8080 proxy. For example, in Firefox:

◇ Firefox -> Edit -> Preferences -> Advanced -> Network -> Settings

◇ Manual proxy configuration -> HTTP proxy: localhost -> Port: 8080

- A [Webmin module](#) is available to administer settings. Also, a [GUI](#) to change Dansguardian settings called [Webstrict](#) is in development.
- A [GUI for use with IPCop](#) (based on the webmin module) is also available.

# System Administration

## Automating Tasks

- Cron is a system daemon that runs tasks in the background according to instructions found in a crontab file. To edit the crontab file for the current user:

```
crontab -e
```

Tasks that normally require administrative (sudo) privileges should be added to the root user's crontab:

```
sudo crontab -e
```

Add commands using the format specified [here](#) (or see the [Ubuntu Community Help](#)). The crontab command format can also be found using:

```
man crontab
```

- Scheduled/automated tasks (cron events) can also be edited using the [GNOME schedule](#) GUI interface.

Menu -> System -> Administration -> Task Scheduler

- If the GNOME Schedule task scheduler is not installed, install it:

```
sudo apt-get install gnome-schedule
```

## Boot Menu

### Login Menu settings

You can change the Login menu settings from the GUI interface:

Menu -> System -> Administration -> Login Manager

You can choose an integrated theme or select individual components of the login screen/process.

## Automating bootup options

[StartupManager](#) is a GUI to manage settings for Grub (Grub Legacy), Grub 2, Usplash, and Splashy.

## GRUB boot manager settings

### Grub2

Natty comes with [Grub2](#), a difficult boot manager to customize. (Grub2 is also known as grub-pc.) See the evolving instructions at the [Ubuntu wiki](#) or [Ubuntu forums](#). In brief, some settings can be edited:

```
sudo nano /etc/default/grub
sudo grub-mkconfig --output=/boot/grub/grub.cfg
```

Alternatively, use the command:

```
sudo update-grub
```

### Grub2 background image, colors, fonts

- See [this Ubuntu Forums thread](#).
- Any background image can be used for Grub2 by placing the image in the /boot/grub folder and then reconfiguring Grub2:

```
sudo update-grub
```

The image ought to be the same size as the Grub2 startup resolution specified in /etc/default/grub (e.g. 1024x768).

- A selection of splashimages can be installed into the /usr/share/images/grub folder:

```
sudo apt-get install grub2-splashimages
```

◇ One of the images can be linked to the /boot/grub folder and used as the splash image. For example:

```
sudo ln -s /usr/share/images/grub/Plasma-lamp.tga /boot/grub
sudo update-grub
```

### Protecting Grub2 from cracking

- See [this section of the Grub Manual](#) for important information on securing Grub2.
- To add password protection, in the `/etc/grub.d/40_custom` configuration file, add the lines:

```
set superusers="user1"  
#password_pbkdf2 user1 grub.pbkdf2.sha512.10000.biglongstring  
  
password user1 insecurecleartextpassword
```

and change your password to something other than `insecurecleartextpassword`, or use the pbkdf2-encrypted method described [here](#). You can then password-lock menu items as well. For detailed info see [this blog](#).

### GRUB Legacy

The older version of GRUB ("[Grub Legacy](#)") is available, for use with a boot partition, for example. Install:

```
sudo apt-get install grub
```

- If you have [multiple operating systems \(OS\)](#) on your computer, you may be using the GRUB Legacy boot manager (in a boot partition, for example). You can edit the options for GRUB Legacy in the `menu.lst` configuration file. (See [this detailed info](#).)

```
sudo nano /boot/grub/menu.lst
```

(`gedit` can also be used instead of `nano` as the text editor.)

### Chainloading Grub2 from Grub Legacy

To chainload Grub2 (installed in this example in the `/dev/sda7` partition) from Grub Legacy, use an entry of this format in the Grub Legacy `menu.lst` configuration file (stored in a boot partition, for example):

```
title Kubuntu Maverick OS (chainloader)  
rootnoverify (hd0,6)  
kernel /boot/grub/core.img
```

### Protecting Grub Legacy from cracking

- See [this section of the Grub Manual](#) for important information on securing Grub Legacy.
- To add password protection, in the `/boot/grub/menu.lst` configuration file, uncomment (remove the hashmark) from the line:

```
#password topsecret
```

and change your password to something other than *topsecret*, or use the md5-encrypted method described [here](#). You can then password-lock menu items by adding the descriptor *lock* below the title of any item menu.

## Default Applications

In previous version of ubuntu, you could choose which program to use as your default program for a specific task.

Menu -> System -> Administration -> Default Applications

or by *right-clicking* on any file and choosing the "Open with Other Application..." option.

The Default Applications menu has now been removed from Ubuntu, however. For a GUI that will allow this and multiple similar Ubuntu system tweaks, install [Ubuntu Tweak](#):

```
wget http://launchpad.net/ubuntu-tweak/0.5.x/0.5.8/+download/ubuntu-tweak_0.5.8-1_all.deb
sudo dpkg -i ubuntu-tweak_0.5.8-1_all.deb
```

## Kill a process

Sometimes a program (or "process") just freezes. To "kill" (or end) the program/process:

Menu -> System -> Administration -> System Monitor -> highlight the errant process -> Kill process

From the command line:

```
sudo killall process
```

where *process* is the name of the frozen program, such as *firefox*.

## Enabling NUM LOCK On Startup

Menu -> System -> Administration -> Keyboard & Mouse -> Keyboard -> "turn on Numlock on Startup"

## Working with Menus

### Create an encrypted folder

You can create a folder whose contents are encrypted. See [these instructions](#).

### Create a symlink from a file to another location

A [symbolic link](#) (also known as a symlink) is a method in Linux of referring to a file (or directory) in one location from another location. Usage:

```
ln -s /path/to/source /path/to/destination
```

If */path/to/destination* requires superuser rights, then use:

```
sudo ln -s /path/to/source /path/to/destination
```

This is similar to, but more powerful than, creating Shortcuts, with which former Windows users may be familiar.

### Assign a root password

To be able to log in as root directly, you must assign a root password. This can be done with:

```
sudo passwd root
```

Afterwards, you can use

```
su
```

to get a root prompt. You would then use the root password.

### Get a root prompt without using a root password

If you have not set a root password (or don't know it), you can obtain root user privileges anyway. From the command-line Terminal:

```
sudo -s
```

or

```
sudo su
```

or

```
sudo bash
```

You will use your own user password instead of a root password.

You could also get a prompt to become any other user on the computer by typing:

```
sudo su <username>
```

## Use the File Manager as root

```
sudo nautilus
```

or

```
gksudo nautilus
```

## Manually Mount and Unmount a device

To manually mount a device:

```
mount /dev/hda
```

replace /dev/hda with the location of the device.

To manually unmount a device:

```
umount /dev/hda
```

replace /dev/hda with the location of the device.

## Windows Compatibility

**Mounting NTFS Partitions (with read/write privileges)**

Find out the name of your ntfs partition:

```
sudo fdisk -l
```

Method 1: In this example, the NTFS drive is listed by fdisk as /dev/sda2, but yours may differ.

Make a mount point for the drive:

```
sudo mkdir /media/WindowsNTFS
```

Edit fstab:

```
sudo nano /etc/fstab
```

Comment out the automatically added lines by Ubuntu installation:

```
#/dev/sda2 auto nouser,atime,noauto,rw,nodev,noexec,nosuid 0 0
#/dev/sda2 /mnt auto user,atime,noauto,rw,nodev,noexec,nosuid 0 0
```

and instead add the line:

```
/dev/sda2 /media/WindowsNTFS ntfs-3g quiet,defaults,rw 0 0
```

Note: There are many ways to mount the drive, depending on your needs. The [fstab](#) file controls this process. See [How to edit and understand fstab](#) and [Intro to using fstab](#).

In this example, I indicated that the file system was an ntfs-3g filesystem, so did not use the auto option (which detects the filesystem automatically). I used rw to specify read/write privileges for all users, but umask=0 and umask=000 are accepted by some kernels.

Method 2: Edit fstab:

```
sudo nano /etc/fstab
```

When Ubuntu installation finishes, it mounts all ntfs partitions automatically with ntfsprogs, adding a line similar to the following to fstab:

```
UUID=8466268666267956 /media/sda1 ntfs defaults,gid=46 0 1
```

Change this line to:

```
UUID=8466268666267956 /media/sda1 ntfs-3g defaults,nls=utf8,locale=zh_CN.UTF-8,rw,gid=46
```

In this example, I have a Chinese-language Windows installation on my first partition, so I set the locale parameter (`locale=zh_CN.UTF-8`) so that my Chinese documents can display correctly. Setting `rw` (same as `umask=0` or `umask=000`) lets me read/write the partition without `sudo`. `gid=46` specifies that the drive will belong to the group of hot-pluggable devices (`plugdev`) and is not necessary unless your `ntfs` drive is a hot-pluggable one (such as an external USB drive). `nls=utf8` is the default and is optional for most `ntfs` users, but there are other options for Chinese (and other specialized character-set users).

### Mounting FAT32 Partitions

Follow the above instructions, but use `vfat` instead of `ntfs-3g`.

In other words, if you have made a mount point directory `/mnt/WindowsFAT32` and your FAT32 drive is `/dev/sda3`, then edit the `/etc/fstab` file to include the line:

```
/dev/sda3 /mnt/WindowsFAT32 vfat quiet,defaults,rw 0 0
```

### Synchronize clock to network time server

The Network Time Protocol (NTP) allows time synchronization of your computer to time servers on the Internet. To enable it:

- Applications menu -> System Settings -> Date & Time
- Check the "Set date and time automatically" option
- Choose an `ntp` time server near you.

# Hardware

## CPU and motherboard

The Linux kernel in versions of (K)Ubuntu starting with Karmic Koala implemented mandatory CPU temperature and fan speed sensor monitoring (which was optional in previous kernels). The output from the sensors is used to effect CPU scaling (throttling) in the event of "out of range" temperature values. However, not all motherboards/CPUs have sensor drivers available, and due to a bug in the feedback routine, missing sensors drivers incorrectly report as an "out of range" error in the kernel. Originally this threw multiple errors which were logged (using rsyslogd) to both the `/var/log/kern.log` and the `/var/log/syslog` files, filling them to multiple Gb size within a few hours. This had the effect of slowing, then freezing, the machine. Currently, the machine will simply not boot.

If your machine is affected by this problem, you may be restricted to versions of (K)Ubuntu that are Jaunty or earlier (or you must undertake extensive workarounds).

## Disable CPU Frequency scaling

(Note: These instructions may not work with newer Linux kernels.) My motherboard does not have drivers for my CPU fan sensor. Therefore, the Linux kernel cannot monitor the temperature and fan speeds properly and throttles the CPU (aka frequency scaling) inappropriately. This has the effect of slowing or freezing my computer. To turn off this behavior, I used the Debian RCConf utility:

```
sudo apt-get install rconf
sudo rconf
```

and unchecked the ONDEMAND item. (I also unchecked the fan control item). I then rebooted. For more info, see [this](#).

## libsensors

libsensors (libsensors3 and/or libsensors4) is a module that allows an interface (such as lm-sensors) to monitor your motherboard/CPU temp and fan speeds. You can adjust settings:

```
sudo kate /etc/sensors.conf
sensors -s
```

libsensors and lm-sensors are not used by the Linux kernel (which uses other routines).

Some hardware CPU sensors are not recognized by the Linux kernel, causing system slowdown or freezing. [Here](#) is some info about hardware/sensors problems.

## Sensors-applet (Motherboard monitoring)

Sensors-applet (or xsensors) is the Gnome (Ubuntu) frontend for lm-sensors. These sensors monitor the temperature and fan-speed sensors of your motherboard.

```
sudo apt-get install sensors-applet lm-sensors
sudo sensors-detect
sensors-applet
```

- Make sure your sensors are installed.

```
sensors
```

For more info, see [this thread](#).

## Graphics Cards

### Frequency Out of Range / Choose New Resolution

- If this error appears when booting Natty Narwhal, see the solution found [here at Ubuntu Forums](#):

◇ Edit the grub configuration file:

```
sudo gedit /etc/default/grub
```

◇ Edit the lines:

```
# The resolution used on graphical terminal
# note that you can use only modes which your graphic card supports via VBE
# you can see them in real GRUB with the command `vbeinfo'
#GRUB_GFXMODE=640x480
```

by removing the comment hashmark and choosing an appropriate resolution so that the lines resemble:

```
# The resolution used on graphical terminal
# note that you can use only modes which your graphic card supports via VBE
# you can see them in real GRUB with the command `vbeinfo'
GRUB_GFXMODE=1024x768
```

◇ Re-build the grub configuration file:

```
sudo update-grub
```

### Install Latest Nvidia/ATI drivers

Ubuntu uses a GUI frontend to [Jockey](#) for the installation of the proprietary nVidia drivers (and other proprietary drivers).

Menu -> System -> Hardware Drivers

- Sometimes after a kernel upgrade a proprietary driver may stop working. In such a case, try installing the new linux-headers that match the newly upgraded kernel:

```
sudo apt-get install linux-headers-$(uname -r)
```

If dkms and build-essential have never been installed on your system, these can also be worthwhile:

```
sudo apt-get install dkms build-essential
```

### Intel integrated graphics cards

- With the default installation of Maverick, my computer with integrated Intel graphics blanked the screen at bootup and then froze. These steps work around this problem.
- When booting up, choose recovery mode as root (or "root with networking"). This will give the command line (as root user).
- Edit the Grub2 configuration file:

```
sudo nano /etc/default/grub
```

◇ Change the line:

```
GRUB_CMDLINE_LINUX_DEFAULT="quiet "
```

to

```
GRUB_CMDLINE_LINUX_DEFAULT="quiet i915.modeset=0"
```

◇ Then regenerate the Grub2 configuration file:

```
sudo grub-mkconfig --output=/boot/grub/grub.cfg
```

When I then rebooted, my graphics worked.

### Intel graphics resolution problems

- On a fresh installation of Karmic Koala I had no problems with my onboard Intel graphics card. However, on an update from Jaunty to Karmic, I could not get higher screen resolutions -- the same problem I had in Jaunty. A solution to achieve higher resolutions is to revert to the old Intel drivers (used in Intrepid), as detailed [here](#).

### Screen Keeps Flickering

If you have an Intel Corporation Mobile 915GM/GMS/910GML card, your screen may flicker every 5-10 seconds. To prevent this:

- Menu -> System -> Administration -> Advanced -> Service Manager -> Uncheck "Detect RANDR (monitor) changes"

## Reconfigure xserver-xorg

```
sudo dpkg-reconfigure xserver-xorg
```

### xorg.conf

Before installing any driver for ATI or nvidia, please make backup xorg.conf before following this method.

```
sudo cp /etc/X11/xorg.conf /etc/X11/xorg.conf.bak
```

If you have edited this file but would like it to be automatically updated again, run the following command:

```
sudo dpkg-reconfigure -phigh xserver-xorg
```

If you want to try this xorg.conf after installing the driver, you must back up your xorg.conf as following. And then, edit /etc/X11/xorg.conf in text editor. **Add or modify** this xorg.conf sample.

### xorg.conf for nvidia

```
Section "Screen"
Identifier "Default Screen"
Device "Configured Video Device"
Monitor "Configured Monitor"
```

## Ultimate Edition Guide

```
SubSection "Display"
Depth 16
Modes "1280x1024" "1024x768"
Option "AddARGBGLXVisuals" "True"
EndSubSection

Option "AddARGBGLXVisuals" "True"
Defaultdepth 24
EndSection
Section "Module"
Load "glx"
Load "GLcore"
Load "v4l"
EndSection
Section "Device"
Identifier "Configured Video Device"
Boardname "vesa"
Busid "PCI:1:0:0"
Driver "nvidia"
Screen 0
EndSection

Section "Device"
Identifier "Device0"
BoardName "Generic Geforce 5500"
Driver "nvidia"
Vendorname "NVIDIA Corporation"
Option "DualHead" "1"
Option "ShadowFB" "1"
Option "FPScale" "1"
Option "TwinView" "True"
Option "TwinViewOrientation" "RightOf"
Option "UseEdidFreqs" "True"
Option "Metamodes" "1024x768,1024x768"
Option "UseDisplayDevice" "DFP"
EndSection

Section "Device"
Identifier "Videocard0"
Driver "nv"
VendorName "NVIDIA Corporation"
BoardName "GeForce 7600 GT"
EndSection

Section "InputDevice"
Identifier "Generic Keyboard"
Driver "kbd"
Option "XkbRules" "xorg"
Option "XkbModel" "pc105"
Option "XkbLayout" "us"
EndSection

Section "InputDevice"
```

```
Identifier "Configured Mouse"  
Driver "mouse"  
EndSection  
Section "ServerLayout"  
Identifier "Default Layout"  
screen 0 "Default Screen" 0 0  
EndSection  
  
Section "Extensions"  
Option "Composite" "Enable"  
EndSection
```

## Installation of ATI and nVidia Graphics drivers

### nVidia Driver

The current proprietary nVidia drivers are automatically installed using:

Menu -> System -> Administration -> Hardware Drivers

Look for the current drivers to activate there.

- Here are alternate manual instructions.

◇ Please make a backup of xorg.conf before following this method.

```
sudo cp /etc/X11/xorg.conf /etc/X11/xorg.conf.bak
```

◇ Install the nvidia-settings package:

```
sudo apt-get install nvidia-settings
```

◇ Download the nVidia driver:

```
wget -O NVIDIA-Linux-x86-pkg1.run http://www.nvidia.com/Download/index.aspx?lang=en-us  
sudo sh NVIDIA-Linux-x86-pkg1.run
```

and choose yes to any verbose response. After you install the driver, reboot your computer.

### ATI Driver

If you have problems with ATI drivers after upgrading, check [this link](#) for solutions to common problems with ATI.

## Monitors / Displays

### Turn off power saving

Even when on AC power, the power saver feature of Ubuntu sometimes changes the screen brightness to the battery setting on laptops. This was a problem with the ACPI power management module in the past, but should now be fixed. If not, change the settings:

To access the Guidance Power Manager module, click on the power icon on the desktop taskbar. Change the brightness setting for "Battery powered" to maximum.

You can also turn off power management settings (invoked when the computer is idle):

Menu -> System -> Preferences -> Power Management -> Display -> Put display to sleep when inactive for: *Never* -> Close

### Configure Dual Monitors with nVidia

- Make sure that the nVidia driver has been installed and is functioning properly on your first screen. Also, make sure both monitors are connected.
- Menu -> Administration -> NVIDIA X Server Settings

or from the command-line terminal (Terminal or Konsole) type:

```
sudo nvidia-settings
```

- Select "X Server Display Configuration".
  - You should see 3 boxes (2 if your card doesn't have an S-Video out). From here you can configure all of your card's outputs.
  - Check the "(Disabled)" box.
  - Select "Configure...".
    - ◊ The most common choice is TwinView. Select it.
- Setup the desired screen resolutions and positions of your two active displays.
  - The new display will likely have resolution set to "Auto" to match your first. Change this if you wish.
  - Leave the first screen's position as "Absolute" and set your second display's position relative to that.

- "Clone" means the same output on both.
- Once you are satisfied with your settings, hit Apply to test them.
  - Note: if your displays are side-by-side, the kicker may extend across both screens as well as any maximized applications. This will be corrected when the X server is restarted.
  - If everything else is ok, hit "Save to X Configuration File". Now hit Ctrl+Alt+Backspace to restart X. You now have 2 screens!
- Troubleshooting: if the X server fails to reload you can recover your old X configuration. In a terminal:

```
sudo cp /etc/X11/xorg.conf.backup /etc/X11/xorg.conf
```

## Hard Drives and USB Storage

### Optical Drives

### Printers & Scanners

The new CUPS interface recognizes many printers. Specific printers not recognized can often be installed using instructions found at [the Linux Foundation OpenPrinting database](#).

#### Add a Printer

Menu -> System -> Administration -> Printing -> Server -> New -> Printer

Most of the time, your printer (if connected and turned on) will be detected automatically.

My network printer with its own IP address at 192.168.0.124 was correctly installed at

```
socket://192.168.0.124:9100.
```

You can also choose printers on a Windows system via Samba and other types of networked printers, in addition to directly connected printers.

## Use CUPS web interface

From any web browser, go to the URL:

```
http://localhost:631
```

## Brother printers

Most Brother printers are auto-detected or can be installed directly from the CUPS interface. For additional drivers and instructions see the [Brother help site](#). For information on a specific model, see [the Linux OpenPrinting site](#).

- [MFC-7820N](#)

## HP Printers

For Hewlett Packard printers / scanners, install hplip and hplip-gui.

```
sudo apt-get install hplip hplip-gui
```

- Add the printer:

Menu -> Applications > System Tools > HP Toolbox

This should set up printer / scanners for scanning as well.

- For scanning, install Xsane:

```
sudo apt-get install sane xsane
```

Run:

Menu -> Applications -> Graphics > Xsane image scanning

A full library of Linux drivers for HP printers is [here](#).

## Sound

If you get no sound with a fresh install, check that the sound levels are not set to zero. Click on the sound (speaker) icon on the panel, and then mixer. You may need to expand the dialog window to show labels.

Ensure levels aren't set to zero, especially PCM.

Sound is routed by Phonon either directly to your sound card or through the PulseAudio sound system. To use [PulseAudio](#), you must install it (see below). Some experimentation with the settings in

Menu -> System -> System Settings -> Multimedia

may be necessary to make sound on your system work properly.

Try setting PulseAudio as the first sound system if you are having troubles getting sound (even if you are using ALSA). If that doesn't work, try making it the last choice.

Some programs require ALSA sound and try to send sound directly through ALSA drivers. Check your program's preferences section to see if ALSA is selected. You may have to switch to PulseAudio (or even OSSound) if you can't get sound.

## PulseAudio

Maverick has PulseAudio in the repositories:

```
sudo apt-get install pulseaudio pavucontrol padevchooser
```

Add your user to the proper groups:

Menu -> System -> Administration -> Users and Groups -> user -> Manage Groups --> pulse, pulse-access, pulse-rt, audio -> Properties -> Group Members -> user (ticked)

Configure Pulse Audio:

Menu -> System -> Preferences -> PulseAudio Preferences Sound Audio preferences

## HDMI with PulseAudio

I could only get my HDMI audio on my computer to work this way, and I can't quite figure out why it works.

- I checked to make sure my Mobile Intel 4 Series HDMI audio driver was installed (it is part of the most recent kernels):

```
aplay -l  
aplay -L
```

This told me the HDMI card was recognized and configured properly. The problem was that no matter what I did, I couldn't get the sound piped through the HDMI card using ALSA, Kmix or any other settings (I tried every permutation).

- I installed Pulse Audio:

```
sudo apt-get install pulseaudio pavucontrol padevchooser
pavucontrol
padevchooser
```

- In PAVUControl I selected the HDMI card as the output device:

Menu -> Multimedia -> PulseAudio Volume Control -> Configuration -> Internal Audio -> Digital Stereo (HDMI) Output

Then everything played through the HDMI audio card (through the cable to my HDTV).

This worked whether I had PulseAudio selected as the default audio or not (in System settings -> Multimedia). Don't ask me why.

- My HDMI port/output is only recognized if the HDMI cable is plugged in at bootup (it does not matter whether the HDTV power is on or not). If I plug in the HDMI cable after bootup, it isn't recognized.
- After doing this, every program I use works: VLC, Audacious, or whatever. It does not seem to matter whether the application is using Default, ALSA, or PulseAudio for the audio output plugin. None of this makes sense to me, but it works. I'm happy to be able to play HDMI movies (through VLC) to my HDTV.
- To change sound output back to my computer's internal speakers (ALSA), I returned the output setting:

Menu -> Multimedia -> PulseAudio Volume Control -> Configuration -> Internal Audio -> Analog Stereo Output

## Airport Express

### Airport Express with Pulse Audio

Audio output can be streamed over your local network to an Airport Express. Make sure your [firewall](#) is not blocking ports 5353, 5000, and 6000. These capabilities require the pulseaudio-module-raop (for Airport Express) and pulseaudio-module-zeroconf for the Zeroconf/Bonjour networking protocol.

Install Pulse Audio:

```
sudo apt-get install pulseaudio pavucontrol padevchooser pulseaudio-module-raop pulseaudio-modu
pavucontrol
padevchooser
```

Then configure Pulse Audio:

K Menu -> Settings -> PulseAudio Preferences Sound Audio preferences -> Network Access

and check both:

Make discoverable network sound devices available locally  
Make discoverable Apple Airtunes devices available locally

You can switch between devices and control device volume independently using:

K menu -> Multimedia -> PulseAudio Device Chooser  
K menu -> Multimedia -> PulseAudio Volume Control

- Select Pulse Audio as the output device in

K menu -> System -> System Settings -> Multimedia -> Device Preference

Note: Make sure your [firewall](#) is not blocking ports 5353, 5000, and 6000.

My AEX is discovered, but I got no sound through it until I selected it as the default sink (output) by one of two methods:

- From the PulseAudio Volume Control:

K menu -> Multimedia -> PulseAudio Volume Control -> Output Devices  
then click the arrow and set the AEX device as default

- From the PulseAudio Device Chooser:

K menu -> Multimedia -> PulseAudio Device Chooser -> Manager -> Devices -> Sinks

I then noted the name of my Airport Express device to be raop.Base-Station-e60157.local, so  
I entered that as the sink:

PulseAudio Device Chooser -> Default sink -> Other -> raop.Base-Station-e60157.local

Now, any devices (or multimedia players) setup to play through PulseAudio will play through the stereo attached to the Airport Express.

### raop-client (Airport Express streaming)

Another method to stream audio to the Airport Express uses raop-client, a tool written in Ruby. See information [here](#).

### GSTransmit (Airport Express streaming)

[GSTransmit](#) is a tool to allow GStreamer-based utilities to stream output to an Apple iTunes Device (such as the Airport Express). It is available as a self-installing .deb file from the website.

### Airfoil (Airport Express streaming)

You can stream media from a PC running Windows or Mac OS X connected to an Airport Express network to your Kubuntu Linux desktop, using [Airfoil](#). (Unfortunately you cannot send media output from Kubuntu to the Airport Express network with Airfoil, only receive.) This can be useful in a distributed multimedia system, for example, in which your Kubuntu PC is connected to a media center. You must be running [Mono](#). You can download the .deb package [at Rogue Amoeba](#). Installation instructions are at [Rogue Amoeba Linux support](#).

## Mice

### Activate side-mouse-buttons in FireFox

Adding two lines to xorg.conf will activate side-mouse-buttons in FireFox.

- This should work with most brands of the 5-button mouse. Here is a list of mice that worked with this instruction.

- Logitech MX310
  - Logitech MX510
  - Logitech MX518
  - Logitech MX700
  - Logitech MX Revolution
  - Intellimouse Explorer (first edition)
  - Razer Copperhead

- Backup X.org configuration file

```
sudo cp /etc/X11/xorg.conf /etc/X11/xorg.conf.bak
```

- Modify the X.org configuration file

```
kdesu kate /etc/X11/xorg.conf
```

- Find the Input Device section for your mouse and add two lines as shown below.
  - You may also increase the number of buttons if your mouse has more than 7 -- just fix the rest of the section based upon the number of buttons.

Note: "back/forward", "wheel click" & "tilt left/right" all count as buttons

- Change:

```
Section "InputDevice"
  Identifier "Configured Mouse"
  Driver "mouse"
  Option "CorePointer"
  Option "Device" "/dev/input/mice"
  Option "Protocol" "ExplorerPS/2"
  Option "ZAxisMapping" "4 5"
  Option "Emulate3Buttons" "true"
EndSection
```

to:

```
Section "InputDevice"
  Identifier "Configured Mouse"
  Driver "mouse"
  Option "CorePointer"
  Option "Device" "/dev/input/mice"
  Option "Protocol" "ExplorerPS/2"
  Option "ZAxisMapping" "4 5"
  Option "Emulate3Buttons" "true"
  Option "Buttons" "7"
  Option "ButtonMapping" "1 2 3 6 7"
EndSection
```

## Touchpad

For Synaptics Touchpads:

```
sudo apt-get install gsynaptics
```

For more info, see [the Ubuntu help wiki](#).

## Wacom Pen Tablets

Support for the Wacom pen tablet is integrated into Jaunty by default, including for hotplugging. For more info, see the [Ubuntu documentation](#).

## Remote Controls

### LIRC (Infrared Remote Controls)

[LIRC](#) (Linux Infrared Control) allows you to use [most infra-red remote controls](#). This can be installed from Menu -> Applications -> Ubuntu Software Center -> System -> lirc

or

```
sudo apt-get install lirc
```

### Remuco (Bluetooth and WiFi Remote Controls)

[Remuco](#) is a utility for controlling [many multimedia players](#) (such as VLC, Amarok, Rhythmbox, Audacious, and many others) using [a Bluetooth or WiFi remote control](#). Each player has its own package. For example, the VLC package is named remuco-vlc and can be installed:

```
sudo apt-get install remuco-vlc
```

## Bluetooth

[BlueZ](#) is the package that allows Bluetooth connectivity in Ubuntu Linux. This package is included within the current kernel of Ubuntu. To add utilities to check whether your Bluetooth adapter's firmware is current, install:

```
sudo apt-get install bluez-utils bluez-firmware
```

then run

```
sudo dfutool
```

## WiiMote

The WiiMote (Wii Remote Control) uses both Bluetooth and Infra-red technology. It communicates with Ubuntu Linux using the incorporated BlueZ Bluetooth drivers and/or LIRC drivers. (It can function with Bluetooth alone, however.) You will need a Bluetooth receiver on your PC (such as a Bluetooth USB stick or built-in Bluetooth receiver, for example). (Note: not all Bluetooth receivers will work with the Bluez drivers. Check [this list](#) or test yours first.)

- Install the [cwiid](#) WiiMote controller package and the lswm WiiMote discovery package:

```
sudo apt-get install wminput lswm
```

- Install the drivers (or just reboot):

```
modprobe uinput
```

Note: You can also add uinput to the modules files so it loads automatically at bootup:

```
sudo echo "uinput" >>/etc/modules
```

Run (while pressing button 1/2 on the WiiMote):

```
sudo wminput
```

For more info, and to learn how to enable the infra-red functions, see [this guide](#).

## USB

### Wireless Cards

#### Atheros Cards

Atheros Wireless cards should work automatically with the new kernel by installing the proprietary driver. At installation, after the first reboot, you will be prompted whether to use the proprietary drivers.

It should no longer be necessary to install the following package:

```
sudo apt-get install madwifi-tools
```

These instructions for the Atheros 802.11 b/g integrated card are here for reference only (or if you wish to install them manually instead):

- Download the latest '[snapshot](#)' driver from [Madwifi](#). When I was doing it, the version was:

```
madwifi-hal-0.10.5.6-current.tar.gz
```

- Extract the files
- Make sure your linux headers and build-essential packages are installed:

```
sudo apt-get install build-essential
sudo apt-get install linux-headers-$(uname -r)
```

- Unload any drivers already running.

```
sudo ifconfig ath0 down
sudo ifconfig wifi0 down
```

- Change to the directory where you extracted the driver.

```
cd <directory_where_driver_unzipped>
```

- From that directory, run the installation scripts:

```
cd scripts
sudo ./madwifi-unload
sudo ./find-madwifi-modules.sh $(uname -r)
cd ..
```

- Complete the installation by compiling the source and installing it.

```
sudo make
sudo make install
```

- Add the installed drivers to your system.

```
sudo modprobe ath_pci
```

Following this, Network Manager was able to see the wireless card and I was able to configure everything else (WEP / WPA key, etc.) from there.

Complete instructions are available at [MadWifi UserDocs](#).

### Atheros AR242x

Alternate instructions for installing the Atheros AR242x card are [here](#).

## 3G

[3G protocols](#) allow wide area cellular communications that include not only cellphone voice transmission but also integrated broadband internet connections. This can be integrated into a single device, or communications can be received through an EVDO adapter. Examples of 3G radio interfaces include Mobile WiMax, CDMA-2000, TD-CDMA, EDGE, and DECT. For info using 3G with the Ubuntu Network Manager, see [this page](#). For additional info on using 3G with Ubuntu, see [this guide](#).

### he220r1

[he220r1](#) is a (K)ubuntu driver package for the Huawei e220 USB modem. It has also been found to work with other 3G devices, such as Nokia, Sony Ericsson, and Motorola. See the website for download and installation instructions.

### T-Mobile Option 225 (Web'N'Walk) Stick

[This website](#) offers a driver optimised for the T-Mobile Web'n'Walk Stick/Option 225.

### Virgin Huawei e169

See [this Ubuntu forum solution](#):

```
sudo gedit /etc/ppp/options
```

find the line that says:

```
#-chap
```

and uncomment it (delete #)

```
-chap
```

this (I think) disables CHAP authentication

I also had to change the APN to VirginBroadband instead of VirginInternet which was the default, and now it's happy.

```
Other settings
Number *99#
Uname <your virgin username>
PW <your virgin password>
```

## EVDO Cards

EVDO cards include USB modems and adapters to receive wide-area cellular broadband Internet connections.

### Sprint

Sprint EVDO cards can be used most easily through KPPP. For instructions, read the [Sprint Mobile Broadband Setup Guide](#). Also see the [EVDO Forums](#).

### Verizon

See this [Crystal Networking guide](#).

#### Tethering your PC to your Verizon cell phone

This is a per-minute plan in which you can use Verizon broadband services through your cell phone (such as the Motorola RAZR) connected to your PC via a USB cable. See [this guide](#).

## Digital Cameras

## WebCams

See the [Ubuntu webcam guide](#) for more info. Many webcams that worked in Hardy Heron may not work in Intrepid Ibex. This may be due to a migration from v4l (video for Linux) to v4l2. See [this discussion](#).

## EasyCam

[EasyCam2](#) is a utility for finding and installing drivers for your webcam. See [these installation instructions](#).

## iSight

Linux drivers for the digital iSight camera (connected by FireWire), using ALSA for sound, are [here](#). The video component is already supported by current kernels (see [here](#) for more information).

## Luvcvview (USB webcam viewer)

Luvcvview can be used to view your USB webcam to test it. Install:

```
sudo apt-get install luvcvview
```

View your webcam:

```
luvcvview -f yuv
```

## Netbooks

Ubuntu can be installed on netbooks. (See this [this page for laptop and netbook compatibility reviews](#).) At this time the Ubuntu Netbook Remix (or equivalent) is preferred to the standard Gnome-based desktop, especially for new users. [Ubuntu Netbook Remix](#) is provided to several individual netbook manufacturers (such as Asus and Acer) to be optimised for that device. (You can contact your specific netbook manufacturer for specific details on this product.) If you already have Ubuntu Netbook Remix (or eeebuntu Netbook Remix) installed, you can choose to add the full Ubuntu (Gnome) desktop, if you wish:

```
sudo apt-get install ubuntu-desktop
```

- Asus eeePC 1000H
  - Reduce font size one or two sizes, and set the screen DPI to 120.
  - [eeebuntu Netbook Remix](#) is available for this device.
- Dell Mini 9
  - Ubuntu Netbook Remix runs on this device well. See [this guide](#).
- HP Mini 1000 Mi

- A custom edition of Ubuntu is installed on this version of [this device](#). No additional configuration is necessary.
- Samsung NC10
  - Some package should be installed for keyboard functions (FN Key+functions). The procedure to install these package is available in [this forum](#).

Another method is to install Ubuntu onto your netbook from scratch using a [USB flashdrive LiveCD](#).

### Acer Aspire One

There are several Ubuntu-based and other Linux-based OS's specially customised for the Acer Aspire One. Some of them are:

- [DebianAcerOne](#)
- [Kuki Linux](#)
- [Linux4One](#)
- [Lord-Linux](#)
- [eeebuntu Netbook Remix](#) is available for this device as well. See [this article](#) for the necessary tweaks.

Also see [the Ubuntu website](#) for detailed tweaks and fixes. More useful information can be found in the [Ubuntu Linux sub-forum](#) at aspireoneuser.com

### Palm

### Mobile Devices

Ubuntu Linux offers an operating system for Mobile Devices (such as the Samsung Q1 Ultra or Elektrobot MIMD) with a unique and simplified interface. For more information see the [Ubuntu MID Edition](#) site.

### GPS

[Tux Mobil](#) has a list of Linux applications for use with GPS devices, and compatible hardware. Two GPS packages are available from the Ubuntu/Kubuntu repositories:

- [Viking](#) is a free open source package to view GPS data in maps, and to plot co-ordinates. This has been [reviewed](#) as the best Linux GPS mapping program.

```
sudo apt-get install viking
```

- [GPS Drive](#) is a free navigation software package that displays your position on a zoomable map using your GPS device. It is GTK-based but can be used in Kubuntu. It uses the [gpsd](#) daemon that interfaces with a variety of [GPS hardware](#). A [.deb package](#) of the current version is also available from the website. Install:

```
sudo apt-get install gpsdrive
```

- [tangoGPS](#) is a beautiful, lightweight GPS mapping program that uses map data from the [Openstreetmap](#) project. It is a GPL-licensed open source project. A .deb package can be found [here](#).

## MP3 / Video Players

### Sansa Fuze

The Sansa Fuze is a very high quality MP3 audio as well as video player. It is recognized by default as a USB device in Ubuntu/Kubuntu. To convert videos into a format that can be copied to the player, use [Video4Fuze](#).

- Download and install:

```
wget http://video4fuze.googlecode.com/files/fuzemux-0.1_amd64.deb
wget http://video4fuze.googlecode.com/files/video4fuze-0.6_all.deb
sudo dpkg -i fuzemux-0.1_amd64.deb
sudo dpkg -i video4fuze-0.6_all.deb
```

Use *fuzemux-0.1\_i386* instead of *fuzemux-0.1\_amd64.deb* if using a 32-bit OS.

- Start video4fuze from the command line:

```
video4fuze
```

or create a menu item with the Command: video4fuze.

- Convert files (mpg or mp4) using Video4Fuze. Do not use the Sansa Fuze player as the output folder, but use an output folder on your computer. Once the files have been converted, then copy them directly to a Video folder on the Sansa Fuze (using Nautilus in Ubuntu or Dolphin in Kubuntu).
- I like [k9copy](#) to extract something (that I have saved) on a DVD to an mp4 (.avi) first. The Sansa Fuze likes video at 224 x 176 and DivX 4/5, so I extract to those specifications:

Menu -> Multimedia -> k9copy -> Input: DVD -> Output: MPEG-4 encoding -> folder icon:

```
/home/user/Videos
```

```
k9configure -> MPEG-4 -> Video -> Codec: MPEG-4 (DivX 4/5) -> Width: 224 -> Height: 176  
-> Audio: mp3 (lame) -> Bitrate: 128
```

I then use video4fuze to convert the extracted mp4 (.avi) into the format that the Sansa Fuze likes.

- Limitations: At this time Flash videos (.flv) cannot be converted directly by Video4Fuze. You must convert flash videos to another format (such as .mpg or mp4/.avi) prior to Video4Fuze conversion, using a converter such as mencoder or [ffmpeg](#) (e.g. with WinFF as the GUI).

### MachSpeed Trio

The MachSpeed Trio works natively with (K)Ubuntu Linux. Files can be copied directly to the device from a File Manager (Dolphin or Nautilus).

- Video formats include .mpg, .flv and .avi. However, the screen is 7.5 cm x 4 cm, which is a 1.875 ratio (widescreen). If your video has a 1.33 ratio (fullscreen), you must add left and right padding to make it look normal. If your video is 320 x 240, for example, you must add left and right padding of 64 each (making it 448 x 240, which is approximately a 1.875 ratio).

In addition, I found I had to convert some videos twice (using [ffmpeg](#)) to get it into a format the Trio would accept. For example, I have a 160x120 .avi video I recorded on my camera. (This requires 32 padding on each side instead of 64.) There was a 2 step conversion required to get it into a format the Trio liked:

```
ffmpeg -i cameravideo.avi -target ntsc-dvd -s 160x120 tempvideo.avi  
ffmpeg -i tempvideo.avi -padleft 32 -padright 32 triovideo.avi
```

The first step does whatever it takes to get the video into a NTSC-compatible format. However, it encodes into the ac3 audio codec, which the Trio doesn't like. The second step converts the audio from the ac3 format to the default mp2 audio format (which the Trio likes better) as well as adds the padding (which in reality can be done in either step). I have tried to simplify this into a single command but haven't figured out how to do it yet.

I then copy the converted file directly onto the Trio, where it plays.

# Networking

Only one network manager and GUI interface can be enabled. Network-Manager is installed by default, but many users prefer [Wicd Network Manager](#).

## Network Manager

[Network Manager](#) is network manager installed by default in Ubuntu. It has a tray applet that allows you to switch between Internet connections (such as wireless APs or wired connection).

## Wicd Network Manager

[Wicd Network Manager](#) is a GTK-dependent networking manager written in Python that can be used in all variants of Ubuntu. Many users (including me) report it to be faster and more stable than Network Manager. To avoid networking conflicts, Wicd requires the removal of Network Manager prior to installation.

```
sudo apt-get remove network-manager
sudo reboot
sudo apt-get install wicd
```

## Set a static IP address

I have never been able to get Network Manager to accept my static IP address settings. If you only use only a wired interface, you do not need a network manager and it can be removed.

- Remove Network Manager:

```
sudo apt-get remove network-manager
sudo reboot
```

- Edit the `/etc/network/interfaces` file:

```
sudo gedit /etc/network/interfaces
```

- and replace the line (ok if line is missing)

```
iface eth0 inet dhcp
```

- with the following lines (using your own LAN settings, of course):

```
auto eth0
iface eth0 inet static
address 192.168.0.35
netmask 255.255.255.0
network 192.168.0.0
broadcast 192.168.0.255
gateway 192.168.0.1
```

- Then restart networking:

```
sudo /etc/init.d/networking restart
```

- Check to see if your settings are now correct:

```
ifconfig
```

- If you need a static IP address and have a wireless connection, Wicd Network Manager works:

◊ Uninstall Network Manager and install Wicd instead:

```
sudo apt-get remove network-manager
sudo reboot
sudo apt-get install wicd
```

## Manual configuration from the command-line

3 steps for WEP:

```
sudo iwconfig eth[N] essid [SSID]
sudo iwconfig eth[N] key restricted s:[PASSWORD]
sudo dhclient
```

WPA is more complicated:

```
su
mkdir /etc/wpa_supplicant
cd /etc/wpa_supplicant
echo network = { > wpa_supplicant.conf
echo ssid="SSID" >> wpa_supplicant.conf
echo key_mgmt=WPA-PSK >> wpa_supplicant.conf
echo psk="PRESHAREDKEY" >> wpa_supplicant.conf
echo } >> wpa_supplicant.conf
cd /etc/network
vim interfaces
```

Now add after "auto eth[N] ..." & "iface eth[N] .." (press 'i'):

```
wpa-driver wext # or whatever driver your network card needs
wpa-conf /etc/wpa_supplicant/wpa_supplicant.conf
```

Save the file ('Esc', ':x', 'Enter') and restart your system.

## Internet connection sharing (DHCP server)

In most LANs, an inexpensive router is used to provide [DHCP](#) functions (internet connection sharing).

However, DHCP services can also be provided by a single host computer on your [LAN](#) if it is directly connected to the Internet. (This is useful, for instance, if you have a 3G or other wireless EVDO connection to your computer which you want to share with the other computers on your LAN). Other client computers on your LAN would then connect to the Internet through your host computer's Internet connection. The host computer now essentially performs the DHCP functions of a router.

All "client" computers on the LAN ought to be connected to a central LAN switch or router. (If using a router, it should have its own DHCP functions disabled -- you shouldn't have 2 DHCP servers on a LAN unless you know how to [nest LANs](#)). They should all be set up to obtain DHCP-assigned dynamic IP addresses and use the same LAN subnet settings (which in the example below is LAN IP range *10.0.0.1 - 10.0.0.250* with netmask *255.255.255.0* and gateway *10.0.0.1*). The host computer to be used as the gateway/DHCP server is then connected (through its own ethernet port) either to one to the ports of the switch (if used), or to a LAN port of a router (don't use the WAN port). The host computer then connects directly to the Internet ([WAN](#)) through a second port (which in the example below will be a wireless (wifi) port (wlan0)).

(Note: This setup is easiest if you connect all computers on the LAN with Ethernet cables to the central switch or router. But also see [using a nested wireless LAN router](#) below.)

(Note: If you want your LAN to use the same subnet as your WAN, see [network interface bridging](#).)

- Install the DHCP server and firewall programs:

```
sudo apt-get install dhcp3-server firestarter
```

- Rename the startup command (through a symbolic link) for the DHCP server. This is required or Firestarter will not know where to find it:

```
sudo ln -sf /etc/init.d/dhcp3-server /etc/init.d/dhcpd
```

- Edit the DHCP server configuration file:

```
sudo nano -w /etc/default/dhcp3-server
```

Change the line

```
INTERFACES=""
```

to

```
INTERFACES="eth0"
```

- Restart the DHCP server:

```
sudo dhcpd restart
```

- Right click on Network-Manager -> Edit Connections... -> Wired -> Add

-> Connection name: *Shared internet connection*

-> IPv4 Settings -> Method: Manual -> Add

-> Address: *10.0.0.1* -> Netmask: *255.255.255.0* -> Gateway: *0.0.0.0*

-> Available to all users: [x]

- Attach the ethernet cable to (eth0).

Network-Manager -> Wired Networks -> *Shared internet connection*

- Adjust your firewall to allow the internet connection sharing. Start Firestarter:

```
sudo firestarter
```

◊ Tell the firewall which port is your direct Internet Connection:

Firestarter -> Preferences -> Firewall -> Network Settings -> Internet connected network device: (wlan0)

-> IP address is assigned by DHCP: [x]

◊ Tell the firewall which port is for the LAN, and specify the details for the LAN:

Firestarter -> Preferences -> Firewall -> Network Settings -> Local network connected device: (eth0)

-> Enable internet connection sharing: [x]

-> Enable DHCP for the local network: [x]

-> DHCP server details -> Create new DHCP configuration -> Lowest IP address to assign:  
*10.0.0.2*

-> Highest IP address to assign: *10.0.0.250* -> Name server: <dynamic>

Note: Use your own desired LAN settings (internal [DHCP-assigned dynamic IP](#) address range), of course. In this example I don't use the full IP range *10.0.0.2 - 10.0.0.255* for dynamic IP addresses because I want to reserve some LAN addresses (*10.0.0.251 - 10.0.0.255*) to be used as static IP

addresses).

- Notes:

- ◊ If you wish to use this setup all the time, make the "*Shared internet connection*" profile your default connection profile in Network Manager.

## Using a nested wireless LAN router

Many users will already have an established LAN that uses an existing wireless router and has client computers that are setup to connect wirelessly to the router. Here's how to maintain this setup and still use the internet connection sharing method of a single host computer as described above. This method is known as **nested LANs**. The wireless router will serve as a nested LAN for its wireless clients (only), but in turn will appear as a single device to the main LAN. The two LANs must have different IP ranges. For example, the main LAN may have an IP range *10.0.0.1 - 10.0.0.255* (with netmask *255.255.255.0*), as in the above example. The router's nested wireless LAN must then use a different IP range (for example *192.168.0.1 - 192.168.0.255* with netmask *255.255.255.0*).

- Do not use your wireless router's WAN (Internet) port.
- Connect the host computer (to be used as your main LAN gateway/router) to a LAN port (not the WAN/Internet port) of the wireless LAN router.
- Configure your wireless router's LAN so that it appears to be a *single device* to the main LAN:
  - ◊ Setup your wireless router so that the Internet Connection type is "Static IP" (often in the "Internet Setup" section). Configure the settings so that its "Internet IP address" is within the static IP address range of your main LAN (e.g. *10.0.0.254*), and make sure the subnet mask matches the one you chose for your main LAN (e.g. *255.255.255.0*). The gateway setting should be set to match the IP address of your host computer of the main LAN (e.g. *10.0.0.1* in the example of the preceding section). Now the wireless router will appear to the host computer as just another device on the main LAN.
  - ◊ If your wireless LAN is already functioning, you probably don't have to change any settings, but double-check to make sure the schema are compatible. Configure the wireless router's settings for the nested wireless LAN. This is done by enabling the router's DHCP server functions (in "Network Setup" or some similar configuration section of the router). The router ought to have as its own wireless LAN gateway address a "local IP address" (or "LAN IP address") of *192.168.0.1* (for the IP address range used in this example), and a "starting IP address" (for the DHCP-assigned dynamic IP address range to be used for the wireless clients) to be *192.168.0.2* or greater. (Some routers ask you to specify the entire range (such as *192.168.0.2 - 192.168.0.255*.)
- Make sure all your wireless client computers are set to obtain their DHCP-assigned dynamic IP addresses from the wireless router (gateway IP *192.168.0.1*) instead of from the main LAN gateway.

- Now all communications from the wireless client computers will be routed to the wireless LAN router first, which will then in turn route them to the host computer (which is acting as the main LAN gateway/router), which will then in turn route them to the Internet (WAN).
- Note: The host computer for the main LAN must have a static IP address (e.g. *10.0.0.1* as in the example of the preceding section) and it must match the gateway IP address configured in the wireless LAN router settings.

## Network Interfaces Bridging

- Install `bridge-utils` to be able to create network bridges:

```
sudo apt-get install bridge-utils
```

- Edit `/etc/network/interfaces`:

```
sudo nano /etc/network/interfaces
```

The `interfaces` file should look like this after editing it:

```
auto eth0
iface eth0 inet manual
#
auto br0
iface br0 inet dhcp
#
bridge_ports eth0 wlan0
#
# The loopback network interface
auto lo
iface lo inet loopback
```

- Restart networking with:

```
sudo /etc/init.d/networking restart
```

## Using Dynamic IP addresses for a webserver

Normally, domain name servers (DNS) that are used publicly on the Internet match a web server's URL name with the IP address of the server's host computer. If your computer has a static IP address, then you can publish your own web server's URL as belonging to the static, unchanging IP address of your computer.

However, if your IP address is dynamic (always changing) because you use an ISP (Internet Service Provider) that constantly changes your IP address (using DHCP), then you will need a Dynamic DNS service to

constantly keep track of your dynamically changing IP address and match it to of your web server's URL. Fortunately, there are a few Dynamic DNS services that will do this for you, either for a small fee or even for free. For more info, see [this Ubuntu Community help](#) article.

For specific tips on setting up Dynamic DNS, see [this article](#).

## Filesharing

### NFS

NFS is the default networking protocol for network file sharing in \*nix systems (including Ubuntu Linux).

### Samba File Sharing

#### Samba client

Samba is a networking protocol that allows compatibility with Windows-based networks. The Samba client is installed by default in Ubuntu and should work seamlessly (unless you have have a firewall blocking the ports).

#### Samba server

[Samba](#) provides file/print services for the SMB/CIFS protocol used in Windows-based networks. See the [official Ubuntu documentation](#) for more information about providing services in a Windows network. A Samba server can be installed using the tasksel option during installation of the Ubuntu [server](#) from the LiveCD, or at any time using:

```
sudo tasksel install samba-server
```

- An alternative method of installation is:

```
sudo apt-get install samba samba-tools system-config-samba smbfs
```

Note: samba-tools, system-config-samba, and smbfs are optional.

- Modify Samba settings.

◇ Method 1:

Menu -> System -> Administration -> Samba  
(Note: this is available only if you installed system-config-samba.)

It is recommended that your user be a member of the sambashare [group](#), as well.

### ◇ Method 2:

Enable File Sharing Server With User Login (Very Reliable Method)

Do the following on the machine that has the files to be shared:

- Add current user to Samba:

```
sudo smbpasswd -a username
```

(replacing username with your login username)

- Open the samba config file:

```
sudo nano /etc/samba/smb.conf
```

- Add the directories to be added (right at the end) in the following format:

```
[Pictures]
path = /home/username/<folder_to_be_shared>
```

(Replace username with your username and <folder\_to\_be\_shared> with the folder you want to share)

Press CTRL+X and then Y to save.

- Restart Samba:

```
sudo service smbd restart
sudo service nmbd restart
```

Note: Prior versions used:

```
sudo /etc/init.d/samba restart
```

- On Windows access the folder in the following format in Windows Explorer:

```
\\192.168.x.x
```

(replace 192.168.x.x with the actual IP address of your server which is serving the folder)

- On Linux type the following in Konqueror or Nautilus:

```
smb://192.168.x.x
```

(replace 192.168.x.x with the actual IP address of your server serving the folder)

Note: If you use Sharing in KDE's System Settings panel, be aware that there is a small bug, reported [here](#). In brief, you need to comment out/delete any instances of these two lines in /etc/smb.conf :

```
case sensitive  
msdfs proxy
```

### Change your Workgroup

To change your Samba (Windows network) workgroup:

```
sudo nano /etc/samba/smb.conf
```

Look for the line:

```
workgroup = WORKGROUP
```

and change the setting to whatever your LAN workgroup is.

### Recognizing Win98 machines

Microsoft networking is extremely quirky. To enable recognition of PCs with Windows 98, edit your Samba configuration file:

```
sudo nano /etc/samba/smb.conf
```

Then add the following lines to the file:

```
[global]  
# THE LANMAN FIX  
client lanman auth = yes  
client ntlmv2 auth = no
```

### Integrating into Mac OS X Network

See [this guide](#) for information on integrating Ubuntu into an existing Mac OS X Appletalk network.

## FTP Server

An FTP server allows the easy transfer of files between systems over the network. Clients such as [Filezilla](#) can be used to interact with an FTP server.

### vsftpd

[vsftpd](#) is an FTP server available in (K)Ubuntu. For configuration information, see the [official Ubuntu documentation](#). Install:

```
sudo apt-get install vsftpd
```

### proftpd

[Proftpd](#) is an FTP server available in (K)Ubuntu that can be used with either the MySQL or PostgreSQL database. Install:

```
sudo apt-get install proftpd-basic
```

## WebDAV

[WebDAV](#) is a method for allowing remote access to local folders via an HTTP-based web browser or file manager. This can be combined with user authentication (using LDAP or other password mechanism).

- See [this page](#) for instructions.

## Local Area Network

### Modems / Dial-up

Network Manager does not accept modem connections. See [Ubuntu help](#) for information on identifying and connecting with a modem. These instructions require `gnome-network-admin` (install while connected to a wired ethernet connection):

```
sudo apt-get install gnome-network-admin
```

## Gnome PPP and wvdial

[Gnome PPP](#) is a discontinued GUI frontend for the [wvdial](#) PPP modem dialer. It is still available as a package. Install:

```
sudo apt-get install gnome-ppp wvdial
```

See [this forum thread](#) for tweaks required to make Gnome PPP and wvdial operational in Lucid.

## GPPP

GPPP was the default modem dialing application in previous versions of Ubuntu.

Menu -> Applications -> Internet -> GPPP Internet Dial-up

# Remote Access

There are several methods of remote access. VNC sharing allows you to view and control a remote computer's desktop. (Windows users use a similar proprietary protocol called remote desktop protocol (RDP)). XDMCP allows a complete remote X-windows based login. Remote connections are hazardous unless proper security precautions are taken to prevent unauthorized logins and to ensure encryption of transmitted data.

## SSH

Secure Shell or SSH is a network protocol that allows data to be exchanged over a secure channel (or "tunnel") between two computers. Encryption provides confidentiality and integrity of data. The OpenSSH client is installed by default in Ubuntu so you can connect to another computer that is running an SSH server.

### Connect to a remote SSH server

#### From the command-line terminal

Install the [OpenSSH](#) client (if not already installed):

```
sudo apt-get install openssh-client
```

From the command-line Terminal type:

```
ssh -C <username>@<computer name or IP address>
```

Note: The `-C` option indicates compression, which speeds up transmission through the tunnel.

For example:

```
ssh -C joe@remote.computer.xyz
```

or:

```
ssh -C mike@192.168.1.1
```

or

```
ssh -C 192.168.1.1 -l mike
```

Note: `-l` specifies the login id.

If the SSH server is listening on a port other than port 22 (the default), you can specify that in your connection (with the `-p` option). For example, if the SSH server is listening on port 11022, connect:

```
ssh -C joe.friday@remote.computer.xyz:11022
```

or

```
ssh -C remote.computer.xyz -p 11022 -l joe.friday
```

If you have made a public/private key using `ssh-keygen`, the private key must be stored in `/home/user/.ssh`. The key should be accessible only to `user`

```
sudo chmod 600 /home/user/.ssh/identity
```

or

```
sudo chmod 600 /home/user/.ssh/id_rsa
```

To login with the key:

```
ssh -C remote.computer.xyz -p 11022 -l joe.friday
```

Note: You can run the command as a menu item, but the command must be "run in terminal."

## Port forwarding through SSH

- See [Using SSH to Port Forward](#) for full details.
- In brief, use

```
ssh -C <remote ip> -p <SSH tunnel port> -L <local port>:<remote computer>:<remote port> -l <user>
```

This specifies that any communications from your computer (localhost) going out through `<local port>` will be transmitted securely through the the SSH tunnel port. To use VNC through the tunnel, you would use an application like Krdc or Vinagre:

```
krdc vnc://localhost:<local port>
```

Note: `localhost` is equivalent to (and interchangeable with) `127.0.0.1`. Either can be used.

Note that for VNC, the default `<local port>` is 5900. In general, a remote VNC server (such as [X11VNC](#)) is also listening on the default `<remote port>` 5900 as well. The default `<SSH tunnel port>` is 22, as discussed above. All these can be changed, however, if you desire greater security.

For me, I noticed that I had to set <remote computer> to be the internal LAN IP address of the remote **computer** (such as 192.168.1.155) instead of the remote **router's** IP address, which is specified in <remote IP>. (If the remote computer has a static IP address (i.e. is directly connected to the Internet without an intervening router), then <remote computer> and <remote ip> would be the same.)

*Example:* For extra security, my SSH Server uses <SSH tunnel port>=11022. I want to VNC to a remote computer on a remote LAN with a router whose IP address is <remote ip> = 244.205.123.123. The remote computer to which I want to connect has a static IP address within the remote LAN of <remote computer> = 192.168.1.155. I have set up an [X11VNC server](#) on this computer that is listening on <remote port> = 6912 (instead of the default 5900). I setup port forwarding on the router of this remote LAN to forward port 6912 to this server computer. I want to VNC to this remote computer from my laptop, through the Internet. My laptop VNC client (Krdc) will use the default <local port> = 5900. My name is <user> = joe.friday. This is my story.

```
ssh -C 244.205.123.123 -p 11022 -L 5900:192.168.1.155:6912 -l joe.friday
krdc vnc://localhost:5900
```

If you have set up a private/ public key pair with a passphrase, or if your SSH server requires a passphrase, of course, you will be prompted for the passphrase after issuing the SSH command.

Note: Port forwarding assumes that the ports are also forwarded through the router(s) and through any firewalls. See the documentation for your router(s) and firewall to learn how to do this. The advantage of SSH tunneling is that only the <SSH tunnel port> needs to be open and forwarded by a router. All encrypted communications will go through your router using this single port. This is what makes the communications secure.

## PuTTY

[PuTTY](#) is a GTK-based GUI client-interface for SSH connections and eases the setup for port forwarding, SSH public key authentication, and automated login. A user would run Putty to create the SSH tunnel (instead of the ssh command) and then run a program such as Krdc or Vinagre. PuTTY is available for both Linux and Windows (but for routine Linux usage [OpenSSH](#) is generally recommended instead).

```
sudo apt-get install putty putty-tools
```

- To create a 2048-bit RSA key pair compatible with OpenSSH, it is possible to use [Puttygen](#) (part of Putty-tools). (For me the Linux version of Puttygen is occasionally buggy, however, so I recommend [OpenSSH keygen](#) for routine usage instead):

```
puttygen -t rsa -b 2048 -O private -o putty_rsa.ppk
puttygen putty_rsa.ppk -O public-openssh -o id_rsa.pub
puttygen putty_rsa.ppk -O private-openssh -o id_rsa
```

- Move the OpenSSH-compatible keys to the ~/.ssh (i.e. the /home/user/.ssh) folder

```
mv id_rsa* ~/.ssh
```

- **Copy the public key** ( /home/user/.ssh/id\_rsa.pub ) to the server that is hosting the OpenSSH server, into the /home/serveruser/.ssh (for whichever user is the administrative user for the server -- generally the user that installed the server initially). If the SSH tunnel is (still) set at default port 22, you can copy the key using the utility:

```
ssh-copy-id serveruser@remoteserver.computer.xyz
```

- Connect a VNC client (such as Krdc) through SSH using the command-line:

```
putty -ssh -i ~/.ssh/id_rsa -l serveruser -L 5900:127.0.0.1:5900 remoteserver.computer.xyz -P 22
krdc vnc://127.0.0.1:5900
```

or as a single command:

```
putty -ssh -i ~/.ssh/id_rsa -l serveruser -L 5900:127.0.0.1:5900 remoteserver.computer.xyz -P 22
```

- Alternatively, the PuTTY SSH Client GUI can be run (from Menu -> Internet -> PuTTY SSH Client) and options configured from there.

## Using keys created by Puttygen in OpenSSH

The public security key generated by Puttygen in Windows is generally not compatible with OpenSSH security keys unless it is edited. For example, the default OpenSSH key is 2048-bit RSA (SSH-2). When a 2048-bit RSA (SSH-2) PuTTY public/private key pair is generated (by Puttygen) in Windows (see [this tutorial](#)), the public key looks like:

```
----- BEGIN SSH2 PUBLIC KEY -----
Comment: "rsa-key-20100302"
AAAAB3NzaC1yc2EAAAABJQAAAQEAjdp567qxsGkhELlMQup2mXHdsveCWq/maU6k
unPpbkwEuhkasuOrhkAWgv5v3d8S857zdHcfnXWi2FkEaJuFxqpJ2IkFuvqRdqYD
ZCcASj2S0LoXdWpC4uon6VH8oBT31r+wkDfmI2a+K74jgXjtm1BWWxwOpKaWQH9
YItbY/06renRex34n3ej020JRqD/BxnFU7ND41Szo3ZMKoa0yzhevU2ntt74BCvC
bYFHdSoRbi3AH8qGIInzFfhXPdrG8qA382ZKEh5Bmy8Qxb9Uen/+jjP51YxN/ykee
RwSrdSCZekB6jN6uuTLNDEXJSJizqlPU8tROqf3pYv1kxzD9bw==
----- END SSH2 PUBLIC KEY -----
```

- To be used by OpenSSH, the saved public key must be edited.

- ◊ Delete the first two lines (with the BEGIN and Comment: in them) and the last line.
- ◊ Join the remaining lines into a single line.
- ◊ Place ssh-rsa at the beginning.
- ◊ It should end up looking like:

```
ssh-rsa AAAAB3NzaC1yc2EAAAABJQAAAQEAjdp567qxsGkhELlMQup2mXHdsveCWq/maU6kunPpbkwEuhkasuOrhkAWgv5
```

- Once the PuTTY public key is in this format, it can be appended to the `~/.ssh/authorized_keys` file on the OpenSSH server. (The private key stays on the client computer, of course). PuTTY can then connect (from Windows or Linux) to an OpenSSH server using the public/private key method.

## Connect using SSH Agent

With SSH Agent you can automate the use of public key authentication and open an XDM or VNC session using a script. See [this tutorial](#).

Also see this alternative simple approach: [Connect with SSH and start an application with a single command](#).

## Setup an SSH server

- Install the [OpenSSH](#) server:

```
sudo apt-get install openssh-server
```

or

```
sudo tasksel install openssh-server
```

Note: The OpenSSH server can also be installed when doing a [server](#) installation as an option from the LiveCD.

Note: An OpenSSH server can also be set up on a Windows server using Cygwin. See [these instructions](#).

- Don't forget to forward the port on which your OpenSSH server is listening. The default SSH port is 22; if the default is used, the router should therefore forward port 22 to the computer on the LAN that is hosting the OpenSSH server. The OpenSSH listening port can be changed; in fact, each computer on the LAN can listen on its own unique SSH port, if desired. The router must forward each specified listening port to the correct computer. Therefore, if computer 1 has its OpenSSH server set to listen on port 22221, then the router should forward port 22221 to computer 1's LAN IP address. If computer 2 has its OpenSSH listening port set to 22222, then obviously the router must forward port 22222 to computer 2's LAN IP address. To change the listening port of the OpenSSH server, edit the `/etc/ssh/sshd_config` file:

```
sudo gedit /etc/ssh/sshd_config
```

and change the listening port from 22 to your desired listening port:

Port 22221

then restart the OpenSSH server:

```
sudo /etc/init.d/ssh restart
```

◇ For greater port security (and to minimize [brute-force attacks](#)), consider using [Knockd](#).

## Limit authorized SSH users

- See [Limit the user accounts that can connect through OpenSSH remotely](#)

## OpenSSH Public Key Authentication

See this [OpenSSH Public Key Authentication Tutorial](#).

In brief, it is necessary to generate a public / private key pair. On your client machine, generate the pair:

```
ssh-keygen
```

A prompt asks for a passphrase. If you wish to use OpenSSH without a password from a secure client (to which no one but you has access), leave the passphrase blank. If you enter a passphrase, you will be asked for this passphrase each time you use the SSH client. By default, a 2048-bit RSA SSH-2 key pair is generated and stored in the `/home/user/.ssh` folder. The private key is named `id_rsa` and is meant to stay in that folder. (The public key is `id_rsa.pub` and is meant to be copied to the OpenSSH server.)

◇ The private key must only be accessible (and should be read-only) to `user`, the owner of the file:

```
chmod 600 /home/user/.ssh/id_rsa
```

You could also make the entire `.ssh` folder accessible only to `user`:

```
chmod 700 /home/user/.ssh
```

- Copy the public key ( `/home/user/.ssh/id_rsa.pub` ) to the server that is hosting the OpenSSH server, into the `/home/serveruser/.ssh` (for whichever user is the administrative user for the server -- generally the user that installed the server initially). If the SSH tunnel is (still) set at default port 22, you can copy the key using the utility:

```
ssh-copy-id serveruser@remoteserver.computer.xyz
```

- ◇ The `ssh-copy-id` utility only works over port 22. An alternative if you have changed your SSH port is to copy the `/home/user/.ssh/id_rsa.pub` key to the server manually. On the server make sure the directory `/home/serveruser/.ssh` exists and that there is a file `authorized_keys` (with write privileges) in that folder. If not, create such a file while logged into the server as `serveruser` (the `touch` command creates an empty file):

```
mkdir ~/.ssh
cd ~/.ssh
touch authorized_keys
```

Then concatenate the `id_rsa.pub` key you have copied to the `~/.ssh` folder. (Make sure the owner of `id_rsa.pub`, after copying, is `serveruser`):

```
cd ~/.ssh
chown serveruser id_rsa.pub
cat authorized_keys id_rsa.pub >> authorized_keys
```

- Make sure the OpenSSH server knows to look for the key file. On the remote server, edit the OpenSSH configuration file:

```
sudo nano /etc/ssh/sshd_config
```

- ◇ Uncomment the line (i.e. remove the `#` at the beginning of the line):

```
#AuthorizedKeysFile %h/.ssh/authorized_keys
```

- Remove the ability to login to the OpenSSH server using password authentication:

```
sudo nano /etc/ssh/sshd_config
```

- ◇ Change the line

```
#PasswordAuthentication yes
```

to

```
PasswordAuthentication no
```

- Restart the OpenSSH server:

```
sudo /etc/init.d/ssh restart
```

- Now you can connect securely with an SSH tunnel without requiring a password, logging in as `serveruser`.

```
ssh -l serveruser -L 5900:127.0.0.1:5900 remoteserver.computer.xyz -p 22
```

## Connect with SSH and start an application with a single command

- If you have created an [OpenSSH key pair](#) (without a password), you can start both the SSH tunnel and a VNC program (such as Krdc or Vinagre) to run through the SSH tunnel with a single command:

```
ssh -f -l serveruser -L 5900:127.0.0.1:5900 remoteserver.computer.xyz -p 22 sleep 5; krdc vnc:/
```

- ◊ Alternatively (and probably preferably) you can create a Menu Item / Shortcut with the above command.

Note: This command is a command-line mini-script. The SSH option `-f` option tells the SSH client to fork into the background after starting. (This option is not available in the PuTTY client.) This allows the command line to continue to proceed to the next command(s) listed on the command line mini-script. The 5 second wait ("sleep") timeout allows time for the SSH tunnel to be created before proceeding to the next command. (This can be lengthened if necessary.) After the wait period, the program (Krdc VNC in this example) is started.

- Of course, any program could be started (to be run through the SSH tunnel) in this fashion, not just a VNC program.

## Automate SSH connections that require a password

This method is strongly advised against. Transmitting an unencrypted password through the Internet (in order to establish an SSH connection) invites password sniffing. Use the [OpenSSH key pair](#) methods described above, instead. This method is listed here for reference.

- Terminal interactions (such as the SSH password challenge) can be automated using the [expect](#) utility. Install:

```
sudo apt-get install expect
```

- If, for example, your SSH client ID is *clientuserID*, your password is *not#1sostrong*, and the remote SSH server is *remoteserver.computer.xyz* (using the default SSH port of 22), then use this command to start the SSH tunnel:

```
expect -c 'spawn ssh -l clientuserID -L 5900:127.0.0.1:5901 remoteserver.computer.xyz -p 22; ex
```

There are other parameters in this example. *5900* and *5901* are the ports to be used on either side of the tunnel (port *5900* is used for VNC, for example). See [Port forwarding through SSH](#) for more details.

You can use the entire command as a menu item (must be "Run in terminal" in the Advanced menu options).

## VNC

Virtual Network Computing (VNC) mirrors the desktop of a remote ("server") computer on your local ("client") computer (it is not a separate remote login, as is XDMCP). A user on the remote desktop must be logged in and running a VNC server (such as [X11VNC](#), [Vino](#), or Krfb). Keyboard and mouse events are transmitted between the two computers. VNC is platform-independent - a VNC viewer on one operating system can usually connect to a VNC server on any other operating system.

### Vino Remote Desktop VNC server

Vino-server (the Gnome VNC server) is included by default in Ubuntu. Start:

Menu -> System -> Preferences -> Remote Desktop

- You can accept uninvited connections in the Security section. You can require a password for these connections.
- This implementation of Vino does not allow changing the default listening ports (which start at 5900). If you wish to customize your VNC connection, use [X11VNC](#) instead.
- A user can connect using [Vinagre](#), the [Terminal Server Client](#), or any other VNC client.

### How to securely use VNC with SSH tunneling

It is less secure to leave the VNC listening port open to the Internet, even with a password. (This can expose you to password cracking attempts.)

It is more secure to use SSH to tunnel your VNC connection. Under [SSH port forwarding](#), the VNC listening port is the <remote port>. To increase security, this listening port can be changed from the default 5900. Only the VNC server and the SSH client need to specify the <remote port> in a secure connection.

### X11VNC Server

While Vino is easy to use, X11VNC allows far more customization and therefore can be used more in situations where greater security is needed.

- Install an X11VNC server to share your desktop with other computer:

```
sudo apt-get install x11vnc
```

- Run X11VNC without a password:

```
x11vnc -forever -rfbport 5900
```

Note: `-rfbport 5900` specifies the port to listen on. The port number can be changed. This option is not required if the default port 5900 will be used. Don't forget to open/forward this port in your firewall/router. By default X11VNC server exits after the first client disconnects. To keep it running (and allow future connections), use the `-forever` option. See [here](#) for more command line options.

- Create a password to use with X11VNC:

```
mkdir ~/.vnc
x11vnc -storepasswd YOUR_PASSWORD ~/.vnc/x11vnc.pass
```

- X11VNC can then be started with a password:

```
x11vnc -forever -rfbport 5900 -rfbauth ~/.vnc/x11vnc.pass -o ~/.vnc/x11vnc.log -loopbg -display
```

- You can create a startup script so that X11VNC is automatically loaded at startup (with password settings):

```
echo "/usr/bin/x11vnc -forever -rfbport 5900 -rfbauth ~/.vnc/x11vnc.pass -o ~/.vnc/x11vnc.log -"
chmod +x ~/.config/autostart/x11vnc.sh
```

◊ You can test the startup script:

```
~/.config/autostart/x11vnc.sh
```

## Using VNC with SSH

See [Port forwarding through SSH](#) for additional information.

## Vinagre VNC client

[Vinagre](#) is the default Gnome-based VNC client used in Ubuntu.

- Menu -> Applications -> Internet -> Remote Desktop Viewer

## Terminal Server Client

The Terminal Server Client is an Ubuntu/Gnome frontend for [rdesktop](#) (for RDP connections to Windows computers) and one of several `vncviewer` clients (for VNC connections). It can be used instead of Vinagre.

- Menu -> Applications -> Internet -> Terminal Server Client
- To use it with VNC, one of the VNC clients must be installed first. For example, install the [TightVNC](#) client:

```
sudo apt-get install xtightvncviewer
```

◊ Note that the TightVNC client can be used from the command line (or as a menu item) directly:

```
vncviewer 192.168.0.12:5900
```

where *192.168.0.12* is an example *host* location that is running a VNC server on port 5900. For more command-line options, use

```
man vncviewer
```

## Krdc VNC client

Krdc is the default VNC client in Kubuntu/KDE but can be used in GNOME. It can be used for both VNC and RDP connections. Installing it will also install the Qt platform and many KDE utilities (a large download).

```
sudo apt-get install krdc
```

- Run:

Menu -> Applications -> Internet -> Krdc

- The command-line connection (for use as a menu-item, for example) is:

```
krdc vnc://<remote IP>
```

- If the remote (Krfp) VNC server is using a <remote port> other than the default 5900 port, use

```
krdc vnc://<remote IP>:<remote port>
```

- Krdc can also connect to a Windows server using RDP (Remote Desktop Protocol).

```
krdc rdp://<remote IP>:<remote port>
```

## Using a VNC client with SSH

See [this howto](#) for an automated setup using a script (it did not work for me, but it might for you).

In brief, you would initiate an [SSH tunnel with port forwarding](#) using Putty or the command line:

```
ssh -C <remote ip> -p <SSH tunnel port> -L <local port>:<remote computer>:<remote port> -l <user>
```

then you would start a VNC client such as Krdc:

```
krdc vnc://localhost:<local port>
```

<local port> will usually be the default 5900, in which case you could simply use

```
krdc vnc://localhost
```

## XVNC4Viewer VNC Client

XVNC4Viewer is an alternative to Vinagre or the Terminal Server Client (vncviewer). Install:

```
sudo apt-get install xvnc4viewer
```

## Automatic user login (for use with VNC)

VNC only works if a user is logged in. When a computer (hosting one or more servers) is intended to start up unattended and VNC (with or without SSH tunneling) is to be used, the computer ought to start with the primary user logged in. To accomplish this:

Menu -> System -> System Settings -> Login Manager -> Convenience -> Enable Auto-Login  
(*ticked*) -> Lock session (*ticked*)

- > Pre-select user: Specified: *Choose primary user* (i.e. the user hosting the SSH tunnel, if any, and the VNC server)
- > Automatically log in again after X server crash (*ticked*)

- Also make sure the VNC server is set to Autostart at bootup.

## FreeNX

[FreeNX](#) is a remote desktop display server/client solution that natively incorporates SSH tunneling (unlike VNC). It is therefore more secure than VNC (unless VNC is coupled with SSH tunneling).

## FreeNX Server

The Free server .deb package can be downloaded from [No Machine free server downloads](#).

- Alternatively, [add the following repositories](#):

```
sudo add-apt-repository ppa:freenx-team
```

- Install the package:

```
sudo apt-get update
sudo apt-get install freenx
```

## FreeNX Client

Download the self-installing .deb file from [No Machine Client downloads](#).

## XDMCP

[XDMCP](#) allows a separate remote login by an authorized user. This login is separate from the local user.

- XDMCP is not secure over the Internet and should only be used within a LAN. It cannot be tunnelled through SSH. It is turned off by default in Ubuntu. To enable it, edit the configuration file:

```
gedit /etc/gdm/custom.conf
```

- Find and change (or add) the line from false to true so that it reads:

```
[Xdmcp]
Enable=true
```

## Telnet

SSH is, basically, secure Telnet.

## VPN clients

A [VPN](#) (Virtual Private Network) allows a secure encrypted connection ("tunnelling") over the Internet between a client (either standalone or on a separate LAN) and a home or corporate LAN server.

## VPN through Network Manager

- The default Network Manager in Ubuntu/Kubuntu has a VPN client available. This includes support for IPSec and Cisco-compliant VPN connections. Install:

```
sudo apt-get install network-manager-vpnc
```

- To connect to a VPN network using OpenVPN (SSL), install the plugin:

```
sudo apt-get install network-manager-openvpn
```

- To connect to a VPN network using PPTP (MS Windows servers), install the plugin:

```
sudo apt-get install network-manager-pptp
```

- Configure:

Network Manager icon (in system tray) -> VPN Connections -> Configure VPN

## vpnautoconnect (vpn daemon)

[vpnautoconnect](#) is a daemon to allow automatic vpn connections through Network Manager. [Download](#) and install the .deb package for your OS version.

## Other VPN clients

Standalone VPN clients based on protocol are available (but not necessary if using Network Manager):

- ◇ [vpnc](#), [grml-vpn](#) -- for Cisco-compliant (IPSec) VPN networks
- ◇ [openswan](#) -- for IPSec (OpenSwan) VPN networks
- ◇ [pptp-linux](#) -- for PPTP (MS Windows-compliant) VPN networks
- ◇ [openvpn](#), [gadmin-openvpn-client](#) -- for OpenSSL (OpenVPN) VPN networks

## VPN servers

### OpenVPN

[OpenVPN](#) is a free, GPL-licensed open-source cross-platform VPN solution based on OpenSSL (not IPSec). Install the server (then see the website for further installation instructions):

```
sudo apt-get install openvpn bridge-utils
```

A GUI configuration utility (GTK-based) is available:

```
sudo apt-get install gadmin-openvpn-server
```

Also see [these installation tips](#).

### Poptop (PPTP Server)

[Poptop](#) is a free open-source PPTP-based VPN server compatible with MS-windows PPTP clients. Install:

```
sudo apt-get install pptpd
```

### OpenSwan

[OpenSwan](#) is the open source implementation of IPSec-based VPN connections for Linux (and is a successor to FreeSwan). Install:

```
sudo apt-get install openswan linux-patch-openswan
```

# Security

Ubuntu by default is a fairly safe system. However, if you intend to use Ubuntu as a server, or for critical applications in which loss of data (by accident or by malicious intrusion) would be disastrous, you should learn how to make Ubuntu more secure. A good introduction to [Ubuntu Security Best Practices](#) is available. Recommended reading includes the book [Cyber War](#) by [Richard Clark](#) and [this interview](#) with Joe Weiss (IT advisor for the energy-sector smart grid).

## Firewall

Network communications go through "channels" called ports. You can restrict which ports are available ("open") for network communications, creating a barricade to unwanted network intrusion. Firewalls do this job for you. But I guarantee that if you install one before you know how to use it that one or more networking programs on your system will stop working. Read every bit of documentation about a firewall before installing it -- you won't regret the time invested. All of these packages modify [iptables](#), which is the set of rules that controls network access in and out of your computer. (You can modify iptables manually from the command line, as well, but if you are that much of an expert, you probably don't need this guide.) Also see the [official Ubuntu documentation](#).

## Firestarter

[Firestarter](#) is an intuitive firewall manager used to set the iptables values which provide firewall capabilities in Linux (including Ubuntu). It has a very easy-to-use GUI.

```
sudo apt-get install firestarter
```

### Firestarter fails to open system log

This is a problem in Natty. See the [solution here](#).

## Guarddog

[Guarddog](#) is a GUI firewall configuration utility that has been used for KDE. It has a complex array of configuration, and is difficult to use for some beginners.

```
sudo apt-get install guarddog
```

## Uncomplicated Firewall

[Uncomplicated Firewall](#) is installed in Ubuntu by default, but all ports are open initially. It is configurable through the [command-line interface](#). See [this forum thread](#), [or this usage tutorial](#), or [Ubuntu community help](#) for tips on how to set up and use it. If not installed, it can be installed:

```
apt-get install ufw
```

### Gufw

[Gufw](#) is a graphical user interface for Uncomplicated Firewall. Install:

```
sudo apt-get install gufw
```

## Anti-virus

If you are running a file server, interface frequently with Windows drives, or use virtualization, you will want a virus checker for your Windows files.

### ClamAV

[ClamAV](#) is the open source virus tool for Linux. To install ClamAV:

```
sudo apt-get install clamav
```

### AVG

[AVG](#) offers a free virus scanner for Linux in a .deb package. Download and install from the website.

### Avast

[Avast](#) offers a Linux edition (for home users only) in a .deb package. Download and install from the website.

## Anti-spam

## Spam Assasin

[SpamAssassin](#) is written in perl, and is mostly for use with a server (such as a groupware server or Apache).

Install:

```
sudo apt-get spamassassin
```

## Rootkit checkers

[Rootkits](#) are malicious [trojan](#)-like programs to allow an intruder to become a root user and therefore have complete administrative control over the system. There aren't many rootkits in the wild for Linux. Still, this is a growing security problem (especially in other operating systems) and it is a matter of time before more rootkits appear in Linux. Checking for rootkits isn't always successful from a system that is already infected. Your rootkit checker should therefore be run from another system, or a [USB pendrive with an Ubuntu LiveCD installation](#). See the rootkit checker manuals for instructions how to do this. If you are infected with a rootkit, you must backup all your files and re-install your system. (Thank goodness this is easy with Ubuntu, unlike with other operating systems).

## Chkrootkit

[Chkrootkit](#) checks locally for signs of a rootkit. See the [chkrootkit manual](#) for usage instructions.

Install:

```
sudo apt-get install chkrootkit
```

Run:

```
sudo chkrootkit
```

## Rootkit Hunter

[Rootkit Hunter](#) is compatible with (K)Ubuntu systems. See the [usage instructions](#).

Install:

```
sudo apt-get install rkhunter
```

Run:

```
sudo rkhunter
```

## Malicious commands to avoid

There are many [malicious commands](#) to be avoided in Linux (as in all operating systems). It is worthwhile to be aware of these dangerous commands so that they are not executed by accident or by malicious advice.

## USB drives

USB drives are a major source of security risk and means of data theft.

- An administrator password should be set for the computer BIOS and booting from a USB drive or CD/DVD should be disabled. (Otherwise, any passerby can boot their own OS and then use it to steal data from the hard drive.)
- See [this article](#) for methods of restricting USB usage to authorized users.

## Prevent unauthorized boots and system access

Many computers are kept in places where casual passersby may have an opportunity to access the computer, unobserved for short periods. In addition to physical precautions to prevent or slow computer theft (such as locked cases, alarms, and security cables similar to those used to slow bicycle theft), [precautions](#) should be taken to prevent an unauthorized operating system from being booted using an external device (such as USB drive). Once such as external OS is booted, it can be used to access most hard drive(s) on the computer and the contents copied to a second external device (to be examined or unencrypted later). This is a common means of data theft that is fast and easy to accomplish, and means to deter it should be taken on any public or semi-public computer.

- Set BIOS to restrict bootup to the hard drive only.
  - ◇ Set a Supervisor/Administrator password for your computer's BIOS. (I recommend writing it down and taping it to the inside cover of the computer case prior to locking the computer case.) Disable booting from all devices except the hard drive. Setting the hard drive as the first priority boot device is not enough, as most current BIOS menus allow manual selection of any enabled boot devices. Only the hard drive should be left enabled.
- Enable Hard Drive locking, if your computer's BIOS allows it. Most hard drives allow a password to be set by the BIOS and stored in a chip on the hard drive controller which can only be reset by disassembling the hard drive. (Some manufacturers provide a backdoor security key, however.) BIOS versions found on newer computers/laptops allow this password to be set in the BIOS, so that only a BIOS containing the correct password can unlock the hard drive. (If the hard drive is then removed from the computer, it cannot be accessed by any BIOS that does not have the correct password or backdoor security key.) Note, however, that this precaution does not protect against booting from

external devices if the BIOS is still set to allow that.

- ◇ There is a risk to this security measure. If you forget the password and the BIOS passwords somehow get reset, the hard drive would become inaccessible. The BIOS and Hard Drive password(s) should always be stored in a safe location.
- Password protect the Grub bootloader. Without password protection, Grub can be used to circumvent BIOS restrictions. See this section for [Grub Legacy](#) and this section for [Grub2](#).
- Make sure all user accounts are protected by a password, and always require passwords for login. Never create an "administrator" user account (hidden or not) and leave it unprotected by a password. Never enable automatic login without a password to any user account.
  - ◇ It is possible to enable [automatic login](#) to a preferred password-protected user account while simultaneously enabling a password-protected screensaver (the password for which must still be entered even before initial user access). This is a reasonable solution that offers protection while still allowing automatic login.
- Make sure a password-protected [screensaver](#) is always enabled (that will engage after a reasonably short period of inactivity).

# Network Monitors

There are two types of network monitors: those that monitor your own system's network settings and those that monitor network traffic. The latter includes security tools (that can also be used as hackers tools) for exposing security weaknesses in a network. Be aware and be safe! A list of available tools is at [Top Ubuntu Security Tools](#).

## Netstat

[Netstat](#) is the Linux command-line tool to monitor network status and functions. There are many usage parameters. See the manual for help.

```
netstat
```

## Etherape (Network monitoring)

[EtherApe](#) is a graphical utility that allows you to see (in real-time) where connections are being made on your network, or between your network (or computer) and the Internet. If you are experiencing unexpected network activity on your computer or LAN and wish to see where the activity is occurring, this is an easy tool to use. Both "local" user and "root user" installations are created; in general you must use the root user installation to see all your network traffic.

```
sudo apt-get install etherape
```

## List open files

Sometimes you will see your network slowing and want to know which files are sending data over ports. Use this command:

```
lsof -i -n -P
```

## Nmap

[Nmap](#) is a free open source utility for network exploration (including showing open ports and running services) and security auditing. Install:

```
sudo apt-get install nmap
```

Scan your own PC:

```
nmap localhost
```

(Once you have found out which ports are open, use a [firewall](#) to close the ones you don't want open.)

### Nmap GUI

Install:

```
sudo apt-get install nmapfe
```

or you can try Zenmap:

```
sudo apt-get install zenmap
```

### Nessus

[Nessus](#) is a proprietary comprehensive vulnerability scanning suite that is free for personal, non-enterprise usage. See the website for details.

### Snort

[Snort](#) is the de facto open source standard for intrusion detection. Install:

```
sudo apt-get install snort
```

It can be used with an MySQL database (sudo apt-get install snort-mysql) or with a PostgreSQL database (sudo apt-get install snort-pgsql).

### AcidBase

[AcidBase](#) is an intrusion detection / basic analysis and security engine that uses Snort. Install:

```
sudo apt-get install acidbase
```

### AppArmor

[AppArmor](#) is a set of security enhancements developed by Novell for SUSE Linux. It is installed in (K)ubuntu by default.

## Disable AppArmor

AppArmor can prevent some services from running as expected and cannot be used in conjunction with SELinux. To disable it:

```
/etc/init.d/apparmor stop
update-rc.d -f apparmor remove
apt-get remove apparmor apparmor-utils
```

## SELinux

[SE Linux](#) (Security Enhanced Linux) is an NSA (US National Security Administration) recommended set of tools for enhanced security in Linux systems. It enforces strict access controls (privileges) and is meant for mission-critical installations. It is not suitable for the casual desktop user. It was first available in Hardy Heron and is being updated for Intrepid Ibex. It is not compatible with AppArmor (which must first be removed).

```
sudo apt-get install selinux
```

## Knockd (Port security)

[Knockd](#) is a small server that listens for a pre-defined sequence of port opening attempts (a "knock") before opening an otherwise closed firewall port for communications. Install:

```
sudo apt-get install knockd
```

# Network Management

Monitor your network or datacenter with a framework of utilities. Comparable to IBM Tivoli (which can cost thousands of dollars), these solutions are generally available as either community or enterprise editions.

- [Hyperic](#) is an open-source network monitoring framework that can be used in either a datacenter or a cloud environment (it is used for Amazon Cloud). Both a free community version and a subscription enterprise version are available.
- [Groundwork OpenSource](#) offers a community edition that integrates other packages such as Nagios, Nmap, and others. There is a subscription enterprise version as well. It has its roots in a university setting.
- [OpenORM](#) is the GPL-licensed, free open-source community successor to the very popular network monitoring solution Qlusters. It is [available](#) as a Debian/Ubuntu package. See the website for details.
- Canonical offers the [Landscape](#) network management service for \$150 per node, with a free trial available.
- [Zenoss](#) is a commercial network monitoring subscription package (about \$150/node) with a limited free "core" edition also available.

## Nagios

[Nagios](#) is a free open source network monitoring solution. It is administered from a web interface (<http://localhost/nagios>) and is expandable using a large number of available plugins. For additional configuration information, see the [official Ubuntu documentation](#). Install:

```
sudo apt-get install nagios3
```

## Munin

[Munin](#) is a free GPL-licensed open source networking monitoring tool based on [RRDTool](#), in which a master network node queries other network resources, cataloging and graphically displaying changes. It has a web interface and multiple plugins. For additional configuration information, see the [official Ubuntu documentation](#). Install:

```
sudo apt-get install munin
```

## Cacti Monitoring Server

[Cacti](#) is a complete, free open source network graphing solution designed to harness the power of [RRDTool](#)'s data storage and graphing functionality. Cacti provides a fast poller, advanced graph templating, multiple data acquisition methods, and user management features out of the box. It uses MySQL

and PHP (part of the [LAMP](#) server stack). All of this is wrapped in an intuitive, easy to use interface that makes sense for LAN-sized installations up to complex networks with hundreds of devices. For more info see [Cacti Server Setup](#). Install:

```
sudo apt-get install cacti
```

## Cluster SSH

[ClusterSSH](#) allows replication of a command on an administration console to be replicated via SSH to multiple computers in a cluster. Install:

```
sudo apt-get install clusterssh
```

## Enterprise Network Firewall

### IPCop

[IPCop](#) is a free open source (GPL-licensed) firewall solution for use as an independent appliance (on a dedicated PC) in an enterprise network. It allows remote management and can protect multiple servers, including web and email servers. IPSec-based OpenVPN is supported. The CD image .iso and other files can be downloaded [here](#). Installation instructions are on the website.

### SmoothWall

[SmoothWall Express](#) is an award-winning, free, open source (with a GPL license) firewall solution for use as an independent appliance (on a dedicated PC) in an enterprise network. Download the installation CD .iso image [here](#) (server OS included), burn onto a CD, and install on a new, dedicated PC. Many features, however, such as VPN server, database access authentications, and content filtering are only implemented in a commercial version, however, and are not available in the community version.

### Endian

[Endian](#) is a very robust, free, open source universal threat management appliance similar to IPCop and Smoothwall. It also incorporates OpenVPN. Like Smoothwall, Dansguardian is used for content filtering (and is included in the community edition). Commercial and hardware versions with some additional features, automatic updates, and professional support are available. See the website for details.

## LTSP (Thin client support)

[LTSP](#) (the Linux Terminal Server Project) adds [thin-client](#) support to Linux servers. The package is free, GPL-licensed, and the client can be used to run programs on either Linux or Windows LTSP servers. There is a module for classroom management (ltsp-controlaula) as well. Installation instructions are [here](#). The alternate LiveCD can also be used to install a terminal server, as indicated in [these instructions](#).

### LTSP Server

Install:

```
sudo apt-get install ltsp-server ltsp-manager
```

### LTSP Client

Install:

```
sudo apt-get ltsp-client
```

## iTALC (Thin client for Education)

[iTALC](#) is a free, open source (GPL-licensed) thin client solution that supports both (K)Ubuntu Linux and Windows XP. It has been used widely in educational settings to monitor, share, and control multiple workstations. See the website for download and installation instructions.

## Internet Cafe software

Internet Cafe (or CyberCafe) software is specialized LAN-administration software that includes time usage monitoring, billing, and administration. It can also be used in schools, libraries, and organizations with multiple monitored workstations requiring usage limits.

### OutKafe

[OutKafe](#) is a free, open-source, GPL-licensed cybercafe solution based on a postgresQL database server stack. It is run on hundreds of sites. It is GTK-based but can be run with Kubuntu (KDE).

## OpenKiosk

[OpenKiosk](#) is a free open source multi-platform server/client solution for administering and monitoring groups of workstations, such as in libraries, school labs, and internet cafes. Installation is from source files. See the website for details.

## CafePilot

[CafePilot](#) is a free multi-platform Java-based server/client solution for real-time monitoring and billing of Cybercafe workstations. A complete custom Ubuntu-based LiveCD server/multiple-client solution (including OS and many applications for unlimited workstations) is available for \$100 [here](#).

## Miscellaneous solutions

[This thread](#) discusses several other solutions, including:

- [Untangle](#)
- [m0n0wall](#)
- [ClearOS](#)

## Pessulus (Lockdown Editor)

Pessulus is a GTK (Gnome)-based utility that allows an a computer administrator to restrict access to several administrative functions, including the command-line Terminal and many other functions. This is useful on public kiosk PCs, for example. Install:

```
sudo apt-get install pessulus
```

## Cluster (cloud) computing

- [Eucalyptus](#) is a project from University of California Santa Barbara to facilitate cluster computing on Ubuntu servers that have [Xen](#) enabled. It is available for the server edition and is referred to as the [Ubuntu Enterprise Cloud](#).
- Also see the [Ubuntu Cloud Computing](#) page.

### A warning about distributed computing

Cloud computing is often mistaken for remote hosting. While cloud computing using public hosts may be beneficial in "farming out" a few of your non-sensitive computing needs, the recent ease of cloning filesystems and the promiscuity of datacenters has placed a great deal of sensitive data at risk when databases and critical server functions themselves are remotely hosted at a site not under your complete control. Even "trusted" banks and other large businesses routinely trade and sell our sensitive "private" data to multiple partners (sometimes for profit and sometimes unwittingly). Hosted servers are compromised on a daily basis and it is not very easy for an end customer to know how effective are the security practices of a remote hosting service. Further, any data left on public storage devices (cloud servers) in the US for more than 180 days are subject to search and seizure by government agencies there. Therefore, it is almost always more secure to host your own server(s) in house and to limit the traffic and access to your databases and servers to members of your own organization. Learning how to run your own servers is worth the effort, and powerful hardware on which to run them is inexpensive these days.

The Ubuntu cloud computing environment allows you to recruit the multiple computers within your own organization for distributed ("cloud") computing and thereby keep it all "in house" (behind secure firewalls). You do not need to expose your organization to insecure remote public hosts in order to use cloud computing.

### BOINC (Berkeley Open Infrastructure for Network Computing)

[BOINC](#) is middleware software developed at [UC Berkeley](#) to allow multiple computers to operate as a grid-based (cloud based) supercomputer. There are over half a million computers participating in BOINC projects. To [install BOINC](#) and participate in one or more of these projects:

```
sudo apt-get install boinc
```

# Servers

Many server packages (such as Apache2, MySQL, PHP, etc.) can be installed individually, on either a Desktop edition or a Server edition (using the `tasksel` command described below). It is not necessary in general, therefore, to install Ubuntu Server if you only wish to use an occasional server package on a Desktop edition. Most of the instructions for individual server packages will work on the Server edition, on the Desktop edition, or on a Server edition that has had an Ubuntu or Kubuntu desktop installed on it.

Nevertheless, the Server edition is optimised for speed and ease of monitoring and maintenance when implemented in large networks and is therefore recommended. (For complete information see the [Ubuntu Server Guide](#).) It is always possible to [add an Ubuntu \(Gnome\) or Kubuntu \(KDE\) GUI desktop to an Ubuntu Server](#) at any time.

- Download the latest Ubuntu Server ISO image from [Ubuntu downloads](#).
- See [this guide](#) for burning the ISO image to a CD.
- [Use the CD](#) for installation of the server.

(If you are attempting to create a dual-boot or multi-boot configuration with multiple operating systems on your computer, then see [these tips](#).)

(Tip: During installation of the server, an initial user / password is created. Many servers are intended to run unattended with little subsequent intervention and it can be easy to forget the original user / password pair that is created at installation. I suggest writing this information down and taping it to the inside of the computer case cover for later reference. (Lock the computer case if you desire extra security.)

There are many server packages that are available to be installed as a one-step process during the Server edition installation process from the LiveCD, or at any time (on most editions) using the `tasksel` command. For a list of server packages that can be installed using the `tasksel` command:

```
sudo tasksel --list-tasks
```

or using a GUI list:

```
sudo tasksel
```

## Ultimate Server Walkthrough

- Using instructions from [Ubuntu guide](#), an ultimate server can be created with two wikis ([MediaWiki](#)), two [Drupal](#) websites, a [Moodle](#) online learning website, a [BigBlueButton](#) teleconferencing server, an [Ubuntu desktop](#), and [dynamic DNS](#) access from the web. All components can be expanded and/or additional servers added.

- ◇ [Lucid](#) ultimate server walkthrough.
- ◇ Original [Jaunty](#) ultimate server walkthrough.
  
- ◇ To run multiple servers on multiple computers on a LAN using only a single IP address and router, see [Reverse proxy Servers and Load Balancers](#).

## Add a desktop to an Ubuntu Server

Packages that require server capabilities (such as Drupal with Apache, etc.) are often happier when a Server edition is installed as the base OS. However, adding a desktop can make the administration and maintenance of many packages easier for many users (albeit with a cost of reduced server speed). Add an Ubuntu (Gnome) or Kubuntu (KDE) desktop to a server using:

```
sudo apt-get install ubuntu-desktop
```

or

```
sudo apt-get install kubuntu-desktop
```

## LAMP server installation

During [server](#) installation, you will have the option of installing a LAMP (Linux, Apache, MySQL, PHP) server stack. Many (but not all) open source servers use this integrated server stack. Drupal, for example, needs to have a LAMP server installed. If you intend to install a groupware server, however, make sure it is compatible with a LAMP server stack before choosing this option. Many groupware servers will install LAMP (or their own variation) automatically, so you do not need to install the LAMP stack. Others will install and use postgresSQL instead of MySQL, so you would not need to install a LAMP server.

### Apache2 + MySQL + PHP

This is the preferred method:

```
sudo tasksel install lamp-server
```

(Tip: During installation of the LAMP server, an initial MySQL "root" user password is created. This information will sometimes be needed when installing other server packages that use MySQL. I suggest writing the MySQL password down and taping it to the inside of the computer case cover for later reference. (Lock the computer case if you desire extra security.))

## Other servers

During server installation, you can choose other servers to install, as well. These include a [Mail server](#) (Postfix with Dovecot), a [DNS server](#) (bind9), the [OpenSSH server](#), a [print server](#), a [Tomcat Java web server](#), a [Samba file server](#) (for use with Windows networks), and a [virtual machine host](#) (Xen). Again, if you are using a groupware solution, you should be careful about installing these services, as they may conflict with similar (but competing) servers which the groupware solution will install by default.

### eBox (server and network manager)

[eBox](#) is a web-browser based server management platform that is useful in managing multiple servers and networking functions in a small to medium business. It is modular so that as the network grows and more networking functions or servers (such as the ones listed below) are added, eBox can manage those, as well. Install:

```
sudo apt-get install ebox
```

### OpenSSH server

OpenSSH allows encrypted communications through a designated secure port. See [setting up an SSH server](#).

### Postfix (Mail Server)

[Postfix](#) is a free open source mail server. It interfaces directly to [Dovecot](#), the free open source [IMAP](#) and [POP3](#) server. For more information see [the official Ubuntu documentation](#). It can be installed using the `tasksel` option during installation of the Ubuntu [server](#) from the LiveCD, or at any time using:

```
sudo tasksel install mail-server
```

### Bind9 (DNS server)

[BIND](#) DNS servers are the most commonly used on the Internet. Bind9 is the current edition. See the [usage instruction here](#). Also see the [official Ubuntu documentation](#) for more configuration information. It can be installed using the `tasksel` option during installation of the Ubuntu [server](#) from the LiveCD, or at any time using:

```
sudo tasksel install dns-server
```

## Apache Tomcat (Java server)

[Tomcat](#) is a free open source platform from Apache which provides a "pure Java" HTTP web server environment for Java code to run (see [here](#) for more info).

It is not part of the Apache2 web server. See the [official Ubuntu documentation](#) for more configuration information. It can be installed using the tasksel option during installation of the Ubuntu [server](#) from the LiveCD, or at any time using:

```
sudo tasksel install tomcat-server
```

## Xen virtual machine host

[Xen](#) is a free open source virtualization platform that allows the host to run "guest" operating systems simultaneously (see [here](#) for more info). Xen implementation in the (K)ubuntu server is based on integration with [KVM](#), the kernel-based virtualization platform in Linux. KVM integrates with [QEMU](#) components, which have been merged with Xen.

Note: KVM requires a 64-bit processor with a virtualization extension, i.e. an [Intel VT](#) or [AMD-V](#) CPU, therefore this package currently is successful only with the 64-bit Ubuntu server installation and on those CPUs.

It can be installed using the tasksel option during installation of the Ubuntu [server](#) from the LiveCD, or at any time using:

```
sudo tasksel install virt-host
```

## Print server

Ubuntu uses the [CUPS print server](#), which is integrated into the desktop. Installing a print server in Ubuntu Server is necessary only if you do not intend to use a desktop (i.e. you intend a "headless" server). It can be installed using the tasksel option during installation of the Ubuntu [server](#) from the LiveCD, or at any time using:

```
sudo tasksel install print-server
```

## OpenLDAP

[OpenLDAP](#) is a community-based [LDAP](#) server that allows directory querying over TCP/IP, generally for organizations arranged by domain. Ubuntu uses the slapd daemon for the OpenLDAP server. See the [official](#)

[Ubuntu documentation](#) for more information about installation and setup.

## Proxy server

### Squid

[Squid](#) is a widely-used proxy web server and web cache daemon that is useful for corporate or other large LANs that wish to accelerate and/or control traffic through the LAN. For initial configuration information, see the [official Ubuntu documentation](#). Install:

```
sudo apt-get install squid
```

### Privoxy

[Privoxy](#) is a non-caching web proxy with advanced filtering capabilities for enhancing privacy, modifying web page data and HTTP headers, controlling access, and removing ads and other obnoxious Internet junk. It is easier to configure and more useful for individual users. Install:

```
sudo apt-get install privoxy
```

## Reverse proxy Servers and Load Balancers

A [reverse proxy](#) server allows incoming web traffic on a LAN to be directed to multiple computers (each running one or more servers) on the LAN. When redundant instances of a server exist on a LAN, a [Load Balancer](#) allows traffic to be directed to the most available instance.

### Pound (Reverse proxy and load balancer)

[Pound](#) is a free, open source (GPL-licensed) lightweight reverse proxy and load balancer. Also see the [Ubuntu Community](#) instructions. Install:

```
sudo apt-get install pound
```

### Apache Reverse proxy

The Apache2 server has a [mod\\_proxy](#) module available that enables reverse proxies. See [these instructions](#) for a simple method to implement reverse proxies using this Apache module.

## Control panels

There are several free and/or GPL-licensed control panel utilities for managing multiple servers on a single physical server or cluster of servers running Debian/Ubuntu-based servers. [Here](#) is a brief overview.

- [Webmin](#) is the most widely used web browser-based free open source web hosting control panel for Linux.
- [GNUPanel](#) is a free GPL-licensed web hosting control panel system that is compatible with Debian/Ubuntu OS using PHP.
- [Web-cp.net](#) is a free GPL-licensed web hosting control panel system that is compatible with Debian/Ubuntu OS using PHP.

# Network Attached Servers

## FreeNAS

[FreeNAS](#) allows a PC with several hard drives to function as a self-contained network attached storage RAID device. It is a very small, fast system, so that an older PCs could function quite well as an NAS.

# Setup RAID in Ubuntu/Kubuntu

See [this thread](#) for a discussion how to set up RAID on an Ubuntu/Kubuntu server.

# Databases

There are several free enterprise-strength databases that can be used in (K)Ubuntu Linux.

## PostgreSQL

[PostgreSQL](#) is a free standards-compliant enterprise-strength open-source database, initially developed at UC Berkeley. See the [PostgreSQL Server documentation](#) for server configuration information. Install using the dummy task:

```
sudo tasksel postgresql-server
```

or install directly:

```
sudo apt-get install postgresql-8.4
```

or

```
sudo apt-get install postgresql
```

## MySQL

[MySQL](#) is one of the most widely-used relational databases, and has been licensed under the GPLv2. It has now been bought by Oracle as part of the purchase of Sun. It has long been integrated into co-ordinated server platforms using the [LAMP](#) stack, but it can also be installed separately.

```
sudo apt-get install mysql-server
```

# Tips & Tricks

## Run Command

You can run any application in your path using the Run Command. Use Alt+F2.

## Turn off Hot Keys

This is the most evil option on any operating system, in my opinion. A mis-stroke enables any number of random events. Unfortunately, this problem is pervasive in operating systems and is difficult to turn off.

Menu -> System -> Administration-> Advanced -> Input Actions -> General Settings -> check "Disable KHotKeys daemon"

Menu -> System -> Administration-> Advanced -> Input Actions -> Gestures Settings -> check "Disable mouse gestures globally"

If you wish to be selective about it (this doesn't often work, however), start by disabling unnecessary desktop hotkeys.

Menu -> System -> Administration-> Advanced -> Keyboard & Mouse -> Keyboard Shortcuts

Also, you may want to deactivate linking gestures to sticky and slow keys:

Menu -> System -> Administration -> Accessibility -> Activation Gestures -> uncheck "Use gestures for activating sticky keys and slow keys"

Note: You probably will have to disable hotkeys in many applications, as well.

Hotkeys from the Synaptics Touchpad can be selectively turned off using [this information from the Ubuntu documentation](#).

## Associate default applications

- To assign the default DVD player (make sure you have [enabled DVD playback capability](#) first:

Menu -> System -> Administration-> Advanced -> File Associations -> x-content -> video-dvd -> Applications Preference order -> Add...

then choose your favourite media player. There are similar options for Blu-Ray (video-bluray) and HD DVD (video-hddvd). Set each individually.

- To assign the default player for playing mpegs (or other video formats):

Menu -> System -> Administration-> Advanced -> File Associations -> video -> mpeg -> Applications Preference order -> Add...

then choose your favourite media player. You can do this for a host of video file formats, including .wmv (x-ms-wmv, or Microsoft WMV format), .flv (x-flv, or Flash video), quicktime, and so on.

- To assign .pls audio streams to play through [Audacious](#):

Menu -> System -> Administration-> Advanced -> File Associations -> audio -> x-scpls -> Applications Preference order -> Move Audacious to the top (or Add... it).

Make sure \*.pls appears in the Filename Patterns section.

### Automatic user login

- To accomplish this (yet still require a user password):

Menu -> System -> System Settings -> Login Manager -> Convenience -> Enable Auto-Login (*ticked*) -> Lock session (*ticked*)

-> Pre-select user: Specified: *Choose primary user*

- This ought to be combined with a password-protected [screensaver](#).

### Autostart a program at bootup

Any program (or script) can be made to Autostart at bootup by creating a symbolic link to that program (or script) in the ~/.config/autostart folder.

For example, to start Firefox at bootup, create a symbolic link:

```
sudo ln -s /usr/bin/firefox ~/.config/autostart
```

## Run a script from a menu item

It is possible to place a short script in a menu item / shortcut to answer an interactive query (such as a password query). Here is an example that is used to enter a password during an SSH negotiation. First, install the utility [expect](#):

```
sudo apt-get install expect
```

The use a command in the Menu Item / Shortcut similar to:

```
expect -c 'spawn ssh -l sshuser -L 5900:127.0.0.1:5900 remoteserver.remotedomain.org -p 22 ; ex
```

In this example the password *sshpassword* is returned when the ssh program requires a password. Expect waits for some text to be displayed in the command-line terminal then returns text in return. The Menu Item must be "Run in terminal", therefore.

## SHC (Encrypt scripts)

[SHC](#) is a simple script compiler that will convert a script into a binary, obscuring the code (and passwords, etc.). Usage instructions are [here](#). Install by adding the Debian Etch repository:

```
sudo add-apt-repository 'http://archive.debian.org/debian etch main'
```

then install the shc package:

```
sudo apt-get install shc
```

## Capture a screenshot

See [this tutorial](#).

## Customize desktop to look like KDE

In recent versions of Ubuntu, the Gnome desktop can be made to resemble the cleaner KDE desktop with some customization. (Customizations are highly personal, and this section represents preference only.)

- See [Desktop Customization](#).

## Run a KDE 4 desktop from Ubuntu

It is possible to install the KDE4-based desktop (the default in Kubuntu) in Ubuntu.

```
apt-get install kubuntu-desktop
```

There is a risk of software bloat and some incompatibilities between modules when doing this. At login, you can choose (as an option) whether to start the KDE (Kubuntu) desktop or the Gnome (Ubuntu) desktop. Nevertheless, when there are two modules trying to perform the same function (one from each desktop), it is possible to have conflicts.

## Run a KDE 3 desktop from Ubuntu

You can also install the older KDE 3 desktop on Lucid, or almost any KDE3 application.

- Add the following KDE 3 repositories:

```
sudo add-apt-repository ppa:kde3-maintainers
```

- Install KDE 3.5 desktop:

```
sudo apt-get update
sudo apt-get install kubuntu-desktop-kde3
```

- To install any KDE3 app, append "-kde3" suffix to package name. See [Pearson Computing](#) for additional details.

## Kill (end) a process

- There are many tricks to try to fix a frozen PC. Press Alt+F2, and use killall to end the frozen application. Example:

```
sudo killall amarok
sudo killall firefox
```

- In order to terminate a stuck graphical application use the xkill utility. Press Alt+F2, type xkill, and press Run. Point the cursor to the application you want to kill and press the left mouse button. This should kill the selected application.

```
xkill
```

- Another trick to try is pressing AltGr+SysRq+K (RightAlt+PrintScreen+K). This will log you out. But, what happens if this does not work? Try pressing Ctrl+Alt+F1, login, enter your password and run:

```
sudo killall gdm
sudo startx
```

## View hidden files

In the Nautilus file manager, press:

```
Ctrl+ H
```

## Mute notifications (alerts)

- Notifications (alerts) can be disabled:

Menu -> System -> Preferences -> Sound -> Sound Effects -> Sound theme: -> *No sounds* -> Close

- GNOME notifications (alerts) are associated with sounds by default. This can also be disabled separately:

Alt-F2 -> gconf-editor -> /apps/indicator-sound -> volume\_mute (*ticked*)

- Turn off login notification sound:

Menu -> System -> Preferences -> Startup Applications -> Startup Programs -> GNOME Login Sound (*unticked*) -> Close

-> Menu -> System -> Administration -> Login Screen -> Unlock -> Play login sound (*unticked*) -> Close

## Random password generator

- Pwgen is a command line utility to generate a block of random passwords. Run it from Konsole (in Kubuntu) or Terminal (in Ubuntu). Install:

```
sudo apt-get install pwgen
```

◊ Run pwgen:

```
pwgen
```

- `UUIDgen` is a default utility to generate a random UUID. Run:

```
uuidgen
```

The random UUID can also be used as a password, if desired.

## Password checker and enforcement

[John the Ripper](#) is a free open source password cracker that uses a dictionary of over 4 million commonly used passwords in many languages. Because this tool is widely available, it is useful for scanning and securing your own LAN and computers for password strength. Install:

```
sudo apt-get install john
```

- [Passwdqc](#) is a module to enforce password strength. Install:

```
sudo apt-get install passwdqc
```

## MD5Sum

To check the MD5 sum of a file, use this command in the command line:

```
md5sum filename
```

## Filenames with spaces

- Filenames or folder names with spaces in them should be enclosed with parentheses (" "). For example, to change to a directory named "This Dir" or "/home/This Dir", use the command:

```
cd "This Dir"
```

or

```
cd /home/"This Dir"
```

- Alternatively, a space in a filename or folder name can be preceded with a backslash. For example, to change to a directory named "This Dir" or "/home/This Dir":

```
cd This\ Dir
```

or

```
cd /home/This\ Dir
```

## Alien

[Alien](#) is a method for converting (Red Hat) .rpm packages into (Debian) .deb packages. It is not reliable and converted packages must be tested extensively for functionality, with line changes often required. It is often more reliable to [create \(Debian\) .deb packages from source](#), and even the Alien software maintainers do not recommend using Alien for important packages. To keep alien from changing the version number, use the following command

```
alien -k rpm_file_name.rpm
```

Convert the package.rpm into a package.deb

```
alien -d package-name.rpm
```

Convert the package.rpm into a package.deb, and install the generated package

```
alien -i package-name.rpm
```

To convert .rpm to debian

```
sudo alien -k *.rpm
```

# Software Troubleshooting

## Permissions error on program startup

If you get a permissions error, try the following:

```
sudo chown -R user /home/user
```

Note: Replace *user* with the actual username. This command changes the owner of the folder */home/user* to *user*. -R means "recursively", i.e. including all subfolders.

## CD-ROM Troubleshooting

If you receive the "cdrecord has no permission to open the device" error while burning using a CD burner, open a terminal and type:

```
sudo chmod 777 /dev/scd0
```

Note: replace */dev/scd0* with your own device.

Note: *chmod 777* is the universal option for granting full permission to a folder. The *777* mask indicates that read, write, and execute permission is given to all users.

# Licenses

Linux is largely a community of volunteers and as such represents one of the largest altruistic efforts on earth. This includes companies who decide to contribute their own software into the public domain for free use. The continued success of sharing depends on licenses that keep software free and usable for anyone who wants to use it. However, there must be a method for Linux users and developers to make money, as well. Licensing helps protect each of these efforts. See the [Wikipedia Free Software Licensing article](#) and the [GNU operating system licensing page](#) for more complete information.

## GPL license

The [GPLv3](#) license (and the [Affero GPLv3](#) license for network-based software) intends that the software module or package is free to use in any environment, and furthermore, any software that relies on that GPLv3-licensed module must in turn also be completely free. Commercial and proprietary software packages can't use or incorporate GPLv3-licensed modules.

## LGPL license

The [Lesser GPL](#) license intends that the software module or package is free to use in any environment, including in commercial and proprietary software packages. This allows companies to develop proprietary packages which includes LGPL-licensed modules, from which they can make a profit. The disadvantage is that their products (which benefit from the LGPL-licensed modules) are not required to be in the public domain in turn. (Many companies often later donate their entire package into the public domain, however, after they no longer make a profit from them.)

## Apache license

The [Apache license](#) has been around a long time. It is compatible with the GPLv3 license, but, unlike the GPLv3 license, it does not require modified software to retain the Apache license. In other words, Apache-licensed software can be modified and the modified software then made proprietary (and therefore not returned to the open source community).

## BSD license

The [BSD license](#) is similar to a public domain license. There are currently many confusing iterations of the BSD license, mostly regarding attribution notices and advertising that is required to be provided along with any software derivatives. The BSD license allows the option of propagation of either (otherwise-licensed) free

open source restrictions *or* proprietary restrictions. It therefore allows a mix of (otherwise-licensed) proprietary modules and open sourced-licensed modules to co-exist in the same package. This flexibility has made the BSD license popular with complex distributions (such as the (BSD Unix-based) Mac OS X operating system, for example).

## Proprietary licenses

There is a vast array of proprietary licenses, all different. You never know what your limitations for software are unless you read every word. Most are attempts by lawyers to have an opportunity to create a lawsuit in the future. Some may be called "free" licenses but have many limitations which you will not be aware of until you are in the middle of a lawsuit. No license outside of the GPLv3 license is recommended. Be careful when committing your organization to a mission-critical software package with a proprietary license. Also see this outstanding article on the [Open Source Enterprise Trap](#).

Search



### **Ultamatix**

#### ***What is Ultamatix?***

I would like to start off by saying the software if you so choose to install is based off "Automatix", but sold out to pioneer linux so no such thing anymore. I picked up the source and began continuing development. I love GPL. What it is:

- Software installation where it does not exist (repo / license / 0 user knowledge required)
- Choice of free software or otherwise.
- Automation of the above
- Choice of what you would like installed (you build your own O/S)

#### **What it is:**

- Software installation where it does not exist (repo / license / 0 user knowledge required)
- Choice of free software or otherwise.
- Automation of the above
- Choice of what you would like installed (you build your own O/S)

### What it is not:

- Software that accepts the license agreement for you.

### What it has (143 applications / games):

- [Ultimate Edition 2.3 theme pack beta](#) - this is for testing purposes
- [Ultimate Edition .0.0.7 theme pack](#)
- Amarok 1.4 Fast Forward PPA and Amarok 2 Nightly build they can run side by side
- Open Office 3
- [Ultimate Edition 2.1 theme pack](#)
- [Xmas Edition Theme Pack](#)
- Lanshark - Easy networking tool
- XBMC Media Center
- libdvdcss2 - DVD Decryption library
- Vuze (Azureus) P2P file sharing app
- Audacious music player
- Realplayer browser plugin support
- Torcs game
- Volleyball game
- S.C.O.R.G.E game
- Oolite game
- GL-117 game
- Gtk atlantic game
- Netpanzer game
- Nethack game
- Blob and conquer game
- Google Gadgets
- Ubuntu Studio Environment
- K3b burning software
- [Ultimate Edition 2.2 theme Pack](#)
- PPA repo driven compiz fusion (latest and greatest)
- Moaning Goat Meter (MGM)
- Terminator (multi-window terminal)
- Jedit Editor
- Ghpeditor
- Abiword
- Wifi-support & Wifi Tools
- T.V. Capture card software & tools
- Blender, Yafaray and Inkscape vector based editors
- Qemulator, Qemu Virtualization tools
- Yakuake Terminal
- DeVeDe Dvd movie creator
- Lemonrip dvd ripper

- Isomaster
- Brasero
- Kmymoney2
- Gnucash
- Ktorrent
- DVD Styler
- ManDVD
- Avant Window Navigator & PPA repo driven
- Actioncube
- Gridwars
- Banshee - media player
- Lives - Movie editor
- Gourmet - Recipe Manager
- Anjuta - IDE
- Bluefish editor
- Glade 3 - Programming GTK
- Quanta Plus - HTML editor
- BUM - Boot-up Manager
- Acetone - ISO Editor
- Start up manager
- Sysinfo
- Ubuntu Restricted Extras and Multimedia Codecs
- Media Players and Editors
- Adobe Acrobat Reader
- Additional fonts, MS fonts, and Red Hat Liberation fonts
- Additional archiving tools (rar, unrar, ace, and 7zip, etc.)
- Skype
- Google Earth
- DVD Ripping software
- Codecs and Plugins (some unacceptable for use in the US and will prompt you.)
- Google Picasa
- Wine & Wine doors
- NON-FREE w32codecs and DVD codecs (you make this decision)
- Nautilus Scripts (many scripts written by me)
- SUN JAVA 1.6 JRE and JDK as per your agreement
- OpenOffice Clipart
- CheckGmail
- xDVDshrink
- Songbird
- Developer Essentials
- Microsoft Office OpenXML Translator
- RTCW: Enemy Territory
- Americas Army Game
- Alien Arena 2007 Game

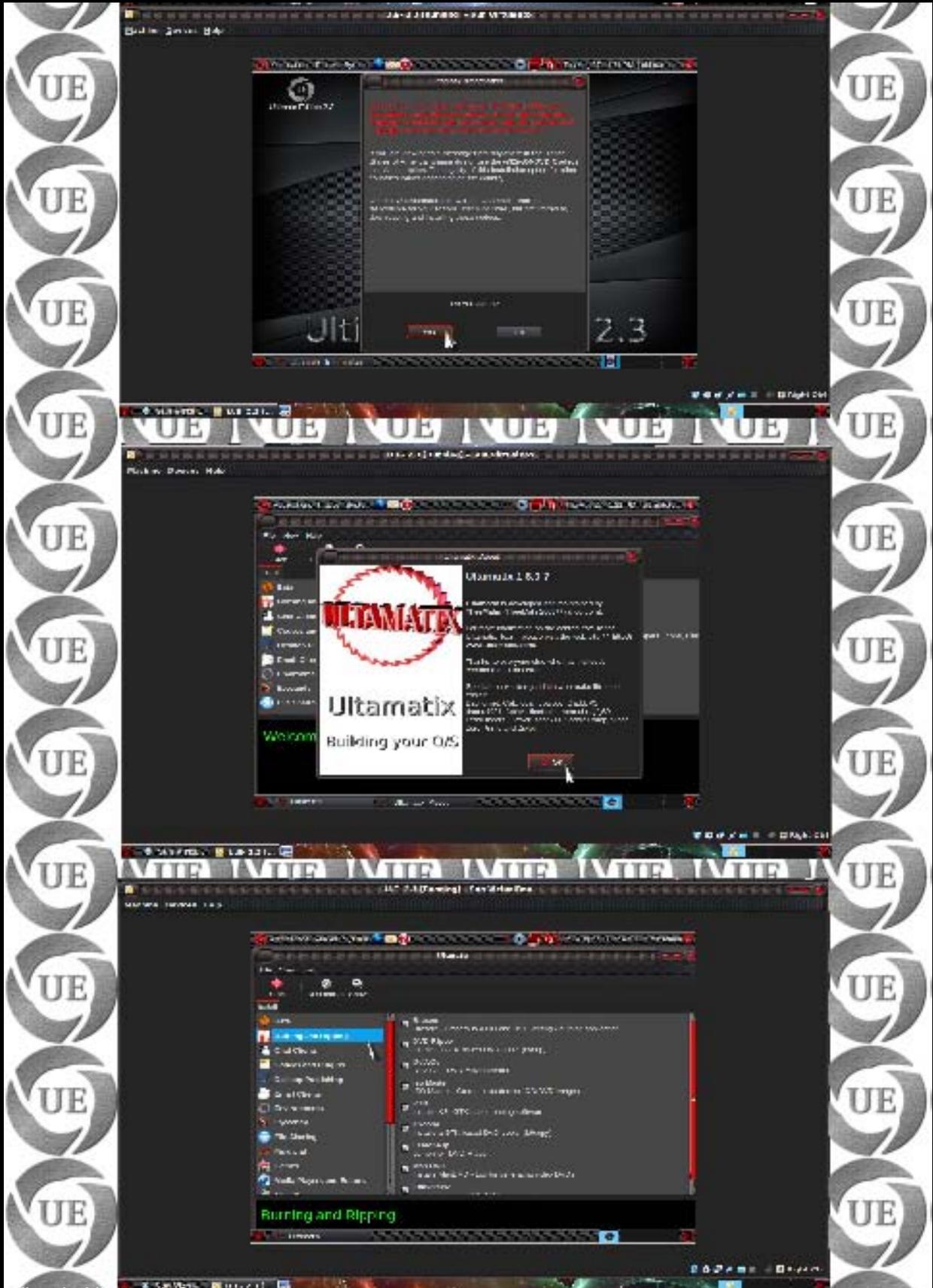
- Amoebax Game
- AssaultCube Game
- ATanks Game
- Legends Game
- Sauerbraten Game
- Frostwire
- Atanks Game
- Totem-Xine
- Fspot
- Kino
- DeVeDe
- Extra Fonts
- Nexuiz
- Glest
- Tremulous
- Wesnoth
- Open Arena
- Warsow
- Boswars
- Vdrift
- BzFlag
- Screenlets
- Gdesklets
- Ubuntu Tweak
- Amarok 2 Neon (alpha)
- More to follow
- Orbital Sniper
- Chess Games
- Neverball
- Urban Terror
- Vegastrike
- Tile Racer
- Scorched 3D
- FooBillard
- Wormux
- World Of Padman (WOP)
- Frozen Bubble
- Flightgear
- Freecol
- Globulation 2
- Adobe flash player 10 and works in 64bit...
- Pingus Game
- UFO: AI
- Warzone 2100

- Dark Oberon
- Firefox Mplayer Plugin
- NTFS Read / Write Support
- K9 Copy
- AMSN Chat Client
- Pidgin
- KVirc
- Extra Themes
- Chromium
- Dragon Player
- Amarok
- Transmission torrent client
- VLC Media player
- DVD Styler
- ManDVD
- Actioncube
- Banshee - Media player
- Anjuta - IDE
- Bluefish editor
- Glade 3 - Programming GTK
- Quanta Plus - HTML editor
- Screem - HTML editor
- Firestarter - Firewall
- BUM - Boot-up Manager
- KDE 3 Environment (Experimental)
- XUbuntu Environment (Experimental)
- Edubuntu Environment (Experimental)
- Ubuntu Studio Environment (Experimental)

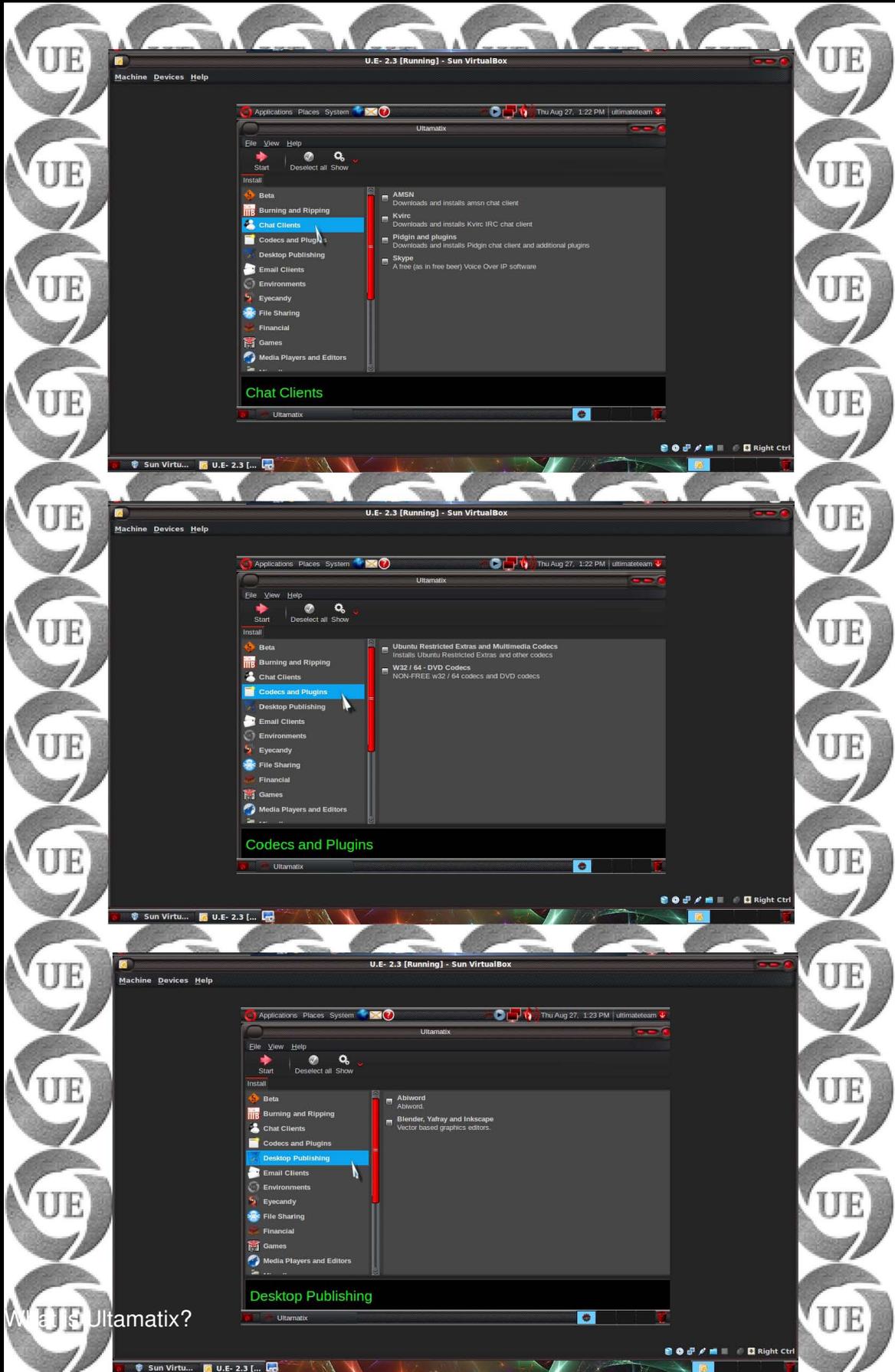
*and adding.....*

*Here are a few screenshots for you of this mighty software. Enjoy !!!*

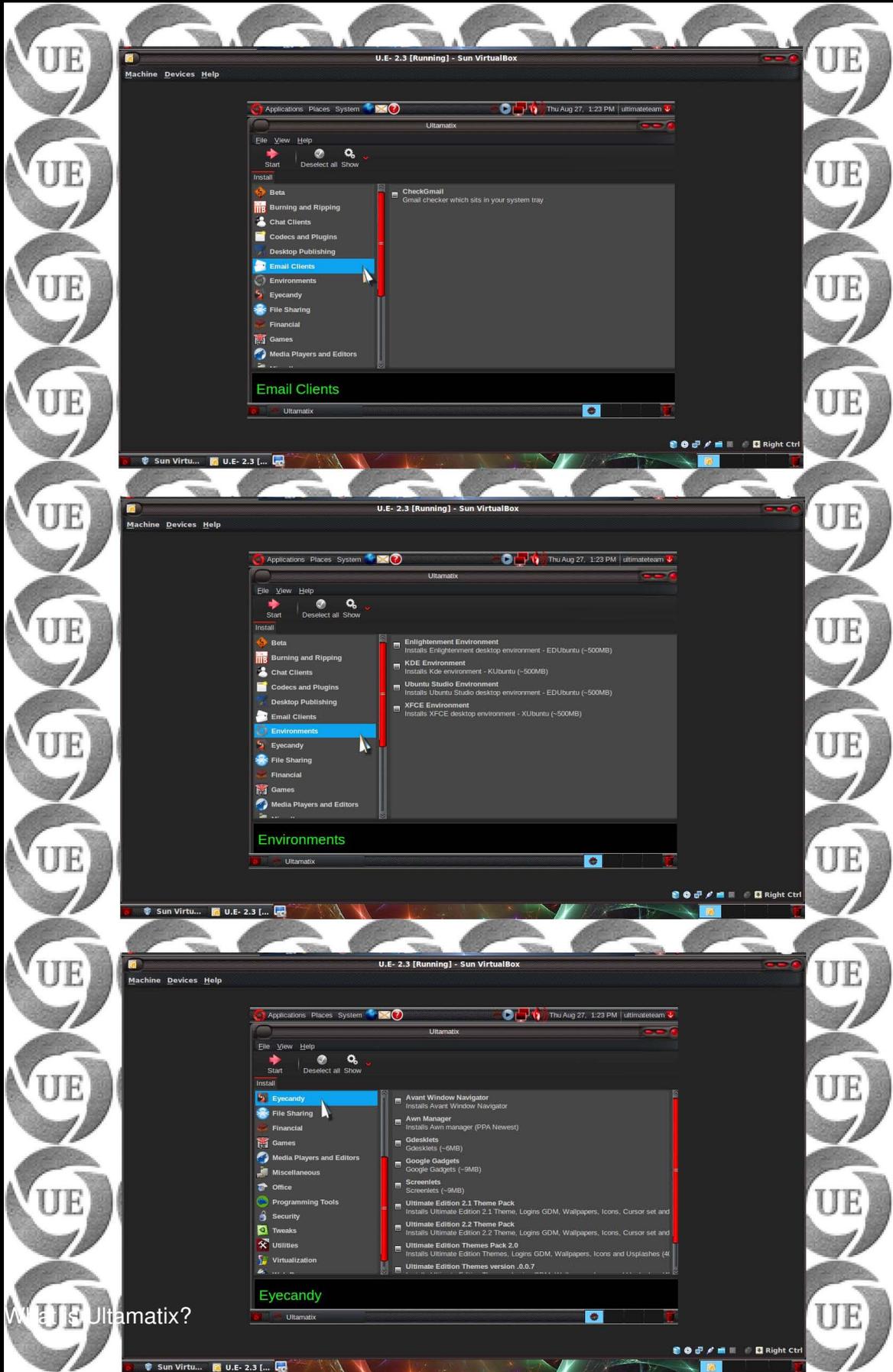




What is Ultimatrix?

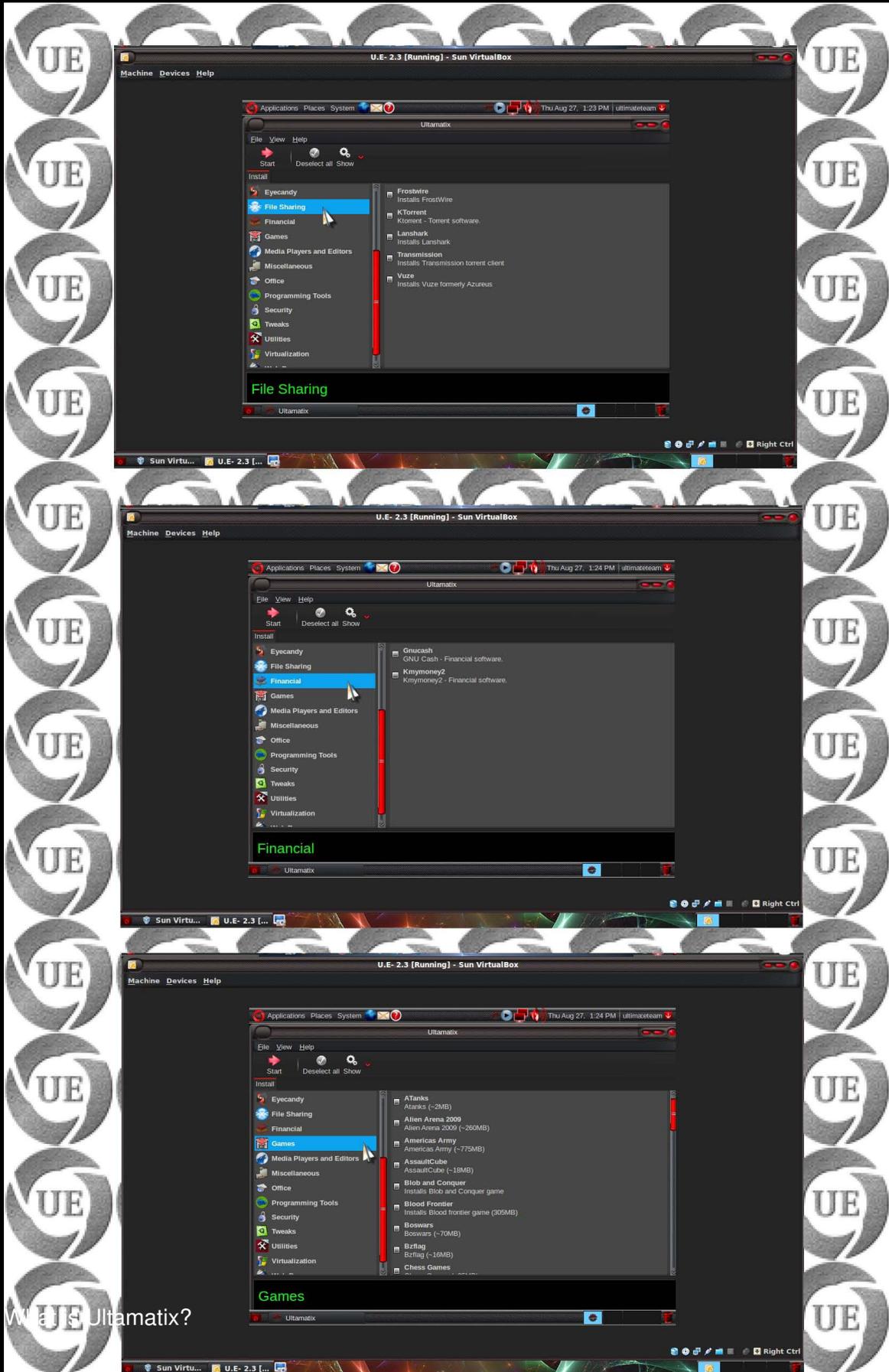


# Ultimate Edition Guide



What's Ultimatix?

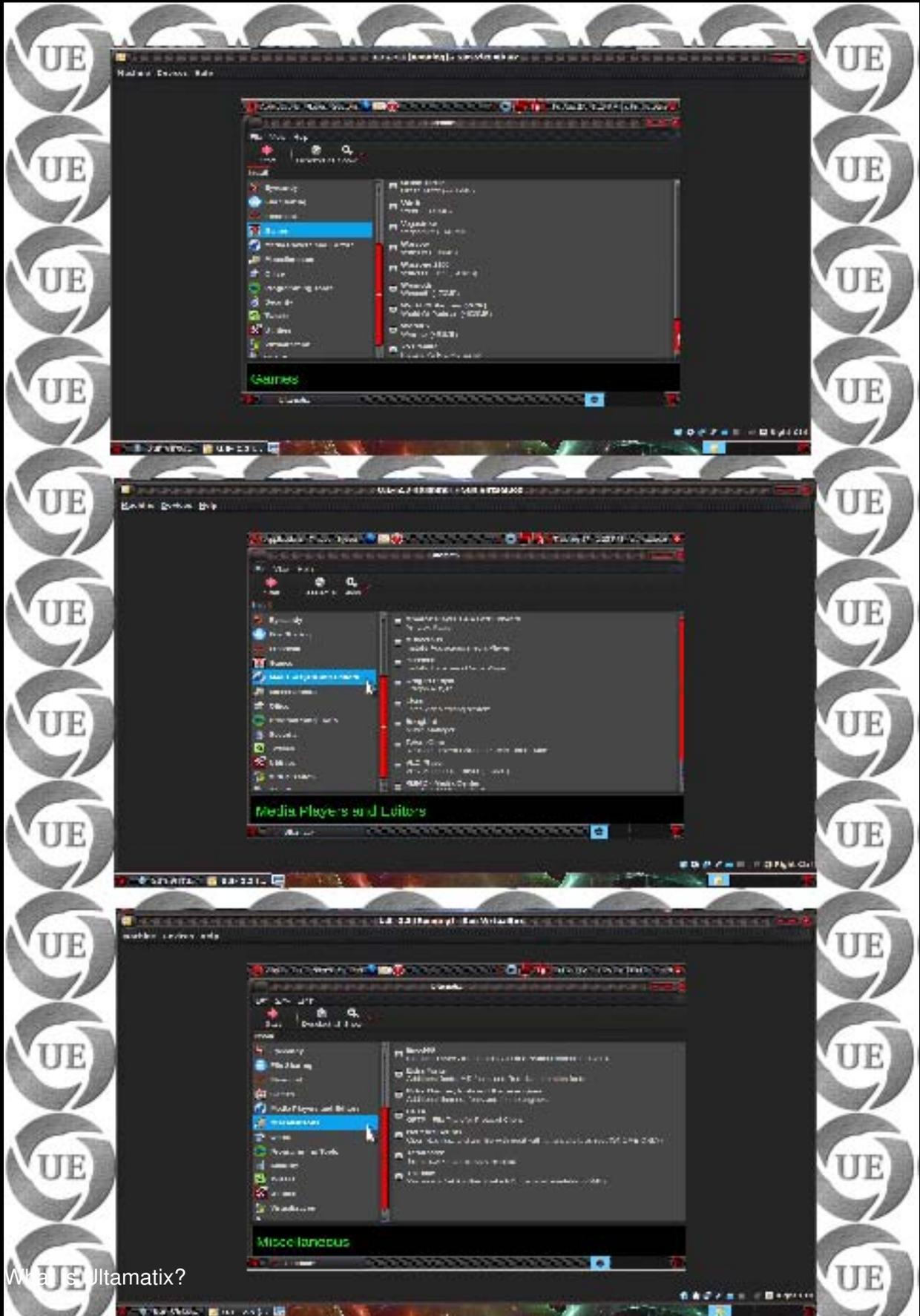
# Ultimate Edition Guide



What's Ultimatix?

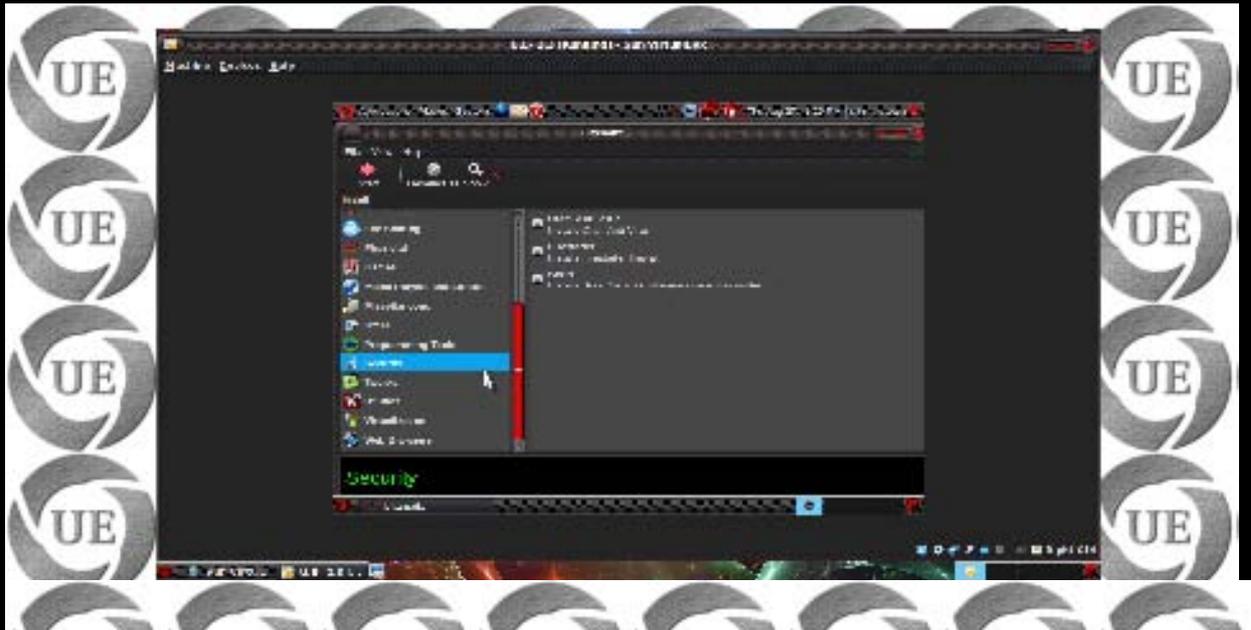




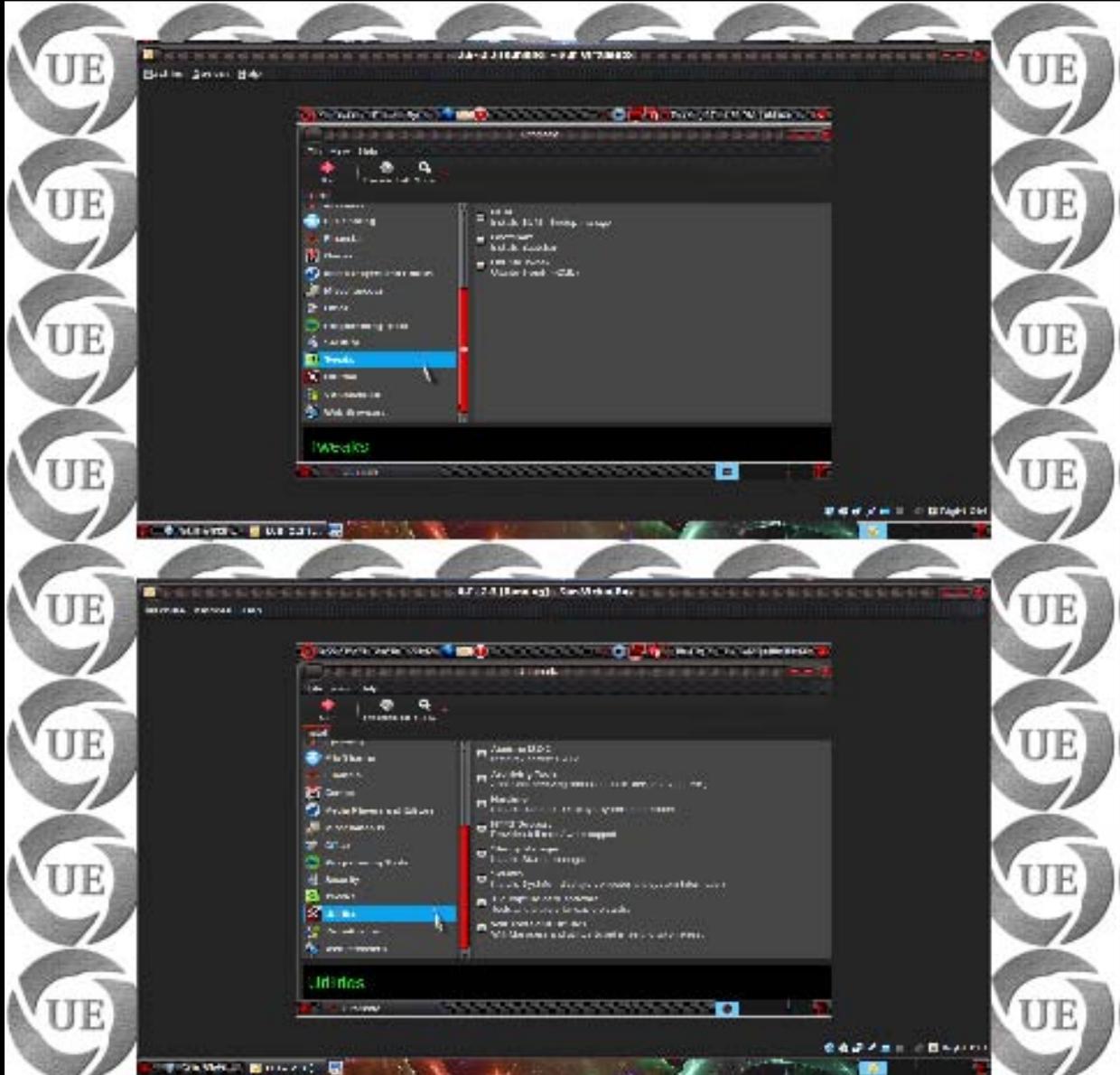


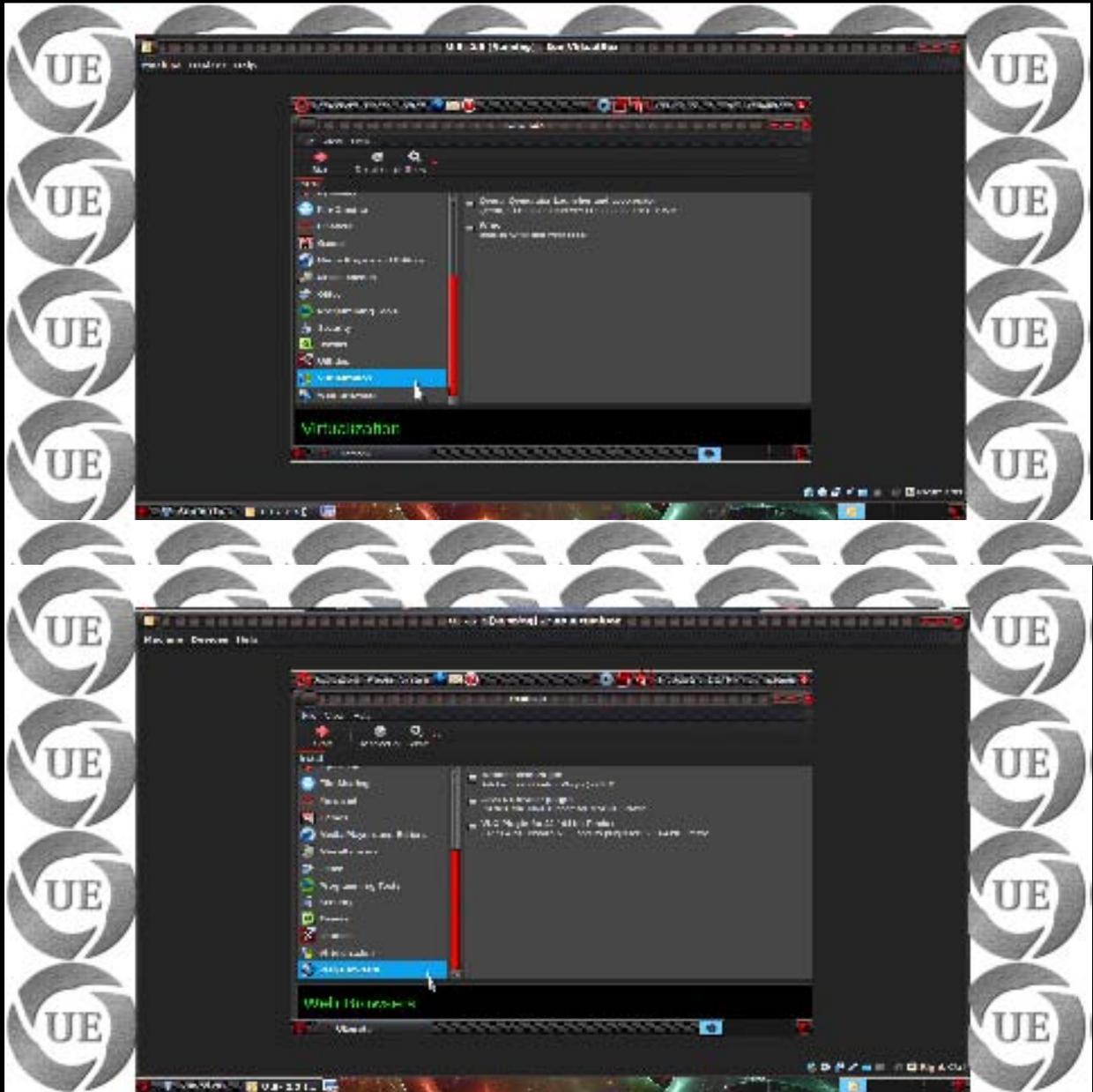


## Ultimate Edition Guide



# Ultimate Edition Guide





*To install any software through Ultamatrix all you have to do is select the software from the list on right and click Start and magic starts...Ultamatrix will automatically download software, resolve dependencies, resolve conflicts and install it for you. Just start using software after selecting it from the gnome menu.*

***Try Ultamatix to truly enjoy and trust this amazing piece of software. It makes Linux far more enjoyable and super easy and you get best of all worlds. Try it to believe it...***



*- Enjoy Ultimate Edition -*



## **Configure your AUDIO**

In this part we will discuss the operation of all our sound card options. There are different sound card/s but the mixer process is nearly similar. In general, each sound card has its own different possibilities. Here look at how the mixer works with ALSA.

## Ultimate Edition Guide



First right-click the speaker on the top bar.



Now unmute the PC speakers, open preferences and select various options as per your sound card and your preferences

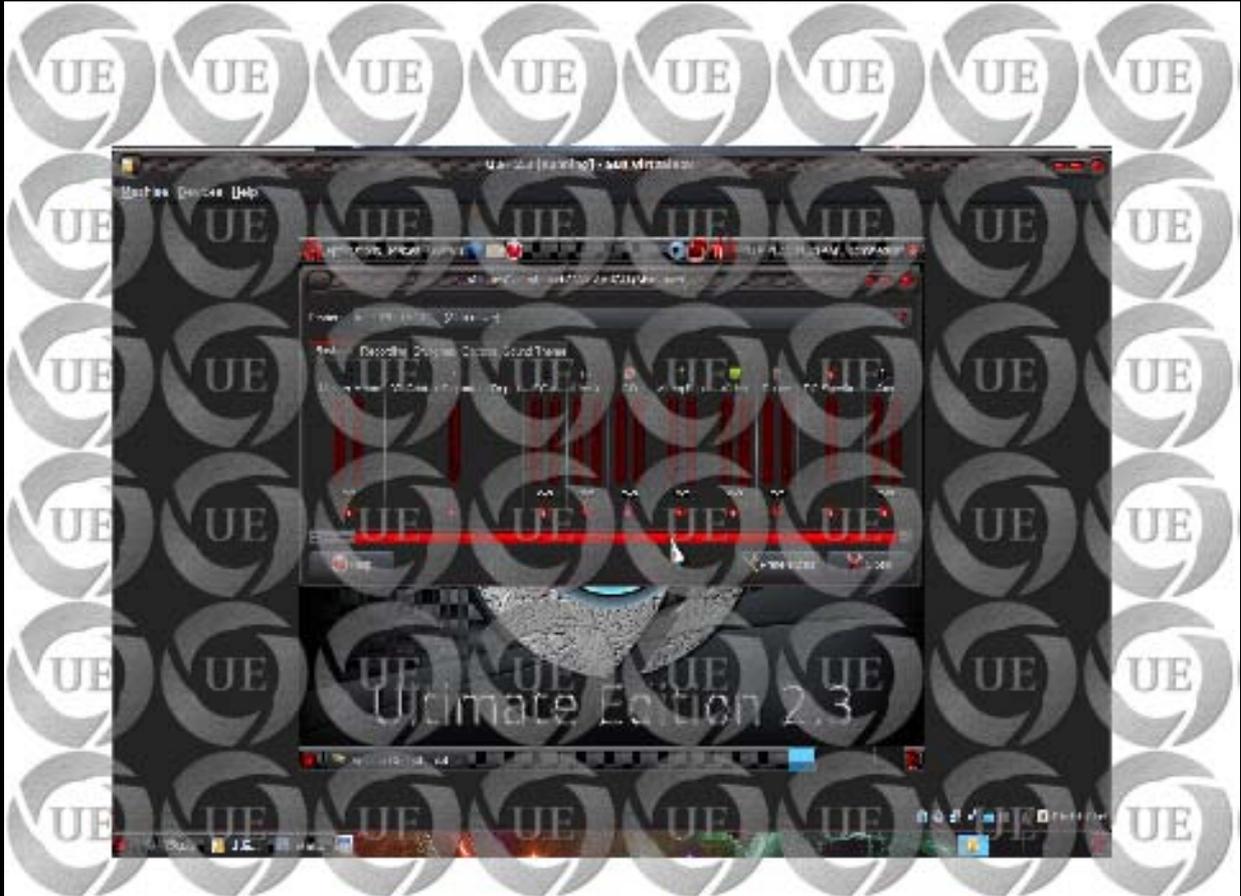
## Ultimate Edition Guide



Click Preferences



Select various mixers or channels that you want to be displayed on the volume control panel



All your selected mixers/channels are shown in this way on Volume Control panel



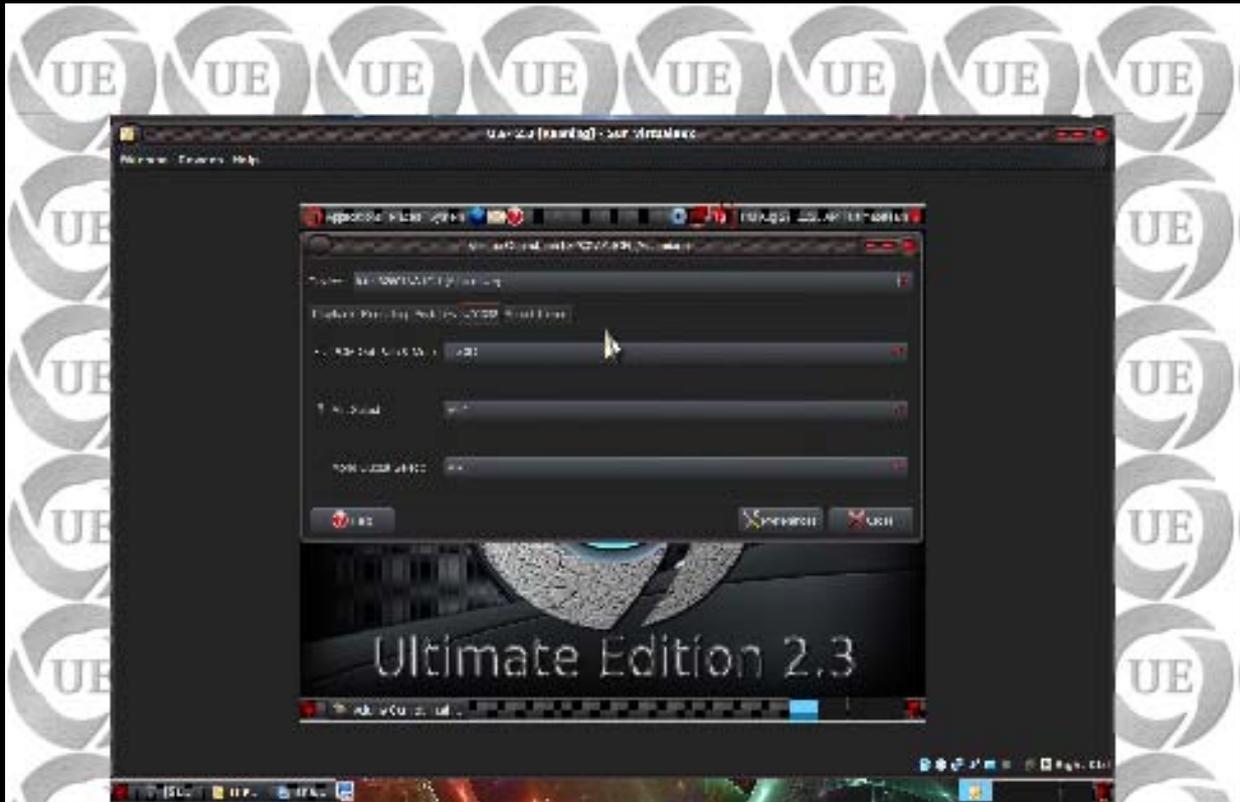
Select your recording preference





Select your switch preference





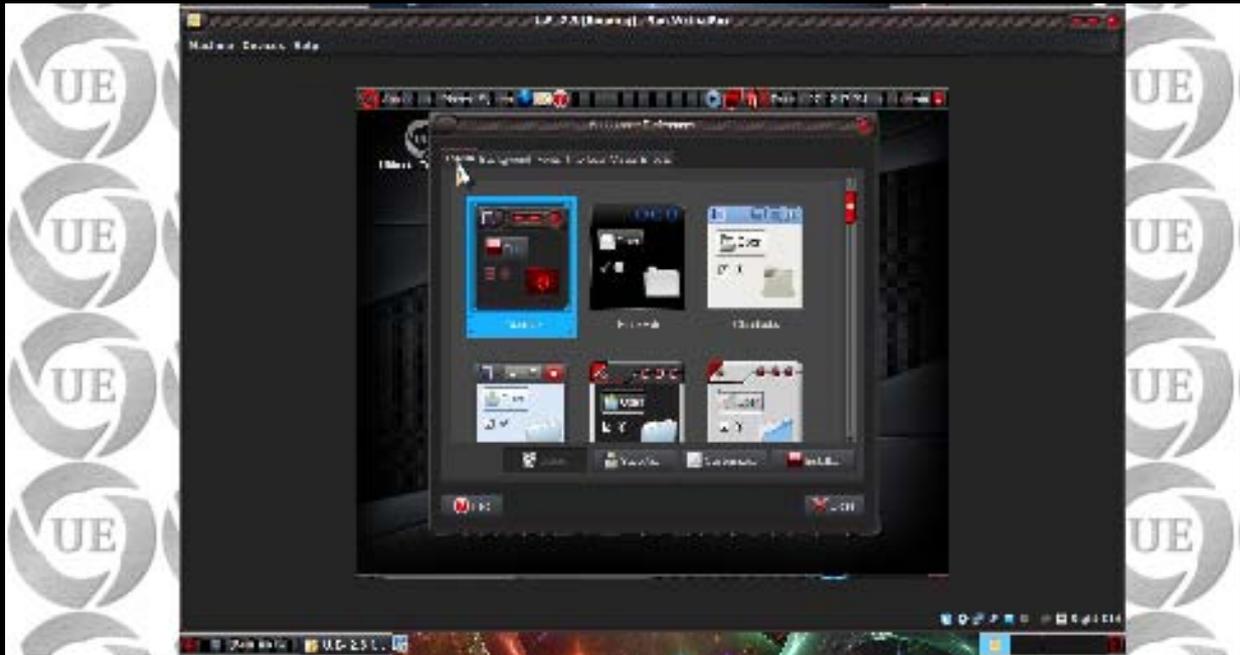
Select more options as per your sound card like 3D , etc.





*Right click on Desktop screen and select “Change Desktop Background”*

## Ultimate Edition Guide



*Select your desired Theme*



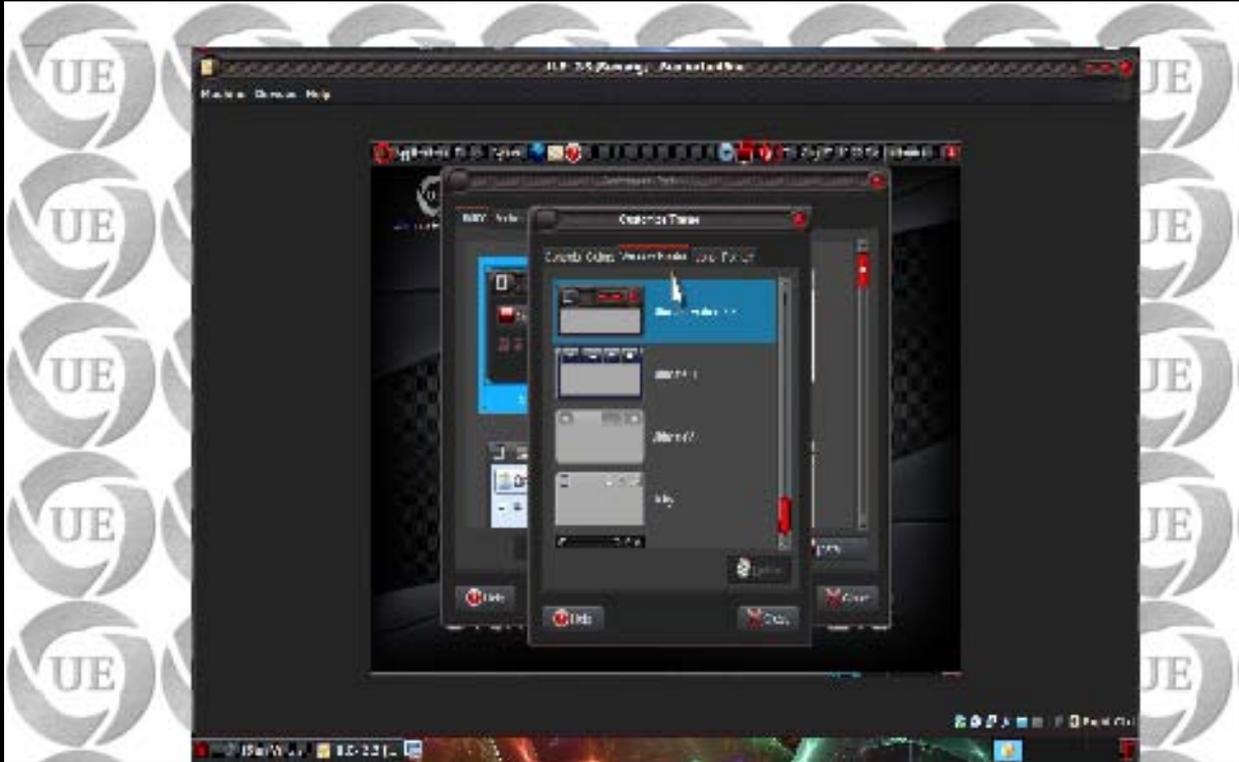
*Click “Customize” to edit your selected theme further*



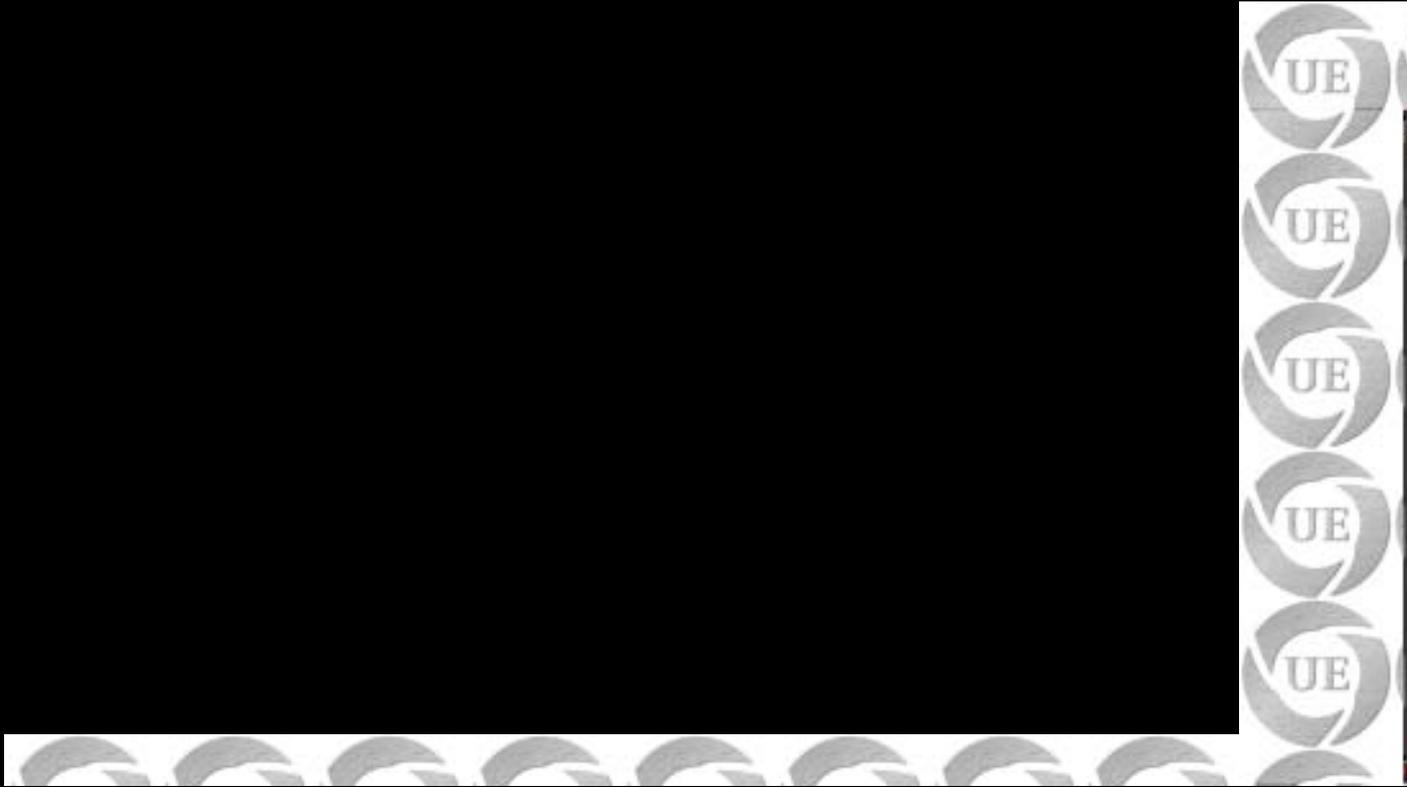
*Select your desired "Widows decoration/Controls"*



*Select your desired “Colors”*



*Select your desired "Window borders"*



*Select your desired “Icons set”*

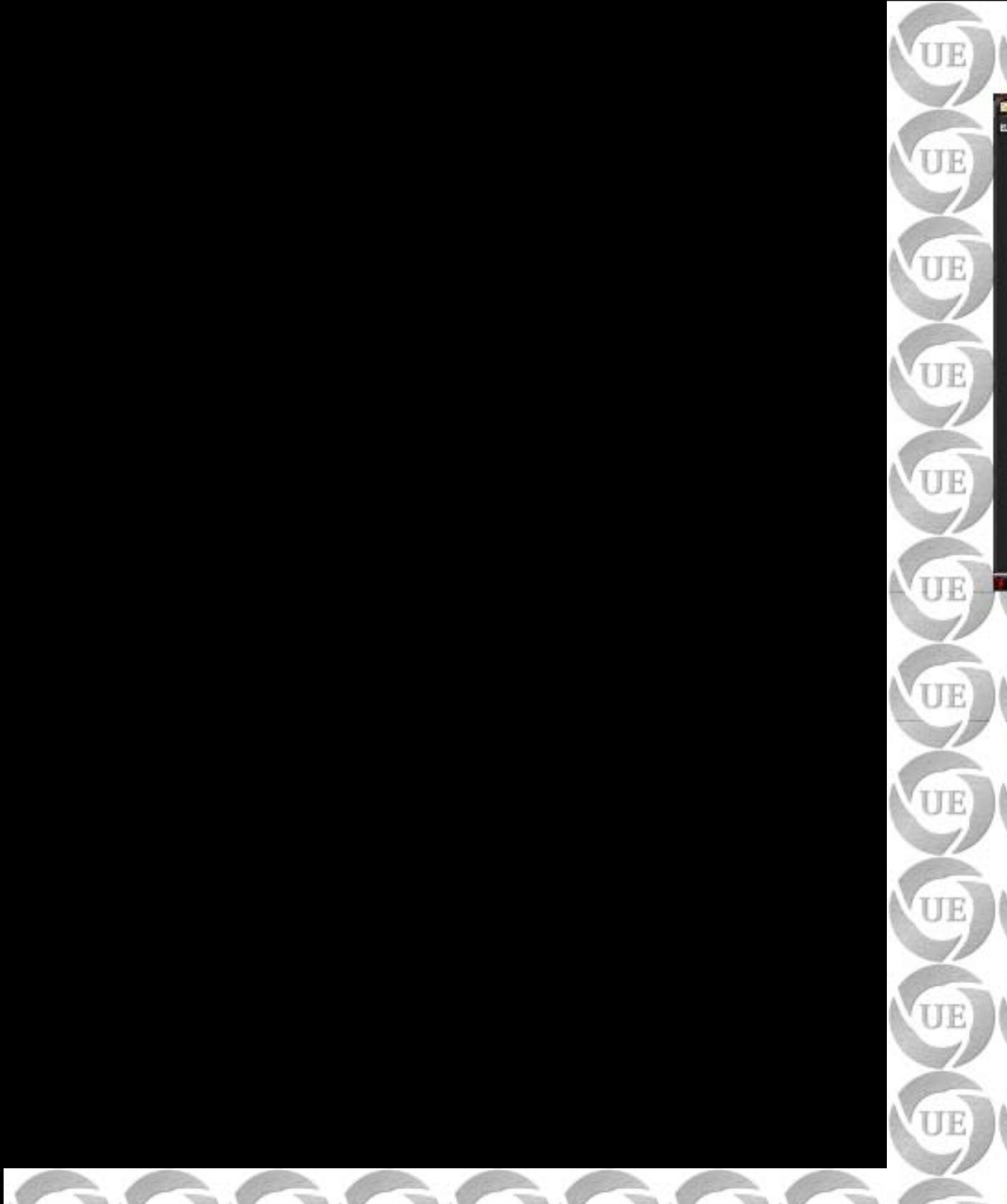




*Select your desired “Background/Wallpaper”*



*Select your desired "Fonts" for Window titlebars, Applications, Menus, etc.*



## Ultimate Edition Guide

*Make desired changes in “Interface”*



*choose levels of effects you want to have. Generally “Normal” is good for most of the cards. For “Extra” you will need a reasonably powerful Graphics cards. Select “None” to disable any effects.*



*Have fun !!!*



## Guide for Installation of Ultimate Edition

### Contents:

- [Before we begin](#)
- [Installing Ultimate Edition](#)
- [After installation of Ultimate Edition](#)
- [Support Forum](#)

---

### [Pre-Installation using Ultimate Edition 2.3 as an example.](#)

#### Examples of a releases:

**Release Name:** Ultimate Edition 2.3  
**Architecture:** x86 (32bit)  
**Code base:** Ultimate Edition 2.2 (Jaunty)  
**File size:** 2.1 GB (2,268,733,440 bytes)  
**MD5SUM:** 2ec4d3a0012aa0c999eb0eedc1e24f1e

**Release Name:** Ultimate Edition 2.3  
**Architecture:** 64 Bit  
**Code base:** Ultimate Edition 2.2 (Jaunty)  
**File size:** 2.2 GB (2,378,180,608 bytes)  
**MD5SUM:** de7b5156fd7ec104158e6e401fb88246

Before we even waste a dvd burning it we want to verify that we have downloaded a "good" copy. In linux this is simple open a terminal **Applications >> Accessories >> Terminal**. Supposing you downloaded it to your desktop & using the 64bit in this example:

```
cd Desktop  
md5sum ultimate-edition-2.3-x64.iso
```

In windows:

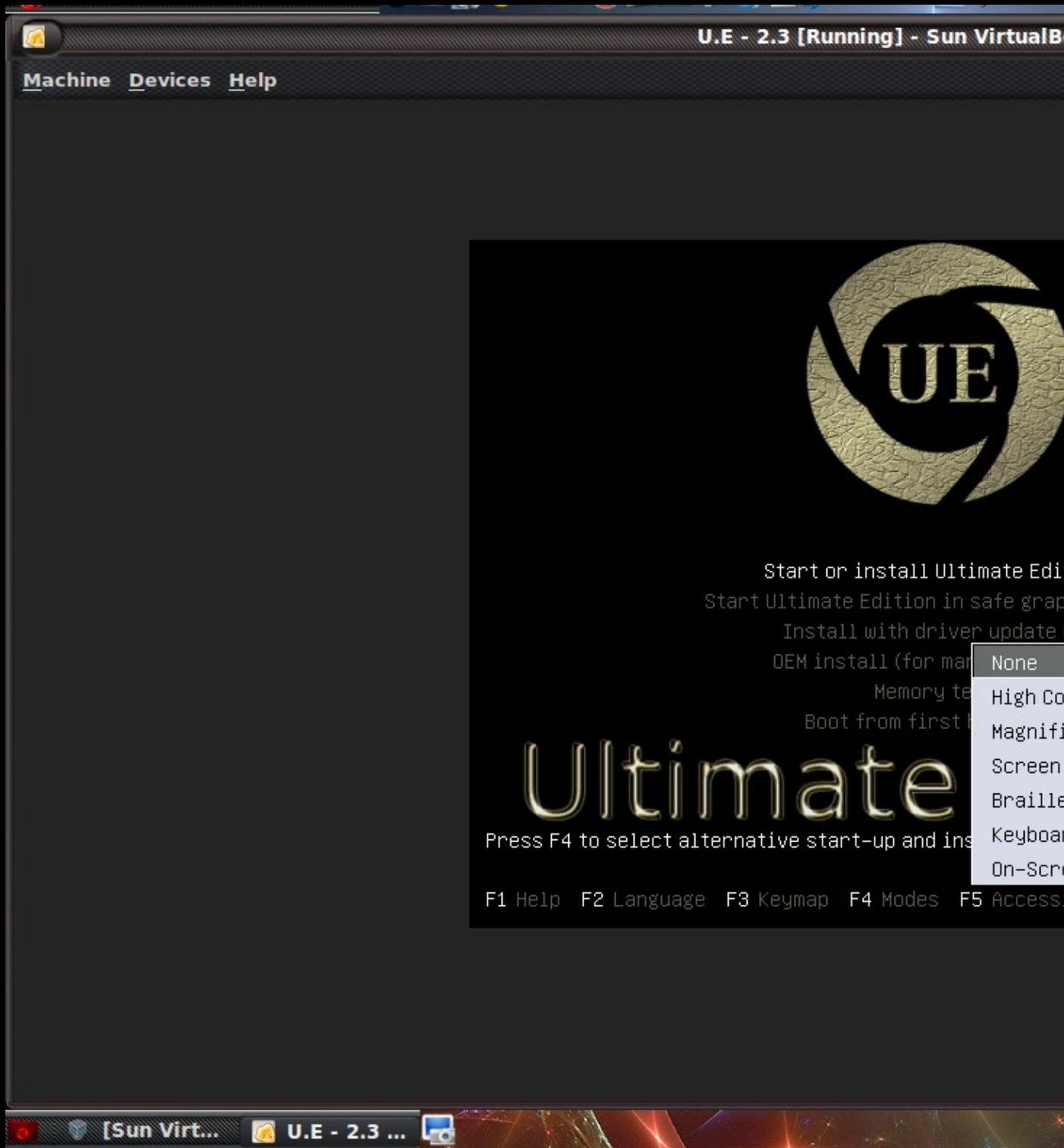
[Download MD5summer](#)

If it returns anything different then the above alpha numeric number, you have a bad copy and must re-download it. I highly suggest when you do burn it; you burn it at your drives slowest speed to once again ensure that you have a good copy.

---

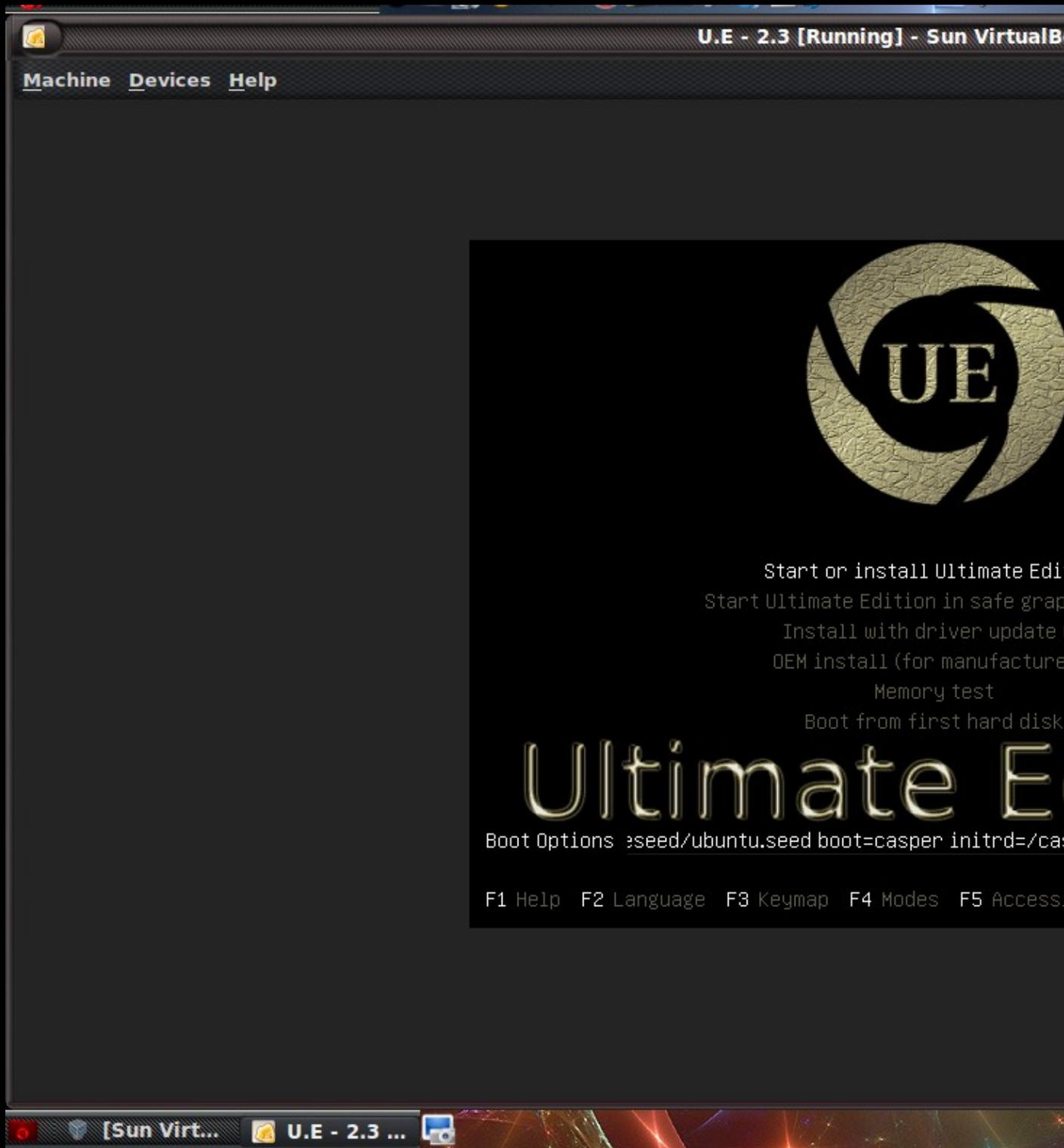
### [Installation Guide using Ultimate Edition 2.3](#)

Fill in simple description here. **Installation process:**



## Ultimate Edition Guide

If you have issues such as getting a black screen and not making it to the desktop 2 things to attempt at this stage is pressing F4 and selecting Safemode VGA. Another being F6 acpi=off, as can be seen in screenshot below.



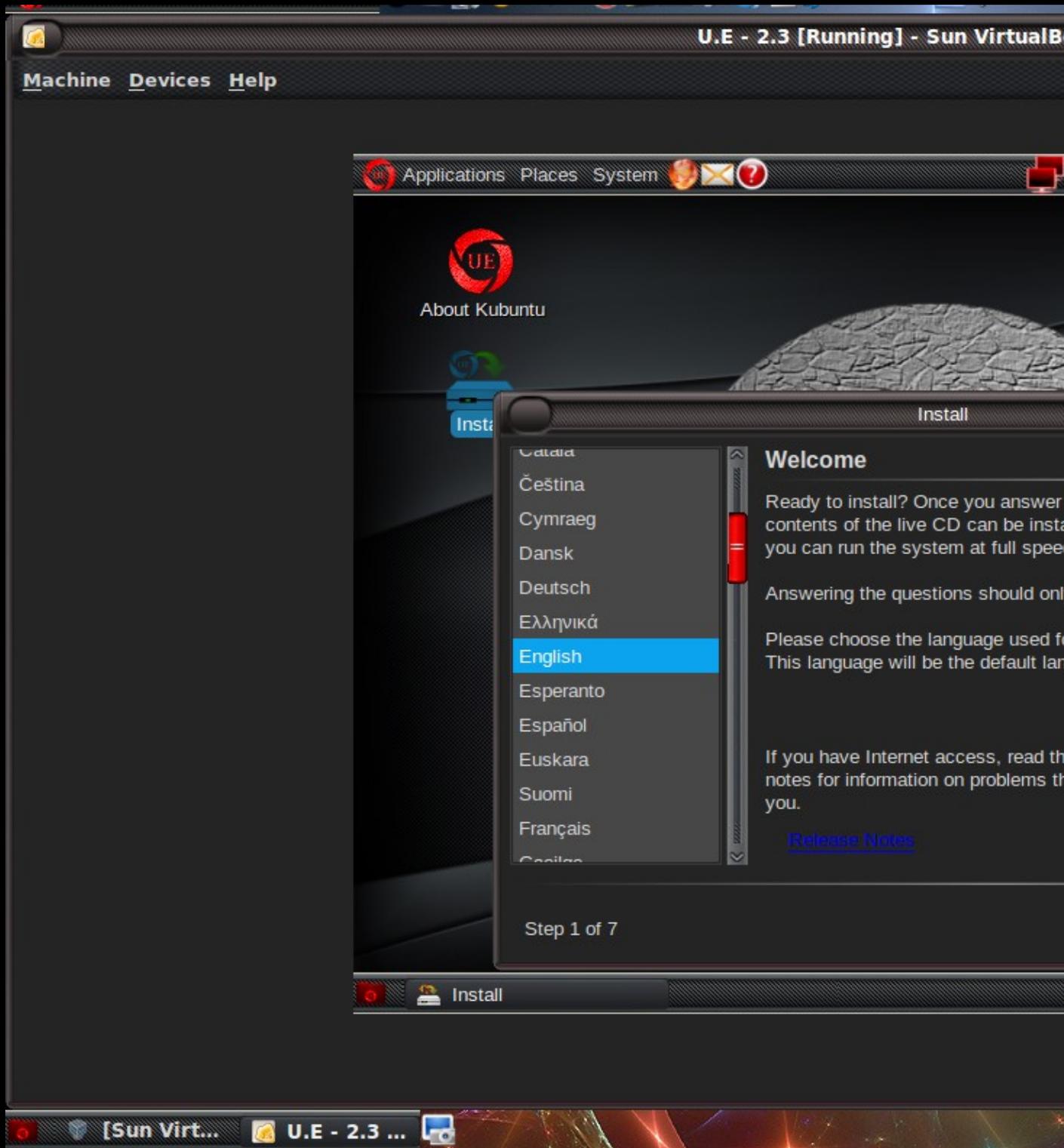
Other options.



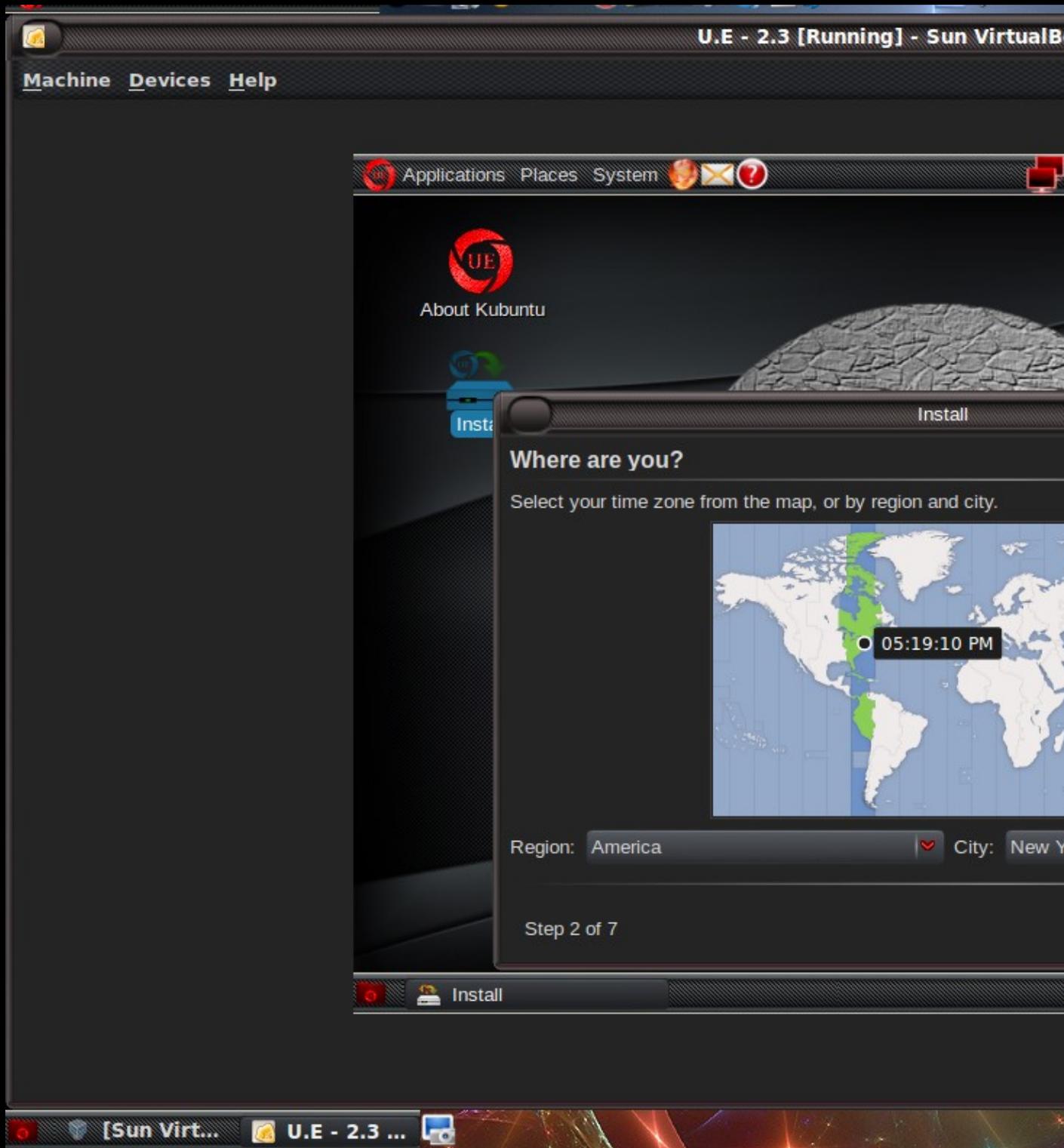
USplash.



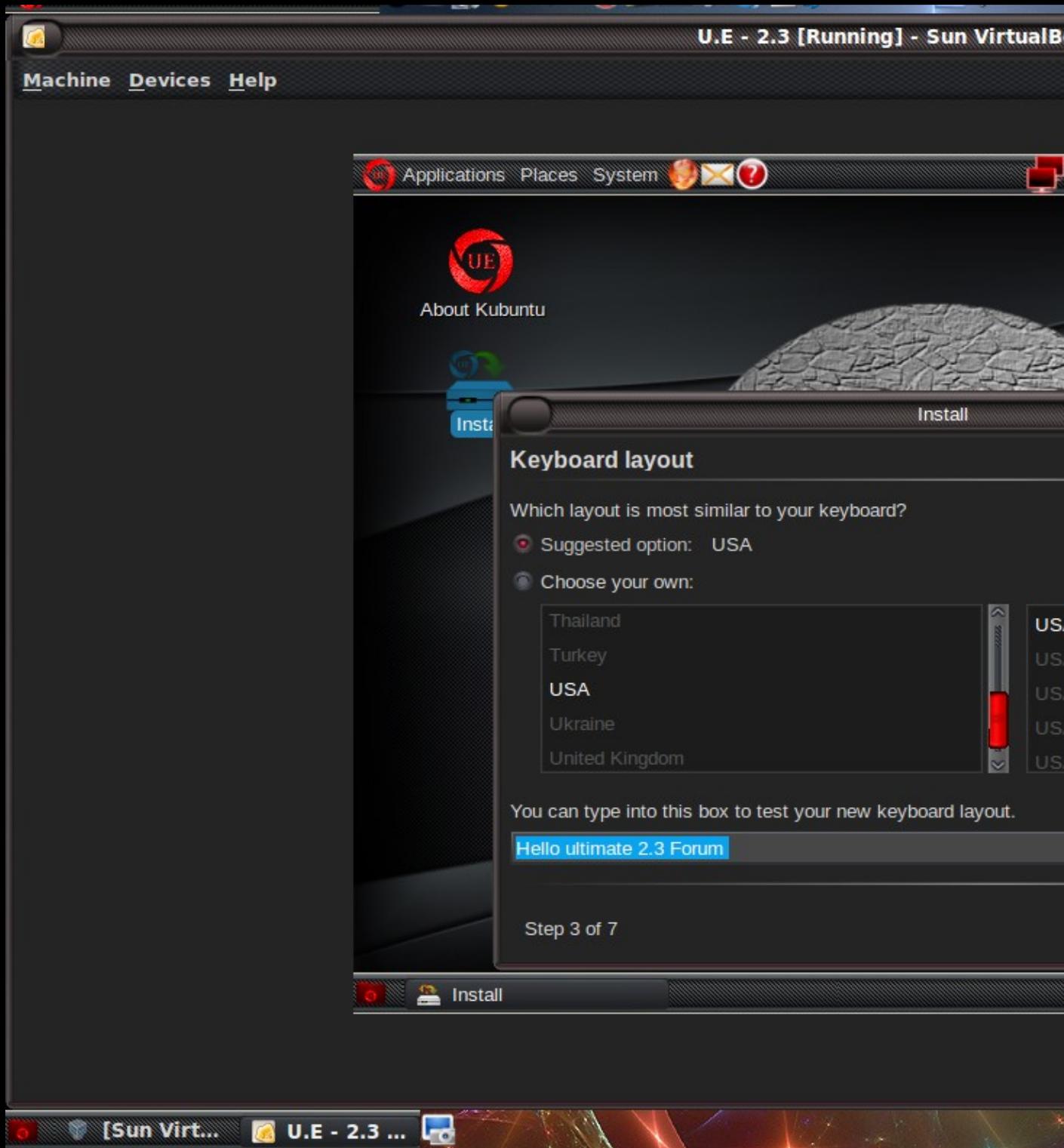
Initial Desktop.



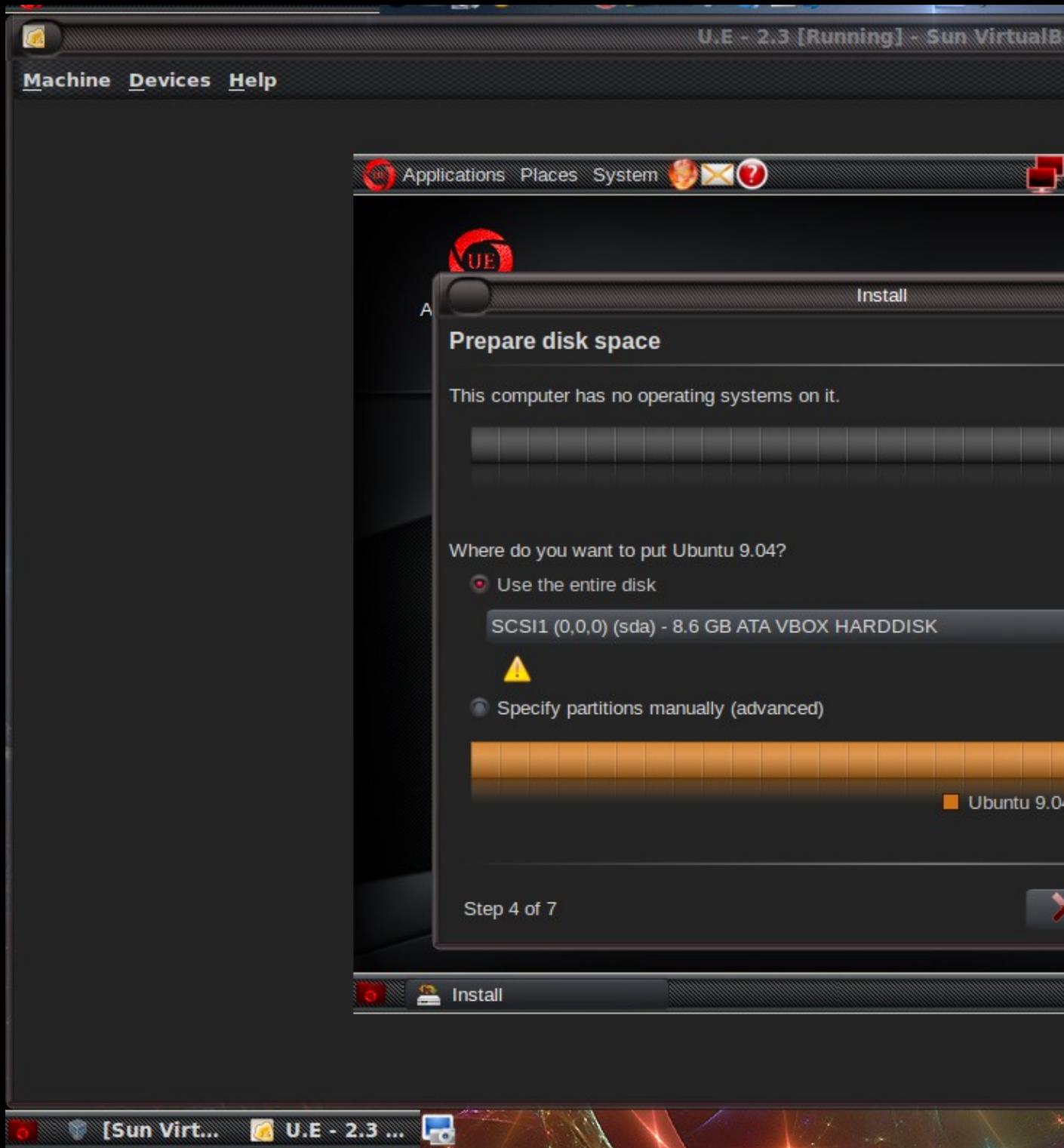
Installation Step 1 of 7 - Language selection.



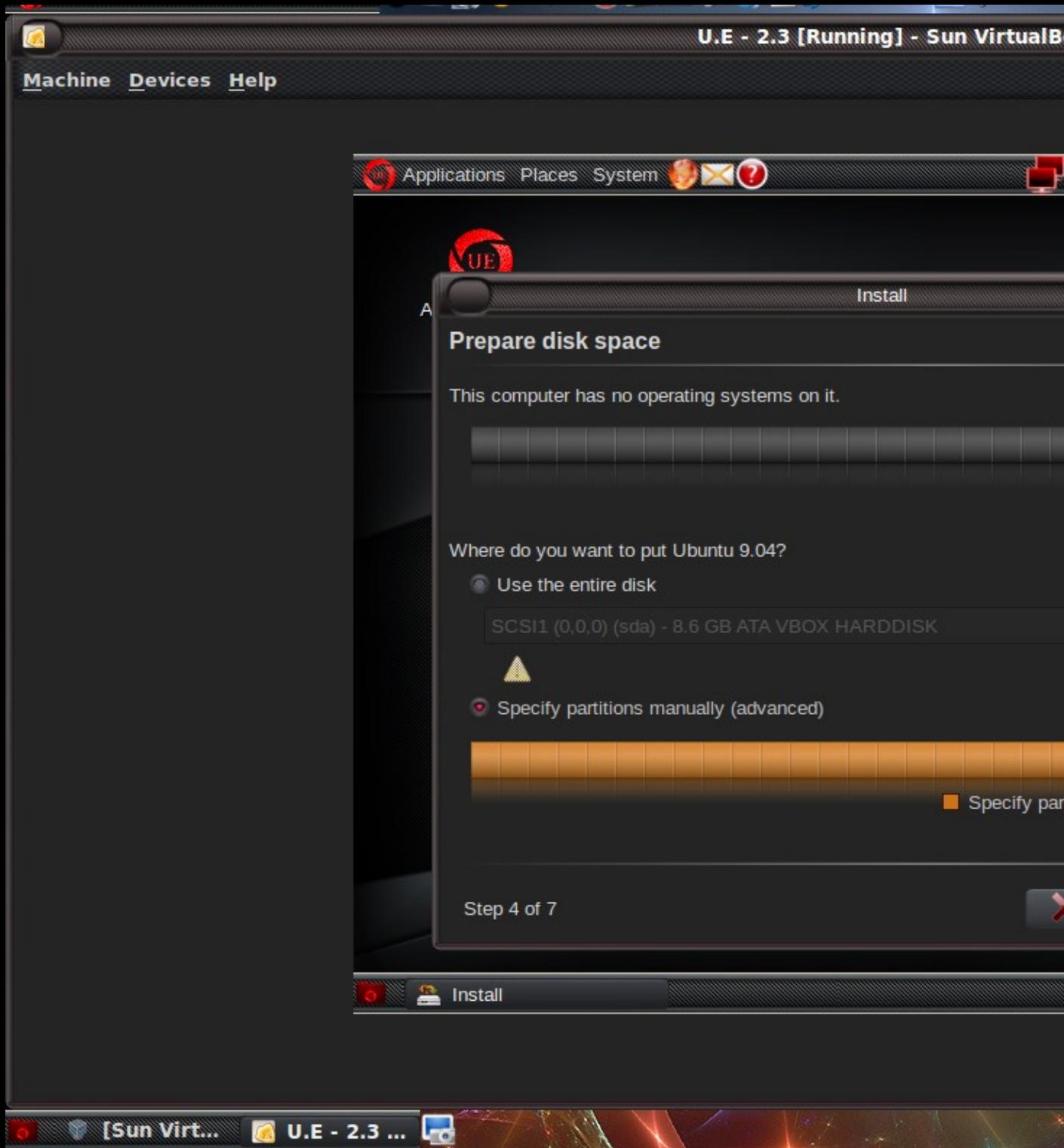
Installation Step 2 of 7 - Timezone selction.



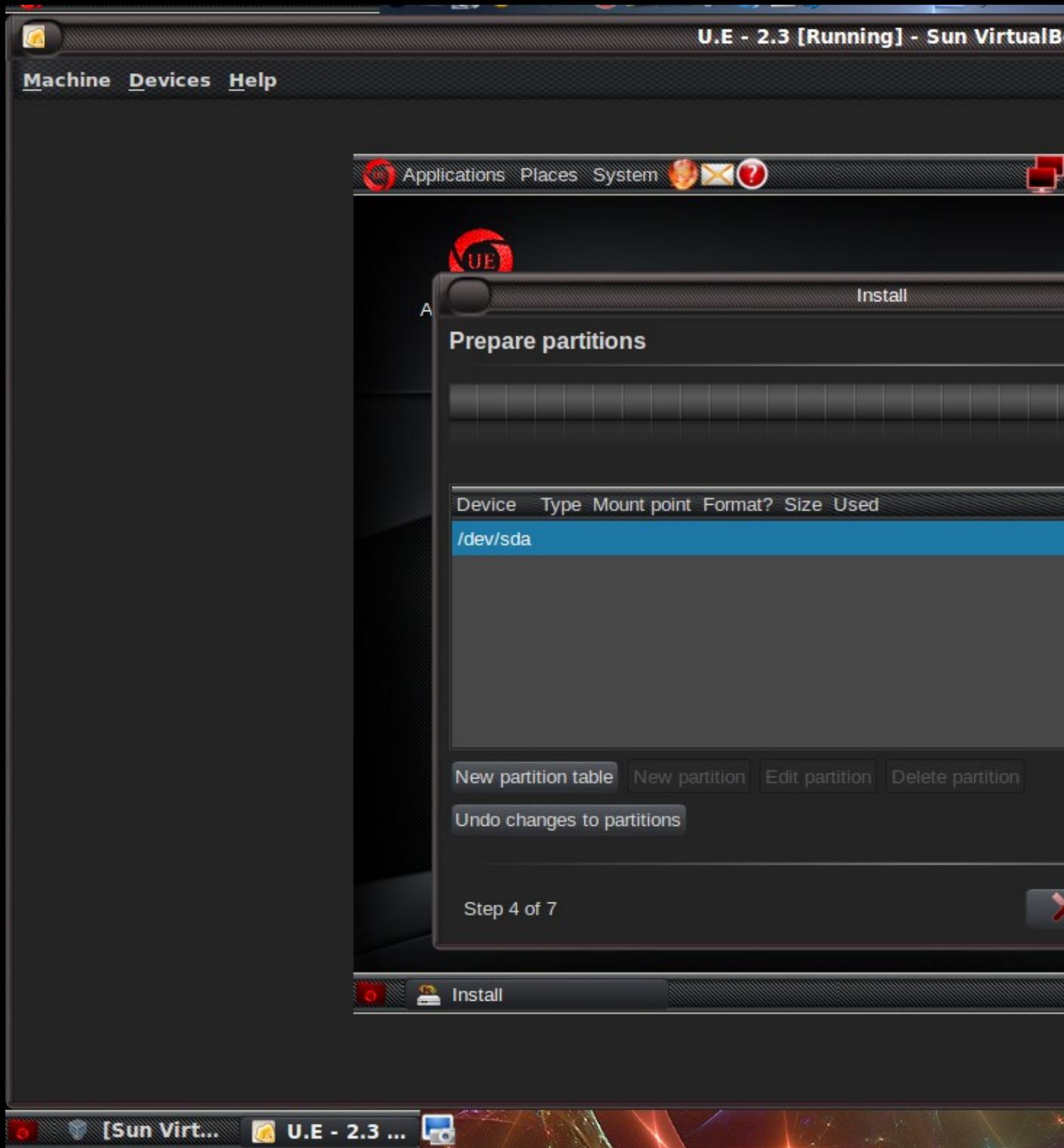
Installation Step 3 of 7 - Keyboard selection.



Installation Step 4 of 7 - Partitioning.



Manual partitioning selected.

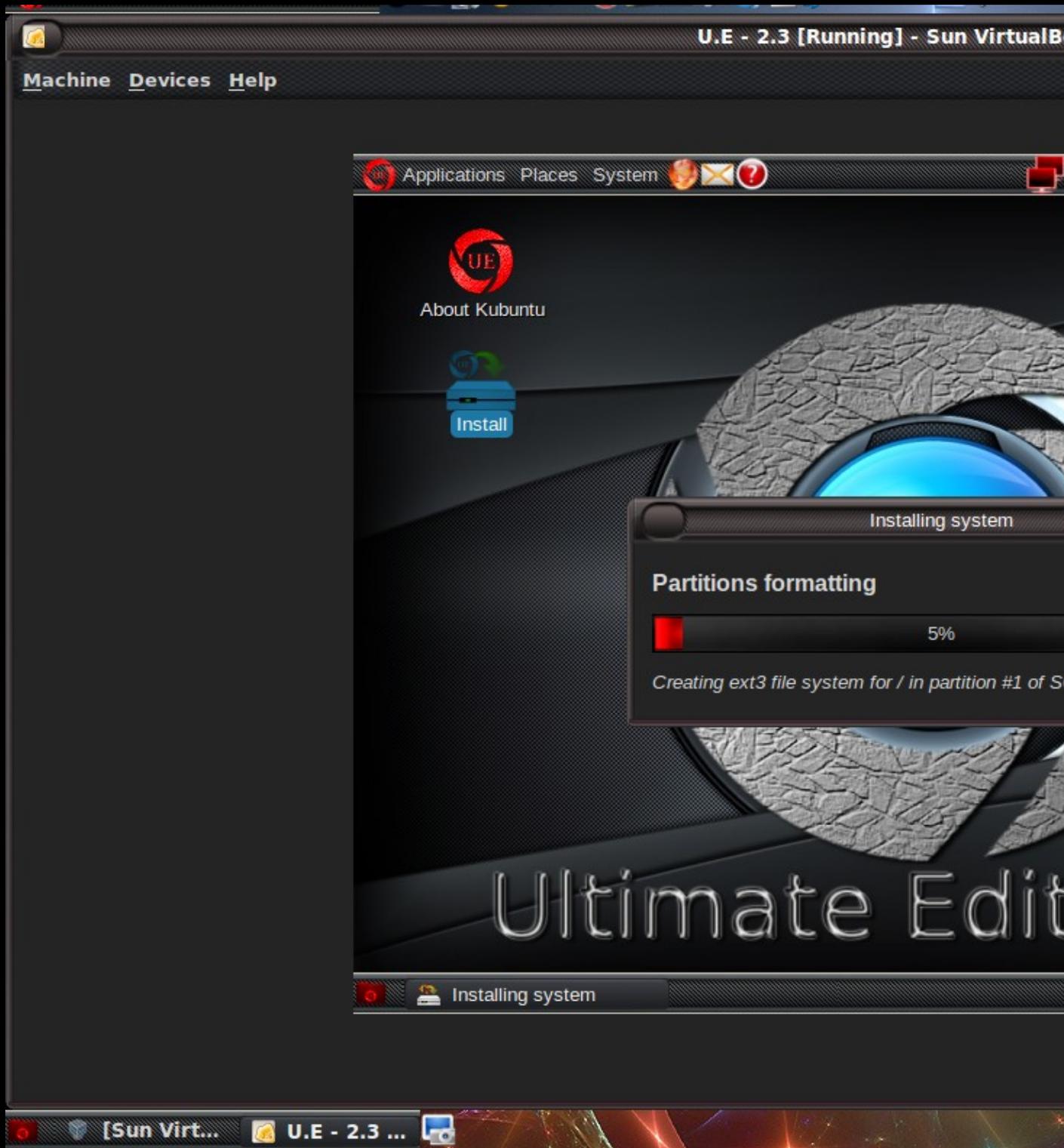


Most users this will be unnecessary use whole drive is typical unless you are dual booting windows.

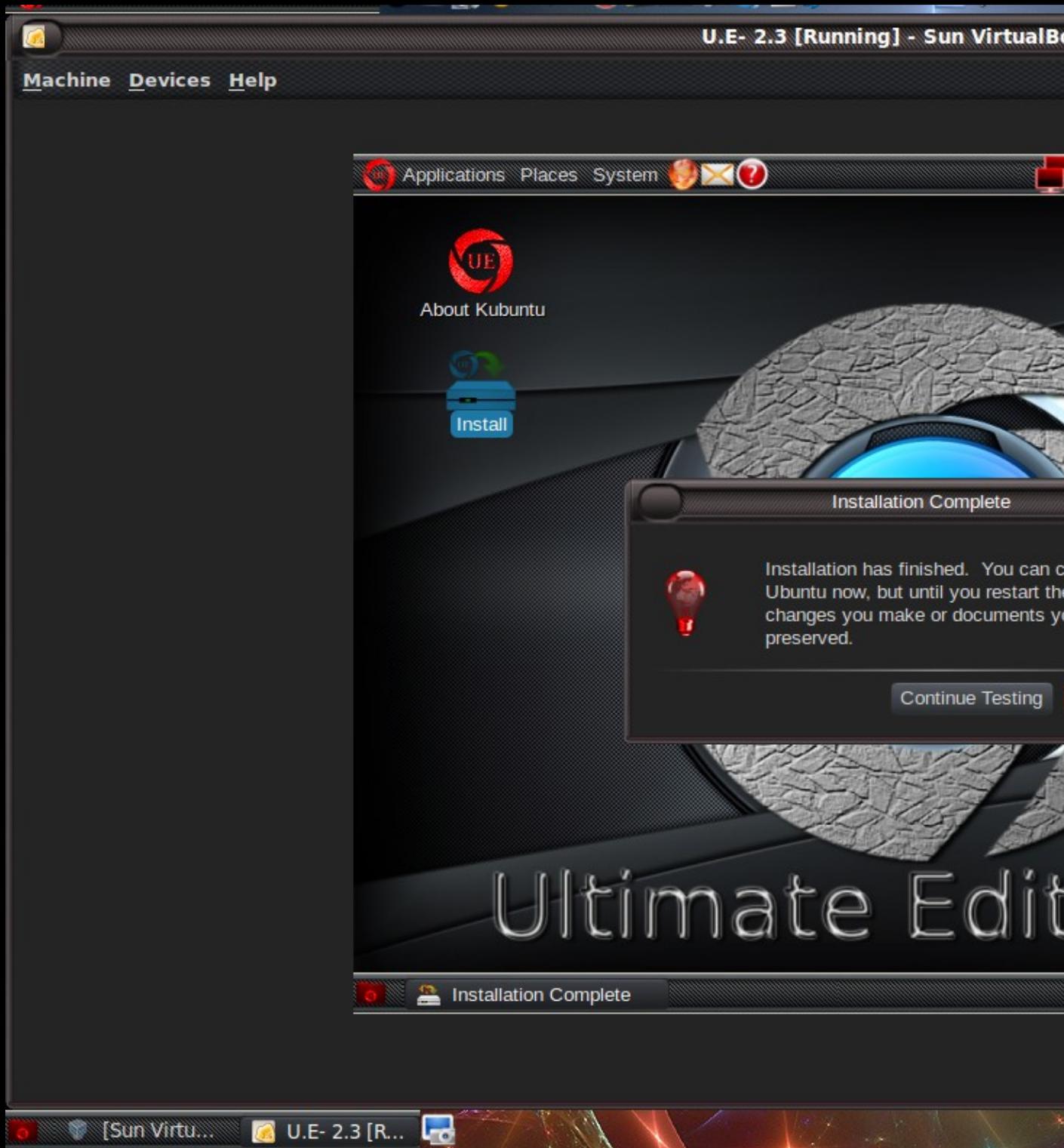


## Ultimate Edition Guide

Step 5 and 6 is username entry and importing of windows documents. Installation Step 7 of 7 - Begin installation.



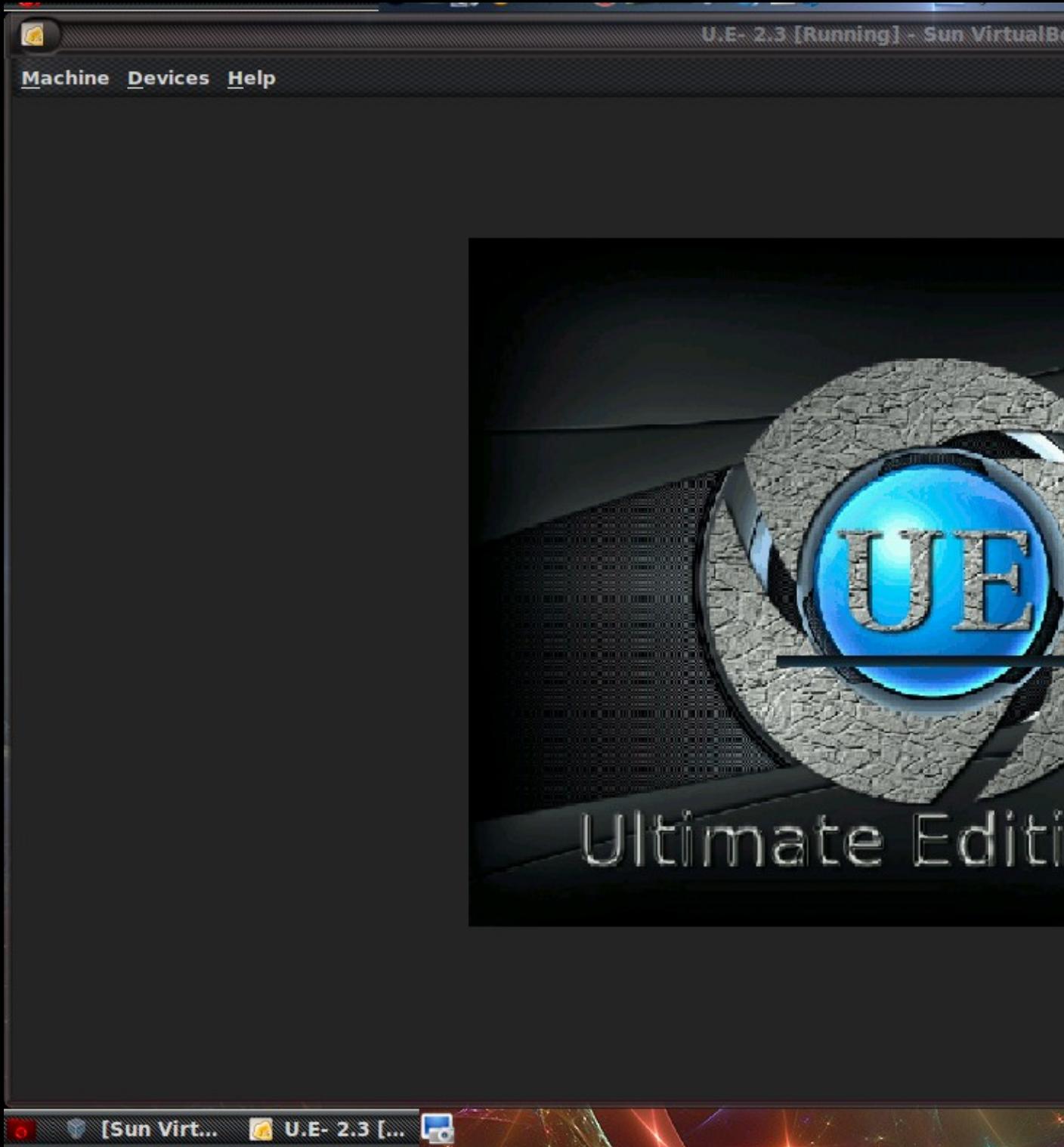
Formatting.



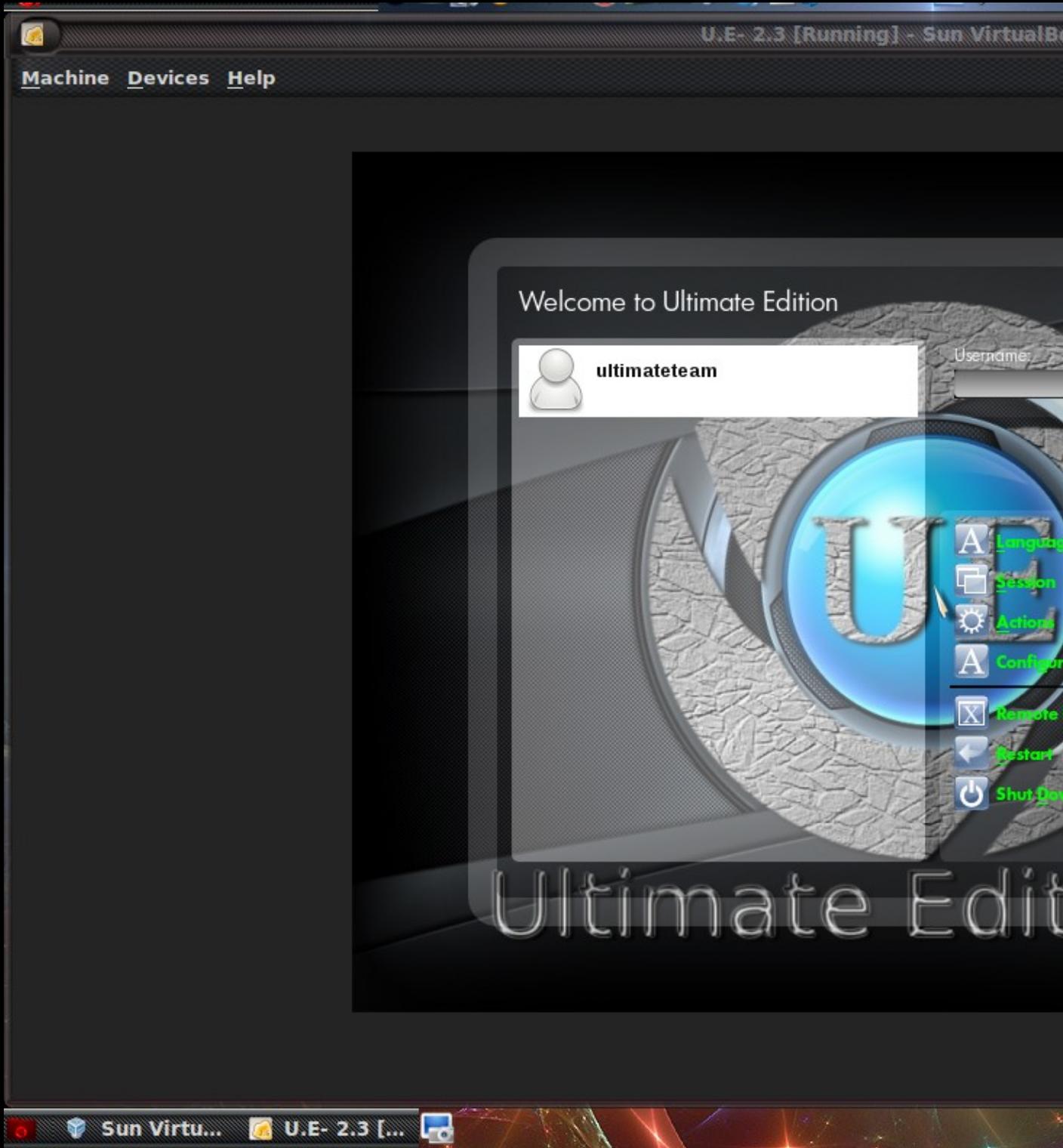
Installation complete.

---

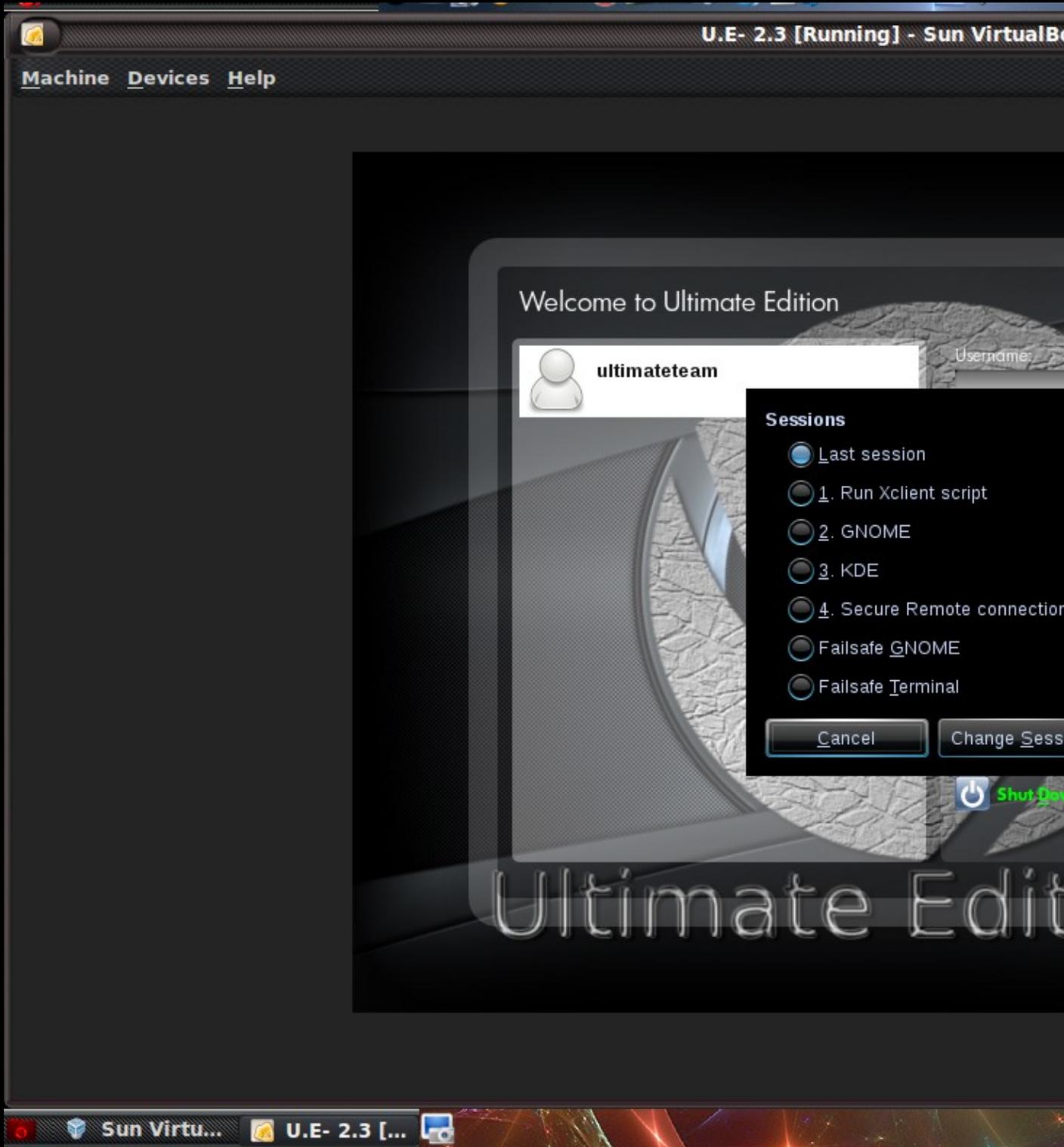
**Post Installation Guide**



Rebooting.

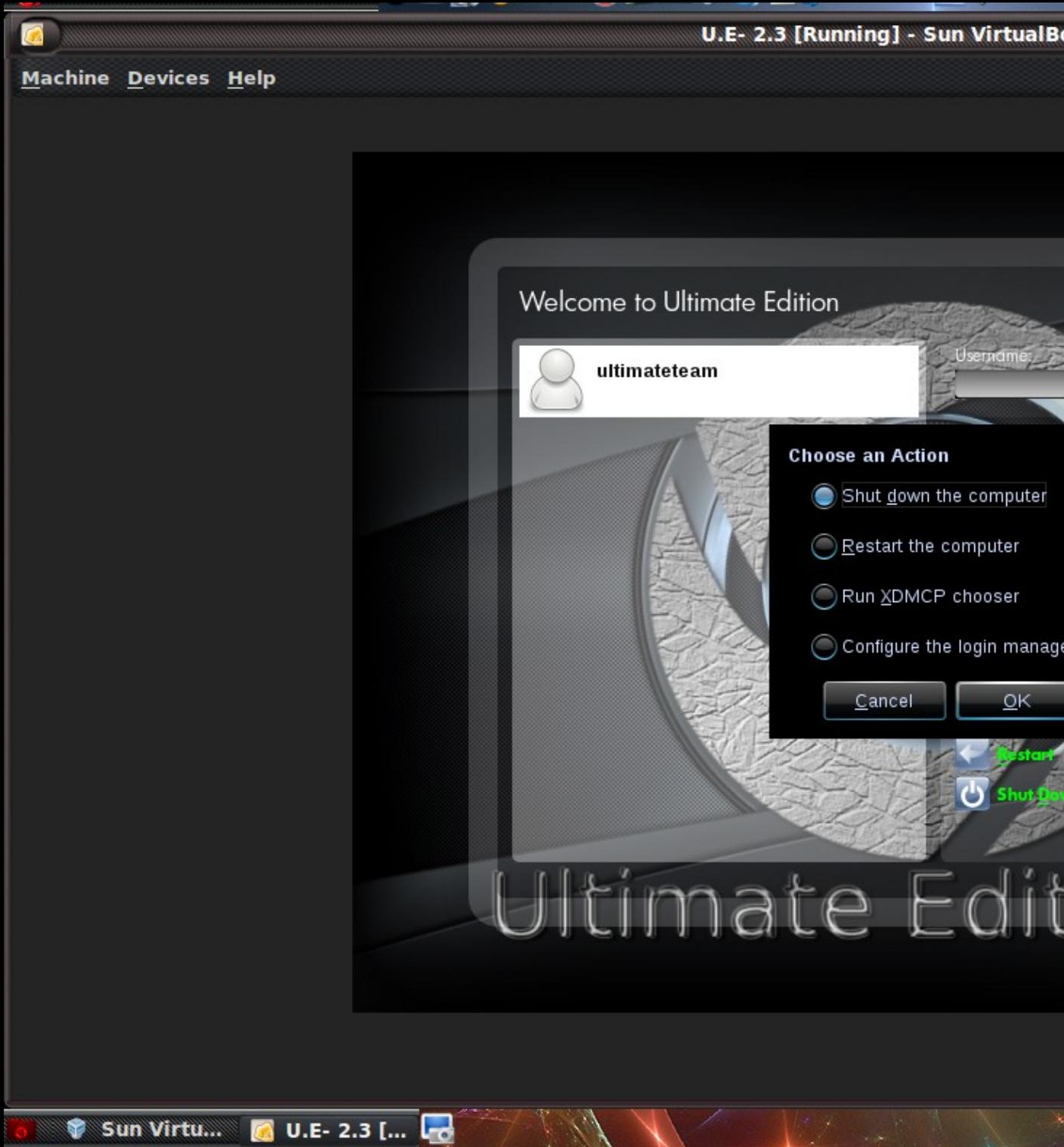


Login screen (GDM).

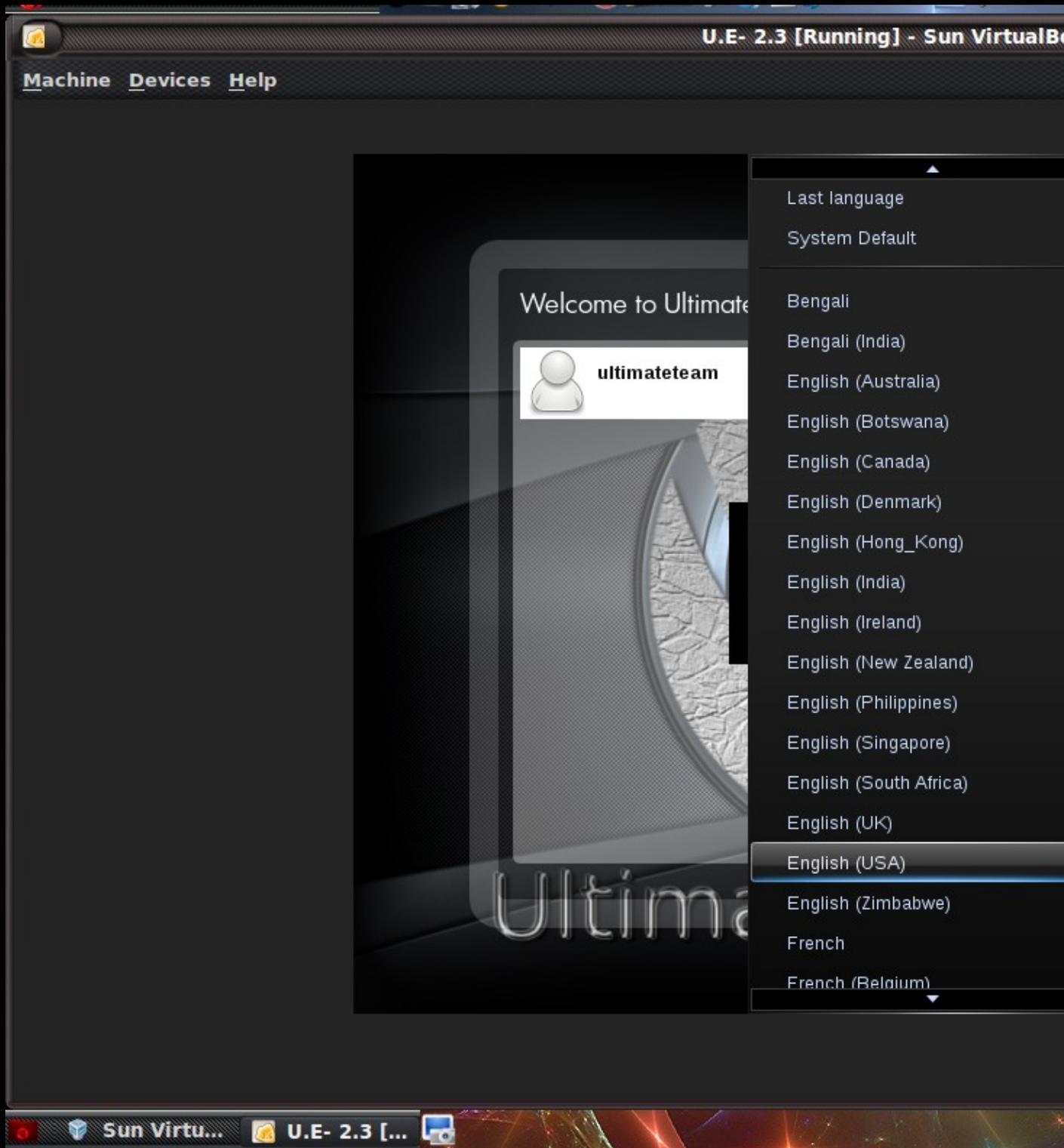


## Ultimate Edition Guide

Session selection, this is where you choose to goto KDE or gnome if using a odd number distro IE 2.3 of Ultimate Edition.



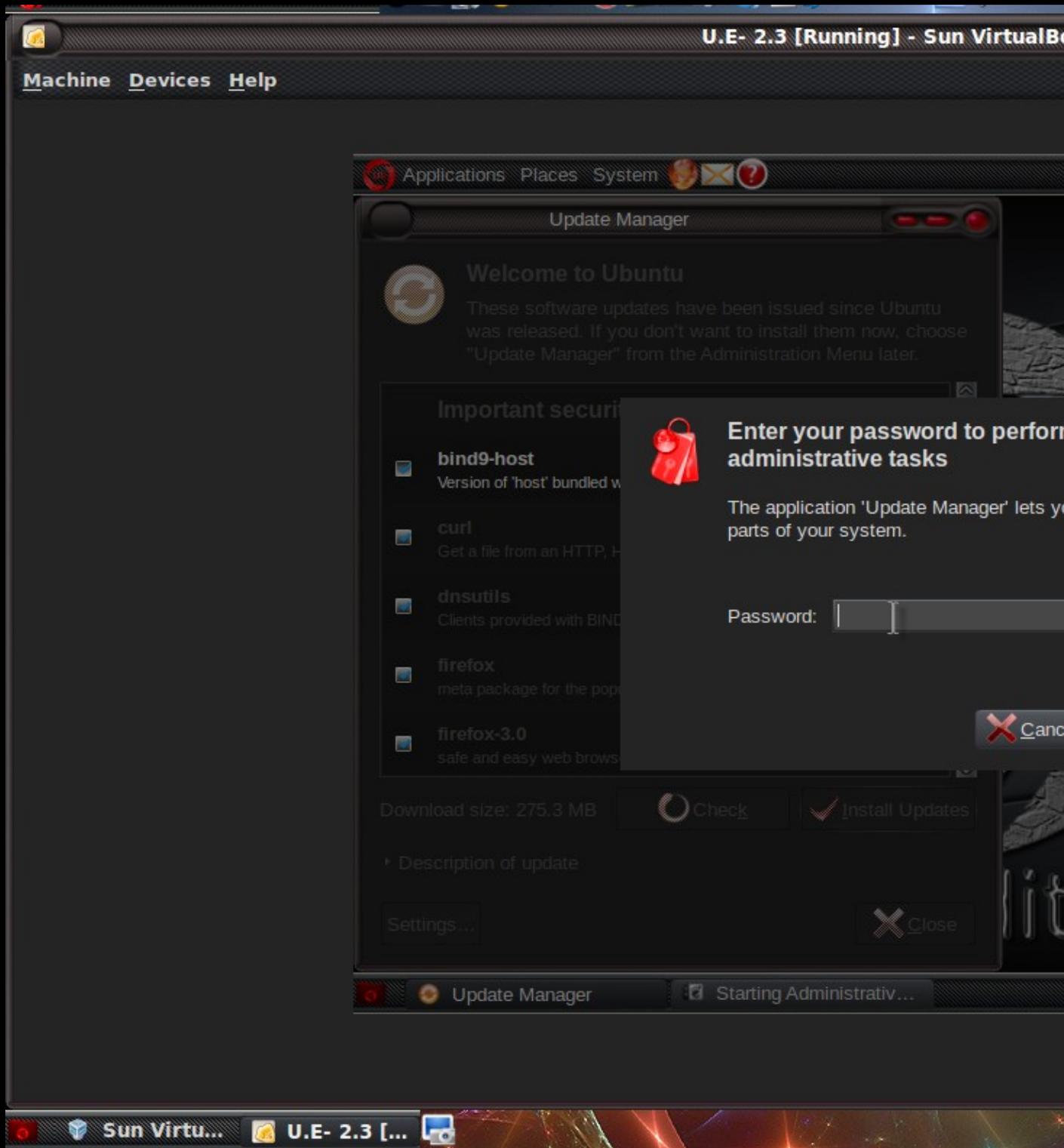
Action menu.



Language selection.



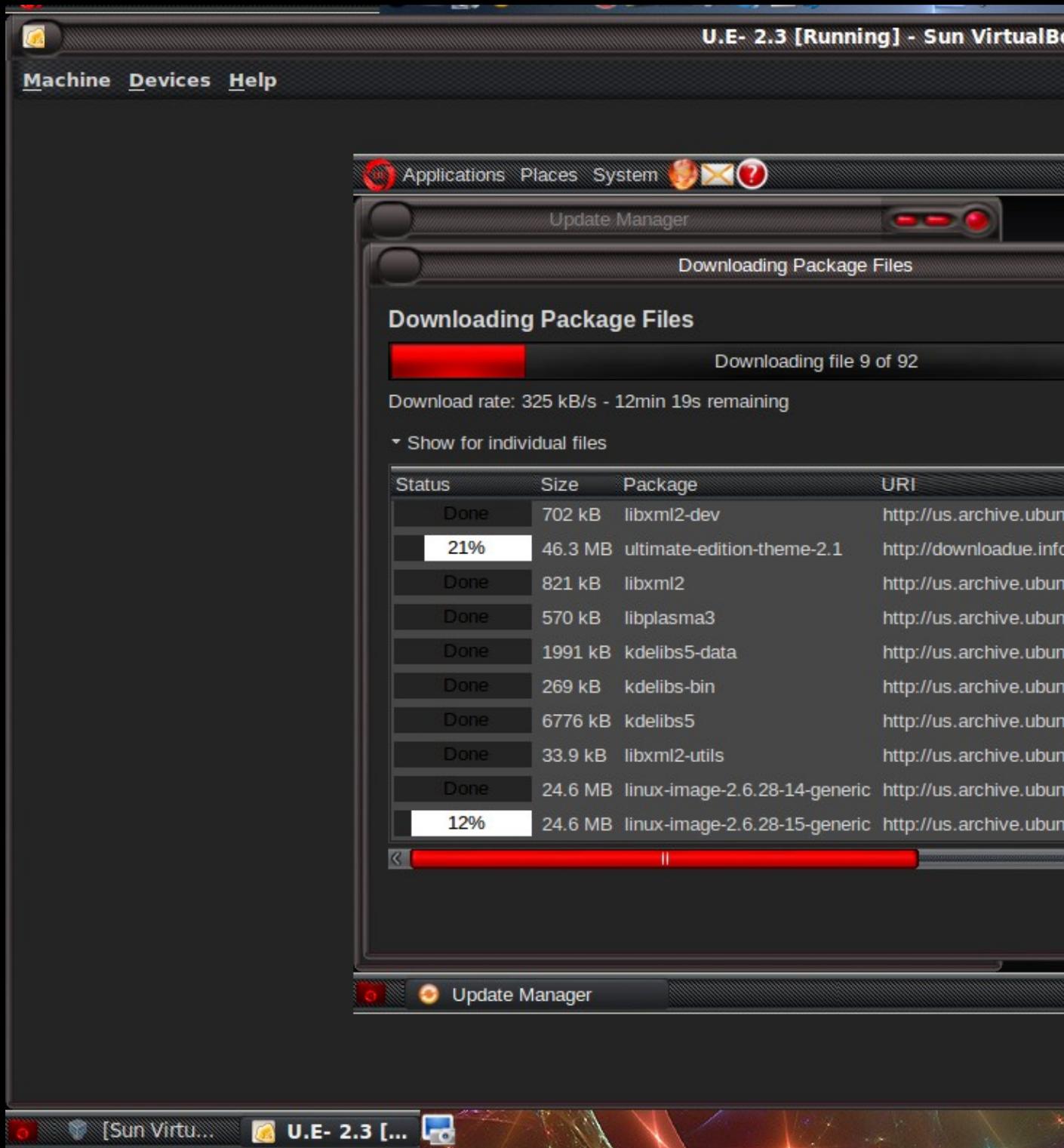
This should be the first thing you do when you get to the desktop, if you do not want to wait for the O/S to do it proceed to **System >> Administration >> Update Manager**.



Password entry.







Downloading Updates.



**Driver Installation:**

Computer with video card of Nvidia or ATI.

The most important thing to do first with Ultimate Edition is to install your graphics card driver.

**STEP 1: Install/Enable Nvidia/ATI driver**

After installing the graphics card driver. You will have to restart your computer. Hit the enable button on the bottom.



Immediately after the update you will be prompted to restart your computer.

Please do not do anything else on the computer. It is very important to restart the computer. After reboot the card's 3D mode will be working. We can move to the next level to work in an orderly fashion.

Intel graphics card will receive these special explanation for the subject.

**DOING THINGS BELOW THIS ARE NOT NECESSARY**, however can enhance (Compiz) / make your desktop more secure & provides nice howto's.

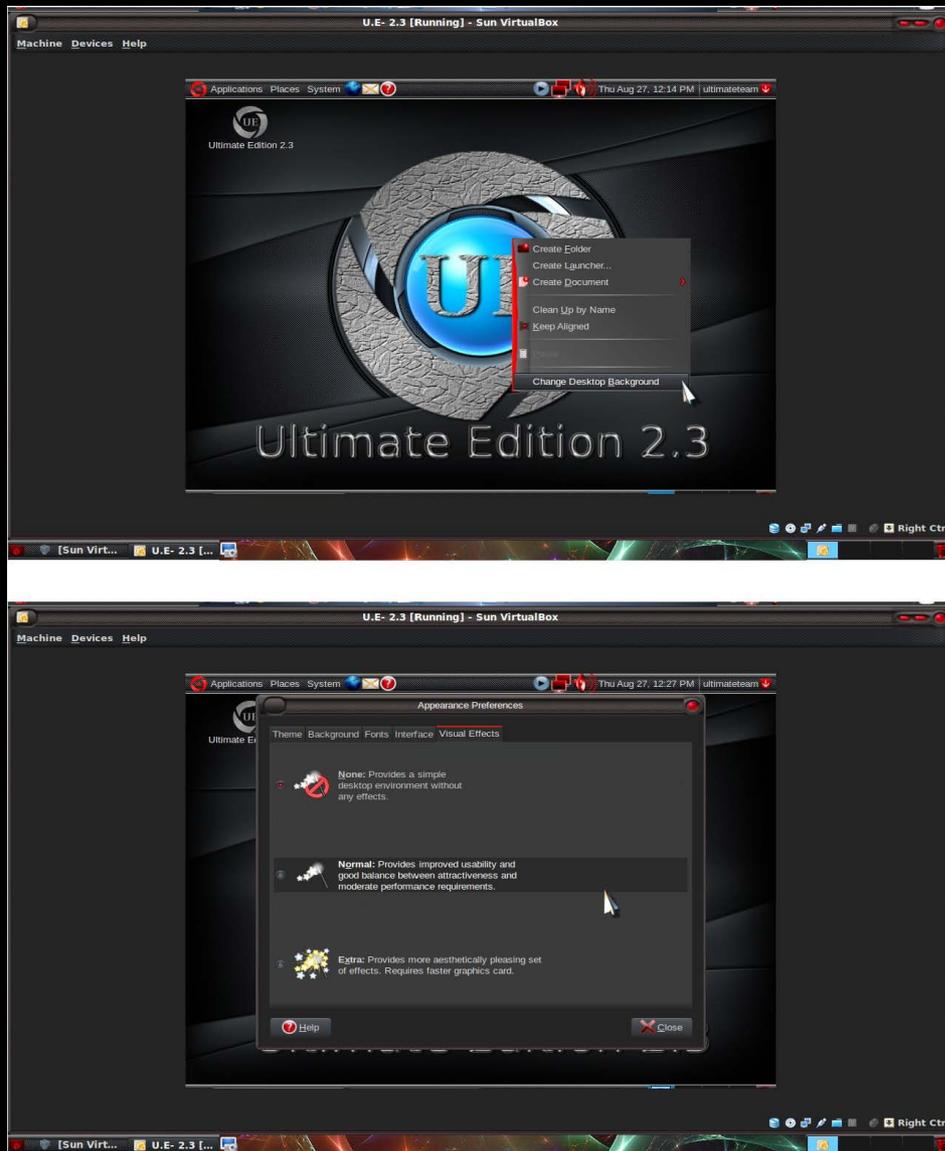
## Ultimate Edition Guide

STEP 2: Lets Go!

Go to **System->Preferences->Desktop Effects**, click the 'Enable Desktop Effects' button.

Alternatively:

Right click on your Desktop, change Desktop Background.



Now to increase the number of our working environments.

# Ultimate Edition Guide



Pre-Installation using Ultimate Edition 2.3 as an example.

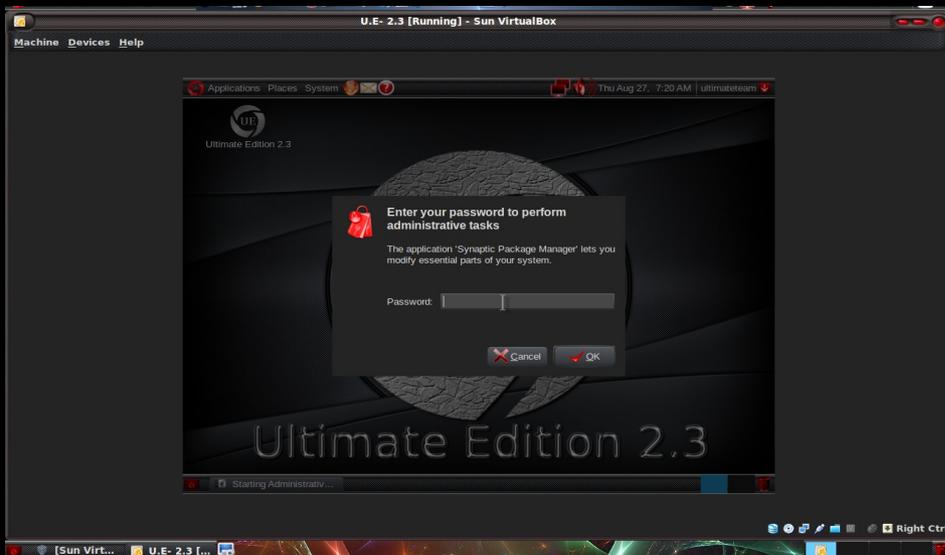
## Ultimate Edition Guide

Now we have 4 workspaces are ready to work with the cube.

Synaptic-package manager.



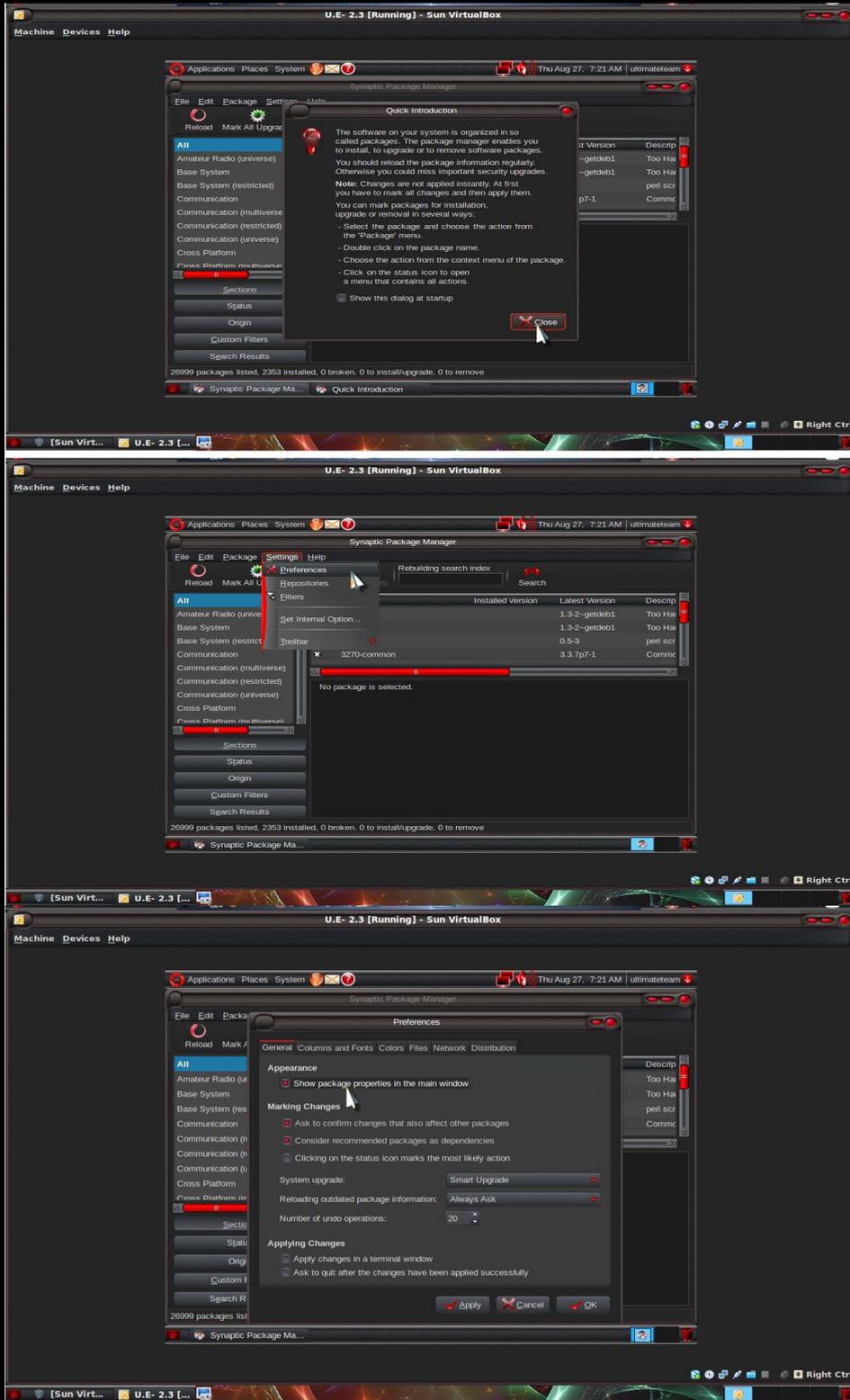
Enter the password for Root



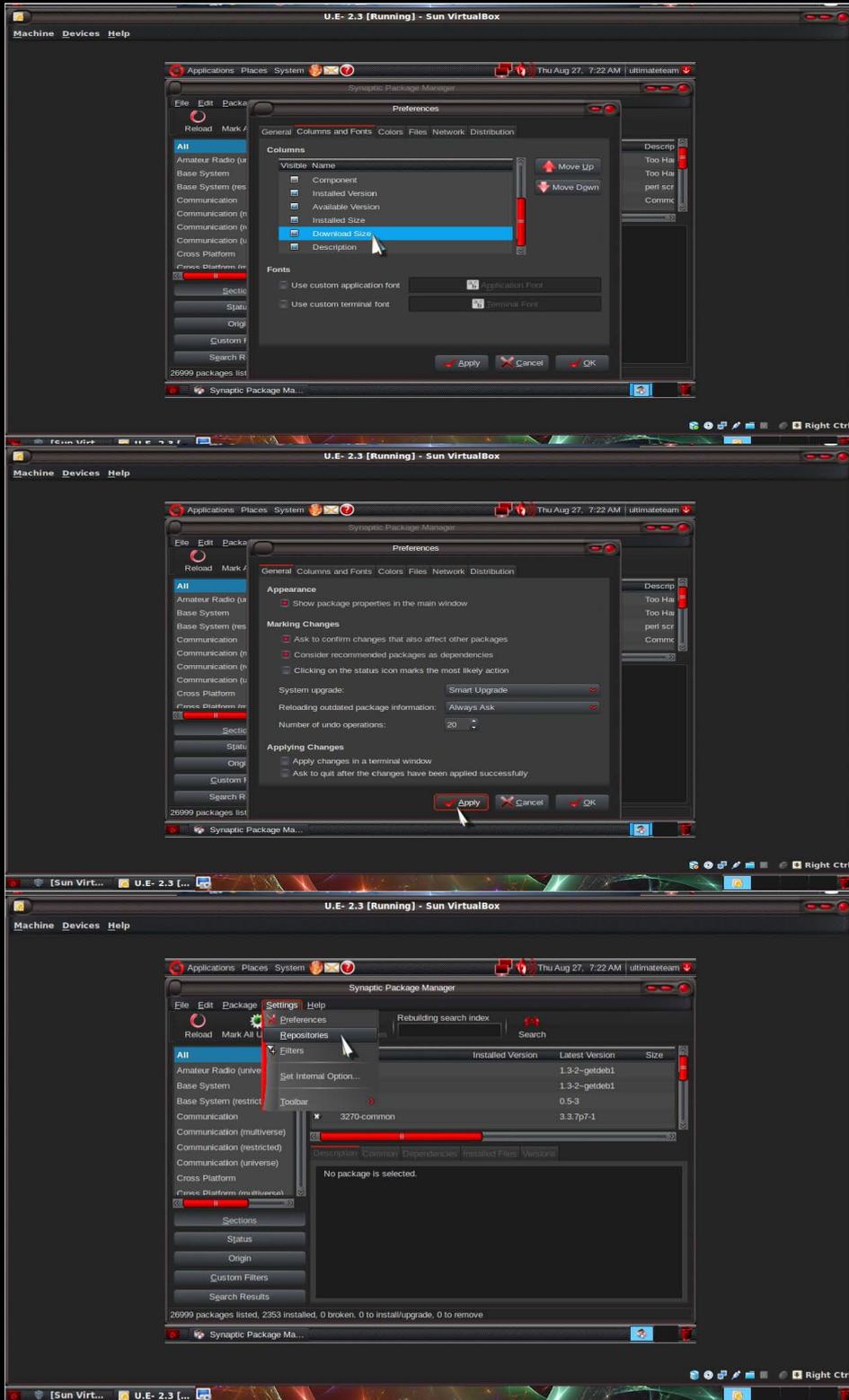
Software sources - HOW TO



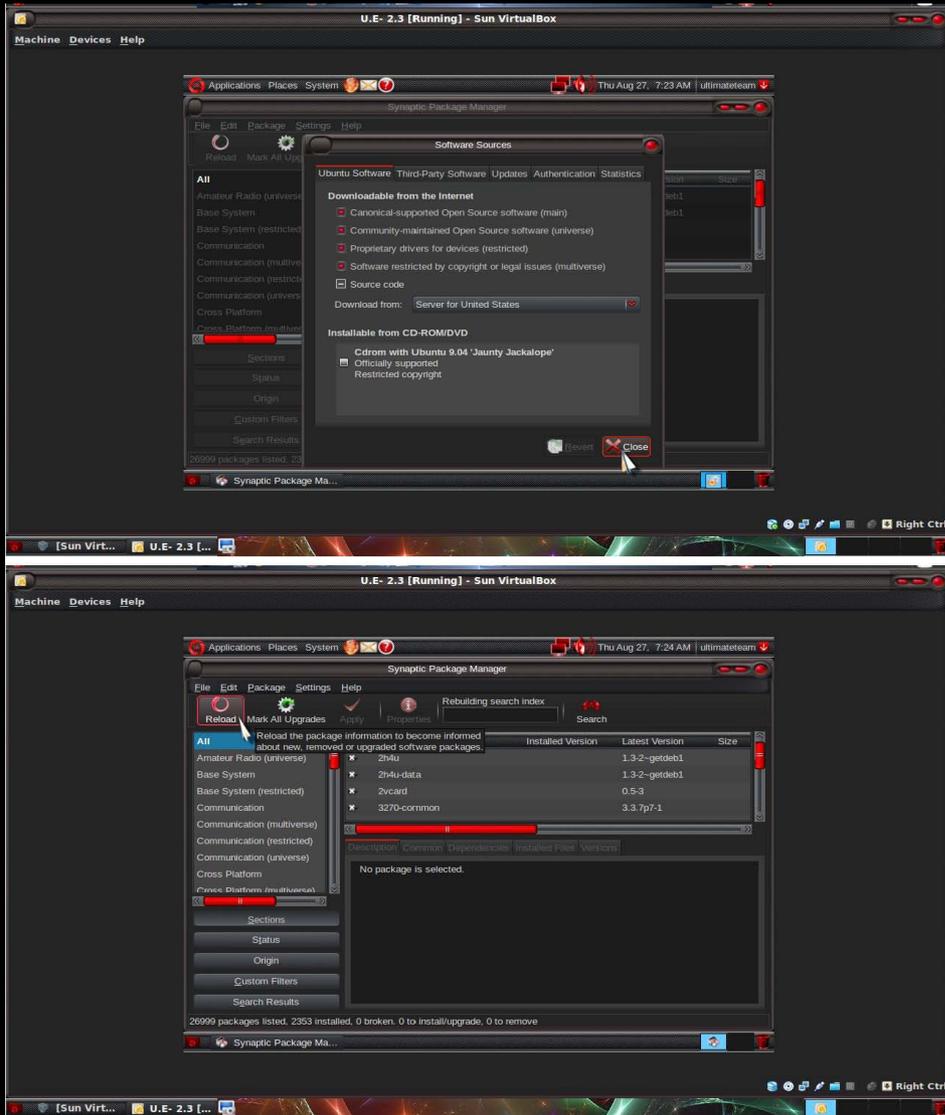
# Ultimate Edition Guide



# Ultimate Edition Guide



## Ultimate Edition Guide



Next we configure the Firewall to be secure. It is important to know, after each restart of the computer / exit you must run it manually to start your Firewall.

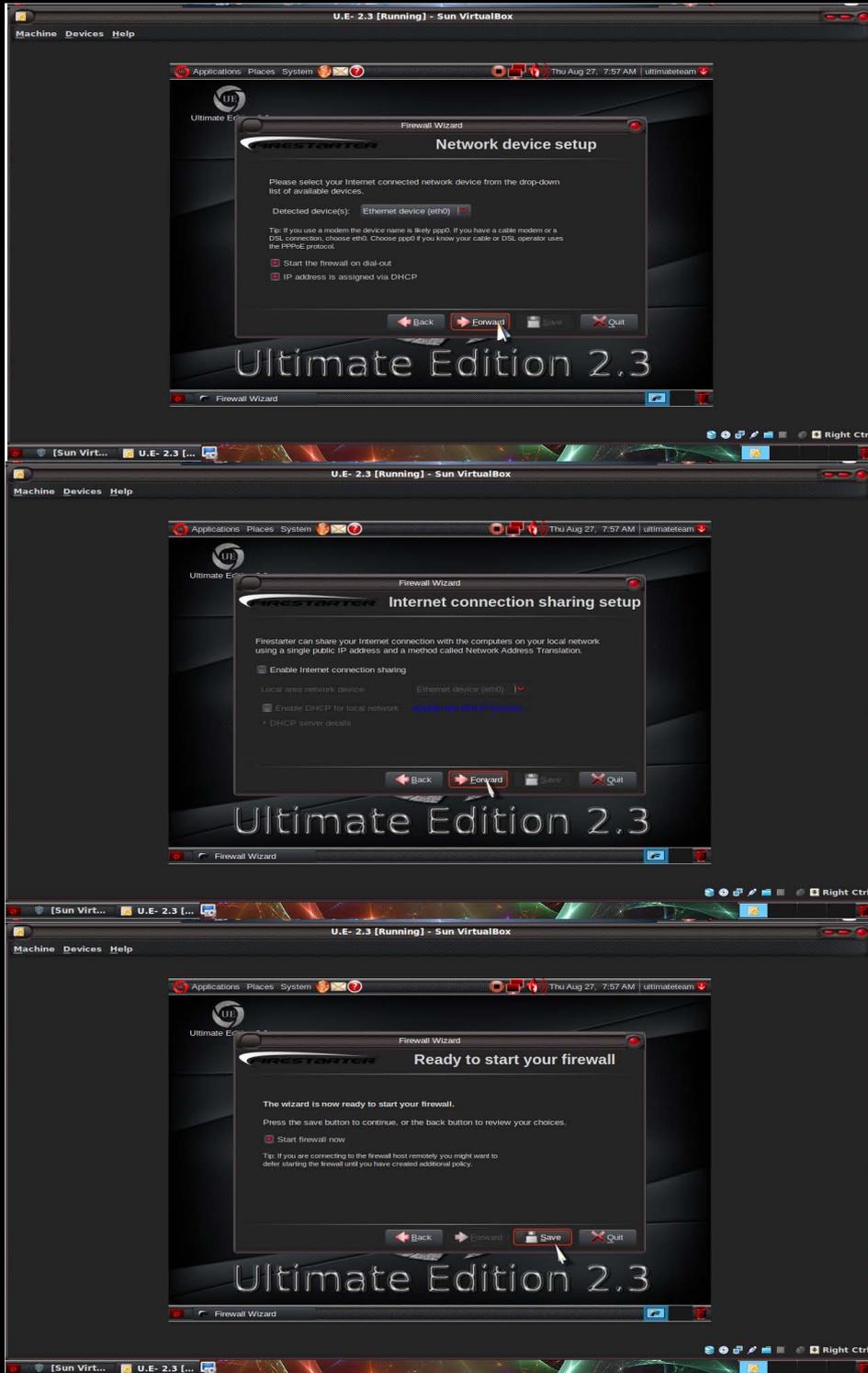
Firestarter Configuration:



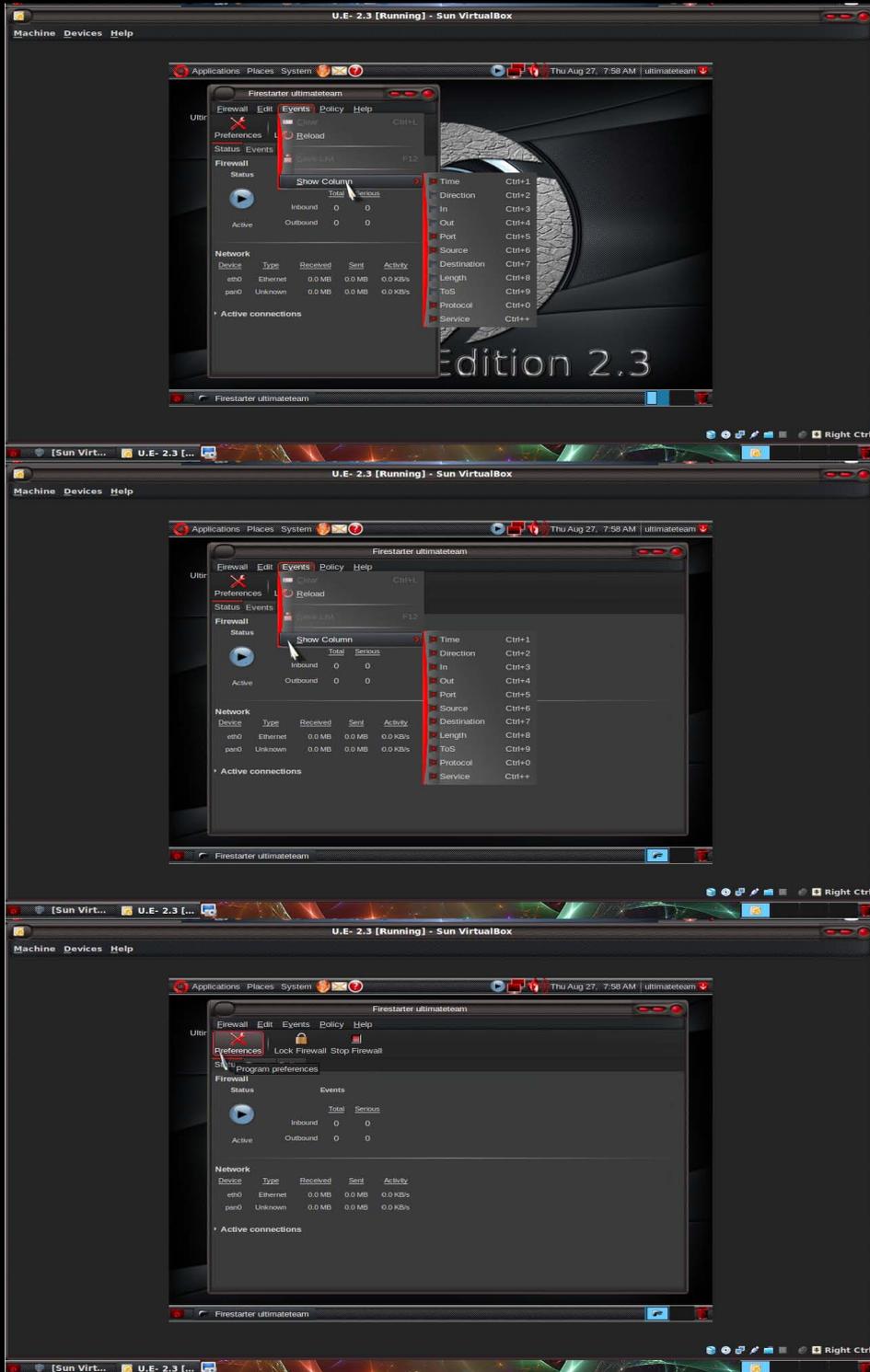
# Ultimate Edition Guide



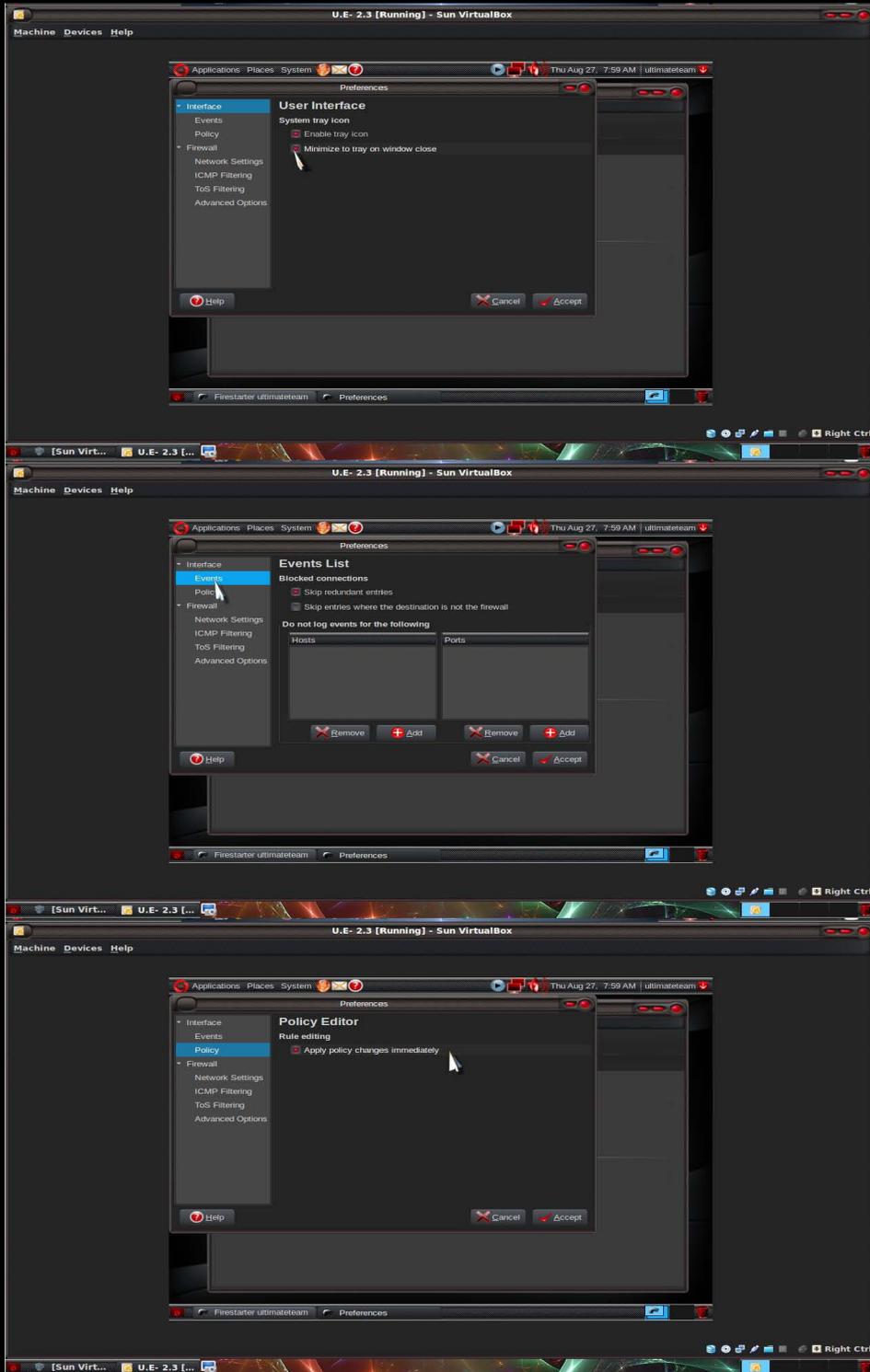
# Ultimate Edition Guide



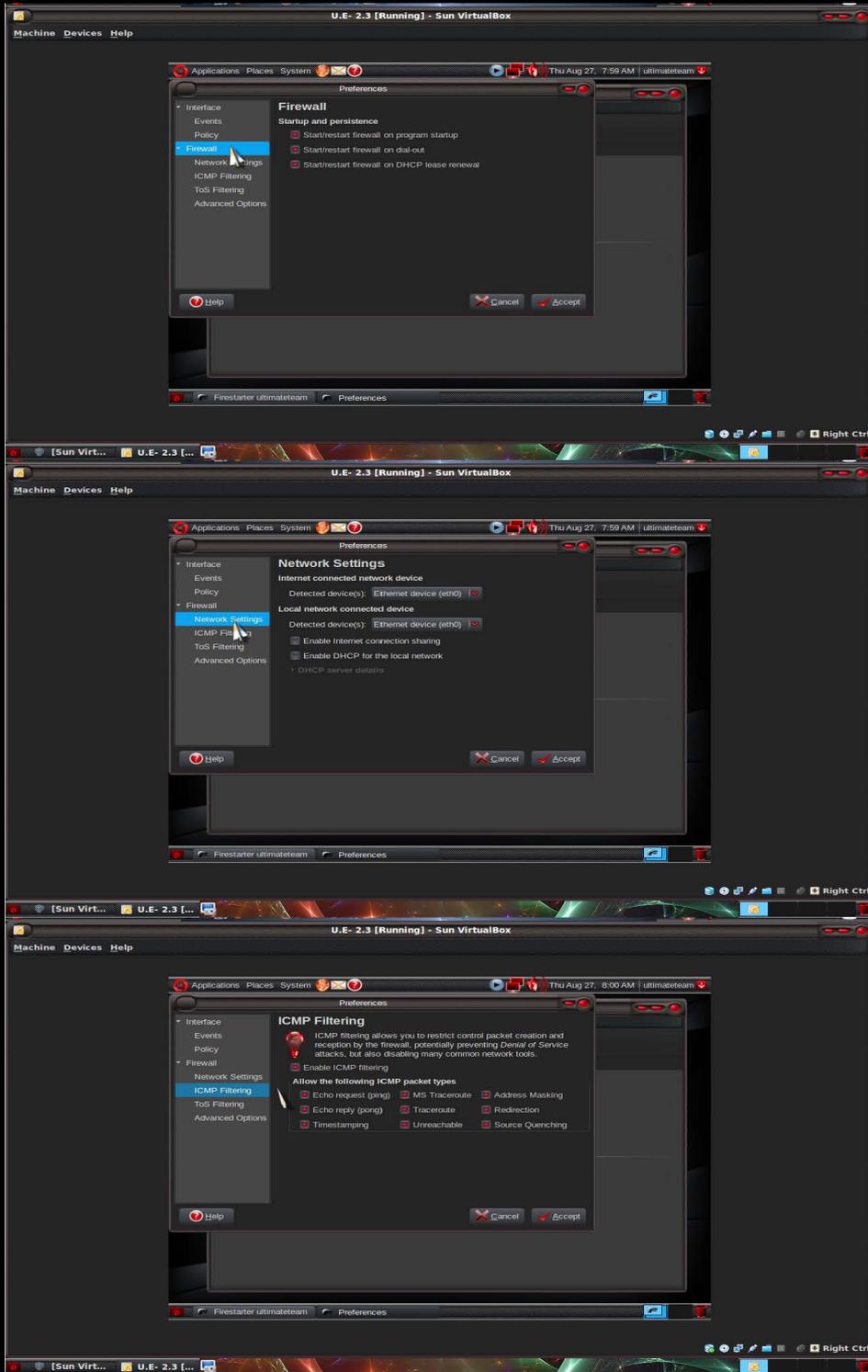
# Ultimate Edition Guide



# Ultimate Edition Guide



# Ultimate Edition Guide



## Ultimate Edition Guide



Now we see That the Firewall works.



Remember always start the Firewall before going to the network. Because if you do not your computer will be vulnerable to hostile attack.

Ubuntu Tweak

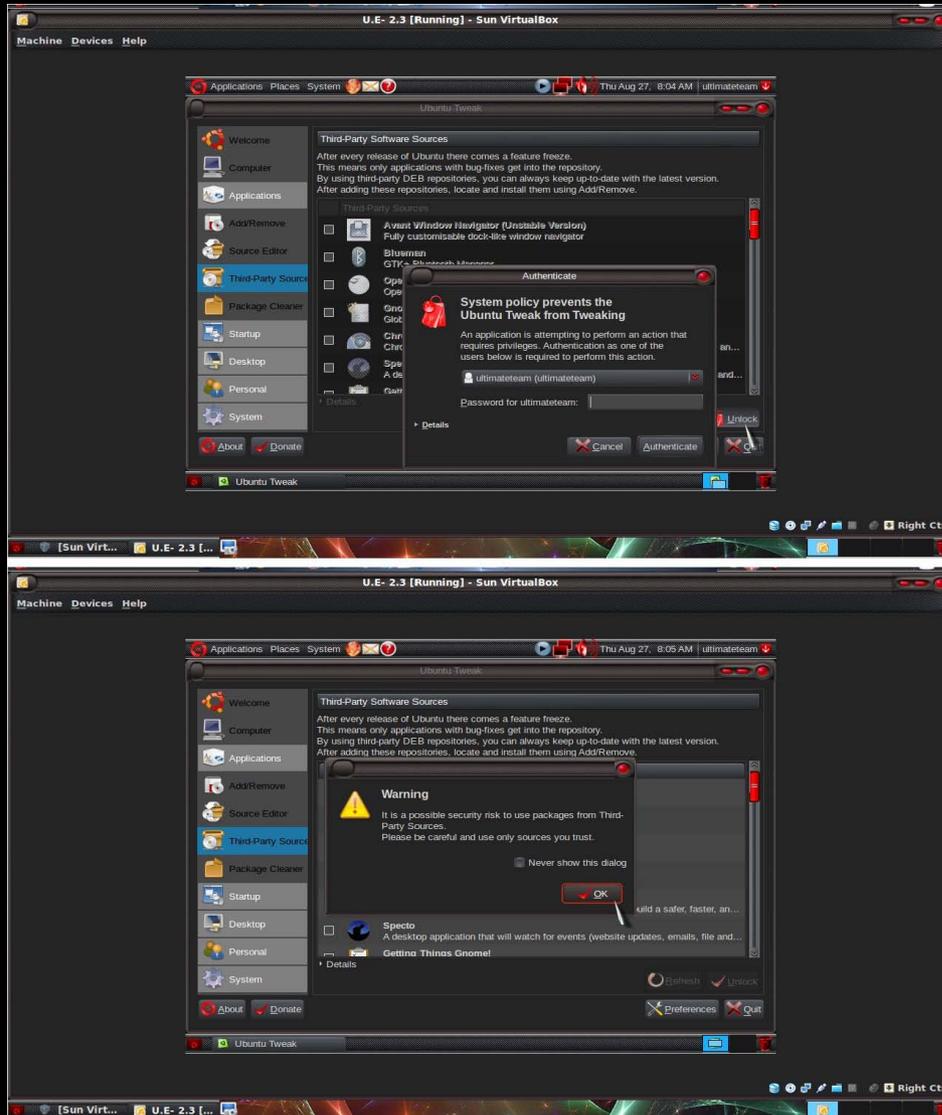
# Ultimate Edition Guide



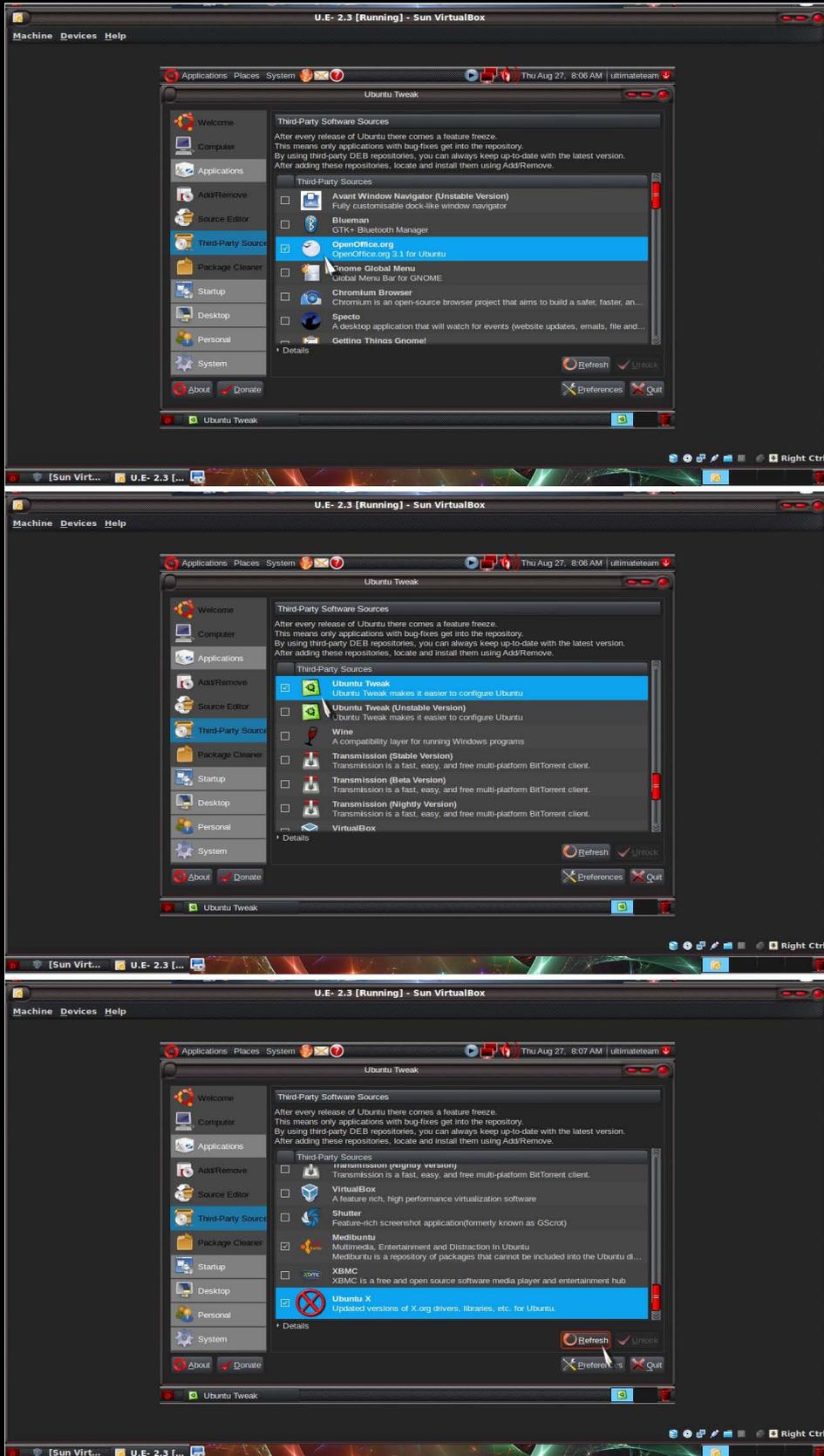
Goto System **Applications => Third-Party** We Hit **Unlock=>Enter Root** password. We need to mark two more Sources to be synchronize with our System.

1 - Ubuntu Tweak. 2 - Ubuntu-X.

Both these sources inform the next step Update Sources Packages in Synaptic and Apt-get. Causing the Video card to update/Upgrade.

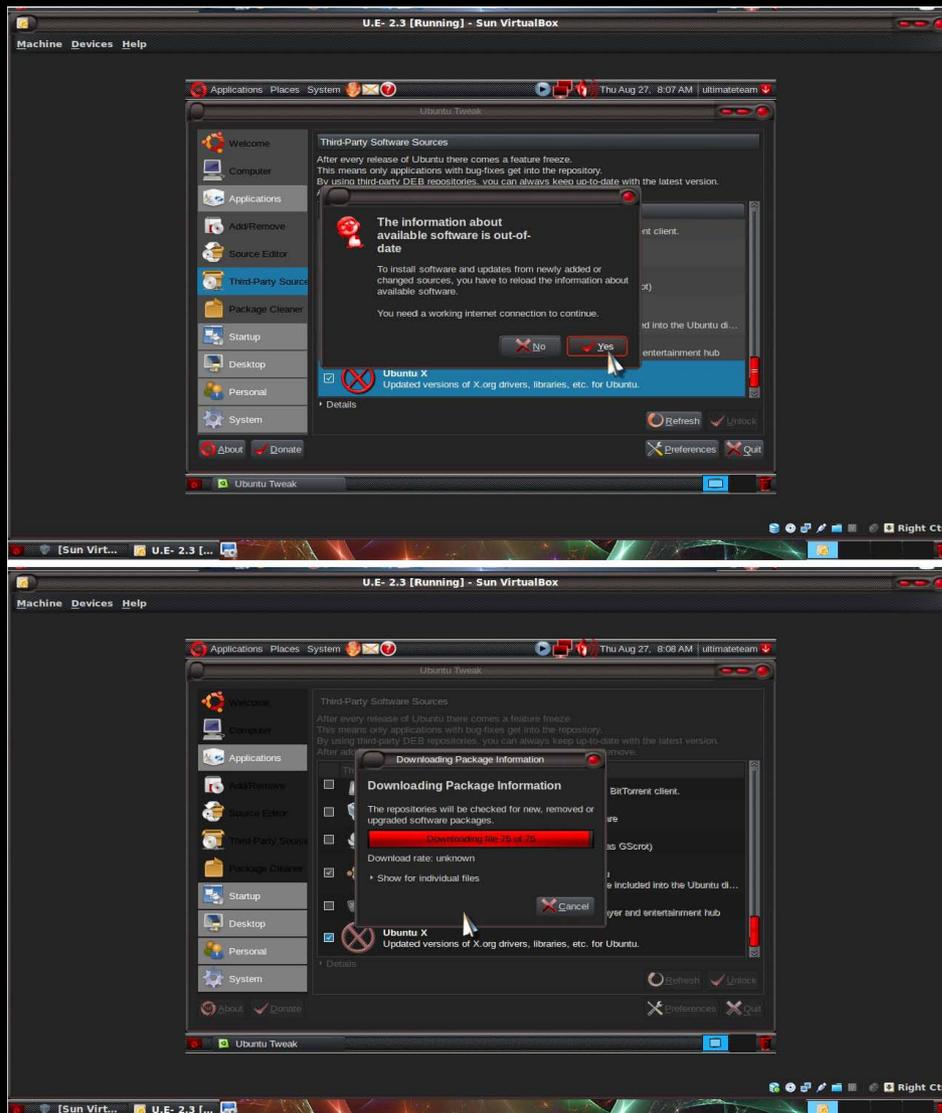


# Ultimate Edition Guide



Pre-Installation using Ultimate Edition 2.3 as an example.

## Ultimate Edition Guide



After an update, Go to Package Cleaner. Unlock and Enter your password Root. Mark Select ALL, And hit Clear. That process will Clean the packages that are not Need no more to the System. After the cleaning operation Close the Ubuntu Tweak. And open the Terminal.

And type the following commands:

```
sudo apt-get update
```

**then:**

```
sudo apt-get upgrade
```

# Ultimate Edition Guide



Pre-Installation using Ultimate Edition 2.3 as an example.

# Ultimate Edition Guide

At this point when you will have Question is you want to upgrade Y-N? Hit-y and Hit the Enter Key.



Now we can see an update databases, Update Packages, Update Drivers

## Ultimate Edition Guide



At this time over an update upgrading, you will have to Restart your machine, So the Update/Upgrade will End the process.









# **MULTIMEDIA**

>

## **GUIDE**

Linux is an extremely powerful Operating System and equally flexible. When it comes to Multimedia it offers a whole lot of options and variables to choose from giving users a highly customized collection of Multimedia related tools including Codecs, Organizers, Editors, and Players.

In this guide we will present all the available options to the users so that they can go ahead and make their own choices. Depending on the Linux distribution you might have all or some of them pre-installed on your system(in Ultimate Edition we have already done all this for you). You can search with these keywords to find out what are all the packages which are already installed and which one you need to install.

>

### **Keywords to search in Synaptic**

gststreamer mms asf plugin codecs flac theora avi ffmpeg mpeg mpg compress convert konverter iso heb MPlayer vlc xmms xine mpg123 mpg321 video audio stream ogg flake x264 libavcodec-51 vorbis mp3 mp4 wma

This is an exhaustive list of the packages that you need to have on your system to be fully equipped for any type of Multimedia requirements. After having all these packages properly installed you will be able to play any type of media on your machine without any hitch or delay. Few packages here will be getting repeated under different heads as they belong to various categories. This is not drawback but strength of the software like vlc and Mplayer.

>

### **GSTREAMER**

GStreamer0.10-FFmpegGStreamer0.10-Fluendo-mp3GStreamer0.10-pitfdllGStreamer0.10-SchroedingerGStreamer0.10-tools GStreamer0.10-esd GStreamer0.10-sdl GStreamer0.10-Gnonlin GStreamer0.10-alsa GStreamer0.10-plugins-baseGStreamer0.10-GnomeVFS GStreamer0.10-PackageKitGStreamer0.10-goodGStreamer0.10-x GStreamer0.10-base-appsGStreamer0.10-plugins-badGStreamer0.10-base-doc GStreamer0.10-plugins-bad-MultiverseGStreamer0.10-plugins-uglyGStreamer0.10-plugins-farsight

GStreamer0.10-plugins-ugly-MultiverseGStreamer0.10-plugins-good-docGStreamer0.10-plugins-ugly-docGStreamer0.10-BlueZ-gstreamerlibgst-ruby1.8libGStreamer0.10-ruby1.8libgst-rubyGStreamer0.10-rubygnome-mediaPython-gst0.10S

PiTiVi libGStreamer-perllibGStreamer0.10-0 libGStreamer0.10-0-dev  
GStreamer-plugins-base0.10OggConvertGNOME-app-installlibClutter-gst-0.8-0libClutter-gst-doclibFarsight0.1-docP  
subtitleditor

MMS

>

**libmms0 XMMS2-plugin-mmsmimms LibGII1**

ASF

>>

**XMMS2-plugin-asfAVIfile-playerlibaudio-wma-perlXMMS2-plugin-avcodecaffmpegliba**  
**Avidemux-qt GStreamer0.10-ffmpegAvidemux Avidemux-cli**  
**Avidemux-common extract awesfx Mplayer-skinsmencoder libextractor1c2a**  
**mplayermplayer-doclibparted1.8-9**

>>

## **PLUG IN**

vlc XMMS2-plugin-XMLvlc-nox  
libxine1-gnomelibpt-1.10.10-plugins-alsaVLC-plugin-jacklibpt-1.11.2-plugins-v4llibpt-1.10.10-plugins-v4llibpt-1.11.2  
GStreamer0.10-plugins-bad-docAbiWord  
GStreamer0.10-plugin-baseGStreamer0.10-plugin-base-docGStreamer0.10-plugins-uglyGStreamer0.10-plugins-goodC  
capsGStreamer0.10-plugins-ugly-doclibxine1-ffmpeg

### Evolution

kdemultimedia-kio-pluginslibxine1-pluginspidginGStreamer0.10-plugins-badGStreamer0.10-plugins-bad-Multiverseli  
VLC-plugin-SVGAlibVLC-plugin-sdIPidgin-extprefsGStreamer0.10-Gnonlin  
libqca2-plugin-ossGStreamer0.10-FFmpegxine-pluginavifile-Vorbis-pluginavifile-win32-pluginGStreamer0.10-esd  
GStreamer0.10-fluendo-mpegmuxGStreamer0.10-sdl XMMS2-plugin-ID3v2XMMS2  
-plugin-icymetaintXMMS2 -plugin-asxMozilla-mplayerXaraLX-svgGStreamer0.10-alsa  
xawtv-pluginsGStreamer0.10-GnomeVFS GNOME-Do-pluginsEvolution-plugins  
libkipi5mozilla-plugin-vlcmozilla-PackageKitlibqBanking-plugins-libgwenhywfar47libaqbanking20-plugins-qtckdegra  
-pluginslibxine1-misc-pluginsLibkipi-commonCompiz-pluginslibdeskbart-Tracker  
libvisual-0.4-pluginsKMyMoney2-plugin-AqBankinglibaqbanking20-pluginsKTorrent  
GStreamer0.10-PackageKitpidgin-ortGStreamer0.10-pitfdllCompiz-fusion-plugins-mainlibextractor-pluginsCompiz-fu  
libxine1-x Libvisual-0.4-0 GStreamer0.10-doc  
Compiz-Fusion-plugins-unsupportedGStreamer0.10-plugins-farsightCompizconfig-backend-gconfXMMS2-plugin-alsa

[-core](#) [libgstFarsight0.10-doc](#) [libgstFarsight0.10libqt4-sql-MySQLBlueZ-gstreamerMountManager](#)

[Seahorse-pluginlibPigment0.3-5Libvisual-0.4-dev](#) [SoundConverter](#)

[Evolution-Exchangesun-Java6-pluginlibk3b3-extradecoders](#) [libnss-mdns](#) [OpenOffice.org-gtklibextractor1c2a](#)  
[MPlayerThumbsBluetooth](#) [libasound2](#) [libgimp2.0OpenOffice.org-kdelibGStreamer0.10-0](#) [GStreamer-tools](#)  
[libGStreamer0.10-0-dev](#) [libAqBanking20ubufox](#) [okular-extra-backends](#) [Python-gst0.10](#) [Nautilus-sendto](#)  
[Pidgin-sipe](#) [Gnumeric-common](#) [GStreamer-tools](#) [libAqBanking-data](#) [AbiWord-helplibgst-ruby1.8libGStreamer](#)  
[0.10-ruby1.8KopeteAqBanking-tools](#) [skde-zeroconf](#) [AbiWord-common](#) [Amarok SCIM](#)  
[Mpg123-esdlibQt4-designerMpg123-alsaMpg123-naslibXMMSclient4](#) [libgst-rubylibGStreamer](#)  
[0.10-rubylibFarsight0.1-3libXMMSclient-glib1libpurple0libaqofxconnect4Python-pkg-ResourcePiTIVi](#)

[compizeditlibaudid3tag1libXMMSclient-ruby1.8libflac8](#) [libflac++6](#) [kvirc](#) [ggzcore-binlibflac-doc](#)  
[libAuthen-sasl-perlXMMS2](#) [Kate flac](#) [Vim-tinympg123Konquerorlibxine1-doc](#)  
[apt-xapian-indexobdclient1debian1](#) [libPlasma2](#) [alsa-oss](#) [Screenlets](#) [libxine1](#) [libGStreamer-perl](#) [sox](#)  
[libFreeType6Gnumeric](#)

>>>

## **CODECS**

[Non-free codecs](#) [GStreamer0.10-PackageKitlibQuicktime1](#) [Quicktime-utils](#) [GStreamer0.10-Pitfdll](#)  
[Quicktime-x11utils](#) [w32codecs](#)

[avifile-win32-pluginlibxine1-ffmpeglibaudid3tag1GNOME-app-installmpeg4ip-serverlibOpenEXR6libmpeg4ip-doclib](#)  
[libPackageKit8PackageKit-backend-aptavifile-MJPEG-pluginAvidemux-qtAvidemux](#) [Avidemux-cli](#)  
[Avidemux-common](#) [transcode-doc](#) [transcode](#) [PackageKitlibccaudio2-0.9-0](#) [libxine-doc](#)  
[Mplayer-skinsmencoder](#) [libxine1-pluginslibxine1](#) [mplayermplayer-doclibTheora0](#)  
[libSpeex1SpeexlibCapsee0libXviDcore4](#) [libAMRWB3](#) [Dirac](#) [libDirac-doc](#) [libJFLAC-java](#)  
[mpnenlibavcodec51](#) [libschroedinger-docl](#) [libschroedinger-1.0-0libschroedinger-devlibCELT0](#) [CELT-doc](#)  
[GStreamer0.10-SchroedingerlibSpeexdsp1libFLAC8](#) [libFLAC++6](#) [libFLAC++-dev](#) [libFLAC-doc](#) [flac](#)  
[ffmpeg2TheoralibTheora-bin](#) [libVorbis0a](#) [flake](#) [libVorbisenc2](#) [libdv4](#) [libVorbisfiles3](#)

## **MPG**

[Mpg123Mpg123-esdMpg123-alsaMpg123-naslibMpg123-0lame](#) [mpg321](#) [gqmpeg](#)

>>

## **FLAC**

[libaudio-file-perllibtunepimp5EasyTAGSoundConverter](#) [libFLAC8](#) [libFLAC++6](#) [libFLAC++-dev](#)  
[libFLAC-doc](#) [flac](#) [libSoX-fmt-flac](#) [libaudio-FLAC-decoder-perllibaudio-FLAC-header-perllibflac-doc](#)  
[XMMS2-plugin-flacmp3burnlibJFLAC-javaflake](#) [soundconvert](#) [Apache 2-mod-musicindexMP3Roaster](#)  
[Python-Mutagenvorbis-tools](#) [dir2ogglibtag1c2alibtagc0nautilus-script-audio-convertlibaudio-file-perl](#)

>>

## **THEORA**

[libTheora0](#) [ffmpeg2theora](#)[libtheora-bin Istanbul](#) [Python-MutagenOggConvert](#)

## **AVI**

[Avidemux](#) [avifile-utils](#) [Avidemux-common](#) [avifile-Player](#)[Avidemux-qt](#)[Avidemux-cli](#) [aview](#)  
[avifile-Vorbis-plugin](#)[avifile-MJPEG-plugin](#)[avifile-Win32-plugin](#)[libavifile-0.7c2](#) [dvgrab](#)[lucvview](#)  
[avifile-MAD-plugin](#)[ffmpegPython-MMP](#)[pythonlibavformat52](#)  
[xvidcap](#)[avifile-XviD-plugin](#)[avifile-DivX-plugin](#)[GStreamer0.10-FFmpeg](#)[xawtv-tools](#) [libMJPEGtools0c2a](#)  
[MJPEGtools](#) [Transcode-doc](#) [Transcode](#) [extract](#) [CamStream](#) [libxine1-doc](#) [Mplayer-skins](#)[mencoder](#)  
[libxine1-plugin](#) [xine-ui](#) [libextractor1c2a](#) [libxine1](#)  
[mpeg4ip-server](#)[libmpeg4ip-doc](#)[libmpeg4ip-0mplayer](#)[mplayer-doc](#)

>>

## **FFMPEG**

[FFmpegthumbnailer](#)[FFmpeg2Theora](#)[FFmpegthumbnailer2](#)[FFmpeglibSoX-fmt-ffmpeg](#)[GStreamer0.10-FFmpeg](#)[php5-ffmpeg](#)  
[moc-ffmpeg-plugin](#)[libpostproc51](#)[libswscale0](#) [libavcodec51](#) [libavformat52](#)  
[libxine1-ffmpeg](#)[mpeg4ip-server](#)[libmpeg4ip-doc](#)[libmpeg4ip-0](#)[libk3b3-extracodecs](#)  
[avifile-MJPEG-plugin](#)[libavifile-0.7c2](#) [libDLNA0](#)

>>>

## **MPEG:**

[mpeg4ip-server](#)[libmpeg4ip-doc](#)[libmpeg4ip-0](#)[libsmpeg0](#)[mozilla-plugin-vlc](#)[libmpeg2-4](#)[vlc-data](#) [libvlccore0](#)  
[libvlc2](#) [VLC-plugin-GGI](#)  
[VLC-plugin-esd](#)[VLC-plugin-aRts](#)[VLC-plugin-SVGA](#)[libVLC-plugin-sdl](#)[VLC-plugin-jack](#)[ffmpegvlc](#)  
[libavcodec51](#) [vlc-nox](#) [libfame-0.9](#) [libTwoLAME0](#) [tooLAME](#) [libiec61883-0](#) [TwoLAME](#) [libXviDcore4](#)  
[libMAD0](#) [gpaclibgpac0.4.4](#)[libMJPEGtools0c2a](#) [MJPEGtools](#) [avifile-MAD-plugin](#)[libMPEG123-0](#) [libFAAD0](#)  
[libdvbpsi4](#)[libFAAC0](#)

## **MP3**

[MP3Gain](#) [mp3burn](#)[mp3cdcheck](#)[mp3libMP3-Info-perl](#)[libMP3-tag-perl](#)[libSoX-fmt-mp3](#)[Mplinuxman](#)[lame](#)  
[libmp3Lame0](#)[Libtunepimp5](#)[normalize-audio](#) [VBRfix](#) [libMP3SPI-javamp3info](#)[Mp3Splt](#)[MP3Roaster](#)  
[mpgtx](#)[libaudio-FLAC-decoder-perl](#)

## **ISO**

[isomd5sum](#) [Python-pyisomd5sum](#) [Gmountiso](#) [libISO9660-5](#) [nrg2isogenisoimage](#) [cdi2iso](#)  
[gISOMountpdi2iso](#) [B5I2ISO](#) [libarchive1](#) [MountManager](#) [libFAAD0](#) [ccd2iso](#) [libmp4v2-0FAAD](#) [libJasPerl](#)  
[libMAD0](#) [gpaclibgpac0.4.4k3b](#) [p7zip-full](#) [rar](#) [unrar](#) [unrar-free](#) [kArchiver](#)

>>

### **CONVERT:**

[cdi2iso](#) [pdi2iso](#) [MP32ogg](#) [B5I2ISO](#) [SoundConverter](#) [ccd2iso](#) [transfig](#) [mdf2iso](#) [OggConvert](#)

*Happy listening and watching !!!*

>

Most of the times in Ultimate Edition (or any Linux distro in that case) your network would be automatically detected and configured and you will be ready to use Internet. In case if your network is not automatically detected and configured you can do it in manual way. Here's how to configure your various networking options :



*Right click on Network applet in Gnome-panel(top right at the screen) and select "Edit*

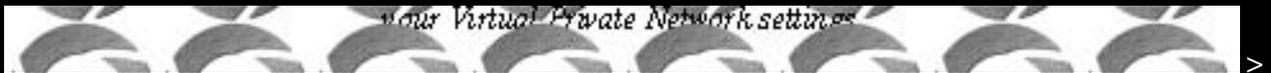


*Now select relevant connection type (like wireless, VPN, DSL, etc.) and click "Add" to add new connection*





*Right click on Network applet and select VPN Connection > Configure VPN to edit/configure*



# Nick's Tips

## Contents:

- [Forum Etiquette](#)
- [Frequently asked questions \(F.A.Q.\)](#)
- [Nick's Howto's](#)
- [Online FAQ](#)
- [Forum Etiquette](#)

### ***How To Ask Questions The Smart Way***

<http://forumubuntusoftware.info/viewtopic.php?f=7&t=3755>

Use meaningful, specific subject headers

Make it easy to reply

Write in clear, grammatical, correctly-spelled language

Send questions in accessible, standard formats

Be precise and informative about your problem

Volume is not precision

Don't claim that you have found a bug

Grovelling is not a substitute for doing your homework

Describe the problem's symptoms, not your guesses

Describe your problem's symptoms in chronological order

Describe the goal, not the step

Don't ask people to reply by private e-mail

Be explicit about your question

When asking about code

Don't post homework questions

Prune pointless queries

Don't flag your question as “Urgent”, even if it is for you

Courtesy never hurts, and sometimes helps

Follow up with a brief note on the solution

If you're reading this document because you need help, and you walk away with the impression you can get it directly from the authors of this document, you are one of the idiots in question. Don't ask us questions. We'll just ignore you. We are here to show you how to get help from people who actually know about the software or hardware you're dealing with, but 99.9% of the time that will not be us. Unless you know for certain that one of the authors is an expert on what you're dealing with, leave us alone and everybody will be happier.

### **Introduction**

In the world of hackers, the kind of answers you get to your technical questions depends as much on the way you ask the questions as on the difficulty of developing the answer. This guide will teach you how to ask questions in a way more likely to get you a satisfactory answer. Now that use of open source has become widespread, you can often get as good answers from other, more experienced users as from hackers. This is a Good Thing; users tend to be just a little bit more tolerant of the kind of failures newbies often have. Still, treating experienced users like hackers in the ways we recommend here will generally be the most effective way to get useful answers out of them, too.

The first thing to understand is that hackers actually like hard problems and good, thought-provoking questions about them. If we didn't, we wouldn't be here. If you give us an interesting question to chew on we'll be grateful to you; good questions are a stimulus and a gift. Good questions help us develop our understanding, and often reveal problems we might not have noticed or thought about otherwise. Among hackers, “Good question!” is a strong and sincere compliment. Despite this, hackers have a reputation for meeting simple questions with what looks like hostility or arrogance. It sometimes looks like we're reflexively rude to newbies and the ignorant. But this isn't really true.

What we are, unapologetically, is hostile to people who seem to be unwilling to think or to do their own homework before asking questions. People like that are time sinks — they take without giving back, and they waste time we could have spent on another question more interesting and another person more worthy of an answer. We call people like this “losers” (and for historical reasons we sometimes spell it “lusers”).

We realize that there are many people who just want to use the software we write, and who have no interest in learning technical details. For most people, a computer is merely a tool, a means to an end; they have more important things to do and lives to live. We acknowledge that, and don't expect everyone to take an interest in the technical matters that fascinate us. Nevertheless, our style of

answering questions is tuned for people who do take such an interest and are willing to be active participants in problem-solving. That's not going to change. Nor should it; if it did, we would become less effective at the things we do best.

We're (largely) volunteers. We take time out of busy lives to answer questions, and at times we're overwhelmed with them. So we filter ruthlessly. In particular, we throw away questions from people who appear to be losers in order to spend our question-answering time more efficiently, on winners. If you find this attitude obnoxious, condescending, or arrogant, check your assumptions. We're not asking you to genuflect to us — in fact, most of us would love nothing more than to deal with you as an equal and welcome you into our culture, if you put in the effort required to make that possible. But it's simply not efficient for us to try to help people who are not willing to help themselves. It's OK to be ignorant; it's not OK to play stupid.

So, while it isn't necessary to already be technically competent to get attention from us, it is necessary to demonstrate the kind of attitude that leads to competence — alert, thoughtful, observant, willing to be an active partner in developing a solution. If you can't live with this sort of discrimination, we suggest you pay somebody for a commercial support contract instead of asking hackers to personally donate help to you. If you decide to come to us for help, you don't want to be one of the losers. You don't want to seem like one, either. The best way to get a rapid and responsive answer is to ask it like a person with smarts, confidence, and clues who just happens to need help on one particular problem.

### **Before You Ask**

Before asking a technical question by e-mail, or in a newsgroup, or on a website chat board, do the following:

1. Try to find an answer by searching the archives of the forum you plan to post to.
2. Try to find an answer by searching the Web.
3. Try to find an answer by reading the manual.
4. Try to find an answer by reading a FAQ.
5. Try to find an answer by inspection or experimentation.
6. Try to find an answer by asking a skilled friend.
7. If you're a programmer, try to find an answer by reading the source code.
8. When you ask your question, display the fact that you have done these things first; this will help establish that you're not being a lazy sponge and wasting people's time. Better yet, display what you have learned from doing these things. We like answering questions for people who have demonstrated they can learn from the answers.

Use tactics like doing a Google search on the text of whatever error message you get (searching Google groups as well as Web pages). This might well take you straight to fix documentation or a mailing list thread answering your question. Even if it doesn't, saying "I googled on the following phrase but didn't get anything that looked promising" is a good thing to do in e-mail or news postings requesting help, if only because it records what searches won't help. It will also help to direct other people with similar problems to your thread by linking the search terms to what will hopefully be

your problem and resolution thread.

Take your time. Do not expect to be able to solve a complicated problem with a few seconds of Googling. Read and understand the FAQs, sit back, relax and give the problem some thought before approaching experts. Trust us, they will be able to tell from your questions how much reading and thinking you did, and will be more willing to help if you come prepared. Don't instantly fire your whole arsenal of questions just because your first search turned up no answers (or too many).

Prepare your question. Think it through. Hasty-sounding questions get hasty answers, or none at all. The more you do to demonstrate that having put thought and effort into solving your problem before seeking help, the more likely you are to actually get help.

Beware of asking the wrong question. If you ask one that is based on faulty assumptions, J. Random Hacker is quite likely to reply with a uselessly literal answer while thinking “Stupid question...”, and hoping the experience of getting what you asked for rather than what you needed will teach you a lesson.

Never assume you are entitled to an answer. You are not; you aren't, after all, paying for the service. You will earn an answer, if you earn it, by asking a substantial, interesting, and thought-provoking question — one that implicitly contributes to the experience of the community rather than merely passively demanding knowledge from others.

On the other hand, making it clear that you are able and willing to help in the process of developing the solution is a very good start. “Would someone provide a pointer?”, “What is my example missing?”, and “What site should I have checked?” are more likely to get answered than “Please post the exact procedure I should use.” because you're making it clear that you're truly willing to complete the process if someone can just point you in the right direction.

### **When You Ask**

Choose your forum carefully Be sensitive in choosing where you ask your question. You are likely to be ignored, or written off as a loser, if you:

- \*  
post your question to a forum where it's off topic
- \*  
post a very elementary question to a forum where advanced technical questions are expected, or vice-versa
- \*  
cross-post to too many different newsgroups
- \*  
post a personal e-mail to somebody who is neither an acquaintance of yours nor personally responsible for solving your problem

Hackers blow off questions that are inappropriately targeted in order to try to protect their communications channels from being drowned in irrelevance. You don't want this to happen to you.

The first step, therefore, is to find the right forum. Again, Google and other Web-searching methods are your friend. Use them to find the project webpage most closely associated with the hardware or software giving you difficulties. Usually it will have links to a FAQ (Frequently Asked Questions) list, and to project mailing lists and their archives. These mailing lists are the final places to go for help, if your own efforts (including reading those FAQs you found) do not find you a solution. The project page may also describe a bug-reporting procedure, or have a link to one; if so, follow it. Shooting off an e-mail to a person or forum which you are not familiar with is risky at best. For example, do not assume that the author of an informative webpage wants to be your free consultant. Do not make optimistic guesses about whether your question will be welcome — if you're unsure, send it elsewhere, or refrain from sending it at all.

When selecting a Web forum, newsgroup or mailing list, don't trust the name by itself too far; look for a FAQ or charter to verify your question is on-topic. Read some of the back traffic before posting so you'll get a feel for how things are done there. In fact, it's a very good idea to do a keyword search for words relating to your problem on the newsgroup or mailing list archives before you post. It may find you an answer, and if not it will help you formulate a better question. Don't shotgun-blast all the available help channels at once, that's like yelling and irritates people. Step through them softly.

Know what your topic is! One of the classic mistakes is asking questions about the Unix or Windows programming interface in a forum devoted to a language or library or tool portable across both. If you don't understand why this is a blunder, you'd be best off not asking any questions at all until you get it.

In general, questions to a well-selected public forum are more likely to get useful answers than equivalent questions to a private one. There are multiple reasons for this. One is simply the size of the pool of potential respondents. Another is the size of the audience; hackers would rather answer questions that educate many people than questions serving only a few.

Understandably, skilled hackers and authors of popular software are already receiving more than their fair share of mis-targeted messages. By adding to the flood, you could in extreme cases even be the straw that breaks the camel's back — quite a few times, contributors to popular projects have withdrawn their support because collateral damage in the form of useless e-mail traffic to their personal accounts became unbearable.

Web and IRC forums directed towards newbies often give the quickest response. Your local user group, or your Linux distribution, may advertise a Web forum or IRC channel where newbies can get help. (In non-English-speaking countries newbie forums are still more likely to be mailing lists.) These are good first places to ask, especially if you think you may have tripped over a relatively simple or common problem. An advertised IRC channel is an open invitation to ask questions there and often get answers in real time.

In fact, if you got the program that is giving you problems from a Linux distribution (as common today), it may be better to ask in the distro's forum/list before trying the program's project forum/list. The project's hackers may just say, "use our build".

Before posting to any Web forum, check if it has a Search feature. If it does, try a couple of keyword searches for something like your problem; it just might help. If you did a general Web search before (as you should have), search the forum anyway; your Web-wide search engine might not have all of this forum indexed recently.

There is an increasing tendency for projects to do user support over a Web forum or IRC channel, with e-mail reserved more for development traffic. So look for those channels first when seeking project-specific help.

As a second step, use project mailing lists. When a project has a development mailing list, write to the mailing list, not to individual developers, even if you believe you know who can best answer your question. Check the documentation of the project and its homepage for the address of a project mailing list, and use it. There are several good reasons for this policy:

\*

Any question good enough to be asked of one developer will also be of value to the whole group. Contrariwise, if you suspect your question is too dumb for a mailing list, it's not an excuse to harass individual developers.

\*

Asking questions on the list distributes load among developers. The individual developer (especially if he's the project leader) may be too busy to answer your questions.

\*

Most mailing lists are archived and the archives are indexed by search engines. If you ask your question on-list and it is answered, a future querent could find your question and the answer on the Web instead of asking it again.

\*

If certain questions are seen to be asked often, developers can use that information to improve the documentation or the software itself to be less confusing. But if those questions are asked in private, nobody has the complete picture of what questions are asked most often. If a project has both a "user" and a "developer" (or "hacker") mailing list or Web forum, and you are not hacking on the code, ask in the "user" list/forum. Do not assume that you will be welcome on the developer list, where they're likely to experience your question as noise disrupting their developer traffic.

However, if you are sure your question is non-trivial, and you get no answer in the "user" list/forum for several days, try the "developer" one. You would be well advised to lurk there for a few days before posting to learn the local folkways (actually this is good advice on any private or semiprivate list).

If you cannot find a project's mailing list address, but only see the address of the maintainer of the project, go ahead and write to the maintainer. But even in that case, don't assume that the mailing list doesn't exist. Mention in your e-mail that you tried and could not find the appropriate mailing list. Also mention that you don't object to having your message forwarded to other people. (Many people believe that private e-mail should remain private, even if there is nothing secret in it. By allowing your message to be forwarded you give your correspondent a choice about how to handle your e-mail.)

### Use meaningful, specific subject headers

On mailing lists, newsgroups or Web forums, the subject header is your golden opportunity to attract qualified experts' attention in around 50 characters or fewer. Don't waste it on babble like "Please help me" (let alone "PLEASE HELP ME!!!!"); messages with subjects like that get discarded by reflex. Don't try to impress us with the depth of your anguish; use the space for a super-concise problem description instead.

One good convention for subject headers, used by many tech support organizations, is "object - deviation". The "object" part specifies what thing or group of things is having a problem, and the "deviation" part describes the deviation from expected behavior. Stupid: HELP! Video doesn't work properly on my laptop! Smart: X.org 6.8.1 misshapen mouse cursor, Fooware MV1005 vid. chipset Smarter: X.org 6.8.1 mouse cursor on Fooware MV1005 vid. chipset - is misshapen The process of writing an "object-deviation" description will help you organize your thinking about the problem in more detail. What is affected? Just the mouse cursor or other graphics too? Is this specific to the X.org version of X? To version 6.8.1? Is this specific to Fooware video chipsets? To model MV1005? A hacker who sees the result can immediately understand what it is that you are having a problem with and the problem you are having, at a glance.

More generally, imagine looking at the index of an archive of questions, with just the subject lines showing. Make your subject line reflect your question well enough that the next guy searching the archive with a question similar to yours will be able to follow the thread to an answer rather than posting the question again.

If you ask a question in a reply, be sure to change the subject line to indicate that you're asking a question. A Subject line that looks like "Re: test" or "Re: new bug" is less likely to attract useful amounts of attention. Also, pare quotation of previous messages to the minimum consistent with cluing in new readers.

Do not simply hit reply to a list message in order to start an entirely new thread. This will limit your audience. Some mail readers, like mutt, allow the user to sort by thread and then hide messages in a thread by folding the thread. Folks who do that will never see your message. Changing the subject is not sufficient. Mutt, and probably other mail readers, looks at other information in the e-mail's headers to assign it to a thread, not the subject line. Instead start an entirely new e-mail.

On Web forums the rules of good practice are slightly different, because messages are usually much more tightly bound to specific discussion threads and often invisible outside those threads. Changing the subject when asking a question in reply is not essential. Not all forums even allow separate subject lines on replies, and nearly nobody reads them when they do. However, asking a question in a reply is a dubious practice in itself, because it will only be seen by those who are watching this thread. So, unless you are sure you want to ask only the people currently active in the thread, start a new one.

### *Make it easy to reply*

Finishing your query with “Please send your reply to...” makes it quite unlikely you will get an answer. If you can't be bothered to take even the few seconds required to set up a correct Reply-To header in your mail agent, we can't be bothered to take even a few seconds to think about your problem. If your mail program doesn't permit this, get a better mail program. If your operating system doesn't support any e-mail programs that permit this, get a better operating system. In Web forums, asking for a reply by e-mail is outright rude, unless you believe the information may be sensitive (and somebody will, for some unknown reason, let you but not the whole forum know it). If you want an e-mail copy when somebody replies in the thread, request that the Web forum send it; this feature is supported almost everywhere under options like “watch this thread”, “send e-mail on answers”, etc.

Write in clear, grammatical, correctly-spelled language

We've found by experience that people who are careless and sloppy writers are usually also careless and sloppy at thinking and coding (often enough to bet on, anyway). Answering questions for careless and sloppy thinkers is not rewarding; we'd rather spend our time elsewhere. So expressing your question clearly and well is important. If you can't be bothered to do that, we can't be bothered to pay attention. Spend the extra effort to polish your language. It doesn't have to be stiff or formal — in fact, hacker culture values informal, slangy and humorous language used with precision. But it has to be precise; there has to be some indication that you're thinking and paying attention.

Spell, punctuate, and capitalize correctly. Don't confuse “its” with “it's”, “loose” with “lose”, or “discrete” with “discreet”. Don't TYPE IN ALL CAPS; this is read as shouting and considered rude. (All-small is only slightly less annoying, as it's difficult to read. Alan Cox can get away with it, but you can't.)

More generally, if you write like a semi-literate boob you will very likely be ignored. So don't use instant-messaging shortcuts. Spelling “you” as “u” makes you look like a semi-literate boob to save two entire keystrokes. Worse: writing like a l33t script kiddie hax0r is the absolute kiss of death and guarantees you will receive nothing but stony silence (or, at best, a heaping helping of scorn and sarcasm) in return.

If you are asking questions in a forum that does not use your native language, you will get a limited amount of slack for spelling and grammar errors — but no extra slack at all for laziness (and yes, we can usually spot that difference). Also, unless you know what your respondent's languages are, write in English. Busy hackers tend to simply flush questions in languages they don't understand, and

English is the working language of the Internet. By writing in English you minimize your chances that your question will be discarded unread.

Send questions in accessible, standard formats If you make your question artificially hard to read, it is more likely to be passed over in favor of one that isn't. So:

\*

Send plain text mail, not HTML. (It's not hard to turn off HTML.)

\*

MIME attachments are usually OK, but only if they are real content (such as an attached source file or patch), and not merely boilerplate generated by your mail client (such as another copy of your message).

\*

Don't send e-mail in which entire paragraphs are single multiply-wrapped lines. (This makes it too difficult to reply to just part of the message.) Assume that your respondents will be reading mail on 80-character-wide text displays and set your line wrap accordingly, to something less than 80.

\*

However, do not wrap data (such as log file dumps or session transcripts) at any fixed column width. Data should be included as-is, so respondents can have confidence that they are seeing what you saw.

\*

Don't send MIME Quoted-Printable encoding to an English-language forum. This encoding can be necessary when you're posting in a language ASCII doesn't cover, but many e-mail agents don't support it. When they break, all those =20 glyphs scattered through the text are ugly and distracting — or may actively sabotage the semantics of your text.

\*

Never, ever expect hackers to be able to read closed proprietary document formats like Microsoft Word or Excel. Most hackers react to these about as well as you would to having a pile of steaming pig manure dumped on your doorstep. Even when they can cope, they resent having to do so.

\*

If you're sending e-mail from a Windows machine, turn off Microsoft's stupid “Smart Quotes” feature. This is so you'll avoid sprinkling garbage characters through your mail.

\*

In Web forums, do not abuse “smiley” and “HTML” features (when they are present). A smiley or two is usually OK, but colored fancy text tends to make people think you are lame. Seriously overusing smileys and color and fonts will make you come off like a giggly teenage girl, which is not generally a good idea unless you are more interested in sex than answers. If you're using a graphical-user-interface mail client such as Netscape Messenger, MS Outlook, or their ilk, beware that it may violate these rules when used with its default settings. Most such clients have a menu-based “View Source” command. Use this on something in your sent-mail folder, verifying sending of plain text without unnecessary attached crud. Be precise and informative about your problem

\*

Describe the symptoms of your problem or bug carefully and clearly.

\*

Describe the environment in which it occurs (machine, OS, application, whatever). Provide your vendor's distribution and release level (e.g.: “Fedora Core 7”, “Slackware 9.1”, etc.).

\*

Describe the research you did to try and understand the problem before you asked the question.

\*

Describe the diagnostic steps you took to try and pin down the problem yourself before you asked the question.

\*

Describe any possibly relevant recent changes in your computer or software configuration. Do the best you can to anticipate the questions a hacker will ask, and answer them in advance in your request for help.

Simon Tatham has written an excellent essay entitled *How to Report Bugs Effectively*. I strongly recommend that you read it. Volume is not precision. You need to be precise and informative. This end is not served by simply dumping huge volumes of code or data into a help request. If you have a large, complicated test case that is breaking a program, try to trim it and make it as small as possible.

This is useful for at least three reasons. One: being seen to invest effort in simplifying the question makes it more likely you'll get an answer, Two: simplifying the question makes it more likely you'll get a useful answer. Three: In the process of refining your bug report, you may develop a fix or workaround yourself.

### *Don't claim that you have found a bug*

When you are having problems with a piece of software, don't claim you have found a bug unless you are very, very sure of your ground. Hint: unless you can provide a source-code patch that fixes the problem, or a regression test against a previous version that demonstrates incorrect behavior, you are probably not sure enough. This applies to webpages and documentation, too; if you have found a documentation “bug”, you should supply replacement text and which pages it should go on. Remember, there are many other users that are not experiencing your problem. Otherwise you would have learned about it while reading the documentation and searching the Web (you did do that before complaining, didn't you?). This means that very probably it is you who are doing something wrong, not the software.

The people who wrote the software work very hard to make it work as well as possible. If you claim you have found a bug, you'll be impugning their competence, which may offend some of them even if you are correct. It's especially undiplomatic to yell “bug” in the Subject line.

When asking your question, it is best to write as though you assume you are doing something wrong, even if you are privately pretty sure you have found an actual bug. If there really is a bug, you will hear about it in the answer. Play it so the maintainers will want to apologize to you if the bug is real,

rather than so that you will owe them an apology if you have messed up. Grovelling is not a substitute for doing your homework

Some people who get that they shouldn't behave rudely or arrogantly, demanding an answer, retreat to the opposite extreme of grovelling. "I know I'm just a pathetic newbie loser, but...". This is distracting and unhelpful. It's especially annoying when it's coupled with vagueness about the actual problem.

Don't waste your time, or ours, on crude primate politics. Instead, present the background facts and your question as clearly as you can. That is a better way to position yourself than by grovelling. Sometimes Web forums have separate places for newbie questions. If you feel you do have a newbie question, just go there. But don't grovel there either.

### *Describe the problem's symptoms, not your guesses*

It's not useful to tell hackers what you think is causing your problem. (If your diagnostic theories were such hot stuff, would you be consulting others for help?) So, make sure you're telling them the raw symptoms of what goes wrong, rather than your interpretations and theories. Let them do the interpretation and diagnosis. If you feel it's important to state your guess, clearly label it as such and describe why that answer isn't working for you.

Stupid: I'm getting back-to-back SIG11 errors on kernel compiles, and suspect a hairline crack on one of the motherboard traces. What's the best way to check for those? Smart: My home-built K6/233 on an FIC-PA2007 motherboard (VIA Apollo VP2 chipset) with 256MB Corsair PC133 SDRAM starts getting frequent SIG11 errors about 20 minutes after power-on during the course of kernel compiles, but never in the first 20 minutes. Rebooting doesn't restart the clock, but powering down overnight does. Swapping out all RAM didn't help. The relevant part of a typical compile session log follows.

Since the preceding point seems to be a tough one for many people to grasp, here's a phrase to remind you: "All diagnosticians are from Missouri." That US state's official motto is "Show me" (earned in 1899, when Congressman Willard D. Vandiver said "I come from a country that raises corn and cotton and cockleburs and Democrats, and frothy eloquence neither convinces nor satisfies me. I'm from Missouri. You've got to show me.") In diagnosticians' case, it's not a matter of skepticism, but rather a literal, functional need to see whatever is as close as possible to the same raw evidence that you see, rather than your surmises and summaries. Show us.

### *Describe your problem's symptoms in chronological order*

The clues most useful in figuring out something that went wrong often lie in the events immediately prior. So, your account should describe precisely what you did, and what the machine and software did, leading up to the blowup. In the case of command-line processes, having a session log (e.g., using the script utility) and quoting the relevant twenty or so lines is very useful. If the program that blew up on you has diagnostic options (such as -v for verbose), try to select options that will add useful debugging information to the transcript. Remember that more is not necessarily better; try to choose a debug level that will inform rather than drowning the reader in junk.

If your account ends up being long (more than about four paragraphs), it might be useful to succinctly state the problem up top, then follow with the chronological tale. That way, hackers will know what to watch for in reading your account.

### *Describe the goal, not the step*

If you are trying to find out how to do something (as opposed to reporting a bug), begin by describing the goal. Only then describe the particular step towards it that you are blocked on. Often, people who need technical help have a high-level goal in mind and get stuck on what they think is one particular path towards the goal. They come for help with the step, but don't realize that the path is wrong. It can take substantial effort to get past this.

Stupid: How do I get the color-picker on the FooDraw program to take a hexadecimal RGB value?

Smart: I'm trying to replace the color table on an image with values of my choosing. Right now the only way I can see to do this is by editing each table slot, but I can't get FooDraw's color picker to take a hexadecimal RGB value.

The second version of the question is smart. It allows an answer that suggests a tool better suited to the task.

### *Don't ask people to reply by private e-mail*

Hackers believe solving problems should be a public, transparent process during which a first try at an answer can and should be corrected if someone more knowledgeable notices that it is incomplete or incorrect. Also, helpers get some of their reward for being respondents from being seen to be competent and knowledgeable by their peers.

When you ask for a private reply, you are disrupting both the process and the reward. Don't do this. It's the respondent's choice whether to reply privately — and if he does, it's usually because he thinks the question is too ill-formed or obvious to be interesting to others.

There is one limited exception to this rule. If you think the question is such that you are likely to get many answers that are all closely similar, then the magic words are “e-mail me and I'll summarize the answers for the group”. It is courteous to try and save the mailing list or newsgroup a flood of substantially identical postings — but you have to keep the promise to summarize.

### *Be explicit about your question*

Open-ended questions tend to be perceived as open-ended time sinks. Those people most likely to be able to give you a useful answer are also the busiest people (if only because they take on the most work themselves). People like that are allergic to open-ended time sinks, thus they tend to be allergic to open-ended questions.

You are more likely to get a useful response if you are explicit about what you want respondents to do (provide pointers, send code, check your patch, whatever). This will focus their effort and implicitly put an upper bound on the time and energy a respondent must allocate to helping you.

This is good. To understand the world the experts live in, think of expertise as an abundant resource and time to respond as a scarce one. The less of a time commitment you implicitly ask for, the more likely you are to get an answer from someone really good and really busy.

So it is useful to frame your question to minimize the time commitment required for an expert to field it — but this is often not the same thing as simplifying the question. Thus, for example, “Would you give me a pointer to a good explanation of X?” is usually a smarter question than “Would you explain X, please?”. If you have some malfunctioning code, it is usually smarter to ask for someone to explain what's wrong with it than it is to ask someone to fix it.

### When asking about code

Don't ask others to debug your broken code without giving a hint what sort of problem they should be searching for. Posting a few hundred lines of code, saying "it doesn't work", will get you ignored. Posting a dozen lines of code, saying "after line 7 I was expecting to see <x>, but <y> occurred instead" is much more likely to get you a response.

If you simply want a code review, say as much up front, and be sure to mention what areas you think might particularly need review and why.

### Don't post homework questions

Hackers are good at spotting homework questions; most of us have done them ourselves. Those questions are for you to work out, so that you will learn from the experience. It is OK to ask for hints, but not for entire solutions. If you suspect you have been passed a homework question, but can't solve it anyway, try asking in a user group forum or (as a last resort) in a “user” list/forum of a project. While the hackers will spot it, some of the advanced users may at least give you a hint.

### Prune pointless queries

Resist the temptation to close your request for help with semantically-null questions like “Can anyone help me?” or “Is there an answer?” First: if you've written your problem description halfway competently, such tacked-on questions are at best superfluous. Second: because they are superfluous, hackers find them annoying — and are likely to return logically impeccable but dismissive answers like “Yes, you can be helped” and “No, there is no help for you.” In general, asking yes-or-no questions is a good thing to avoid unless you want a yes-or-no answer.

Don't flag your question as “Urgent”, even if it is for you. That's your problem, not ours. Claiming urgency is very likely to be counter-productive: most hackers will simply delete such messages as rude and selfish attempts to elicit immediate and special attention.

There is one semi-exception. It can be worth mentioning if you're using the program in some high-profile place, one that the hackers will get excited about; in such a case, if you're under time pressure, and you say so politely, people may get interested enough to answer faster.

This is a very risky thing to do, however, because the hackers' metric for what is exciting probably differs from yours. Posting from the International Space Station would qualify, for example, but posting on behalf of a feel-good charitable or political cause would almost certainly not. In fact, posting "Urgent: Help me save the fuzzy baby seals!" will reliably get you shunned or flamed even by hackers who think fuzzy baby seals are important.

If you find this mysterious, re-read the rest of this how-to repeatedly until you understand it before posting anything at all.

Courtesy never hurts, and sometimes helps Be courteous. Use "Please" and "Thanks for your attention" or "Thanks for your consideration". Make it clear you appreciate the time people spend helping you for free. To be honest, this isn't as important as (and cannot substitute for) being grammatical, clear, precise and descriptive, avoiding proprietary formats etc.; hackers in general would rather get somewhat brusque but technically sharp bug reports than polite vagueness. (If this puzzles you, remember that we value a question by what it teaches us.)

However, if you've got your technical ducks in a row, politeness does increase your chances of getting a useful answer. (We must note that the only serious objection we've received from veteran hackers to this HOWTO is with respect to our previous recommendation to use "Thanks in advance". Some hackers feel this connotes an intention not to thank anybody afterwards. Our recommendation is to either say "Thanks in advance" first and thank respondents afterwards, or express courtesy in a different way, such as by saying "Thanks for your attention" or "Thanks for your consideration".) Follow up with a brief note on the solution

Send a note after the problem has been solved to all who helped you; let them know how it came out and thank them again for their help. If the problem attracted general interest in a mailing list or newsgroup, it's appropriate to post the followup there. Optimally, the reply should be to the thread started by the original question posting, and should have 'FIXED', 'RESOLVED' or an equally obvious tag in the subject line. On mailing lists with fast turnaround, a potential respondent who sees a thread about "Problem X" ending with "Problem X - FIXED" knows not to waste his/her time even reading the thread (unless (s)he personally finds Problem X interesting) and can therefore use that time solving a different problem.

Your followup doesn't have to be long and involved; a simple "Howdy — it was a failed network cable! Thanks, everyone. - Bill" would be better than nothing. In fact, a short and sweet summary is better than a long dissertation unless the solution has real technical depth. Say what action solved the problem, but you need not replay the whole troubleshooting sequence.

For problems with some depth, it is appropriate to post a summary of the troubleshooting history. Describe your final problem statement. Describe what worked as a solution, and indicate avoidable

blind alleys after that. The blind alleys should come after the correct solution and other summary material, rather than turning the follow-up into a detective story. Name the names of people who helped you; you'll make friends that way.

Besides being courteous and informative, this sort of followup will help others searching the archive of the mailing-list/newsgroup/forum to know exactly which solution helped you and thus may also help them.

Last, and not least, this sort of followup helps everybody who assisted feel a satisfying sense of closure about the problem. If you are not a techie or hacker yourself, trust us that this feeling is very important to the gurus and experts you tapped for help. Problem narratives that trail off into unresolved nothingness are frustrating things; hackers itch to see them resolved. The goodwill that scratching that itch earns you will be very, very helpful to you next time you need to pose a question.

Consider how you might be able to prevent others from having the same problem in the future. Ask yourself if a documentation or FAQ patch would help, and if the answer is yes send that patch to the maintainer.

Among hackers, this sort of good followup behavior is actually more important than conventional politeness. It's how you get a reputation for playing well with others, which can be a very valuable asset.

### How To Interpret Answers

**RTFM and STFW: How To Tell You've Seriously Screwed Up** There is an ancient and hallowed tradition: if you get a reply that reads "RTFM", the person who sent it thinks you should have Read The Fucking Manual. He or she is almost certainly right. Go read it.

RTFM has a younger relative. If you get a reply that reads "STFW", the person who sent it thinks you should have Searched The Fucking Web. He or she is almost certainly right. Go search it. (The milder version of this is when you are told "Google is your friend!")

In Web forums, you may also be told to search the forum archives. In fact, someone may even be so kind as to provide a pointer to the previous thread where this problem was solved. But do not rely on this consideration; do your archive-searching before asking.

Often, the person telling you to do a search has the manual or the web page with the information you need open, and is looking at it as he or she types. These replies mean that he thinks (a) the information you need is easy to find, and (b) you will learn more if you seek out the information than if you have it spoon-fed to you. You shouldn't be offended by this; by hacker standards, your respondent is showing you a rough kind of respect simply by not ignoring you. You should instead be thankful for this grandmotherly kindness.

### If you don't understand...

If you don't understand the answer, do not immediately bounce back a demand for clarification. Use the same tools that you used to try and answer your original question (manuals, FAQs, the Web, skilled friends) to understand the answer. Then, if you still need to ask for clarification, exhibit what you have learned.

For example, suppose I tell you: "It sounds like you've got a stuck zentry; you'll need to clear it." Then: here's a bad followup question: "What's a zentry?" Here's a good followup question: "OK, I read the man page and zentries are only mentioned under the -z and -p switches. Neither of them says anything about clearing zentries. Is it one of these or am I missing something here?" Dealing with rudeness

Much of what looks like rudeness in hacker circles is not intended to give offense. Rather, it's the product of the direct, cut-through-the-bullshit communications style that is natural to people who are more concerned about solving problems than making others feel warm and fuzzy. When you perceive rudeness, try to react calmly. If someone is really acting out, it is very likely a senior person on the list or newsgroup or forum will call him or her on it. If that doesn't happen and you lose your temper, it is likely that the person you lose it at was behaving within the hacker community's norms and you will be considered at fault. This will hurt your chances of getting the information or help you want.

On the other hand, you will occasionally run across rudeness and posturing that is quite gratuitous. The flip-side of the above is that it is acceptable form to slam real offenders quite hard, dissecting their misbehavior with a sharp verbal scalpel. Be very, very sure of your ground before you try this, however. The line between correcting an incivility and starting a pointless flamewar is thin enough that hackers themselves not infrequently blunder across it; if you are a newbie or an outsider, your chances of avoiding such a blunder are low. If you're after information rather than entertainment, it's better to keep your fingers off the keyboard than to risk this. (Some people assert that many hackers have a mild form of autism or Asperger's Syndrome, and are actually missing some of the brain circuitry that lubricates "normal" human social interaction. This may or may not be true. If you are not a hacker yourself, it may help you cope with our eccentricities if you think of us as being brain-damaged. Go right ahead. We won't care; we like being whatever it is we are, and generally have a healthy skepticism about clinical labels.) In the next section, we'll talk about a different issue; the kind of "rudeness" you'll see when you misbehave.

### *On Not Reacting Like A Loser*

Odds are you'll screw up a few times on hacker community forums — in ways detailed in this article, or similar. And you'll be told exactly how you screwed up, possibly with colourful asides. In public.

When this happens, the worst thing you can do is whine about the experience, claim to have been verbally assaulted, demand apologies, scream, hold your breath, threaten lawsuits, complain to people's employers, leave the toilet seat up, etc. Instead, here's what you do: Get over it. It's normal. In fact, it's healthy and appropriate.

Community standards do not maintain themselves: They're maintained by people actively applying them, visibly, in public. Don't whine that all criticism should have been conveyed via private e-mail: That's not how it works. Nor is it useful to insist you've been personally insulted when someone comments that one of your claims was wrong, or that his views differ. Those are loser attitudes.

There have been hacker forums where, out of some misguided sense of hyper-courtesy, participants are banned from posting any fault-finding with another's posts, and told "Don't say anything if you're unwilling to help the user." The resulting departure of clueful participants to elsewhere causes them to descend into meaningless babble and become useless as technical forums. Exaggeratedly "friendly" (in that fashion) or useful: Pick one.

Remember: When that hacker tells you that you've screwed up, and (no matter how gruffly) tells you not to do it again, he's acting out of concern for (1) you and (2) his community. It would be much easier for him to ignore you and filter you out of his life. If you can't manage to be grateful, at least have a little dignity, don't whine, and don't expect to be treated like a fragile doll just because you're a newcomer with a theatrically hypersensitive soul and delusions of entitlement. Sometimes people will attack you personally, flame without an apparent reason, etc., even if you don't screw up (or have only screwed up in their imagination). In this case, complaining is the way to really screw up.

These flammers are either lamers who don't have a clue but believe themselves to be experts, or would-be psychologists testing whether you'll screw up. The other readers either ignore them, or find ways to deal with them on their own. The flammers' behavior creates problems for themselves, which don't have to concern you.

Don't let yourself be drawn into a flamewar, either. Most flames are best ignored — after you've checked whether they are really flames, not pointers to the ways in which you have screwed up, and not cleverly ciphered answers to your real question (this happens as well).

### Questions Not To Ask

Here are some classic stupid questions, and what hackers are thinking when they don't answer them.

- Q: Where can I find program or resource X?
- Q: How can I use X to do Y?
- Q: How can I configure my shell prompt?
- Q: Can I convert an AcmeCorp document into a TeX file using the Bass-o-matic file converter?
- Q: My {program, configuration, SQL statement} doesn't work
- Q:

I'm having problems with my Windows machine. Can you help?

Q:

My program doesn't work. I think system facility X is broken.

Q:

I'm having problems installing Linux or X. Can you help?

Q:

How can I crack root/steal channel-ops privileges/read someone's e-mail?

Q:

Where can I find program or resource X?

A: The same place I'd find it, fool — at the other end of a web search. God, doesn't everybody know how to use Google yet?

Q: How can I use X to do Y?

A: If what you want is to do Y, you should ask that question without pre-supposing the use of a method that may not be appropriate. Questions of this form often indicate a person who is not merely ignorant about X, but confused about what problem Y they are solving and too fixated on the details of their particular situation. It is generally best to ignore such people until they define their problem better.

Q: How can I configure my shell prompt?

A: If you're smart enough to ask this question, you're smart enough to RTFM and find out yourself.

Q: Can I convert an AcmeCorp document into a TeX file using the Bass-o-matic file converter?

A: Try it and see. If you did that, you'd (a) learn the answer, and (b) stop wasting my time.

Q: My {program, configuration, SQL statement} doesn't work

A: This is not a question, and I'm not interested in playing Twenty Questions to pry your actual question out of you — I have better things to do. On seeing something like this, my reaction is normally of one of the following:

\* do you have anything else to add to that? \* oh, that's too bad, I hope you get it fixed.

• and this has exactly what to do with me? •

Q: I'm having problems with my Windows machine. Can you help?

A: Yes. Throw out that Microsoft trash and install an open-source operating system like Linux or

BSD. Note: you can ask questions related to Windows machines if they are about a program that does have an official Windows build, or interacts with Windows machines (i.e., Samba). Just don't be

surprised by the reply that the problem is with Windows and not the program, because Windows is so broken in general that this is very often the case.

Q: My program doesn't work. I think system facility X is broken.

A: While it is possible that you are the first person to notice an obvious deficiency in system calls and libraries heavily used by hundreds or thousands of people, it is rather more likely that you are utterly clueless. Extraordinary claims require extraordinary evidence; when you make a claim like this one, you must back it up with clear and exhaustive documentation of the failure case.

Q: I'm having problems installing Linux or X. Can you help?

A: No. I'd need hands-on access to your machine to troubleshoot this. Go ask your local Linux user group for hands-on help. (You can find a list of user groups [here](#).) Note: questions about installing Linux may be appropriate if you're on a forum or mailing list about a particular distribution, and the problem is with that distro; or on local user groups forums. In this case, be sure to describe the exact details of the failure. But do careful searching first, with "linux" and all suspicious pieces of hardware.

Q: How can I crack root/steal channel-ops privileges/read someone's e-mail?

A: You're a lowlife for wanting to do such things and a moron for asking a hacker to help you. Good and Bad Questions Finally, I'm going to illustrate how to ask questions in a smart way by example; pairs of questions about the same problem, one asked in a stupid way and one in a smart way. Stupid: Where can I find out stuff about the Foonly Flurbamatic? This question just begs for "STFW" as a reply.

Smart: I used Google to try to find "Foonly Flurbamatic 2600" on the Web, but I got no useful hits. Can I get a pointer to programming information on this device? This one has already STFWed, and sounds like he might have a real problem.

Stupid: I can't get the code from project foo to compile. Why is it broken? The querent assumes that somebody else screwed up. Arrogant git...

Smart: The code from project foo doesn't compile under Nulix version 6.2. I've read the FAQ, but it doesn't have anything in it about Nulix-related problems. Here's a transcript of my compilation attempt; is it something I did?

The querent has specified the environment, read the FAQ, is showing the error, and is not assuming his problems are someone else's fault. This one might be worth some attention.

Stupid: I'm having problems with my motherboard. Can anybody help?

J. Random Hacker's response to this is likely to be "Right. Do you need burping and diapering, too?" followed by a punch of the delete key.

Smart: I tried X, Y, and Z on the S2464 motherboard. When that didn't work, I tried A, B, and C. Note the curious symptom when I tried C. Obviously the florbish is grommicking, but the results aren't what one might expect. What are the usual causes of grommicking on Athlon MP motherboards? Anybody got ideas for more tests I can run to pin down the problem?

This person, on the other hand, seems worthy of an answer. He/she has exhibited problem-solving intelligence rather than passively waiting for an answer to drop from on high. In the last question, notice the subtle but important difference between demanding "Give me an answer" and "Please help me figure out what additional diagnostics I can run to achieve enlightenment."

In fact, the form of that last question is closely based on a real incident that happened in August 2001 on the linux-kernel mailing list (lkml). I (Eric) was the one asking the question that time. I was seeing mysterious lockups on a Tyan S2462 motherboard. The list members supplied the critical information I needed to solve them.

By asking the question in the way I did, I gave people something to chew on; I made it easy and attractive for them to get involved. I demonstrated respect for my peers' ability and invited them to consult with me as a peer. I also demonstrated respect for the value of their time by telling them the blind alleys I had already run down.

Afterwards, when I thanked everyone and remarked how well the process had worked, an lkml member observed that he thought it had worked not because I'm a "name" on that list, but because I asked the question in the proper form.

Hackers are in some ways a very ruthless meritocracy; I'm certain he was right, and that if I had behaved like a sponge I would have been flamed or ignored no matter who I was. His suggestion that I write up the whole incident as instruction to others led directly to the composition of this guide.

### *If You Can't Get An Answer*

If you can't get an answer, please don't take it personally that we don't feel we can help you. Sometimes the members of the asked group may simply not know the answer. No response is not the same as being ignored, though admittedly it's hard to spot the difference from outside. In general, simply re-posting your question is a bad idea. This will be seen as pointlessly annoying. Have patience: the person with your answer may be in a different time-zone and asleep. Or it may be that your question wasn't well-formed to begin with.

There are other sources of help you can go to, often sources better adapted to a novice's needs. There are many online and local user groups who are enthusiasts about the software, even though they may never have written any software themselves. These groups often form so that people can help each other and help new users. There are also plenty of commercial companies you can contract with for

help, both large and small (Red Hat and SpikeSource are two of the best known; there are many others). Don't be dismayed at the idea of having to pay for a bit of help! After all, if your car engine blows a head gasket, chances are you would take it to a repair shop and pay to get it fixed. Even if the software didn't cost you anything, you can't expect that support to always come for free.

For popular software like Linux, there are at least 10,000 users per developer. It's just not possible for one person to handle the support calls from over 10,000 users. Remember that even if you have to pay for support, you are still paying much less than if you had to buy the software as well (and support for closed-source software is usually more expensive and less competent than support for open-source software).

### How To Answer Questions in a Helpful Way

Be gentle. Problem-related stress can make people seem rude or stupid even when they're not. Reply to a first offender off-line. There is no need of public humiliation for someone who may have made an honest mistake. A real newbie may not know how to search archives or where the FAQ is stored or posted.

If you don't know for sure, say so! A wrong but authoritative-sounding answer is worse than none at all. Don't point anyone down a wrong path simply because it's fun to sound like an expert. Be humble and honest; set a good example for both the querent and your peers. If you can't help, don't hinder. Don't make jokes about procedures that could trash the user's setup

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the poor sap might interpret these as instructions. Ask probing questions to elicit more details. If you're good at this, the querent will learn something

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and so might you. Try to turn the bad question into a good one; remember we were all newbies once.

While muttering RTFM is sometimes justified when replying to someone who is just a lazy slob, a

pointer to documentation (even if it's just a suggestion to google for a key phrase) is better. If you're going to answer the question at all, give good value. Don't suggest kludgy workarounds when somebody is using the wrong tool or approach. Suggest good tools. Reframe the question. Help your community learn from the question. When you field a good question, ask yourself "How would the relevant documentation or FAQ have to change so that nobody has to answer this again?" Then send a patch to the document maintainer.

If you did research to answer the question, demonstrate your skills rather than writing as though you pulled the answer out of your butt. Answering one good question is like feeding a hungry person one meal, but teaching them research skills by example is showing them how to grow food for a lifetime.

### Related Resources

If you need instruction in the basics of how personal computers, Unix, and the Internet work, see *The Unix and Internet Fundamentals HOWTO*. When you release software or write patches for software, try to follow the guidelines in the *Software Release Practice HOWTO*. Acknowledgements

Evelyn Mitchell contributed some example stupid questions and inspired the “How To Give A Good Answer” section. Mikhail Ramendik contributed some particularly valuable suggestions for improvements. How to enable root login ( for newbies )

<http://forumubuntu.org.uk/viewtopic.php?f=7&t=3657> Navigate through System-->Administration--> Login Window, I was presented with the Login Window Preferences window. On the Security tab I found an empty checkbox labelled 'Allow local system administrator login'. I ticked this box and pressed 'Close'. I had already set a root password xxxxxx as described below ( In Green ), and when I rebooted Ultimate, I only had to enter Username: root and Password: xxxxxx in the opening screen to open Ultimate with full root privileges.

To set the password for 'root':- Go to System-->Administration-->Users and Groups. Enter your User password. Select 'root' in the Users settings window and press 'Properties', Set and confirm your new password xxxxxx for root in the Account 'root' Properties window. Press 'OK' and 'Close'. Done.

Tor on Ultimate Edition 9.04 <http://forumubuntu.org.uk/viewtopic.php?f=7&t=3534> Time to get Tor working on Ultimate Edition Jaunty, the new release. I'll be doing this on a pretty recent install. If you don't know what Tor is, let me explain. Tor (The Onion Router) is a anonymity network, which is meant to make you more anonymous. Because of the way Tor works, people won't get to know your original IP address if you set it up right. Please note that the government will still be able to monitor what you do, since they can monitor both sides of the connection. If you want to share files securely with high encryption, try Freenet. Anyway, it's time to get going. Add these lines to '/etc/apt/sources.list' with your favorite text- editor. deb <http://mirror.noreply.org/pub/tor> jaunty main deb-src <http://mirror.noreply.org/pub/tor> jaunty main Next open the terminal and do the following to make sure the system sees the new repos as 'trusted'. gpg --keyserver subkeys.gpg.net --recv 94C09C7F gpg --fingerprint 94C09C7F

```
gpg --export 94C09C7F | sudo apt-key add - And update with 'sudo aptitude update'. Now install Tor with 'sudo aptitude install tor'.
```

Congratulations, you've just installed Tor! Now it's time to make Tor work with FireFox.

Install FoxyProxy and restart FireFox. Right click on 'FoxyProxy: Disabled' and then click on 'Add new proxy'. Give it a name, like Tor, and click on the tab 'Proxydetails', the second tab. Since Tor is a SOCKS proxy working on localhost, select 'SOCKS Proxy?' and click on SOCKS 5. The IP address is 127.0.0.1 and the port is 9050.

If you get questions from FoxyProxy about Tor, read the messages and select the default settings. Remember to disable cookies, javascript, java, set the 'offline' buffer to 0 MB (Settings -> Advanced -> Network) and disable automatic update from FireFox (Settings -> Advanced -> Updates). You can enable and disable Tor by clicking right-clicking on 'FoxyProxy: Disabled' and select the Tor proxy.

Make sure Tor is running, and if it's not, go to the terminal and type 'sudo /etc/init.d/tor start'.

To check if Tor works, go to <http://torcheck.xenobite.eu/>. For you really paranoid, Modify Headers is able to disable and edit some browser headers, like user-agent and referrer. [Howto Find Maximum memory capacity of Your Computer](http://forumubuntu.com/viewtopic.php?f=7&t=3506) <http://forumubuntu.com/viewtopic.php?f=7&t=3506> Before Upgrading your Computers Memory capacity, You have to check maximum memory capacity of your system supports. How to check your maximum memory capacity it is simple \$ sudo dmidecode | grep Maximum output Maximum Size: 64 KB Maximum Size: 4096 KB Maximum Size: 0 KB Maximum Capacity: 4 GB

Solve missing gpg key error <http://forumubuntu.com/viewtopic.php?f=7&t=2720> Solve missing gpg key error ie: W: GPG error: <http://ppa.launchpad.net/intrepid> Release: The following signatures couldn't be verified because the public key is not available: NO\_PUBKEY 778978B00F7992B0

W: You may want to run apt-get update to correct these problems I made a perl script that:

```
- Can detect and fix any launchpad PPA link in /etc/apt/sources.list
- Backs up the original /etc/apt/sources.list as /etc/apt/sources.list.backup
- Imports GPG keys for the links detected in /etc/apt/sources.list Requirements:
-Administrative privileges
- Perl
- Internet connection
- HTML::Parser Open a terminal Applications>accessories>terminal & paste this Select all text
in blue sudo apt-get install libhtml-parser-perl mkdir gpg-fix && cd gpg-fix wget
http://savvas.radevic.com/launchpad/change.tar.gz -O change.tar.gz tar xzvf change.tar.gz
perl ./*.pl cd .. rm -Rf gpg-fix sudo apt-get update ( wait for a while while it gets the keys ) coffee
yum ....then press enter when it shows apt get update PulseAudio Fixes & System-Wide Equalizer
Support http://forumubuntu.com/viewtopic.php?f=7&t=3077 Note 1. Jaunty users: do not
follow this guide . Thanks to the hard work of the Ultimate Edition developers, PulseAudio is
optimally configured in the Jaunty release. Note 2. Intrepid users: due to a bug in the ALSA libraries,
your PCM mixer may occasionally become muted or reset to 0% volume. If you cannot hear sound -
or hear a faint crackling - refer to Part C, Step 3. Note 3: OSSv4 users: PulseAudio does not support
OSSv4, so this guide will serve no purpose to you. If you have chosen to install OSSv4 and
experience issues, you should seek guidance within the threads dedicated to OSSv4. I do not
recommend users to install OSSv4 due to compatibility and support issues.
```

PulseAudio is an advanced sound server which has been included in Ultimate Edition (i.e. the standard GNOME version) since the release of Hardy Heron (8.04). Unfortunately, Hardy shipped with a suboptimal configuration of PulseAudio which has resulted in users experiencing various problems, ranging from sporadic crashes in Firefox to sound mixing being completely broken. PulseAudio in Intrepid should work by default, but it is quite possible that your configuration is suboptimal. For more information, refer to the FAQ below. When you are ready to follow this guide, this is all you need to know: Hardy users: Follow Part A & B. Intrepid users: Follow Part A & C. Additionally:

\*

Appendix A gives general troubleshooting tips - if you have problems, start here.

\*

Appendix B gives useful information on the more advanced/technical features of PulseAudio.

\*

Appendix C gives information on how to properly configure specific applications that may not work with PulseAudio by default, including (but not limited to): WINE, Skype, and all OSS applications.

\*

Appendix D will show you how to enable equalized audio for *\*all\** applications on your system - this is especially useful for laptop users who experience poor audio quality with their internal speakers.

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### **Frequently asked questions (F.A.Q.)**

The most common queries are answered here.

Q. What exactly is PulseAudio?

A. From the homepage: Quote: PulseAudio is a sound server for POSIX and Win32 systems. A sound server is basically a proxy for your sound applications. It allows you to do advanced operations on your sound data as it passes between your application and your hardware. Things like transferring the audio to a different machine, changing the sample format or channel count and mixing several sounds into one are easily achieved using a sound server. Simplified: PulseAudio is responsible for playback and mixing of audio on your system. It is not a sound driver - in fact, it runs on top of the Advanced Linux Sound Architecture (ALSA). Aside from all the cool effects PulseAudio provides, it serves as a replacement for ALSA's virtual sound mixing device (DmixPlugin, or "dmix") - thus allowing multiple applications to share access to your sound card.

Q. PulseAudio? Bleh! I don't want it on my system.

A. Well... tough! PulseAudio is already installed and active on Hardy and Intrepid by default; it replaces ESD (ESound Daemon) for system sounds, and most of Ultimate Edition's default applications already use it (Totem, Rhythmbox, and any other applications using the GStreamer

framework). Although some high-profile applications support PulseAudio natively (such as VLC and mplayer), most applications use plain ALSA or OSS output, and thus don't have native PulseAudio support.

Q. If PulseAudio is already installed, why do I need this guide?

A. While PulseAudio has been installed by default since Hardy Heron (8.04), we dropped the ball when it came to the configuration part. A quote from the main PulseAudio developer, Lennart Pöttering: Quote: Some distributions did a better job adopting PulseAudio than others. On the good side I certainly have to list Mandriva, Debian, and Fedora. OTOH Ultimate Edition didn't exactly do a stellar job. They didn't do their homework. Adopting PA in a distribution is a fair amount of work, given that it interfaces with so many different things at so many different places. The integration with other systems is crucial. The information was all out there, communicated on the wiki, the mailing lists and on the PA IRC channel. But if you join and hang around on neither, then you won't get the memo. To my surprise when Ultimate Edition adopted PulseAudio they moved into one of their 'LTS' releases rightaway. Which I guess can be called gutsy -- on the background that I work for Red Hat and PulseAudio is not part of RHEL at this time. I get a lot of flak from Ultimate Edition users, and I am pretty sure the vast amount of it is undeserving and not my fault. When PulseAudio is running, it requires exclusive access to your sound card in order to work correctly as it assumes responsibility for mixing application's sounds instead of ALSA's "dmix" device. If you launch a "regular" application that does not have explicit PulseAudio support, it will most likely try to open the "Dmix" device - and this will deprive PulseAudio of control over the sound card. From the user's perspective, they will observe that audio mixing between applications is broken. PulseAudio includes ALSA plugins (within the package "libasound2-plugins") which are designed make regular ALSA applications remap audio to the PulseAudio server (and thus avoid mixing problems as described above). Unfortunately, Hardy Heron shipped without these plugins enabled (or even installed) by default, which is causing many, many audio mixing issues for users. To compound the problem, the version of these PulseAudio ALSA plugins in the Hardy repositories do not function correctly, so updated versions are required for ALSA applications to work correctly with PulseAudio. By following this guide, your system will be configured to use these PulseAudio ALSA plugins for Hardy users (and updated versions of necessary packages will get installed from my PPA). Although Intrepid has these plugins installed and configured by default, following this guide is still worthwhile because a) it will ensure you have a clean PulseAudio configuration, and b) you will hopefully gain a better understanding of how PulseAudio works.

Q. I'm glad to hear these issue are fixed in Intrepid, but why the hell aren't they fixed in Hardy already?

A. The simplest answer to this question is: complexity. Hardy is a LTS (Long Term Support) release, and there is a very strict policy towards updates (SRU; even the most trivial of bugfixes are entered into a code review). In order to fix Hardy, many components will require updates and changes, including but not limited to: libflashsupport, ia32-libs, pulseaudio, libasound2, libasound2plugins, flashplugin-nonfree, nspluginwrapper... Up until the last moment of Hardy's development cycle, the PulseAudio ALSA plugins weren't

functioning correctly, and Flash 9 absolutely would not work without the "evil" libflashsupport library (I say evil, because it caused frequent random crashes in Firefox) - and so it wasn't possible to enact the required changes before the final release. It's possible now, but there would require a huge amount of effort to review and apply these changes.

Q. I followed your guide and PulseAudio still doesn't work!

A. Refer to Appendix A and provide the requested information in your post.

Q. I can't get Skype/WINE/an OSS application/XYZ working correctly with PulseAudio, what can I do?

A. Some applications require some extra configuration, and some applications don't work with PulseAudio - please refer to Appendix C for information on specific applications.

Q. Where can I find the appropriate bug reports related to these issues?

A. If you click on a step number it will link to the appropriate bug report, if one exists. Part A: Common instructions (Hardy & Intrepid) All users must follow the steps in this section to guarantee a fully working PulseAudio configuration.

1. Backup (and then delete) your previous configuration files: Code: `$ mkdir ~/pulse-backup && cp -r ~/.pulse ~/.asound* /etc/asound.conf /etc/pulse -t ~/pulse-backup/ $ sudo rm -r ~/.pulse ~/.asound* /etc/asound.conf` Note: Don't worry if some of these files did not exist on your system.
2. Ensure you have Adobe Flash & the necessary PulseAudio libraries and configuration utilities installed: Code: `$ sudo apt-get install libasound2-plugins padevchooser libao-pulse libssl1.2debian-pulseaudio flashplugin-nonfree`
3. Ensure the evil "libflashsupport" library is not installed: Code: `$ sudo apt-get remove --purge libflashsupport flashplugin-nonfree-extrasound`
4. Open System/Preferences/Sound. In the Devices section, ensure that all "Sound playback" options are set to Autodetect. Set the "Sound capture" item to "ALSA", or the appropriate hardware definition. Close the application when you're finished. Note: Choosing PulseAudio for sound capture may result in crashes, so you are advised to choose the "direct" ALSA device instead.
5. Open the PulseAudio Volume Control application ("pavucontrol", or you can launch "Applications/Sound & Video/PulseAudio Device Chooser" and select Volume Control from this applet's menu). In the Output Devices section you will see a listing of the playback devices available on your system. Right-click on the entry that you desire to be made the default playback device on your system and enable the "Default" checkmark. Similarly, navigate to Input Devices, then right-click on the device you wish to set as your default input device (microphone), and ensure the "Default" setting is checked. Close the application when you're finished. Note: If you are greeted with the error "Connection failed: Connection refused", manually launch PulseAudio before opening the PulseAudio Volume Control

application: Code: `$ pulseaudio & pavucontrol`

6. Continue to Part B if you are running Hardy Heron (8.04), or Part C if you are running Intrepid Ibex (8.10). Part B: Hardy Heron (8.04) Follow the steps in this section only if you are running the Hardy Heron release. Disclaimer: My PPA contains the necessary packages backported from Intrepid for: PulseAudio, ALSA, Flash 10 and nspluginwrapper. If you upgrade to a newer distribution, or Hardy receives official updates for any of these packages, you will not experience any issues.
1. 64-bit users only: Install "getlibs" and some extra 32-bit libraries that are required for Flash 10 & Skype to function properly: Code: `$ wget http://www.boundless-supremacy.com/Cappy... bs-all.deb && sudo dpkg -i getlibs-all.deb && rm getlibs-all.deb $ sudo getlibs -p libnss3-1d libnspr4-0d libcurl3 libasound2-plugins`
2. Edit /etc/apt/sources.list: Code: `$ gksudo gedit /etc/apt/sources.list` If they don't already exist, add the following lines to the end of this file and save: Code: `# PulseAudio Fixes - http://ubuntuforums.org/showthread.php?t=789578 deb http://ppa.launchpad.net/psyke83/Ultimate Edition hardy main deb-src http://ppa.launchpad.net/psyke83/Ultimate Edition hardy main`
3. Update your repositories and upgrade packages: Code: `$ sudo apt-get update && sudo apt-get dist-upgrade` Note: You may be warned that some packages cannot be authenticated - that's normal. Simply press "y" to confirm installation of unsigned packages.
4. Enable the PulseAudio ALSA plugins: Code: `$ asoundconf set-pulseaudio` Note: Please wait until you have upgraded packages in the previous step before running this command. My packages have a patch for "asoundconf" to ensure it enables the PulseAudio plugins correctly.
5. Log out & back in for changes to take effect! Part C: Intrepid Ibex (8.10) Follow the steps in this section only if you are running the Intrepid Ibex release. Disclaimer: Currently there are no updated packages for Intrepid in my PPA (except for an updated nspluginwrapper package for 1386 users). I have decided to keep this step in the guide in case I upload any important updates that will not make it into the official repositories. I will never upload any "risky" packages (i.e. highly untested backports), only upgrades that seem compelling and relatively stable.
1. Edit /etc/apt/sources.list: Code: `$ gksudo gedit /etc/apt/sources.list` If they don't already exist, add the following lines to the end of this file and save: Code: `# PulseAudio Fixes - http://ubuntuforums.org/showthread.php?t=789578 deb http://ppa.launchpad.net/psyke83/Ultimate Edition intrepid main deb-src http://ppa.launchpad.net/psyke83/Ultimate Edition intrepid main`
2. Update your repositories and upgrade packages: Code: `$ sudo apt-get update && sudo apt-get dist-upgrade` Note: You may be warned that some packages cannot be authenticated - that's normal. Simply press "y" to confirm installation of unsigned packages.
3. Ensure that your sound card's PCM mixer is not muted or set to 0% volume (this appears to be a bug in Intrepid): Code: `$ alsamixer -Dhw` Note: When the PulseAudio ALSA plugins are active, you must explicitly specify your hardware device in alsamixer (marked in blue above), otherwise it will open the PulseAudio mixer.
4. Log out & back in for changes to take effect! Appendix A - General Troubleshooting

This section will outline some general troubleshooting steps you can perform to help identify your problem, and the information I need to help with your issues:

1. Close all applications that may be accessing the sound card.
2. Open the "PulseAudio Device Chooser" from Applications/Sound & Video. Click on the applet icon, and click "Volume Control...". Click on the "Playback" tab.
3. Launch the application you wish to test and allow it to play sound.
4. Check PulseAudio Volume Control's Playback tab and see if the application displays an entry while the application is (or should be) playing audio. Here are the possible results within the PulseAudio Volume Control's Playback tab:
  1. The application does play audio and does list an entry in the Playback tab;
    - the application is using PulseAudio correctly.
  2. The application does play audio and does not list an entry in the Playback tab;
    - the application is either accessing your sound card directly or playing sound via ALSA's dmix device. This will prevent PulseAudio from working correctly & cause audio mixing errors.
  3. The application does not play audio and does list an entry in the Playback tab;
    - the application is using PulseAudio but there is a problem, such as: a bug in PulseAudio, a problem with your ALSA kernel module or libraries, or your PCM/Master volume is muted.
  4. The application does not play audio and does not list an entry in the Playback tab;
    - the application is trying either to access your sound card directly or to play sound via ALSA's dmix device, but the sound card is already in use. This is the opposite case to result B, which will also cause mixing errors.
  5. The PulseAudio Volume Control application displays the error: "Connection failed: Connection refused";
    - the PulseAudio daemon is not running. -
  6. Other (please specify). Note: Unless the application you are testing is known to be incompatible with PulseAudio, you should always expect result "A" on a properly configured system. If you require assistance with a particular application - or simply cannot get PulseAudio to work - provide the following information:
    1. Your distribution version and architecture (e.g. Hardy Heron i386, Intrepid Ibex amd64, etc.).
    2. A listing of your sound devices: Code: `$ aplay -l`
    3. The verbose output from pulseaudio on your system: Code: `$ pkill pulseaudio; sleep 2; pulseaudio -vv`
    4. If you are having a problem only with a specific application, specify the application's name and result you received from the instructions above (A-F). Appendix B: Advanced PulseAudio Configuration This appendix will explain some of the more advanced/technical

features of PulseAudio.

Q. Where are the PulseAudio configuration utilities?

A. Providing you've followed this guide, you can gain access to all the utilities by launching "Applications/Sound & Video/PulseAudio Device Chooser". The applet's icon will appear in your notification tray - left-click to see the options. The main applications you will want to check are the Manager (to see the current server status) and Volume Control (to manipulate the volume and stream settings). Note: Please don't mess with any of the options until you have established a working configuration by following this guide - otherwise it'll be a nightmare to isolate your problem.

Q. How can I tell if an application is using PulseAudio successfully?

A. The application will give you result "A" from the troubleshooting steps of Appendix A.

Q. How can I change the default playback and/or recording device for my system?

A. Refer to Part A, Step 5.

Q. Is it possible to change to a different playback and/or recording device for an individual application?

A. Yes. Launch the desired application and play some sound (or begin recording), and open the PulseAudio Volume Control. Click the Playback or Recording tab (depending on which you want to change) and right-click on the desired application's entry. Choose the option "Move Stream..." and select the desired output device. Note: The volume level, sink (playback) and source (recording) settings will be saved automatically for every application you run, so PulseAudio should remember your settings. If you wish to view or delete these saved settings, they're stored in the file "~/.pulse/volume-restore.table".

Q. If I plug in my USB/Bluetooth headset, my external speakers no longer work!

A. This is normal behaviour, as PulseAudio supports "hotplugging" of audio devices. If you plug in a new device, PulseAudio may choose it as the default sink (audio device). Also see Part A, Step 5.

Q. PulseAudio is working correctly, but I am noticing some stuttering on my system. Is there anything I can do to help?

A. Edit the file `/etc/pulse/daemon.conf`: Code: `$ gksudo gedit /etc/pulse/daemon.conf` Find the following lines (usually at the bottom): Code: `default-fragments = 8 default-fragment-size-msec = 10` Try experimenting with different values for both of these entries. I can't tell you what values are optimal for your system, as each sound card has different buffer sizes and characteristics - therefore you'll need to use trial & error. The default fragment amount and size used by an untweaked PulseAudio installation is 4 and 25, respectively. Note 1: you must restart pulseaudio for any configuration changes to take effect. Note 2: If your system was stuttering in versions of Ultimate

Edition prior to Hardy, then you could be suffering from an ALSA kernel issue - these instructions probably won't help.

Q. I'm unhappy about the audio quality / CPU usage of PulseAudio. How do I change this?

A. For the record, PulseAudio should offer superior quality audio playback than ALSA's by default, as PulseAudio uses a higher quality audio resampler. This also means that PulseAudio may use more CPU usage compared to ALSA, unfortunately. If you wish to change the resampler: Edit `/etc/pulse/daemon.conf`: Code: `$ gksudo gedit /etc/pulse/daemon.conf` Find the following line: Code: `resample-method = speex-float-1` You can change the resampler to any of the following, listed in descending order, from highest quality to lowest quality (and therefore, CPU usage): Quote: `src-sinc-best-quality, src-sinc-medium-quality, src-sinc-fastest, speex-float-{10-0}, speex-fixed-{10-0}, ffmpeg, src-zero-order-hold, src-linear, trivial` Appendix C: Application Compatibility Guide This appendix will explain how to configure specific applications that may require manual configuration to work with PulseAudio. OSS applications: You need to launch the application using the "padsp" wrapper. For more

information, see "man padsp". Skype: Open Skype's Options, then go to Sound Devices. You need to set "Sound Out" and "Ringing" to the "pulse" device, and set "Sound In" to the hardware definition of your microphone. For example, my laptop's microphone is defined as "plughw:I82801DBICH4,0". WINE: Open the Wine Configuration application ("winecfg"). On the Audio tab, choose the ALSA driver, and leave everything else to default. If your sound stutters, choose the OSS driver instead, and use the "padsp" wrapper to launch the wine executable (via the terminal, or edit your shortcuts). Audacity (updated 11/12): From the PerfectSetup page: Quote: Audacity has now been packaged with a proper "alsa: pulse" device listed, in a ppa for Ultimate Edition intrepid. See <https://launchpad.net/~diwic/+archive> Everything else: refer to the Third Party Applications section of the upstream PerfectSetup wiki page. Note: Many of the instructions on the PerfectSetup page are either outdated, too distro-agnostic to work on Ultimate Edition, or have been obsoleted by the fixes in this guide. You should ignore the advice for: ALSA applications, Flash, ESOUND, GNOME, GStreamer Applications, SDL, and Skype.

Appendix D: System-Wide Equalizer In this section, we will configure PulseAudio to use equalized output, which is especially useful for laptops speakers which have very poor frequency response. If your sound is "tinny" or distorted at high ranges, then this will most likely enhance the quality of your audio. Warning 1: Do not attempt to set up the equalizer until you have followed the other parts of this guide and verified that PulseAudio works correctly using "unmodified" output. Warning 2: The equalizer may not work on 64 bit systems, as extra 32-bit libraries could be required. If it doesn't work, simply revert the changes you made.

1. Install the required LADSPA plugins and tools: Code: `$ sudo apt-get install swh-plugins ladspa-sdk`
  1. Edit `~/asoundrc`: Code: `$ gedit ~/asoundrc` Append the following text to the bottom of this file and save: Code: `pcm.equalized { type plug slave.pcm "equalizer"; } pcm.equalizer { type ladspa # The output from the EQ can either go direct to a`

hardware device # (if you have a hardware mixer, e.g. SBLive/Audigy) or it can go # to the software mixer shown here. slave.pcm "plughw" #slave.pcm "plug:dmix" # Sometimes you may need to specify the path to the plugins, # especially if you've just installed them. Once you've logged # out/restarted this shouldn't be necessary, but if you get errors # about being unable to find plugins, try uncommenting this. path "/usr/lib/ladspa" plugins [ { label mbeq

2. id 1197 input { #this setting is here by example, edit to your own taste #bands: 50hz, 100hz, 156hz, 220hz, 311hz, 440hz, 622hz, 880hz, # 1250hz, 1750hz, 25000hz, 50000hz, 10000hz, 20000hz #range: -70 to 30 controls [ -1 -1 -1 -1 -5 -10 -20 -17 -12 -7 -6 -5 -5 0 0 ] } } } Note 1: If you are on Intrepid, this file will not exist - that's ok. Simply paste into the new file and save normally. Note 2: If you have multiple sound cards, the section of this text marked in blue may need to be modified slightly. If you have problems, ask in the thread.

2. Edit /etc/pulse/default.pa: Code: \$ gksudo gedit /etc/pulse/default.pa Find the following line marked in blue: Code: ### Load audio drivers statically (it's probably better to not load ### these drivers manually, but instead use module-hal-detect -- ### see below -- for doing this automatically) #load-module module-alsa-sink #load-module module-alsa-source device=hw:1,0 #load-module module-oss device="/dev/dsp" sink\_name=output source\_name=input Change the line in blue to the following, and save: Code: load-module module-alsa-sink device=equalized Note: Be sure to also remove the comment (#) at the beginning of the line.

3. Log out & back in for changes to take effect! That's all folks! Howto: Alt Ctrl Del - Ultimate Edition Task Manager <http://forumubuntusoftware.info/viewtopic.php?f=7&t=2638> Damn I installed Ultimate Edition and the only complaint I had was no alt-ctrl-del for a task manager in Ultimate Edition. To bind your system monitor to pop up when you use ctrl+al+del use the following commands in xterm/gnome-terminal: remove the spaces between these "<" ">" gconftool-2 -t str --set /apps/metacity/global\_keybindings/run\_command\_9 "< Control >< Alt >Delete" gconftool-2 -t str --set /apps/metacity/keybinding\_commands/command\_9 "gnome-system-monitor" 58 Cool Hacks

<http://forumubuntusoftware.info/viewtopic.php?f=7&t=3155> One of the great things about Linux is that there's usually more than one way to do something. Chances are, the way you are doing a particular task right now isn't necessarily the best way either. This collection of hacks is the result of a lot of effort: some are functional, some are fun, but they are all cool! So, start reading, and find out what you could be doing with Linux... **DISCLAIMER:** Obviously, anything you do to your computer is your responsibility, and while we have made every effort to test these hacks, your mileage may vary. With most of them, it is highly unlikely that you can do any damage - but the expert tips carry a higher risk of something going wrong, especially if you don't follow the instructions carefully. Table of contents [showhide]

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### Fix a wonky terminal

\*

Difficulty: Easy

\*

Application: bash We've all done it - accidentally used less or cat to list a file, and ended up viewing binary instead. This usually involves all sorts of control codes that can easily screw up your terminal display. There will be beeping. There will be funny characters. There will be odd colour combinations. At the end of it, your font will be replaced with hieroglyphics and you don't know what to do. Well, bash is obviously still working, but you just can't read what's actually going on! Send the terminal an initialisation command: reset and all will be well again. [edit] Creating Mozilla keywords

\*

Difficulty: Easy

\*

Application: Firefox/Mozilla A useful feature in Konqueror is the ability to type gg onion to do a Google search based on the word onion. The same kind of functionality can be achieved in Mozilla by first clicking on Bookmarks>Manage Bookmarks and then Add a New Bookmark. Add the URL as: `http://www.google.com/search?q=%s` Now select the entry in the bookmark editor and click the Properties button. Now enter the keyword as gg (or this can be anything you choose) and the process is complete. The %s in the URL will be replaced with the text after the keyword. You can apply this hack to other kinds of sites that rely on you passing information on the URL. Alternatively, right-click on a search field and select the menu option "Add a Keyword for this Search...". The subsequent dialog will allow you to specify the keyword to use. [edit]

### Running multiple X sessions

\*

Difficulty: Easy

\*

Application: X If you share your Linux box with someone and you are sick of continually logging in and out, you may be relieved to know that this is not really needed. Assuming that your computer starts in graphical mode (runlevel 5), by simultaneously pressing the keys Control+Alt+F1 - you will get a login prompt. Insert your login and password and then execute: `startx -- :1` to get into your graphical environment. To go back to the previous user session, press Ctrl+Alt+F7, while to get yours back press Ctrl+Alt+F8. You can repeat this trick: the keys F1 to F6 identify six console sessions, while F7 to F12 identify six X sessions. Caveat: although this is true in most cases, different distributions can implement this feature in a different way. [edit]

### Faster browsing

\*

Difficulty: Easy

\*

Application: KDE In KDE 3.2, a little-known but useful option has been added to speed up your web browsing experience. Start the KDE Control Center and choose System > KDE performance from the sidebar. You can now select to preload Konqueror instances.

Effectively, this means that Konqueror is run

on startup, but kept hidden until you try to use it. When you do, it pops up almost instantaneously.

Bonus! [edit]

### Backup your website easily

\*

Difficulty: Easy

\*

Application: Backups If you want to back up a directory on a computer and only copy changed files to the backup computer instead of everything with each backup, you can use the rsync tool to do this. You will need an account on the remote computer that you are backing up from. Here is the command: `rsync -vare ssh`

`jono@192.168.0.2:/home/jono/importantfiles/* /home/jono/backup/` Here we are backing up all of the files in `/home/jono/importantfiles/` on 192.168.0.2 to `/home/jono/backup` on the current machine. [edit]

### Keeping your clock in time

\*

Difficulty: Easy

\*

Application: NTP If you find that the clock on your computer seems to wander off the time, you can make use of a special NTP tool to ensure that you are always synchronised with the kind of accuracy that only people that wear white coats get excited about. You will need to install the ntpdate tool that is often included in the NTP package, and then you can

synchronise with an NTP server: `ntpdate ntp.blueyonder.co.uk` A list of suitable NTP servers is available at [www.eecis.udel.edu/~mills/ntp/clock1b.html](http://www.eecis.udel.edu/~mills/ntp/clock1b.html). If you modify your boot process and scripts to include this command you can ensure that you are perfectly in time whenever you boot your computer. You could also run a cron job to update the time. [edit]

### Finding the biggest files

\*

Difficulty: Easy

\*

Application: Shell A common problem with computers is when you have a number of large files (such as audio/video clips) that you may want to get rid of. You can find the biggest files in the current directory with: `ls -lSrh` (the `r` causes the large files to be listed at the end, the `h` gives human readable output (MB and such)) You could also search for the biggest MP3/MPEGs: `ls -lSrh *.mp*` You can also look for the largest directories with: `du -kx | egrep -v "\././" | sort -n` [edit]

### Nautilus shortcuts

\*

Difficulty: Easy

\*

Application: Nautilus Although most file managers these days are designed to be used with the mouse, it's also useful to be able to use the keyboard sometimes. Nautilus has a few keyboard shortcuts that can have you flying through files:

\*

Open a location - `Ctrl+L`

\*

Open Parent folder - `Ctrl+Up`

\*

Arrow keys navigate around current folder. You can also customise the file icons with 'emblems'. These are little graphical overlays that can be applied to individual files or groups. Open the `Edit > Backgrounds and Emblems` menu item, and drag-and-drop the images you want. [edit]

### Defrag your database

\*

Difficulty: Easy

\*

Application: MySQL Whenever you change the structure of a MySQL database, or remove a lot of data from it, the files can become fragmented resulting in a loss of performance, particularly when running queries. Just remember any time you change the database to run the optimiser: `mysqlcheck -o <databasename>` You may also find it worth your while to defragment your database tables regularly if you are using VARCHAR fields: these variable-length columns are particularly prone to fragmentation. [edit]

### Quicker emails

\*

Difficulty: Easy

\*

Application: KMail Can't afford to waste three seconds locating your email client? Can't be bothered finding the mouse under all those gently rotting mountains of clutter on your desk? Whatever you are doing in KDE, you are only a few keypresses away from sending a mail. Press Alt+F2 to bring up the 'Run command' dialog. Type: `mailto:plop@ploppypants.com` Press return and KMail will automatically fire up, ready for your words of wisdom. You don't even need to fill in the entire email address. This also works for Internet addresses: try typing `www.slashdot.org` to launch Konqueror. [edit]

### Parallelise your build

\*

Difficulty: Easy

\*

Application: GCC If you're running a multiprocessor system (SMP) with a moderate amount of RAM, you can usually see significant benefits by performing a parallel make when building code. Compared to doing serial builds when running make (as is the default), a parallel build is a vast improvement. To tell make to allow more than one child at a time while building, use the `-j` switch: `make -j4`; `make -j4 modules` [edit]

### Save battery power

\*

Difficulty: Intermediate

\*

Application: hdparm You are probably familiar with using hdparm for tuning a hard drive, but it can also save battery life on your laptop, or make life quieter for you by spinning down drives. `hdparm -y /dev/hdb` `hdparm -Y /dev/hdb` `hdparm -S 36 /dev/hdb` In order, these commands will: cause the drive to switch to Standby mode, switch to Sleep mode, and finally set the Automatic spindown timeout. This last includes a numeric variable, whose units are blocks of 5 seconds (for example, a value of 12 would equal one minute). Incidentally, this habit of specifying spindown time in blocks of 5 seconds should really be a contender for a special user-friendliness award - there's probably some historical reason for it, but we're stumped. Write in and tell us if you happen to know where it came from! [edit]

### Wireless speed management

\*

Difficulty: Intermediate

\*

Application: iwconfig

The speed at which a piece of radio transmission/receiver equipment can communicate with another depends on how much signal is available. In order to maintain communications as the available signal fades, the radios need to transmit data at a slower rate. Normally, the radios attempt to work out the available signal on their own and automatically select the fastest possible speed. In fringe areas with a

barely adequate signal, packets may be needlessly lost while the radios continually renegotiate the link speed. If you can't add more antenna gain, or reposition your equipment to achieve a better enough signal, consider forcing your card to sync at a lower rate. This will mean fewer retries, and can be substantially faster than using a continually flip-flopping link. Each driver has its own method for setting the link speed. In Linux, set the link speed with iwconfig: iwconfig eth0 rate 2M This forces the radio to always sync at 2Mbps, even if other speeds are available. You can also set a particular speed as a ceiling, and allow the card to automatically scale to any slower speed, but go no faster. For example, you might use this on the example link above: iwconfig eth0 rate 5.5M auto Using the auto directive this way tells the driver to allow speeds up to 5.5Mbps, and to run slower if necessary, but will never try to sync at anything faster. To restore the card to full auto scaling, just specify auto by itself: iwconfig eth0 rate auto Cards can generally reach much further at 1Mbps than they can at 11Mbps. There is a difference of 12dB between the 1Mbps and 11Mbps ratings of the Orinoco card - that's four times the potential distance just by dropping the data rate! [edit]

Unclog open ports

\*

Difficulty: Intermediate

\*

Application: netstat Generating a list of network ports that are in the Listen state on a Linux server is simple with netstat: root@catlin:~# netstat -lnp Active Internet connections (only servers) Proto Recv-Q Send-Q Local Address Foreign Address State PID/Program name tcp 0 0 0.0.0.0:5280 0.0.0.0:\* LISTEN 698/perl tcp 0 0 0.0.0.0:80 0.0.0.0:\* LISTEN 217/httpd tcp 0 0 10.42.3.2:53 0.0.0.0:\* LISTEN 220/named tcp 0 0 10.42.4.6:53 0.0.0.0:\* LISTEN 220/named tcp 0 0 127.0.0.1:53 0.0.0.0:\* LISTEN 220/named tcp 0 0 0.0.0.0:22 0.0.0.0:\* LISTEN 200/sshd udp 0 0 0.0.0.0:32768 0.0.0.0:\* 220/named udp 0 0 10.42.3.2:53 0.0.0.0:\* 220/named udp 0 0 10.42.4.6:53 0.0.0.0:\* 220/named udp 0 0 127.0.0.1:53 0.0.0.0:\* 220/named udp 0 0 0.0.0.0:67 0.0.0.0:\* 222/dhcpd raw 0 0 0.0.0.0:1 0.0.0.0:\* 7 222/dhcpd That shows you that PID 698 is a Perl process that is bound to port 5280. If you're not root, the system won't disclose which programs are running on which ports. [edit]

Faster Hard drives

\*

Difficulty: Expert

\*

Application: hdparm You may know that the hdparm tool can be used to speed test your disk and change a few settings. It can also be used to optimise drive performance, and turn on some features that may not be enabled by default. Before we start though, be warned that changing drive options can cause data corruption, so back up all your important data first. Testing speed is done with:

hdparm -Tt /dev/hda You'll see something like: /dev/hda: Timing buffer-cache reads: 128 MB in 1.64 seconds =78.05 MB/sec Timing buffered disk reads: 64 MB in 18.56 seconds = 3.45MB/sec Now we can try speeding it up. To find out which options your drive is currently set to use, just pass hdparm the device name: hdparm /dev/hda /dev/hda: multcount = 16 (on) I/O support = 0 (default 16-bit)

unmaskirq = 0 (off) using\_dma = 0 (off) keepsettings = 0 (off) readonly = 0 (off) readahead = 8 (on) geometry = 40395/16/63, sectors = 40718160, start = 0 This is a fairly default setting. Most distros will opt for safe options that will work with most hardware. To get more speed, you may want to enable dma mode, and certainly adjust I/O support. Most modern computers support mode 3, which is a 32-bit transfer mode that can nearly double throughput. You might want to try `hdparm -c3 -d1/dev/hda` Then rerun the speed check to see the difference. Check out the modes your hardware will support, and the `hdparm` man pages for how to set them. [edit]

### Uptime on your hands

\*

Difficulty: Expert

\*

Application: Perl In computing, wasted resources are resources that could be better spent helping you. Why not run a process that updates the titlebar of your terminal with the current load average in real-time, regardless of what else you're running? Save this as a script called `tl`, and save it to your `~/bin` directory: `#!/usr/bin/perl -w use strict; $!++; my $host=`/bin/hostname`; chomp $host; while(1) { open(LOAD,"/proc/loadavg") || die "Couldn't open /proc/loadavg: $!\n"; my @load=split(/ /,<LOAD>); close(LOAD); print "\033]0;"; print "$host: $load[0] $load[1] $load[2] at ", scalar(localtime); print "\007"; sleep 2; }` When you'd like to have your titlebar replaced with the name, load average, and current time of the machine you're logged into, just run `tl&`. It will happily go on running in the background, even if you're running an interactive program like Vim. [edit]

### Grabbing a screenshot without X

\*

Difficulty: Easy

\*

Application: Shell There are plenty of screen-capture tools, but a lot of them are based on X. This leads to a problem when running an X application would interfere with the application you wanted to grab - perhaps a game or even a Linux installer. If you use the venerable ImageMagick `import` command though, you can grab from an X session via the console. Simply go to a virtual terminal (`Ctrl+Alt+F1` for example) and enter the following: `chvt 7; sleep 2; import -display :0.0 -window root sshot1.png; chvt 1;` The `chvt` command changes the virtual terminal, and the `sleep` command gives it a while to redraw the screen. The `import` command then captures the whole display and saves it to a file before the final `chvt` command sticks you back in the virtual terminal again. Make sure you type the whole command on one line. This can even work on Linux installers, many of which leave a console running in the background - just load up a floppy/CD with `import` and the few libraries it requires for a first-rate run-anywhere screen grabber. [edit]

### Access your programs remotely

\*

Difficulty: Easy

\*

Application: X If you would like to lie in bed with your Linux laptop and access your applications from your Windows machine, you can do this with SSH. You first need to enable the following setting in `/etc/ssh/sshd_config`: `X11Forwarding yes` We can now run The GIMP on 192.168.0.2 with: `ssh -X 192.168.0.2 gimp [edit]`

*Making man pages useful*

\*

Difficulty: Easy

\*

Application: man If you are looking for some help on a particular subject or command, man pages are a good place to start. You normally access a man page with `man <command>`, but you can also search the man page descriptions for a particular keyword. As an example, search for man pages that discuss logins: `man -k login` When you access a man page, you can also use the forward slash key to search for a particular word within the man page itself. Simply press `/` on your keyboard and then type in the search term. [edit]

*Talk to your doctor!*

\*

Difficulty: Easy

\*

Application: Emacs To say that Emacs is just a text editor is like saying that a Triumph is just a motorcycle, or the World Cup is just some four-yearly football event. True, but simplified juuuust a little bit. An example? Open the editor, press the Esc key followed by X and then enter in doctor: you will be engaged in a surreal conversation by an imaginary and underskilled psychotherapist. And if you want to waste your time in a better way Esc-X tetris will transform your 'editor' into the old favourite arcade game. Does the madness stop there? No! Check out your distro's package list to see what else they've bundled for Emacs: here at LXF Towers we've got chess, Perl integration, IRC chat, French translation, HTML conversion, a Java development environment, smart compilation, and even something called a "semantic bovinator". We really haven't the first clue what that last one does, but we dare you to try it out anyway! (Please read the disclaimer first!) [edit]

*Super cow powers*

\*

Difficulty: Easy

\*

Application: Debian A strange but endearing hidden feature within the highly regarded apt-get tool in Debian is its secret cow powers. Type the following command to experience the wrath of the super cow powers:

**apt-get moo**

Some people really have too much time on their hands... [edit]

Generating package relationship diagrams

\*

Difficulty: Easy

\*

Application: Debian The most critical part of the Debian system is the ability to install a package and have the dependencies satisfied automatically. If you would like a graphical representation of the relationships between these packages (this can be useful for seeing how the system fits together), you can use the Graphviz package from Debian non-free (apt-get install graphviz) and the following command: apt-cache dotty > debian.dot The command generated the graph file which can then be loaded into dotty: dotty debian.dot [edit]

Unmount busy drives

\*

Difficulty: Easy

\*

Application: bash You are probably all too familiar with the situation - you are trying to unmount a drive, but keep getting told by your system that it's busy. But what application is tying it up? A quick one-liner will tell you: lsof +D /mnt/windows This will return the command and process ID of any tasks currently accessing the /mnt/windows directory. You can then locate them, or use the kill command to finish them off. [edit] Text file conversion

\*

Difficulty: Easy

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Application: recode recode is a small utility that will save you loads of effort when using text files created on different platforms. The primary source of discontent is line breaks. In some systems, these are denoted with a line-feed character. In others, a carriage return is used. In still more systems, both are used. The end result is that if you are swapping text from one platform to another, you end up with too many or too few line breaks, and lots of strange characters besides. However, the command parameters of recode are a little arcane, so why not combine this hack with HACK 26 in this feature, and set up some useful aliases: alias dos2unix='recode dos/CR-LF..11' alias unix2win='recode 11..windows-1250' alias unix2dos='recode 11..dos/CR-LF' There are plenty more options for recode - it can actually convert between a whole range of character sets. Check out the man pages for more information. [edit]

\*

Difficulty: Easy

\*

Application: Various You are probably familiar with the problem. Sometime earlier in the day, you created a text file, which now is urgently required. However, you can't remember what ridiculous name you gave it, and being a typical geek, your home folder is full of 836 different files. How can you find it? Well, there are various ways, but this little tip shows you the power of pipes and joining together two powerful shell commands: ls -al --time-style=+%D | grep `date +%D` The parameters to the ls command here cause the

datestamp to be output in a particular format. The cunning bit is that the output is then passed to `grep`. The `grep` parameter is itself a command (executed because of the backticks), which substitutes the current date into the string to be matched. You could easily modify it to search specifically for other dates, times, filesizes or whatever. Combine it with HACK 26 to save typing! [edit]

### Listing today's files only

### Avoid common mistypes and long commands

\*

Difficulty: Easy

\*

Application: Shell The `alias` command is useful for setting up shortcuts for long commands, or even more clever things. From HACK 25, we could make a new command, `lsnew`, by doing this: `alias lsnew="ls -al --time-style=+%D | grep `date +%D` "` But there are other uses of `alias`. For example, common mistyping mistakes. How many times have you accidentally left out the space when changing to the parent directory? Worry no more! `alias cd..="cd .."` Alternatively, how about rewriting some existing commands? `alias ls="ls -al"` saves a few keypresses if, like us, you always want the complete list. To have these shortcuts enabled for every session, just add the `alias` commands to your user `.bashrc` file in your home directory. [edit]

### Alter Mozilla's secret settings

\*

Difficulty: Easy

\*

Application: Mozilla If you find that you would like to change how Mozilla works but the preferences offer nothing by way of clickable options that can help you, there is a special mode that you can enable in Mozilla so that you can change anything. To access it, type this into the address bar: `about:config` You can then change each setting that you are interested in by changing the `Value` field in the table. Other interesting modes include general information (`about:`), details about plugins (`about:plugins`), credits information (`about:credits`) and some general wisdom (`about:mozilla`). [edit]

### A backdrop of stars

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Difficulty: Easy

\*

Application: KStars You may already have played with KStars, as it was included with the astronomy software that featured in LXF50's Roundup; but how about creating a KStars backdrop image that's updated every time you start up? KStars can be run with the `--dump` switch, which dumps out an image from your startup settings, but doesn't load the GUI at all. You can create a script to run this and generate a desktop image, which will change every day (or you can just use this method to generate images). Run KStars like this: `kstars --dump`

```
--width 1024 --height 768 --filename = ~/kstarsback.png
```

You can add this to a script in your ~/.kde/Autostart folder to be run at startup. Find the file in Konqueror, drag it to the desktop and select 'Set as wallpaper' to use it as a randomly generated backdrop. [edit]

### Open an SVG directly

\*

Difficulty: Easy

\*

Application: Inkscape You can run Inkscape from a shell and immediately edit a graphic directly from a URL. Just type: `inkscape http://www.somehost.com/graphic.svg` Remember to save it as something else though! [edit]

### Editing without an editor

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Difficulty: Intermediate

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Application: Various Very long files are often hard to manipulate with a text editor. If you need to do it regularly, chances are you'll find it much faster to use some handy command-line tools instead, like in the following examples. To print columns eg 1 and 3 from a file file1 into file2, we can use awk: `awk '{print $1, $3}' file1 > file2` To output only characters from column 8 to column 15 of file1, we can use cut: `cut -c 8-15 file1 > file2` To replace the word word1 with the word word2 in the file file1, we can use the sed command: `sed "s/word1/word2/g" file1 > file2` This is often a quicker way to get results than even opening a text editor. [edit]

### Backup selected files only

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Difficulty: Intermediate

\*

Application: tar Want to use tar to backup only certain files in a directory? Then you'll want to use the -T flag as follows. First, create a file with the file you want to backup: `cat >> /etc/backup.conf # /etc/passwd # /etc/shadow # /etc/yp.conf # /etc/sysctl.conf EOF` Then run tar with the -T flag pointing to the file just created: `tar -cjf bck-etc-`date +%Y-%m-%d`.tar.bz2 -T /etc/backup.conf` Now you have your backup. [edit]

### Merging columns in files

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Difficulty: Intermediate

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Application: bash While splitting columns in files is easy enough, merging them can be complicated. Below is a simple shell script that does the job: `#!/bin/sh length=`wc -l $1 | awk '{print $1}'` count=1 [ -f $3 ] && echo "Optionally removing $3" && rm -i $3 while [`

```
"$count" -le "$length" ] ; do
a=`head -$count $1 | tail -1` b=`head -$count $2 | tail -1` echo "$a $b" >> $3 count=`expr $count + 1`
done
```

Give to this script the name `merge.sh` and make it executable with: `chmod u+x merge.sh` Now, if you want to merge the columns of `file1` and `file2` into `file3`, it's just matter of executing `/path/to/merge.sh file1 file2 file3` where `/path/to` has to be replaced with the location of `merge.sh` in your filesystem. [edit]

### Case sensitivity

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Difficulty: Intermediate

\*

Application: bash Despite the case of a word not making any difference to other operating systems, in Linux "Command" and "command" are different things. This can cause trouble when moving files from Windows to Linux. `tr` is a little shell utility that can be used to change the case of a bunch of files. `#!/bin/sh for i in `ls -1`; do file1=`echo $i | tr [A-Z] [a-z]` mv $i $file1 2>/dev/null done` By executing it, `FILE1` and `fiLe2` will be renamed respectively `file1` and `file2`. [edit]

### Macros in Emacs

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Difficulty: Intermediate

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Application: Emacs When editing files, you will often find that the tasks are tedious and repetitive, as LXF's Production Editor knows only too well! To spare your time, you can record a macro. In Emacs, you will have to go through the following steps:

1. Press `Ctrl+X` to start recording.
2. Insert all the keystrokes and commands that you want
3. Press `Ctrl+X` to stop when you're done. Now, you can execute that with `Ctrl -u <number> Ctrl -x e` where `<number>` is the number of times you want to execute the macro. If you enter a value of 0, the macro will be executed until the end of the file is reached. `Ctrl -x e` is equivalent to `Ctrl -u 1 Ctrl-x e`. [edit]

### Replacing same text in multiple files

\*

Difficulty: Intermediate

\*

Application: find/Perl If you have text you want to replace in multiple locations, there are several ways to do this. To replace the text `Windows` with `Linux` in all files in current directory called `test[something]` you can run this: `perl -i -pe 's/Windows/Linux/;' test*` To replace the text `Windows` with `Linux` in all text files in current directory and down you can run this: `find . -name '*.txt' -print | xargs perl -pi -e's/Windows/Linux/ig' *.txt` Or if you prefer this will also work, but only on regular files: `find -type f -name '*.txt' -print0 | xargs --null perl -pi -e 's/Windows/Linux/'`

Saves a lot of time and has a high guru rating! [edit]

Simple spam killing

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Difficulty: Intermediate

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Application: KMail Spam, or unsolicited bulk email, is such a widespread problem that almost everyone has some sort of spam protection now, out of necessity. Most ISPs include spam filtering, but it isn't set to be too aggressive, and most often simply labels the spam, but lets it through (ISPs don't want to be blamed for losing your mails). The result is that, while you may have anti-spam stuff set up on the client-side, you can make its job easier by writing a few filters to remove the spam that's already labelled as such. The label is included as a header. In KMail, you can just create a quick filter to bin your mail, or direct it to a junk folder. The exact header used will depend on the software your ISP is using, but it's usually something like X-Spam-Flag = YES for systems like SpamAssassin. Simply create a filter in KMail, choose Match Any of the Following and type in the header details and the action you require. Apply the filter to incoming mail, and you need never be troubled by about half the volume of your spam ever again. [edit]

Read OOo docs without OOo

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Difficulty: Intermediate

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Application: OpenOffice.org Have you ever been left with an OOo document, but no OpenOffice.org in which to read it? Thought you saved it out as plain text (.txt), but used the StarOffice .sxw format instead? The text can be rescued. Firstly, the sxw file is a zip archive, so unzip it: `unzip myfile.sxw` The file you want is called 'content.xml'. Unfortunately, it's so full of xml tags it's fairly illegible, so filter them out with some Perl magic: `cat content.xml | perl -p -e "s/<[^>]*>/ /g;s/\n/ /g;s/ +/ /;"` It may have lost lots of formatting, but at least it is now readable. [edit]

Find and execute

\*

Difficulty: Intermediate

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Application: find The find command is not only useful for finding files, but is also useful for processing the ones it finds too. Here is a quick example. Suppose we have a lot of tarballs, and we want to find them all: `find . -name '*.gz'` will locate all the gzip archives in the current path. But suppose we want to check they are valid archives? The `gunzip -vt` option will do this for us, but we can cunningly combine both operations, using xargs: `find . -name '*.gz' | xargs gunzip -vt` [edit]

Use the correct whois server

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Difficulty: Intermediate

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Application: whois The whois command is very useful for tracking down Internet miscreants and the ISPs that are supplying them with service. Unfortunately, there are many whois servers, and if you are querying against a domain name, you often have to use one which is specific to the TLD they are using. However, there are some whois proxies that will automatically forward your query on to the correct server. One of these is available at <http://whois.geektools.com> whois -h whois.geektools.com plop.info

[edit]

### Where did that drive mount?

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Difficulty: Intermediate

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Application: bash A common problem with people who have lots of mountable devices (USB drives, flash memory cards, USB key drives) is working out where that drive you just plugged in has ended up? Practically all devices that invoke a driver - such as usb-storage - will dump some useful information in the logs. Try `dmesg | grep SCSI` This will filter out recognised drive specs from the dmesg output. You'll probably turn up some text like: SCSI device sda: 125952 512-byte hdwr sectors (64 MB) So your device is at sda. [edit]

### Autorun USB devices

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Difficulty: Expert

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Application: hotplug scripts Want to run a specific application whenever a particular device is added? The USB hotplug daemon can help you! This service is notified when USB devices are added to the system. For devices that require kernel drivers, the hotplug daemon will call a script by the same name in `/etc/hotplug/usb/`, for example, a script called `usb-storage` exists there. You can simply add your own commands to the end of this script (or better still, tag a line at the end of it to execute a script elsewhere). Then you can play a sound, autosync files, search for pictures or whatever. For devices that don't rely on kernel drivers, a lookup table is used matching the USB product and manufacturer ID. Many distros already set this up to do something, but you can customise these scripts pretty easily. See <http://jphoto.sourceforge.net/?selected=sync> for an example of what can be done. [edit]

### Rename and resize images

\*

Difficulty: Expert

\*

Application: bash Fond of your new camera but can't put up with the terrible names? Do you want also to prepare them for publishing on the web? No problem, a simple bash script is

what you need: `#!/bin/sh counter=1 root=mypict resolution=400x300 for i in `ls -l $1/*.jpg`; do echo "Now working on $i" convert -resize $resolution $i ${root}_${counter}.jpg counter=`expr $counter + 1` done` Save the script in a file called `picturename.sh` and make it executable with `chmod u+x picturename.sh` and store it somewhere in your path. Now, if you have a bunch of `.jpg` files in the directory `/path/to/picdir`, all you have to do is to execute `picturename.sh /path/to/picdir` and in the current directory you'll find `mypict_1.jpg`, `mypict_2.jpg` etc, which are the resized versions of your original ones. You can change the script according to your needs. [edit]

### Secure logout

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Difficulty: Easy

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Application: bash When you are using a console on a shared machine, or indeed, just on your own desktop, you may find that when you logout, the screen still shows a trace of who was logged in and what you were doing. A lot of distros will clear the screen, but some don't. You can solve this by editing your `~/.bash_logout` file and adding the command: `clear` You can add any other useful commands here too. [edit]

### Transferring files without ftp or scp

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Difficulty: Easy

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Application: netcat Need to transfer a directory to another server but do not have FTP or SCP access? Well this little trick will help out using the netcat utility. On the destination server run: `nc -l -p 1234 | uncompress -c | tar xvpf -` And on the sending server run: `tar cfp - /some/dir | compress -c | nc -w 3 [destination] 1234` Now you can transfer directories without FTP and without needing root access. [edit]

### Backing up a Debian package list

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Difficulty: Easy

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Application: Debian If you are running Debian and have lost track of which packages you are running, it could be useful to get a backup of your currently installed packages. You can get a list by running: `dpkg --get-selections > debianlist.txt` This will put the entire list in `debianlist.txt`. You could then install the same packages on a different computer with: `dpkg --set-selections < debianlist.txt` You should bear in mind that you would also need to copy over configuration files from `/etc` when copying your system to a new computer. To actually install the selections, use: `apt-get -u dselect-upgrade`. [edit]

### Hardening ssh

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Difficulty: Easy

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Application: ssh Although SSH is a pretty secure way to connect to your server, there are two simple changes you can make that will boost its security even further. First, you almost certainly don't want people logging in directly as root - instead, they should logon as a normal user, then use the su command to switch over. You can change this simply in the /etc/ssh/ssh\_config file by adding the line: PermitRootLogin no Now the only way to get root privileges is through su, which means crackers now need to break two passwords to get full access. While you are editing that file, find the line which says: Protocol 2, 1 And change it to: Protocol 2 This removes the option to fallback on the original SSH protocol, now considered very vulnerable. [edit]

\*

Difficulty: Easy

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Application: sysctl While ping is a very useful command for discovering network topology, the disadvantage is that it does just that, and makes it easier for hackers on the network to target live servers. But you can tell Linux to ignore all pings - the server simply won't respond. There are a number of ways to achieve this, but the best is to use sysctl. To turn off ping replies: sysctl -w net.ipv4.icmp\_echo\_ignore\_all=1 To turn it back on, again use: sysctl -w net.ipv4.icmp\_echo\_ignore\_all=0 If turning off ping is too severe for you, take a look at the next hack. [edit]

*Stop replying to pings Slow down ping rates*

\*

Difficulty: Easy

\*

Application: sysctl You may want to keep the ability to reply to pings, but protect yourself from a form of attack known as a 'ping flood'. So how can you manage such a feat? The easiest way is to slow down the rate at which the server replies to pings. They are still valid, but won't overload the server: sysctl -w net.ipv4.icmp\_echo\_reply\_rate=10 This slows the rate at which replies are sent to a single address. [edit]

*Clean up KDE on logout*

\*

Difficulty: Easy

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Application: bash On Windows there are plenty of programs that do stuff like clean out your web cache, remove temporary files and all sorts of other stuff when you logout. Wouldn't it be cool to do this on Linux too? With KDE, you don't need to even install any new software, as the startkde script will automatically run scripts you put in special places. First, you need to create a directory called shutdown in your .kde directory: mkdir /home/username/.kde/shutdown Now create a script to do any stuff you like on shutdown. Here is an example: #!/bin/bash #clear up temp folder rm -rf ~/tmp/\* #clear out caches rm -rf ~/.ee/minis/\* rm -rf ~/.kde/share/cache/http/\* # delete konqueror form completions rm ~/.kde/share/apps/khtml/formcompletions Now make sure you set the correct permissions:

`chmod ug+x ~/.kde/shutdown/cleanup.sh` (or whatever you called it). As well as cleaning up sensitive files, you can also have global shutdown scripts for all users, by placing the script in your default KDE folder, in a subfolder called shutdown. To find out which is your default KDE directory, try: `kde-config --path exe [edit]`

Password-less ssh

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Difficulty: Intermediate

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Application: ssh Tired of typing your password every time you log into the server? ssh also supports keys, so you'll only have to type in your password when you log in to the desktop. Generate a keypair on your desktop machine:

`ssh-keygen -t dsa -C your.email@ddress` Enter a passphrase for your key. This puts the secret key in `~/.ssh/id_dsa` and the public key in `~/.ssh/id_dsa.pub`. Now see whether you have an ssh-agent running at present: `echo $SSH_AGENT_PID` Most window managers will run it automatically if it's installed. If not, start one up: `eval $(ssh-agent)` Now, tell the agent about your key: `ssh-add` and enter your passphrase. You'll need to do this each time you log in; if you're using X, try adding `SSH_ASKPASS=ssh-askpass ssh-add` to your `.xsession` file. (You may need to install `ssh-askpass`.) Now for each server you log into, create the directory `~/.ssh` and copy the file `~/.ssh/id_dsa.pub` into it as `~/.ssh/authorized_keys`. If you started the ssh-agent by hand, kill it with `ssh-agent -k` when you log out. [edit]

Using rsync over ssh

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Difficulty: Intermediate

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Application: Shell Keep large directory structures in sync quickly with rsync. While tar over SSH is ideal for making remote copies of parts of a filesystem, rsync is even better suited for keeping the filesystem in sync between two machines. To run an rsync over SSH, pass it the `-e` switch, like this: `rsync -ave ssh greendome:/home/ftp/pub/ /home/ftp/pub/` Note the trailing `/` on the file spec from the source side (on greendome.) On the source spec, a trailing `/` tells rsync to copy the contents of the directory, but not the directory itself. To include the directory as the top level of what's being copied, leave off the `/`: `rsync -ave ssh bcnu:/home/six .` This will keep a copy of the `~/six/` directory on village in sync with whatever is present on `bcnu:/home/six/`. By default, rsync will only copy files and directories, but not remove them from the destination copy when they are removed from the source. To keep the copies exact, include the `--delete` flag: `rsync -ave ssh --delete greendome:~one/reports .` Now when old reports are removed from `~one/reports/` on greendome, they're also removed from `~six/public_html/reports/` on the synced version, every time this command is run. If you run a command like this in cron, leave off the `v` switch. This will keep the output quiet (unless rsync has a problem running, in which case you'll receive an email with the error output). Using SSH as your transport for rsync traffic has the advantage of encrypting the data over the network and also takes advantage of any trust relationships

you already have established using SSH client keys. [edit]

### Asset scanning

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Difficulty: Intermediate

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Application: nmap Normally, when people think of using nmap, they assume it's used to conduct some sort of nefarious network reconnaissance in preparation for an attack. But as with all powerful tools, nmap can be made to wear a white hat, as it's useful for far more than breaking into networks. For example, simple TCP connect scans can be conducted without needing root privileges: nmap rigel nmap can also scan ranges of IP addresses by specifying the range or using CIDR notation: nmap 192.168.0.1-254 nmap 192.168.0.0/24 nmap can provide much more information if it is run as root. When run as root, it can use special packets to determine the operating system of the remote machine by using the -O flag.

Additionally,

you can do half-open TCP scanning by using the -sS flag. When doing a half-open scan, nmap will send a SYN packet to the remote host and wait to receive the ACK from it; if it receives an ACK, it knows that the port is open. This is different from a normal three-way TCP handshake, where the client will send a SYN packet and then send an ACK back to the server once it has received the initial server ACK. Attackers typically use this option to avoid having their scans logged on the remote machine. nmap -sS -O rigel Starting nmap V. 3.00 ( www.insecure.org/nmap/ ) Interesting ports on rigel.nnc (192.168.0.61): (The 1578 ports scanned but not shown below are in state: filtered) Port State Service 7/tcp open echo 9/tcp open discard 13/tcp open daytime 19/tcp open chargen 21/tcp open ftp 22/tcp open ssh 23/tcp open telnet 25/tcp open smtp 37/tcp open time 79/tcp open finger 111/tcp open sunrpc 512/tcp open exec 513/tcp open login 514/tcp open shell 587/tcp open submission 7100/tcp open font-service 32771/tcp open sometimes-rpc5 32772/tcp open sometimes-rpc7 32773/tcp open sometimes-rpc9 32774/tcp open sometimes-rpc11 32777/tcp open sometimes-rpc17 Remote operating system guess: Solaris 9 Beta through Release on SPARC Uptime 44.051 days (since Sat Nov 1 16:41:50 2003) Nmap run completed -- 1 IP address (1 host up) scanned in 166 seconds With OS detection enabled, nmap has confirmed that the OS is Solaris, but now you also know that it's probably Version 9 running on a SPARC processor. One powerful feature that can be used to help keep track of your network is nmap's XML output capabilities. This is activated by using the -oX command-line switch, like this: nmap -sS -O -oX scandata.xml rigel This is especially useful when scanning a range of IP addresses or your whole network, because you can put all the information gathered from the scan into a single XML file that can be parsed and inserted into a database. Here's what an XML entry for an open port looks like: <port protocol="tcp" portid="22"><state state="open" /> <service name="ssh" method="table" conf="3" /> </port> nmap is a powerful tool. By using its XML output capabilities, a little bit of scripting, and a database, you can create an even more powerful tool that can monitor your network for unauthorized services and machines. [edit]

### Backup your bootsector

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Difficulty Expert

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Application Shell Messing with bootloaders, dual-booting and various other scary processes can leave you with a messed up bootsector. Why not create a backup of it while you can: `dd if=/dev/hda of=bootsector.img bs=512 count=1` Obviously you should change the device to reflect your boot drive (it may be sda for SCSI). Also, be very careful not to get things the wrong way around - you can easily damage your drive! To restore use: `dd if=bootsector.img of=/dev/hda [edit]`

Protect log files

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Difficulty: Expert

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Application: Various During an intrusion, an attacker will more than likely leave telltale signs of his actions in various system logs: a valuable audit trail that should be protected. Without reliable logs, it can be very difficult to figure out how the attacker got in, or where the attack came from. This info is crucial in analysing the incident and then responding to it by contacting the appropriate parties involved. But, if the break-in is successful, what's to stop him from removing the traces of his misbehaviour? This is where file attributes come in to save the day (or at least make it a little better). Both Linux and the BSDs have the ability to assign extra attributes to files and directories. This is different from the standard Unix permissions scheme in that the attributes set on a file apply universally to all users of the system, and they affect file accesses at a much deeper level than file permissions or ACLs. In Linux, you can see and modify the attributes that are set for a given file by using the `lsattr` and `chattr` commands, respectively. At the time of this writing, file attributes in Linux are available only when using the `ext2` and `ext3` filesystems. There are also kernel patches available for attribute support in `XFS` and `ReiserFS`. One useful attribute for protecting log files is `append-only`. When this attribute is set, the file cannot be deleted, and writes are only allowed to append to the end of the file. To set the `append-only` flag under Linux, run this command: `chattr +a filename` See how the `+a` attribute works: create a file and set its `append-only` attribute: `touch /var/log/logfile echo "append-only not set" > /var/log/logfile chattr +a /var/log/logfile echo "append-only set" > /var/log/logfile bash: /var/log/logfile: Operation not permitted` The second write attempt failed, since it would overwrite the file. However, appending to the end of the file is still permitted: `echo "appending to file" >> /var/log/logfile cat /var/log/logfile append-only not set appending to file` Obviously, an intruder who has gained root privileges could realise that file attributes are being used and just remove the `append-only` flag from our logs by running `chattr -a`. To prevent this, we need to disable the ability to remove the `append-only` attribute. To accomplish this under Linux, use its capabilities mechanism. The Linux capabilities model divides up the privileges given to the all-powerful root account and allows you to selectively disable them. In order to prevent a user from removing the `append-only` attribute from a file, we need to remove the `CAP_LINUX_IMMUTABLE` capability. When present in the running system, this capability allows the `append-only` attribute to be modified. To modify the set of capabilities available to the system, we will use a simple utility called `lcap` (<http://packetstormsecurity.org/linux/ad...>

.3.tar.bz2). To unpack and compile the tool, run this command: `tar xvfj lcap-0.0.3.tar.bz2 && cd lcap-0.0.3 && make`

Then, to disallow modification of the append-only flag, run: `./lcap CAP_LINUX_IMMUTABLE`  
`./lcap CAP_SYS_RAWIO` The first command removes the ability to change the append-only flag, and the second removes the ability to do raw I/O. This is needed so that the protected files cannot be modified by accessing the block device they reside on. It also prevents access to `/dev/mem` and `/dev/kmem`, which would provide a loophole for an intruder to reinstate the `CAP_LINUX_IMMUTABLE` capability. To remove these capabilities at boot, add the previous two commands to your system startup scripts (eg `/etc/rc.local`). You should ensure that capabilities are removed late in the boot order, to prevent problems with other startup scripts. Once `lcap` has removed kernel capabilities, they can be reinstated only by rebooting the system. Before doing this, you should be aware that adding append-only flags to your log files will most likely cause log rotation scripts to fail. However, doing this will greatly enhance the security of your audit trail, which will prove invaluable in the event of an incident. [edit]

Automatically encrypted connections

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Difficulty: Expert

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Application: FreeS/WAN One particularly cool feature supported by FreeS/WAN is opportunistic encryption with other hosts running FreeS/WAN. This allows FreeS/WAN to transparently encrypt traffic between all hosts that also support opportunistic encryption. To do this, each host must have a public key generated to use with FreeS/WAN. This key can then be stored in a DNS TXT record for that host. When a host that is set up for opportunistic encryption wishes to initiate an encrypted connection with another host, it will look up the host's public key through DNS and use it to initiate the connection. To begin, you'll need to generate a key for each host that you want to use this feature with. You can do that by running the following command: `ipsec newhostkey --output /tmp/hostname`.key` Now you'll need to add the contents of the file that was created by that command to `/etc/ipsec.secrets`: `cat /tmp/hostname`.key >> /etc/ipsec.secrets` Next, you'll need to generate a TXT record to put into your DNS zone. You can do this by running a command similar to this one: `ipsec showhostkey --txt @colossus.nnc` Now add this record to your zone and reload it. You can verify that DNS is working correctly by running this command: `ipsec verify` Checking your system to see if IPsec got installed and started correctly Version check and ipsec on-path [OK] Checking for KLIPS support in kernel [OK] Checking for RSA private key (/etc/ipsec.secrets) [OK] Checking that pluto is running [OK] DNS checks. Looking for TXT in forward map: colossus [OK] Does the machine have at least one non-private address [OK] Now just restart FreeS/WAN - you should now be able to connect to any other host that supports opportunistic encryption. But what if other hosts want to connect to you? To allow this, you'll need to create a TXT record for your machine in your reverse DNS zone. You can generate the record by running a command similar to this: `ipsec showhostkey --txt 192.168.0.64` Add this record to the reverse zone for your subnet, and other machines will be able to initiate opportunistic encryption with your machine. With opportunistic encryption in

use, all traffic between the hosts will be automatically encrypted, protecting all services simultaneously. [edit]

### Eliminate suid binaries

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Difficulty: Intermediate

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Application: find If your server has more shell users than yourself, you should regularly audit the setuid and setgid binaries on your system. Chances are you'll be surprised at just how many you'll find. Here's one command for finding all of the files with a setuid or setgid bit set: `find / -perm +6000 -type f -exec ls -ld { } \; > setuid.txt` & This will create a file called `setuid.txt` that contains the details of all of the matching files present on your system. To remove the s bits of any tools that you don't use, type: `chmod a-s program` [edit]

### Mac filtering Host AP

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Difficulty: Expert

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Application: iwpriv While you can certainly perform MAC filtering at the link layer using iptables or ebtables, it is far safer to let Host AP do it for you. This not only blocks traffic that is destined for your network, but also prevents miscreants from even associating with your station. This helps to preclude the possibility that someone could still cause trouble for your other associated wireless clients, even if they don't have further network access. When using MAC filtering, most people make a list of wireless devices that they wish to allow, and then deny all others. This is done using the `iwpriv` command. `iwpriv wlan0 addmac 00:30:65:23:17:05 iwpriv wlan0 addmac 00:40:96:aa:99:fd ... iwpriv wlan0 maccmd 1 iwpriv wlan0 maccmd 4` The `addmac` directive adds a MAC address to the internal table. You can add as many MAC addresses as you like to the table by issuing more `addmac` commands. You then need to tell Host AP what to do with the table you've built. The `maccmd 1` command tells Host AP to use the table as an "allowed" list, and to deny all other MAC addresses from associating. Finally, the `maccmd 4` command boots off all associated clients, forcing them to reassociate. This happens automatically for clients listed in the table, but everyone else attempting to associate will be denied. Sometimes, you only need to ban a troublemaker or two, rather than set an explicit policy of permitted devices. If you need to ban a couple of specific MAC address but allow all others, try this: `iwpriv wlan0 addmac 00:30:65:fa:ca:de iwpriv wlan0 maccmd 2 iwpriv wlan0 kickmac 00:30:65:fa:ca:de` As before, you can use `addmac` as many times as you like. The `maccmd 2` command sets the policy to "deny," and `kickmac` boots the specified MAC immediately, if it happens to be associated. This is probably nicer than booting everybody and making them reassociate just to ban one troublemaker. Incidentally, if you'd like to remove MAC filtering altogether, try `maccmd 0`. If you make a mistake typing in a MAC address, you can use the `delmac` command just as you would `addmac`, and it (predictably) deletes the given MAC address from the table. Should you ever need to flush the current MAC table entirely but keep the current policy, use this command: `iwpriv wlan0 maccmd 3` Finally, you can view the running MAC table by using

/proc: cat /proc/net/hostap/wlan0/ap\_control The iwpriv program manipulates the running Host AP driver, but doesn't preserve settings across reboots. Once you are happy with the contents of your MAC filtering table, be sure to put the relevant commands in an rc script to run at boot time. Note that even unassociated clients can still listen to network traffic, so MAC filtering actually does

very little to prevent eavesdropping. To combat passive listening techniques, you will need to encrypt your data. [edit]

### Check processes not run by you

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Difficulty: Expert

\*

Application: bash Imagine the scene - you read our list of Linux Format Awards nominees this month, saw Crack Attack! on there, and took it upon yourself to give it a (very) thorough testing before casting your vote in its favour. Sadly, to your shock, the game drags to a halt just as you're about to beat your uppity subordinate - what could be happening to make your machine so slow? It must be some of those other users, stealing your precious CPU time with their scientific experiments, webservers or other weird, geeky things! OK, let's list all the processes on the box not being run by you! `ps aux | grep -v `whoami`` Or, to be a little more clever, why not just list the top ten time-wasters: `ps aux --sort=-%cpu | grep -m 11 -v `whoami`` It is probably best to run this as root, as this will filter out most of the vital background processes. Now that you have the information, you could just kill their processes, but much more dastardly is to run xeyes on their desktop. Repeatedly! Retrieved from "[http://www.linuxformat.co.uk/wiki/index.php/58\\_Cool\\_Hacks](http://www.linuxformat.co.uk/wiki/index.php/58_Cool_Hacks)"

HOWTO: Flash BIOS, The Ultimate Edition Way

<http://forumubuntu.org.uk/viewtopic.php?f=7&t=3080> The Quick Disclaimer: You will find I reiterate myself a number of times below. Some may consider it beating the proverbial dead horse. But, this is for good reason. BIOS flashing is destructive. Again, BIOS flashing is destructive. If you don't understand what this means, then please stop reading here. Many manufacturers now include native linux utilities to assist in a BIOS flash. If you fit in this category then it is recommended to use the method provided by them. If you are feeling daring, know exactly what you are doing, or just want to know a little more about this topic, then please continue reading. Update, 2009-03-02: This post details a variety of methods. Choose what works best for you. For example, a generic utility called Flashrom also exists (<http://www.coreboot.org/Flashrom>) -- this utility may or may not work for you -- DO YOUR HOMEWORK BEFORE ATTEMPTING A FLASH AS I WILL NOT BE HELD RESPONSIBLE WHEN THINGS GO AWRY. This post IS NOT a comprehensive tutorial that details every possible way to flash your BIOS -- it describes a few methods and links to others -- USE WHAT WORKS BEST FOR YOU (AND DO YOUR HOMEWORK!!)

Release Compatibility Ultimate Edition 9.04 Jaunty Jackalope Ultimate Edition 8.10 Intrepid Ibex Ultimate Edition 8.04 Hardy Heron Ultimate Edition 7.10 Gutsy Gibbon Ultimate Edition 7.04 Feisty Fawn Ultimate Edition 6.06.2 LTS Dapper Drake (Maintenance release) Ultimate Edition 6.06.1 LTS Dapper Drake (Maintenance release) End of Life (EOL) (HOWTO still applies) Ultimate Edition 6.10

Edgy Eft Ultimate Edition 5.10 Breezy Badger Ultimate Edition 5.04 Hoary Hedgehog Ultimate Edition 4.10 Warty Warthog As always, do your research before attempting a BIOS upgrade.

The bulk of this guide is an attempt at providing an easy solution to create either a floppy or CD using an Ultimate Edition system which will contain the open source OS FreeDOS as well as the required/necessary files from the BIOS/Hardware manufacturer in order to flash (upgrade) your Motherboard's BIOS. ( Sites currently suspended but should be up soon I hope ) Changes made to your BIOS are permanent in the sense that you are overwriting your previous BIOS with a new one. The procedure below will replace your current BIOS ROM (or Flash ROM) with a new version meant specifically for your BIOS by way of its make, model, and manufacturer -- you will need to grab the necessary files to complete the tutorial and you can find them respectively at your BIOS or Hardware manufacturers' web sites.

Flashing your BIOS is a potentially dangerous activity that can render your Motherboard (and computer for that matter) inoperable. Please proceed with caution and due diligence, and fully understand what you are doing before attempting the commands below! The only way to reverse the commands below, to revert back to your original setup, is to make a copy of your BIOS configuration and re-flash (if your BIOS supports that) or by reinstalling the original BIOS (or newer) to your Motherboard.

Again, proceed with CAUTION!!! If you don't know what you are doing or feel unsafe at this point, please ask someone with more experience to help you. If you want to take a look at an alternative way of doing this, when an ISO for flashing has already been created for you, but for some reason you need to modify the ISO file by adding other files into it, for example, then please take a look here: [Read-only issues with ISO files](#)

**WARNING:** Some motherboards have what are called "CMOS Jumpers" which in effect may prevent you from properly flashing your BIOS. If you believe you fall into this category, it is then necessary to read your BIOS flashing instructions from either your BIOS or hardware manufacturer for proper instructions on how to physically remove this jumper to allow for BIOS flashing. These instructions will be unique to each BIOS/hardware manufacturer. To get you started in finding out this information, here is a link to Google. You should modify this search query with your specific BIOS/hardware manufacturer's name to get unique hits/results.

### Setting up

In order to create the boot disk you will need a boot disk image. For this guide we will use a FreeDOS image. FreeDOS is open source, and a pre-made usable image can be found at <http://www.fdos.org>. There are several images to choose from, but for this guide we'll assume that you want to upgrade your BIOS, in which case you'll want nothing but the OS plus the new BIOS and flashing tool provided by the motherboard manufacturer on your floppy. In this case you should download the file named "FDOEM.144.gz". (Once downloaded you can keep it on your hard disk, and use it whenever you need a boot floppy.) Here's a link to what you need in case you can't find it: [FDOEM.144](#)  
Creating the disk (floppy-method) To create the disk you must first unpack the image file by changing

directories to where the image was downloaded and issuing the following: Code:

>

**gunzip FDOEM.144.gz**

Next insert the floppy you want to write to into the floppy drive. (Note that any data on it will be irreversibly erased.) Then run the following command: Code:

>>

**dd if=FDOEM.144 of=/dev/fd0**

If your floppy (for some odd reason) isn't /dev/fd0 then you need to replace that part with the correct path. Once the command has finished executing, you may then mount the floppy and copy the BIOS + flash-tool onto it. That's all there is to it. Reboot, flash, and enjoy your new BIOS. If you need more assistance in unzipping your .EXE file, then refer to the heading below titled Unzipping the .EXE located under the Creating the disk (CD-Method). Creating the disk (CD-method) WARNING: If you don't have a floppy-drive, and use this method to create a bootable CD for BIOS-flashing, please note that the BIOS-flash utility will not be able to save a backup of the old BIOS, since it won't have access to any writeable media. To create the disk you must first unpack the image file by changing directories to where the image was downloaded and issuing the following: Because the image will be modified when using this method, you may want to make a backup copy of it and store it in a safe place, ready to be reused when needed Code:

>>

**gunzip FDOEM.144.gz**

Next open up a root-console. I like to run a quick sudo -i command. Then, if you don't yet have a directory to mount items temporarily, create one: Code:

>>

**mkdir /mnt/temp**

If you compiled the loopback device support as a module you will then need to issue the following command (if it's compiled in-kernel you can skip it): Code:

>>

## **modprobe loop**

Next, it's time to mount the freedos-image:

Code:

>>

**mount -o loop -t vfat FDOEM.144 /mnt/temp**

After the image has been mounted, you need to then copy the flashing tool and the new BIOS file to /mnt/temp (or whichever working temp directory you choose to use). The code isn't listed, because the filenames vary depending on the motherboard manufacturer, model and BIOS in question. Just in case you can't figure out what to do, here's a quick primer on grabbing the necessary files from what is almost always in the form of an .EXE file

### Unzipping the .EXE

Okay. So you've downloaded an .EXE that contains your BIOS manufacturers flash program as well as the new BIOS ROM file. In addition, you'll probably find a Readme.txt file of some sort that will tell you exactly the syntax they want you to use to flash your BIOS. You can then unzip the .EXE file -- you can grab unzip by going to <http://packages.Ultimate Edition.com>, selecting your release, and then choosing the unzip application. If you want or need a much more robust set of archiving apps, then you can run the following in a terminal (universe and multiverse will need to be enabled. See Enabling Extra Repositories, written by aysiu, for information on how to enable extra repositories)

Code:

**sudo aptitude update && sudo aptitude install cabextract rar unace unrar p7zip arj unzoo lha libarchive1 libarchive-tar-perl libarchive-zip-perl dpkg-dev**

The unzipping process would look something like this:

**unzip ~/Desktop/hpbios.exe**

Various files have now been extracted to your Desktop View the Readme file with cat or less: cat Readme.txt or less Readme.txt

Copy the new flashing utility and the new BIOS ROM to /mnt/temp [1]

Move to the next step of unmounting the image

[1] which now should include your flash program and the new BIOS ROM file as well...in addition, there may be other files that you wish to copy over, such as an Autoexec.bat file to automate the process. If you don't want to enter any commands manually upon reboot, then copy over all files that

were extracted to your Desktop and make sure they are part of FDOEM.144 located under the /mnt/temp directory. You can check to make sure that all files were copied over successfully by changing directories into /mnt/temp and viewing the newly copied files from the "deflated" .EXE  
Next, unmount the image: Code:

>>

**umount /mnt/temp**

We are now ready to proceed with creating an ISO-image from the floppy-image. First we make sure that mkisofs is currently installed on our system: Code:

>>

**sudo aptitude update && sudo aptitude install mkisofs**

Then we create an ISO-image: Code:

>>

**mkisofs -o Bootable-CD-BIOS-Image.iso -b FDOEM.144 FDOEM.144**

The image is now created and can be burnt to disc.

Option 1 You can burn your new ISO straight from the command line (remember to put a blank CD into your drive before you issue the command). Code:

>>

**cdrecord -v Bootable-CD-BIOS-Image.iso**

Option 2 Burn the image with your favorite CD-burning software, then reboot from the CD, and then flash your BIOS with the commands provided by the BIOS manufacturer! Enjoy your new BIOS!

Send pictures and files by email in nautilus

<http://forumubuntu.com/viewtopic.php?f=7&t=3086>

<http://ubuntuforums.org/showthread.php?t=1131770> Runs on x64 looks good, trying now

<http://razerraz.free.fr/mailpictures-0.93.deb> You must log out/log on your session to have the nautilus menu entry

**BitDefender** A new free antivirus for Unix/Linux platform

<http://forumubuntu.com/viewtopic.php?f=7&t=3059> Today I'd like to introduce to you all a brand new antivirus for Unix/Linux platform from a famous company, BitDefender. A couple of days ago, BitDefender introduced a new antivirus for Unix/Linux OS called BitDefender Antivirus Scanner

for Unices. Just because you use Linux, it doesn't mean your computer doesn't have viruses or worms. They are just lying dormant, embedded in the EXE files on the NTFS partitions, or hiding beside those DLLs on the dual-boot computers, waiting for you to send them to your Windows-using friends. Unless you sadistically enjoy seeing your non-Linux peers suffer, you should act responsibly and get yourself an anti-virus scanner that runs on Linux. One such is the latest BitDefender Antivirus Scanner For Unices. If you agree to use it on your home computers only, you can have it for free - that's free as in freeware, not Richard Stallman free.

Virus is a catch-all phrase, and BitDefender's designed to catch them all - from executable viruses, script viruses, macro viruses, to backdoors, trojans, spyware, adware, diallers, and more. BitDefender looks inside files created by over 70 packers, compressors, and installers, from the most common ones such as Zip, 7-Zip, and .tar.gz to more exotic ones such as UPX, ASPack, PECrypt, etc. We found that it even picked up an infected file inside an archive split into multiple volumes. To avoid being caught out by Zip bombs, BitDefender has an adjustable compression depth.

Product Description BitDefender Antivirus Scanner for Unices is a versatile on-demand scanner built for Linux and FreeBSD systems. It provides antivirus and antispyware scanning for both UNIX-based and Windows-based partitions. BitDefender Antivirus Scanner for Unices is highly customizable and capable of script and extension-based integration with various applications such as file managers and mail clients. Licensing BitDefender Antivirus Scanner for Unices may be used free of charge at home or on your personal computer. In case you want to use BitDefender Antivirus for Unices for business purposes, a registration key must be purchased through the BitDefender Online Store or from BitDefender certified partners

### Features and Benefits

\*

On-demand antivirus and antispyware protection

\*

Script and extension-based integration with various applications and services:

- a. o Mail clients (e.g. Pine, Evolution) and Mail Server services
- b. o Scheduling services (e.g. Cron) ensuring scan and update automation

\*

Classic command line scanner complete with a graphical user interface for better integration with desktop environments

\*

Automatic addition of the scanner's GUI to the system menu

\*

Three popular file manager plugins (the GPL-ed sources) included in the GUI package: Konqueror (KDE), Nautilus (GNOME) and Thunar (Xfce)

\*

Action setting based on scan result type

System Requirements

Operating System: Linux, FreeBSD

Linux Kernel: 2.4.x or 2.6.x (recommended)

FreeBSD: 5.4 (or newer with compat5x)

glibc: version 2.3.1 or newer, and libstdc++5 from gcc 3.2.2 or newer

Processor: x86 compatible 300 MHz; i686 500MHz; amd64(x86\_64)

Minimum Memory: 64MB (128MB recommended)

Minimum Free Disk Space: 100MB

Supported Distributions:

- \* RedHat Enterprise Linux 3 or newer
- \* SuSE Linux Enterprise Server 9 or newer
- \* Fedora Core 1 or newer
- \* Debian GNU/Linux 3.1 or newer
- \* Slackware 9.x or newer
- \* Mandrake/Mandriva 9.1 or newer
- FreeBSD 5.4 or newer Terminal Command check / Update / Upgrade  
<http://forumubuntusoftware.info/viewtopic.php?f=7&t=3069>

What do we type into a terminal to check our repositories, make updates where needed and upgrade the packages What is the difference between updating and upgrading?

#### **sudo apt-get update && sudo apt-get upgrade**

*The difference, Update brings the list of packages up to date, Upgrade actually installs new versions of the packages.*

You need to update first before upgrading. So should I type: Code:

>>

#### **sudo apt-get upgrade && sudo apt-get update**

No, it's the other way around:

>>

#### **Code: sudo apt-get update && sudo apt-get upgrade**

##### *Creating a Trusted Local Repository*

<http://forumubuntusoftware.info/viewtopic.php?f=7&t=3079> Creating a Trusted Local Repository from which Software Updates can be installed. Abstract.

If you manage multiple PCs running Ultimate Edition, you will likely want to keep them all updated. Thus, you will want to install the Ultimate Edition updates to each of them as they become available, and you will have each PC individually download all of the updates from the Ultimate Edition repositories on the internet. This may, however, be impractical to you—particularly if, e.g., you are on

a rather slow internet connection, or if your monthly data transfer volume is severely limited, or if you simply prefer to save the bandwidth. If you would like to download the updates just once, and further distribute the downloaded files locally, you can set up a Local Repository. Basically, a "repository" is a directory that contains a set of software packages (i.e., ".deb" files, in the case of Debian-based distributions—such as Ultimate Edition), plus an index file that lists the packages that are available in the directory. Such a repository, however, is considered "untrusted": the software installer (i.e., the "APT" system—which includes the "apt-get" command, the "Synaptic Package Manager," the "Update Manager," etc.) will ignore any package that is present in the repository whenever another copy of the package is available in another, trusted, repository—i.e., most likely, on the internet. To create a trusted repository, you need to take a few extra steps, in addition to creating the index file:

\*

Create a "release" file, which is a small text file that contains, among other details, a checksum for the index file;

\*

Generate a digital signature for the release file, to prevent tampering by unauthorised individuals. Whenever the software installer attempts to use the trusted repository, it will verify if the digital signature for the release file is correct—i.e., if it corresponds to the current contents of the file. If the digital signature is correct, then the installer will trust the contents of the release file—which includes the checksum for the index file. If, subsequently, that checksum corresponds to the current contents of the index file, then the contents of that file can be trusted as well. Finally, the index file includes a checksum for each of the packages made available by the repository, so the packages themselves can be verified too.

Thus, before you can set up a trusted local repository, you will have to make sure that you can generate a digital signature for its release file. To that end, you will have to create a "GPG Key Pair" for yourself, and register it (or, more precisely, its public key part) as a trusted key for APT to use—so that APT can verify any digital signatures that are generated with this key pair (or, more precisely, with its private key part).

Step 1: Generating your GPG Key Pair. To generate a GPG key pair, start the following command:  
Code:

```
>>
```

```
gpg --gen-key
```

After some introductory text, the program will ask you which type of key you want to create: Code:  
Please select what kind of key you want:

- (1) DSA and Elgamal (default)
- (2) DSA (sign only)
- (5)

RSA (sign only)

Since you will be using your key only for generating digital signatures, you don't need option 1, "DSA and Elgamal," (although it will work fine), but you can get by with a "sign only" key—i.e., option 2, "DSA," or option 5, "RSA." Of these two, RSA is the more powerful, so I suggest you select that: Code:

Your selection? 5 If you opt for an RSA key, the program will next ask you what size you want for the key; for maximum security, you will most likely want the longest possible key—i.e., 4096 bits (however, longer keys will require more computing resources, so you may prefer a shorter key if your computer is not all too powerful):

Code: RSA keys may be between 1024 and 4096 bits long. What keysize do you want? (2048) 4096 Next, the program will ask you if you want to attach an expiration date to the key; if you don't, then the key will remain valid indefinitely:

Code: Please specify how long the key should be valid. 0 = key does not expire

<n> = key expires in n days <n>w = key expires in n weeks <n>m = key expires in n months <n>y = key expires in n years For a high-risk key (e.g., a key that you will use to digitally prove your identity), it may be critical to set an appropriate expiration date, but the type of key that you are currently generating doesn't really need an expiration date. The default option—i.e., a key that won't expire—is, therefore, perfectly acceptable. Alternatively, you may prefer the key to expire in, say, 5 years or so:

Code: Key is valid for? (0) 5y The program will show you the expiration date and time for the key, and ask you to confirm if that is what you want:

Code: Key expires at Thu 06 Mar 2014 21:12:03 CET Is this correct? (y/N) Y Now it's time to specify the "user id" for your new key:

Code: You need a user ID to identify your key; the software constructs the user ID from the Real Name, Comment and E-mail Address in this form: "Heinrich Heine (Der Dichter) <heinrichh@duesseldorf.de>" The program will ask you for the following three items:

\*

Real name For a key that you will use to prove your identity, you should specify your own real name here. In this case, however, you should really avoid using your own name. Technically, you can give the key any name that you like—even something totally unrelated to the function of the key, like "Bart Bogus" or "Teri Hatcher is the Greatest!" or even "Who the Hell is Teri Hatcher, anyway?" will do. Since you will be using the key to sign your local Ultimate Edition repository, you should probably name it

"Local Ultimate Edition Repository" or (if you want to mention the specific Ultimate Edition release for which you will be using the key) "Local Ultimate Edition Intrepid Ibex

Repository" or some such.

\*

E-mail address You needn't specify an e-mail address for this key.

\*

Comment You needn't specify a comment either. So, for example: Code: Real name: Local Ultimate Edition Intrepid Ibex Repository E-mail address: Comment: You selected this USER-ID: "Local Ultimate Edition Intrepid Ibex Repository" You will get a chance to modify the user id; if you're satisfied with what you entered, then select Okay to continue: Code: Change (N)ame, (C)omment, (E)-mail or (O)kay/(Q)uit? O

At this point, the program has all the data that it needs to generate your new key. The key will actually consist of two parts:

\*

A private (or secret) key—which (as the name suggests) you should keep secret, to prevent "digital identity theft." In this case, you don't really reveal your identity, but anyone who gains access to your secret key will be able to create falsely "trusted" software repositories that could be installed on any computer that knows about your key.

\*

A public key—which you are supposed to distribute to anyone who should be able to verify your identity. In this particular case, you will add this public key to the list of trusted keys on any computer on which you want to install the packages from your local repository. It should be obvious that the secret key should really be kept secret. Therefore, the program will ask you for a "passphrase" (or "password"), which will protect your secret key: Code: You need a Passphrase to protect your secret key. Enter passphrase: Select a sufficiently complex passphrase, but one that you can remember—if you ever forget it, then you will lose access to your secret key, and you will no longer be able to generate any digital signatures with it. You will have to repeat your passphrase: Code: Repeat passphrase: Finally, the program will begin to compute your new key pair: Code: We need to generate a lot of random bytes. It is a good idea to perform some other action (type on the keyboard, move the mouse, use the disks) during the prime generation; this gives the random number generator a better chance to gain enough entropy. You should really follow the advice that the program gives you, and keep your system busy. If you don't, then the program will complain that it cannot generate enough random bytes for your key— and it will make you wait until it can: Code: ...+++++ Not enough random bytes available. Please do some other work to give

the OS a chance to collect more entropy! (Need 182 more bytes) .....+++++ Once your new key pair is ready, the program will produce the following output: Code: gpg: /home/luvr/.gnupg/trustdb.gpg: trustdb created gpg: key xxxxxxxx marked as ultimately trusted public and secret key created and signed. gpg: checking the trustdb gpg: 3 marginal(s) needed, 1 complete(s) needed, PGP trust model gpg: depth: 0 valid: 1 signed: 0 trust: 0-, 0q, 0n, 0m, 0f, 1u gpg: next trustdb check due at 2014-03-06 pub 4096R/xxxxxxxx 2009-03-07 [expires: 2014-03-06] Key fingerprint = xxxx xxxx xxxx xxxx xxxx xxxx xxxx xxxx uid Local Ultimate Edition Intrepid Ibex Repository Note that this key cannot be used for encryption. You may want to use the command "--edit-key" to generate a subkey for this purpose. The bold, underlined and coloured text, xxxxxxxx, represents the "key id"—which you will have to specify when you export the (public) key, next. Note:

You can list your keys at any time, with the following command: Code: `gpg --list-keys` The output will include the key id, as shown below: Code: `/home/luvr/.gnupg/pubring.gpg`

```
pub 4096R/xxxxxxxx 2009-03-07 [expires: 2014-03-06] uid Local Ultimate Edition Intrepid Ibex
Repository Step 2: Exporting your newly generated Public Key. Now that your GPG key pair is ready,
you will have to export the public key to a text file, using the following command: Code: gpg --output
pubkey-export-file --armor --export xxxxxxxx You should, obviously, replace the pubkey-export-file
parameter string with an appropriate name for the output file. Furthermore, the xxxxxxxx parameter
represents the key id, as discussed above. Step 3: Importing your Public Key into the APT List of
Trusted Keys. Note: You will have to perform this step on every computer on which you want to
install software packages from your (yet to be created) local software repository. You can perform
this step at any time, and on as many computers as you deem appropriate. Make sure that you have
the pubkey-export-file (which you created in Step 2, above) available, and execute the following
command to import it into the list of keys that will be trusted by APT: Code:
```

>>

### **sudo apt-key add pubkey-export-file**

Note: To verify if the key was successfully imported into APT, you can run the following command: Code:

>>

### **sudo apt-key list**

Alternatively, you could start the "Software Sources" utility (from the "System" "Administration" menu) and display its "Authentication" tab page. Moreover, you can also start the "Software Sources" utility from within the "Synaptic Package Manager," through its "Settings" "Repositories" menu.

Step 4: Installing the Debian Package Development Tools.

Return to the computer on which you generated your key pair (i.e., where you ran steps 1 and 2 above). Execute the following command to install the Debian Package Development Tools: Code:

>>

### **sudo apt-get install dpkg-dev**

Once this package is installed, you will be able to create software package repositories on this system.

Step 5: Creating the Directory Structure for your Local Repository. You will be setting up a simple repository—i.e., one that consists of just one directory. Complex repositories, consisting of a deeper directory hierarchy, are out of the scope of this document. As an example, the following commands

will create a "LocalRepository" subdirectory under your personal home directory, Code:

```
cd mkdir LocalRepository cd LocalRepository
```

(The first "cd" command will set your current directory to your home location, after which the second command will create the "LocalRepository" subdirectory, and the third command will enter the newly created directory.) To kickstart your new local repository, you can load it with the software packages that you have recently installed. Whenever you install new software or updates through APT, the required packages will be loaded into the APT cache—i.e., the "/var/cache/apt/archives" directory on your system. You can now copy these packages to your local repository: Code:

```
>>
```

```
cp /var/cache/apt/archives/*.deb .
```

(Notice the lone dot (".") at the end of this command—it is required, and is a placeholder for the "current directory." The command effectively copies all Debian packages from the APT cache into your current directory—i.e., into your local repository.)

Note: If your APT cache does not contain any packages, then be sure to verify the "Temporary Files" setting in the "Synaptic Package Manager," as follows:

- \* Open "Synaptic Package Manager" ("System" "Administration" "Synaptic Package Manager");
- \* Display its "Preferences" dialogue ("Settings" "Preferences");
- \* Display the "Files" tab page;
- \* Under the "Temporary Files" header, ensure that either "Leave all downloaded packages in the cache" or "Only delete packages which are no longer available" is selected.

Step 6: Creating the Index File for your Local Repository. Once your local repository contains all the packages that you want to make available through it, you are ready to create the index file for the repository. To that end, run the following command: Code:

```
>>
```

```
dpkg-scanpackages . /dev/null > Packages
```

This will create a text file, "Packages," which is the plain-text, uncompressed version of the index file. You should also create a compressed version of the index file, using the following command: Code:

```
>>
```

## gzip -9c Packages > Packages.gz

This will create the compressed version, "Packages.gz," of the index file, without deleting the original, uncompressed file.

Step 7: Creating the Release File for your Local Repository. The release file is a small text file that should contain:

\*

A header. A detailed description of the format of this section is out of the scope of this document, but the following is a simple example of a perfectly valid header: Code: Archive: intrepid Origin: Ultimate Edition Label: Local Ultimate Edition Intrepid Repository Architecture: i386 MD5Sum:

\*

Two detail lines—one for the uncompressed "Packages" file, and one for the compressed "Packages.gz" file. The detail lines should be formatted as follows:

- a. o One blank space;
- b. o The MD5 checksum for the file, as calculated by the "md5sum" command;
- c. o One blank space;
- d. o The size, in bytes, of the file, right-aligned and padded to the left with blanks, in a 16-character field;
- e. o One blank space;
- f. o The name of the file. The following example shows two valid detail lines: Code:  
d8cd948e0371a338025d3d99f5f9f304 454617 Packages  
7e43f7e45a7f49dbb01e659c25997446 109619 Packages.gz Obviously, it would be an awfully error-prone process if you were to try and manually type in these lines. Hence, an automated process is highly desirable—and, fortunately, not too hard to develop. For example, you can construct the command to generate the detail line for the "Packages" file as follows:

\*

To calculate the MD5 checksum, run the "md5sum" command: Code: \$ md5sum Packages  
d8cd948e0371a338025d3d99f5f9f304 Packages

\*

You should keep only the checksum value, and drop the file name from the output of the "md5sum" command. To that end, pipe the output through the "cut" command, keeping only the first blank-delimited field: Code: \$ **md5sum Packages | cut --delimiter=' ' --fields=1 d8cd948e0371a338025d3d99f5f9f304**

\*

To obtain the size of the file, you can use the "wc" command with the "--bytes" option: Code: \$ **wc --bytes Packages 454617 Packages**

\*

Again, you need keep only the first blank-delimited field of the output: Code: \$ **wc --bytes Packages | cut --delimiter=' ' --fields=1 454617**

\*

To generate the properly formatted output line, you can use the "printf" command. The checksum can be inserted directly into the format string thanks to the "\$(...command...)" construct supported by the shell; for the file size, the format string can specify a 16-character decimal number field, and the value can be given as an argument to be substituted into the format string: Code: `$ printf '$(md5sum Packages | cut --delimiter=' ' --fields=1)' %16d Packages\n' \> $(wc --bytes Packages | cut --delimiter=' ' --fields=1)`  
**d8cd948e0371a338025d3d99f5f9f304 454617 Packages**

Based on the above description, the following is a command sequence to fully automate the creation of the release file. To generate the header, a so-called "here" document is used--i.e., the input text is copied directly into the command sequence, with a specified marker string (in this case, "EOF") used to mark the end of the document. Code:

```
cat > Release <<EOF
```

```
Archive: intrepid Origin: Ultimate Edition Label: Local Ultimate Edition Intrepid Repository
Architecture: i386 MD5Sum: EOF
```

```
printf '$(md5sum Packages | cut --delimiter=' ' --fields=1)' %16d Packages\n' \$(wc --bytes
Packages | cut --delimiter=' ' --fields=1) >> Release printf '$(md5sum Packages.gz | cut
--delimiter=' ' --fields=1)' %16d Packages.gz' \$(wc --bytes Packages.gz | cut --delimiter=' '
--fields=1) >> Release
```

Step 8: *Generating the Digital Signature for the Release File*. The digital signature for the release file should be written to a file named "Release.gpg," using the following command: Code:

```
>>
```

```
gpg --armor --detach-sign --output Release.gpg Release
```

With this step, your local repository is ready for use.

Step 9: *Adding your Local Repository as an APT Source*. Now that your local repository is fully set up, you can copy it to any computer on which you want to use it, and add it to its APT source configuration file, "/etc/apt/sources.list." You will need root privileges to edit the "/etc/apt/sources.list." file—therefore, if you want to start up your text editor (e.g., "gedit") from a terminal, you should run the command as follows: Code:

```
>>
```

```
sudo gedit /etc/apt/sources.list
```

Alternatively, you can start the text editor from the GNOME desktop environment by pressing <Alt>-<F2> to display the "Run Application" dialog, and typing the following command: Code:

>>

**gksudo gedit /etc/apt/sources.list**

At the top of the file, add a definition for the local repository, as follows: Code:

>>

**deb file:///home/luvr/LocalRepository /**

(Note that you should, of course, specify the correct path to your repository on the "file://" protocol.) Finally, you should let APT update its internal package index: Code:

>>

**sudo apt-get update**

(Alternatively, you can execute the "Reload" function in "Synaptic Package Manager.") Epilogue: Keeping your Local Repository Up-To-Date. From now on, whenever you perform any further software installations through APT, you should perform the following steps to keep your local repository updated:

\* Copy the downloaded packages from the APT cache to your local repository—e.g.: Code:

>>

**cd ~/LocalRepository cp /var/cache/apt/archives/\*.deb .**

*[How to Optimize your Internet Connection using MTU and RWIN](http://forumubuntu.com/showthread.php?p=7&t=3078)*

<http://forumubuntu.com/showthread.php?p=7&t=3078> TCP Maximum Transmission Unit (MTU)

The TCP Maximum Transmission Unit (MTU) is the maximum size of a single TCP packet that can pass through a TCP/IP network. An easy way to figure out what your MTU should be is to use ping where you specify the payload size: Code:

>>

**ping -s 1464 -c1 google.com**

Note though that the total IP packet size will be  $1464+28=1492$  bytes since there is 28 bytes of header info. Thus if the packet gets fragmented for payload above 1464, then you should set your MTU=1492. Ping will let you know when it becomes fragmented with something like the following:

Code:

>>

**john@TECH5321:~\$ ping -s 1464 -c1 google.com**

PING google.com (72.14.207.99) 1464(1492) bytes of data. 64 bytes from eh-in-f99.google.com (72.14.207.99): icmp\_seq=1 ttl=237 (truncated) --- google.com ping statistics --- 1 packets transmitted, 1 received, 0% packet loss, time 0ms rtt min/avg/max/mdev = 118.672/118.672/118.672/0.000 ms

**john@TECH5321:~\$ ping -s 1465 -c1 google.com**

PING google.com (64.233.167.99) 1465(1493) bytes of data. From adsl-75-18-118-221.dsl.sndg02.sbcglobal.net (75.18.118.221) icmp\_seq=1 Frag needed and DF set (mtu = 1492) --- google.com ping statistics --- 1 packets transmitted, 0 received, +1 errors, 100% packet loss, time 0ms In other words, to find your correct MTU, you would first start with a small packet size, and then gradually increase it until you see fragmentation; the cutoff point will be what to use for your MTU (using the formula payload + 28 = MTU). Note in the first case shown above where the payload size is 1464, the packet was transmitted fine, but in the second case where the payload size is 1465, ping complains "Frag needed"; to clarify, that means any packet with a payload of 1464 or less will be sent just fine, but a payload size of 1465 or above will end up being fragmented. Therefore, 1464 is the maximum payload, and that means the MTU is 1464+28=1492. To set the MTU temporarily (will be lost after a reboot), you can do: Code:

>>

**sudo ifconfig <interface> mtu 1492**

Note that unfortunately some NICs do not allow you to change their MTU. You can use "ifconfig" by itself to see what the MTU is for your NIC and whether the MTU changes when you use the above command. Or to make the change permanent, you can add it to /etc/network/interfaces: Code:

>>

**gksudo gedit /etc/network/interfaces**

And then add "mtu <value>" in it for the particular interface. Here's an example of mine that uses my wireless interface wlan0: Code:

**iface wlan0 inet static**

address 192.168.1.23 netmask 255.255.255.0 gateway 192.168.1.1 wireless-essid John's Home WLAN mtu 1492 TCP Receive Window (RWIN)

In computer networking, RWIN (TCP Receive Window) is the maximum amount of data that a computer will accept before acknowledging the sender. In practical terms, that means when you download say a 20 MB file, the remote server does not just send you the 20 MB continuously after you request it. When your computer sends the request for the file, your computer tells the remote server what your RWIN value is; the remote server then starts streaming data at you until it reaches your RWIN value, and then the server waits until your computer acknowledges that you received that data OK. Once your computer sends the acknowledgement, then the server continues to send more data in chunks of your RWIN value, each time waiting for your acknowledgment before proceeding to send more.

Now the crux of the problem here is with what is called latency, or the amount of time that it takes to send and receive packets from the remote server. Note that latency will depend not only on how fast the connection is between you and the remote server, but it also includes all additional delays, such as the time that it takes for the server to process your request and respond. You can easily find out the latency between you and the remote server with the ping command. When you use ping, the time that ping reports is the round-trip time (RTT), or latency, between you and the remote server. When I ping google.com, I typically get a latency of 100 msec. Now if there were no concept of RWIN, and thus my computer had to acknowledge every single packet sent between me and google, then transfer speed between me and them would be simply the (packet size)/RTT. Thus for a maximum sized packet (my MTU as we learned above), my transfer speed would be: Code:  $1492 \text{ bytes} / .1 \text{ sec} = 14,920 \text{ B/sec}$  or  $14.57 \text{ KiB/sec}$  That is pathetically slow considering that my connection is 3 Mb/sec, which is the same as 366 KiB/sec; so I would be using only about 4% of my available bandwidth. Therefore, we use the concept of RWIN so that a remote server can stream data to me without having to acknowledge every single packet and slow everything down to a crawl. Note that the TCP receive window (RWIN) is independent of the MTU setting. RWIN is determined by the BDP (Bandwidth Delay Product) for your internet connection, and BDP can be calculated as: Code:  $\text{BDP} = \text{max bandwidth of your internet connection (Bytes/second)} * \text{RTT (seconds)}$  Therefore RWIN does not depend on the TCP packet size, and TCP packet size is of course limited by the MTU (Maximum Transmission Unit). Before we change RWIN, use the following command to get the kernel variables related to RWIN: Code: `sysctl -a 2> /dev/null | grep -iE "_mem |_rmem|_wmem"` Note the space after the `_mem` is deliberate, don't remove it or add other spaces elsewhere between the quotes. You should get the following three variables: Code: `net.ipv4.tcp_rmem = 4096 87380 2584576`  
`net.ipv4.tcp_wmem = 4096 16384 2584576` `net.ipv4.tcp_mem = 258576 258576 258576` The variable numbers are in bytes, and they represent the minimum, default, and maximum values for each of those variables. Code: `net.ipv4.tcp_rmem = Receive window memory vector` `net.ipv4.tcp_wmem = Send window memory vector` `net.ipv4.tcp_mem = TCP stack memory vector` Note that there is no exact equivalent variable in Linux that corresponds to RWIN, the closest is the `net.ipv4.tcp_rmem` variable. The variables above control the actual memory usage (not just the TCP window size) and include memory used by the socket data structures as well as memory wasted by short packets in large buffers. The maximum values have to be larger than the BDP (Bandwidth Delay Product) of the path by some suitable overhead. To try and optimize RWIN, first use ping to send the maximum size packet your connection allows (MTU) to some distant server. Since my MTU is 1492, the ping command payload would be  $1492 - 28 = 1464$ . Thus: Code:

&gt;&gt;

**john@TECH5321:~\$ ping -s 1464 -c5 google.com**

PING google.com (64.233.167.99) 1464(1492) bytes of data. 64 bytes from py-in-f99.google.com (64.233.167.99): icmp\_seq=1 ttl=237 (truncated) 64 bytes from py-in-f99.google.com (64.233.167.99): icmp\_seq=2 ttl=237 (truncated) 64 bytes from py-in-f99.google.com (64.233.167.99): icmp\_seq=3 ttl=237 (truncated) 64 bytes from py-in-f99.google.com (64.233.167.99): icmp\_seq=4 ttl=237 (truncated) 64 bytes from py-in-f99.google.com (64.233.167.99): icmp\_seq=5 ttl=237 (truncated) --- google.com ping statistics --- 5 packets transmitted, 5 received, 0% packet loss, time 3999ms rtt min/avg/max/mdev = 101.411/102.699/105.723/1.637 ms Note though that you should run the above test several times at different times during the day, and also try pinging other destinations. You'll see RTT might vary quite a bit. But for the above example, the RTT average is about 103 msec. Now since the maximum speed of my internet connection is 3 Mbits/sec, then the BDP is: Code:  $(3,000,000 \text{ bits/sec}) * (.103 \text{ sec}) * (1 \text{ byte}/8 \text{ bits}) = 38,625 \text{ bytes}$  Thus I should set the default value in net.ipv4.tcp\_rmem to about 39,000. For my internet connection, I've seen RTT as bad as 500 msec, which would lead to a BDP of 187,000 bytes. Therefore, I could set the max value in net.ipv4.tcp\_rmem to about 187,000. The values in net.ipv4.tcp\_wmem should be the same as net.ipv4.tcp\_rmem since both sending and receiving use the same internet connection. And since net.ipv4.tcp\_mem is the maximum total memory buffer for TCP transactions, it is usually set to the the max value used in net.ipv4.tcp\_rmem and net.ipv4.tcp\_wmem. And lastly, there are two more kernel TCP variables related to RWIN that you should set: Code: `sysctl -a 2> /dev/null | grep -iE "rcvbufsave"` which returns: Code: net.ipv4.tcp\_no\_metrics\_save = 1 net.ipv4.tcp\_moderate\_rcvbuf = 1 Note enabling net.ipv4.tcp\_no\_metrics\_save (setting it to 1) means have Linux optimize the TCP receive window dynamically between the values in net.ipv4.tcp\_rmem and net.ipv4.tcp\_wmem. And enabling net.ipv4.tcp\_moderate\_rcvbuf removes an odd behavior in the 2.6 kernels, whereby the kernel stores the slow start threshold for a client between TCP sessions. This can cause undesired results, as a single period of congestion can affect many subsequent connections. Before you change any of the above variables, try going to <http://www.speedtest.net> or a similar website and check the speed of your connection. Then temporarily change the variables by using the following command with your own computed values: Code: `sudo sysctl -w net.ipv4.tcp_rmem="4096 39000 187000" net.ipv4.tcp_wmem="4096 39000 187000" net.ipv4.tcp_mem="187000 187000 187000" net.ipv4.tcp_no_metrics_save=1 net.ipv4.tcp_moderate_rcvbuf=1` Then retest your connection and see if your speed improved at all. Once you tweak the values to your liking, you can make them permanent by adding them to /etc/sysctl.conf as follows: Code: `net.ipv4.tcp_rmem=4096 39000 187000 net.ipv4.tcp_wmem=4096 39000 187000 net.ipv4.tcp_mem=187000 187000 187000 net.ipv4.tcp_no_metrics_save=1 net.ipv4.tcp_moderate_rcvbuf=1` And then do the following command to make the changes permanent: Code: `sudo sysctl -p` If everything went well, now you can enjoy a faster internet connection!

&gt;&gt;

## Simple guide to Sound Solutions for Hardy,Intrepid and Jaunty

<http://forumubuntu.org.uk/viewtopic.php?f=7&t=3068>

If you have just upgraded to or installed Hardy or Intrepid or Jaunty and you have some sound somewhere, but not everywhere for everything, this is a fast way to get all the missing stuff you need and give you some tools to figure out what is going on. If you hear the startup sound but nothing else, or if some applications work and others don't, this is for you. If you have no sound at all, there is a link at the end of this post for more extensive troubleshooting help but you should try this first anyway as it may solve your problem and will not make matters worse. Make sure that your system is fully updated.

Credit goes to markbuntu forum article <http://ubuntuforums.org/showthread.php?t=997506> Required Packages

First you need to get some missing packages with Synaptic. These packages were not installed by default but are important for getting your sound working properly:

[asoundconf-gtk](#)

This is a little Default Sound Card application for choosing the default sound card for alsa.

[gnome-alsamixer](#)

This is a gui mixer, far easier to use than the command line alsamixer.

[alsa-oss](#)

This is the wrapper for oss applications so they will use alsa instead of grabbing the sound card all for themselves libasound2 libasound2-plugins These are the plugins for alsa

[padevchooser](#)

This is the Pulse Audio device chooser and will pull in the pavucontrol which is the Pulse Audio Volume Control and papref which is the Pulse Audio Preferences along with the Pulse Audio

[Volume Meters](#). [gstreamer0.10-pulseaudio](#) This is the gstreamer plugin for pulseaudio

[Ultimate Edition-restricted-extras](#)

This is the package with all the restricted codecs and java and flashplayer so you can watch youtube and play your mp3s,etc.. If you have other applications like mplayer, vlc, amarok, or audacious be sure to get any extra packages available for them also. Single command to install

```
sudo apt-get install asoundconf-gtk alsa-oss libasound2 libasound2-plugins padevchooser  
gstreamer0.10-pulseaudio Ultimate Edition-restricted-extras
```

>>

### Setting things up

Once you have all these packages installed, close any application that may be trying to use sound and go to System/Preferences/Sound and set all the preferences from automatic to PulseAudio except Default Mixer Tracks which you should set to your sound card. Go to System/Preferences/Default Sound Card and choose pulseaudio. Next, right click on the little speaker on the top panel, that is the Panel Volume Control. Click Open Volume Control and make sure it is set to the same thing as the Default Mixer Tracks. Click on Preferences and make sure that Master and PCM and whatever else you want to control are selected. Make sure that any boxes labeled SPDIF or IEC958 are not checked. Close the Preferences box. Push up the sliders in the volume control and make sure the little speakers do not have little red mute marks on them. Go to Applications/Sound and Video/GNOME ALSA Mixer and see if there is anything you missed because sometimes, for some cards, not all the options are in the Panel Volume Control.

Go to Applications/Sound and Video and select Pulse Audio Device Chooser. This will put a little icon on the panel near the Panel Volume Control. Click on the new icon and choose Volume Control. This will open the Pulse Audio Volume Control. Go to Output Devices and see if your sound card is there, it will be listed as ALSA PCM on front:...(ALC8 via DMA or whatever your sound card is. If you have a usb device it will be listed as ALSA PCM on front:...(USB Audio) via DMA or something like that. Make sure the sliders are up and the device is not muted. If any of the above is giving you problems, try rebooting.

Now, open Rythmbox and play something. If you have nothing handy just play one of the radio stations, you should hear something. In the Pulse Audio Volume Control/Playback you should see something like this Rythmbox: Playback Stream and some Volume sliders that you can adjust. more than one device. If you have more than one device listed in Output Devices, Rythmbox may be playing in the wrong one if you do not hear anything so right click on the stream and choose move stream and move it to another device. If you have more than one device and you want to use them all, like a usb headset and your speakers, go back to the Pulse Audio Device chooser on the panel and select Configure Local Sound Server/Simultaneous Output and click the box: "Add virtual output device for simultaneous output on all local sound cards" Now you can right click on the stream and move it to your new device. You should have sound from all your sound devices now or at least a clue about how it is supposed to work.

>>

## Other stuff

Another thing you may need to do, Check in System/Administration/Users and Groups that your users and root are enabled as members of the following groups: pulse pulse-access pulse-rt This seems to be a particular problem for some people after getting recent updates. If you still have problems look in to the following references (They are very good) <http://ubuntuforums.org/showthread.php?t=843012>  
<http://ubuntuforums.org/showthread.php?p=5931543> 50 amazing Ultimate Edition time-saving tips  
<http://forumubuntusoftware.info/viewtopic.php?f=7&t=2692>

### A Small post

#### System performance

1. Shorten the boot menu timeout If you're fed up of waiting for the boot menu to timeout before your favourite operating system launches, open '/boot/grub/menu.lst' with a text editor and look for the line starting with 'timeout'. Just lower the number to its the right. This is the number of seconds the menu system will wait before booting the default operating system (0 or 1 is not recommended).
2. Monitor boot performance

One of the best utilities you can install for checking your system's performance is called 'bootchart'. After installation and a reboot, 'bootchart' will create a complex graph of everything that's running and taking up resources as your system boots, and place an image of the graph in the /var/log/bootgraph folder.

3. Improve boot speed When the boot menu appears (you might have to press escape) select the default Ultimate Edition boot option

and press 'e'. Cursor down to the line starting with 'kernel' and press 'e' again. You're now editing the boot parameters, and you need to press space and add the word 'profile'. Press return followed by 'b' to boot. Disk access during your boot sequence will now be profiled, which means that subsequent booting should be faster.

1. Trim unwanted services The default Ultimate Edition installation takes an over cautious approach to background services. Bluetooth tools may be running, for example, even if you don't have the hardware. Disable the services you don't need by opening the Services window from the System>Administration menu. Be careful not to disable services you rely on.
2. Monitor CPU usage You might think that CPU monitors are purely for geeks trying to steal a few extra cycles from their overclocked processors. But this isn't true. A discreet CPU monitor is the best way detecting a wayward process that's slowing down the rest of the system. Right click on the desktop panel, and select 'System Monitor' for our favourite. There's a similar applet for KDE.

3. Manage your processes If you do detect a process on your system that's stealing more CPU cycles than it really should, then you need to end that process to get those cycles back. Save all your work, and use the Ultimate Edition process manager. This is part of the System Monitor tool, and this can be opened from the System>Administration menu.
  1. Be nice to one another If you use the System Monitor to manage your running tasks, you might have noticed the 'nice' column. 'nice' is basically a task's priority, and ranges between -20 to 19. If you have a CPU heavy task running, such as a 3D calculation for example, increasing the nice will lower its priority, and make your system feel more responsive.
  2. The default Gnome desktop
4. Enable Gnome Auto login A lot of us are the sole users of our computers, and it makes little sense navigating through a login screen before getting to our desktops. You can enable auto-login for a default account on your Ultimate Edition machine by selecting 'Login Window' from the System> Administration window. Switch to the 'Security' page, enable 'Automatic Login' and select the user.
  1. Remove the menu popup delay HCI gurus insist that there should be a delay between when you click on a menu and when it appears, but if it's speed you're after, you can remove the delay. Open a terminal, and type 'nano ~/.gtkrc-2.0', then add a single line 'gtk-menu-popup-delay = 0'. Save this by pressing escape and typing 'Y', and after a restart you should find your menus are ultra quick.
  2. Add More Workspaces Workspaces are one of the best things about Linux. They're a great way of organising your applications onto different virtual screens. By default, Ultimate Edition sets up only two, but you can adjust this number by right clicking on the workspace switcher in the bottom right corner of the display and opening the Preferences window.
  3. Use Workspaces more effectively Use 'Ctrl alt' and either cursor left or right to switch between adjacent workspaces, and if you hold down the shift key, the active window will move to the new desktop too. For better control, right click on any windows top border to open a context menu, and from here you can choose to move the window to another workspace.
  4. Don't start everything As with system services, the average Ultimate Edition installation runs lots of different programs at startup. You can remove those you don't need by launching the Sessions window from the Preferences menu. If you don't use the desktop search, for instance, disable 'Tracker'. Other likely candidates for removal include Bluetooth, the Evolution Alarm Notifier and the Print Queue Applet.
  5. Remember the running session Another neat feature of the setting manager is that you can configure your desktop to remember the applications that were running when you shutdown your machine. This is a great way of quickly launching into your working environment. Just switch to the Session Options page and enable the 'Automatically Remember' option.
  6. Fine tune the Gnome desktop Application shortcuts are hidden behind the Gnome equivalent of the Windows registry editor. This can be launched from the command-line by typing 'gconf-editor'. But be careful, settings changed here could mess up your desktop. If you do, then the desktop can be restored to its default state by deleting the '.gconf' and '.gconfd' folders from your home directory.
  7. Launching applications with a key combination One of the settings hidden in Gconf is the ability to launch applications with a key combination. Navigate to

'apps>metacity>key\_binding\_commands', double click on one of the 'command\_' entries and enter the launch command for the application you want to run. To set the key, double click on the same entry in 'apps>metacity> global\_keybindings' and press a key. Holding 'Ctrl Shift alt' and that key will now launch the application.

8. Use pervasive searches Ultimate Edition comes with an excellent utilities for searching through the contents of files and emails, but it's not enabled by default. Open the Search and Indexing window from the Preferences menu, and enable both indexing and watching. After the index has been created, you can search through your files using the 'Tracker Search Tool' in the 'Applications>Accessories' menu.
9. Switch To A Faster Desktop Ultimate Edition uses the Gnome desktop by default. It's a good choice because Gnome is powerful, capable and popular. But it's not streamlined or particularly efficient. A faster alternative is XFCE, the source of Xubuntu, and this can be installed through the Synaptic package manager by searching for the 'xubuntu-desktop' meta-package.
1. KDE auto-login If you prefer Kubuntu or the KDE desktop, then you'll need to use a different configuration panel to enable auto-login. Open KDE's System Settings application, and switch to the Advanced page and open the Login Manager. Enter your root password and switch to the convenience page. From here you can choose to enable a user for auto login.
2. Pre-load Konqueror If you're always launching KDE's file and web browser, you can pre-load several instances of it to speed up launch time. Open the Settings>Configure Konqueror window, and switch to the Performance page. Increase the number of instances from 1 to something like 4 or 5. Each instance takes extra system memory, but each session of Konqueror will now load almost instantly.
3. Use Konqueror shortcuts Konqueror is a great file and web browser with plenty of shortcuts for the power user. Our favourite is the ability to use shortcuts in the location field to perform online searches. Typing 'wp:linux' will search Wikipedia for Linux, while 'gg:linux' and 'ggi:linux' will search Google and Google Images. System-wide
4. Launch OpenOffice.org faster The default OpenOffice.org configuration errs on the side of caution. There are 100 levels of undo, for example, and reducing this number will reduce the amount of memory it uses. This setting can be found from the Options window by switching to the Memory page. Try reducing the undo steps to 30.
5. Use the quick launch toolbar In both Gnome and KDE, you can drag applications from the launch menu onto the desktop and onto the toolbar. Clicking on these icons is the quickest way of launching your most used applications, short of holding down a certain key combination.
6. Replace slow applications One of the best things about open source is that there's always an alternative, and switching to one can vastly improve your system's performance. Try Abiword instead of OpenOffice.org's Writer, Thunar instead of Nautilus and Opera instead of Firefox. All are broadly compatible with their alternatives, and perform faster.
7. Rapid application launch If you know the name of the application or tool you want to launch, you can quickly start it by pressing Alt and F2. This displays a single command-line prompt in a window, and into this you type your application name. Type 'firefox' and its icon will appear. Pressing enter will launch it.

8. Take a screenshot Pressing the Print key will take a screenshot and bring up the save file window. Being able to take a screenshot at any moment is incredibly useful, and is great for saving online order details, for example, or just your high score in Crack Attack. Pressing Alt and Print will take a screenshot of the currently active window.
9. Quickly restart the desktop Occasionally, you may find that your desktop hangs and you can no longer use the keyboard or mouse. Fortunately, the desktop process is entirely independent of the rest of the operating system, and you can reset the desktop by holding down the Ctrl Alt and backspace keys. But you will still lose any unsaved data, so be careful.
10. Jump to a console Another option if your desktop has crashed is jumping to a command-line console. Pressing Ctrl and alt, followed by F1-F6 will switch the display to one of six different consoles. From here, you can login and try to kill the process causing trouble, before switching back to your desktop by pressing Ctrl Alt and F7.

1. Tweak your Nvidia settings After installing the proprietary driver, Nvidia graphics hardware provides exceptional 3D and 2D acceleration for the Linux desktop. You can fine-tune your Nvidia hardware by installing an application called 'nvidia-settings', from which you can edit your monitor settings, enable twin displays and add a drop shadow to the cursor.
2. Track down large unused files Large and scattered files can start to slow your desktop down, as well as any applications that rely on reading the contents of a directory. The best tool we've found for consolidating and deleting unused files is called Filelight. It uses a pie chart to show where the largest files are located, and you can easily delete directories of junk from the right click menu.
3. Enable vertical sync in Compiz Compiz, the 3D whizzy desktop effects application, can be either a resource hog or even an acceleration tool. It depends on the power of your graphics hardware. But we've nearly always had better more responsive results on the desktop by enabling the vertical sync option in the general option page of the Compiz settings manager.
4. Don't Compiz On the other hand, the wonderful effects that Compiz produces can't really be described as functional, although they do provide some improved usability for some. You can free up plenty of resources by disabling the desktop effects from the Visual Effects page of the Preferences>Appearance window.
5. Get packages off a CD or DVD Even in these times of pervasive internet, you sometimes need to be able to install a package without having an internet connection. Fortunately, the Synaptic package manager can read the contents of an Ultimate Edition installation CD, and add those packages to the database for installation from the drive. Open the Software Sources window from the Administration menu, switch to the 'Third Party' page and click on the 'Add CD-ROM' button.
6. Boost load speed with Preload Preload is a tool you can install through the Synaptic package manager. It will run silently in the background, from where it will try to guess which libraries you're likely to use before you use them. It will then load these into memory so that your applications load quicker. The effects seem to be minimal with recent releases of Ultimate Edition, but it's worth a try.
7. Use a virtual desktop If you enjoy trying different distributions, but have always been put off by the installation, try Virtual Box from the official Ultimate Edition repositories. It's easy to

use and lets you install a virtual version of almost any Linux installation (and even Windows) right on your desktop, and running at close to native speeds.

1. *Boot into text mode* Sometimes, a graphical environment is unnecessary, especially if you use your machine as a server. Which is exactly why there's a version of Ultimate Edition called the Server edition. By default, Server has no graphical desktop. But in all other ways, it's the same Ultimate Edition. This makes it perfect as
  2. a web or media streaming server.
8. *Suspend your system* Why wait for your system to boot when you can resume your session from hibernation. This is quicker than booting, and you can continue where you left off. But it's also dependent on your hardware behaving itself. Just give it a go to see if your hardware supports the feature. Click on the logout button, and if hibernate appears as an option, it should work.
1. *Try it, it's really not that bad* The command-line really is your friend. After opening Terminal from the Applications>Accessories menu (or Konsole in KDE), you can accomplish many common tasks much more effectively than from any desktop GUI. To copy folder, for example, type 'cp -rf source destination', rename a file with 'mv' and edit a text file using a command called 'nano'.
  1. *Easy command shortcuts* You can press the tab key while using the command-line to automatically complete command names as well as system paths. You can also cursor up through your command history, and use 'Ctrl
    2. • r' to search for a command starting with the characters you begin to type.
  2. *Replace heavy GUI applications with command-line equivalents* There are command-line versions of most desktop applications. You could install and use 'pine' for your email and news, for instance. Or try 'lynx' for web browsing and 'wget' or 'ncftp' for downloading files. 'mc', short for Midnight Commander, is a feature-full file manager, and all of these tools will run on hardly any memory with hardly any CPU requirements.
  3. *Create an ISO image from a CD or a DVD* You can create an ISO image from optical media, and most attached devices, by using a single command on the terminal. Type 'dd if=/dev/cdrom of=disk.iso bs=1024' to make a raw copy of the data and drop it into the disk.iso file. You may need to unmount the drive first, by typing 'sudo umount /dev/cdrom'.
  4. *Read an ISO disc image without burning it* If you've downloaded an ISO disc image, and you want to access the files on it without wasting an optical disk, you can create a virtual drive from the image with a single command. Open the terminal from the Accessories menu. Type 'sudo mkdir /mnt/image', followed by 'sudo mount -o loop disk.iso /mnt/image'. You can now browse the disc by pointing a file browser at the '/mnt/image' folder.
  5. *Use the 'screen' command* After you've got used to the command-line, one of the best commands to learn is called 'screen'. It's the command equivalent to virtual desktops, and it lets you run several sessions at once, as well as suspend and resume a session. Type 'screen' to start, then press 'Ctrl a' followed by 'c' to create a new session. 'Ctrl a' and 'n' or 'p' will switch through the active sessions. 'Ctrl a' and 'd' will detach from the session, while typing 'screen -r' will resume one.
  6. *Access your Ultimate Edition machine from anywhere* The best thing about the command-line is that you can use it to access your machine securely from anywhere on the internet. The key to this is something called 'SSH' - the secure shell. Install 'openssh-server' through Synaptic

and use a tool called 'putty' on a Windows machine, or 'ssh' on Linux, to access the command-line through your user accounts on your Ultimate Edition box.

1. Transfer files between computers files quickly and securely With the open SSH server installed and running, you can quickly and securely transfer files to and
2. from the remote computer using the 'sftp' command. It works just like FTP, and accepts both 'put' and 'get' for file transfers. If you prefer a GUI, we recommend using Filezilla on Windows, or 'sftp://' as a protocol in KDE.
7. Avoid typing 'sudo' You might have noticed that for almost every important configuration command you type, you need to precede it with 'sudo' and your password. This can be a real pain if you're typing one sudo command after the other. Avoid this hassle by typing 'sudo bash', this transparently replaces the current shell with a new one, complete with administrator privileges.
8. Create a root account If you find yourself spending more and more time requiring system administration privileges, you may as well enable the root account. Just type 'sudo passwd root', and enter your password followed by a new one for the root account. You can now type 'su root' to login as root, but you should only use this mode for essential system maintenance.

Speed up web surfing in Ultimate Edition 8.10 (Intrepid) Should work for all though <http://forumubuntusoftware.info/viewtopic.php?f=7&t=2394> Everyone wants to have a faster web browsing experience! In this short How-To I'm going to cover an easy way of doing this using the recently released Ultimate Edition 8.10 Intrepid distribution. My recommendation in this article is to install a proxy server on your local computer. This stores local copies (caching) of web sites on your computers hard drive. When you surf to a site it checks the cache first and if it finds the page or image there, it loads directly from the local hard drive copy. This is much faster than downloading again from the Internet, especially if you don't have a fast connection speed and it has the added benefit of reducing downloads from the Internet.

To install and use this in Ultimate Edition 8.10 is incredibly simple. Go to the System menu, select Administration and then Synaptic Package Manager. Click on search and type in squid. In the main part of the window, you'll need to go about two-thirds of the way down the page until you find squid. Right-click on it and select Mark for Installation. Click Apply. This will then install squid and any dependencies it has (squid-common from memory). As this is a relatively tiny application this really only takes a few seconds.

When this is done, go to Firefox and click on Edit, Preferences, Advanced, Network, Settings. Click on Manual proxy configuration, and type into the box marked "Http proxy" the word localhost. In the port number, type in 3128. You can also tick the "Use this proxy for all protocols box". If web pages don't load after following the instructions, try the following trouble-shooting tips and tricks.

Firstly, as squid installs itself as a service that loads on start-up, we are going to check if the service is actually running. The easiest way to do this is...(queue the dramatic music!)...using the Command Line Interface. Go to Applications, Accessories, Terminal. Type in the following: `sudo service squid status`, and hit Enter and then your password. If you get a message that the service is running, then it should be working through Firefox. Reboot your computer and try Firefox again.

If however, it says the service is stopped, then type in the same command (or hit the up arrow on your keyboard) and replace "status" with "start" or "restart" and then Enter. It should only take a few seconds to get it going again. If you try the "status" command again, it should tell you that the service is running.

The second trouble-shooting tip is to disable IPv6 on your computer. This is also incredibly easy. In

the Command Line Interface terminal, type in the following: `sudo gedit /etc/modprobe.d/aliases`, followed by your password. This opens up a simple text editor, which is very similar to Windows Notepad.

Change the line: "alias net-pf-10 ipv6" to "alias net-pf-10 off" (so, simply delete the "ipv6" and replace with "off"). This disables IPv6. Save the file, close the editor window and the terminal, reboot and try again.

If you still can't get it going (and I'd be really surprised), then let me know here and I'll do what I can to help you!

Note that these instructions only work for 8.10. If you are using a previous version then they are a bit different. You have to edit the `/etc/squid/squid.conf` file to uncomment and create the `visible_hostname` field and then run `sudo squid -z` to create the directories. So, there you have it. A simple way to help speed up your web browsing and lower your downloads.

>>

### **KDE tips and tricks**

<http://forumubuntusoftware.info/viewtopic.php?f=7&t=2571> The K Desktop Environment (KDE) is incredibly popular in the world of GNU/Linux. Distributions such as SUSE and Mandrakelinux use it by default. KDE has some useful features that, while easily accessible, are less prominent. Just as a camera inexplicably makes a cell phone more fun to use, KDE's cool but unnoticed details may make it more attractive to prospective users. Read on to learn about a few such features may help you every day.

The K Desktop Environment (KDE) is incredibly popular in the world of GNU/Linux. Distributions such as SUSE and Mandrakelinux use it by default. KDE has some useful features that, while easily accessible, are less prominent. Just as a camera inexplicably makes a cell phone more fun to use, KDE's cool but unnoticed details may make it more attractive to prospective users. Read on to learn about a few such features may help you every day.

KWin is KDE's window manager, which means it organizes the placement of applications into windows so that you may easily use many of them simultaneously.

# To shade a window, right-click on its border and click Shade in the resulting menu. After you do, the window will roll up whenever you aren't using it. When you want to see it again, moving your cursor over its border will restore it.

# To keep a window on top, right-click on its border, select the Advanced sub-menu, and click Keep Above Others. This will keep the window visible as you work in the windows below it.

# To resize a window to the full-screen, right-click on its border, select the Advanced sub-menu, and click Fullscreen. To return the window to its previous size, press Alt-Space and disable the Fullscreen option.

# To hide a window's border, right-click on its border, select the Advanced sub-menu, and click No Border. To restore the window's border, press Alt-Space and disable the option. Removing the border will save you a few pixels of valuable screen space.

### Creating and using hot keys

Hot keys are keyboard shortcuts to commands. They allow you easy access to any action without fumbling through menus, by simply pressing a short sequence of keys. The KDE Control Center (KControl) allows you to create hot keys you can use with any application.

Let's assign one of the actions in the previous section to a hot key. Open KControl (use the console command `kcontrol` or find it in the K Menu), expand the Regional and Accessibility branch, and select Keyboard Shortcuts. You will be presented with dozens of actions to assign hot keys to. Scroll down to (or search for) the Shade action and select it. In the Shortcut for Selected Action frame, select the Custom button and enter a key sequence -- for instance, `Ctrl-Alt-S` -- then click the Apply button. Press the sequence to try shading KControl.

Next, let's assign a keyboard shortcut to a command using the Desktop Communications Protocol (DCOP). Still in KControl under the Regional and Accessibility branch, select the KHotKeys module. From here you can assign keyboard shortcuts and mouse gestures to commands that the Keyboard Shortcuts module does not provide.

For the purposes of this example we will set a key to pause the Kaffeine media player. Press the New Action button to begin, and set the Action type to Keyboard Shortcut -> DCOP Call (simple). Select the Keyboard Shortcut tab, then click the lone button to follow the familiar steps of assigning a key sequence. Now select the DCOP Call Settings tab and type `kaffeine` for Remote Application. Set the Remote object to `KaffeineIface` and the Called function to `pause`, then click Apply. Your keyboard shortcut will now toggle a running Kaffeine player between pause and play. You can do something similar for other applications; you can generally find instructions in each application's documentation.

Most applications designed for integration with KDE have a Configure Shortcuts dialog accessible through their Settings menu that will let you create hot keys that work specifically for that application, and only when its window is selected.

### Using Konqueror's advanced features

Konqueror is KDE's file manager and Web browser. You can turn on its sidebar by going to the 'Window' menu and selecting Show Navigation Panel. The Navigation Panel will appear as a sidebar to Konqueror, with tabs to switch between tools. You can use it to Quick Browse your filesystem (Folder utility), mount CDs (Services utility), or even play music (Sidebar Media Player utility). To have more than one panel open at once, right-click on one of the tabs, select the Configure Navigation Panel sub-menu, and then the Multiple Views option. You can also add new tabs from this menu. Also, clicking Show Terminal Emulator in the Window menu will open an integrated Konsole.

Konqueror supplies many different ways to view your files. Along with the standard Icon, Tree, and Detailed List views is the excellent File Size view, which displays files and folders as graphical sections of your Konqueror page. Larger files are represented by larger blocks, allowing you to visualize your file system. You can configure how this information is presented to you in the bottom section of the View menu. In Konqueror's Window menu are options to Split View horizontally and vertically. Splitting a window's view lets you see two pages at once, which can be useful for filling in forms at one Web page with information from another, or easily dragging and dropping files from one folder to another. If you've created a combination of Konqueror options that suits you, you can save it for future use. Go to the Settings menu and click Save View Profile, enter a name for it, and click Save. To load it again later, go back to the Settings menu, the Load View Profile submenu, and click on the name you saved.

KIO slaves are a much-touted, and oft under-appreciated, aspect of KDE. KIO slaves allow you to access a number of APIs as if they were Internet protocols in Konqueror. In the same way that you would attach `http://` to a Web site's URL, you can access your configured devices by going to `devices://` in Konqueror. You can find a list of the KIO slaves on your system in the Protocols section of KInfoCenter. A few you might appreciate are `locate://`, `man://`, `settings://`, and `print://`. The `audiocd:/` KIO slave is especially well implemented. Visiting it with an audio CD in a drive presents you with a list of the files on the CD, any of which can be double-clicked to play. There will also be MP3 and Ogg Vorbis folders that you can simply copy to your hard drive to rip the CD to either format.

### GTK

One of the most unfortunate side effects of choice is incompatibility. You may have noticed that applications meant for KDE (which are written using Trolltech's Qt toolset) look different from those meant for GNOME (which uses the GIMP Toolkit (GTK+)). If you want a more consistent look, you can turn to the GTK-Qt project, which creates a KControl module for simple configuration. Installing and enabling (through KControl) GTK-Qt forces GTK+ applications to call Qt to render their widgets, effectively making GNOME software look like KDE software. I hope these tips may help those of you who are partial to KDE squeeze more use out of your desktop experience.

GUI CPU Speed Selector <http://forumubuntusoftware.info/viewtopic.php?f=7&t=2639> So, recently I saw an article about using the "cpufreq-selector" utility to set the CPU scaling speed of my Core 2

Duo. As a person who likes simplicity, I decided it might be useful to have a graphical interface for Ultimate Edition users who prefer to avoid the command prompt. Here's what I came up with. First, Ultimate Edition installs Zenity by default. Zenity is a utility which allows you to integrated graphical elements into shell scripts. Using Zenity, one could create a selection dialogue which allows the user to choose the SpeedStep frequency for their CPU. Here's how:

1. Open a new instance of gedit (Applications->Accessories->Text Editor).
2. Enter the following code: Code: 

```
#!/bin/bash CURRENT=`cat /proc/cpuinfo | grep "^cpu MHz.*" | awk -F": " '{print $2}' | sed 's@\.@@g' | uniq` if [ "${CURRENT}" == "1000000" ] ; then SETA='TRUE'; SETB='FALSE'; SETC='FALSE'; fi if [ "${CURRENT}" == "1333000" ] ; then SETA='FALSE'; SETB='TRUE'; SETC='FALSE'; fi if [ "${CURRENT}" == "1667000" ] ; then SETA='FALSE'; SETB='FALSE'; SETC='TRUE'; fi ans=$(zenity --list --text "Select CPU Speed" --radiolist --column "" --column "Speed" ${SETA} "1.0 GHz" ${SETB} "1.33 GHz" ${SETC} "1.67 GHz") ; VALUE=1000000 if [ "${ans}" == "1.0 GHz" ] ; then VALUE=100000; fi if [ "${ans}" == "1.33 GHz" ] ; then VALUE=1333000; fi if [ "${ans}" == "1.67 GHz" ] ; then VALUE=1667000 ; fi gksu "cpufreq-selector -f ${VALUE}"
```

3. Save the new file as "cpuScaler" and give the file execute permissions.
4. Review your CPU seppings for you particular computer. My computer has 3 settings of 1, 1.3, and 1.66 GHz. Yours may differ, but you should easily be able to figure it our using cpufreq-selector and looking at the contents of /proc/cpuinfo.
5. Modify the seppings to suit your computer.

**BleachBit.....**

<http://forumubuntu.com/viewtopic.php?f=7&t=2654>

BleachBit deletes unnecessary files to free valuable disk space, maintain privacy, and remove junk. Rid your system of old clutter including cache, temporary files, cookies, and broken shortcuts. Designed for Linux systems, it wipes clean Bash, Beagle, Epiphany, Firefox, Flash, Java, KDE, OpenOffice.org, Opera, RealPlayer, rpmbuild, VIM, XChat, and more. Install BleachBit in Ultimate Edition use the following command

**wget http://downloads.sourceforge.net/bleach ... ntu810.deb**

Now you have bleachbit\_0.2.0-1\_all\_ubuntu810.deb package. Install this .deb package using the following command

**sudo dpkg -i bleachbit\_0.2.0-1\_all\_ubuntu810.deb**

You must check for updates once installed to make sure you have the latest version Use with caution

>>

**Get Internet via your Bluetooth-connected mobile phone**

<http://forumubuntusoftware.info/viewtopic.php?f=7&t=2234>

I've knocked up a guide to using your mobile phone as a modem device connected to your PC via Bluetooth. Once again, this is a menagerie of various guides already out there, but merged into one coherent mass with modifications to suit newbies. Purpose: To access the Internet on your Ultimate Edition Linux laptop via your mobile phone's data service, and do it via Bluetooth. Scenario: You're on the move, you need access to the Internet. You can't make use of an unsecured access point because you're travelling on a train/bus/car/segway/pony. What to do? Solution: You reach into your pocket. Your mobile phone has data services on it. Your phone and laptop also have Bluetooth. Your mind slowly does the math: Mobile + Bluetooth + Laptop = Mobile Internet Access. Why not use that? NOTE: FOR ALL Ultimate Edition INTREPID USERS - There is an even simpler solution for you using Intrepid's new Mobile Broadband feature. The current solution utilises the cabled USB connection to your phone rather than Bluetooth, but it's quick, simple and it works like a charm. Prerequisites:

\*

A mobile phone with Bluetooth enabled. In this tutorial, I'm using my Nokia N95.

\*

Data enabled on your plan. In my case I'm using the Vodafone \$79 plan that includes data at a rate of \$0.90 per 5 minutes regardless of what is downloaded. This comes off the included monthly call allowance, ie: you are not paying extra on top of your call allowance unless you've used it all up

already.

\*

A laptop. In my case, a legtop - my EeePC 701.

\*

Bluetooth interface to your PC. This can be inbuilt, such as on a modern notebook PC, or a USB dongle such as the one I use.

\*

Ultimate Edition Hardy 8.04 (I'm using 8.04.1 32-bit in this example). Pros:

\*

Internet access anywhere, anytime, as long as you have mobile coverage.

\*

Convenient - you don't need to do anything on your mobile to connect (other than enable Bluetooth) - it's all controlled by your lappy, and your phone can stay in your pocket/bag.

\*

Reasonably fast - my tests at the time of writing saw me pull between 0.82mbps and 1.04mbps via Oz Speed Test (Internode mirror) on three bars reception. More than adequate for general surfing, and as it turns out, more than enough to watch YouTube videos too.

\*

## Ultimate Edition Guide

Much easier to surf the 'net on a lappy than it is on your mobile's diminutive screen. Cons:

\*

Battery draining - Your lappy and mobile phone will sap more energy to generate that Bluetooth connection, but that said, it should be less draining than WiFi.

\*

Speed - I wouldn't bother trying to download a distro ISO. The speed is great for general surfing, but nothing bigger unless you are prepared to wait.

\*

Potentially expensive - On Vodafone, \$0.90 cents is for a five minute block of time, whether I am idle or not. There is no data limit. That makes it reasonably pricey, but it is a small price to pay for drop-in access. Keep an eye on your usage otherwise you may run out of credit. Based on my speed tests, I can download about 37MB of data, assuming constant transfer rate, in five minutes. These instructions are fairly generic and should be adaptable to other distros, mobile phones and mobile networks.

1. Fire up/install Ultimate Edition as normal.
2. Plug in or enable your Bluetooth adapter. Your Bluetooth adapter will be automatically detected and drivers loaded - there is nothing for you to do manually here.
3. If you have NEVER used Bluetooth on your Ultimate Edition setup before, then go to the next step, otherwise skip to Step 11 because you're probably already setup properly.
4. Get into a terminal.
5. Verify that your Bluetooth adapter is running with: Code: `$ hciconfig -a` If you get details about hci0 listed including manufacturer's name, then your adapter is working. .
6. Type in the following to edit your Bluetooth configuration file: Code: `$ sudo gedit /etc/bluetooth/hcid.conf` This will bring up the Bluetooth configuration into the GEdit text editor. .
  1. Near the top of the file you will see the following: Code: `# HCID options options { # Automatically initialize new devices autoinit yes; # Security Manager mode # none - Security manager disabled # auto - Use local PIN for incoming connections # user - Always ask user for a PIN # security user; Change the security user line to security auto`
  2. .
7. A few lines beneath this is a section that reads as follows: Code: `# Default PIN code for incoming connections passkey "1234";` Change the 1234 to something else, eg: 4493. This is the pin number required for other Bluetooth devices to connect to you and it would be insecure to leave it at the default. .
8. Save and exit.
9. Now restart Bluetooth by typing in: Code: `$ sudo /etc/init.d/bluetooth restart` When you do this, an informational bubble will appear in your task bar saying `<hostname>-0 Device has been made connectable`, eg: if your PC's name is "gordon", the message would say "gordon-0 Device has been made connectable". .
10. If it isn't enabled already, turn on Bluetooth on your mobile phone. On a Nokia N95, you bring up the main menu, then go to Tools->Bluetooth->Change OFF to ON.
11. In your terminal, type in the following: Code: `$ hcitool scan` Your PC will now scan for local Bluetooth devices and your mobile phone should appear in the resulting list after a few

seconds (along with anyone else's Bluetooth-enabled mobile phones that are in range). The output will look something like: Code: \$ hcitool scan Scanning ... 00:11:22:AA:BB:CC Nokia N95 \$ In this example, my PC has found my Nokia mobile phone and shown me the MAC address for it. .

12. Highlight and copy the MAC address of the phone to the clipboard using your mouse and CTRL + SHIFT + C.
  1. Now we need to find the channel that your phone uses for Dial-Up Networking. Type in: Code: \$ sdptool browse 00:11:22:AA:BB:CC (Remember to paste, using CTRL + SHIFT + V, the MAC address of YOUR phone in place of the example above that you copied earlier). .
    1. You will see a whole lot of output as the services on your phone are queried and displayed. Scroll back a bit and look for an entry that looks similar to the following: Code: Service Name: Dial-Up Networking Service RecHandle: 0x10022 Service Class ID List: "Dialup Networking" (0x1103) Protocol Descriptor List: "L2CAP" (0x0100) "RFCOMM" (0x0003) Channel: 2 Language Base Attr List: code\_ISO639: 0x454e encoding: 0x6a base\_offset: 0x100
    2. Profile Descriptor List: "Dialup Networking" (0x1103) Version: 0x0100 ...and note down the Channel number. In the case of my Nokia N95, the channel used is 2. .
  2. Now type in: Code: sudo gedit /etc/bluetooth/rfcomm.conf Add the following to the end of the file (NOTE: if you already have an rfcomm0 defined for another device, then simply increment the number, eg: rfcomm1, for your mobile phone entry): Code: rfcomm0 { bind no; device 00:11:22:AA:BB:CC; channel 2; comment "Nokia N95 via Bluetooth"; } (Remember to paste down YOUR MAC address and set YOUR channel number as derived from your phone). .
  3. Save and exit.
  4. Now test the connection to your phone using the following commands: Code: \$ rfcomm release 0 \$ rfcomm connect 0 At this point, if your phone wasn't paired with Ultimate Edition already, your phone will prompt for the PIN number to access Ultimate Edition and once accepted, Ultimate Edition will then prompt you for the mobile phone's PIN. Enter them accordingly. NOTE: If you setup anything other than rfcomm0 earlier, change the number 0 in the connect command to the number of the device you created, eg: rfcomm1 would mean typing in rfcomm connect 1 instead. After a brief delay, you will see the following: Code: Connected /dev/rfcomm0 to 00:11:22:AA:BB:CC on channel 2 Press CTRL-C for hangup Hooray! You have a data connection to your phone, but not to the Internet yet. Press CTRL + C to break the connection to your mobile. .
    1. Now we need to setup PPP (Point to Point Protocol). This is exactly what your home ADSL/Cable modem uses to connect to your Internet Provider, though in our case, the "provider" is Vodafone. Type in: Code: \$ sudo gedit /etc/ppp/peers/vodafone ...and a blank file called "vodafone" will be created. You can name it anything you want really, but once created, populate the file with the following: Code: # Vodafone PPP initialisation/termination script noauth connect "/usr/sbin/chat -v -f /etc/chatscripts/vodafone-connect" disconnect "/usr/sbin/chat -v -f /etc/chatscripts/vodafone-disconnect" silent debug

2. `/dev/rfcomm0 115200 defaultroute usepeerdns` (Remember to change the `rfcomm` device number if you're not using zero). To reduce the number of messages going to `/var/log/messages`, you can remove the "debug" line too. .
5. Save and exit.
6. Now type in: Code: `$ sudo gedit /etc/chatscripts/vodafone-connect ...`and you are presented with another blank file. Populate it with: Code: `# Vodafone PPP CONNECT script  
TIMEOUT 5 ECHO ON ABORT '\nBUSY\r' ABORT '\nERROR\r' ABORT '\nNO  
ANSWER\r' ABORT '\nNO CARRIER\r' ABORT '\nNO DIALTONE\r' ABORT  
\nRINGING\r\n\r\nRINGING\r' " \rAT TIMEOUT 12 OK ATE1 OK  
'AT+cgdcont=1,"IP","vfineternet.au"' OK ATD*99***1# If you are not in Australia (or indeed  
not with Vodafone), you will need to change the "vfineternet.au" bit on the second last line  
above to your local country's/provider's Access Point Name. Refer to your provider for  
assistance, or you can try and see if your country and provider is listed on this nifty site I  
came across, and get the Access Point name from that. .`
7. Save and close.
8. Now type in: Code: `$ sudo gedit /etc/chatscripts/vodafone-disconnect ...`and populate the empty file with: Code: `# Vodafone PPP DISCONNECT script ABORT "BUSY" ABORT  
"ERROR" ABORT "NO DIALTONE" SAY "\nSending break to the modem\n" "" "\K" ""  
"\K" "" "\K" "" "+++ATH" "" "+++ATH" "" "+++ATH" SAY "\nPDP context detached\n"`
9. Save and exit.
  1. Now we are ready to rock and/or roll. Let's try and connect to the Internet! First, let's reconnect to the phone via Bluetooth:
  2. Code: `$ rfcomm connect 0`
10. Once the connection is established, open up a second terminal window and type in: Code: `$ pon vodafone`
11. Now let's see if we picked up the network settings. Type in: Code: `$ ifconfig ...`and you should see an entry similar to the following: Code: `ppp0 Link encap:Point-to-Point Protocol  
inet addr:10.120.11.197 P-t-P:10.6.6.6 Mask:255.255.255.255 UP POINTOPOINT  
RUNNING NOARP MULTICAST MTU:1500 Metric:1 RX packets:4 errors:1 dropped:0  
overruns:0 frame:0 TX packets:5 errors:0 dropped:0 overruns:0 carrier:0 collisions:0  
txqueuelen:3 RX bytes:64 (64.0 B) TX bytes:97 (97.0 B) Yes, we have an IP address! NOTE:  
If you cannot see the entry for "ppp0" in your ifconfig output, your phone may be taking a  
little longer to negotiate the connection. Wait a couple of seconds and try issuing the ifconfig  
command again. Failing that, re-issue the pon vodafone command and check ifconfig again. If  
you still cannot get ppp0 up, it is possible you might not have data enabled on your  
phone/plan. Refer to your provider for assistance, but essentially if you can surf the 'net from  
your mobile phone itself, then ppp0 should appear if the rfcomm connection was successful.  
Anyway, if you can see ppp0, you can now try and hit the Internet: Code: $ ping -c4  
www.overclockers.com.au ...and you should get output similar to the following: Code: PING  
overclockers.com.au (203.220.0.228) 56(84) bytes of data. 64 bytes from  
chips.ocau.ausgamers.com (203.220.0.228): icmp_seq=1 ttl=49 time=159 ms 64 bytes from  
chips.ocau.ausgamers.com (203.220.0.228): icmp_seq=2 ttl=49 time=134 ms 64 bytes from  
chips.ocau.ausgamers.com (203.220.0.228): icmp_seq=3 ttl=49 time=127 ms 64 bytes from  
chips.ocau.ausgamers.com (203.220.0.228): icmp_seq=4 ttl=49 time=136 ms ---`

overclockers.com.au ping statistics --- 4 packets transmitted, 4 received, 0% packet loss, time 3002ms rtt min/avg/max/mdev = 25.838/25.885/25.957/0.045 ms \$ Congratulations - you've connected to the Internet via your mobile! .

12. Now bring up Firefox (or other browser) and try and hit a website. If you get an "offline" error, make sure your browser is not operating in offline mode. In Firefox, uncheck the "Work Offline" box in the File menu.
13. Once you've gotten over how exciting this all is, you need to disconnect from Vodafone to ensure you're not going to rack up a huge phone bill, so go back into the second terminal window and enter: Code: \$ poff vodafone ...and this will automatically break the rfcomm0 connection without needing to press CTRL + C in the first terminal window. .
  1. If you'd like to automate the commands entered to initiate PPP with your phone, create a new text file on your desktop (or wherever) as follows:
  2. Code: \$ gedit ~/Desktop/Start\_Vodafone\_Internet ...and then populate the file with the following: Code: #!/bin/bash rfcomm release 0 rfcomm connect 0 & sleep 5 pon vodafone read -p "Press Enter to terminate your session." poff vodafone This will simply ensure the rfcomm device is released, then will connect to the phone, wait for 5 seconds to ensure the connection is up, then start the PPP to Vodafone. It will then sit there and wait for you to hit Enter at which point it will terminate the PPP. .
14. Save and exit.
15. Now at the terminal, make the file executable with: Code: \$ chmod a+x ~/Desktop/Start\_Vodafone\_Internet ...and now you can just double-click on the icon on your desktop, then Run In Terminal, to connect to your mobile phone in one hit. Once finished, issue the poff vodafone command again, or hit Enter in the terminal window running the script above. Fix Frozen Desktop or Application In Ultimate Edition Linux <http://forumubuntusoftware.info/viewtopic.php?f=7&t=2529> Linux is Very Stable operating system unlike windows.It have very less crashes,stuckes and freezes which is very common with windows.But at rare cases this may occur in Linux. We have 3 Quick ways to fix this problem without switching off your computer or rebooting it. 1)If only some applications are not responding not the whole desktop is frozen Take system->Administartion->System Monitor. Then select the frozen application.Now click Kill process. 2)Try the key combination of Ctrl + Alt + Backspace to logout.Then login. 3)Use Virtual console This way is little complicated than the first one but better method.Press Ctrl + Alt + F2 to take the virtual console.Then log in and type: ps -ax | grep startx This command will return the PID of the Xserver. Kill Xserver kill -9 PID\_Number Return to your first console. Press Alt + F1. How to use Magic System Request Keys in Ultimate Edition Linux <http://forumubuntusoftware.info/viewtopic.php?f=7&t=2395> The magic SysRq keys are key combinations within the Linux kernel that allows the user to perform various low level commands regardless of the system's state, except during kernel panics or freezes. It is often used to recover from X-Server freezes, or to reboot a computer without corrupting the file system.

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### **Restarting Ultimate Edition safely when it is frozen**

If anyone faces a freeze with Ultimate Edition where you cannot do anything, then this will certainly be helpful if you want to reboot the OS as cleanly as possible without damaging their HDD's or losing their data.

In case of a freeze where you cannot do anything, simply press Alt+PrintScreen+R+E+I+S+U+B, keep in mind that the underlined keys must be kept pressed through the rest of the sequence AND that you will need to keep holding the sequence keys for a small period of time before going to the next one so that their actions can be carried out properly (For example, hold the R key for about 1-2 seconds before moving on to S). If the sequence does not work at first, then increase the time period between each sequence key press and try again.

If anyone requires a good way of remembering the sequence R+E+I+S+U+B, just remember "Reboot Even If System Utterly Broken".

Raw (take control of keyboard back from X), tErminate (kill -15 programs, allowing them to terminate gracefully), kIll (kill -9 unterminated programs), Sync (flush data to disk), Unmount (remount everything read-only), reBoot. NOTE:- This keystroke does not work in the event of a kernel freeze as the keystroke sequence depends on the kernel in order to unmount and make the required steps before the restart. Safely shutting down Ultimate Edition when it is frozen

The key sequence to achieve this does not differ from the one used to restart Ultimate Edition safely except for the last key. So here it is as follows:

Alt+PrintScreen+R+S+E+I+U+O, keep in mind that as in the previous sequence, the underlined keys must be kept pressed through the rest of the sequence AND that you will need to keep holding the sequence keys for a small period of time before going to the next one so that their actions can be carried out properly.

If someone requires a good description on what each keystroke here does, there is not much of a difference from the last one, except(Once again),the final key:Raw (take control of keyboard back from X), tErminate (kill -15 programs, allowing them to terminate gracefully), kIll (kill -9 unterminated programs), Sync (flush data to disk), Unmount (remount everything read-only), shutdown.

NOTE:- This keystroke does not work in the event of a kernel freeze as the keystroke sequence depends on the kernel in order to unmount and make the required steps before the shutdown. Brief descriptions about the keys you can use in magic SysRq sequences 0 - 9 - sets the console log level, controlling which kernel messages will be printed to your console so that you don't get flooded. B - restarts the system without making steps to ensure that the conditions are good for a safe reboot, using this key alone is like doing a cold reboot. E - sends SIGTERM to all processes except init. This means that an attempt is done to end the current processes except init, safely, e.g. saving a document. F - call oom\_kill(Out Of Memory Killer), which will kill a process that is consuming all available memory. H

- displays help about the SysRq keys on a terminal though in actuality you can use any key except for the ones specified, to display help. I - sends SIGKILL to all processes except init. This means that all the processes except for init are killed, any data in processes that are killed will be lost. K - kills all processes on the current terminal. It is a bad idea to do this on a console where X is running as the GUI will stop and you can't see what you type, so you will need to switch to a tty after doing the magic SysRq. L - sends SIGKILL to all processes, including init. This means that every process including init will be killed, using this key will render your system non-functional and no further magicSysRq keys can be used. So in this case you will have to cold reboot it. M - dumps memory info to your console.

O - shuts down the system via ACPI or in older systems, APM. As in key "B", using this key alone is like a cold reboot(Or in this case, a cold shut down). P - dumps the current registers and flags to your console. Q - dumps all timers info to your console. R - takes keyboard and mouse control from the X server. This can be useful if the X-Server crashed, you can change to a console and kill the X-Server or check the error log. NOTE:- The documentation refers to this key's task as "Turns off keyboard raw mode and sets it to XLATE", but we suppose it's safe enough to assume that it takes back control from X. S - writes all data from the disc cache to the hard-discs, it is a sync and is necessary to reduce the chances of data corruption. T - dumps a list of current tasks and info to your console. U - remounts all mounted filesystems read-only. After using this key, you can reboot the system with Alt+SysRq+B without harming the system. W - dumps uninterruptable (blocked) state tasks. Controlling the use of SysRq keys

There are some ways of controlling the use of SysRq keys(i.e. what can be used, enabling or disabling them completely), two ways of doing this are:1) Configuring the SysRq keys during kernel compilation itself. There isn't much here since you can only disable SysRq keys and not actually control or define what you can and can't use. The option you are looking for is:MAGIC\_SYSRQ 2) Using proc sysrq trigger calls. This is much more flexible than changing the configuration of the kernel but this has one downside with security which is explained after(since it is very minor). You use the echo command to achieve this for ease but you could also use any normal text editor to achieve this. Now the command is(you will need root permissions):echo \* > /proc/sys/kernel/sysrq where "\*" is a number, which can be any one of these:- 0 - disable sysrq keys completely 1 - enable all functions of sysrq 2 - enable control of console logging level 4 - enable control of keyboard (SAK, unraw) 8 - enable debugging dumps of processes etc. 16 - enable sync command 32 - enable remount read-only 64 - enable signalling of processes (term, kill, oom-kill) 128 - allow reboot/poweroff 256 - allow nicing of all RT tasks(control the nice level(priority) of Real Time tasks) So you can define what SysRq keys can be used, and also define whether they are all on or off. Now for the "downside". For example you disable SysRq keys when you want to stop people(local) from doing key presses and then shutting down or messing up the PC during an important task. Now with configuring the kernel, you can stop SysRq keys from being used at all from the beginning of the boot process right upto the end, with calling the proc sysrq triggers however, your option only takes place when it is executed(i.e. after the system has booted up) so there is a certain area of vulnerability with calling the triggers whereas there is no such thing in configuring the kernel, some people are that desperate to secure their systems to care about a few seconds, however do not blame me for it. Something about the magicSysRq keys is that they can be used in

any sequence and in any way to achieve the required objective, for example you can just press Alt+SysRq+B to do something like a cold reboot.

### Enabling Temperature Sensors in Linux

<http://forumubuntusoftware.info/viewtopic.php?f=7&t=1988>

Most computers these days come with a myriad of sensors to monitor the temperature of your computer. These sensors are generally located on the processor and the motherboard, and you might also have sensors on your video card. On top of that, all S.M.A.R.T-enabled hard drives have built-in temperature monitoring.

The temperature of your computer is a vital thing to keep track of - heat and computers don't mix very well. Unfortunately, Ultimate Edition doesn't setup your computer's sensors automatically; but you can follow these steps to enable the temperature sensors in your computer in Ultimate Edition, or any other version of Linux. While sensor-monitoring is somewhat hardware dependant, this guide will work for most users. It involves heavy use of the command-line, but don't worry - I will walk you through it step-by-step.

1. Installing the sensor libraries First thing's first - you need to install the libraries that allow Linux to read your sensors. To do this, install the lm-sensors library, by running the command:

```
sudo apt-get install lm-sensors
```

This will install the libraries for your motherboard's sensors. For your hard-disk sensors, you'll want to install hddtemp:

```
sudo apt-get install hddtemp
```

In Ultimate Edition, the install will ask you several questions. First it will ask if it should run SUID root, select "yes." It will then ask you for an interval for logging the temperature to a file; since we are going to have an applet display our system temperatures for us, this isn't necessary, so most users will be fine leaving the default of '0' and pressing enter; if you wish to log this data, however, I'd recommend a value between 2 and 10 seconds. Next, it will ask if it should run as a daemon; select yes, and leave the default values for hostname and port. Finally, it will ask if you wish for it to run on startup - select "yes."

1. Running sensors-detect Now that your sensor libraries are installed, you need to detect your sensors! Run the command: `sudo sensors-detect` Which will probe your system for sensors. Answer "YES" to all questions! Don't just hit enter, type "YES", because at the end there will be a question for which the default answer is "no", and we'll want to answer in the affirmative. The sensors-detect program will scan your system, and then give you a summary, stating which sensors it has found. It will then say: I will now generate the commands needed to load the required modules. After you hit ENTER to continue, it will ask, Do you want to

add these lines to /etc/modules automatically? (yes/NO) This is the question we want to make sure we answer YES to.

2. Loading the modules Since we answered YES to the previous question, our sensor modules will be loaded by default the next time we start up. But since we don't want to have to reboot, we're going to use the information we got from the sensors-detect script to load the modules ourselves, this time only. Right above the last question will appear a list of modules that you should load, in the form of: #---cut here--- # Chip drivers smsc47m1 #---cut here---

You may have more, or different, items listed - that's fine! What we want to do now, to load these modules, is use the modprobe command, as follows:

>>

**sudo modprobe [module name]**

So, in my case, I would type:

```
sudo modprobe smsc47m1
```

If all goes well, you should be returned to the command-line, without any output.

4. Monitoring the sensors! Wow, that was a lot of work! Now, let's see the rewards. On the command line, you can simply run the sensors command; this will output the information from your motherboard's sensors. However, we'd rather have a graphical interface for checking up on our hardware, so let's install an applet for our Gnome desktop to keep an eye on our system's temperature. Run the command: **sudo apt-get install sensors-applet** to install the applet. Now, add the applet by right-clicking on your desktop panel, selecting "Add to Panel," and you will now see a "Hardware Sensors Monitor" applet in the System & Hardware section. Click and drag this to your panel to add it.

The applet will now say that you haven't enabled any sensors; right click on the applet and open its preferences. The first screen is for general settings:

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### Howto Setup Bluetooth Keyboard and Mouse in Ultimate Edition

<http://forumubuntusoftware.info/viewtopic.php?f=7&t=1990> We need the MAC address (e.g. 00:00:00:00:00) of the mouse and keyboard. You can use KEYBOARD\_ADDR and MOUSE\_ADDR where you should find the addresses for the keyboard and mouse respectively. Press the button on the mouse that makes it visible to be found by the computer. Do the same for the keyboard. Now open a terminal window and run the following command `hcitool scan` Scanning ... KEYBOARD\_ADDR Microsoft Wireless Keyboard MOUSE\_ADDR Microsoft Mouse Adding the Keyboard and Mouse Now we need to add the keyboard and mouse to the bluetooth configuration files. Run the following command to pop up GEdit `sudo gedit /etc/bluetooth/hcid.conf`

You may be asked for your password, this is because we used sudo. At the end of the file, add the following (replacing KEYBOARD\_ADDR and MOUSE\_ADDR for the keyboard and mouse MAC addresses as found earlier) device KEYBOARD\_ADDR { name "Microsoft Wireless Keyboard"; auth enable; encrypt enable; } device MOUSE\_ADDR { name "Microsoft Mouse"; } Now you need to restart the bluetooth subsystem so that it refreshes it's configuration file. sudo /etc/init.d/bluez-utils restart

\* Restarting Bluetooth services... [ ok ] Pairing the Devices You now need to pair the devices with the computer. Do not press any buttons on the keyboard as we'll need to use it to enter a passcode so we can pair. Run the following command sudo hidd --search Searching ... Connecting to device MOUSE\_ADDR Connecting to device KEYBOARD\_ADDR They could pair with the computer in any order, you will need to remember which one is the keyboard. As soon as Connecting to device KEYBOARD\_ADDR appears you must enter a PIN code into the keyboard. It must consist of numbers not using the numpad, somewhere between 4 and 8 should be fine. Type this number in to the keyboard and press Return. A window should pop up on your computer asking you for the number you just entered on the keyboard. You should now be set up. The devices should automatically reconnect when they go to sleep and when your computer boots up. Troubleshooting If you have followed all the steps above and you find your mouse or keyboard don't automatically reconnect, we can fix it. Run the following command in a terminal sudo gedit /etc/default/bluez-utils Find the following lines HIDD\_ENABLED=0 HIDD\_OPTIONS="" Change them to HIDD\_ENABLED=1 HIDD\_OPTIONS="--master --connect KEYBOARD\_ADDR --connect MOUSE\_ADDR --server" Now reboot and hopefully they'll automatically connect (give them a few seconds to connect after you move the mouse/press a key).

>>>

### **10 things you didn't know you could do in Ultimate Edition**

<http://forumubuntusoftware.info/viewforum.php?f=7&start=125>

#### Create website links that automatically install software

Sometimes if you're trying to help somebody fix a problem, you'll have to tell them how to install software. Yet for some Ultimate Edition newbies, even this can be confusing. The solution is to create a "software install" hyperlink within a web page (such as a forum posting), new email window, or Pidgin message window. To do this, simply click the "create link" button on the web page or within the email (the precise name of this will vary depending on the software/website used), and then type apt:packagename in the URL field, replacing packagename with the precise name of the package as listed in Synaptic. For example, let's say you want to tell somebody how to install the thunar package, a lightweight file manager. If you're creating an email with the instructions, ensure the new mail uses HTML (ensure HTML is checked on the Format menu), and then click Insert -> Link. In the URL field, delete what's there, and type apt:thunar. Don't worry about the Description field—leave it with the default contents that will probably mirror what's in the URL field. Then click the Close button. Note that there's a slight bug in Evolution that means, for some reason, the hyperlink won't actually

appear as a link until you type some more into the new mail window, or click the Send button. Perhaps it goes without saying that should you ever receive such a link in an email, or see one on a website, you should be very wary (especially if there are also additional instructions telling you to add a new software repository). It would be easy to disguise a malicious link as something seemingly benign, although you will always be prompted to confirm the choice of software before installation.

### *Do stuff without touching the mouse*

If you want to run an application, just hit Alt + F2 and then type the name of the program. If it needs to run with root privileges, just type gksu beforehand. For example, to run GNOME Terminal, you would type terminal. To run Gedit, type gedit. If the program is command line, check the Run In Terminal box (use the Tab key to move from field to field in the dialog box and hit the Space to select a field). This will then open a terminal window and run the command, but be aware that the terminal window will then close as soon as the command has finished, so you won't be able to inspect the output. Want to browse to a file system location, but too lazy to grab the mouse and click the Places menu? Hit the forward slash (/), and then type the path into the dialog box that appears. Want to rename a file but don't want to use the mouse? Just ensure the file is highlighted (use the cursor keys to highlight it if necessary) and hit F2. Then type the new filename. To change the file extension too (which isn't highlighted for deletion by default), just hit Ctrl + a and then type the complete new filename.

### *Instantly Search Google for Any Word or Phrase*

Have you ever been reading a document and wanted to look up something in Google? In Firefox you can just highlight the word or phrase, right-click it, and select Search Google. However, what if you're reading, say, a PDF file? Or a man page in a terminal window? A very simple but effective solution is Googlizer, which you can install using Synaptic. Once installed, it's added to the Applications -> Internet menu, so you'll have to manually drag and drop it to a blank spot on the panel for quicker access. How it works is simple. Highlight any text, in any application, and then click Googlizer's icon to instantly search Google. If a Firefox window is open, a new tab will be added showing the search results. Otherwise, Firefox will be started, and the search results shown. Give it a try. It's one of those simple things that might just change the way you work forever. Googlizer can be personalized so that it searches the version of Google localized to your country, or even a non-Google search engine. To do this, you'll need to discover the search URL for the engine you want to use. To do so, just perform a search using either the localized version of Google (for example, <http://www.google.co.uk>, if you live in the UK) or a different search engine. Then look at the URL for the part where your search term appears, and highlight/copy all that comes before. If I search for Ultimate Edition Kung Fu using <http://www.google.co.uk>, I get the following URL for the search results page: [http://www.google.co.uk/search?hl=en&q= ... arch&meta= ...](http://www.google.co.uk/search?hl=en&q=...arch&meta=...)so I chop the end off, from the Ultimate Edition+Kung+Fu part onward, and I'm left with following, which I copy into the clipboard (highlight the text, and hit Ctrl + c ): <http://www.google.co.uk/search?hl=en&q=> Once you have the information, right-click the Googlizer panel icon, and select Properties. In the Command text field, add -url after googlizer, and then paste your Google URL. For example, I ended up with the following: `googlizer --url http://www.google.co.uk/search?hl=en&q=` You can also change the icon if

you want by clicking the icon preview at the top left of the dialog box. When finished, click the Close button, and then test the new localized search. Here are some URLs that will make Googlizer use other search engines—just add these addresses after the `-url` part of the Command text field, as described earlier: Yahoo.com: `http://search.yahoo.com/search?p=` Ask.com: `http://www.ask.com/web?q=` Microsoft Live: `http://search.live.com/results.aspx?q=`

### Create a File Delete Command That Uses the Trash

The `rm` command doesn't have a trash facility. Once files are deleted, they're gone forever. However, you can create your own trash command, which, when used at the prompt, will move files and/or folders to Ultimate Edition's standard trash folder. The files can then be recovered, if desired, or permanently deleted in the usual way by emptying the Trash folder. To add the new command, you'll have to create an alias. You'll need to edit the `.bashrc` file in your `/home` folder and add a line to the bottom, as follows:

1. Open a terminal window, and type `gedit ~/.bashrc`.
2. At the bottom of the file that appears, add the following new line: `alias trash="mv -t ~/.local/share/Trash/files --backup=t"`
3. Save the file, close Gedit, and open a new terminal window to test your new command. To delete `filename.doc`, for example, you would type `trash filename.doc`. The new command will work on

folders too, and multiple files/folders can be specified one after the other (for example, `trash filename1.doc filename2.doc`).

### Repair Windows from Within Ultimate Edition

If Windows is refusing to boot, for whatever reason, you can try repairing the file system from within Ultimate Edition. Use Synaptic to search for the `ntfsprogs` package. Once it's installed, unmount your Windows partition (if it's mounted), and type `sudo ntfsfix /dev/sda1` to check and fix the partition (assuming your Windows partition is `/dev/sda1`—likely if you installed Ultimate Edition in a dual-boot configuration on a computer already running Windows). This tip is also useful if you see the "Cannot mount volume" error when attempting to access your Windows partition from within Ultimate Edition.

### Dump the Text on a Virtual Console to a File

If you're trying to fix a problem, you might want to capture the output of a command for reproduction on a website forum, along with the command you typed to get the results. If you're working in a terminal window, you can cut and paste, but what if you're working at a virtual console? If you simply want to capture the result of a command, just redirect the output:

```
ls > output.txt 2>&1
```

This will send both the output and error output (if any) of the `ls` command to `output.txt`. If you want to capture the command you typed and any other command-line detritus (including output), use the `screendump` command. The following will send everything currently on the current screen (command-line prompts included) to a text file called `output.txt`: `sudo screendump > output.txt` The command has to be issued as root because of permission issues, but the resulting file will be owned by you.

### *Instantly Hide a File or Folder*

Any file or folder whose name is preceded with a period (`.`) is hidden from view in Nautilus and also won't appear in the list of shell commands such as `ls`, unless the user specifically chooses to view hidden files (`ls -a`, or clicking `View → Show Hidden Files` in Nautilus). So to hide a file or folder, just rename it (select it and hit `F2`), and then put a period in front of the filename. Gone. If the file doesn't vanish, hit `F5` to refresh the file listing. To return the file to view, just remove the period. If you want to make a file disappear from Nautilus' view of files (including the desktop) but still appear in command-line listings, add a tilde symbol (`~`) to the end. For example, to hide `partypicture.jpg`, change its filename to `partypicture.jpg~`. To hide text file, change its name to `text file~`.

### *Print at the Command Line*

You can quickly send text or configuration files to the printer using the `lp` command. For example, to print the `/etc/fstab` configuration file, you would type `lp /etc/fstab`. The formatting of the printed page is rough (no margins, and non-proportional font used), but it's OK for quick hard copy viewing. If you want you can set a top page margins using the `-o page-top=` command option. The following will print the same file with a one-inch (72 pica) margin at the top: `lp -o page-top=72 /etc/fstab` Note that for the `lp` command to work, you'll need to first make your printer the system default (even if it's the only one attached). To do so, click `System → Preferences → Default Printer`. Select your printer, and then click `Set Default`. Then click `Close`.

### *Listen to MP3s when no GUI is running*

So you've tweaked Ultimate Edition into a state of disrepair. Any hope of a GUI is a pipe-dream, at least for the moment. While you hack away fixing things, wouldn't it be nice to have some music to console you at the console?

Just switch to an unused virtual console, login, and type **`sudo apt-get install vlc`**. VLC is a GUI media playback application normally used on the desktop, but it can also run with a text-mode interface—just start it with the `-I ncurses` command option (note that's a capital I, not L). For example, to play back `filename.mp3`, I would type `vlc -I ncurses filename.mp3`. Multiple files can be specified one after the other, thus creating a playlist, or a wildcard can be used to playback all files in a particular folder (ie `vlc -I ncurses ~/Music/*.mp3`). Use the `a` and `z` keys to alter the volume. If playback is still too quiet (or too loud), switch to another virtual console and type `alsamixer`. Hey, presto—primitive but useful text-mode faders. Use the left and right cursor keys to move between faders. Use the up and down keys to change the values. Hit `Escape` to quit.

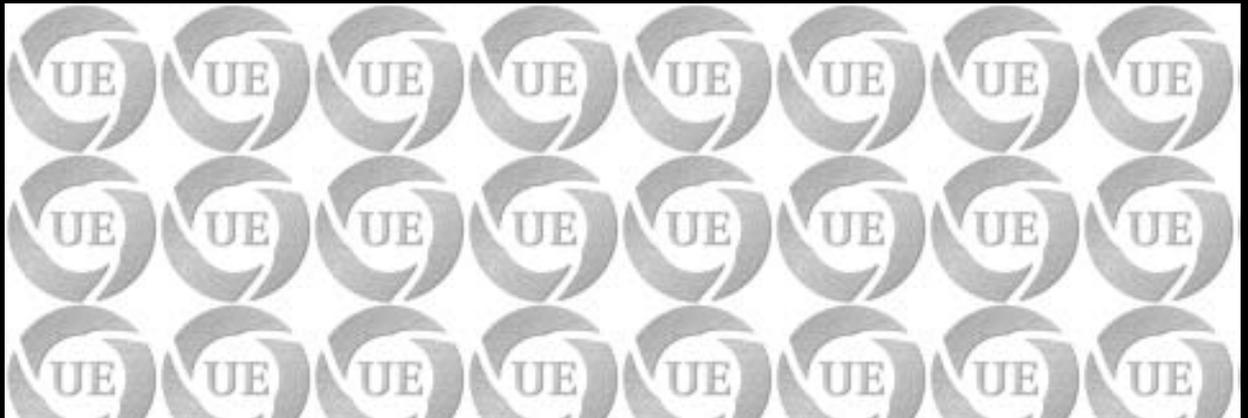
### Turn your desktop into your /home folder

Do you use your desktop as a dumping ground for files, and pretty much ignore your actual /home folder, which is where you should store things? If so, you might be interested in this tweak, which effectively makes Ultimate Edition use your /home folder for the desktop, instead of the actual /home/username/Desktop folder. Anything saved to the desktop, such as files/folders dropped there, will be placed in your /home folder. Additionally, anything in your /home folder will appear on the desktop. To give this a try, start gconf-editor (hit Alt + F2 and type gconf-editor) and navigate to /apps/nautilus/preferences and put a check alongside desktop\_is\_home\_dir. Then log out and back in again. Remember that the contents of your desktop haven't vanished. They're still in the Desktop folder in your /home folder.

### BONUS TIP! Quickly Set Wallpaper with One Click

The easiest way of setting your own picture as a desktop wallpaper is to click and drag the image to the desktop using the middle mouse button (if the image is already on the desktop, then click and drag it a few inches to the left/right). On most modern mice, the middle mouse button is the scroll wheel, which also doubles as a third mouse button. On the menu that appears when you release the button, click Set as Background. If that sounds a little too unorthodox for you (it can be hard to use the middle mouse button), you can also use Synaptic to install the nautilus-wallpaper package, which adds a simple Set as Wallpaper option to the menu that appears when you right-click an image file. After installation, you'll need to log out and then in again before the option becomes visible.

Have fun !!!



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# PlayOnLinux

>

## Guide

PlayOnLinux is a great piece of software just like Ultamatix that allows you to download and install some of the best softwares including games of Microsoft world to your Linux machines.

Here is a complete illustrated guide of PlayonLinux that will get you started in few minutes only and you will be enjoying best of the worlds within no time.

Before starting with it we would advise you to update and upgrade your machine so as to avoid any driver or software related troubles. You can do this by typing in terminal

**sudo aptget update && upgrade.**

Now to install PlayOnLinux on your machine type

**sudo aptget install playonlinux** or use **Synaptic**.

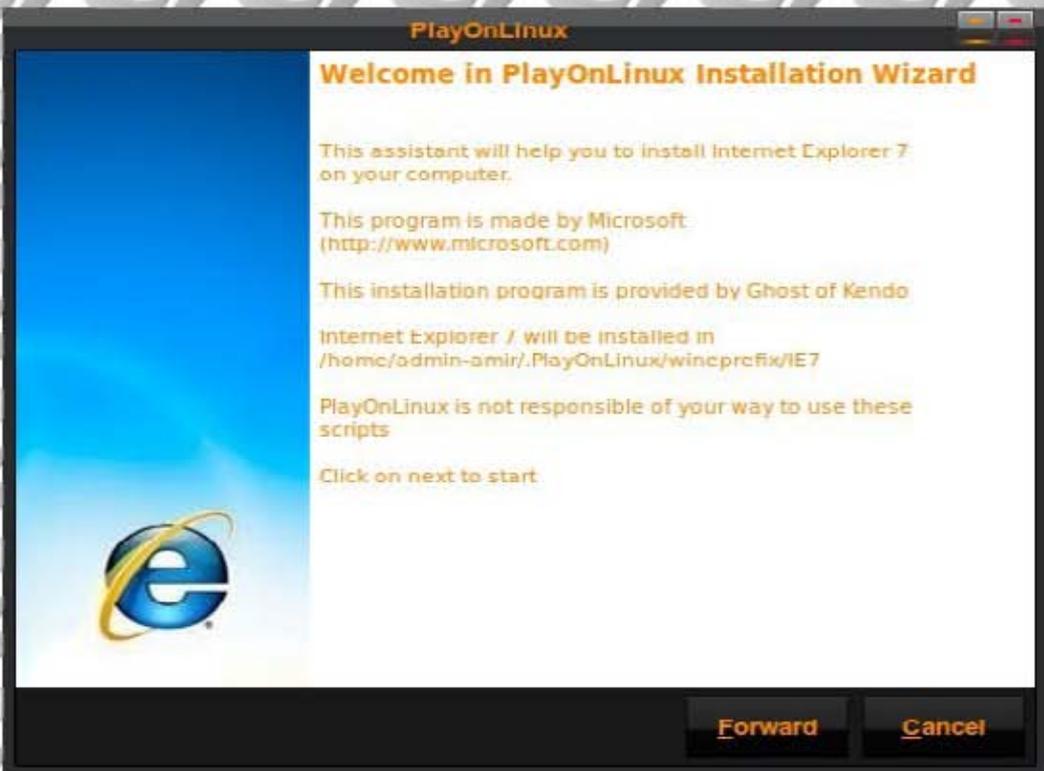
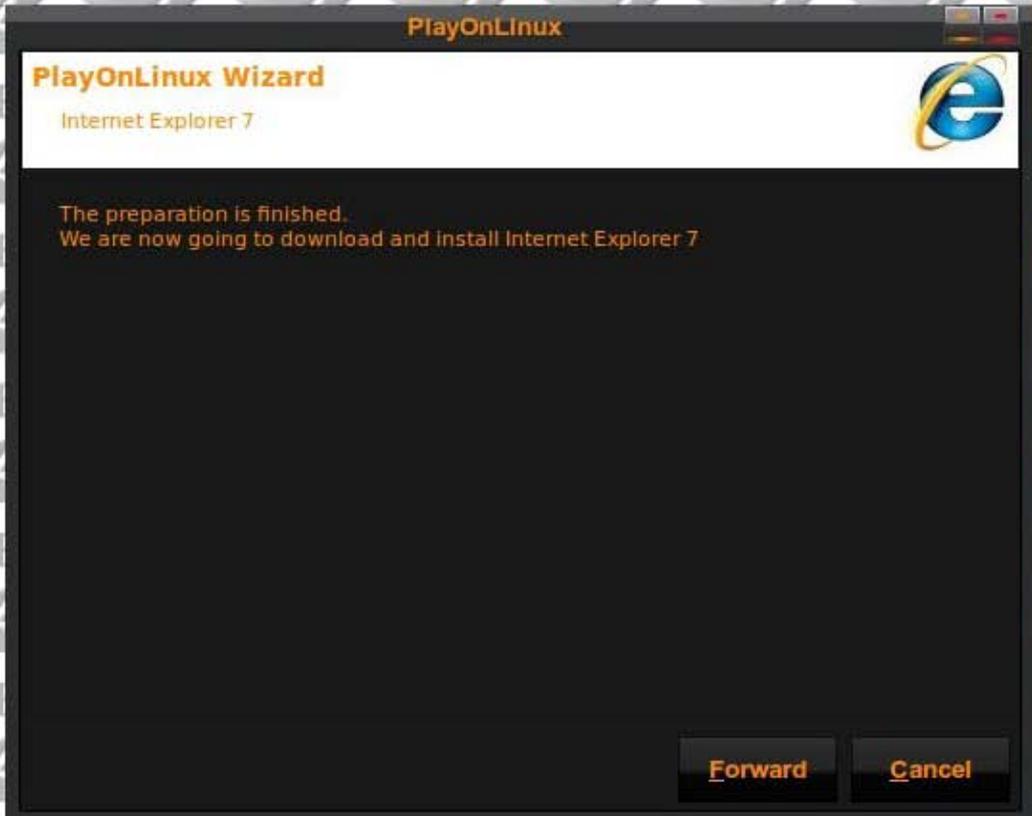
To keep the guide simple and comprehensive we have given you extensive collection of screenshots that will make you familiar with PlayOnLinux very easily and in no time. *After all, a picture says more than a thousand words.*

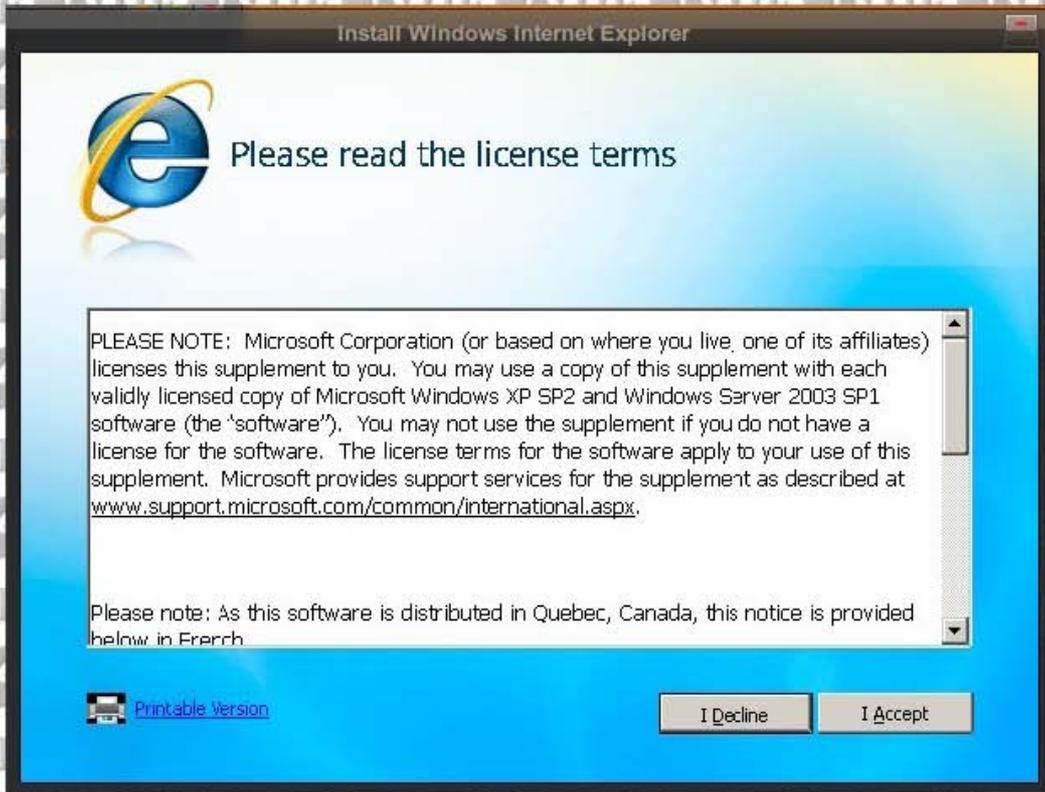
So lets get started...



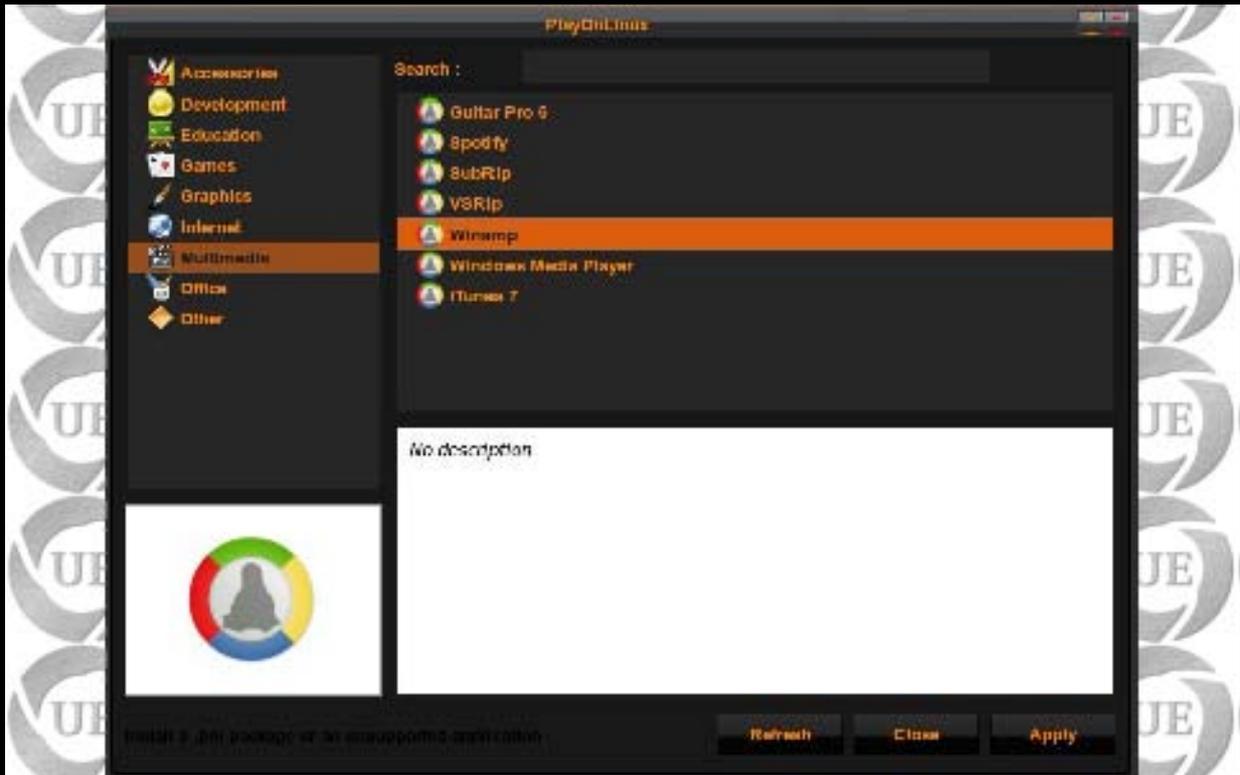


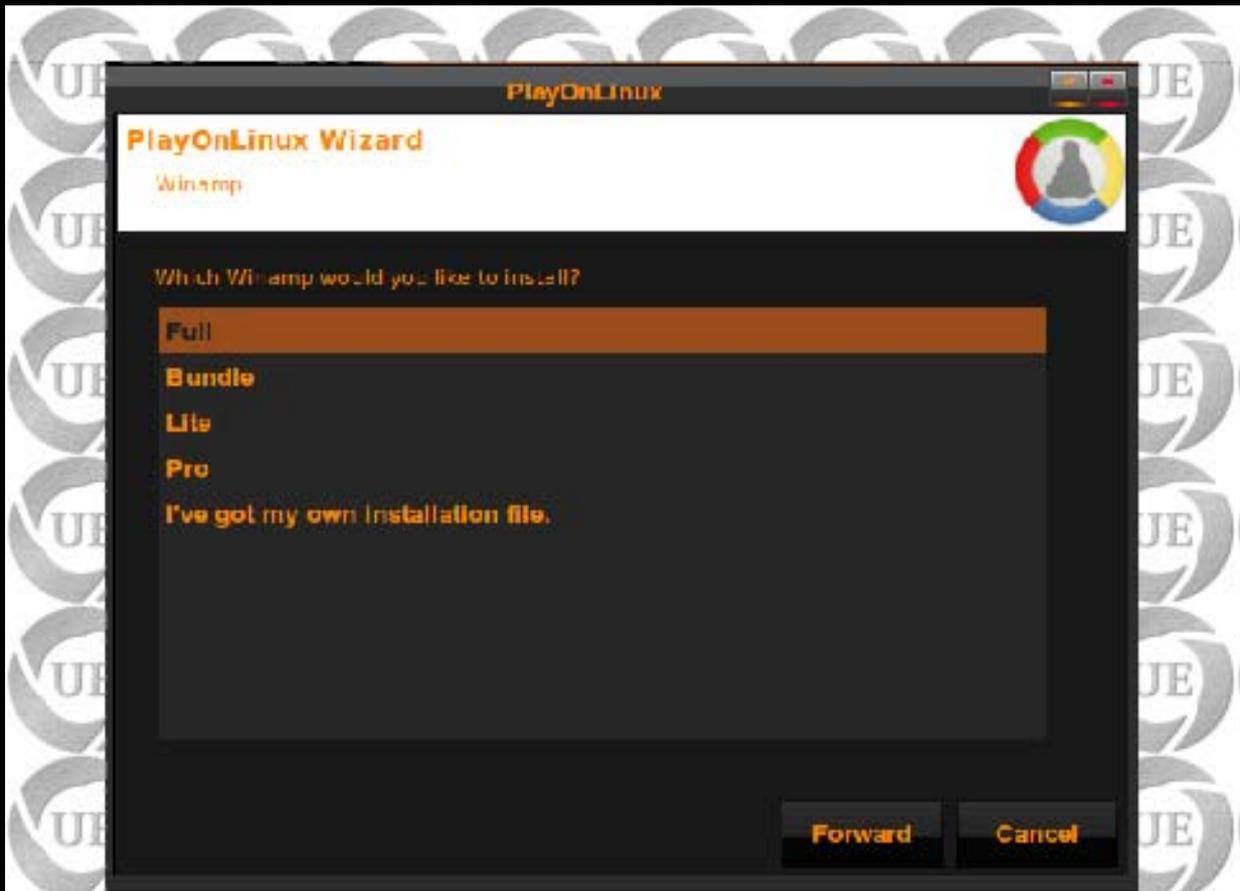




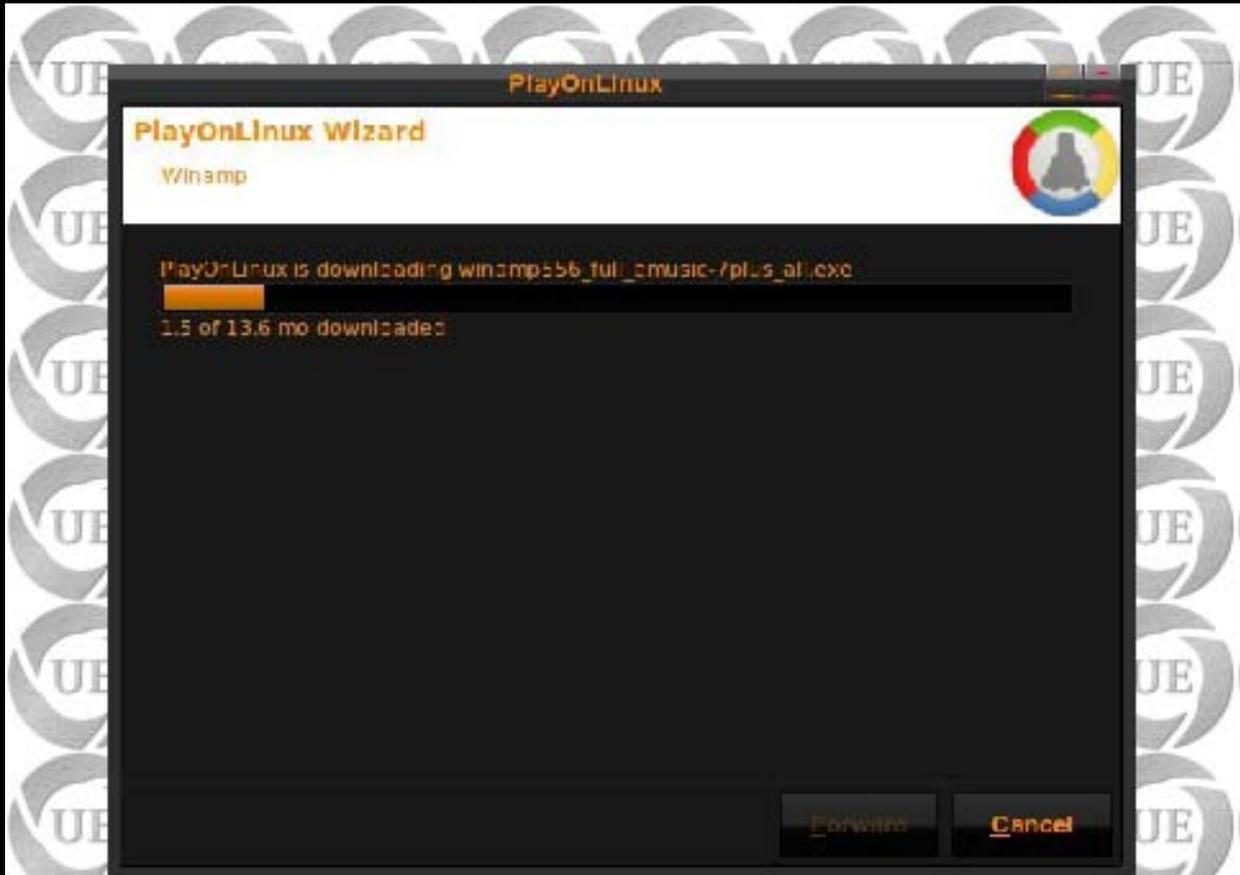


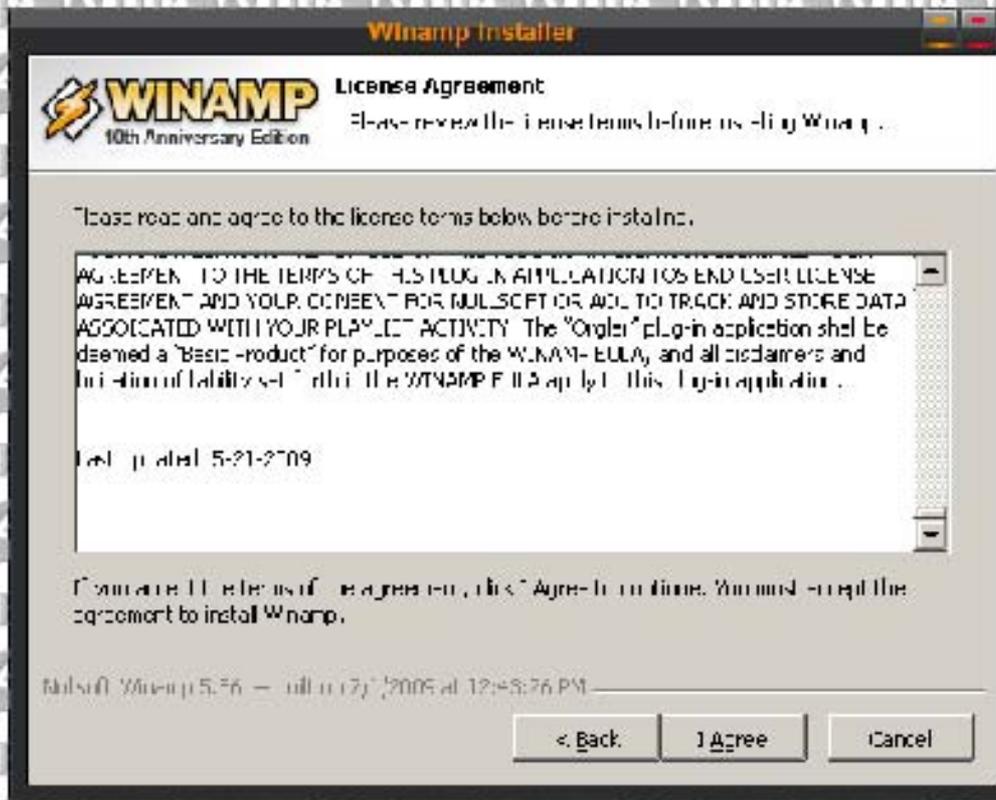
*Ok now lets install Winamp. Cool.....yes it is !*

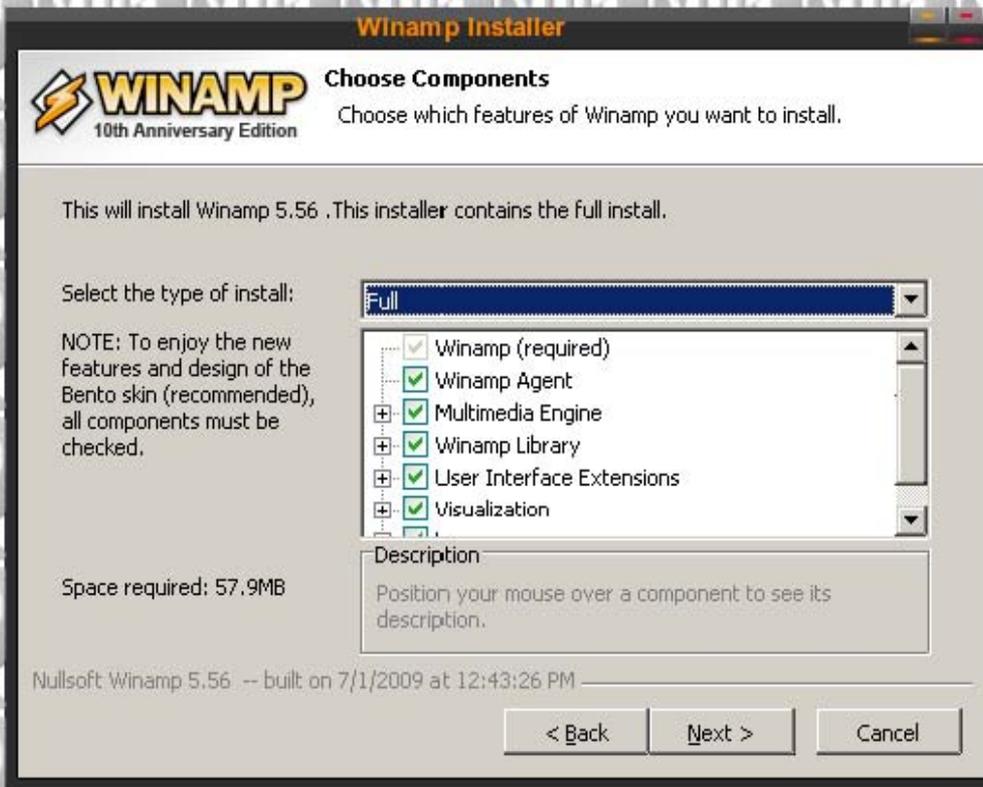




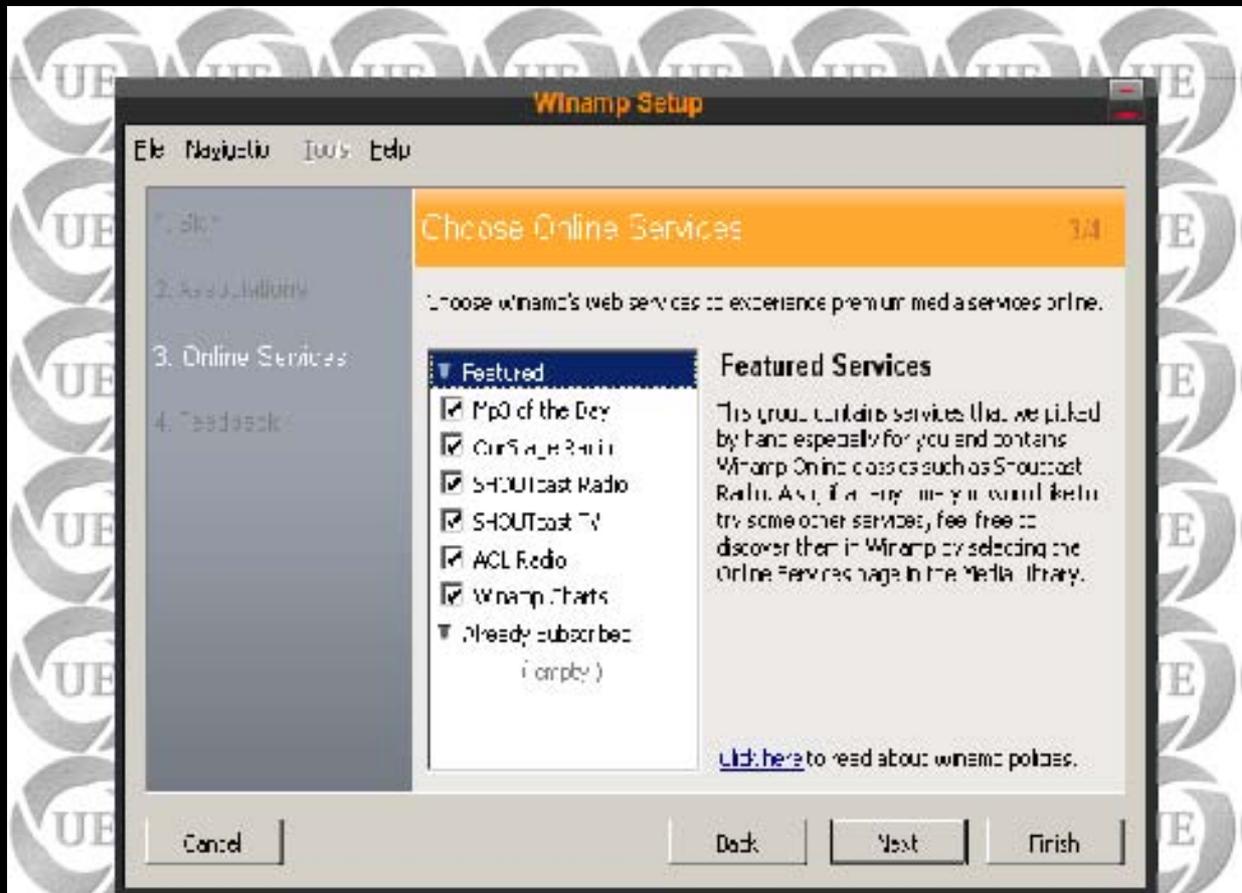








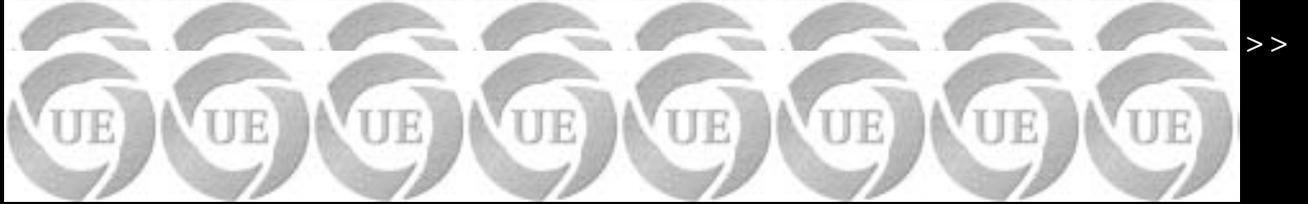








Enjoy !!!



***Time and Date configuratioN***

To set the date and time your system clock, right click on the clock and then click Preferences.

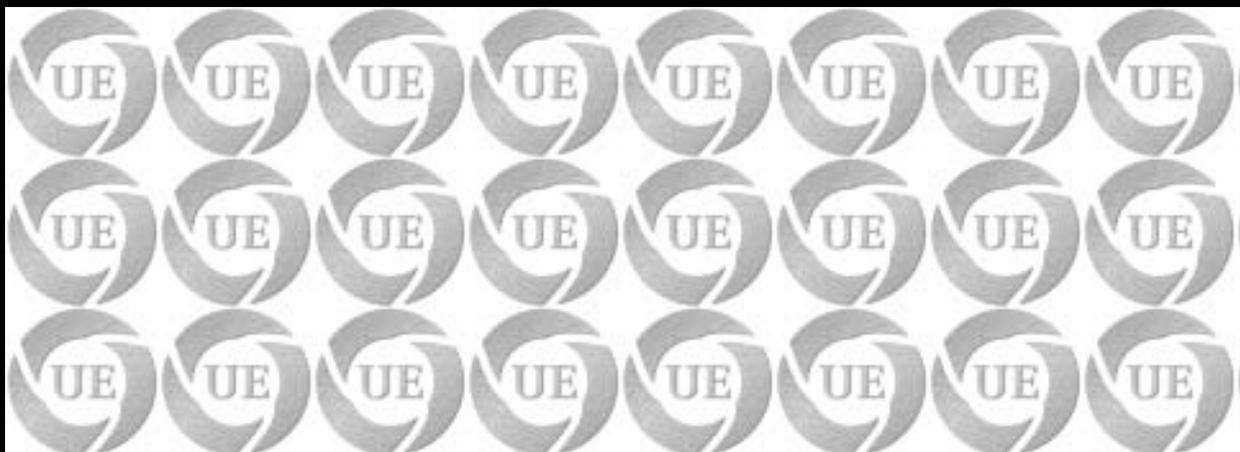


*Select your desired settings for Time format and to enable/disable Weather and Temperature*

*To add your location to show weather conditions*



*Select Locations>Add. Just fill in the required fields like name of the place and time offset.*



*Have fun !!!*



## Guide for Ultimate Edition Nautilus scripts

### Contents:

- [Ultimate Edition Nautilus scripts?](#)
- [TheeMahn's Usplash Maker \(TUM\)](#)
- [TheeMahn's GDM Maker](#)
- [TheeMahn's XSplash Maker](#)
- [Other tools](#)
- [Ultimate Edition Nautilus Extentions thread](#)

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### [Ultimate Edition Nautilus scripts?](#)

Ultimate Edition Nautilus Scripts is a collection of useful scripts to extend the right click functionality of Nautilus.

#### As of Version 1.4 Package contents:

- Auto Thumbnail
- Browse as root
- Convert image to GIF
- Convert image to JPG
- Convert image to PNG
- Copy to ...
- Copy to Desktop
- Copy to Download
- Copy to Home

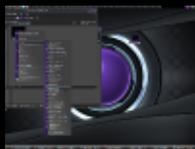
- Link to ...
- Link to Desktop
- Link to Download
- Link to Home
- MakeGDM
- MakeUsplash
- MakeXsplash
- MountISO
- Move to ...
- Move to Desktop
- Move to Download
- Move to Home
- Open with gedit
- Open with gedit as root
- Search in current folder
- Set image as wallpaper
- Terminal Here
- Terminator

---

### **TheeMahn's USplash Maker (TUM)**

Theemahn's USplash Maker (TUM) is a Nautilus extension that makes USplashes based on the users architecture (32 bit / 64bit). You simply right click a picture and hit make USplash & answer a few questions and you have a USplash. Thanks to the help of redteam the images are now palletted producing color coordinated progress bar. A video of this can be seen [here](#).

#### **Beginning process:**



#### **Explanation of what it is about to do:**



#### **Resolution Selection (please leave as default until I can re-write the c code):**



**Going to work:**



**Building Usplash:**



**Prompt for Usplash installation:**



**Installing the Usplash:**



**Load startup manager prompt:**



**U splash Selection (Start up manager):**



---

### **TheeMahn's GDM Maker**

TheeMahn's GDM Maker is a simple tool designed to create GDM's as a Nautilus script. You simply right click a image in Nautilus and hit MakeGDM, answer a few questions and a tar.gz is sitting in the same folder to be loaded into the login manager. Please note: The gdm's created will only work in GDM 2.20 or less IE Jaunty or less. A video of this can be seen [here](#).

**Beginning process:**



**Explanation of GDM:**



**Output of NAME\_ENTERED.tag.gz name (no spaces are allowed):**



**Authors name:**



**Description:**



**Explanation of what is about to transpire:**



**Launch login manager:**



**After clicking add and selecting NAME\_ENTERED.tar.gz file:**



**Does it work (yep):**



The easiest way to test this is to enter the following command in a terminal: `gdmflexiserver -n`

---

### **TheeMahn's XSplash Maker**

TheeMahn's XSplash Maker is a fairly complicated tool designed to create XSplash's as a Nautilus script. You simply right click a image in Nautilus and hit MakeXSplash, answer a few questions and a deb is sitting in the same folder ready to be installed. Please note: You can only have one xsplash installed at a time, if you wish to install anoth XSplash you will need to remove the previously installed xsplash. The XSplash maker will provide you the command to remove it should you decide to change it. A video of this can be seen [here](#).

**Beginning process:**



**Explanation:**



**Animation selection:**



**Distro logo selection:**



Please note by selecting other will bring up a file selection box allowing you to add custom distro logos & by canceling this box no logo will be used.

**Going to work:**



**Author name (enter your name here):**



**Description for your xsplash:**



**Your E-Mail address:**



Prompts you for installation (and tells you the command to later remove it):



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## Other Tools

The other tools included in this deb are mainly geared for productivity. Some are written by me. Eventually all of them will. I intend to remove the dependancy on ubuntu-tweak; if necessary I will write each one of them in one of 3 languages.

**Auto Thumbnail:** Will thumbnail images into a folder called thumbnails based on size selected by the user.

**Browse as root:** Will fire up Nautilus as root.

**Convert image to GIF:** Will convert selected image file to a gif.

**Convert image to JPG:** Will convert selected image file to a jpg.

**Convert image to PNG:** Will convert selected image file to a png.

**Copy to ...:** Will bring up a dialog to ask you where you wish to copy the selected file(s).

**Copy to Desktop:** Will copy the selected file(s) to your Desktop.

**Copy to Download:** Will copy the selected file(s) to your download folder.

**Copy to Home:** Will copy the selected file(s) to your home folder.

**Link to ...:** Will create a symbolic link for the file(s) selected in the folder selected by the dialog box.

**Link to Desktop:** Will create a symbolic link for the file(s) selected on your desktop.

**Link to Download:** Will create a symbolic link for the file(s) selected in your download folder.

**Link to Home:** Will create a symbolic link for the file(s) selected in your home folder.

**MountISO:** Will mount an ISO (disk) image.

**Move to ...:** Will prompt you where you wish to move the currently selected file(s).

**Move to Desktop:** Will move the currently selected file(s) to your desktop.

**Move to Download:** Will move the currently selected file(s) to your download folder.

**Move to Home:** Will move the currently selected file(s) to your home folder.

**Open with gedit:** Will open the currently selected file(s) with gedit.

**Open with gedit as root:** Will open the currently selected file(s) with gedit as root.

**Search in current folder:** Self explanatory.

**Set image as wallpaper:** Will set the currently selected image as your desktop wallpaper.

**Terminal Here:** Will open a terminal in the currently selected folder.

**Terminator:** Will open a terminator (multi-window terminal) in the currently selected folder.

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